

Software Requirements Specification for Exam Management System

Version 1.2

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Revision History

Name	Date	Reason for Changes	Version
Draft	03/02	Initial document	1.0
Second Draft	03/31	Fixing product functions and formats	1.1
Final	04/07	Fixing descriptions and rationales and other issues	1.2

1. Introduction

1.1. Purpose

The purpose of this document is to present a detailed description of the Exam Management System, a system designed to manage students and exams and provide organized records of exam results and program completion by students. It will explain the functions that faculty members and students will be able to access, the interfaces of the system, what the system will do, the constraints under which it must operate and how it will react to external stimuli. This document is intended for both students and faculty members of Texas State University and developers and will be submitted to the customer for approval.

1.2. Scope

The Exam Management System is a software system that will be used by faculty members and students of the Computer Science department of Texas State University. The system will help faculty members and students to track the student progress and determine when and if the student can graduate according to graduation requirements.

More specifically, the system is designed to allow the faculty members to login and create the core, programming, and communication exams. Once the exams are created, the faculty member can view the details of the registered students, edit and view each exam details and publish the results. The system is also designed to assist a faculty member to manage student record information. The system will allow faculty member to add, edit, view, and search the student record information, including the exam results. The system will also allow the faculty to view all students that have completed all the graduation requirements, therefore eligible to graduate.

The system is also designed for students, who can login, register or withdraw from an specific exam, and view its results for all exams.

1.3. Definitions, acronyms, and abbreviations

Term	Definition
TXStateID	Texas State University Student and Faculty Identification

1.4. References

[1] IEEE Software Engineering Standards Committee, "IEEE Std 830-1998, IEEE Recommended Practice for Software Requirements Specifications", June 25 1998. <https://standards.ieee.org/findstds/standard/830-1998.html>

1.5. Overview

The rest of the document is organized as follows: Section 2 gives an overview of the functionality of the product. It describes the informal requirements and is used to establish a context for the technical requirements specification in the following chapter.

Section 3 describes in technical terms the details of the functionalities of the product and is written primarily for the developers.

Both sections of the document describe the same software product in its entirety, but are intended for different audiences and thus use different language.

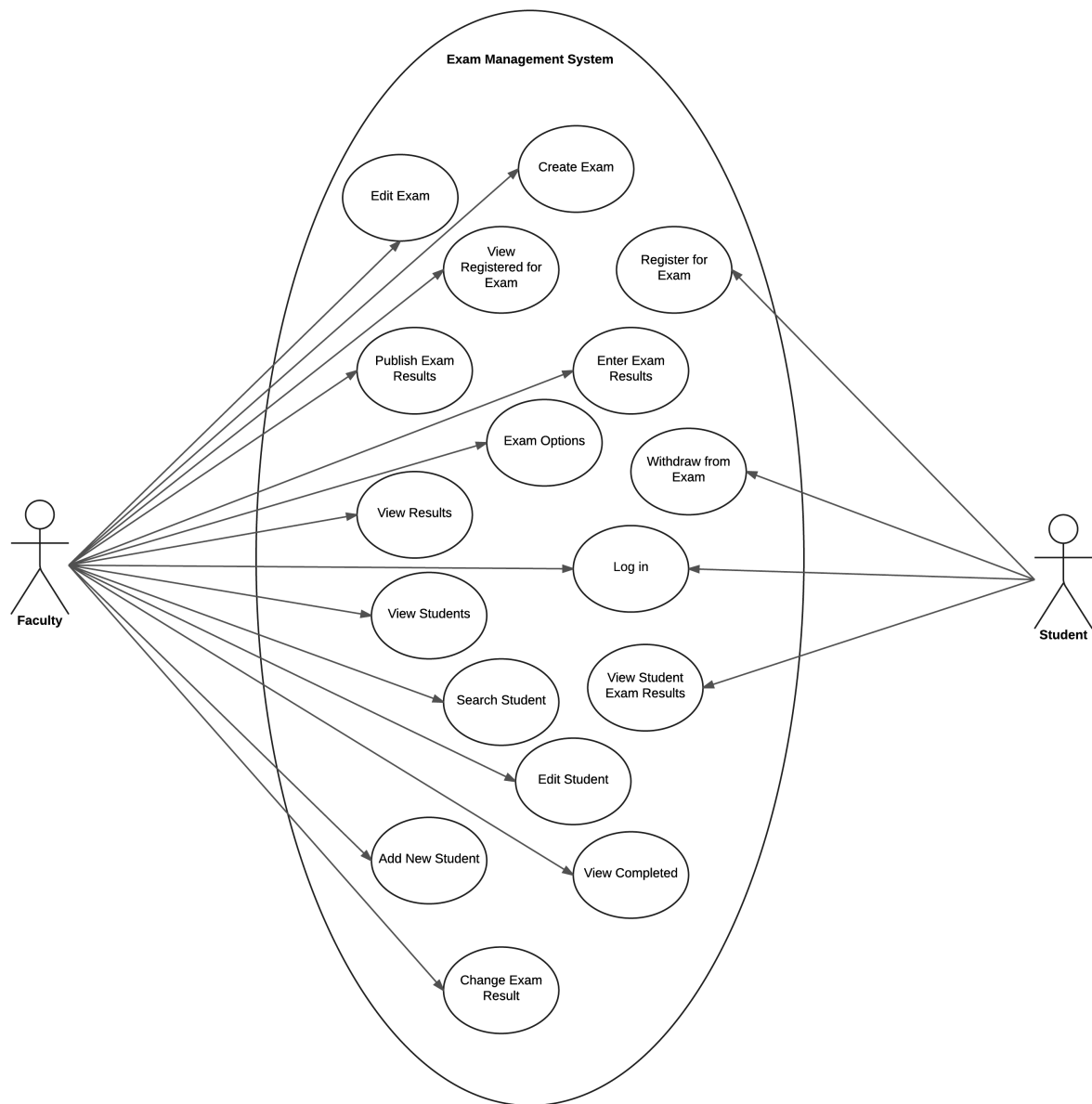


Fig. 1. Summary of use cases

2. Overall Description

2.1. Product Perspective

The Exam Management System is a new web-based application and does not depend or is a part of any other system. It has two different actors: faculty members and students. Both students and faculty members need a compatible web browser and internet access to access the system.

2.2. Product Functions

The online exam management system can be accessed by faculty members and students. The system will assist in tracking the progress of the students and determine whether the student is ready to graduate or not.

The system will provide different functions for both faculty members and students. This section outlines the product functions for faculty members and students pictured on Figure 1.

2.2.1. Shared functions

2.2.1.1. Login

2.2.1.1.1. Description

The user (Faculty or Student) logs in to the Exam Management System using a TxStateID and password.

Rationale: This function will authenticate user access to the Exam Management System.

2.2.2. Faculty functions

2.2.2.1. Create Exam

2.2.2.1.1. Description

The faculty member creates an exam, entering information such as the subject of the exam, when it will take place, where it will take place, the registration capacity, and the registration deadline.

Rationale: This function will make the exam viewable to users (student and faculty) and users will be able to perform the functions provided to them in regard to the exam.

2.2.2.2. Exam Options

2.2.2.2.1. Description

The faculty member lists all exams previously created and has convenient access to exam functions such as: View Registered for Exam, Edit Exam, Enter Exam Results, View Exam Results, Publish Exam Results.

Rationale: This function allows a faculty member to list and manage the exams created.

2.2.2.3. View Registered for Exam

2.2.2.3.1. Description

The faculty member views all the students that have already registered for the selected exam.

Rationale: This function provides a convenient interface for an organized record of students.

2.2.2.4. Edit Exam

2.2.2.4.1. Description

The faculty member edits any exam by changing any of its attributes such as when the exam takes place, where the exam takes place, the exam's status of being cancelled or active, the exam's registration capacity, and the exam's registration deadline.

Rationale: This function provides the Faculty member with an option to change information of an exam to fix any misinformation and/or make changes that are necessary.

2.2.2.5. Enter Exam Results

2.2.2.5.1. Description

The faculty member enters the result of an exam for each student. The result contains information regarding if the student was present and if he/she passed or failed.

Rationale: This function allows the faculty member to maintain an organized record of the exam results and make the results available to all students registered for that exam.

2.2.2.6. View Exam Results

2.2.2.6.1. Description

The faculty member views the exam results and displays statistics relative to the average, the passing rate, and the total number of students marked absent.

Rationale: This function will give the Faculty member access to an interface of statistics and results that can be provided to and maintained by the department.

2.2.2.7. Publish Exam Results

2.2.2.7.1. Description

The faculty member publishes the results for a particular exam and makes the results available to students.

Rationale: This function provides the Faculty member with the ability to share exam results with the Student.

2.2.2.8. View Students

2.2.2.8.1. Description

The faculty member views all students that have been previously added to the exam management system by a faculty member.

Rationale: This function allows the faculty member to manage all students that have access to the system.

2.2.2.9. Add new Student

2.2.2.9.1. Description

The faculty member adds a new student to the system using the student's TxStateID, last name, first name, major, and e-mail.

Rationale: This function gives the faculty member the ability account for any new student that needs to be entered into the system.

2.2.2.10. Search Student

2.2.2.10.1. Description

The faculty member searches for a specific student in the system using the student's TxStateID and/or last name and first name.

Rationale: This function gives the faculty user the ability to access student's information with ease.

2.2.2.11. Edit Student

2.2.2.11.1. Description

The faculty member edits the attributes of a student previously added to the system, with any student's attributes being TxStateID, last name, first name, major, and e-mail.

Rationale: This function provides the faculty member with an option to change information of a Student to fix any misinformation and/or make changes that are necessary.

2.2.2.12. Change Exam Result

2.2.2.12.1. Description

The faculty member selects a student by any view function or by search and changes the given student's published exam result. The result options are pass or fail.

Rationale: This function provides the faculty member with the option to change results that are outdated or wrong.

2.2.2.13. View Completed

2.2.2.13.1. Description

The faculty member views the students who have passed the programming, communication, and core exams.

Rationale: This function allows the faculty member to view students who have passed all exams and are allowed to graduate.

2.2.3. Student functions

2.2.3.1. Register for Exam

2.2.3.1.1. Description

The student registers for an exam that has been made available by faculty members.

Rationale: This function provides the student ability to register for an exam that is open for registration.

2.2.3.2. Withdraw from Exam

2.2.3.2.1. Description

The student withdraws from an exam that he was previously registered.

Rationale: This function provides the student ability to withdrawn from an exam according to its needs.

2.2.3.3. View Student Exam Results

2.2.3.3.1. Description

The student views his own exam results that were already published by faculty members.

Rationale: This function allows the student to track his or her own progress.

2.3. User Classes and Characteristics

The users are faculty members and students from the Texas State University. They have have high education degrees and know how to use a web browser.

2.4. Constraints

2.4.1. Usability

The system shall be implemented in a way that the faculty members and the students can fully use after 2 hours of training.

2.4.2. Availability

The system shall be available 24/7 and must not exceed 30 minutes of unavailability per day.

2.4.3. Security

The system shall use encrypted passwords.

2.4.4. Performance

The system response time shall not exceed 10 seconds for any user interaction event.

2.5. Assumption and Dependencies

Faculty members and students have reliable internet connection to access to the exam management system. They must have a username and password to connect to the system and permission to use appropriate functions.

3. Specific Requirements

3.1. Functions

3.1.1. Shared Functions

3.1.1.1. Login

Function	Login
Description	The user enters username and password. The system verifies the username and password. If the username and password are correct, the user gets logged in the system, otherwise it shows error messages.
Inputs	Username and Password
Source	User
Outputs	Successful login or error messages
Destination	Screen
Pre-condition	The login page is displayed on the user's screen
Post-condition	The user is logged into the system or error messages are displayed on the user's screen.
Side-effects	None

3.1.2. Faculty Functions

3.1.2.1. Create Exam

Function	Create Exam
Description	The Faculty enters exam type, date, start time, end time, semester, location, registration deadline. The system validates the data and creates the exam or shows error messages.
Inputs	Type (Programming, Communication or Core), Date (yyyy-mm-dd format), start time and end time (24hr format HH:MM:SS), Semester (Fall, Spring), Location and Registration deadline (yyyy-mm-dd format)
Source	User
Outputs	New exam or error messages
Destination	Database or Screen
Requires	Logged user with Faculty role.
Pre-condition	Create Exam page is displayed on the user's screen.
Post-condition	The exam is created or error messages are displayed on the user's screen.
Side-effects	None

3.1.2.2. Exam Options

Function	Exam Options
Description	See 2.2.2.2.1
Inputs	None
Outputs	Information for each exam: Type (Programming, Communication or Core), Date (yyyy-mm-dd format), Start and end time (24hr format HH:MM:SS), Semester (Fall, Spring), Location and Registration deadline (yyyy-mm-dd format). List of functions: View Registered for Exam, Edit Exam, Enter Exam Results and Publish Exam Results
Destination	Screen
Requires	Logged user with Faculty role.
Pre-condition	Exam Options page is displayed on the user's screen.
Post-condition	Exam Options page is displayed on the user's screen with the list of exams.
Side-effects	None

3.1.2.3. View Registered for Exam

Function	View Registered for Exam
Description	See 2.2.2.3.1
Inputs	Exam identifier
Source	Database
Outputs	Information for each student: Username, TXStateID, Last name, First name, Results (registered or not), Comments
Destination	Screen
Requires	Logged user with Faculty role.
Pre-condition	The View Registered for Exam page is displayed on the user's screen.
Post-condition	The View Registered for Exam page is displayed on user's screen with a list of students registered.
Side-effects	None

3.1.2.4. Edit Exam

Function	Edit Exam
Description	The system shows the current exam information: exam type, date, start time, end time, semester, location, registration deadline. The user edits the desired information. The system saves the changed data or shows error messages.

Inputs	Exam identifier, Type (Programming, Communication or Core), Date (yyyy-mm-dd format), Start and end time (24hr format HH:MM:SS), Semester (Fall, Spring), Location and Registration Deadline (yyyy-mm-dd format)
Source	Exam type, date, start time, end time, semester, location, registration deadline are input by the user. Exam identifier from the database.
Outputs	Edit Exam successfully or error messages
Destination	Database or Screen
Requires	Logged user with Faculty role.
Pre-condition	Edit Exam page is displayed on user's screen.
Post-condition	The exam gets updated with the new information or error messages are displayed.
Side-effects	None

3.1.2.5. Enter Exam Results

Function	Enter Exam Results
Description	The system shows a list of students registered for the exam showing only the TXStateID. The user enters the results for each student. The system saves the results.
Inputs	TXStateID, Exam identifier, Exam result (noshow, passed, failed)
Source	Exam result is input by the user. TXStateID and exam identifier from the database.
Outputs	Results successfully saved or error messages
Destination	Database or Screen
Requires	Logged user with Faculty role.
Pre-condition	Enter Exam Results page is displayed on the user's screen.
Post-condition	The results are saved to the database or error messages are displayed.
Side-effects	None

3.1.2.6. View Exam Results

Function	View Exam Results
Description	The system shows a list of students registered for the exam and a summary of the exam results: result (noshow, passed, failed), total results, how many passed, how many failed, how many noshow.
Inputs	Exam identifier
Source	Database
Outputs	Username, TXStateID, Last name, First name, Result. Total Results, How many passed, How many failed, how many noshow.

Destination	Screen
Requires	Logged user with Faculty role.
Pre-condition	The View Exam Results page is displayed on the user's screen.
Post-condition	The student list with individual results and summary are displayed on the user's screen.
Side-effects	None

3.1.2.7. Publish Exam Results

Function	Publish Exam Results
Description	See 2.2.2.7.1
Inputs	Exam identifier
Source	Database
Outputs	Publish Exam Results successfully
Destination	Database
Requires	Logged user with Faculty role.
Pre-condition	The Publish Exam Results page is displayed on the user's screen.
Post-condition	The results for the selected exam are published.
Side-effects	The results for the selected exam becomes available for the students.

3.1.2.8. View Students

Function	View Students
Description	See 2.2.2.8.1.
Inputs	None
Source	None
Outputs	Username, TXStateID, Last name, First name, Major, Email, Result of programming exam, Result communication exam, Result of core exam and Exam history (exam name, exam date, exam result)
Destination	Screen
Requires	Logged user with Faculty role.
Pre-condition	The View Students page is displayed on the user's screen.
Post-condition	The student list with all data is displayed on the user's screen.
Side-effects	None

3.1.2.9. Add new Student

Function	Add new Student
Description	The Faculty enters student data: username, txstateid, last name, first name, major, email, result of programming exam, result of communication exam, result of core exams, local phone, local address, local city, local state, local zip. The system saves the new student or display error messages.
Inputs	Username, TXStateID, Last name, First name, Major, Email, Result of Programming Exam, Result of Communication Exam, Result of Core Exams, Local phone, Local address, Local city, Local state, Local zip.
Source	User
Outputs	New Student or error messages
Destination	Database or Screen
Requires	Logged user with Faculty role.
Pre-condition	Add New Student page is displayed on the user's screen.
Post-condition	The new student is created to the database or error messages are displayed on the user's screen.
Side-effects	None

3.1.2.10. Search Student

Function	Search Student
Description	The Faculty enters search data: username, TXStateID, last name, first name, major, email, result of programming exam, result of communication exam, result of core exams. The system shows a list of students in the database according to that search criteria.
Inputs	Username, TXStateID, Last name, First name, Major, Email, Result of Programming Exam, Result of Communication Exam and Result of Core Exams.
Source	User
Outputs	Each student information: Username, TXStateID, Last name, First name, Major, Email, Result of Programming Exam, Result of Communication Exam, Result of Core Exams.
Destination	Screen
Requires	Logged user with Faculty role.
Pre-condition	The Search student page is displayed on the user's screen.
Post-condition	The student list according to the search criteria is displayed on the user's screen.
Side-effects	None

3.1.2.11. Edit Student

Function	Edit Student
Description	The Faculty enters Username or TXStateID. The system loads the student information: username, TXStateID, last name, first name, major, email, programming exam result, communication exam result, core exam results, local phone, local address, local city, local state, local zip. The Faculty edits the student information except for username and TXStateID. The system saves the student information or shows error messages.
Inputs	Username, TXStateID, Last name, First name, Major, Email, Programming Exam Result, Communication Exam Result, Each core exam result, Local phone, Local address, Local city, Local state, Local zip
Source	User
Outputs	Edit Student successfully or error messages
Destination	Database or Screen
Requires	Logged user with Faculty role.
Pre-condition	The Edit Student page is displayed on the user's screen
Post-condition	The student gets updated with the new information or error messages are displayed.
Side-effects	None

3.1.2.12. Change Exam Result

Function	Change Exam Result
Description	The Faculty enters Username or TXStateID. The system loads the student information. The Faculty edits the result information: Programming Exam Result, Communication Exam Result, Core Exam results. The system saves the results.
Inputs	Username, TXStateID, Programming Exam Result, Communication Exam Result, Core Exam Results.
Source	User
Outputs	Change Exam Result successfully or error messages
Destination	Database or Screen
Requires	Logged user with Faculty role.
Pre-condition	The Change Exam Result page is displayed on the user's screen
Post-condition	The student results gets updated with the new information or error messages are displayed.
Side-effects	None

3.1.2.13. View Completed

Function	View Completed
Description	See 2.2.2.13.1

Inputs	None
Outputs	Information for each student: Username, TXStateID, Last name, First name, Major, Email, Result of programming exam, Result of communication exam, Result of core exams
Destination	Screen
Requires	Logged user with Faculty role.
Pre-condition	The View Completed page is displayed on the user's screen
Post-condition	The students that have passed all exams are displayed on the user's screen.
Side-effects	None

3.1.3. Student Functions

3.1.3.1. Register For Exam

Function	Register for Exam
Description	The system shows all exams open for registration. The Student chooses the Exam to register. The system registers the student on the desired exam and makes it available for Faculty.
Inputs	Student identifier, Exam identifier.
Source	Database
Outputs	Successful registration
Destination	Screen and Database
Requires	Logged user with Student role and Exam open for registration.
Pre-condition	The Register for Exam page is displayed on the user's screen
Post-condition	The student is registered for the exam
Side-effects	The student registration becomes available for the Faculty.

3.1.3.2. Withdraw from Exam

Function	Withdraw from Exam
Description	The system shows all exams that the user is registered and the registration deadline has not passed yet. The Student chooses the Exam to withdraw. The system withdraws the student from the desired exam and makes it available for Faculty or shows error messages.
Inputs	Student identifier, Exam identifier.
Source	Database
Outputs	Successful withdrawn or error messages
Destination	Screen and Database

Requires	Logged user with Student role, Student already registered for the Exam and registration deadline has not passed yet.
Pre-condition	The Withdraw from Exam is displayed on the user's screen
Post-condition	The student is withdrawn from the exam or error messages are displayed
Side-effects	The student withdrawn becomes available for the Faculty.

3.1.3.3. View Student Exam Results

Function	View Student Exam Results
Description	See 2.2.3.3.1
Inputs	Student identifier.
Source	Database
Outputs	Result of programming exam, Result of communication exam, Result of core exams
Destination	Screen
Requires	Logged user with Student role.
Pre-condition	The View Student Exam Results page is displayed on the user's screen
Post-condition	The exam results for the logged student are displayed on the user's screen
Side-effects	None