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Progress 2 Project

Subject: Enterprise Systems Development Concepts

Topic: Task Management Module

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1 System Overview

1.1 Introduction

This report will present an overview of the general architecture for some functions of the **Task Management Module**, including interview questions, requirements collection questionnaire, functional and non-functional requirements described by the use case diagram and specification. The thesis will also mention the technology selected to implement the project and the reasons for the choice.

1.2 System Specification

A technology organization needs to develop a **task management module** on a web application to improve the efficiency of task management in a project as well as increase interaction between project participants. At the request of the organization, the module will have 2 main types of users, including: **project leader and project members**.
For the **project leader**, the module helps the team leader to create or delete the project and add or remove the members who will join the project from the list of employees of the organization. In addition, the project team leader will also create tasks and moderate the assigned tasks for project members to perform.
For **project members**, these members will receive the task created by the team leader, view project details, add work files after the project is completed.
In addition, the module also supports the following additional functions:
- The module will automatically send notifications via email and on the member's system when there is a task assigned by the leader.
- The module will automatically send notifications to the leader and member receiving the task when the task has any changes.
- The module automatically records the edit history of the task so that the leader and the member receiving the task track the progress of the task and the change of the task.
- The module supports the comment system on the task to support the leader and member to exchange information related to the task

1.3 Topic Scope

This project is a **Task Management Module**, only ensuring some basic functions just enough for the team leader to manage the work and project participants as well as support communication between members and team leaders about the tasks. The project was implemented and developed under the guidance of university faculty.

1.3.1 Objects and Functions Boundaries

- Objects Boundary: Project Leader, Members
- Functions Boundary:

  - Project Leader: Create project, add member, remove member, create task, delete task, check work and confirm.
  - Members: view assigned tasks, add work done to task, Mark as Done, Add comment

1.3.2 Technologies Boundaries

- Main technology used:

- Front-end: HTML, CSS, JavaScript, Bootstrap
- Back-end: ExpressJS
- Database: MongoDB

1.4 Practical Implications

- Assist the project leader in creating, managing the tasks and work of the project members
- Support project members to receive projects and submit work directly to team leader.
- Assist the individuals involved in the project to keep a close eye on the assigned tasks when there are any changes related to the assigned tasks.

1.5 Thesis Layout

- Thesis consists of 4 parts:

- Part 1 - System Overview: Introduction to the goal, scope and practical significance of the topic.
- Part 2 - System Analysis and Design:Presents functional requirements, non-functional requirements, Use Case diagram and Use Case specification.
- Part 3 - System Implementation: Present the expected technology to be used to deploy the module and the reasons for its choice.
- Appendix A - Question List Collect Request: Presents interview questions, questionnaire

2 System Analysis and Design

2.1 Functional Requirement

2.1.1 Create Project

- The system allows the team leader to create a new project on the module

2.1.2 Add Members

- The system allows the team leader to add members to the project from the list of employees working for the organization.

2.1.3 Remove Members

- The system allows the team leader to remove members from the project if the member has not been assigned a task or has completed all the assigned tasks.

2.1.4 Create Task

- The system allows the team leader to create tasks.
- The system allows the team leader to add or edit the information of the created task.
- The system allows the team leader to change the member assigned the task.

2.1.5 Delete Task

- The system allows the team leader to delete the created task.

2.1.6 Check Work and Confirm

- The system allows the team leader to view the details of the tasks assigned to the project members.
- The system allows the team leader to check and confirm the work when the member marks the task done.
- The system allows the team leader to add comments to the tasks.

2.1.7 View the Assigned Tasks

- The system allows project members to view the list of tasks assigned by the team leader
- The system allows project members to view details of assigned tasks

2.1.8 Add Work Done to Task

- The system allows project members to add components of work done or completed to the assigned task.
- The system allows users to attach files or add descriptions, summary, comments to the work performed in the task

2.1.9 Mark as Done

- The system allows project members to mark the work as completed to notify the team leader to check and confirm the work results..

2.1.10 Add comment

- The system allows project members to add comments to work parts in assigned tasks.
- The system allows the team leader to add comments on every assigned task.

2.2 Non-functional Requirement

- Operational: The system can work on any browser and on most devices with Internet
- Performance:
  - System has a fast response time
  - The system is open 24/7
  - The module will automatically send task related notifications when the task has any changes to the team leader and assigned members
  - The module will log the history of any changes to the quest
- Security:
  - No user can log into another account without a password
  - Members are not allowed to change the information of the task that they are not assigned
- Cultural and Political: None

2.3 Use Case Diagram

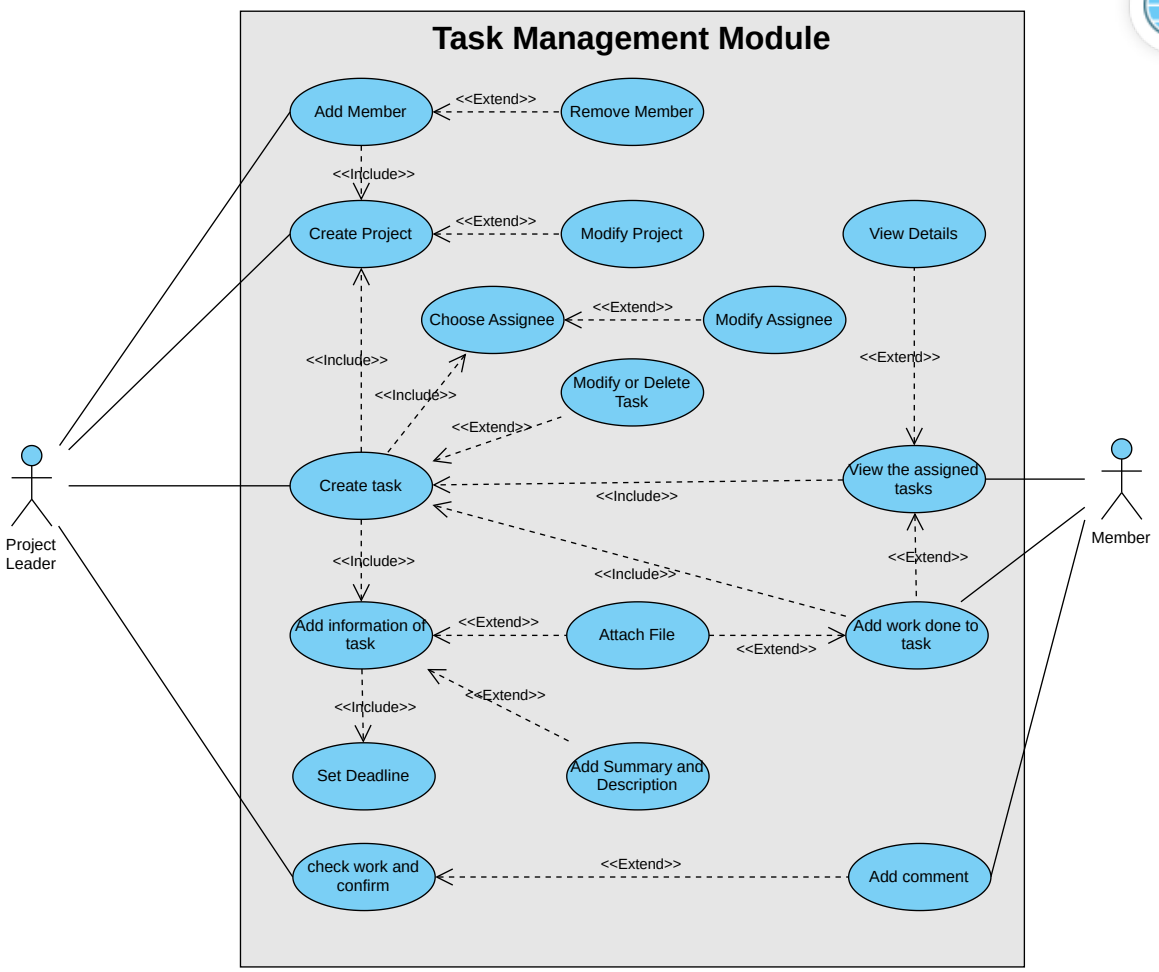

Figure 1: Use Case Diagram of Task Management Module

2.4 Use Case Specification

2.4.1 Use Case Login

Use case ID	UC001
Use case Name	Login
Primary Actor	Project Leader, Member
Stakeholder and Interests	None
Summary	The function helps users log into the system before using other functions
Pre-Condition	User must have an account in the database
Trigger	User click the Login button on the system interface
Post-condition	User successfully logged into the system
Relationships	Include: - All use cases in the diagram → Login
Main scenario	1. User want to access the system to use the functions for their work through the link. 2. The browser sends a request to the system. The system displays the login interface for User. 3. User fill in all the information that the system requires and click the Login button. 4. The system checks that the information is sufficiently entered. 5. The system checks that the information entered by users is correct. 6. The system switches the interface to the system interface corresponding to the logged in user
Alternatives	4.a. If the system checks the information entered is missing. The system will send a notification of additional missing information 5.a. If the system checks the information entered is incorrect. The system will send a notification to the user to check the entered information.

Table 1: Login use case specification

2.4.2 Use Case Logout

Use case ID	UC002
Use case Name	Logout
Primary Actor	Project Leader, Member
Stakeholder and Interests	None
Summary	The function helps Users log out of the system
Pre-Condition	User successfully logged in system
Trigger	Users click the Logout button on the system interface
Post-condition	Users successfully logged out of the system
Relationships	Include: Logout → Login
Main scenario	1. After the session ends, the employee wants to log out of the system. Users presses the Logout button. 2. The system records and logs out the User's account. The system finishes session of user in browser and switches the interface to the login interface
Alternatives	None

Table 2: Logout use case specification

2.4.3 Use Case Create Project

Use case ID	UC003
Use case Name	Create Project
Primary Actor	Project Leader
Stakeholder and Interests	None
Summary	The function helps Project Leader create new project
Pre-Condition	Leader successfully logged in system
Trigger	Leader click the create project button
Post-condition	Leader successfully create new project
Relationships	Include: Create Project → Login Extend: Create Project ← Modify Project
Main scenario	1. After successful login to the system. Team leader clicks the create new project button on the system interface 2. The system displays a pop-up window containing the information needed to create a new project 3. The Leader enters all the information required by the system and presses the Create button 4. The system checks that the information entered is complete and correct. The system initiates new projects on the system based on information provided by the Leader 5. After creating the project, the Leader wants to change some information about the project. Team leader clicks Modify Project button. 6. The system displays a pop-up window containing project information for the Leader to change. 7. The Leader fills in the information he wants to change in the corresponding information boxes. 8. The system checks that the information entered by the Leader is the correct data type required by the system. The system updates the project's new information to the system
Alternatives	4.a. The system checks that the information entered by the Leader is incorrect. The system sends a message asking the Leader to re-enter the information in the wrong information box 4.b. The system checks that the input Leader's information is missing information. The system sends a message asking the Leader to add missing information. 8.a. The system checks that the information entered by the Leader is incorrect. The system sends a message asking the Leader to re-enter the information in the wrong information box 8.b. The information boxes that the Leader does not enter, the system defaults to not changing the information

Table 3: Create Project use case specification

2.4.4 Use Case Add Member

Use case ID	UC004
Use case Name	Add Member
Primary Actor	Project Leader
Stakeholder and Interests	None
Summary	The function helps Project Leader add member to project
Pre-Condition	- Leader successfully logged in system - Project is successfully created
Trigger	Leader click the add member button
Post-condition	Leader successfully add new member to project
Relationships	Include: Add Member → Login Add Member → Create Project Extend: Add Member ← Remove Member
Main scenario	1. After the team leader login and create the project successfully. Leader click on the members button to see the list of members in the project 2. System displays the list of project members. 3. Leader clicks the add member button. 4. System displays a pop-up window containing a search bar for the Leader to search for members 5. The Leader enters the information of the member to be searched and presses the search button 6. System displays the list of members that match the information entered by the Leader 7. Group leader clicks select a member in the list and press the add button 8. System adds that member to the project on the system and returns to the interface containing the list of project members 9. System sends a notification to that member about being added to the project 10. The team leader wants to remove some members from the project. The Leader clicks the delete button located in the same row as the member that the Leader wants to delete. 11. System checks that the member has completed all assigned tasks and has not been assigned any tasks. System sends a confirmation message. 12. The Leader confirms the deletion of the member. 13. System deletes that member from the project on the system. 14. System sends a notification to that member about being removed from the project.

Alternatives	2.a. If there are no members in the project, the system will display an empty list. 6.a. If there are no members matching the search information of the Leader, the system will display an empty list 11.a. System checks that the deleted member is being assigned a task and has not yet completed it. System sends a notification requesting to change the recipient of the tasks that the deleted member is receiving before deleting the member and stops the process of deleting the member. 12. The Leader confirms not to delete the member, the system stops the process of deleting the member

Table 4: Add Member use case specification

2.4.5 Use case Create Task

Use case ID	UC005
Use case Name	Create Task
Primary Actor	Project Leader
Stakeholder and Interests	None
Summary	The function helps Project Leader create new task
Pre-Condition	- Leader successfully logged in system - Project is successfully created - Leader successfully added members to project - Leader added information of task
Trigger	Leader click the create task button
Post-condition	Leader successfully create new task
Relationships	Include: Create Task → Login Create Task → Create Project Create Task → Add information of Task Add information of Task → Set Deadline Create Task → Choose Assignee Extend: Create Task ← Modify or Delete Task Choose Assignee ← Modify Assignee Add information of Task ← Add Summary and Description Add information of Task ← Attach File

Main scenario	1. After the Leader login, create the project and add members to the project successfully. Leader clicks create task button to create a new task. 2. System displays a pop-up window containing the information needed to create a new task 3. Leader fills in the task's information in the corresponding information boxes 4. the leader selects assignee from the list of team members 5. Leader attaches necessary files for task 6. The Leader sets the deadline for the task and presses the create button 7. System checks that the Leader has set the deadline and selected the assignee 8. System initializes a new task on the system and returns to the interface containing the list of created tasks. 9. System sends notifications to the assignee about the assigned task 10. After creating the task, the Leader wants to change the task's information. Leader selects the task which leader want to change from the list of created tasks and clicks the modify button. 11. System displays a pop-up window containing the task's information for the Leader to change. 12. The Leader enter the information that the Leader wants to change into the corresponding information box and click the modify button 13. System records and updates the new information entered by the Leader into the system 14. System sends a notification to the assignee of that task about the update of the task 15. system returns to the interface of the list of created tasks 16. The Leader wants to delete a task from the list. The Leader clicks the delete button located in the same row as the task that the group leader wants to delete. 17. system sends confirmation message 18. Team leader confirmed to delete that task 19. The system deletes that task from the project and sends a message to the assignee of that task about the task being deleted 20. system returns to the interface of the list of created tasks
Alternatives	7.a. The system checks that the Leader has not set a deadline or has not selected a task recipient, the system sends a notification to request the Leader to supplement 13.a. The information boxes that the Leader does not enter, the system defaults to not changing the information 18.a. Leader confirmed not to delete the task. The system stops the deletion process

Table 5: Create Task use case specification

2.4.6 Use case Check Work and Confirm

Use case ID	UC006
Use case Name	Check Work and Confirm
Primary Actor	Project Leader
Stakeholder and Interests	None
Summary	The function helps check the work done by assignee and send confirm notification if the work completed
Pre-Condition	- Leader successfully logged in system - Leader successfully created project - Leader successfully created task
Trigger	The leader clicks on a task in the list of unfinished created tasks
Post-condition	Leader confirms task completed
Relationships	Include: Check Work and Confirm → Login Extend: Check Work and Confirm ← Add comment
Main scenario	1. After Leader login, create the project and the task successfully. Leader clicks task that leader wants to check. 2. The system displays all the information of task. 3. The Leader checks based on work data, attachments and comments of the task assignee 4. Leader checks that the task have been completed. Leader clicks Complete button. 5. The system sends a notification to confirm task completion. 6. Leader confirms task completion. 7. The system updates the status of the task as complete and does not allow the task assignee to edit or add the working file to task 9. The system returns the interface containing the created tasks 8. The system sends a notification to the assignee of the task about the Leader confirming the task is completed. 10. After confirming the completion of the task, the Leader checks again that the work of the task is not complete and needs to continue to improve. Leader clicks on restart task button. 11. The system records and changes the status of the task back to Pending and allow task assignee to edit or add work data. 12. the system sends a notification to the task's assignee about the task being restarted.
Alternatives	2.a. If assignee has not added any work data to the task, the system will display a blank interface for assignee's work section. 4.a.1. Leader checks the task's work for errors, the Leader adds comments in the task about those issues. 4.a.2. The system records and sends a notification to the assignee of the task about the Leader adding a comment. 5.a. Leader does not confirm the completion of the task, the system stops updating the status of the task

Table 6: Check Work and Confirm use case specification

2.4.7 Use case View Assigned Tasks

Use case ID	UC007
Use case Name	View Assigned Tasks
Primary Actor	Member
Stakeholder and Interests	None
Summary	Function to help project members view the list of assigned tasks and its details
Pre-Condition	- Team leader must successfully log into the system - Team leader must create project and add members successfully - Team leader must create successful task - Member must successfully log in to the system
Trigger	After the member clicks on one of the participating projects
Post-condition	Members can see the list of assigned tasks in the project
Relationships	Include: View Assigned Tasks → Login View Assigned Tasks → Create Task Extend: View Assigned Tasks ← View Details
Main scenario	1. After the member successfully logs in to the system. Members click to select 1 project in the projects that the member participates in. 2. The system displays the tasks that the member is assigned to perform in the project 3. Members click on one of the tasks. 4. The system displays detailed information of the assigned task
Alternatives	3.a. if the member has not received any tasks in that project, the system will display a blank interface

Table 7: View Assigned Tasks use case specification

2.4.8 Use case Add Work Done to Task

Use case ID	UC008
Use case Name	Add Work Done to Task
Primary Actor	Member
Stakeholder and Interests	None
Summary	Function to help project members add file work done to task
Pre-Condition	- Team leader must successfully log into the system - Team leader must create project and add members successfully - Team leader must create successful task - Member must successfully log in to the system
Trigger	After the member clicks add file button
Post-condition	Members can successfully add file work done to task
Relationships	Include: Add Work Done to Task → Login Add Work Done to Task → Create Task Extend: Add Work Done to Task ← Attach File
Main scenario	1. After the member successfully logs in to the system. Members click to select 1 project in the projects that the member participates in. 2. The system displays the tasks that the member is assigned to perform in the project 3. Members click on one of the tasks. 4. The system displays detailed information of the assigned task 5. The member wants to add the work done files for the team leader to check. Members click the add file button to add work files to the task. 6. The system checks that the files that members upload to the system are valid. The system proceeds to upload those files to the system. 7. The member clicks the submit button to confirm the completion of the work 8. The system sends a notification to the group leader about the member's completion of the task so that the team leader can check the member's work.
Alternatives	3.a. if the member has not received any tasks in that project, the system will display a blank interface 6.a. The system checks that the member's file upload is not supported and exceeds the allowed system capacity. The system sends a warning message with the list of files supported by the system and the allowed capacity.

Table 8: Add Work Done to Task use case specification

2.4.9 Use case Add Comment

Use case ID	UC008
Use case Name	Add Comment
Primary Actor	Member, Project Leader
Stakeholder and Interests	None
Summary	Function to help project leader and members add comment to the task in project
Pre-Condition	- Team leader must successfully log into the system - Team leader must create project and add members successfully - Team leader must create successful task - Member must successfully log in to the system
Trigger	After the member clicks add file button
Post-condition	Members can successfully add file work done to task
Relationships	Include: Add Comment → Login Extend: Add Comment ← Check Work and Confirm
Main scenario	1. After the member successfully logs in to the system. Members click to select 1 project in the projects that the member participates in. 2. The system displays the tasks that the member is assigned to perform in the project 3. Members click on one of the tasks. 4. The system displays detailed information of the assigned task 5. The member wants to add comments to the task. Members click on the comment bar to enter comments 6. The system records and saves that comment to the system. The system sends a notification to other members who also receive the task and the team leader about having a new comment in the task
Alternatives	3.a. if the member has not received any tasks in that project, the system will display a blank interface 6.a. The system checks that the member's file upload is not supported and exceeds the allowed system capacity. The system sends a warning message with the list of files supported by the system and the allowed capacity.

Table 9: Add Comment use case specification

3 System Implementation

3.1 Technology used and Reasons for use

3.1.1 Front-end - HTML,CSS,Javascript

- Basic easy to use with support for many libraries and frameworks

3.1.2 Back-end - ExpressJS

- **Rapid server development**: Expressjs provides many features in the form of functions for easy use anywhere in the program. This eliminated the need to write code thereby saving time.
- **Routing**: Express js provides a routing mechanism that maintains the state of the website with the help of URLs.
- **Templating**: The templating tools provided by Express.js allow developers to build dynamic content on websites by building HTML templates on the server side.
- **Debugging**: For successful development of web applications, debugging is not necessary. Now with Expressjs debugging has become easier thanks to the ability to pinpoint the parts of the web application that have errors.
- **Middleware**: This is middleware that has access to databases, client requests, and other middleware. This middleware is primarily responsible for the systematic organization of Express.js functionality.

3.1.3 Database - MongoDB

- Document oriented
- High performance
- High Scalability – Sharding
- Flexible – add/remove fields with little or no impact on the application
- Data is not consistent
- No joins
- Distributable
- Representing data in JSON or BSON

References

[1] Phuc H.Duong, M.Sc. **Requirement Determination & Use-Case Analysis**. Ton Duc Thang University. 2022

Appendix A-Question List Collect Request

Interview Questions

1. What platform does the system run on? **Web app**
2. On which device do you usually use the system? **Phone**
3. What browser do you usually use to use the system? **Chrome**
4. Maximum number of members in a project? **10**
5. Maximum file size to upload?**50MB**
6. What types of users does the system consist of?**Project Leader and Project Member**
7. What are the functions of the project leader in the module?**- Modify Project, Member of Project and Task; Check and Confirm Work Done**
8. What are the functions of the project member in the module?**View and add work done to the assigned task, add comment**
9. How many member can a task be assigned to? **3**
10. what file types are commonly used in the project? **pdf,docx,js,css,html,zip**
11. What information is needed to create a task? **assignee, description, name, deadline, attachment**
12. What information is needed to create a project? **name, deadline**
13. In addition to the user functions of the system, are there additional functions that need to be added? If yes, please specify it. **Automatically notify, record task edit history, add comment to task**
14. Where will the system send notifications? **User Email and User Account in Module**
15. What notifications should the module send, to whom, and when?
- sent to all members when the project changes
- send to the task's assignee when the task change
- send to the task's assignee when there is a new comment
- send to the task's assignee when the deadline is near
16. How many days before the deadline is the system automatically sending notices?**2 days**

Questionnaire

1. What platform does the system run on?
   (a) **Web App**
   (b) Mobile
   (c) Winform
2. On which device do you usually use the system?
   (a) **Smart Phone**
   (b) Tablet
   (c) Laptop
   (d) PC
3. What types of users does the system consist of?**Project Leader and Project Member**

4. What are the functions of the project leader in the module?**- Modify Project, Member of Project and Task; Check and Confirm Work Done**
5. What browser do you usually use to use the system?
   (a) **Chrome**
   (b) Opera
   (c) Edge
   (d) FireFox
   (e) Another choice
6. Maximum number of members in a project? **10**
7. Maximum file size to upload?**50MB**
8. What are the functions of the project member in the module?**View and add work done to the assigned task, add comment**
9. How many member can a task be assigned to? **3**
10. what file types are commonly used in the project?
    (a) **pdf**
    (b) **zip**
    (c) **docx**
    (d) **Another choice**
11. What information is needed to create a task? **assignee, description, name, deadline, attachment**
12. What information is needed to create a project? **name, deadline**
13. In addition to the user functions of the system, are there additional functions that need to be added? If yes, please specify it. **Automatically notify, record task edit history, add comment to task**
14. Where will the system send notifications?
    (a) **Email**
    (b) SMS
    (c) **System Notification**
15. What notifications should the module send, to whom, and when?
    - sent to all members when the project changes
    - send to the task's assignee when the task change
    - send to the task's assignee when there is a new comment
    - send to the task's assignee when the deadline is near
16. How many days before the deadline is the system automatically sending notices?**2 days**