Detailed Design

Appendix C: Test Plan

Smart Scheduling

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Smart Scheduling

Detailed Design

Appendix A: Test Plan

Contents

Test Plan Identifier and Introduction

1.1 Introduction

The Test Plan should preview and test the functionality of the inner workings of Smart Scheduling. There are several types of tests that Empire Unlimited will be using to check the functionality of Smart Scheduling. These test types include:

Test Case – The simplest form of testing, concerns a particular action and has two forms: pass or fail.

Unit Test – concerned with the knowledge about testing a program unit, typically developed by a single individual, to determine that it is free of data, logic, or standards errors. This unit includes knowledge of dynamic analysis (equivalent partitioning, boundary value analysis, cause-effect graphing, logic based testing, random testing, and syntax testing) and static analysis (complete path testing, decision testing, condition testing, and data-flow testing). *Extracted from *Software Engineering Body of Knowledge Version 1.0*

Integration Test – concerned with knowledge about validating that software components, which have been unit tested separately, interact correctly when they are put together to perform a higher order function. This unit also includes knowledge about dependency checking for class, data, and processes, and about interface checking in terms of range, type compatibility, representation, number and order of parameters, and method of transfer. *Extracted from *Software Engineering Body of Knowledge Version 1.0*

System Test – concerned with the knowledge about validating the specified functional requirements of a system. This unit includes knowledge about techniques to design and enact an independent testing process of all of the system's functions described in the software requirements specification. *Extracted from *Software Engineering Body of Knowledge Version 1.0*

Acceptance Test – concerned with the knowledge about validating the functional and non – functional requirements of a purchased or acquired system. This unit includes knowledge about techniques for using the contract, the statement of work, the software requirements specification, and the request for proposal to ensure that the delivered system meets all of the requirements (as perceived by

the purchasing or acquiring organization) *Extracted from *Software Engineering Body of Knowledge Version 1.0*

1.2 Test Plan Identifier

The test plan is a dynamic aspect of the documentation for Smart Scheduling. The content of this test plan is meant as a detailed checklist of how the software is meant to perform. The test plan will be adjusted as changes are made to the requirements, either added or deleted, to the software. This document will provided a record of any changes, as well as whether a test is passing or failing at that point in time. An updated version will be provided at the end of the Detailed Design phase, and a finalized version will be provided at the end of the Acceptance Test phase.

Item Pass/Fail Criteria

2.1 Functional Requirements Inventory

This section is the part of the test plan that checks to see if the functional requirements of Smart Scheduling are met. The functional requirements can be physically tested since they are either classified as met or unmet depending on the data that the unit tests provide. It will serve as a high level checklist during our more detailed testing, ensuring Dr. Yoder's requirements are met. The following is a list of the functional requirements for each user.

The requirements are grouped based on the 3 different user types of Smart Scheduling.

2.1.1 Course Coordinator

Will be able to find common time slots to schedule departmental meetings or new classes.

YES NO

Will be able to modify the schedule.

YES NO

Will be able to delete previous schedules.

YES NO

Will be able to delete classes.

YES NO

Will be able to modify classes.

YES NO

Will be able to add new classes.

YES NO

Will be able to securely log into the system using a registered username and password.

YES NO

Will be able to view the current schedule.

YES NO

Will be able to filter the schedule by professor(s).

YES NO

Will be able to filter the schedule by classroom(s).

YES NO

Will be able to create a faculty account, where faculty will be able to access the system.

YES NO

Will be able to view and print room reports.

YES NO

2.1.2 Faculty

Will be able to securely log into the system using a registered username and password.

YES NO

Will be able to view the current schedule.

YES NO

Will be able to filter the schedule by professor(s).

YES NO

Will be able to filter the schedule by classroom(s).

YES NO

Will be able to view and print room reports.

YES NO

Will be able to add office hours or other meeting, where they will be available in order to meet with students or fellow teachers.

YES NO

2.1.3 General User

Will be able to view and print room reports.

YES NO

Will be able to view the current schedule.

YES NO

Will be able to filter the schedule by professor(s).

YES NO

Will be able to filter the schedule by classroom(s).

YES NO

2.1 Non-functional Requirements Inventory

The system will be easily maintained.

The process of maintaining the system should not be time consuming and should require minimal backend programming.

The system will be viewable on multiple browsers.

The software should work well and pass our unit tests independent of the user's web browser choice.

The system will be efficient.

Barring external factors (user latency) the system itself should be fast and responsive.

The system will be user friendly and easy to use.

The interface and general web design should not hinder the user from utilizing the software.

2.2 Exception Handling To Test

There are certain areas in Smart Scheduling where errors can occur due to actions made outside the systems control. The system must be able to handle these types of exceptions.

If a user forgets their password, there must be a method of handling it without having the user be forced to create a new account. If a faculty user forgets their password they will click the “Forgot Password” link found on the login screen, which will send them to another page that will ask them for their email address. Once their email address is submitted an automated email will be sent to them with a link they can follow back to Smart Scheduling where they can change their password.

There are various pages in the system where users will have to fill out a form, such as to write on someone’s wall or to add content to their profile tab. Any required fields will be first handled by JavaScript checking to make sure there is data in them. If there are any required fields that have not been filled in then the submit button will not be active for them to click. A second measure of handling will take place once all fields are filled in by checking that the data is in fact valid.

2.3 Testing Approach

The method our team will use to test Smart Scheduling will be to follow the functional and non-functional requirements as defined in this document and others. The first formal test will be the exhaustive Unit Test as defined below. The Unit Test will test the lowest level functions of the application across each type of screen a user of the system may encounter. Each test will have detailed descriptions of each test. The tester(s) will go through each page in the system checking each test off as passing or failing. The tester(s) will repeat this test on the various web browsers that have been stated below in the acceptance test. An Integration/Regression Test (defined later in this document) will then be implemented to ensure that while each unit in the Unit Test is passed, it does not interfere with other units in the Unit Test. Our hope is that this will help to ensure that no errors are overlooked and can be fixed or at the very least reported on in the comments section.

When errors occur or Unit Tests are failed, the team will coordinate to come up with a solution to the problem and then the Unit Test will be performed again, completely, to ensure that nothing else was changed in fixing the previous problem. The Integration/Regression Test will be implemented once we are satisfied that the Unit Test has been passed acceptably, with all failed units either fixed or reported on. If the Regression Test determines that there are issues of one feature breaking another feature, the team will again coordinate to fix the problem. The Unit Test should then be re-implemented to ensure that while fixing the problem another problem was not caused and then re-implementing the Regression Test.

In order to test the Non-Functional Requirements the tester(s) will have to use the system keeping in mind each of the specific Non-Functional Requirement and weighing whether Smart Scheduling passes each one.

2.4 Acceptance Test – Acceptance Criteria

A software project test plan is a document that describes the objectives, scope, approach, and focus of a software testing effort. The process of preparing a test plan is a useful way to think through the efforts needed to validate the acceptability of a software product. The completed test plan will serve to help anyone that is not involved in the testing to understand the 'why' and 'how' of product validation. The test plan documents the approach that will be used to authenticate and make certain that a product or system that is being tested meets the requirements and other conditions.

The acceptance criteria will be determined by the functional requirements inventory listed in section 1.3 of this document and the non-functional requirements inventory listed in section 1.4 of this document. By definition, functional requirements are what the system will be able to do and what is testable about the system while in contrast, the non-functional requirements define how the system will be; the elements of the system that are not testable. At the completion of this project, team Empire Unlimited will determine which of these requirements were met and which were not met. Please refer to the sections listed above, functional and non-functional requirements, to see the complete listing but keep in mind that these requirements are subject to change and can be added to as more information is gathered.

Smart Scheduling will be tested on both Windows and Mac operating systems and with the four major browsers Internet Explorer 7 and 8, Mozilla Firefox, Safari and Google Chrome. Testing requirements will be decided upon and developed by Empire Unlimited. The first set of tests will be a set of individual unit tests that will break the system down into separate modules. Each individual unit of the module will be tested separately from every other unit and module. Once it has been determined that each individual unit works correctly, the module test will be performed, which will test all units of that module together. Next the integration test will be preformed. This test will bring all the modules together to be tested and make sure they run properly. The system test will be a combination of all tests. This will connect all of the units and modules and bring the entire system back together to be tested further as one whole entity. In the next document, the Detailed Design, tests will be written out for each unit and then the results of all of these tests will be presented in the Acceptance Test document where it will be determined whether or not all requirements were met.

2.5 Unit Test Directory

The following is a list of all separate units that will be tested. Once each of these unit tests passes, a full system test will be performed to ensure correctness and efficiency.

List of Units

Add Faculty member
Authenticate
Update Class

2.6.1 Unit Test Cases

A test case includes the test number and description of the test. The action to be performed, or the input entered by the user, the state before the test, and the expected result are described for the three units below. There are cases described for the correct actions of users as well as incorrect actions. After the tests have actually been performed, the observed results will be recorded.

There is a column in the Unit Test Directory that tells which units are integrated with the other units. When something in one of the units is changed we must test the related units to make sure they still work. This is an example of integration testing in our test plan

2.6.2 Directory of Unit Test

System Test **- Test Results**

Team Name **Empire Unlimited**
Project Name **Smart Scheduling**
Client Name **Dr. Yoder**

Directory of *Unit Tests* (note: this could also be called an ***Index*** or a ***Catalog***)

Pass/Fail Status		Unit Number	Unit Test Name	Date Last Tested	Comments or brief description	Integrated with these units
P	F	1	Add Faculty Member	1/0/1900		2,3
F	F	2	Authenticate	1/0/1900		1
F	F	3	Update Class	1/0/1900		1
P	F	4	View All Faculty	1/0/1900		1
P	F	5	View All Rooms	1/0/1900		6,7
P	F	6	New Rooms	1/0/1900		5,7
P	F	7	View Current Courses	1/0/1900		5,8,9
P	F	8	New Course	1/0/1900		7,9,11
P	F	9	View Current Offerings	1/0/1900		8
P	F	10	New Offering	1/0/1900		5,7,9
P	F	11	This Week	1/0/1900		7,9
P	F	12	Today	1/0/1900		7,9,11

2.6.3 Add Faculty Member

Smart Scheduling
Add Faculty Member
Allows coordinator to create a faculty account.

	Test Case									
Pass/Fail Status	**Test Number**	**Description**	**Action to perform test (input)**	**Steps to be Executed**	**State Before Test**	**Expected result**	**Observed result**	**Comments**	**Tested By**	**Test Date**
F	1.001	Null Username Field	Leave username	Fill out remainder	Empty Form.	Displays message				
F	1.002	Invalid Character Entry in Username Field	Put a special character into an entry field.	Press submit.	Empty Form.	Error message "Please do not enter special characters in the Username Field"				
F	1.003	Null First Name Field	Leave first name field blank.	Fill out remainder of form. Press submit.	Empty Form.	Displays message "Please fill out First name Field"				
F	1.004	Null Last Name Field	Leave last name field blank.	Fill out remainder of form. Press submit.	Empty Form.	Displays message "Please fill out Last name Field"				
F	1.005	Invalid Character Entry in First name Field	Put a special character into an entry field.	Press submit.	Empty Form.	Error message "Please do not enter special characters in the First Name Field"				
F	1.006	Invalid Character Entry in Last name Field	Put a special character into an entry field.	Press submit.	Empty Form.	Error message "Please do not enter special characters in the Last Name Field"				
F	1.007	Correct Information is put in First Name	Enter valid information into the First Name Field	Fill out the remainder of the form, press submit.	Empty Form.	No error message should appear regarding the First Name field.				
F	1.008	Correct Information is put in Last Name	Enter valid information into the Last Name Field	Fill out the remainder of the form, press submit.	Empty Form.	No error message should appear regarding the Last Name field.				
F	1.009	Correct Information is put in Status	Enter valid information into Status Field	Fill out the remainder of the form, press submit.	Empty Form.	No error message should appear regarding the Last Name field.				

F	= Unit Summary		0%	passing	0	passed		Date of last test = 1/0/00
	8	tests			8	failed		

2.6.4 Authenticate

Smart Scheduling

Authenticate

Allows users to log on using their accounts.

	Test Case									
Pass/Fail Status	**Test Number**	**Description**	**Action to perform test (input)**	**Steps to be Executed**	**State Before Test**	**Expected result**	**Observed result**	**Comments**	**Tested By**	**Test Date**
F	2.001	Null Username Field	Leave username field blank.	Fill out remainder of form. Press submit.	Empty Form.	Displays message "Please fill out username				
F	2.002	Null Password Field	Leave password field blank.	Fill out remainder of form. Press submit.	Empty Form.	Displays message "Please fill out Password Field"				
F	2.003	Incorrect Password for given username.	Input incorrect Username and password combination.	Press submit.	Empty Form.	Displays message: "Username and Password combination do not match our records."				
F	2.004	Non-existing username.	Input a username which does not exist.	Fill out remainder of form. Press submit.	Empty Form.	Displays message: "Username and Password combination do not match our records."				
F	2.005	Link to Reset password.	Click on link.	Click on the "Reset password" link.	Empty Form.	Should redirect to reset password screen.				
F	2.006	Link to About Smart Scheduling.	Click on link.	Click on the "About Smart Scheduling" link.	Empty Form.	Should redirect to about Smart Scheduling				
F	2.007	Correct Information is put in Username field	Enter valid information into the Username Field	Fill out the remainder of the form, press submit.	Empty Form.	No error message should appear regarding the Username field. Redirected to home page.				
F	2.008	Correct Information is put in Password field	Enter valid information into the Password Field	Fill out the remainder of the form, press submit.	Empty Form.	No error message should appear regarding the Password field. Redirected to home page.				
F	**= Unit Summary**		**0%**	**passing**	**0**	**passed**		**Date of last test =**		**1/0/00**
	8	**tests**			**8**	**failed**				

2.6.5 Update Class

Smart Scheduling

Update Class

The coordinator updates a class.

	Test Case									
Pass/Fail Status	**Test Number**	**Description**	**Action to perform test (input)**	**Steps to be Executed**	**State Before Test**	**Expected result**	**Observed result**	**Comments**	**Tested By**	**Test Date**
F	3.001	Null Course Number	Leave Course Number field blank	Press Submit	Original Data	Displays message "Please fill out Course Number Field"				
F	3.002	Null Description	Leave Description field blank	Press Submit	Original Data	Displays message "Please fill out Description Field"				
F	3.003	Null Teacher	Leave teacher field blank.	Press Submit	Original Data	Displays message "Please fill out Teacher Field"				
F	3.004	Null Attendees	Leave Attendees field blank	Press Submit	Original Data	Displays message "Please fill out Attendees Field"				
F	3.005	Correct Information is put in Course Number field	Enter valid information into the Course Number Field	Fill out the remainder of the form, press submit.	Original Data	No error message should appear regarding the Course Number field.				
F	3.006	Correct Information is put in Description field	Enter valid information into the Description Field	Fill out the remainder of the form, press submit.	Original Data	No error message should appear regarding the Description field.				
F	3.007	Correct Information is put in Attendees field	Enter valid information into the Attendees Field	Fill out the remainder of the form, press submit.	Original Data	No error message should appear regarding the Attendees field.				
F	3.008	Correct Information is put in Teacher field	Enter valid information into the Teacher Field	Fill out the remainder of the form, press submit.	Original Data	No error message should appear regarding the Teacher field.				
F	= Unit Summary		0%	passing	0	passed		Date of last test =		1/0/00
	8	tests			8	failed				

2.6.6 View All Faculty

Smart Scheduling
View All Faculty
View All Faculty Accounts

	Test Case									
Pass/Fail Status	**Test Number**	**Description**	**Action to perform test (input)**	**Steps to be Executed**	**State Before Test**	**Expected result**	**Observed result**	**Comments**	**Tested By**	**Test Date**
F	4.001	Populates	Load page	Hit refresh button after a change	Pre-Populated form	Displays change that was just made.				
F	4.002	"Show" hyperlink works.	Click on "Show"	Click "Show"	Pre-Populated form	Menu will display faculty information.				
F	4.003	"Edit" hyperlink works.	Click on "Edit"	Click "Edit"	Pre-Populated form	Menu displaying populated text fields which can be changed.				
F	4.004	"Delete" hyperlink works.	Click on "Delete"	Click "Delete"	Pre-Populated form	A notification displaying "Are you sure" with yes and no radio buttons. If yes, notification and removal of faculty from list.				
F	**= Unit Summary**		**0%**	**passing**	**0**	**passed**		**Date of last test =**		**1/0/00**
	4	**tests**			**4**	**failed**				

2.6.7 View All Rooms

Smart Scheduling										
View All Rooms										
View All Rooms in the Building										
	Test Case									
Pass/Fail Status	**Test Number**	**Description**	**Action to perform test (input)**	**Steps to be Executed**	**State Before Test**	**Expected result**	**Observed result**	**Comments**	**Tested By**	**Test Date**
F	5.001	Populates	Load page	Hit refresh button after a change	Pre-Populated form	Displays change that was just made.				
F	5.002	"Show" hyperlink works.	Click on "Show"	Click "Show"	Pre-Populated form	Menu will display room information.				
F	5.003	"Edit" hyperlink works.	Click on "Edit"	Click "Edit"	Pre-Populated form	Menu displaying populated text fields which can be changed.				
F	5.004	"Delete" hyperlink works.	Click on "Delete"	Click "Delete"	Pre-Populated form	A notification displaying "Are you sure" with yes and no radio buttons. If yes, notification and removal of faculty from list.				
F	**= Unit Summary**		**0%**	**passing**	**0**	**passed**		**Date of last test =**		**1/0/00**
	4	**tests**			**4**	**failed**				

2.6.8 New Room

Smart Scheduling

New Rooms

Edit information regarding a room

	Test Case									
Pass/Fail Status	**Test Number**	**Description**	**Action to perform test (input)**	**Steps to be Executed**	**State Before Test**	**Expected result**	**Observed result**	**Comments**	**Tested By**	**Test Date**
F	6.001	Populates	Load page	Hit refresh button after a change	Pre-Populated form	Displays change that was just made.				
F	6.002	Only Correct Input	Fill in data fields with incorrect input.	Fill in the fields.	Empty Form	Shows an error.				
F	= Unit Summary		0%	passing	0	passed		Date of last test =		1/0/00
	2	tests			2	failed				

2.6.9 View Current Courses

Smart Scheduling

View Current Courses

View all Courses Being Taught

	Test Case									
Pass/Fail Status	**Test Number**	**Description**	**Action to perform test (input)**	**Steps to be Executed**	**State Before Test**	**Expected result**	**Observed result**	**Comments**	**Tested By**	**Test Date**
F	7.001	Populates	Load page	Hit refresh button after a change	Pre-Populated form	Displays change that was just made.				
F	7.002	"Show" hyperlink works.	Click on "Show"	Click "Show"	Pre-Populated form	Menu will display course information.				
F	7.003	"Edit" hyperlink works.	Click on "Edit"	Click "Edit"	Pre-Populated form	Menu displaying populated text fields which can be changed.				
F	7.004	"Delete" hyperlink works.	Click on "Delete"	Click "Delete"	Pre-Populated form	A notification displaying "Are you sure" with yes and no radio buttons. If yes, notification and removal of faculty from list.				
F	**= Unit Summary**		**0%**	**passing**	**0**	**passed**		**Date of last test =**		**1/0/00**
	4	**Tests**			**4**	**Failed**				

2.6.10 New Coarse

Smart Scheduling

New Course

Edit information regarding a Course

	Test Case									
Pass/Fail Status	**Test Number**	**Description**	**Action to perform test (input)**	**Steps to be Executed**	**State Before Test**	**Expected result**	**Observed result**	**Comments**	**Tested By**	**Test Date**
F	8.001	Populates	Load page	Hit refresh button after a change	Pre-Populated form	Displays change that was just made.				
F	8.002	Only Correct Input	Fill in data fields with incorrect input.	Fill in the fields.	Empty Form	Shows an error.				
F	**= Unit Summary**		**0%**	**passing**	**0**	**passed**		**Date of last test =**		**1/0/00**
	2	**tests**			**2**	**failed**				

Smart Scheduling

View Current Courses

View all Courses Being Taught

2.6.11 View Current Offerings

	Test Case									
Pass/Fail Status	**Test Number**	**Description**	**Action to perform test (input)**	**Steps to be Executed**	**State Before Test**	**Expected result**	**Observed result**	**Comments**	**Tested By**	**Test Date**
F	7.001	Populates	Load page	Hit refresh button after a change	Pre-Populated form	Displays change that was just made.				
F	7.002	"Show" hyperlink works.	Click on "Show"	Click "Show"	Pre-Populated form	Menu will display course information.				
F	7.003	"Edit" hyperlink works.	Click on "Edit"	Click "Edit"	Pre-Populated form	Menu displaying populated text fields which can be changed.				
F	7.004	"Delete" hyperlink works.	Click on "Delete"	Click "Delete"	Pre-Populated form	A notification displaying "Are you sure" with yes and no radio buttons. If yes, notification and removal of faculty from list.				
F	**= Unit Summary**		**0%**	**passing**	**0**	**passed**		**Date of last test =**		**1/0/00**
	4	**Tests**			**4**	**Failed**				

Smart Scheduling

New Offering

New Course Offering

2.6.12 New Offering

	Test Case									
Pass/Fail Status	**Test Number**	**Description**	**Action to perform test (input)**	**Steps to be Executed**	**State Before Test**	**Expected result**	**Observed result**	**Comments**	**Tested By**	**Test Date**
F	10.001	Populates	Load page	Hit refresh button after a change	Pre-Populated form	Displays change that was just made.				
F	10.002	Drop Downs	Drop Down Menus populate	Click drop down arrow	"Please select" displayed in the drop down	Drop Down populates				
F	10.003	Only Correct Input	Fill in data fields with incorrect input.	Fill in the fields.	Empty Form	Shows an error.				
F	**= Unit Summary**		**0%**	**passing**	**0**	**passed**		**Date of last test =**		**1/0/00**
	3	**tests**			**3**	**failed**				

Smart Scheduling

This Week

This week's classes

	Test Case									
Pass/Fail Status	**Test Number**	**Description**	**Action to perform test (input)**	**Steps to be Executed**	**State Before Test**	**Expected result**	**Observed result**	**Comments**	**Tested By**	**Test Date**
F	11.001	Populates	Load page	Hit refresh button after a change	Pre-Populated form	Displays change that was just made.				
F	11.002	Course Selection	Click on course	Click on course	Course boxes displayed by time	Information regarding the course populates on the screen				
F	11.003	Print View	Click "Print View" hyperlink	Click "Print View" hyperlink	Weekly view of courses	Printer friendly view of weekly courses.				
F	= Unit Summary		0%	passing	0	passed			Date of last test =	1/0/00
	3	tests			3	failed				

Smart Scheduling
Today
Today's Classes

	Test Case									
Pass/Fail Status	**Test Number**	**Description**	**Action to perform**	**Steps to be Executed**	**State Before Test**	**Expected result**	**Observed result**	**Comments**	**Tested By**	**Test Date**
F	12.001	Populates	Load page	Hit refresh button after a change	Pre-Populated form	Displays change that was just made.				
F	12.002	Course Selection	Click on course	Click on course	Course boxes displayed by time	Information regarding the course populates on the screen				
F	12.003	Print View	Click "Print View" hyperlink	Click "Print View" hyperlink	Weekly view of courses	Printer friendly view of weekly courses.				
F	**= Unit Summary**		**0%**	**passing**	**0**	**passed**		**Date of last test =**		**1/0/00**
	3	**tests**			**3**	**failed**				

Today
2.6.14

Integration Testing

Integration Testing is concerned with knowledge about validating that software components which have been unit tested separately. It checks that the units interact correctly when they are put together to perform a higher order function. This testing unit also includes knowledge about dependency checking for calls, data, and processes, and about interface checking in terms of range, type compatibility, representation, number and order of parameters, and method of transfer.