
Product Requirements Document

Use Cases Specification

A Team
SWEN90007 SM2 2020 Project

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1 Introduction

1.1 Proposal

This document specifies the SWEN90007 project use cases, describing the flow of events, inputs and outputs of each use case to be implemented.

1.2 Target Users

This document is mainly intended for SWEN90007 students and teaching team.

1.3 Conventions, terms and abbreviations

This section explains the concept of some important terms that will be used throughout this document. These terms are detailed alphabetically in the following table.

Term	Description
LMS	Learning Management System

2 Actors

Actor	Description
Instructor	Academic teaching staff at the University
Student	The University student who will use the system

3 Use Cases

3.1 Instructor Operations

[UC001] Create Exam

Pre-conditions

The instructor shall have permission to access the subject and manage an exam.

Main Events Flow

1. The instructor selects the subject and creates an exam
2. The system displays some fields that need to be entered
3. The instructor adds a question
4. The system displays an interface for the instructor
5. The instructor selects a question type [AF01][AF02]
6. The instructor enters a mark for this question
7. The instructor continues from the main flow step 3,4,5,6 until done
8. The instructor saves the exam
9. The system validates all questions [EF02]
10. The system stores the data and displays all the questions that created

Alternative Flows

[AF01] Choose the short answer question

1. The instructor enters question description
2. The execution flow continues from the main flow step 7

[AF02] Choose the multiple-choice question

1. The instructor enters question description
2. The instructor enters an answer
3. The instructor continues from [AF03] step 2 until done
4. The execution flow continues from the main flow step 7

Exception Flow

[EF01] Unknown Exception

1. The system logs the runtime exception that has happened during the application execution however not recognized

[EF02] Known Exception

1. The system logs an exception during the execution [UC013]

Post-conditions

The instructor visualized all the exam questions that he/she just created on the page, including question descriptions, question-answer options, each question mark, and total marks of the exam.

[UC002] View Exam

Pre-conditions

The instructor shall have permission to access the subject and manage an exam; there is at least one exam that exists in the subject.

Main Events Flow

1. The instructor selects and updates an exam
2. The system displays all the general information of these exams
3. The instructor enters the detailed exam page
4. The system displays all the questions in that exam
5. The instructor goes back to the homepage

The instructor repeats step 1, 2, 3, 4, 5 until done.

Exception Flow

[EF01] Unknown Exception

1. The system logs the unknown runtime exception which happens while the application is executing

Post-conditions

The system state remains unchanged.

[UC003] Update Exam

Pre-conditions

The exam exists, there is no student currently taking the exam and the exam has not been submitted by any student.

Main Events Flow

1. The instructor selects the exam from the subject homepage
2. The system displays all questions of the exam
3. The instructor makes changes to questions
4. The instructor saves the exam [AF01][AF02]

The instructor repeats step 3 until done.

Alternative Flows

[AF01] Student is taking the exam

1. The system logs an exception [EF02]
2. The system refuses to update

[AF02] Student has submitted the exam

1. The system logs an exception [EF02]
2. The system refuses to update

Exception Flow

[EF01] Unknown Exception

1. The system logs the unknown runtime exception which happens while the application is executing

[EF02] Known Exception

1. The system logs an exception during the execution [UC013]

Post-conditions

The exam is updated by the instructor and changes are saved to the exam.

[UC004] Delete Exam

Pre-conditions

The instructor shall have permission to access the subject and manage an exam; there is at least one exam that exists in the subject.

Main Events Flow

1. The instructor selects and deletes the exam
2. The system validates if the exam is deletable [AF01][AF02]
3. The system deletes exam and displays a succeed message

Alternative Flows

[AF01] Student is taking the exam

1. The system logs an exception [EF02]
2. The system refuses to delete

[AF02] Student has submitted the exam

1. The system logs an exception [EF02]
2. The system refuses to delete

Exception Flow

[EF01] Unknown Exception

1. The system logs the unknown runtime exception which happens while the application is executing

[EF02] Known Exception

1. The system logs an exception during the execution [UC013]

Post-conditions

The deleted exam is removed from the database.

[UC005] Publish Exam

Pre-conditions

The instructor shall have permission to access the subject and manage an exam; there is at least one exam that exists in the subject and that exam has not been published before.

Main Events Flow

1. The instructor selects and publishes the exam
2. The exam is published

Exception Flow

[EF01] Unknown Exception

1. The system logs the unknown runtime exception which happens while the application is executing

Post-conditions

The published exam is available to all students.

[UC006] Close Exam

Pre-conditions

The exam is created and published, and the instructor has access to the exam.

Main Events Flow

1. The instructor selects and closes the exam [AF01][AF02]
2. The system saves all submissions

Alternative Flows

[AF01] Student is taking the exam

1. The student is currently doing the exam
2. The system creates a new submission with all answers recorded as “unanswered”

[AF02] Not attempt the exam

1. The student has not attempted to take the exam.
2. The system creates a new submission with all answers recorded as “unanswered” for the student

Exception Flow

[EF01] Unknown Exception

1. The system logs the unknown runtime exception which happens while the application is executing

Post-conditions

The exam is closed, no one can enter the exam and all submissions are saved to the system.

[UC007] Mark Exam

Pre-conditions

The student has submitted the exam, or the exam is closed. The subject instructor has permission to access all the exams in the subject.

Main Events Flow

1. The instructor sees a table of all the students and their exams in this subject.

2. The instructor selects a student to view the student's detailed exam. [AF01]
3. The instructor sees all the question answers given by the student
4. The instructor gives marks to each question.
5. The instructor saves the marks
6. The student's exam mark is calculated and saved by the system.
7. The instructor publishes the results

Alternative Flows

[AF01] Enter score in the table view mode

1. The instructor enters the total mark for the student's exam
2. The instructor saves the entered score
3. The execution flow continues from the main flow 6

Exception Flow

[EF01] Unknown Exception

1. The system logs the unknown runtime exception which happens while the application is executing

Post-conditions

All the exams are marked, and the students are able to view the scores.

Additional Information

Exam Question Fields

Field	Description	Type	Mandatory	Unique	Editable
Question_id	Each question needs a unique identifier	Integer	Yes	Yes	No
Question_type	Short answer or multiple-choice question	Enum	Yes	No	Yes
Question description	The question texts	Text	Yes	No	Yes

Question options	Multiple choice question should have at least two options	Enum	No	No	Yes
Question text box	Only for short answer question should	Text	No	No	No

Exam Fields

Field	Description	Type	Mandatory	Unique	Editable
Exam_id	Each exam has a unique identifier	Integer	Yes	Yes	No
Exam description	The meta data of this exam	Text	Yes	No	Yes
Exam question	Contains all questions of the exam	JSON	Yes	No	Yes

User Fields

Field	Description	Type	Mandatory	Unique	Editable
User_id	Each user has a unique identifier	Integer	Yes	Yes	No

User type	The user can be either student or Instructor	Enum	Yes	No	Yes
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3.2 Student Operations

[UC008] Take Exam

Pre-conditions

The student shall have the permission to see and access the exam created by the subject instructor; the student has not attempted the exam before.

Main Events Flow

1. The student selects one subject from a list of subjects
2. The student enters the exam page [AF01]
3. The student answers question one by one
4. The student repeats step 3 until done

Alternative Flows

[AF01] Exam has not been published

1. The system logs the exception [EF02]
2. The system goes back to previous state

Exception Flow

[EF01] Unknown Exception

1. The system logs the unknown runtime exception which happens while the application is executing

[EF02] Known Exception

1. The system logs an exception during the execution [UC013]

Post-conditions

The student's answers are temporarily saved.

[UC009] Review Answers

Pre-conditions

The student is currently taking the exam.

Main Events Flow

1. The student goes to previous/next question
2. The system displays the student's answers [AF01]
3. The student repeats step 1, 2 until done

Alternative Flows

[AF01] Exam is closed

1. The system logs the exception [EF02]
2. The system exits the exam page

Exception Flow

[EF01] Unknown Exception

1. The system logs the unknown runtime exception which happens while the application is executing

[EF02] Known Exception

1. The system logs an exception during the execution [UC013]

Post-conditions

The student's answers are temporarily saved.

[UC0010] Update Answers

Pre-conditions

The student is currently taking the exam.

Main Events Flow

1. The student goes to previous/next question
2. The system displays the student's answers
3. The student updates the answer [AF01]
4. The student repeats step 1, 2, 3 until done

Alternative Flows

[AF01] Exam is closed

1. The system logs the exception [EF02]
2. The system exits the exam page

Exception Flow

[EF01] Unknown Exception

1. The system logs the unknown runtime exception which happens while the application is executing

[EF02] Known Exception

1. The system logs an exception during the execution [UC013]

Post-conditions

The student's answers are temporarily saved.

[UC0011] Submit Exam

Pre-conditions

The student is currently taking the exam.

Main Events Flow

1. The student has answered the questions and has no intentions to make any changes
2. The student submits the exam [AF01]
3. The system saves all answers

Alternative Flows

[AF01] The exam is closed

1. The system displays a message informing the student [EF02]
2. The system exits the exam

Exception Flow

[EF01] Unknown Exception

1. The system logs the unknown runtime exception which happens while the application is executing

[EF02] Known Exception

1. The system logs an exception during the execution [UC013]

Post-conditions

The student's exam is submitted.

[UC012] View Marks

Pre-conditions

The student has submitted the exam, or the exam is closed, and the exam has been marked.

Main Events Flow

1. The student navigates to the exam attempt history page
2. The student views the exam marks

Exception Flow

[EF01] Unknown Exception

1. The system logs the unknown runtime exception which happens while the application is executing

Post-conditions

The student is able to see the exam mark.

3.3 Exceptions

[UC013] Known Exception

Pre-conditions

The known exception shall be raised by any operation in the system.

Main Events Flow

1. The system identifies one of the following problems:
 - exam creation exception [SF01]
 - exam update exception [SF02]
 - exam deletion exception [SF03]
 - exam publish exception [SF04]
 - exam submission exception [SF05]
2. The system performs the respective Sub Flow

Sub Flows

[SF01] Exam creation exception

1. The system identifies that a multiple-choice question has only one option
2. The system displays the respective error message
3. The system refuses the operation

[SF02] Exam Update exception

1. The system identifies one of the following scenarios:
 - update an exam while at least one student has submitted the exam
 - update an exam while at least one student is currently taking the exam
2. The system displays the respective error message
3. The system refuses the operation

[SF03] Exam deletion exception

1. The system identifies one of the following scenarios:
 - a. delete an exam while at least one student has submitted the exam
 - b. delete an exam while at least one student is currently taking the exam
2. The system displays the respective error message
3. The system refuses the operation

[SF04] Exam publish exception

1. The system identifies that the exam has not been published
2. The system displays the respective error message
3. The system refuses the operation

[SF05] Exam submission exception

1. The system identifies that the exam has already been closed
2. The system displays the respective error messages
3. The system refuses the operation

Post-conditions

The system refuses the operation and remains the previous state.

4 Github

<https://github.com/ZhangzihanGit/SWEN90007-A-Team>

Release tag: SWEN90007_2020_Part1_A_Team

5 Use Case Diagram

