KULLIYYAH OF INFORMATION & COMMUNICATION TECHNOLOGY

CSC 3506 REQUIREMENTS ENGINEERING
SEMESTER 2, 2019/2020
SECTION 1

PROJECT: <IUM Course Repository Management System >

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DUE
<12/8/2020>

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1 Introduction

1.1 Document Purpose

The purpose of this document is to give a clear and or comprehensive overview or description of the requirements for this project entitled, "IIUM Course Repository Management System". It will illustrate the objective and whole declaration for the development of this system. The system constraint, interface, and interactions with the other external applications should be included and explained as well to get the best picture of this particular system.

1.2 Project Scope

The "IIUM Academic Course Repository Management System" is a proposed system where we will try to solve the general problems faced by the stakeholders such as lecturers, and the administration panel which is seeing all the relevant files and materials of a course in an automated online form. the system will help the lecturer and the academic staff to get all the necessary files in one place and also the external and internal auditors to have everything in one place. This system will provide such a platform where everything will be stored in one place like a platform and the authorized personnel will be able to see the course progress, will be able to give feedback and interact with each other.

1.3 Intended Audience and Document Overview

This document is intended to be read by the stakeholders of this project, either directly or indirectly such as project managers, developers, marketing staff, users, system testers, and the documentation writers. This report will also describe the overall process of the system developments, starting with the purpose of this report to the addition of other requirements, by means adding the other section of the requirements domain that has not yet been covered. This document is organized in a sequence manner. It suggests the reader read this document from the beginning that states the overview of this system and then proceeds through each section that is pertinent to readers.

1.4 Definitions, Acronyms, and Abbreviations

AQAL: Academic Quality Assurance Liaison

Database: A storage for keeping data

H.O.D: Head of the department

SRS: Software Requirements Specification

1.5 References and Acknowledgments

1. IEEE Software Engineering Standards Committee, " IEEE Std 1233, 1998 Edition (Includes IEEE Std 1233-196 and IEEE Std 1233a-1998), IEEE Guide for Developing System Requirements Specifications, 1998.

2 Overall Description

2.1 Project Perspective

This section describes in detail the proposed project by providing general ideas of project perspective. The functionality of this project will be included to present the capabilities of this project. In order to simplify the readers, the process will be in graphical and visual representation by using use-classes to map each process. We need to have a repository system to maintain all the relevant files and documents regarding the subject. Which will help the lecturer and the academic staff to get all the necessary files in one place and also the external and internal auditors to have everything in one place. Till now there is no such system where everything of a course will be stored and the academic staff can observe them directly online with the interface, for instance with a progress bar that shows the completeness. So it is needed to build a system where everything will be stored in one place like a platform and the current progress such as course outline, rubrics, slides, materials, examination question and answers, exercise, assignments, attendance, notes can be shown easily.

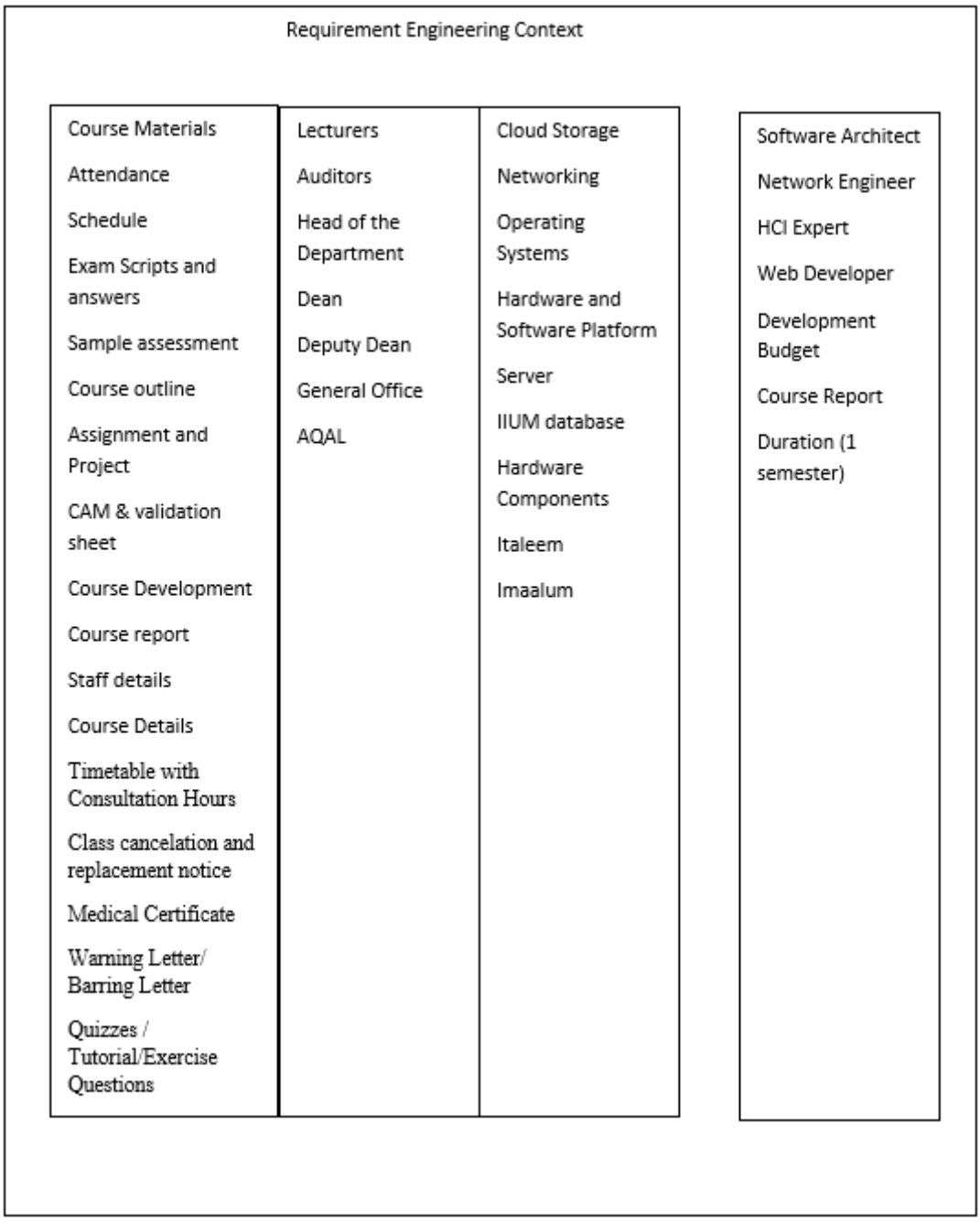


Figure : RE context

2.2 Product Functionality

- All the data uploaded by the lecturers will be stored and maintained
- Academic staff and internal and external auditors can observe the data directly
- Each user of the system can communicate among theme privately or publicly
- Reviewers can review the progress and give feedback
- System will notify the lecturers about the barring if a student misses a certain amount of classes during the semester after getting the warning letter.

2.3 Users and Characteristics

For our system, the target user classes are lecturers, internal and external auditors, H.O.D, dean, deputy dean, and general office and AQAL officer. These all users have direct and indirect interactions with the system. The lecturer will upload the files based on his/her course materials and then the auditors will review the course and will give feedback. The AQAL officer will maintain the quality of the system. H.O.D, dean and deputy dean will be in the administrator panel. They are the higher authority of the system.

Based on the users' perspective the lecturers, HOD and the auditors are the important users for the system.

2.4 Design and Implementation Constraints

There are no major design and implementation constraints for this project. However, the design and implementations constraints part will be explained on the boundaries of the system application.

- Constraint 1: The system must adhere to the rules and regulations of the university authority.
- Constraint 2: When uploading any files, lectures need to login using the user ID and password for clarification of the system and ensure authorized access. Without having any authorized access, users can not able to interact with the system.
- Constraint 3: The Reviewers need to give feedback based on the course materials and need to ensure that the lecturer and the authority can see the feedbacks
- Constraint 4: The development of the system must be developed by one semester within the allocated budget.

1.1 2.5 Assumptions and Dependencies

The system development team has come up with some assumptions in the early stage. The assumptions help the developers and users to have a better understanding to interact with the system.

Before using the system, we assume that the users have experience in online upload, delete and modify method and also have knowledge about communication through online platforms. The stakeholders are moderate computer users who are using the internet. We assume the auditors have basic knowledge about giving feedback in an online platform and have the experience to highlight specific files (if needed). The system operation part can be anytime of the day so no restriction in operation time.

3.1 Requirements Engineering Process Framework

The process model that we have used for our project to help us to guide and stay on track is shown below:

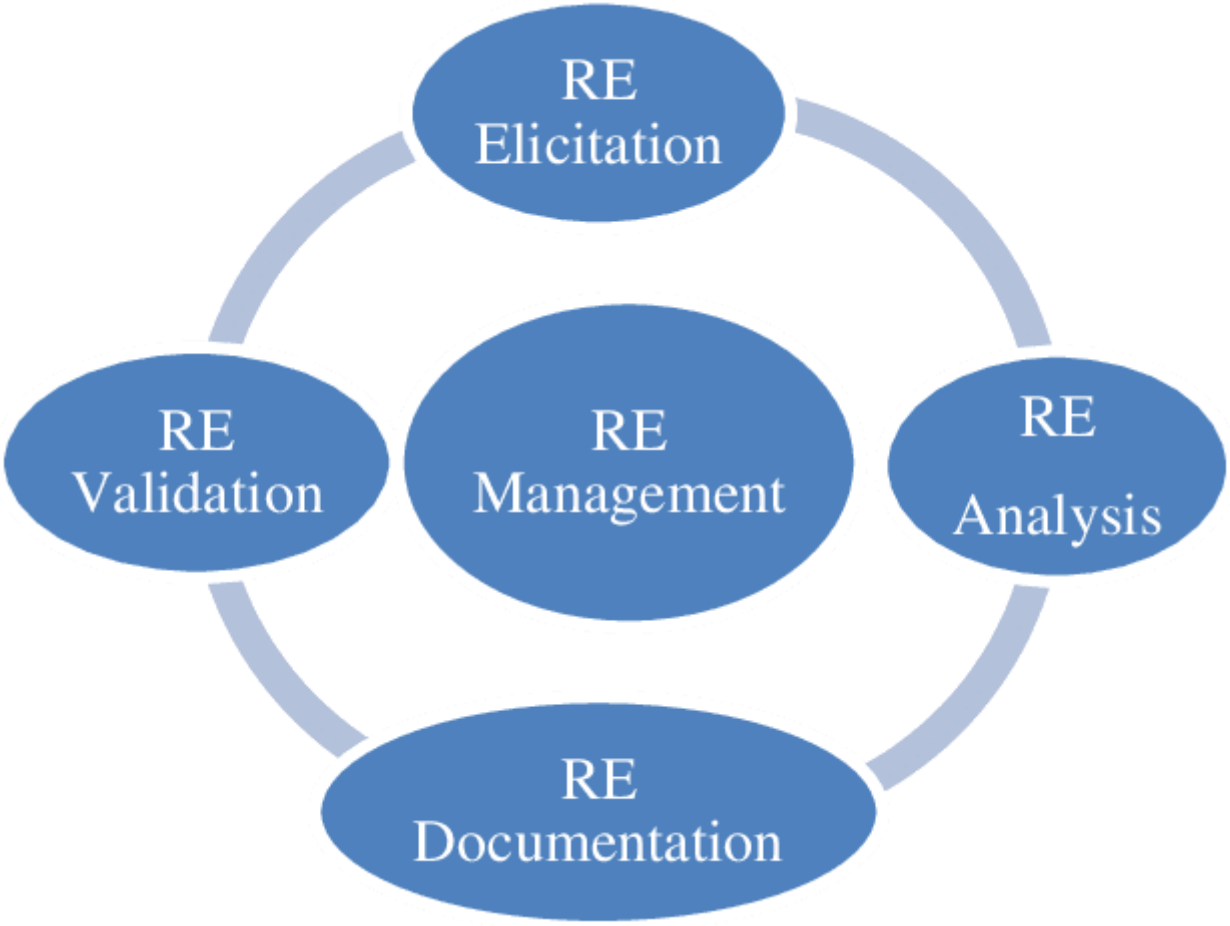


Figure: Process Model

We used this model to follow the steps for our project. Firstly we have gathered all the requirements from the stakeholders and other requirements sources in the elicitation phase for IIUM Course Repository Management System. Then we have analyzed the requirements and put them in different categories, such as functional, quality, constraints and business rules. Then we have documented the gathered requirements by using the proper guidelines and templates. After that we have validated the requirements with our visions and goals. Checking if we are building the right product and is the product building going in the right direction.

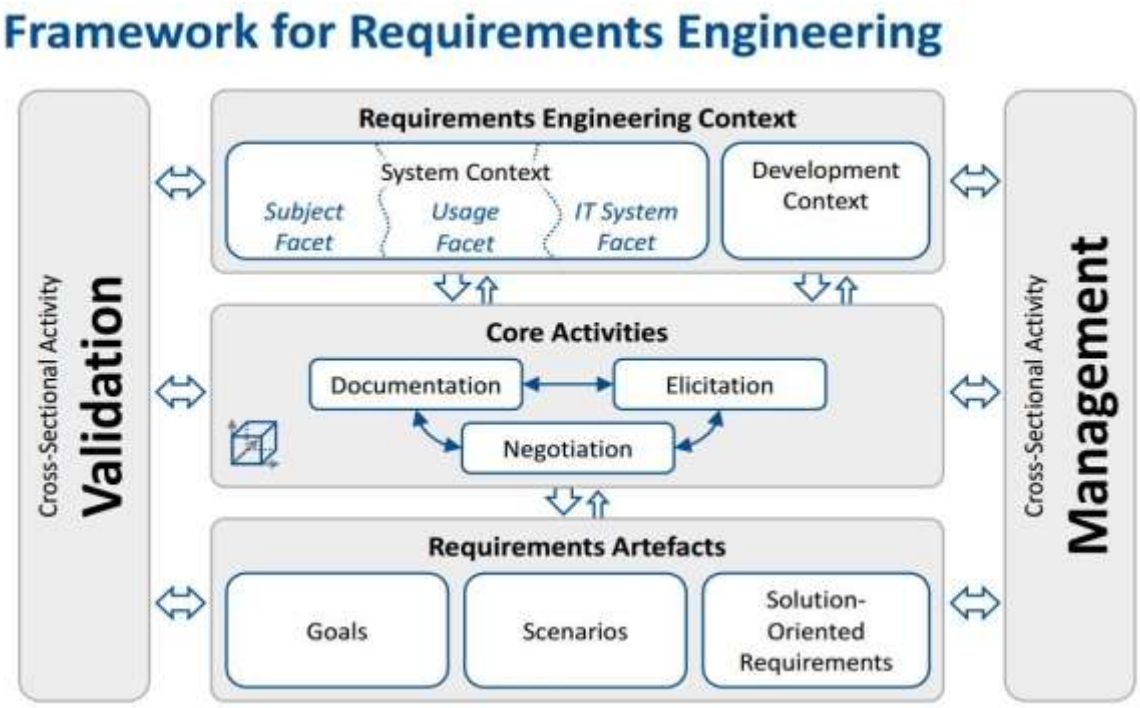


Figure: Requirements Process Framework

From the requirements engineering context, we have listed down the subject, usage and IT system facet and also the development context and listed them in our context diagram. Then in the core activities for the requirements engineering, we have done the requirements elicitation, requirements documentation, and requirements negotiation. This is an iterative process and we had to make corrections in the following phases for the core activities. Elicitation means how we get a clear idea about the features of our proposed system. We used interview, observation, questionnaire and also prototype method. After we got some idea we documented it in SRS form. For the requirements artefacts, we have selected the goals for our IIUM course repository management system, then documented the scenarios for them. For the cross sectional activity requirements management, we used the requirements management tool Jira to store our requirements in a systematic order. It is

basically an agile-based requirements management tool. For our project, we have used the scrum methodology. We have validated the requirements we gathered, for the cross sectional validation part. For validation purposes, we have used the Zephyr. Zephyr for Jira is a native application that resides in Jira software on Jira core and brings test management capabilities to any Jira project. It is widely used as an issue tracking tool for all types of validation.

1.2 3.2 Scope Definition

In terms of managing the files for the lecturers in IIUM and for the evaluation of the contents by the auditors, till now there is no such system where everything of a course will be stored and the academic staff can observe them directly online and see the completeness of a certain course contents.

1.3 3.3 Problem Analysis

The current process of maintaining all the course contents of a particular subject for the lecturers is managing them both online and offline. Which is a very tedious process and there are chances of missing the files if it is maintained offline in hard copies. For the auditors' perspective, it is hard to define the completeness of the materials and contents.

So for IIUM, it is needed to build a system where everything will be stored in one place like a platform and the current progress such as course outline, rubrics, slides, materials, examination question and answers, exercise, assignments, attendance, notes etc can be shown in such a way that it will be convenient to maintain them and assess them .

1.4 3.4 Requirements Elicitation

For the requirements elicitation of IIUM Course Repository Management System project, we have used interview, observation, and questionnaire and prototyping method.

For the interview, we have interviewed two person's namely honorable lecturer from Kulliyah of Information and Communication Technology, Dr. Azlin Binti Nordin and the honorable head of the department of computer science, Dr. Raini Hassan. They both have played the rules of being the stakeholder (Lecturer and H.O.D) interchangeably. We have conducted the interviews in the mid-June, via google meet because of the Covid 19 situation. We have conducted a virtual interview via an online platform. It was an unstructured interview with open ended questions.

Questions for the Interview:

1. Can you please explain your thoughts about the university course repository management system?

2. How is your experience with the current repository management system?

3. Can you please elaborate the process that you currently follow to manage all your course files?

4. What are the problems that you face in that system?

5. If we make a similar system, what would be your expectations? What are the things you think that we should introduce in our system which would rectify the lacking belonging to the previous system?

6. From your experience (completely other domains), do you have any suggestion for us to implement in our system which would help the potential users?

After the interview, group members summarized the whole interview and found the requirements. We sum up the elicited knowledge and check again if we understood the interviewee correctly.

We have done the prototyping as another elicitation technique for our project. We have designed interfaces of our system for the perspectives of Lecturers, Head of the Departments and the auditors. The interface screens are shown on the appendix section. For the project we also did observation of the similar existing systems such as - google drive, italeem, one drive etc and also took some requirements from the documents.

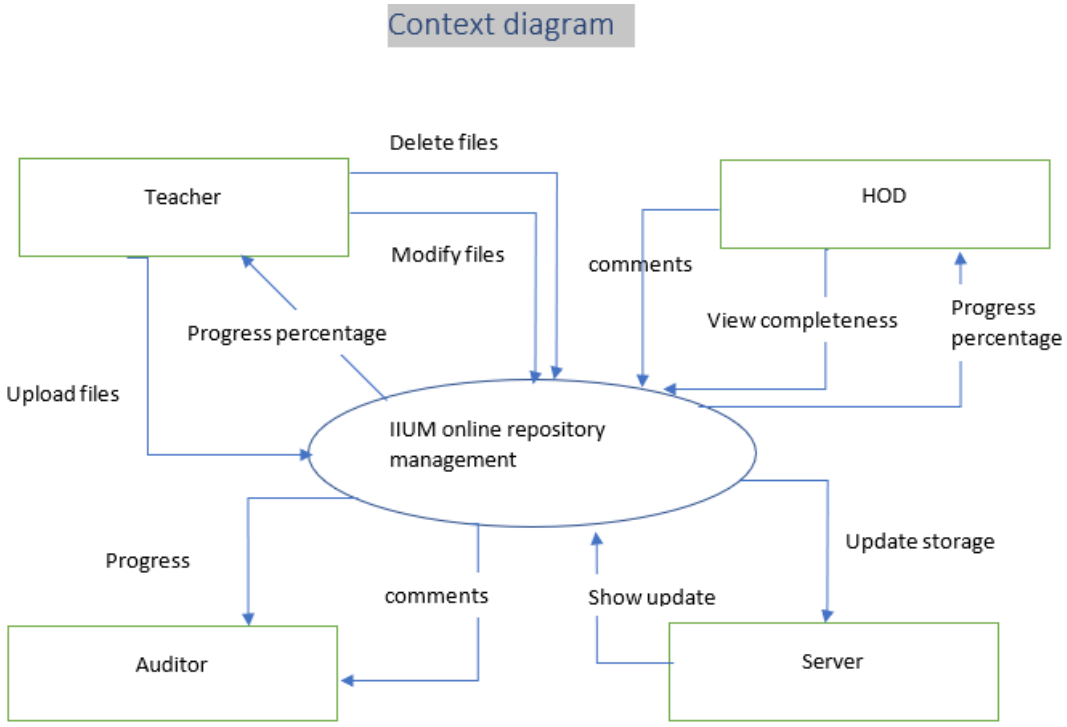
Based on the interview and the project problem, we have created a questionnaire using google form and then we distributed it to the lecturer of IIUM. The questions and the response results are shown on the appendix section.

3.4.1 Functional Requirements

Functional Requirements	**Function Areas**	**Reference**

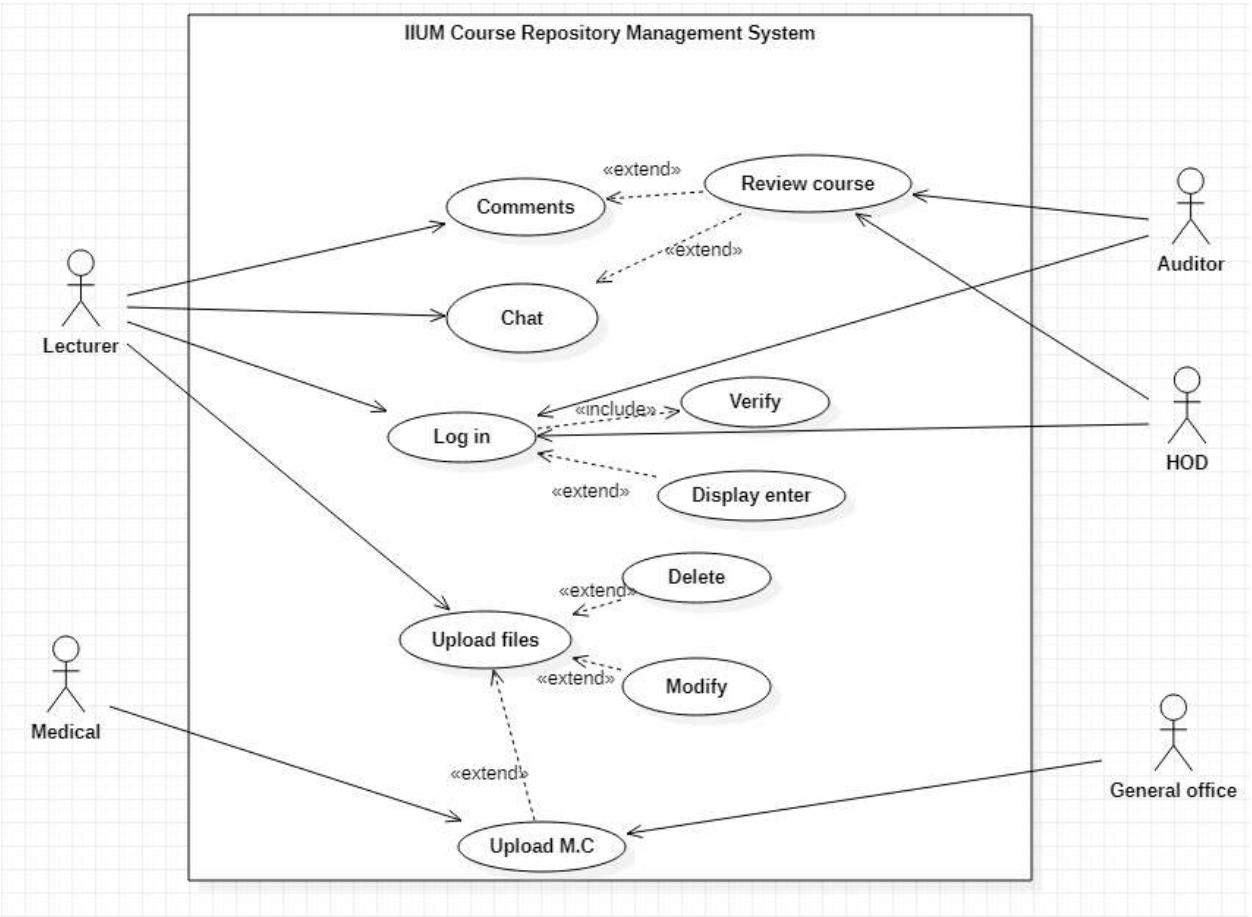
Lecturer	**Login** **Upload Files** **Comment** **Chat**	**Lecturer team SRS**
Head of the department	**Login** **Review Course** **Chat** **Comment**	**Head of the department team SRS**
Auditor	**Review Course** **Chat** **Comment**	**Auditor team SRS**
Medical	**Upload M.C to the General office**	**Medical team SRS**
General Office	**Upload M.C in the system after confirming by the lecturer**	**General office team SRS**

3.4.2 Context Diagram



Description:
Teachers will upload any files including class materials , time table , assignments and any other materials in the service .HOD, Auditor, General officer will review the courses and will comment if they want.Teachers, HOD, Auditors need to log in to the system. Teachers, HOD, Auditors can chat with each other privately or publicly. Medical can provide the softcopy of the M.C. General office will get it.

3.4.3 Use Case Diagram



3.4.4 Use Case Specifications

Use Case	Description	Source
Reviews	HOD, Auditor, General officer will review the courses and will comment if they want. This comment will be notified with the respective teachers. Teachers, HOD, Auditors can chat with each other privately or publicly.	Dr Raini (HOD)

Login	Teachers, HOD, Auditors need to log in to the system.	Dr. Azlin(Lecturer)
Upload files	Teachers can upload any files including class materials, time table, assignments and any other materials in the service. Medical can provide the softcopy of the M.C. General office will get it. The general office will update the information after reconfirming with the course lecturer.	Dr Azlin (Lecturer) and Dr Raini

No		Section	Explanation
ID	1.1	Identifier	IICRMSUC_01
	1.2	Name	Login
Management	2.1	Author(s)	IIUM Course repository management system
	2.2	Version	1.1
	2.3	Change history	
	2.4	Priority	High
	2.5	Criticality	Critical

Context	3.1	Source(s)	Dr. Azlin(Lecturer)
	3.2	Responsible stakeholders	Teachers, Auditor, HOD
Use Case Definition	4.2	Short description	Teachers, Auditor and HOD have to sign in to get access into the system.
	4.4	Associated goal (s)	
	4.5	Primary actor(s)	Teachers, Auditor, HOD
	4.6	Other actors(s)	
	4.7	Pre-condition	Teachers, Auditors, and HOD accounts must be authorized previously .
	4.9	Post-condition	All information must be pre-recorded.
	4.10	Results	All user can access the system
	4.11	Main scenario	1. Teachers, Auditors and HOD. Will insert the username and the password. 2.system will verify the user name and the password .
	4.12	Alternative scenario	The user name is incorrect .Need to check again.

	4.13	Exception scenario	System could not find the username. The account information is wrong.
	4.14	Quality requirements	1e.The user password stored in the system shall be protected against unauthorized access. 2e. When the user changes his/her password, the system shall validate that the new password is at least eight characters long and contains alphanumeric characters.
Relationship	5.1	Goal(s)	Users must be authenticated by the system.
	5.2	Use cases	If the users use the valid information then the system will go to the next use case - verify or display enter. After successful login users will be able to go to the system.
Miscellaneous	6.1	Supplementary information	User information must be reserved in the system.
	6.2	Open issues	N/A .

No		Section	Explanation

ID	1.1	Identifier	IICRMSUC_02
	1.2	Name	Upload files
Management	2.1	Author(s)	IIUM Course repository management system
	2.2	Version	1.1
	2.3	Change history	
	2.4	Priority	High
	2.5	Criticality	Critical
Context	3.1	Source(s)	Dr Azlin (Lecturer)
	3.2	Responsible stakeholders	lecturer
Use Case Definition	4.2	Short description	Teachers can upload any files including class materials, time table, assignments and any other materials in the service. Medical can provide the softcopy of the M.C. General office will get it. The general office will update the information after reconfirming with the course lecturer.

	4.4	Associated goal (s)	Store all the instruments in the server.
	4.5	Primary actor(s)	Teachers
	4.6	Other actors(s)	N/A
	4.7	Pre-condition	File Should be uploaded in the respective date and time .
	4.9	Post-condition	Don’t exist until the upload processing is finished.
	4.10	Results	All the files will be stored in the system
	4.11	Main scenario	1.select the course 2.upload the files 3.Upload MC
	4.12	Alternative scenario	1a.Share the file link which is already uploaded in another platform.

	4.13	Exception scenario	If the file is not supported, the file will be rejected.
	4.14	Quality requirements	The students' projects, assignments and other material shall be protected against any unauthorized access.
Relationship	5.1	Goal(s)	All the files will be stored in the system
	5.2	Use cases	These uploaded files will be shown in the be system. Other users will show these files.
Miscellaneous	6.1	Supplementary information	Every user can see the progress of the courses after uploading the files.
	6.2	Open issues	If the lecturer failed to upload the file in time .The system will show the incompleteness of the respective folder.

No		Section	Explanation
ID	1.1	Identifier	IICRMSUC_03
	1.2	Name	Review Course

Management	2.1	Author(s)	IIUM Course repository management system
	2.2	Version	1.1
	2.3	Change history	N/A
	2.4	Priority	Medium
	2.5	Criticality	Critical
Context	3.1	Source(s)	Dr Raini (HOD)
	3.2	Responsible stakeholders	H.O.D, Auditor
Use Case Definition	4.2	Short description	HOD, Auditor, General officer will review the courses and will comment if they want. This comment will be notified with the respective teachers. Teachers, HOD, Auditors can chat with each other privately or publicly.
	4.4	Associated goal (s)	The lecturer will be able to get the reviews on the materials which is done by the H.O.D and the auditors.
	4.5	Primary actor(s)	H.O.D, auditor

	4.6	Other actors(s)	N/A
	4.7	Pre-condition	The user must be registered and logged in to the system.
	4.9	Post-condition	System takes the review
	4.10	Results	The H.O.D and the auditors will successfully post their reviews.
	4.11	Main scenario	1. The auditor or the H.O.D selects the folder. 2. Selects the item to be reviewed. 3. The review is posted on the materials and the lecturer can see the review. 4. Select chat to interact with each other.
	4.12	Alternative scenario	1a. The user goes to the desired file but does not review the material.
	4.13	Exception scenario	1e. The user reviews the item but the lecturer is not able to see the comments.
	4.14	Quality requirements	N/A
Relationship	5.1	Goal(s)	The H.O.D and the auditor will be able to review the materials uploaded by the lecturer.
	5.2	Use cases	N/A

Miscellaneous	6.1	Supplementary information	The lecturer will be able to reply to the review for further communication.
	6.2	Open issues	Reviewing error.

3.4.5 Goal Modelling

Here is the goal model of IIUM Course Repository Management System

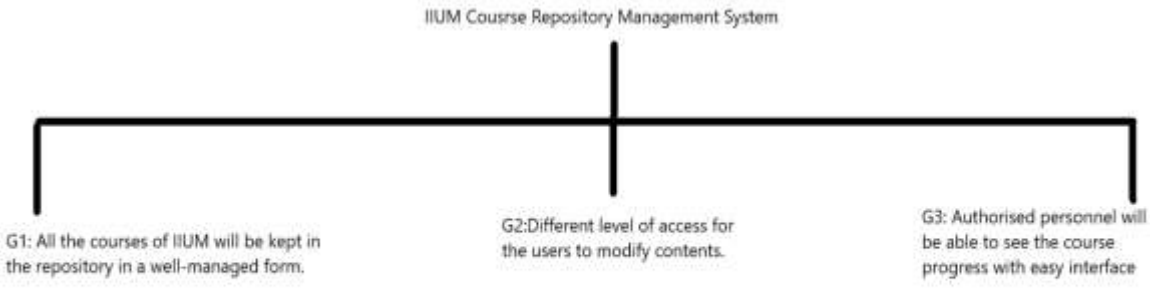


Figure: Goal Modelling Diagram

3.5 Requirements Documentation

Refer to **Functional Requirements** section and **Management SRS**

3.6 Requirements Management

For managing team collaboration, we used Jira. It is an online based requirement management tool. It has the features such as:

1. Organize requirements efficiently.

2. Review and track all changes (Traceability).

3. Stay updated on requirement status.

4. Prioritize requirements with flexibility.

5. Clarify requirements by attaching files.

6. Provides collaborating with team members.

7. Support agile methodology for project development.

8. Jira is very easy to handle the changes in requirements.

9. Provides options for requirements validation.

10. Generates fancy reports and creates dashboards.

Refer to appendix for the screenshot for the requirements management tool that we have used in our project .

3.7 Requirements Validation

When we meet with our stakeholder, we gather the requirements to be used when we build the system. However, sometimes we might gather requirements that are out of correct according to the system expected by our stakeholders. In order to ensure that we are building the right system we

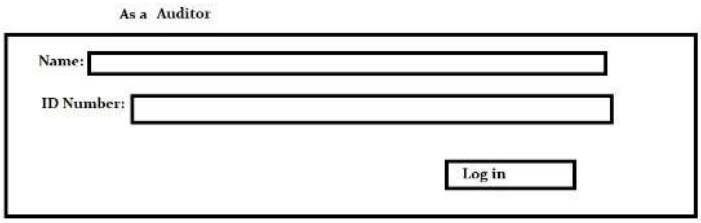
have to agree and validate the requirements that we have gathered during the whole process. We have to check and remove the requirements that are defective and resolve any conflict.

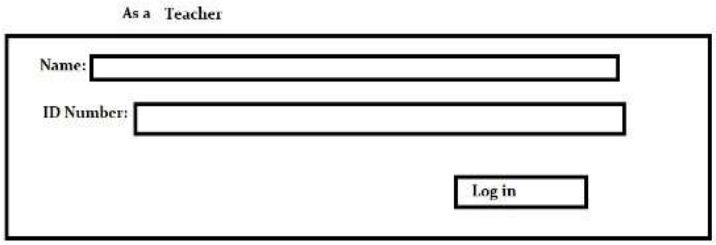
For our project we have used two techniques to validate our requirements. These techniques are commenting artefacts and prototyping. We organized a meeting with our stakeholders and introduced them to the requirements that we already got during the requirements elicitation.

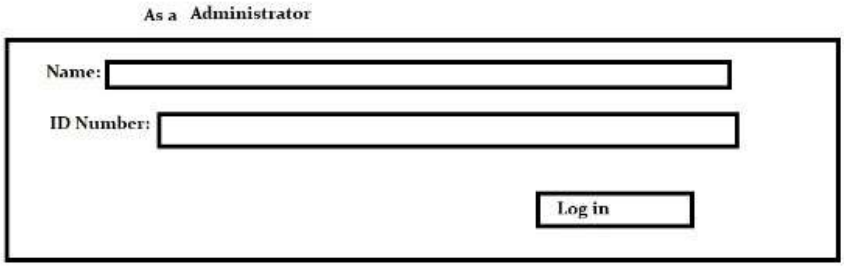
We organized a first meeting with our stakeholders where we discussed the project, the needs of the stakeholders. From that meeting we gathered the requirements and documented them according to the defined documentation and specifications guidelines. These documents have been submitted to the inspectors to be commented and reviewed before being validated. After receiving those comments, some defects have been detected and solved before creating the prototype of our system. The prototype has been submitted to our stakeholders and it has been validated because their inspection did not result in any defect. The stakeholders are satisfied with the latest upgrades.

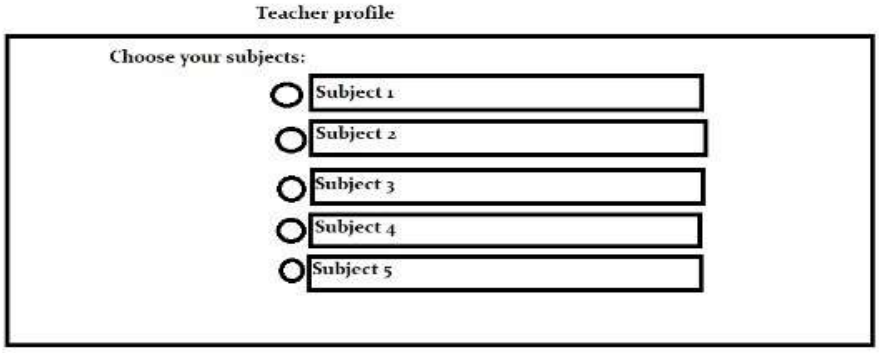
APPENDIX

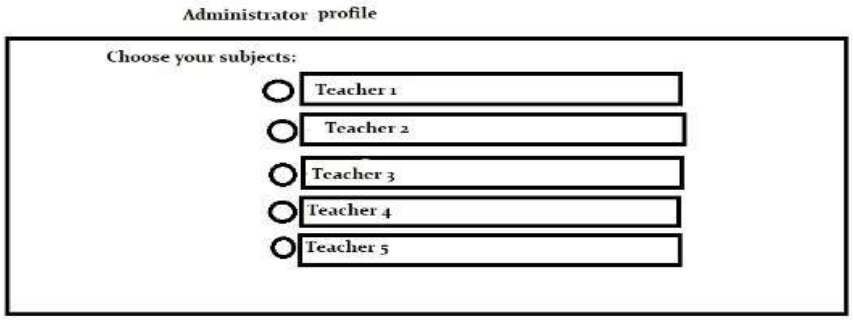
Initial Prototype of the system

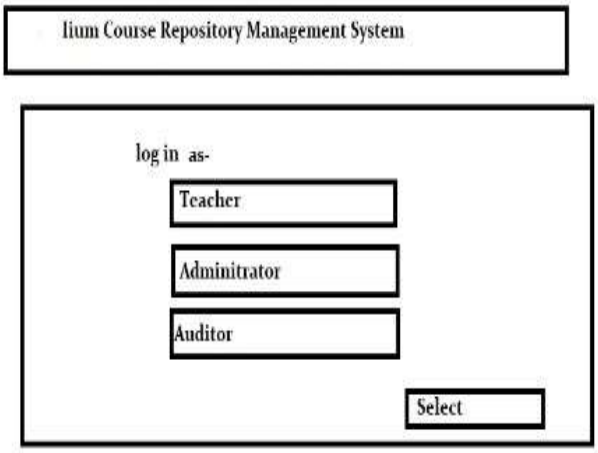





As a Administrator
Name:
ID Number:
Log in


Teacher profile
Choose your subjects:
Subject 1
Subject 2
Subject 3
Subject 4
Subject 5





Figures : Initial Prototyping interface

Final Interfaces for prototyping

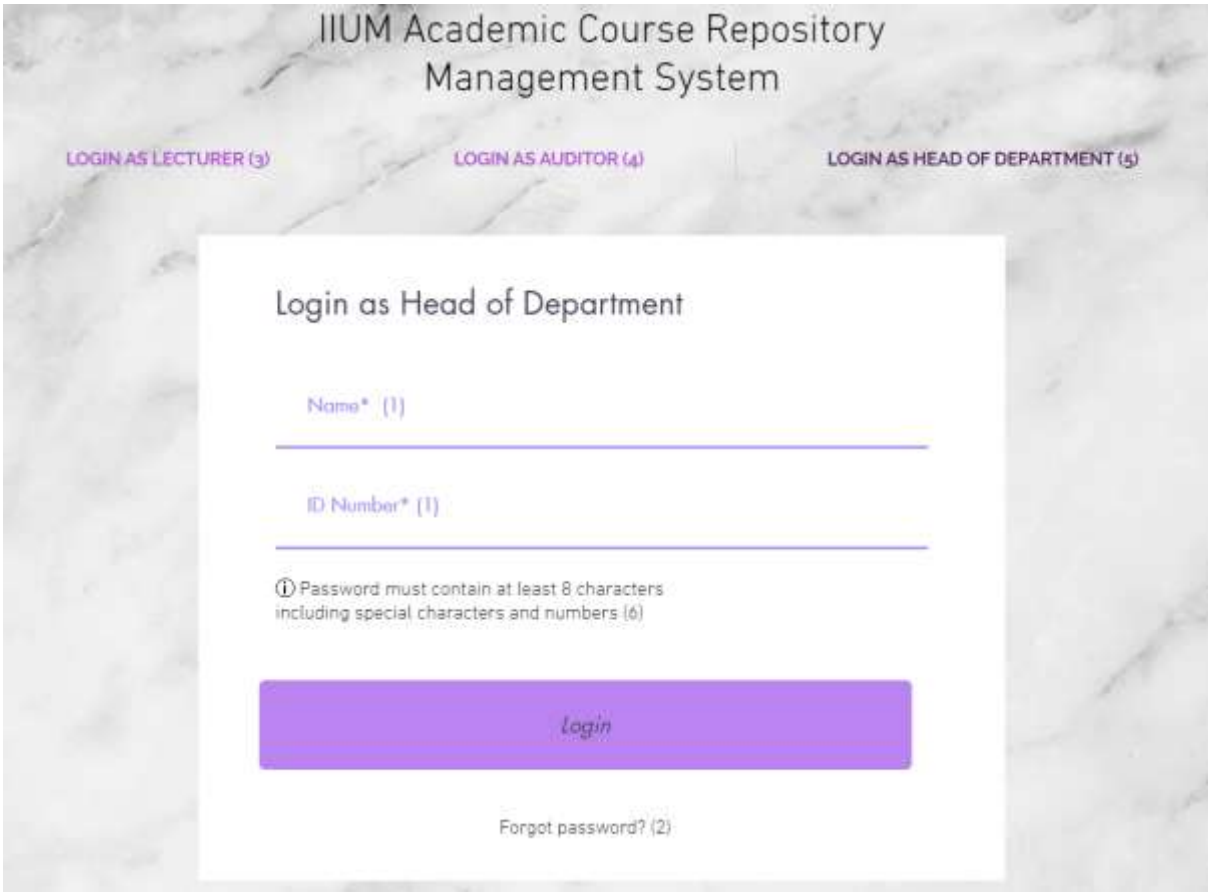


Figure: Login Page

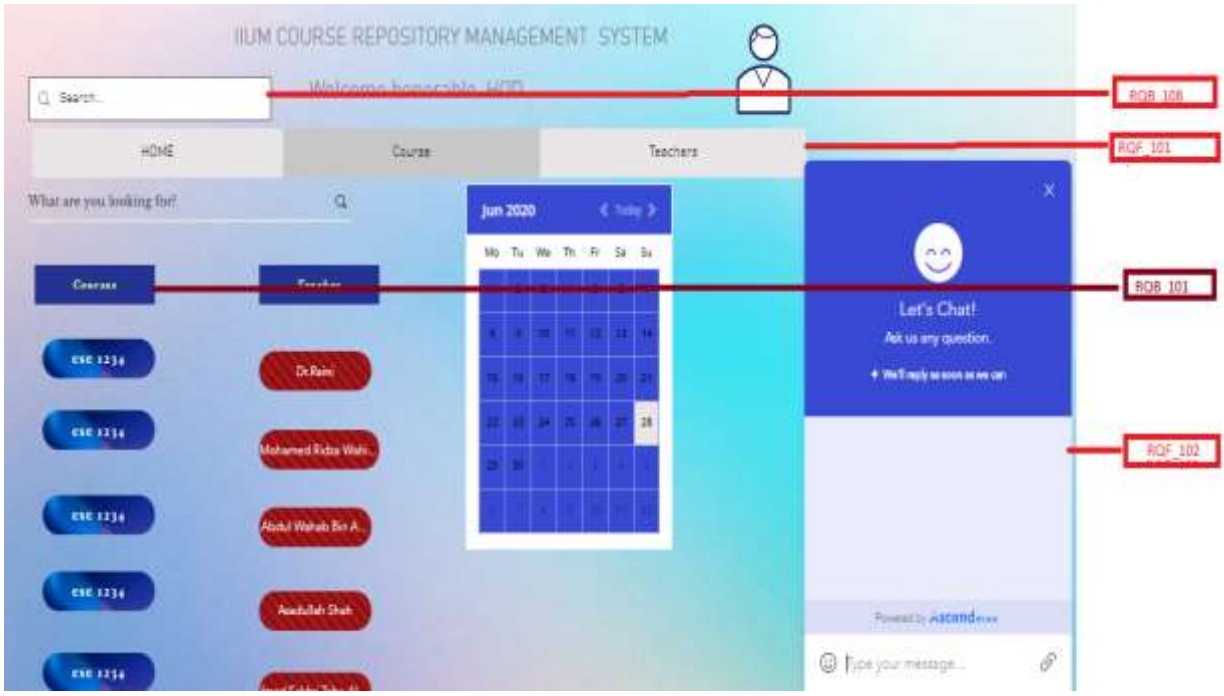


Figure : HOD interface instance

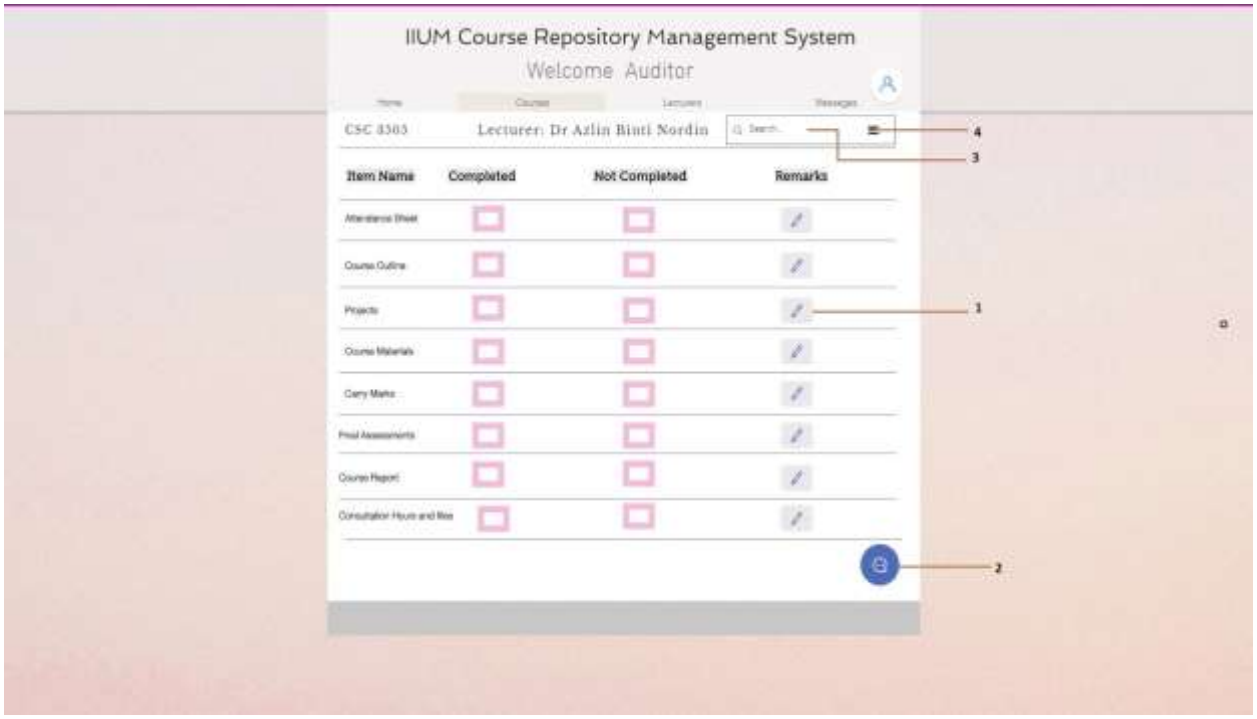


Figure : Auditors interface instance

Figure : Lecturers View

Questionnaire Questions and Responses

IIUM Course Repository Management System

The "IIUM Academic Course Repository Management System" is a proposed system where we will try to solve the general problems faced by the stakeholders such as lecturers, and administration panel which is seeing all the relevant files and materials of a course in an automated online form.As a lecturer he/she has to upload all the file in the current system but he/she can not locate how much of the course is already done till now and how far is left.Also they put some files on online platform and others they have to manage manually in a hard copy which is also hard for the auditors to evaluate.At the same time, the current progress is not easy to see for the administration panel. That's why they can't see the completeness of a course .

* Required

Email address *

Your email

Are you satisfied with the current IIUM Academic Course Repository Management System? *

	1	2	3	4	5	
Dissatisfied	○	○	○	○	○	Satisfied

What are the difficulties you have faced with this current system? *

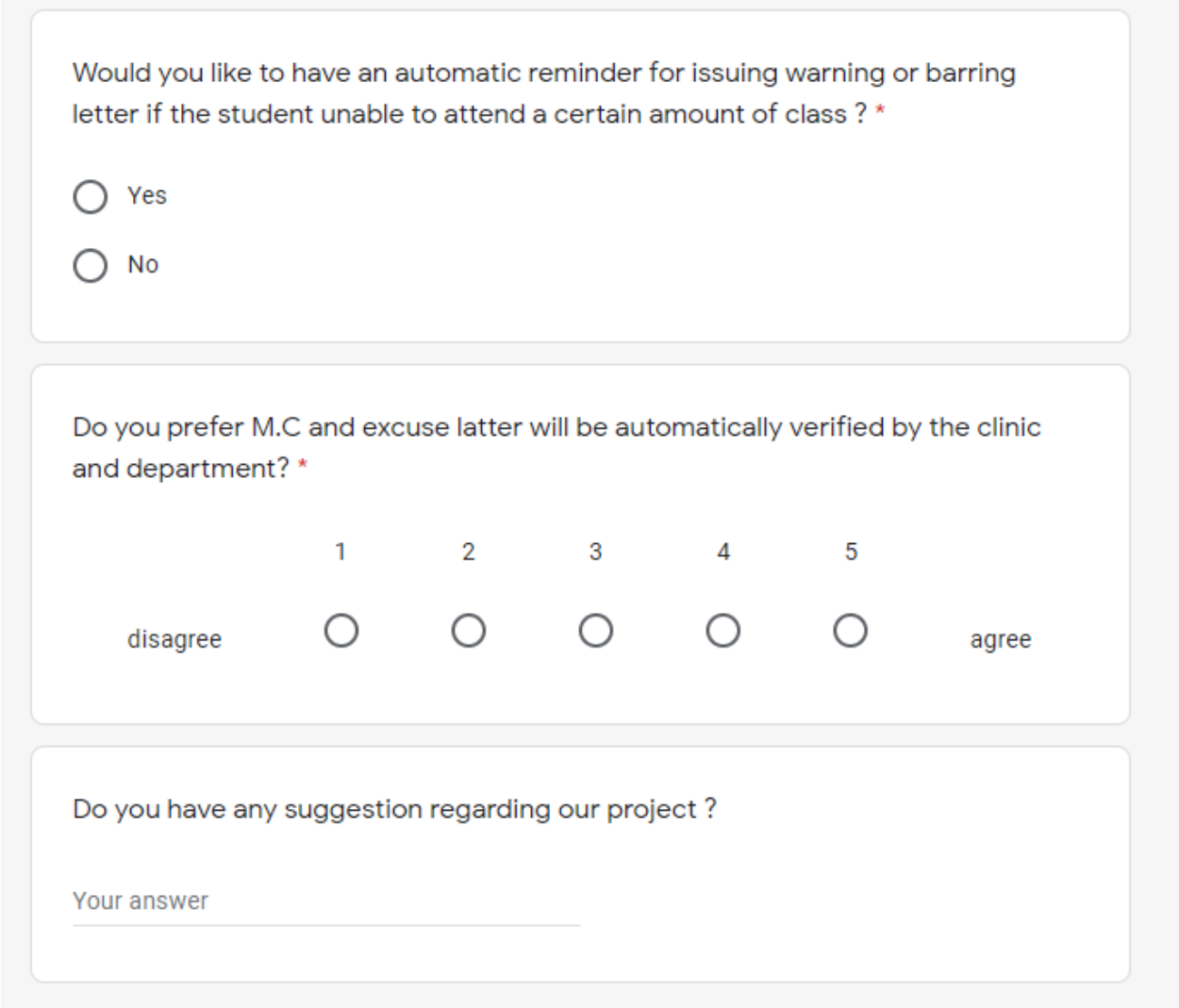
- [ ] Difficult to manage hard and soft copy both
- [ ] Have to explain explicitly to the HOD at the end of the semester
- [ ] Difficult to determine the course progress
- [ ] Have to manage the attendance and excuse letter manually
- [ ] Difficulties in managing student's submission and projects
- [ ] Other: _____

When do you generally update your course materials i.e assignments, assessment marks, schedules etc. *

- ◯ Per day
- ◯ Per week
- ◯ Per Month
- ◯ End of the semester
- ◯ Other: _____

Would you like if we make a system where all the course files would be stored on an online platform and you'll be able to see the course progress? *

- ◯ Yes
- ◯ No



Figures : Questionnaire Questions

5 responses

Accepting responses

Summary | Question | Individual

Who has responded?

Email

afiquezian@gmail.com

hyaacob@iium.edu.my

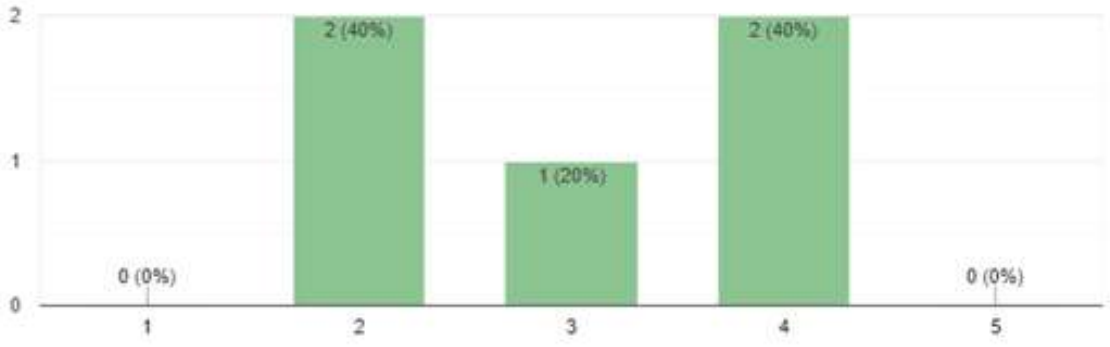
msadri@iium.edu.my

jamalabedin@iium.edu.my

sabariahbakri@iium.edu.my

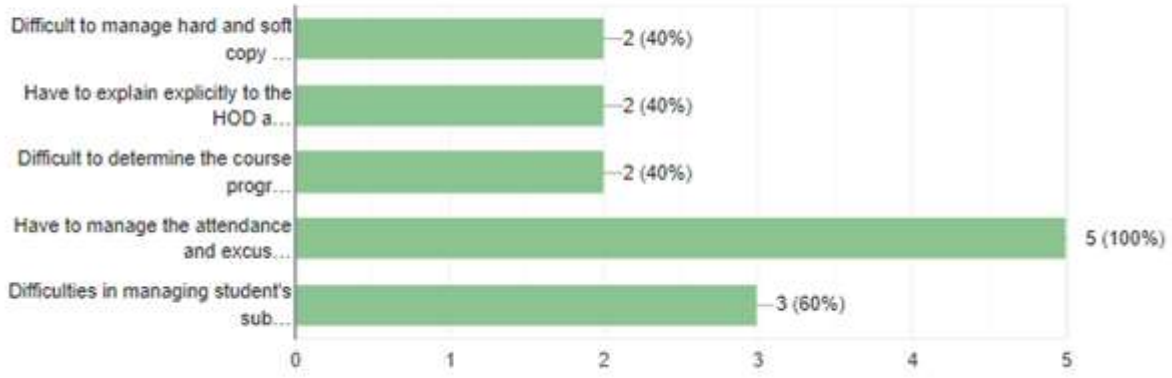
Are you satisfied with the current IIUM Academic Course Repository Management System?

5 responses



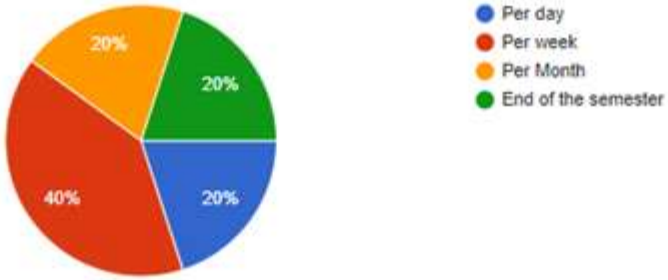
What are the difficulties you have faced with this current system?

5 responses



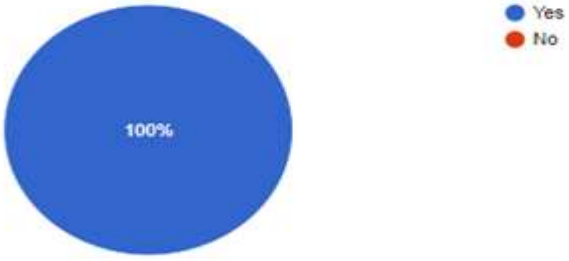
When do you generally update your course materials i.e assignments, assessment marks, schedules etc.

5 responses



Would you like if we make a system where all the course files would be stored on an online platform and you'll be able to see the course progress?

5 responses



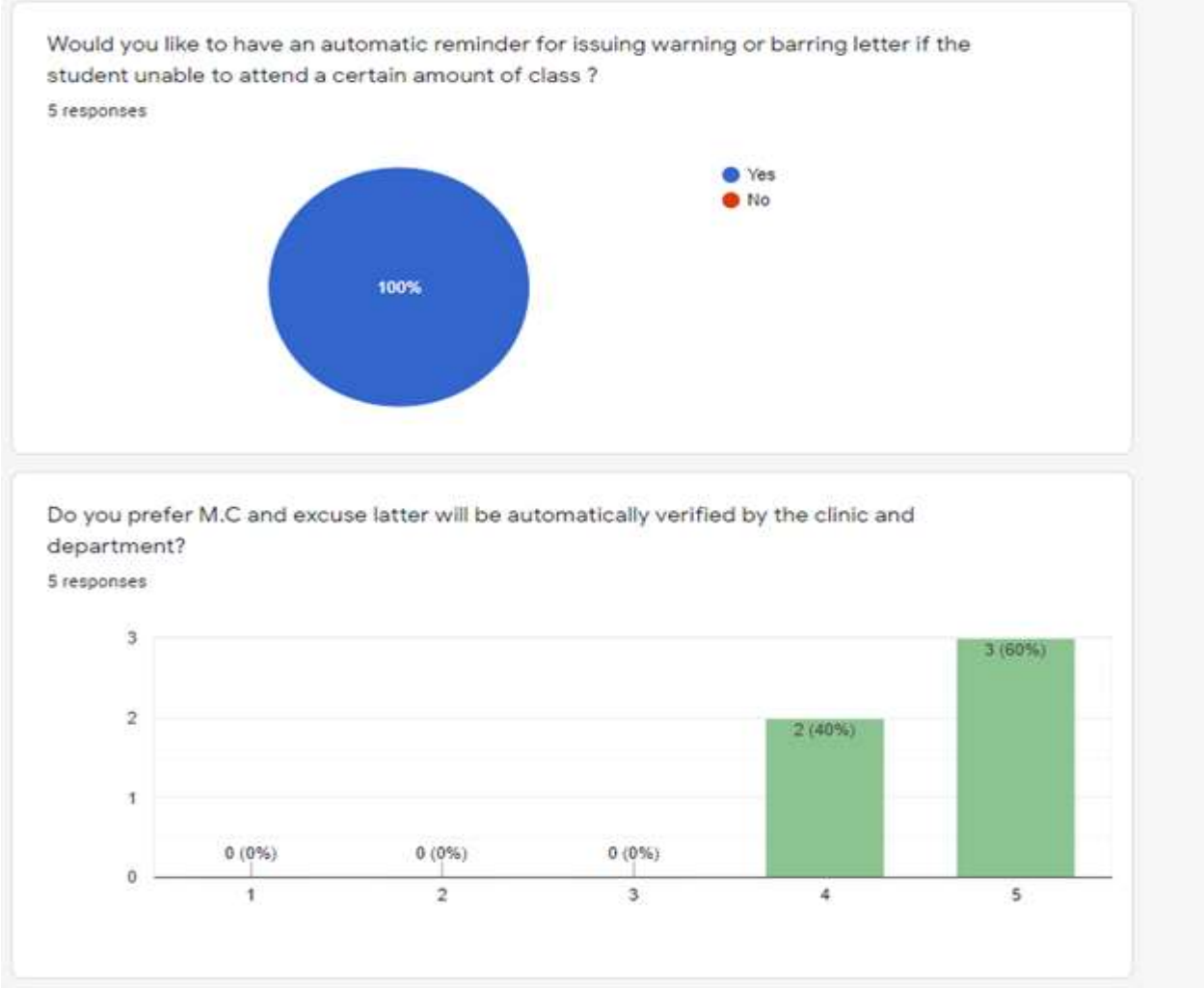


Figure: Questionnaire responses

Requirement Management Tool

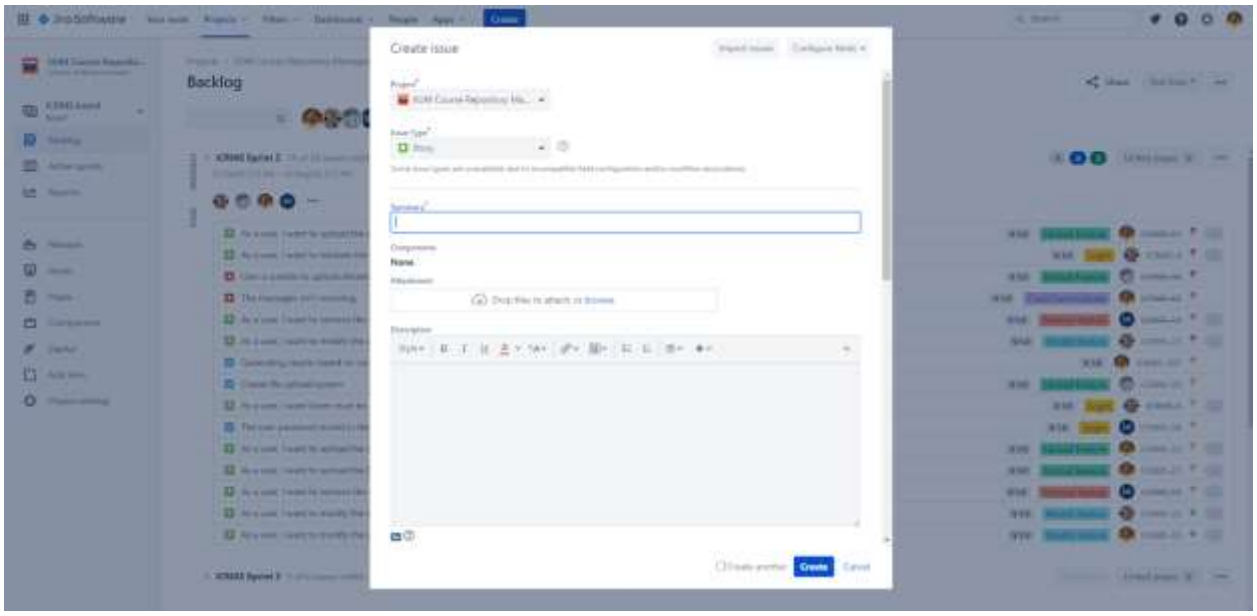


Figure: Template provided by Jira in terms of storing requirements

[ICRMS-21] As a user, I want to upload the course materials in the system

Status:	Done		
Project:	IIUM Course Repository Management System		
Components:	None		
Affects versions:	None		
Fix versions:	V 1.0		
Type:	Story	Priority:	Highest
Reporter:	Nasik Sami	Assignee:	Nasik Sami
Resolution:	Done	Votes:	0
Labels:	None		
Remaining Estimate:	1 hour		
Time Spent:	Not Specified		
Original Estimate:	1 hour		
Epic Link:	Upload Feature		
Sprint:	ICRMS Sprint 2		

Generated at Mon Jul 27 14:45:43 UTC 2020 by Md Saiful Islam using Jira 1001.0.0-SNAPSHOT#100140-sha1:fb0377b3ab7ea61e9e469b27102b7e441e7764d

Figure: Documentation Template

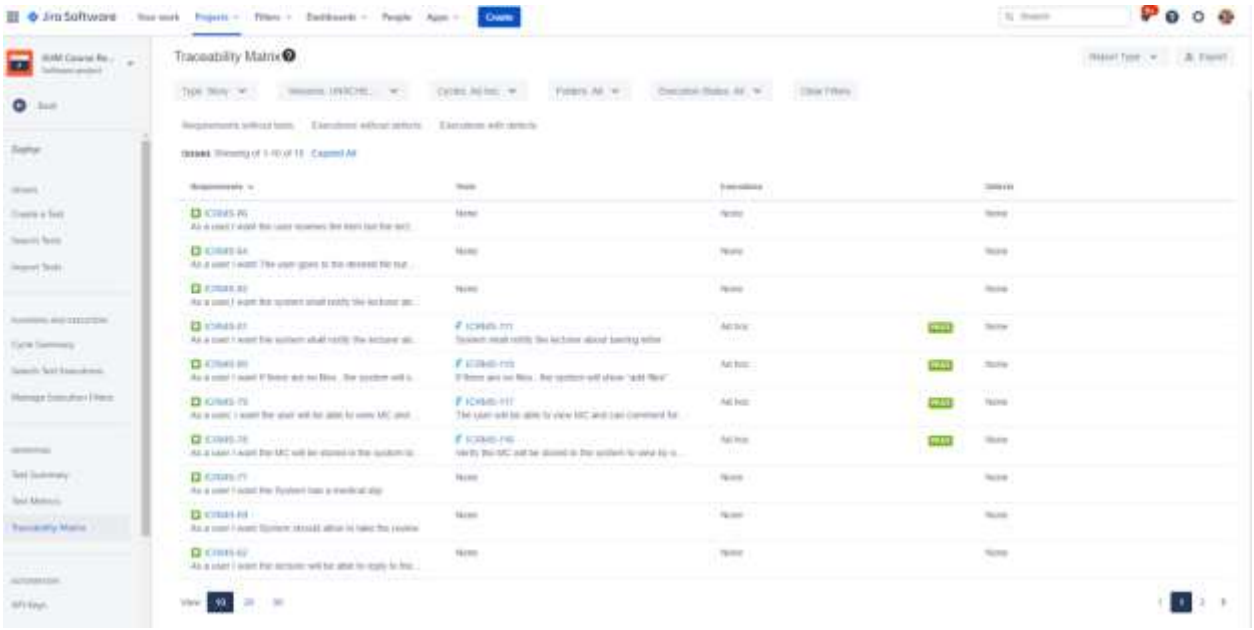


Figure: Traceability Matrix

Executions List

Test Cycle	Test Id	Execution Status	Executed By	Execution Date
Ad hoc	10118	PASS	Afique Amin Zian	Invalid Date
Ad hoc	10117	UNEXECUTED		
Ad hoc	10112	UNEXECUTED		
Ad hoc	10115	PASS	Afique Amin Zian	Invalid Date
Ad hoc	10114	UNEXECUTED		
Ad hoc	10119	PASS	Afique Amin Zian	Invalid Date
Ad hoc	10111	PASS	Afique Amin Zian	Invalid Date
Ad hoc	10112	FAIL	Md Sariful Islam	Invalid Date
Ad hoc	10110	PASS	Afique Amin Zian	Invalid Date
Ad hoc	10116	PASS	Afique Amin Zian	Invalid Date

Size: 10

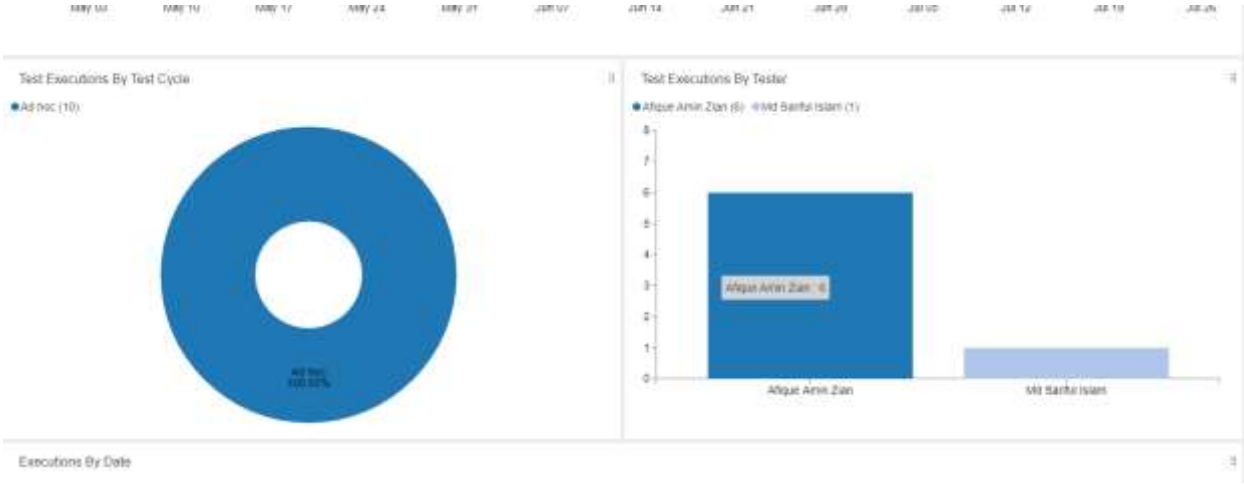


Figure: Test Matrix

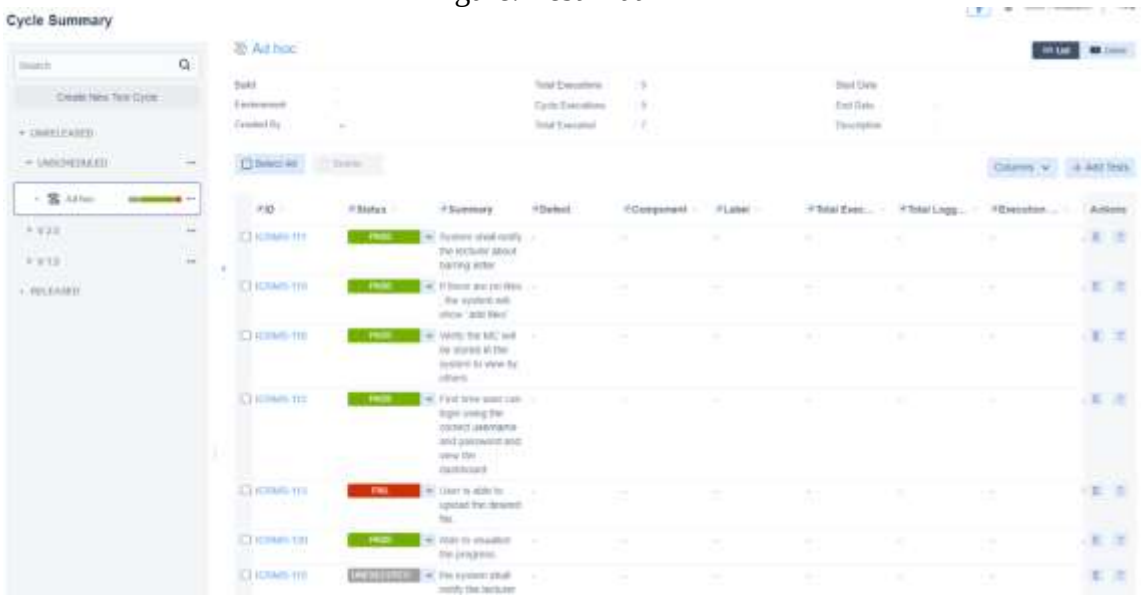


Figure: Cycle Summary

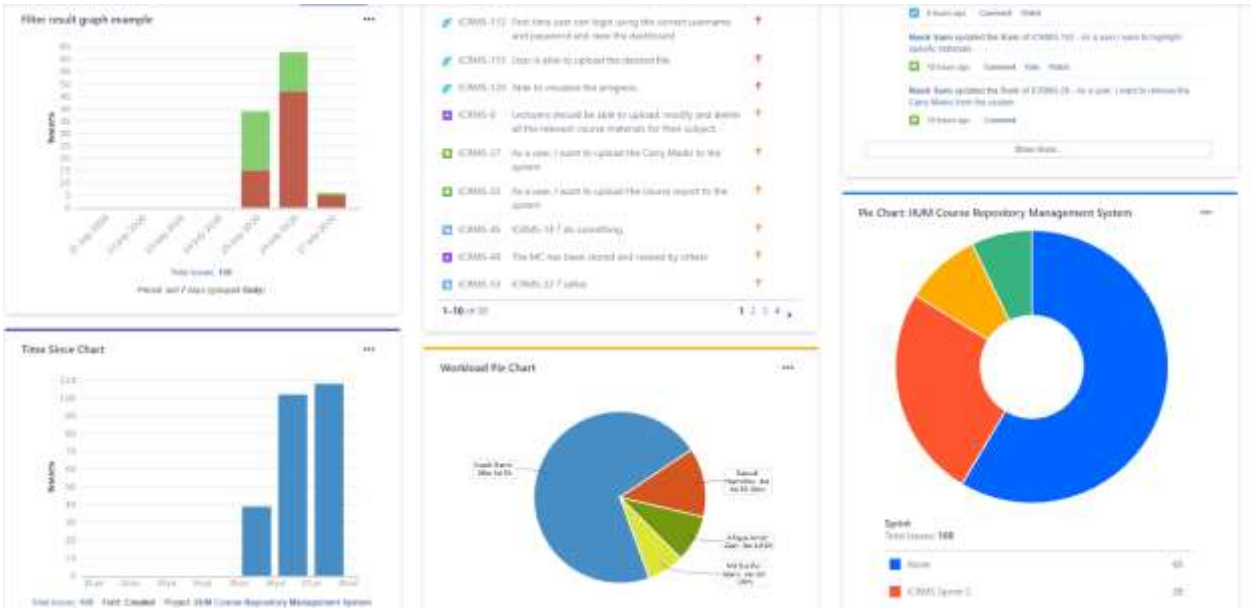
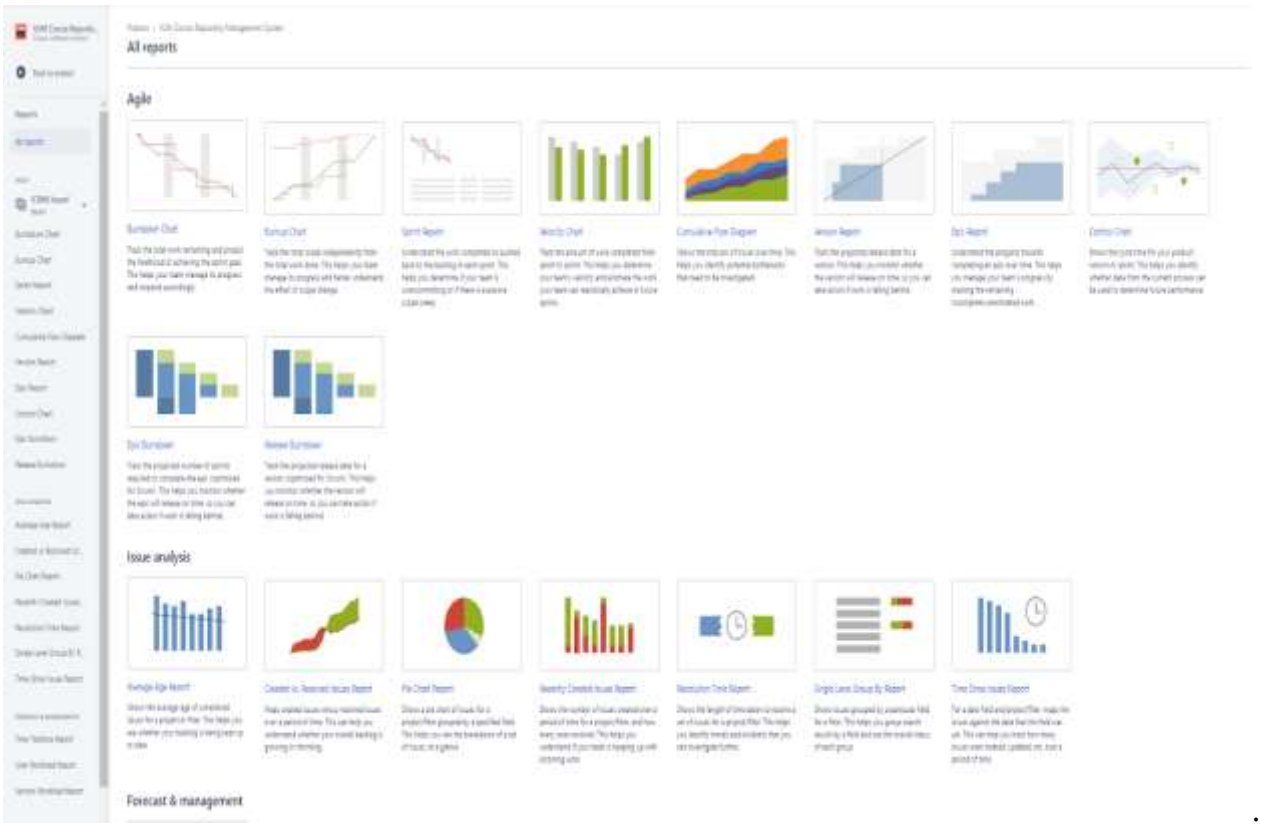
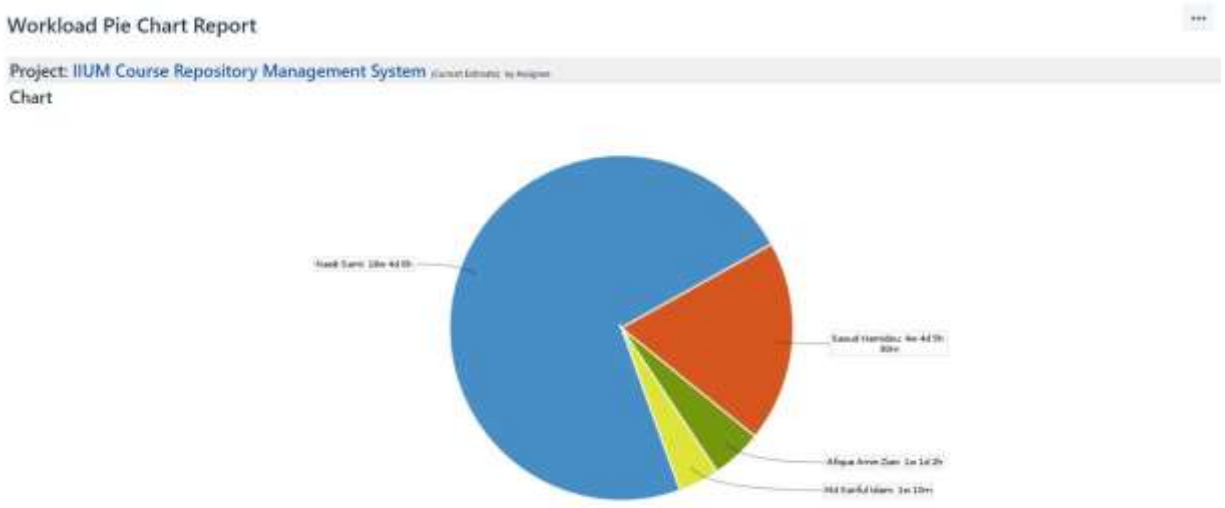
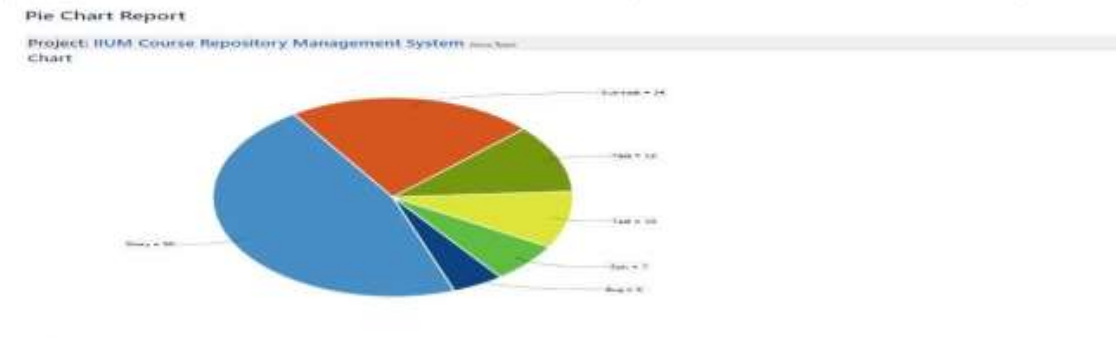


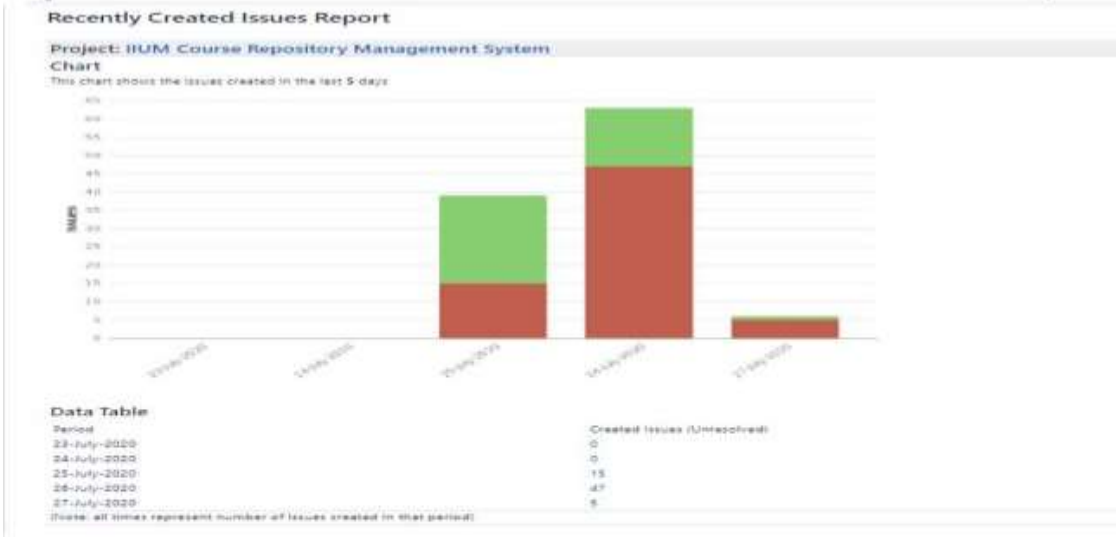
Figure: Instances of dashboard features in our project

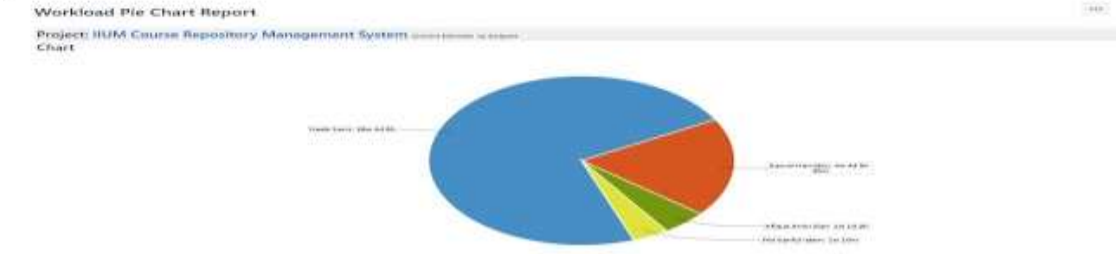

All reports
Agile
Issue analysis
Forecast & management


Workload Pie Chart Report
Project: IIUM Course Repository Management System
Chart


Burndown Chart
How to read this chart
Hide this information
Burnup Chart
Cumulative Flow Diagram
Epic Report







Figures: Reports and dashboards created in Jira

……END……