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Web Programming Assignment

An Internal Enterprise Web Application

Group 6

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1 Introduction

1.1 Problem statement

In this project, we work to develop a web-based system that can be used for employees during their work. This would need to be able to facilitate a smooth working process as well as serve as a platform where everyone can see and update their tasks and information accordingly.

1.2 Motivation

As workspaces around the world are becoming ever increasingly digital, it is vital that a company has a platform to serve as a base of operation. This would enable employees of all levels to keep track of work and look up information on projects and their coworkers. This will enable a smooth, up-to-date, and connected work environment where information is clear for everyone.

1.3 Goals and Scope

Firstly, the website needs a hierarchy of rights where each user is given an account of their rank in the company with the appropriate rights and permission to perform certain actions. All accounts need to contain personal information that can be updated.

Furthermore, the website needs to support managing and assigning tasks by the managers. As for the staff, they need to be able to check to see their assigned tasks as well as update their progress accordingly. Everyone should be able to update their information.

Because of the professional purpose, the website needs to be visually pleasing but not distracting. The information presented needs to be clear and concise.

Due to the nature of being a university project, the scope of our website would not be full-fledged. All requirements for system for employees should be met but to a certain degree given the resources and time available.

2 Requirement analysis

2.1 Functional requirements

- The website needs to support an account system where users can login, logout, declare and update their personal information
- The website account system needs to be multi-level so that users can work on projects and perform tasks according to their rank (for example manager need to be able to create projects and assign tasks while staffs are only allowed to view their tasks)
- Manager must be able to create projects and assign tasks.
- Boss can create/edit/create projects and assign projects to appropriate managers.
- Boss and manager must be able to see report on the progress of all projects.



- Staff can view their tasks and projects.
- Admin can make changes to the system such as creating/deleting projects and creating/deleting/editing users of the system.

2.2 Nonfunctional requirements

- **Visual aspect:** The website needs to look pleasing while still maintaining a degree of professionalism.
- **Compatibility:** The website must support common web browsers(Google, Edge, Firefox) and a number of operating systems Windows,macOS for desktop and Android,iOS for mobile.
- **Performance:** The website needs to be responsive with low latency, throughput, and resource utilization requirements. All actions must be finished within three seconds during an average load, and five seconds during a peak load.
- **Security:** All pages will authenticate users and each user is allowed a specific set of actions and rights either to view websites or do a task.
- **Usability:** The website must be easy to use. A user will be able to use the website to set up his/her account and perform his/her tasks after a 15 minutes guide session.
- **Scalability:** The website must be able to handle a large amount of data (able to contain 1,000,000 users)

3 UML diagram

3.1 Use case diagram

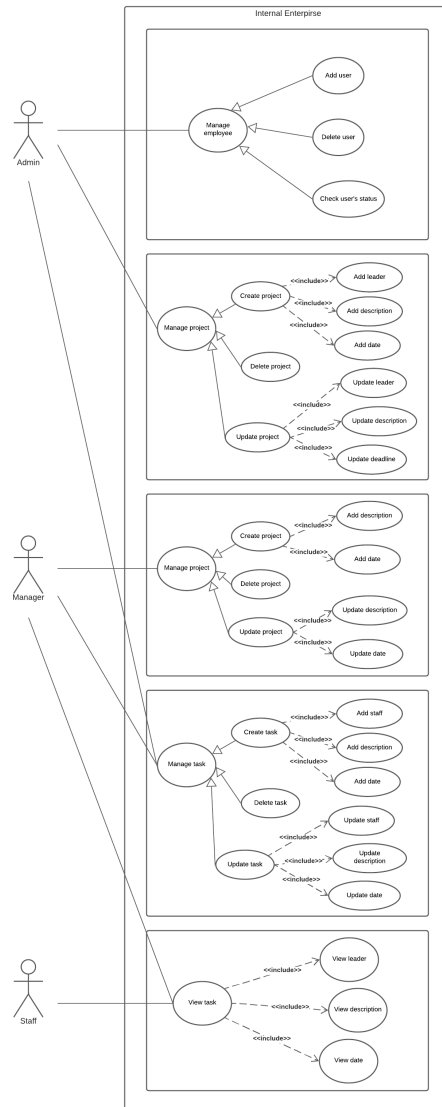


Figure 1: Use case diagram

3.2 One specific feature

3.2.1 Feature

We choose the use-case diagram of "Manage task" feature.

3.2.2 Use-case diagram

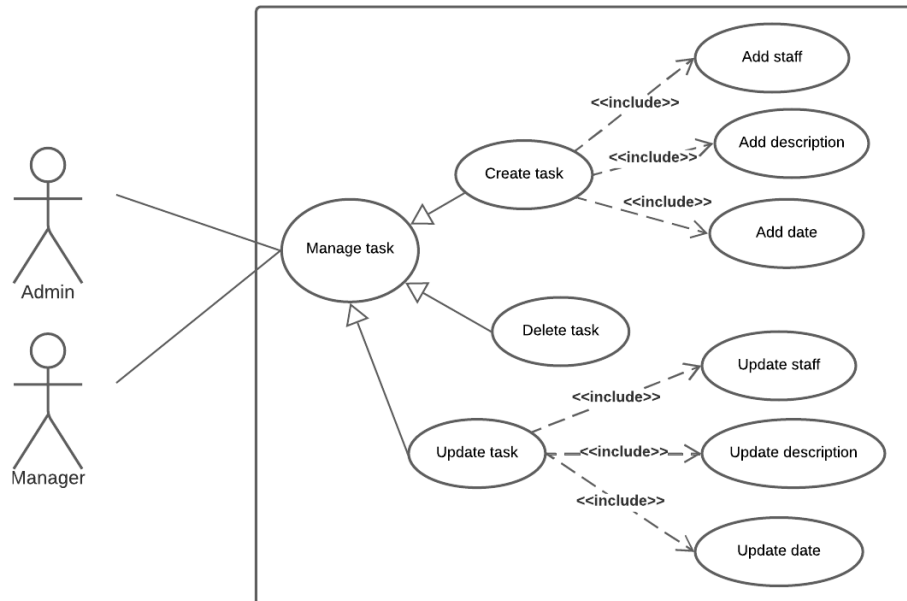


Figure 2: Use case diagram



3.2.3 Description in table format

Name	Manage task
Actor	Admin and Manager
Description	Admin and Manager can manage to Create, Update or Delete task for their Staffs. If a task is Created or Updated successfully, it appears on Staffs' side and they can view its Description, start Date, and due Date.
Preconditions	The account of Admin or Manager has been granted the access to manage the tasks. Additionally, Admin or Manager has created a Project before assigning a task.
Normal flow	<ol style="list-style-type: none">1. Admin and Manager log in to the system using their account.2. They create a Project.3. They choose New task and fill in the information of that task.4. They choose the Staff to fulfill that task.5. The use case ends.
Exceptions	<i>Exception 1: at step 2</i> 2a. If Admin and Manager have not created a Project, they cannot create a New task.
Alternative flow	<i>Alternative 1: at step 2</i> 2a. Admin and Manager have already created a Project: <ol style="list-style-type: none">1. They choose New task and fill in the information of that task.2. They choose the Staff to fulfill that task.3. The use case ends. <i>Alternative 2: at step 2</i> 2b. Admin and Manager have already created a Project: <ol style="list-style-type: none">1. They Update the Staff, the Description, or the Date of the previous tasks.2. The use case ends. <i>Alternative 3: at step 2</i> 2c. Admin and Manager have already created a Project: <ol style="list-style-type: none">1. They Delete the previous tasks.2. The use case ends.



4 Database design

Figure 14 illustrates the database schema of our system. There are five classes including *users*, *project_list*, *task_list*, *works_on*, and *system_settings*.

users contains account information:

- first_name: First name.
- last_name: Last name.
- email: Registered email.
- type: 1 for admin or boss, 2 for manager, or 3 for staff.
- avatar: Destination where the avatar image is stored.
- date_created: The timestamp at which the account is created.

project_list contains project information:

- name: Name of the project.
- description: Description of the project containing the summary of the project.
- status: Project status (1 for pending, 2 for in progress, or 3 for done).
- start_date: Starting date of the project.
- end_date: Due date of the project.
- manager_id: ID of the manager currently in charge of the project.

task_list contains task information:

- project_id: ID of the project including the task.
- assignee_id: ID of the account assigned the task.
- task: Name of the task.
- description: Description of the task.
- status: Task status (1 for pending, 2 for in progress, or 3 for done).
- deadline: Deadline of the task.
- date_created: The timestamp at which the task is created.

works_on contains information of the relationship between projects and users:

- user_id: ID of the user.
- project_id: ID of the project.

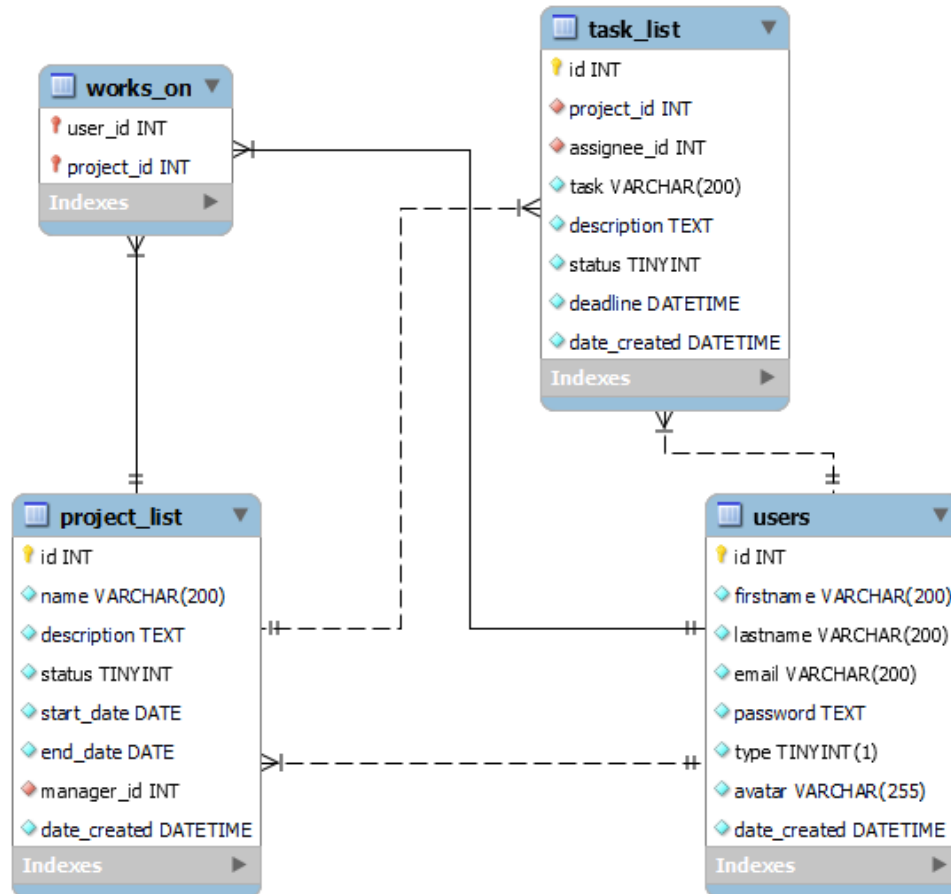


Figure 3: Database schema of Taskify

5 UI-UX Design

5.1 Colours

For a workspace website like this we will choose colours that represent the workspace culture. The colours which we have chosen are: #17A2B8, #005387, and #ffffff. The reason for choosing these colours is blue or the shades of blue represents the strength and power of the youth of passionate workers and it also represents the reliability of the company.

5.2 Pages

Since this is an internal enterprise web application so the design philosophy is simple but professional. We decided on name and logo of the web application (Figure 4).



Figure 4: Logo of Taskify

5.2.1 Login Page:

First will be the Login Page (Figure 5) where the users will be filling their email and password, which is provided by the admin or the boss of the company.

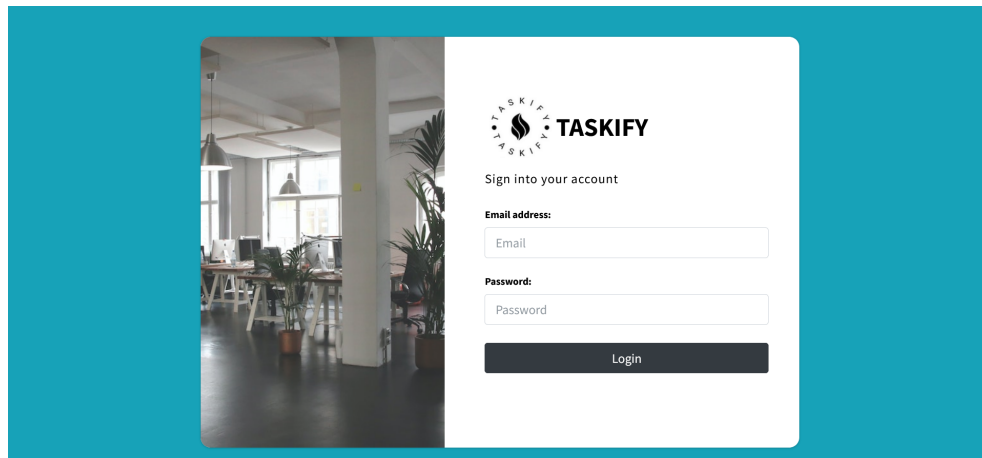


Figure 5: Login Page of Taskify

5.2.2 Home Page:

After login successfully, the user will be landing on the Home Page (Figure 6). The Home Page give an overview of the functionalities of this web application. On the left side of the page is the Sidebar. This sidebar is how the user will be using to the navigating on the page. And depending on what kind of roles the user is, the left sidebar might differ.

On top is the topbar where the user could change your Profile or Logout (Figure 7) of the account by pressing on the person logo on the far right of the bar.

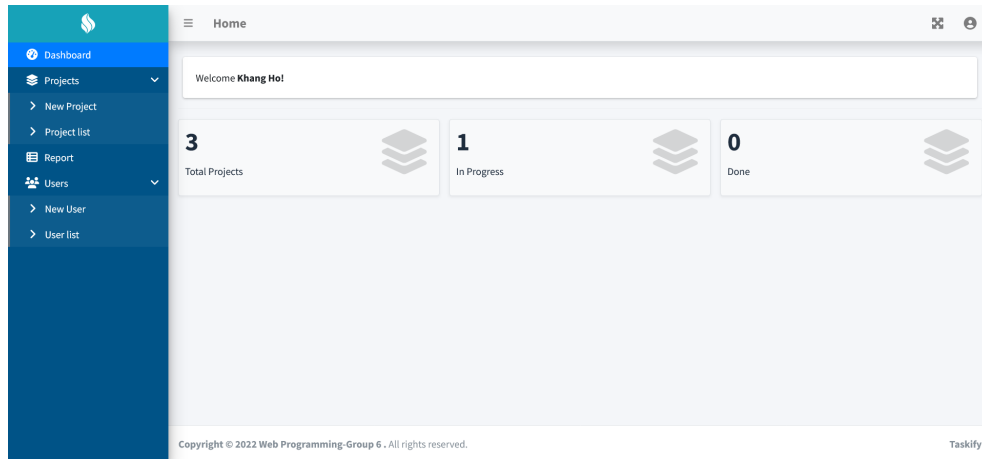


Figure 6: Home Page of Taskify

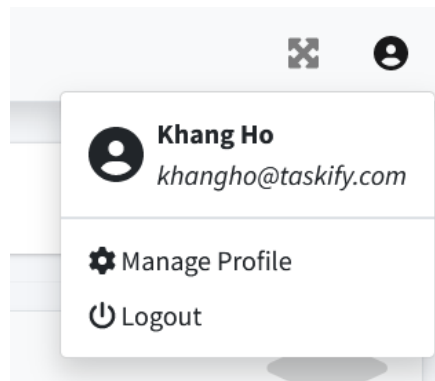


Figure 7: Topbar of Taskify

5.2.3 New Project Page:

The user can create a new project on the New Project page (Figure 8).

5.2.4 Project List Page:

The user can view their project on the Project List page (Figure 9).

5.2.5 Reports Page:

The user can view the summary report of their project on the report page (Figure 10).

5.2.6 New User Page:

The user can add a new user on the New User Page (Figure 11).



Figure 8: New Project Page of Taskify

#	Project	Date Started	Due Date	Status	Action
1	Real Estate Recommendation System <i>Recommendation system to recommend suitable real estate for customers in need</i>	Dec 31, 2022	Dec 31, 2023	Pending	Action
2	Vietnamese OCR Platform <i>Platform to OCR and transform popular documents</i>	Dec 02, 2022	Apr 30, 2023	In Progress	Action
3	Vietnamese Subtitle Generator <i>Vietnamese subtitle generator for video and audio files</i>	Nov 25, 2022	May 22, 2023	Pending	Action

Figure 9: Project List Page of Taskify

5.2.7 User List Page:

The user can a list of users on the User List Page (Figure 12).

5.2.8 View Project Page:

The user can view the individual project on the View Project Page (Figure 13), which contains information of the project.

5.2.9 Task List Page:

The user can view all of the task that is assigned to them (Figure 14).



#	Project	Task	Completed Task	Progress	Status
1	Real Estate Recommendation System Due: 2023-12-31	5	0	0% Complete	Pending
2	Vietnamese OCR Platform Due: 2023-04-30	4	0	0% Complete	In Progress
3	Vietnamese Subtitle Generator Due: 2023-05-22	5	0	0% Complete	Pending

Figure 10: Report Page of Taskify

First Name:

Last Name:

Email:

Password:

Confirm Password:

User Role:

Avatar:

Figure 11: New User Page of Taskify

6 Implementation

Our source code is public available on Github and can be accessed via this link: [Link](#).

6.1 Technologies used

We chose *PHP* as the server-side scripting language and *MySQL* as the database management system for our websites.

For front-end development, *HTML*, *CSS* and *Javascript* are indispensable for any websites, including ours. While *HTML* and *CSS* are necessary for displaying and styling web pages' content, *Javascript* is used to make our web pages interactive. We also used *Boot-*



#	Name	Email	Role	Action
1	Administrator	admin@admin.com	Admin	Action
2	Dung Nguyen Duc	dungnd@taskify.com	Employee	Action
3	Duy Tran Minh	duytm@taskify.com	Employee	Action
4	Hoang Do Minh	hoangdm@taskify.com	Employee	Action
5	Huan Pham Bui Minh	huanpbm@taskify.com	Project Manager	Action
6	Hung Tran Duy	duyth@taskify.com	Employee	Action
7	Khang Ho	khangho@taskify.com	Admin	Action
8	Khoa Vo Dang	khoavd@taskify.com	Employee	Action
9	Khoi Nguyen Luat Gia	khoingl@taskify.com	Project Manager	Action
10	Tan Tran Minh	tantm@taskify.com	Employee	Action

Figure 12: User List Page of Taskify

#	Task	Assignee	Description	Status	Action
1	Competitiveness Study	Tan Tran Minh	Study on competitiveness of the project	In Progress	Action
2	Mining Data	Tan Tran Minh	Mining customer data	Pending	Action
3	Research RS	Dung Nguyen Duc	Research and create a survey report on...	Pending	Action
4	Setup Hardware	Tan Tran Minh	Request and setup development server for...	Pending	Action
5	Summary Data	Hung Tran Duy	Summary customer information	Pending	Action

Figure 13: View Project Page of Taskify

strap, AdminLTE and some other supporting libraries to make our website better and more attractive.

6.2 Security

As our website is for internal use only, security is a top priority to make sure our website is safe from attackers. We used MD5 hashing algorithm to hash the user passwords stored in the database in order to prevent unwanted attacks.

On the other hand, users' access to web pages is designed based on their roles to avoid unexpected behaviours. While staffs can only view their projects and tasks, project

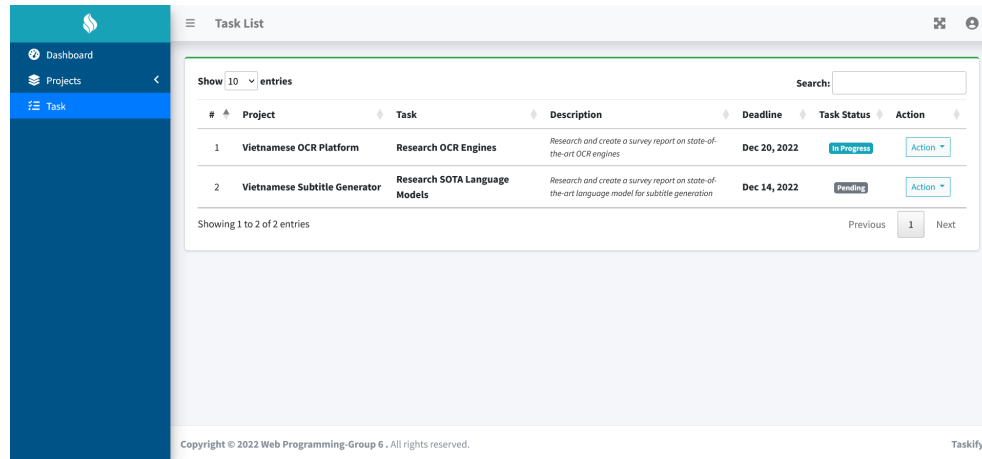


Figure 14: Task List Page of Taskify

managers can also create projects and assign tasks to their team members. Bosses and admins are at the highest level who can also manage the user list of the company.

7 Testing

We manually created some test-cases based on some of the designed use cases to make sure our website works as expected.

7.1 Test case 1: Log in

Preconditions: The user has already signed up and is currently on the login page of the website.

Steps:

1. User fills in the login account's information.
2. If the user enters the information correctly, the website forwards to the home page.

Expected result: The user logs into the system successfully if the account has already been signed up and the account's information is filled in correctly on the login page; otherwise, an error message is displayed in red.

7.2 Test case 2: Create new user

Preconditions: The user's account is the admin's account or has been granted permission to create a new user.

Steps:

1. User fills in the login account's information.
2. The website forwards to the home page.



3. User chooses "Users" on the left taskbar and chooses "New user".
4. User fills in the required information and fields.
5. User chooses "Save" to save the information and create a new account.

Expected result: The account is created successfully and the User or Admin can check the account information at "Users/User list" on the left taskbar.

7.3 Test case 3: Create new project

Preconditions: The website forwards to the home page if the user enters the information correctly home page.

Steps:

1. User clicks on the "Projects" tab on the sidebar and some sub tabs will drop down.
2. User clicks on the "New Project" and the form will appear on the page.
3. User fills the form with the name of the project in the "Name" field, the status of the project (such as "Pending", "In Progress", or "Done"), select the "Start Date" and "End Date" the project, select one "Project Manager" and one or more "Project Team Members".
4. User could fill the "Description" of the project.
5. User presses the "Save" button to save the project or press the "Cancel" button if the User don't want to save the project.

Expected result: A new project is created and the User or Admin can check the project information at "Projects/Project list" on the left taskbar.

7.4 Test case 4: Create new Task

Preconditions: User is either an Admin or a Project Manager and a project have to be already created.

Steps:

1. User clicks on the "Projects" tab on the sidebar and some sub tabs will drop down.
2. User clicks on the "Project list".
3. User chooses the "View" action on one of the already existed project.
4. User clicks on the "New Task" button.
5. User fills the "New Task" form with the task name in the "Task" field, the description in the "Description" field, chooses the deadline of the task in the "Deadline" field, sets the status of the task in the "Status" field, and chooses the staff to be in charge of task in the "Person in charge" field.
6. User presses the "Save" button to save the task or press the "Cancel" button if the User don't want to save the task.

Expected result: A new task is created and the User can check the task information at "Task" on the left taskbar.