Software Requirements Specification

for

<Project Name>

Version 1.0

Prepared by



|  |  |  |
| --- | --- | --- |
| Team Leader | Scott Smoke | ssmoke@una.edu |
| SQA | Riley Smith | rsmith9@una.edu |
| Engineer | Jordan Beck | jbeck@una.edu |
| Engineer | Joshua Ford | jford@una.edu |
| Technical Writer | Jeffrey Allen | jallen2@una.edu |

|  |  |
| --- | --- |
| Instructor : | Patricia Roden, Ph.D |
| Course : | CS455 Software Engineering |

Contents

RevisioNs iii

1 Introduction 1

1.1 Document Purpose 1

1.2 Product Scope 1

1.3 Intended Audience and Document Overview 1

1.4 Definitions, Acronyms and Abbreviations 1

1.5 References and Acknowledgments 2

1.6 Overview 2

2 Overall Description 3

2.1 Product Perspective 3

2.2 Product Functionality 3

2.3 Users and Characteristics 3

2.4 Operating Environment 3

2.5 Design and Implementation Constraints 4

2.6 User Documentation 4

3 Specific Requirements 5

3.1 External Interface Requirements 5

3.2 Functional Requirements 6

3.3 Behaviour Requirements 6

4 Other Non-functional Requirements 7

4.1 Performance Requirements 7

4.2 Safety and Security Requirements 7

4.3 Software Quality Attributes 7

5 Other Requirements 8

6 client-developer agreement 8

Appendix A – Data Dictionary 9

Revisions

| Version | Primary Author(s) | Description of Version | Date Completed |
| --- | --- | --- | --- |
| 1.0 | Jeffrey Allen | Initial draft  Added document’s purpose  Added definitions and acronyms section  Added references and acknowledgements  Added user documentation  Defined intended audience  Added overview of document  Added Product Overview  Added application perspective  Added product functionality  Edited References | 2/20/15 |
| 1.1 |  |  |  |
|  |  |  |  |

# 

# *<In this template you will find text bounded by the “<>” symbols. The word TBD indicates decisions to be made by the team. Yellow highlighted material is ambiguous. Red highlighted material is contradictory. This text appears in italics and is intended to guide you through the template and provide explanations regarding the different sections in this document. There are two types of comments in this document. These comments that are in black are intended specifically for that course. These comments that are in blue are more general and apply to any SRS.*

# Introduction

This section gives a scope description and overview of everything included in this SRS document. Also, the purpose for this document is described and a list of abbreviations and definitions is provided.

## Document Purpose

The purpose of this document is to give a detailed description of the requirements for the “**TBD**” (**TBD**) software package. It will illustrate the purpose and complete declaration for the functionality of the system. It will also explain system constraints, interface and interactions with other external applications. This document is primarily intended to be proposed to a client for its approval and a reference for developing the first version of the system for the development team. Upon agreement of this specification document between the client, Dr. Patricia Roden, and the Tune Squad, both parties will provide their signatures (see section 6).

## Product Scope

The **TBD** application is a desktop application which will allow for two administrative users and multiple general users in the University of North Alabama’s Office of the Registrar to generate a final exam schedule. The application will make use of the data from a previous similar semester to determine trends in popular class times. This application should be able to be obtained by (**TBD** preferably downloaded).

The goal of this software is for a user to be able to display a final exam schedule that has been generated using the software in a similar format displayed on the UNA website as of the year 2015. Previously, a person had to compose schedules by hand which could take days or even weeks to produce a schedule with minimal conflicts. This software attempts to speed up the process by providing a single user with an easy and intuitive work environment by providing a small subset of data to produce a high quality exam schedule. After a final exam schedule is created, only an administrator will be able to finalize the schedule that has been generated.

<Provide a short description of the software being specified and its purpose, including relevant benefits, objectives, and goals.

TO DO: 1-2 paragraphs describing the scope of the product. Make sure to describe the benefits associated with the product.>

## Intended Audience

This document is intended to be read by the client professor, VPAA, the individuals located in the Office of the Registrar that will be using this software, and the Tune Squad development team.

<Describe the different types of reader that the document is intended for, such as developers, project managers, marketing staff, users, testers, and documentation writers (In your case it would probably be the “client” and the professor).

## Definitions, Acronyms and Abbreviations

|  |  |
| --- | --- |
| **Term** | **Definition** |
| Wish | A desirable level of achievement that may not be attainable through available means contained in a language statement |
| User | Someone who interacts with the desktop application |
| UNA | University of North Alabama |
| SRS | Software Specification Document |
| Developer | A member of the Tune Squad |
| Admin/Administrator | System administrator who is given specific permission for managing and controlling the system |
| VPAA | Vice President of Academic Affairs |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

<Define all the terms necessary to properly interpret the SRS, including acronyms and abbreviations. You may wish to build a separate glossary that spans multiple projects or the entire organization, and just include terms specific to a single project in each SRS.

## References and Acknowledgments

[1] IEEE Software Engineering Standards Committee, “IEEE Std 830-1998, IEEE Recommended Practice for Software Requirements Specifications”, October 20, 1998.

[2] University of North Alabama Official Colors, http://www.una.edu/graphic-standards/print-web/

List any other documents or Web addresses to which this SRS refers. These may include user interface style guides, contracts, standards, system requirements specifications, use case documents, or a vision and scope document.

## Overview

In section 2 the application’s functionality is described at a high-level. In section 3, a detailed description of its requirements is presented, including functional requirements and uses cases. Afterwards, located in section 4, are where the non-functional requirements such as authentication error handling and help messages.

# Overall Description

## This section of the SRS describes application at a high-level. The application will be explained in its context to show how it interacts with other systems and introduce basic functionality of it.

## Application Perspective

The **TBD** application is a new and self-contained product of the University of North Alabama. Its only dependency is an external printer in the event a user wishes to print their results of generating a final exam schedule.

## Product Functionality

After successfully authenticating themselves during the login processes, a user will be able to generate final exam schedules. [**TBD** explanation of a user first logging in] The result of generating a final exam schedule will be based on two separate data files provided by the user. The first file provides the application with details which define the time constraints of the exam schedule. This file can either be created with assistance of the software, or it can be loaded from a separate input file. The second file **must** be one that is loaded from a separate file which will provide the application with the data gathered from a previous semester.

The result of generating a final exam schedule from the two files will immediately be displayed in a similar format the University’s website presents the schedule of final exams (see figure 1). A user will be able to view either a single date of class schedules or the schedule in its entirety.

Depending upon the type of user utilizing the application, an administrator will have the option to finalize a schedule that has been generated. This will label the project as “Administratively Approved,” which will apply a seal of approval to all printed documents associated with the finalized schedule.

Figure 1

A user that has questions about the software can refer to the help menu. This menu will demonstrate to the user how to use the application.

<Summarize the major functions the product must perform or must let the user perform. Details will be provided in Section 3, so only a high level summary is needed here. Organize the functions to make them understandable to any reader of the SRS.

TO DO:

1. Provide a bulleted list of all the major functions of the system

## Users and Characteristics

The users of this application will be the VPAA and individuals at the Office of the Registrar. All users should be familiar with opening desktop applications and maneuvering file systems. The VPAA will have an administrative account, and the multiple users at the Office of the Registrar will be considered general users. Privileges are the separating factor between these two different categories of accounts. The privileges of each category are described below.

**TBD:** Considering moving to “3.2 Functional requirements”

### *General Users*

#### Authenticate

General users have the privilege to authenticate themselves as valid users who have been verified by an administrator may operate the application.

**Locked accounts:** After 4 failed authentication attempts, the user’s account will be locked. The only method to unlock the account is for an administrator to log into the system and unlock the account.

#### Define details concerning the exam session times

A general user is able to provide the application with details which define the time constraints of the exam schedule to be generated. The specific details include:

##### Number of days to schedule

##### The beginning time of the first exam of the day

1. Length of time for each exam
2. Length of time between exams
3. Length of time for a lunch period

#### Generate Schedule

An authenticated user will be able to generate final exam schedules when they provide valid details (see section 2.3.1.2) and a valid file representing a previous year’s schedule.

#### Reschedule

After a general user has generated a final exam schedule, they will have the ability to reschedule.

#### Save Schedule

A general user will have the ability to save any information related to an exam schedule.

#### Print Schedule

A general user will be able to

### *Administrative Users*

In addition to having all the privileges a general user have, an administrator will be able to do the following.

#### Create/Delete a General User

#### Lock and Unlock Account

#### Finalize schedule

<Identify the various users that you anticipate will use this product. Users may be differentiated based on frequency of use, subset of product functions used, technical expertise, security or privilege levels, educational level, or experience.

TO DO:

1. Describe the pertinent characteristics of each user. Certain requirements may pertain only to certain users.

3. Distinguish the most important users for this product from those who are less important to satisfy.>

## Operating Environment

The environment in which the software will be developed and operated is in x. The desktop platform **TBD**

<Describe the environment in which the software will operate, including the hardware platform, operating system and versions, and any other software components or applications with which it must peacefully coexist. In this part, make sure to include a simple diagram that shows the major components of the overall system, subsystem interconnections, and external interface

TO DO: As stated above, in at least one paragraph, describe the environment your system will have to operate in. Make sure to include the minimum platform requirements for your system. >

## Design and Implementation Constraints

**TBD**

<Describe any items or issues that will limit the options available to the developers. These might include: hardware limitations (timing requirements, memory requirements); interfaces to other applications; specific technologies, tools, and databases to be used; parallel operations; language requirements; communications protocols; security considerations; design conventions or programming standards (for example, if the customer’s organization will be responsible for maintaining the delivered software).

TO DO: In this section you need to consider all of the information you gathered so far, analyze it and correctly identify at least 5 constraints.>

## User Documentation

The user manual for this application can be found electronically by first clicking the tab labeled “Help” in the menu bar of the application, and then clicking “User’s Manual”. A hard copy of the manual will accompany the final submission of the project.

# Specific Requirements

Descriptions of all functional requirements are described in this section. There are detailed descriptions of all the interfaces in the system and all of the application’s features.

## External Interface Requirements

This section provides a detailed description of all inputs into and outputs from the application. It also contains a description of the hardware and software interfaces. Basic prototypes of the user interface are also provided in this section.

### User Interfaces

<Describe the logical characteristics of each interface between the software product and the users. This may include sample screen images, any GUI standards or product family style guides that are to be followed, screen layout constraints, standard buttons and functions (e.g., Cancel) that will appear on every screen, error message display standards, and so on. Define the software components for which a user interface is needed.

TO DO: The least you can do for this section is to describe in words the different User Interfaces and the different screens that will be available to the user. Those who will be able to provide optional Graphical User Interface screenshots, will be rewarded by extra marks.>

### Hardware Interfaces

The product will be able to communicate with printers through libraries available to the programming language of choice.

<Describe the logical and physical characteristics of each interface between the software product and the hardware components of the system. This may include the supported device types, the nature of the data and control interactions between the software and the hardware. You are not required to specify what protocols you will be using to communicate with the hardware, but it will be usually included in this part as well.

TO DO: Please provide a short description of the different hardware interfaces. If you will be using some special libraries to communicate with your software mention them here. In case you have more than one hardware interface divide this section into subsections.>

### Software Interfaces

#### Save File Dialog

#### Load File Dialog

#### Print Dialog

<Describe the connections between this product and other specific software components (name and version), including databases, operating systems (Windows? Linux? Etc…), tools, libraries, and integrated commercial components. Identify the data items or messages coming into the system and going out and describe the purpose of each. Describe the services needed and the nature of communications. Identify data that will be shared across software components. If the data sharing mechanism must be implemented in a specific way (for example, use of a global data area in a multitasking operating system), specify this as an implementation constraint.

TO DO: The previous part illustrates some of the information you would usually include in this part of the SRS document. To make things simpler, you are only required to describe the specific interface with the operating system.>

### Communications Interfaces

<Describe the requirements associated with any communications functions required by this product, including e-mail, web browser, network server communications protocols, electronic forms, and so on. Define any pertinent message formatting. Identify any communication standards that will be used, such as FTP or HTTP. Specify any communication security or encryption issues, data transfer rates, and synchronization mechanisms.

TO DO: Do not go into too much detail, but provide 1-2 paragraphs were you will outline the major communication standards. For example, if you decide to use encryption there is no need to specify the exact encryption standards, but rather, specify the fact that the data will be encrypted and name what standards you consider using. >

## Functional Requirements

The **TBD** application will allow its users to create a final exam schedule that will make use of data from previous similar semesters to determine trends in popular class times. The application will: (1) provide an authentication system; (2) prompt for two file names; (3) construct a final exam schedule; (4) display the schedule; (5) allow for manual modification of the schedule; (6) and save the schedule to a file.

### Authentication System

### Prompt for File Names

### Construct the Final Exam Schedule

### Display the Schedule

### Allow for Manual Modification of the Schedule

### Save the Schedule to a File

### Reschedule Using the Same Two Files

*< Functional requirements capture the intended behavior of the system. This behavior may be expressed as services, tasks or functions the system is required to perform. This section is the direct continuation of section 2.2 where you have specified the general functional requirements. Here, you should list in detail the different product functions with specific explanations regarding every function.*

*TO DO: Brake the functional requirements to several functional areas and divide this section into subsections accordingly. Provide a detailed list of all product operations related to these functional areas.*

## Behaviour Requirements

### Use Case View

[**TBD** get the usecase diagram from Jeffrey and his lucidchart account.]

<A use case defines a goal-oriented set of interactions between external actors and the system under consideration. Since sometimes we will not be able to specify completely the behaviour of the system by just State Diagrams, we use use-cases to complete what we have already started in section 3.3.1.

TO DO: Provide a use case diagram which will encapsulate the entire system and all possible actors. Do not include detailed use case descriptions (these will be needed when you will be working on the Test Plan), but make sure to include a short description of what every use-case is, who are the actors in your diagram. For more information please refer to your UML guide and the MiniThermostat SRS example file.>

# Other Non-functional Requirements

## Performance Requirements

<If there are performance requirements for the product under various circumstances, state them here and explain their rationale, to help the developers understand the intent and make suitable design choices. Specify the timing relationships for real time systems. Make such requirements as specific as possible. You may need to state performance requirements for individual functional requirements or features.

TODO: Provide at least 5 different performance requirements based on the information you collected from the client. For example you can say “1. Any transaction will not take more than 10 seconds, etc…>

## Safety and Security Requirements

<Specify those requirements that are concerned with possible loss, damage, or harm that could result from the use of the product. Define any safeguards or actions that must be taken, as well as actions that must be prevented. Refer to any external policies or regulations that state safety issues that affect the product’s design or use. Define any safety certifications that must be satisfied. Specify any requirements regarding security or privacy issues surrounding use of the product or protection of the data used or created by the product. Define any user identity authentication requirements.

TODO:

Lockout, encryption

* Provide at least 3 different safety requirements based on your interview with the client or, on your ABM related research, and again you need to be creative here.
* Describe briefly what level of security is expected from this product by your client and provide a bulleted (or numbered) list of the major security requirements.>

## Software Quality Attributes

<Specify any additional quality characteristics for the product that will be important to either the customers or the developers. Some to consider are: adaptability, availability, correctness, flexibility, interoperability, maintainability, portability, reliability, reusability, robustness, testability, and usability. Write these to be specific, quantitative, and verifiable when possible. At the least, clarify the relative preferences for various attributes, such as ease of use over ease of learning.

TODO: Use subsections (e.g., 4.3.1 Reliability, 4.3.2 Portability, etc…) provide requirements related to the different software quality attributes. Base the information you include in these subsections on the material you have learned in the class. Make sure, that you do not just write “This software shall be maintainable…” Indicate how you plan to achieve it, & etc…Do not forget to include such attributes as the design for change. Please note that you need to include at least 2 quality attributes, but it is the mere minimum and it will not receive the full marks.>

# Other Requirements

<This section is **Optional.** Define any other requirements not covered elsewhere in the SRS. This might include database requirements, internationalization requirements, legal requirements, reuse objectives for the project, and so on. Add any new sections that are pertinent to the project.>

6 Client-Developer Agreement

|  |  |  |
| --- | --- | --- |
|  |  |  |
| *Patricia L. Roden, Ph.D, Client* |  | *Date* |
|  |  |  |
| *Scott Smoke, Team Leader* |  | *Date* |
|  |  |  |
| *Riley Smith, SQA* |  | *Date* |
|  |  |  |
| *Jordan Beck, SQA* |  | *Date* |
|  |  |  |
| *Joshua Ford, Engineer* |  | *Date* |
|  |  |  |
| *Jeffrey Allen, Technical Writer* |  | *Date* |

Appendix A – Data Dictionary

*<Data dictionary is used to track all the different variables, states and functional requirements that you described in your document. Make sure to include the complete list of all constants, state variables (and their possible states), inputs and outputs in a table. In the table, include the description of these items as well as all related operations and requirements.>*