TOPIC: EXAMS CREATING AND MANAGING SYSTEM FOR TEACHERS/LECTURERS

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CHAPTER I: OVERVIEW

1. GENERAL INTRODUCTION

In recent years, "Information Technology" has made it way to every part of our life and developed strongly in our country. The convenience and easiness of Information Technology applications is so crucial that we use them in almost all areas of life such as in education, businesses, agencies, industries, health care... We used to do it all by hands and papers, especially in education where thousands of paperwork need to be done precisely and fast. Time is of the essence and this has to change.

Even as of today, simple software like MS Word and Excel are still used in education for managing paperwork, from simple timetables to complicated e-bank storing, managing and distributing. We need something that is cheap, easy to use, to access from anywhere, anytime. To save time is to reduce the cost of everything else, and that is the main objective of a management system.

The system our team is building is based on a website, with its own database and functions, all included in a single URL that you can access via a web browser.

Building a complete system requires many factors. As a matter of fact, software engineering procedures must be followed precisely. Although we tried our best, due to limited time and limited conditions and lack of information at first, it is inevitable that there are shortcomings in this report. Without further ado, below are the details of how the system works and its prototype.

2. PROJECT INTRODUCTION

2.1. Name of project:

Developing software to manage exam questions and grading for teachers

2.2. List of project teams:

Hồ Văn Hiệu _19521497 (leader) Nguyễn Thị Minh Loan _ 20521542 Dương Minh Thành_17521044

2.3. Project implementation time:

Total time: 1 Month

Start date: October 22, 2022 End date: November 22, 2022

3. TARGET

Complete project work according to technical requirements, within budget, on schedule (Technical - Financial - Time)

Project management is the application of tools, knowledge, and techniques to define, plan, implement, organize, control, and close projects.

Building a software to "manage the making and marking of exams" in order to systematically improve the quality of management, reduce human labor, search, store and report statistical information easily and accurately

4. PROPOSED SOLUTIONS

E-Bank management and assessment are complicated tasks, requiring managers to have meticulous, thoughtful and scientific management methods. However, as data tends to grow larger, the number of E-bank questions increases, with different subjects, courses, the job of administrators becomes more and more problematic. The only solution to this problem is: to store them all on a computer. And specifically, online.

4.1. Schedule management

Teachers and lecturers will find hard it hard to reserve a room at a particular time for planning an exam without any means to check for reservations, as for the school to manage and consult with the responsible teachers/lecturers. A schedule system is in need to ensure teachers and lecturers can coordinate time and place for an upcoming exam in the most scientific way possible.

4.2. Planning, arranging and assessing exams manually

Teachers and lecturers can create, edit and plan an exam manually on the system, with rules and orders applied to ensure consistency and precision. An assessment will also be automatically created after an exam has ended or after a particulate date, with a deadline and objectives assigned by the administrators of the system (high level personnel of the school, responsible faculties v.v..). Questions for an exam can also be manually and customarily created. They will then be collected and stored in the E-bank database.

4.2.1. Regularly review and check

While choosing the exam questions, the teacher can mess up the position of each question. Therefore, to be able to ensure the position of each exam question in the library, regularly review and check each item to detect problems that arise, and find ways to fix them in a timely manner. For that matter the system also support removing, editing exam, test questions.

When a new exam is imported to the E-bank database, it requires the teacher/lecturer's account and authentication to enable access to the E-bank database, then from there the new exam will receive a code that is associated with the responsible uploader.

Teachers/Lecturers can only obtain an account from the school's system administrators. Teachers/Lecturers must fill in all the required information on the registration form. The administrators will check the information whether if they are correct and will proceed to save the information in the system, granting an account for them.

Each account contains the teacher/lecturer's basic information, the department he/she is in, a schedule for exams, assessment results and the ability to access the E-bank database at will.

The teacher/lecturer can also add, edit exams created by them but not others', and exams will be validated once uploaded into the database.

The administrators report directly back to the school.

4.2.2. System building

As mentioned in 1., the system will be a website, including its own database and functions like grading, assessment and schedule management, exams planning and making. The website will be built based on:

• Front end: HTML5, CSS, Java script

Back end: JavaLibrary: Node.js

Database: SQL server, SSMSDesign prototype: Figma

Testing platform (browser): Google Chrome(MS Windows 10)

4.3. Required list

#	Name of requirements	Form	Rules	Notes
1	Compose the question	Form 1	Rule 1	
2	Compose the exam	Form 2	Rule 2	
3	Score recognition	Form 3	Rule 3	
4	Look up the exams	Form 4	Rule 4	
5	Make annual report	Form 5	Rule 5	

4.4. List of forms and requirements

4.4.1. Requirements for making a list of questions

Form 1	QUESTION
Subject:	
Level:	
The content of the question:	

Rule 1:

- The lecturer is currently teaching 4 subjects.
- There are 4 difficulty levels (Easy, Medium, Complex, Hard).
 - 4.4.2. Requirements for making a list of exam

Form 2	Form 2 EXAM		
	Exam name:	Class name:	
	Exam duration:	Exam form:	
	Times:		
Questio	Question 1: The content of the question 1.		
Questio	Question 2: The content of the question 2.		

Rule 2:

- There are two forms of the exam (documented, non-documented).
- The test has a maximum of 5 questions.
- A subject has a maximum of two exams (1st time, 2nd time).
- The lecturer estimates the number of classes taught in a year to be 50 classes
- The maximum exam duration is 180 minutes and the minimum is 30 minutes.
 - 4.4.3. Requirements for making the result

Form 3	EXAM RESULTS				
	Exam name:				
Class name:					
	Instructor	's name:			
#	Student ID	Full name	Scores	Letter point	Notes
1					
2					

Rule 3: Minimum score is 0 and maximum is 10

4.4.4. Requirements for making list of the exam

Form 4	LIST OF EXAM				
#	Exam code	Class name	Exam duration	Exam day	Exam form
1					
2					

4.4.5. Requirements for making annual report

Form	Form 5 THE REPORT				
		Year:			
	Total exams: Total marks:				
#	Subject name	Number of exams	Total marks	Exam rate	Score rate
1					
2					

CHAPTER II: USE CASE MODEL

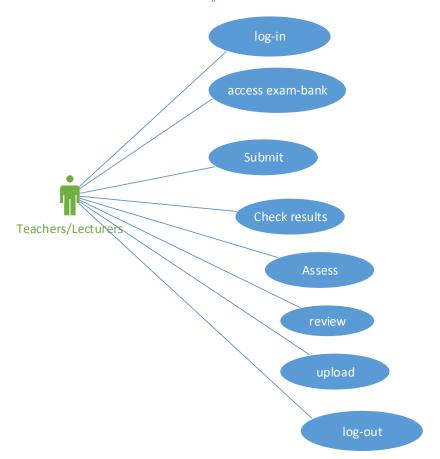
1. USE CASE MODEL

1.1. List of Actor

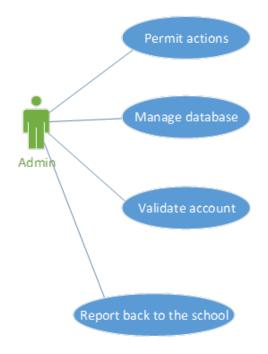
#	Actor	Meaning, Notes	
1	Instructor	Responsible for creating questions and exam	
2	Students	View, search the list of exam	
3	Management	Manage data, add/remove accounts	
4	Principal	The full access	

1.2.Use case diagram

1.2.1. Use case for instructors



1.2.2. Use case for Admin



1.3.List of Use case

#	Use case	Meaning	
1	Log-in	Log-in using an account	
2	Log-out	Log-out from the system	
3	Access E-bank	Access the exam-bank of the school	
4	Submit	Task and work submission	
5	Check results	Exams' results checking	
6	Assess exams	Exams' grading and valuation	
7	Review	Exams review	
8	Upload	Upload test questions to the E-bank	
9	Permit actions	Permit actions of the TEACHER/LECTURER actor	
10	Manage database	Database management	
11	Validate account	Account validation	
12	Report	Report details back to the school	

1.4.Use case Specification 1.4.1. Log-in

Use case Log-in				
Describe	ribe Log-in using an account			
Agent	Lecturers, administrator			
Main stream	Agent's behavior	System's behavior		
	1. User clicks on login button	2. Show login form		
	3. Enter the username and password	4. Check account name and		
	in the form	password		
		5. Successful login message		
		6. Switch to main interface		
Alternative stream	A1. User entered wrong			
	account/password			
	5. Requires re-login			

	Go back to step 2
Preconditions	M The teacher has logged into the
	system
Following conditions	Logged into the system

1.4.2. Log-out

Use case Log-out		
Describe	Log-out from the system	
Agent	Lecturers, adminnistrator	
Main stream	Agent's behavior	System's behavior
	1. User clicks on logout button	2. Show logout form
		3. Successful logout
		message
Alternative stream		
Preconditions	The teacher has logged into the	
	system	
Following conditions		

1.4.3. Access E-bank

Use case Access E-bank		
Describe	Access the exam-bank of the school	
Agent	Lecturers	
Main stream	Agent's behavior	System's behavior
	1. User clicks on "My Tesk Bank"	2. Show list of "My Test
	button	bank"
	3. Select the exam users want to see	4. Show the content of the
		exam
Alternative stream		
Preconditions	The teacher has logged into the	
	system	
Following conditions		

1.4.4. Submit

Use case Submit		
Describe	Task and work submission	
Agent	Lecturers	
Main stream	Agent's behavior	System's behavior
	1. User clicks on "My Department"	2. Show 3 options
		- Assessment
		- Submission
		- Review
	3. Enter the Submission	4. The screen show the
		Submission form
	5.Choose the topic that user want to	6. Save the exam
	submit then "Submit"	

Alternative stream	
Preconditions	The teacher has logged into the
	system
Following conditions	

1.4.5. Check results

Use case Check results		
Describe	Exams' results checking	
Agent	Lecturers	
Main stream	Agent's behavior	System's behavior
	1. User clicks on the "Check results" button	2.Displays the list of topic
	3. Select the topic	4. The screen will show the graph, and the percentage of students who meet and do not meet the standard
Alternative stream		
Preconditions	The teacher has logged into the system	
Following conditions		

1.4.6. Assess exams

Use case Assess exams		
Describe	Exams' grading and valuation	
Agent	Lecturers	
Main stream	Agent's behavior	System's behavior
	1. User clicks on "My Department"	2. Show 3 options
		- Assessment
		- Submission
		- Review
	3.Enter the Assessment	4. Show the list of topics
	5.Choose the topic	5. The screen will show the
		list and scores of the
		students who took the test
Alternative stream		
Preconditions	The teacher has logged into the	
	system	
Following conditions		

1.4.7. Review

Use case Review		
Describe	Exams review	
Agent	Lecturers	
Main stream	Agent's behavior	System's behavior
	1. User clicks on "My Department"	2. Show 3 options
		- Assessment
		- Submission
		- Review
	3. Enter Review	4. Show the form of
		"Review"
	5. Select the exam	
	6.Enter user's notes	
	7. Click "Post"	8. The system will save the
		Review
Alternative stream		
Preconditions	The teacher has logged into the	
	system	
Following conditions		

1.4.8. Upload

Use case Review		
Describe	Upload test questions to the E-bank	
Agent	Lecturers	
Main stream	Agent's behavior	System's behavior
	1. Click the "My drive" bar	2. Show "My drive" form
	3. Click Upload	4. The system will display
		the topics the user wants to
		upload
	4. Choose the topic	5. The system will save the
		selected topics
Alternative stream		
Preconditions	The teacher has logged into the	
	system	
Following conditions		

1.4.9. Permit actions

Use case Review		
Describe	Permit actions of the	
	TEACHER/LECTURER actor	
Agent	Lecturers	
Main stream	Agent's behavior	System's behavior
	1. Manage teacher activities	

	2. Handling tasks related to entering	
	exam questions	
	3. Collect and handle the user's	
	feedback	
Alternative stream		
Preconditions	The administrator has logged into	
	the system	
Following conditions		

1.4.10. Manage database

Use case Review		
Describe	Database management	
Agent	Lecturers	
Main stream	Agent's behavior	System's behavior
	1. Check and manage the database	
	2. Multi-user access control	
	3. Manage security and set rules	
Alternative stream		
Preconditions	The administrator has logged into	
	the system	
Following conditions		

1.4.11. Validate account

Use case Review		
Describe	Account validation	
Agent	Lecturers	
Main stream	Agent's behavior	System's behavior
	1. Identify and authenticate the	
	user's identity	
	2. Ensure maximum safety and	
	security for the account	
Alternative stream		
Preconditions	The administrator has logged into	
	the system	
Following conditions		

1.4.12. Report

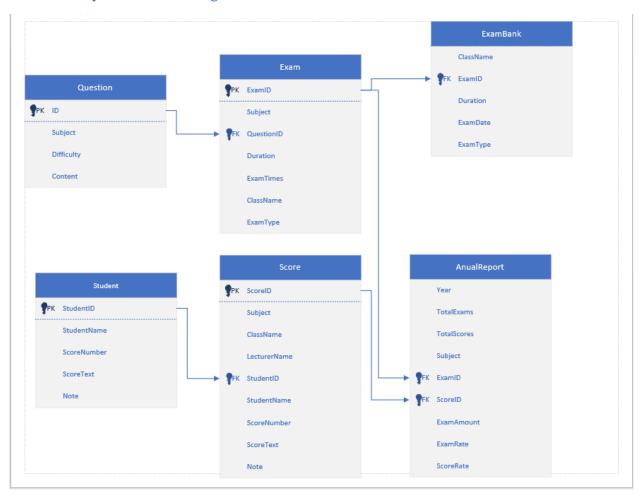
Use case Review	
Describe	Report details back to the school

Agent	Lecturers	
Main stream	Agent's behavior	System's behavior
	1. Summarizing the data	
	2. Make a report to the principal	
Alternative stream		
Preconditions	The administrator has logged into	
	the system	
Following conditions		

CHAPTER III: ANALYSIS

1. CLASS DIAGRAM

1.1. Analysis level class diagram



1.2. List of feature classes

#	Class name
1	Question
2	Exam
3	Exam Warehouse
4	Scores

5	Annual Report
6	Student

1.3.Relationship List

#	Relationship name
1	Question_Exam
2	Exams_Exam Warehouse
3	Student_Score
4	Scores_Annual Report
5	Exam_Annual Report

1.4.Description of each feature class

1.4.1. Questions

Describe	Attributes and functions	Explain
Save question information	ID	Question ID
	Subject	Subject title
	Difficulty	Level
	Content	Content questions

1.4.2. Exams

Describe	Attributes and functions	Explain
Save exam information	ExamID	Exam ID
	Subject	Subject title
	QuestionID	Question ID
	Duration	Exam duration
	ExamTimes	Times
	ClassName	Class name
	ExamType	Exam Type

1.4.3. Exam Warehouse

Describe	Attributes and functions	Explain
Save exam warehouse	ClassName	Class name
information	ExamID	Exam ID
	Duration	Exam duration
	ExamDate	Exam date
	ExamType	Exam Type

1.4.4. Students

Describe	Attributes and functions	Explain
Save student information	StudentID	Studen tID
	StudentName	Student's name
	ScoreNumber	Scores
	ScoreText	Letter point
	Note	Notes

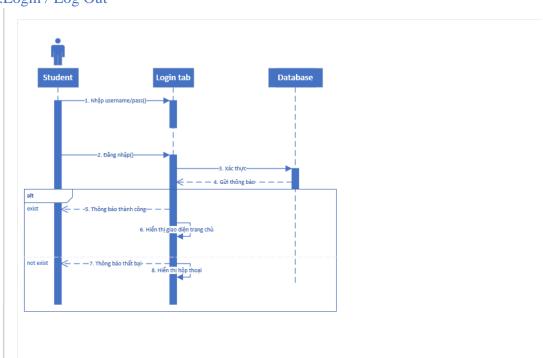
1.4.5. Scores

Describe	Attributes and functions	Explain
Save score information	ScoreID	Score ID
	Subject	Subject title
	ClassName	Class name
	LecturerName	Instructor's name
	StudentID	Student ID
	StudentName	Student's name
	ScoreNumber	Scores
	ScoreText	Letter point
	Note	Notes

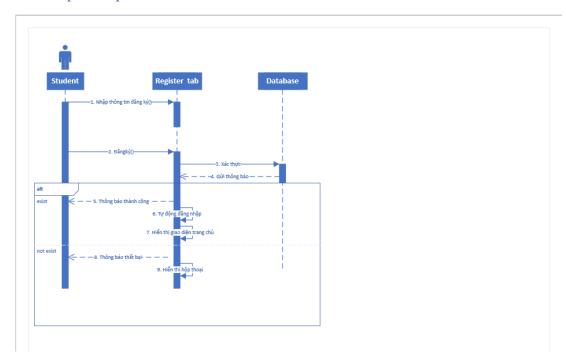
1.4.6. Annual report

Describe	Attributes and functions	Explain
Save annual report	Year	Year
information	TotalExams	Total number of exams
	TotalScore	Total marks
	Subject	Subject title
	ExamID	Exam ID
	ScoreID	Score ID
	ExamAmount	Number of exams
	ExamRate	Exam rate
	ScoreRate	Score rate

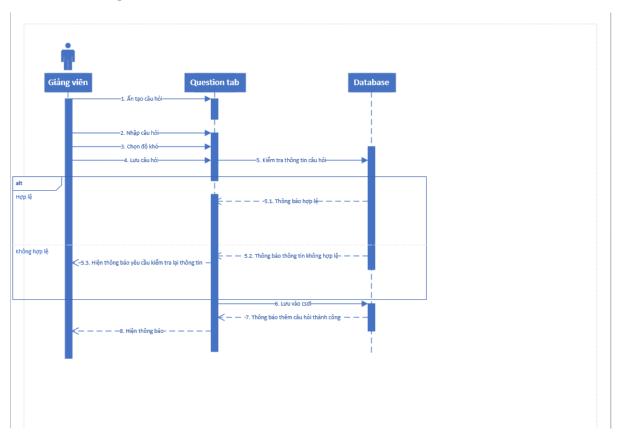
2. SEQUENCE DIAGRAM 2.1.Login / Log Out



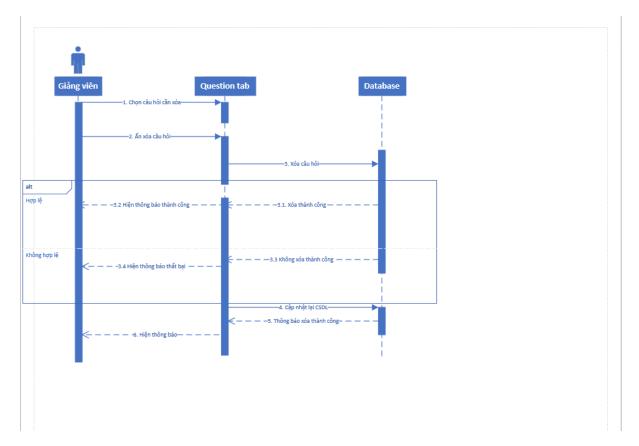
2.2.Compose a question



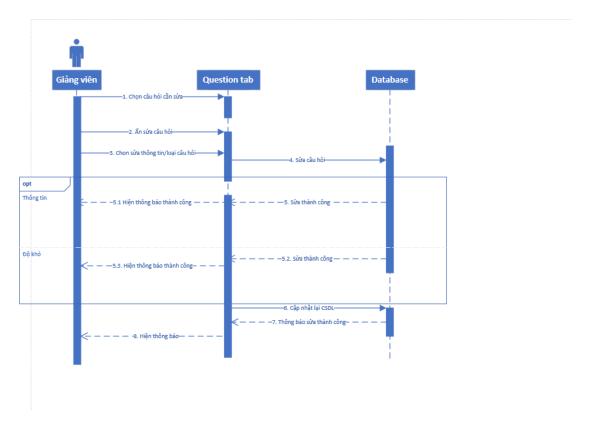
2.2.1. Add questions



2.2.2. Delete question

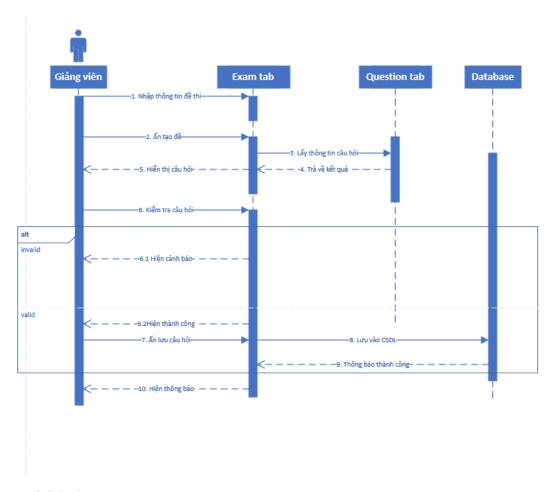


2.2.3. Fix question

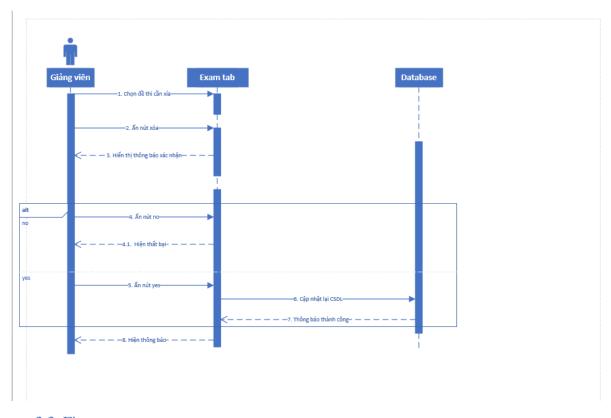


3. PREPARE EXAMS

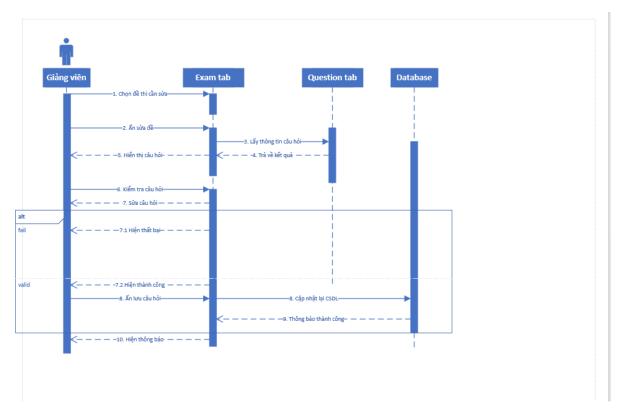
3.1. Add exams



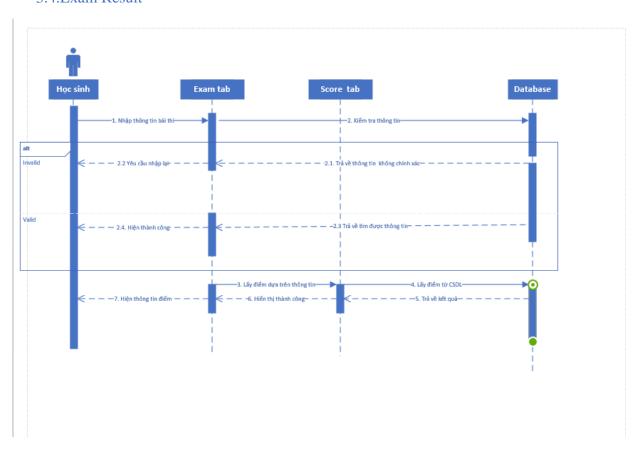
3.2.Delete exams



3.3. Fix exams

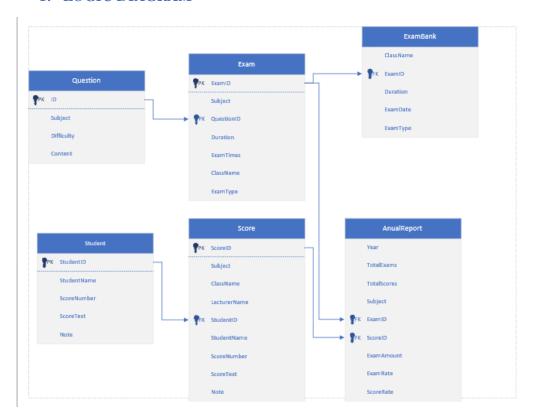


3.4.Exam Result



CHAPTER IV: DATABASE DESIGN

1. LOGIC DIAGRAM



2. DETAILED DESCRIPTION OF THE COMPONENTS IN THE LOGIC DIAGRAM

#	Table name	Explain
1	Question	Question information storage
2	Exam	Store exam information
3	ExamBank	Store information about exam questions
4	Student	Student information storage
5	Score	Store score information
6	AnualReport	Annual report card

2.1. Question table

#	Column name	Datatypes	Constraint	Explain
1	ID	Varchar(255)	Main key	Question ID
2	Subject	Varchar(255)		Theme
3	Difficulty	Varchar(255)		Level
4	Content	Varchar(255)		Content Questions

2.2. Exam table

#	Column name	Datatypes	Constraint	Explain
1	ExamID	Varchar(255)	Main key	Exam ID
2	Subject	Varchar(255)		Theme

3	QuestionID	Varchar(255)	Foreign key	Question ID
4	Duration	Int		Exam duration
5	ExamTimes	Int		Times
6	ClassName	Varchar(255)		Class name
7	ExamType	Varchar(255)		Exam type

2.3. Exam warehouse table

#	Column name	Datatypes	Constraint	Explain
1	ClassName	Varchar(255)		Class name
2	ExamID	Varchar(255)	Foreign key	Exam ID
3	Duration	int		Exam duration
4	ExamDate	Varchar(255)		Exam date
5	ExamType	Varchar(255)		Exam type

2.4. Student table

#	Column name	Datatypes	Constraint	Explain
1	StudentID	Varchar(255)	Main key	Student ID
2	StudentName	Varchar(255)		Student's name
3	ScoreNumber	int		Scores
4	ScoreText	Varchar(255)		Letter point
5	Note	Varchar(255)		Notes

2.5. Scores table

#	Column name	Datatypes	Constraint	Explain
1	ScoreID	Varchar(255)	Main key	Score ID
2	Subject	Varchar(255)		Theme
3	ClassName	Varchar(255)		Class name
4	LecturerName	Varchar(255)		Instructor's name
5	StudentID	Varchar(255)	Foreign key	Student ID
6	StudentName	Varchar(255)		Student's name
7	ScoreNumber	int		Scores
8	ScoreText	Varchar(255)		Letter point
9	Note	Varchar(255)		Notes

2.6. Annual report table

#	Column name	Datatypes	Constraint	Explain
1	Year	int		Year
2	TotalExams	int		Total number of exams
3	TotalScores	int		Total score
4	Subject	Varchar(255)		Theme
5	ExamID	Varchar(255)	Foreign key	Exam ID
6	ScoreID	Varchar(255)	Foreign key	Score ID
7	ExamAmount	int		Number of exams

8	ExamRate	double	Exam rate
9	ScoreRate	double	Score rate

CHAPTER V: INTERFACE DESIGN

1. LIST OF PAGES

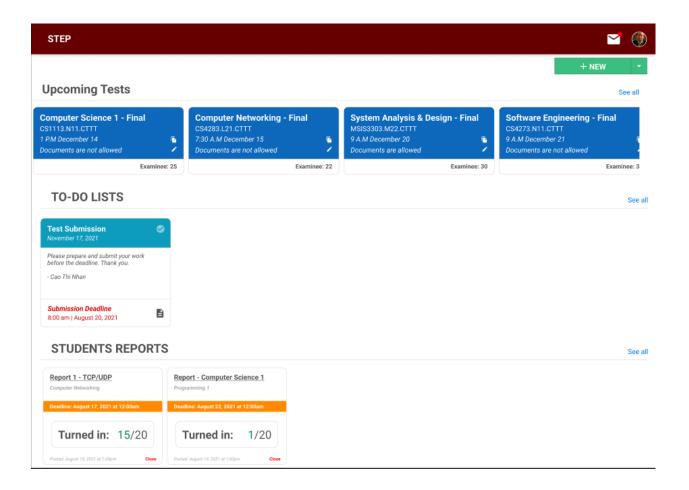
#	Name	Type	Function	
1	Log-in	Input page	Allows user to log in	
2	Dashboard	Main page	Displays information about exams schedule, students' reports and to-do list	
3	My Department	Information page	Displays information about users departments and functions inside of it	
3.1	Assessment		Allows users to assess exams and check for finished ones	
3.1.1	Exam Summary	Information page	Displays exam summary	
3.1.2	Create Assessment Adding details	Input page	Allows users to create an assessment and add details like duration, location, title, description	
3.1.3	Create Assessment Adding questions		Allows users to add questions from My Test Bank to the assessment	
3.1.4	Create Assessment Begin assessment		Allows users to schedule the newly created assessment	
3.2	Submission		Allows users to submit works, assessment	
3.3	Review form	Input page	Allows users to write a review form regarding exams and test results	
4	Profile	Information page	Displays account's information	
5	Drive	Upload page	Allows users to upload files to the school's drive	
6	My Test Bank	storage page	Used to create, store and manage users' test questions, exams	
6.1	Add questions - multiple choices		Allows users to add questions of multiple	
6.2	Add questions - true/false		methods (MC, T/F, open) and store them inside My Test Bank	
6.3	Add questions - open			
6.4	View questions - multiple choices			
6.5	View questions – true/false		Allows users to view questions that were created	

6.6	View questions – open		
7	E-Library	Information page	Used by the school's administrators to manage the Exam bank and is used by users to download, view and export exams from the E-library database

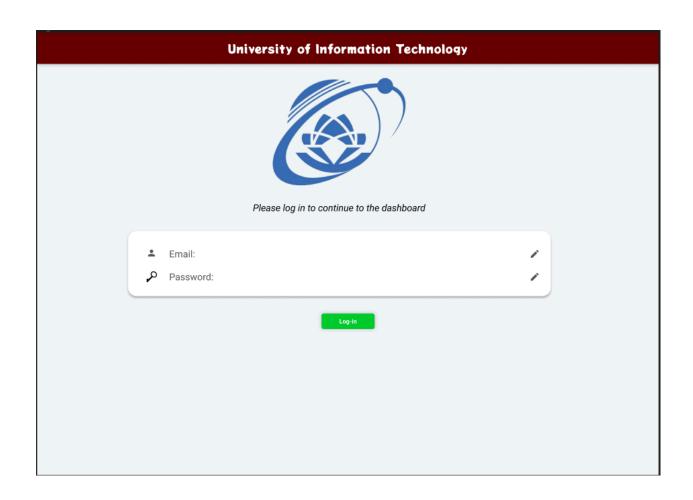
2. DETAILED DESCRIPTION OF EACH PAGE

2.1. Dashboard

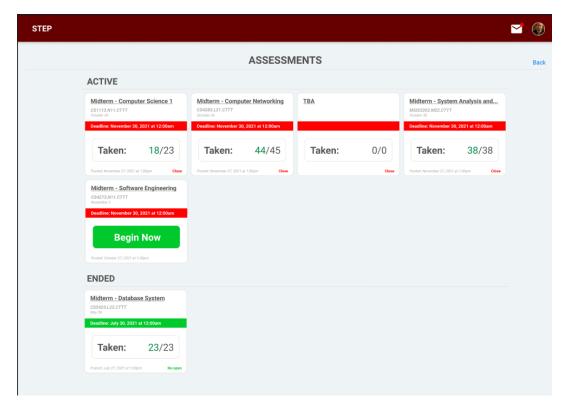
Interface:



2.2. Log-in screen

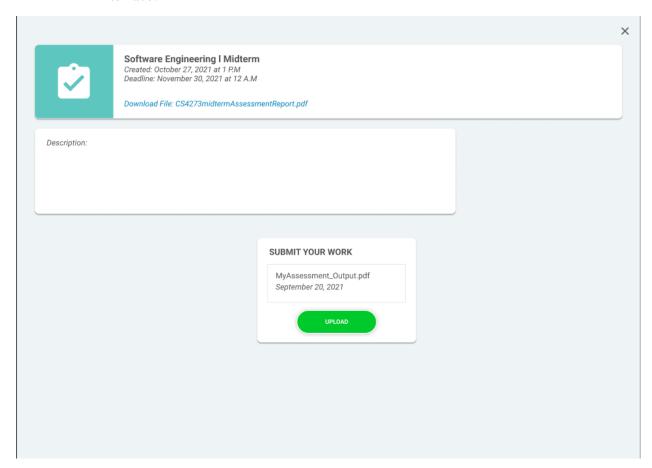


2.3. Assessment page

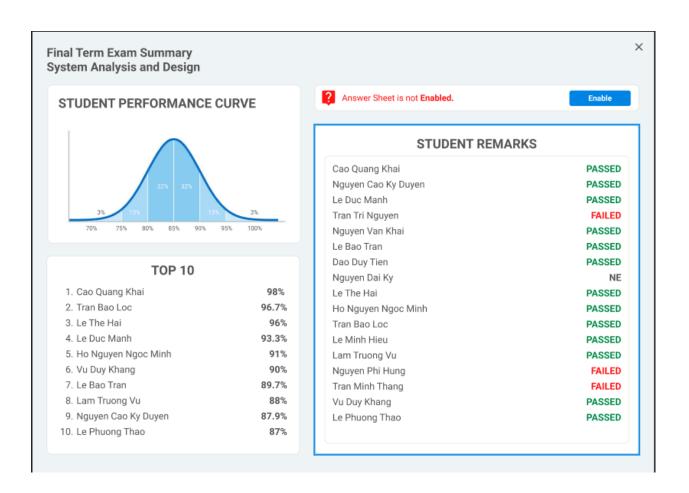


2.4.Submission

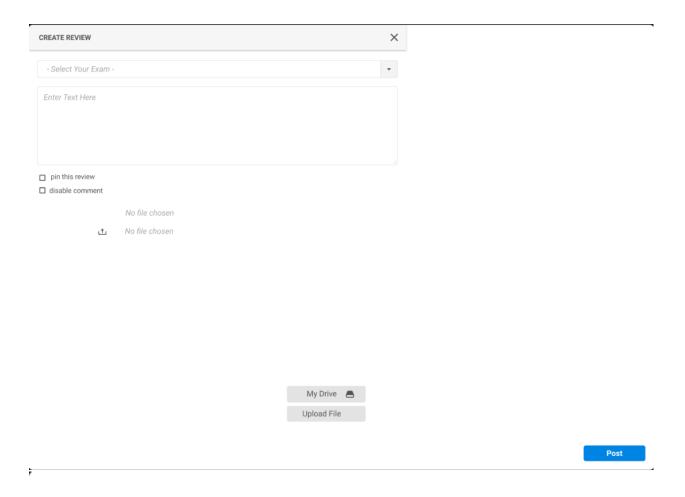
Interface:



2.5.Exam Summary



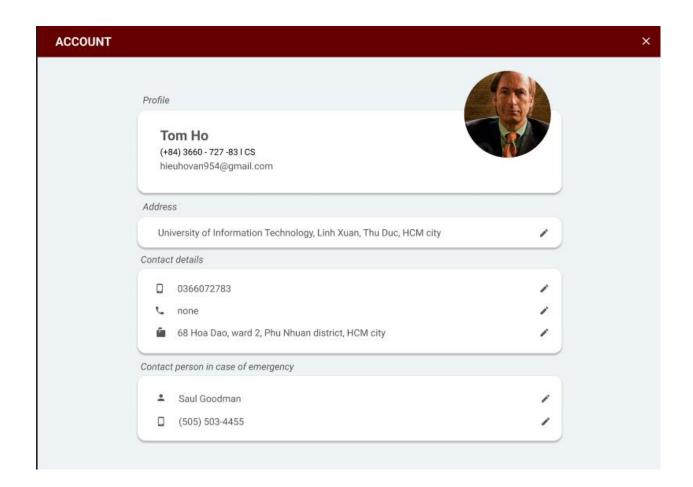
2.6.Review form



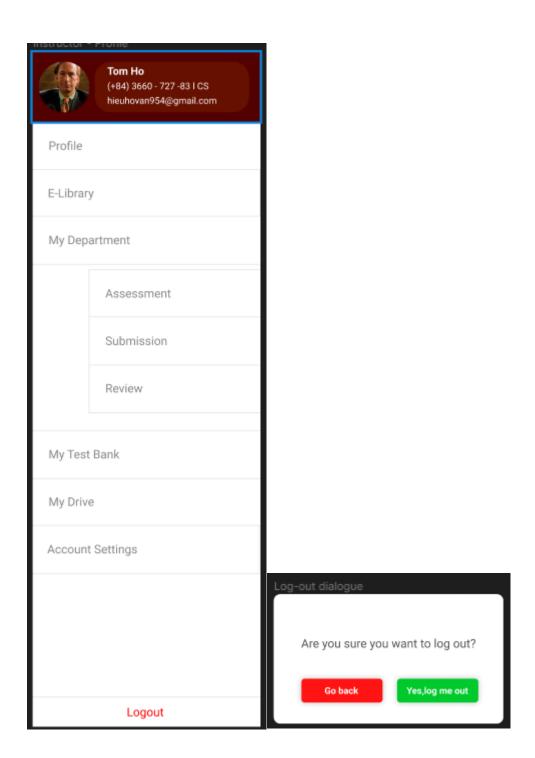
Are you sure you want to exit and discard this post?



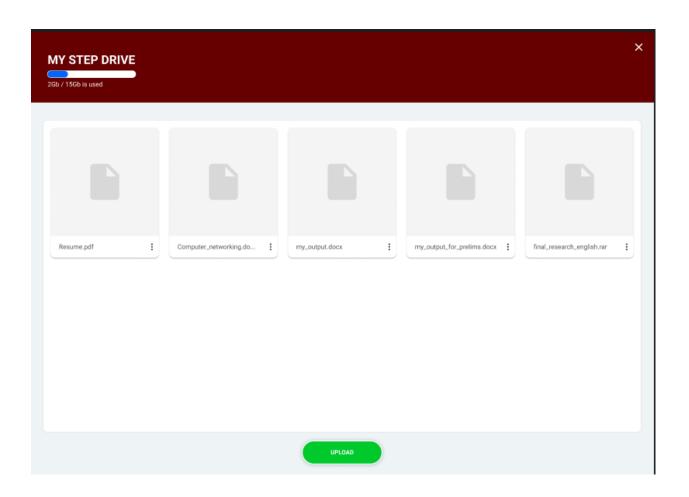
2.7.Profile



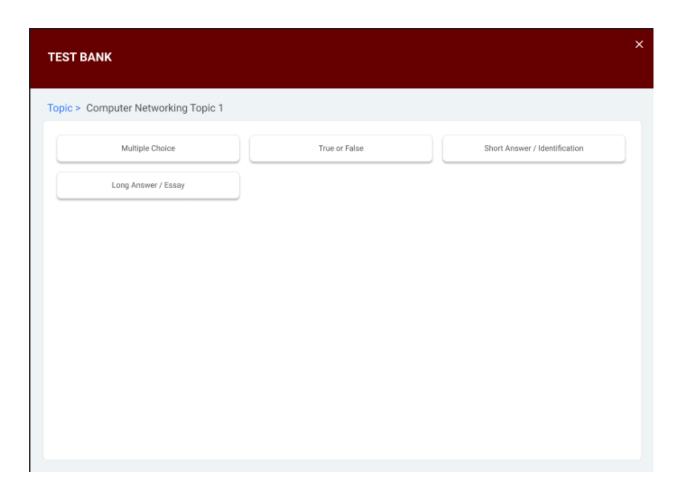
2.8.Sub-profile and log-out dialogue



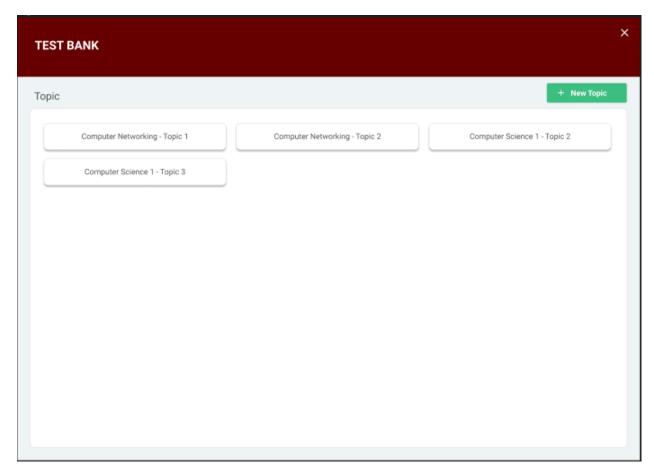
2.9.Drive



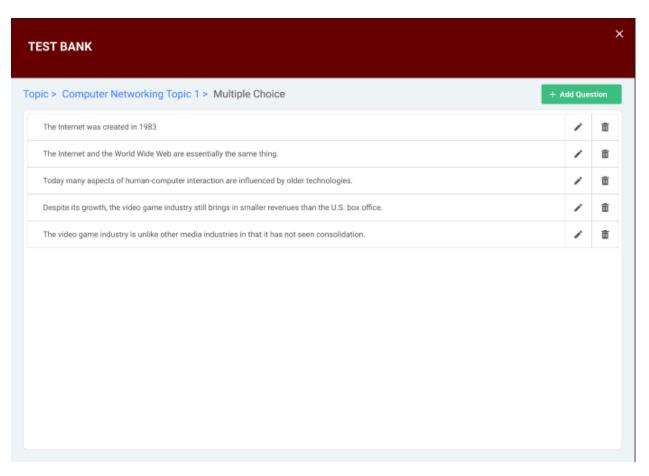
2.10. My Test Bank Interface:



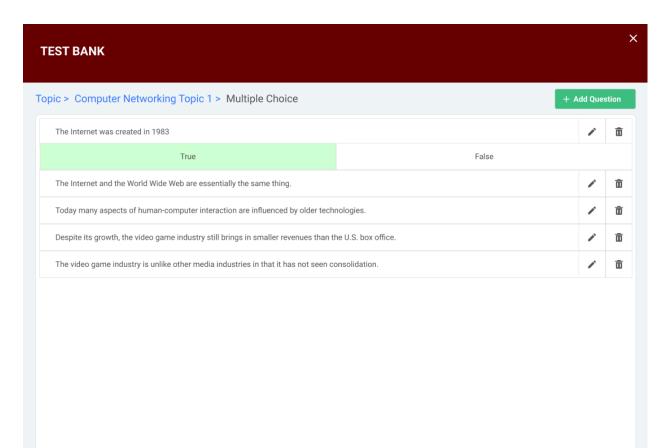
Choosing methods in My Test Bank

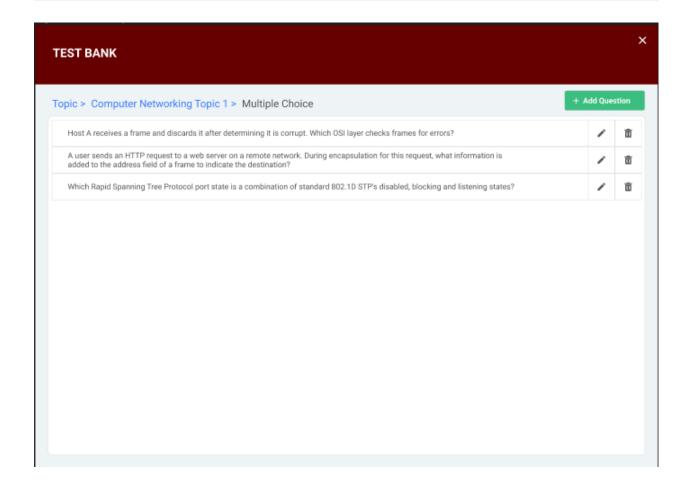


Choosing test topic from the available collection

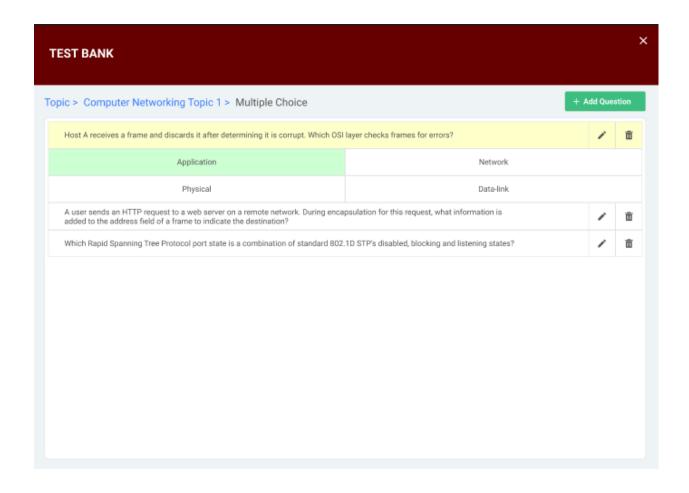


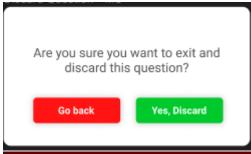
Viewing TRUE/FALSE questions to the assigned topic in My Test Bank

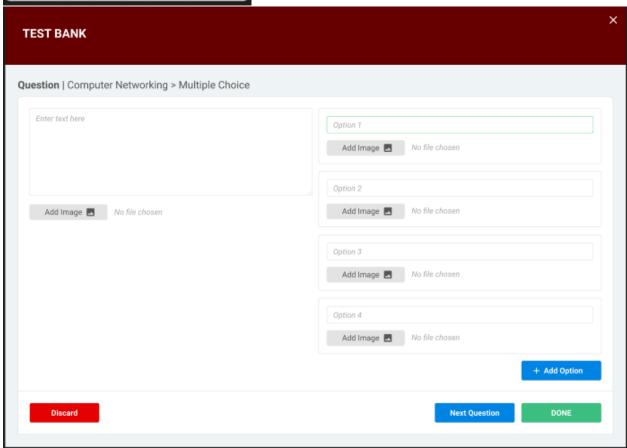




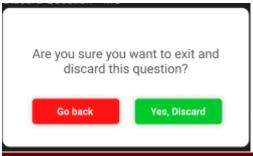
Viewing Multiple choices questions to the assigned topic in My Test Bank

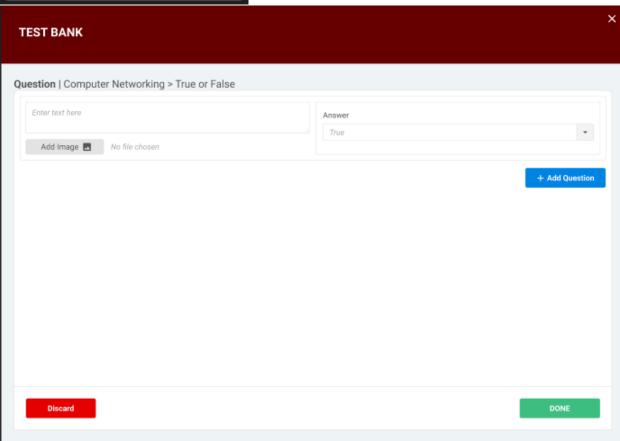






Adding Multiple choices questions to the assigned topic in My Test Bank



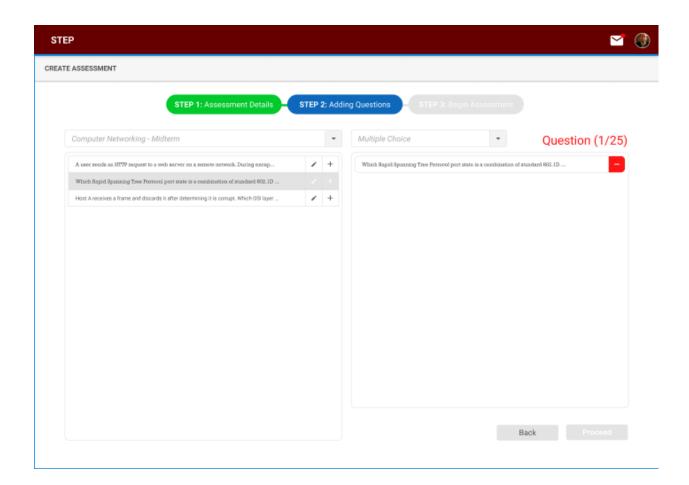


Adding TRUE/FALSE questions to the assigned topic in My Test Bank

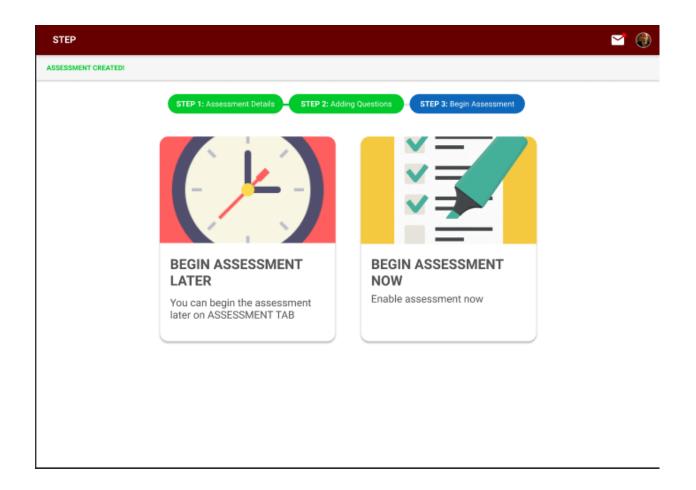
2.11. Create Assessment Interface:

STEP		\leq	
CREATE ASSESSMENT			
	STEP 1: Assessment Details STEP 2: Adding Questions STEP 3: Begin Assessment		
	- Select Room -		
	Assessment details		
	Title		
	Description (optional)		
	Exam duration (in minutes) Examination period		
	Minutes Exam Period ▼		
	Type of Question		
	Multiple Choice ▼ No. of Items		
	+ Add Type randomized item		
	Discard Proceed		
Are you sure you want to exi discard this assessment			

2.12. Create Assessment – Adding questions Interface:



2.13. Create Assessment – Begin assessment Interface:



CHAPTER VI: SUMMARY

1. Developing environment and executing environment

#	Requirements	Completion	Note
1	Composing test questions	100%	
2	Creating assessment	100%	
3	Grading assessment	100%	
4	Exam questions look-up	100%	
5	Annual report	0%	Not included in the
			interface

2. Results

- Reliability: The system provides simple and effective exam-test questions storing, as well as providing users the ability to manage their own test bank, assessment, schedule and useful functions such as uploading documents, submitting works which will help users go through procedures faster to reduce time and labor.
- Security: The system decentralizes user level into 2 groups, with the superior group being the administrators with much more administrative authority over the system thus making it more safe and secure.

- Ease of use: The interface was designed with users in mind, providing simple but helpful, intuitive interface and it comes with sufficient, easy to use functions as well.
- The website can be run on almost all kinds of computers with a variety of platforms.

3. Cons

- Test questions can only be input by hands, not from a file.
- Missing the download function for the E-library
- Test questions stored in the database can't be automatically collected to form an exam for printing.
- Grading requires teachers/lecturers to do separately from the website before uploading the results
- The results need to be manually input

4. Development orientations

- Improve the interface for better navigation
- Automate functions to reduce manual tasks
- Provide users with more functions like print out a collection of test questions in a standardized form for use outside of the website, automatically valuate results input by users for assessment without having to manually input one by one