6.0 Design

This chapter discusses the design elements of the information system, both inside as to the database design and framework used, and outside as to the user interface and user experience.

6.1 Design Strategies

The system development side of Kernel uses the Model-View-Controller (MVC) framework, specifically CodeIgniter, for the logic and back-end manipulation, and the Bootstrap framework for the front-end and user interface design. The MVC framework has three (3) main parts that work together as a whole. The model is responsible for data manipulation, the view is the main source of the user interface as it displays the information retrieved from the model, and the controller handles user input (Foote, n.d.).

The developers took a minimalistic approach when it came to the design of the system. The main color scheme ensures that it suits TEI's theme colors - red, white, and black. During the designing stage of the system, the developers consulted hand in hand with TEI to seek both their approval and suggestion for the design cues, such as colors, icons, and general layout. The system is designed in such a way that it follows the stoplight colors to represent statuses of projects and tasks. Specifically, green represents ongoing, amber represents planning, and red represents delay. All throughout the system, the preferred way to display information is through tables, in which when clicked displays more details about the information clicked. This enables the user to view all immediate details about a project or a task and also has the option to view more details if he clicks on the specific data row. The current date can also be found on the sidebar, due to the fact that it will not be blocked other elements such as modals, to aid the user during tasks that require date inputs. This could serve as a quick point of reference when making decisions on dates. To serve as a symbol of urgency, the entire row of a delayed task is highlighted in red in the dashboard in order to catch the user's attention.

All of the buttons, both action and navigational, are represented by standard icons, foregoing the common practice of putting words right beside the icon or simply just text. This is done to maintain the minimalistic approach for designing the system. To compensate the absence of button labels, the developers added tooltips for each button when hovered over. The tooltips provide additional information in circumstances wherein the user does not immediately understand the purpose/action of the button. Moreover, navigational buttons or buttons that redirects the user to a new page are colored blue to differentiate them from the buttons that performs action, which are colored green. Additionally, all text found in the system are in Title case or maintains capitalization on the first letter of every word except articles and conjunctions

As the designing of the system occurred alongside with Taters themselves, the developers made sure that the system flow would not deviate much from their existing workflow.

6.2 Data Specifications

This section discusses the database design of the information systems, from the relationship to the columns of each database table. Each database table is detailed by specifying the field name, description, data type, default value, and accepted value.

6.2.1 Entity-Relationship Diagram

The entity-relationship diagram *(Refer to Appendix Q for Entity-Relationship Diagram)* mainly portrays the movement of the main users/actors to kickstart a project. The blue rectangles represent the actors, the yellow diamonds represent the action being done, the black lines connecting each element represents the relationship, and the type of the relationship is determined by the indicator next to the blue rectangle, whether it is “1” for one entity or “M” for many.

The entities involved are the main users and actors of the system, namely, the project owner, department heads, supervisors, and staff. Each user/actor is also related to each other wherein a department head manages a group of both supervisors and staff, a supervisor manages a group of staff assigned under him, and a project owner may either be a department head or a supervisor. The project owner, although may be either of the two pre-existing actors, is its own element since it has special capabilities and functions that are specific to a project owner, as compared to that of a department head or a supervisor.

The actions are focused on the creation of the project wherein the entirety of the monitoring and controlling would depend. The process begins when a project owner creates a project, a project consisting of tasks, specifically the main activities, sub activities, and tasks. The project owner then assigns a department to each activity or task. By selecting a department, the system forwards it to a department head, which explains the relationship as portrayed. The department head now has the freedom to further delegate the task given to him/her by a department head to a staff that he/she supervises, or to accept the task and perform it himself/herself. The staff member simply has the ability to accept and perform a task, along with the department heads and supervisors.

6.2.2 Tables/Files Layout

The database being utilized for the information systems consists if fourteen (14) tables, each of which are detailed as follows:

Change Requests

Field Name	*Description*	*Type (Length)*	*Default Value*	*Accepted Values*
Request Details	Details of the request being made	TEXT	Not Null	Any string value
Request Status	Statuses vary from Pending, Approved, or Denied	VARCHAR(45)	Not Null	Any string value
Remarks	Special remarks or concerns to be addressed	TEXT	Null	Any string value
New End Date	New date for task	VARCHAR(20)	Null	Any string value
Date of Request	Date when request was made	VARCHAR(20)	Not Null	Any string value
Date of Approval	Date when request was approved	VARCHAR(20)	Null	Any string value
Request Type	Type of request that was made	INT	Null	1 or 2

Department Assessment

Field Name	*Description*	*Type (Length)*	*Default Value*	*Accepted Values*
Completeness	Completeness rate	DOUBLE	Null	Any non-zero decimal value
Timeliness	Timeliness rate	DOUBLE	Null	Any non-zero decimal value

Documents

Field Name	*Description*	*Type (Length)*	*Default Value*	*Accepted Values*
Document Link	URL of the uploaded document	VARCHAR (2048)	Not Null	Any string value
Document Name	Name of the document	VARCHAR(45)	Not Null	Any string value
Document Status	Statuses vary from Published, Pending, Acknowledge	VARCHAR(45)	Not Null	Any string value
Uploaded By	Uploader of the document	INT (11)	Not Null	Any non-zero integer

Document Acknowledgement

Field Name	*Description*	*Type (Length)*	*Default Value*	*Accepted Values*
Acknowledge d By	Uploader of the document	INT (11)	Not Null	Any non-zero integer
Acknowledge d Date	Date of acknowledgem ent	VARCHAR(20)	Not Null	Any string value

Employee Assessment

Field Name	*Description*	*Type (Length)*	*Default Value*	*Accepted Values*
Completeness	Completeness rate	DOUBLE	Null	Any non-zero decimal value
Timeliness	Timeliness rate	DOUBLE	Null	Any non-zero decimal value

Logs

Field Name	*Description*	*Type (Length)*	*Default Value*	*Accepted Values*
Timestamp	Date and time a log was made	VARCHAR (1000)	Not Null	Date and Time format
Log Details	Details of the log	DATETIME	Not Null	Any string value

Notifications

Field Name	*Description*	*Type (Length)*	*Default Value*	*Accepted Values*
Details	Details of the notification	TEXT	Not Null	Any string value
Status	Statuses vary from Pending, and Read	VARCHAR(45)	Not Null	Any string value
Notification Date	Date when the notification should be sent	VARCHAR(20)	Not Null	Any string value
Type	Types vary from Docu, Pre-req, Post-req, RFC	INT	Not Null	Any non-zero value

Projects

Field Name	*Description*	*Type (Length)*	*Default Value*	*Accepted Values*
Project Title	Title of the project	VARCHAR (100)	Not Null	Any string value
Project Start Date	Start date of project	VARCHAR(20)	Not Null	Any string value
Project End Date	Target end date of project	VARCHAR(20)	Not Null	Any string value
Project Description	Description of the project	TEXT	Not Null	Any string value
Project Status	Statuses vary from Planning, Ongoing, Delayed, and Archived	VARCHAR(45)	Not Null	Any string value
Project Actual End Date	Date when the project actually closes	VARCHAR(20)	Null	Any string value
Project Adjusted End Date	Adjusted end date based on the delays	VARCHAR(20)	Null	Any string value
Date Created	Date the project was created	VARCHAR(20)	Not Null	Any string value
Project Actual Start Date	Actual start date of project	VARCHAR(20)	Not Null	Any string value
Project Actual End Date	Actual end date of project	VARCHAR(20)	Not Null	Any string value

Project Assessment

Field Name	*Description*	*Type (Length)*	*Default Value*	*Accepted Values*
Completeness	Completeness rate	DOUBLE	Null	Any non-zero decimal value
Timeliness	Timeliness rate	DOUBLE	Null	Any non-zero decimal value

RACI

Field Name	*Description*	*Type (Length)*	*Default Value*	*Accepted Values*
User	User	INT	Not Null	Any non-zero decimal value
Role	Role	INT	Not Null	Number 0 to 5
Status	Status of the role, can either be changed or current	VARCHAR(45)	Not Null	Any string value

Tasks

Field Name	*Description*	*Type (Length)*	*Default Value*	*Accepted Values*
Task Title	Title of the task	VARCHAR(45)	Not Null	Any string value
Task Start Date	Start date of task	VARCHAR(20)	Not Null	Any string value
Task End Date	Target end date of project	VARCHAR(20)	Not Null	Any string value
Task Status	Statuses vary from Pending, Completed, Delayed	VARCHAR(45)	Not Null	Any string value
Task Remarks	Special remarks or concerns to be addressed	VARCHAR(45)	Null	Any string value
Task Actual Start Date	Actual start date of task	VARCHAR(20)	Not Null	Any string value
Task Actual End Date	Actual end date of task	VARCHAR(20)	Not Null	Any string value
Task Adjusted End Date	Adjusted end date based on the delays	VARCHAR(20)	Not Null	Any string value

Templates

Field Name	*Description*	*Type (Length)*	*Default Value*	*Accepted Values*
Project Title	Title of the project	VARCHAR (100)	Not Null	Any string value
Project Start Date	Start date of project	VARCHAR(20)	Not Null	Any string value
Project End Date	Target end date of project	VARCHAR(20)	Not Null	Any string value
Project Description	Description of the project	TEXT	Not Null	Any string value
Project Status	Statuses vary from Planning, Ongoing, Delayed, and Archived	VARCHAR(45)	Not Null	Any string value

Users

Field Name	*Description*	*Type (Length)*	*Default Value*	*Accepted Values*
First Name	Given name of the employee	VARCHAR (100)	Not Null	Any string value
Last Name	Surname of the employee	VARCHAR (100)	Not Null	Any string value
Email	Email of the employee	VARCHAR (100)	Not Null	Any string value
Position	Position of the employee	VARCHAR (100)	Not Null	Any string value

6.2.3 Data Coding Standards

The easiest standard to spot is the naming convention for the tables and the columns. For both elements to be easily distinguishable, the table names are in lowercase letters, while the column names are in uppercase letters. CamelCase naming is used for all the methods, both in the controller and the model. In addition, it is also used for the newly initialized variables in line the views or in JavaScript.

The data coding standards revolve mainly around the database design. The most commonly used format is that of the columns where a foreign key is present. The standard format used is the <table name>_<column name>. For example, the users table has a foreign key with the departments table, therefore the column connecting the two tables from the users table is called “departments_DEPARTMENTID”.

The users are classified into five (5) types, which use a numerical character as follows:

- 1 - Admin
- 2 - Executive
- 3 - Department Heads / Managers
- 4 - Supervisors
- 5 - Staff

The departments are also classified by a numerical character wherein:

- 1 - Executive
- 2 - Marketing
- 3 - Finance
- 4 - Procurement
- 5 - Human Resource (HR)
- 6 - Management Information System (MIS)
- 7 - Store Operations
- 8 - Facilities Administration Manager

The responsibility assignment matrix consists of R, A, C, and I, as a type of responsibility and has its own table in the database which is also referred to with a numerical character as follows:

- 1 - Responsible
- 2 - Accountable
- 3 - Consulted
- 4 - Informed

As the system supports multiple delegations, a special numerical character is assigned to the user wherein he/she is tasked to delegate R, A, C, and I of that task:

- 0 - Current Delegation
- 5 - Past Delegation

Change requests are also being stored in the database which has two types, which are also stored using a numerical character as follows:

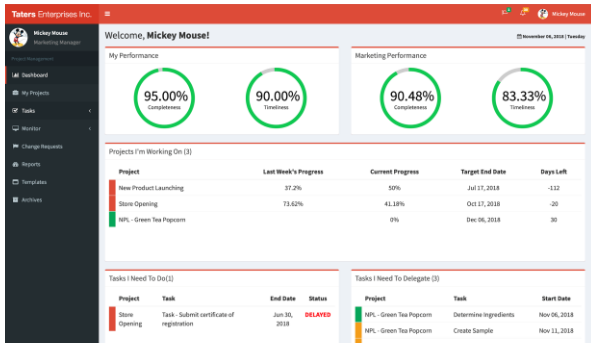
- 1 - Change performer type
- 2 - Change dates type

6.3 Screen Specifications

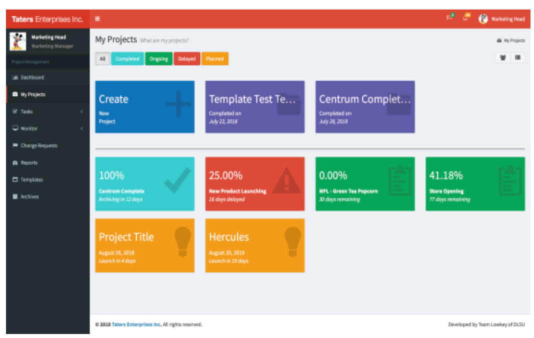
This section identifies the screen details alongside the corresponding description and use of the web page. The established design strategies can be seen in each screen.

Screen Name: 0.0 Login Screen
File Name: login.php
Description: This screen is for login and it validates the user logging in, as it checks if the user is providing the correct username and password for their account. It also checks the usertype of the person logging in. It redirects to the user's home screen once the login was validated.
Layout:

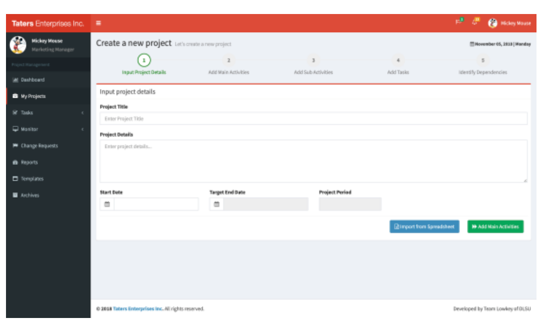
Screen Name: 1.0 Dashboard Screen
File Name: dashboard.php
Description: This page will show the user's performance, as well as, the performance of the team they belong to. It will also show all projects that the user is currently working on and tasks assigned to them that are already delayed and will end in 2 days. Activities that also needs the user's action such as delegating tasks, approving requests, and acknowledging documents can also be seen in this screen.
Layout:



Screen Name: 2.0 My Projects Screen
File Name: myProjects.php
Description: Only projects wherein the user is involved in can be seen in this screen. Through the different colors, the user can exactly tell the status of a project. From this screen, the user can either click on a project, or a project template to be redirected to the project gantt chart, or to click on create new project to be redirected to the project creation form. A list view and grid view are also provided for the user's ease of viewing.
Layout:

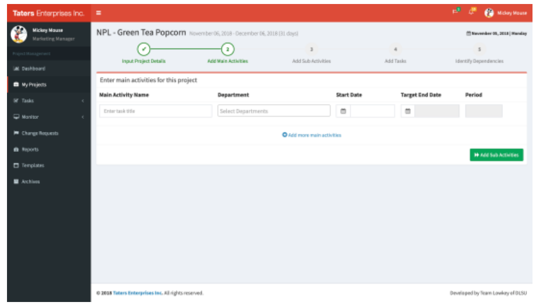


Screen Name: 3.0 Create A New Project Screen
File Name: addProjectDetails.php
Description: Creating a new project can be done through this page. All fields are required to have an input to be able to proceed to the next step, which is adding main activities.
Layout:

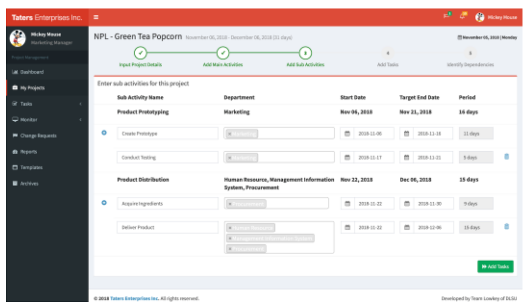


Screen Name: 3.1 Adding Main Activities Screen
File Name: addMainActivities.php
Description: In this screen, main activities of the project will be inputted here by the

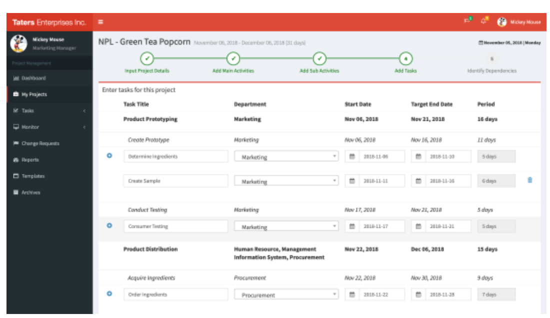
user. Details such as, main activity name, start date, end date, and the department that will perform the activity should be provided by the user. The user can then proceed to adding sub activities.
Layout:



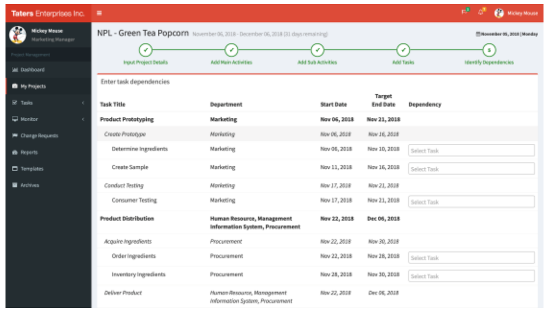
Screen Name: 3.2 Adding Sub Activities Screen
File Name: addSubActivities.php
Description: This page is similar with the previous screen in terms of user interface, the only difference is that it redirects the user to the adding tasks screen after filling out the required fields.
Layout:



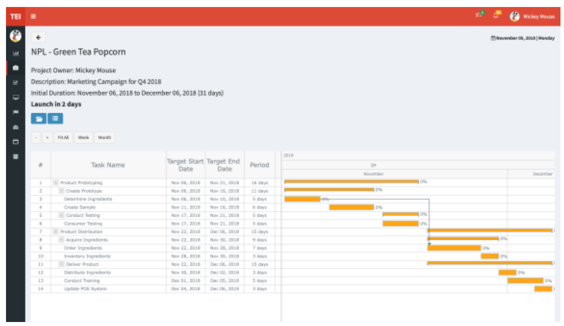
Screen Name: 3.3 Adding Tasks Screen
File Name: addTasks.php
Description: The user can add all the tasks under the sub activities they previously created. Layout wise, it looks the same with the 2 previous forms. This page navigates to adding dependencies on the tasks.
Layout:



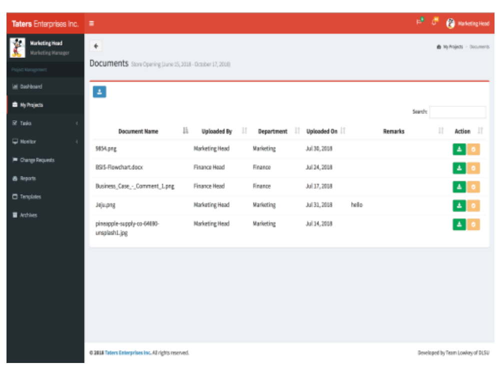
Screen Name: 3.4 Adding Dependencies Screen
File Name: addDependencies.php
Description: This screen lets the user define the pre-requisites of the tasks that were made prior. After defining the pre-requisites, the last step is to generate the gantt chart.
Layout:



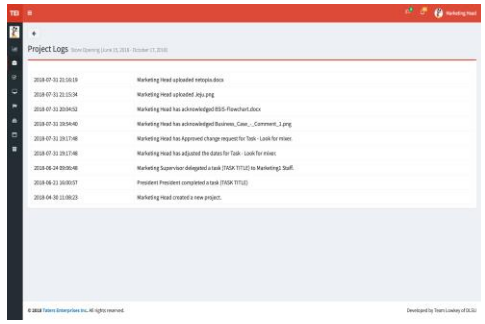
Screen Name: 4.0 Project Gantt Screen
File Name: projectGantt.php
Description: This page shows the gantt chart, a visual representation of the schedules of tasks in the project. It also shows the performance of the user in that project and all overall performance of the project. From the gantt chart, the user can be navigated to the project documents or project logs.
Layout:



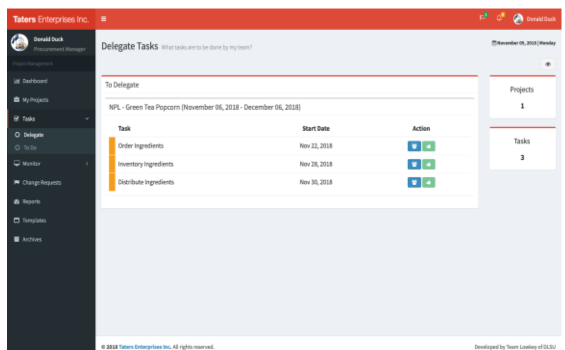
Screen Name: 5.0 Project Documents Screen
File Name: projectDocuments.php
Description: All documents uploaded in that project can be viewed in this page. Some of the documents can only be seen by limited people depending on what the uploader chose. Also in this page the user can acknowledge, download, and upload document.
Layout:

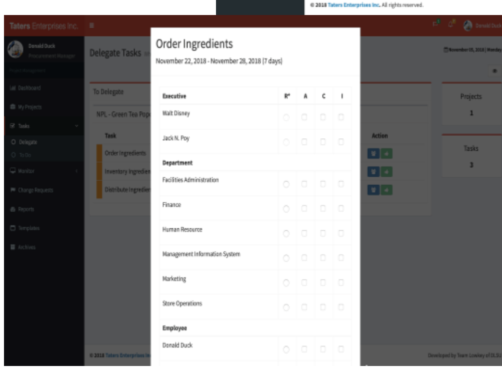


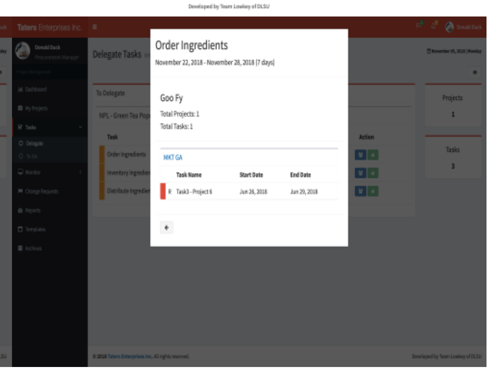
Screen Name: 6.0 Project Logs Screen
File Name: projectLogs.php
Description: This is the page where the user can view all the actions that were done in the project.
Layout:



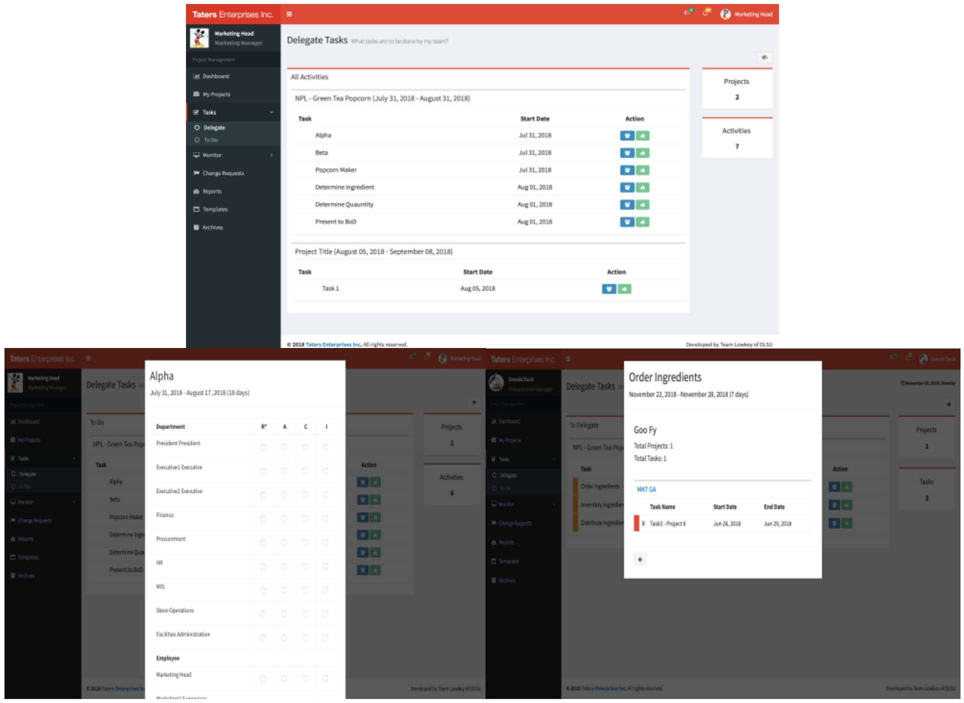
Screen Name: 7.0 Delegate Task Screen
File Name: taskDelegate.php
Description: This screen is where the department heads or the supervisors can delegate a task that was assigned to them by the project owner during project creation. When the delegate button is clicked it will show all the possible people that they can delegate the task to. To see the workload assessment of the a person in their team, the user can simply click on the name of the user and a modal with the workload assessment will appear.
Layout:



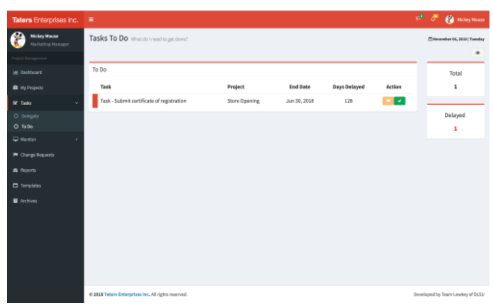




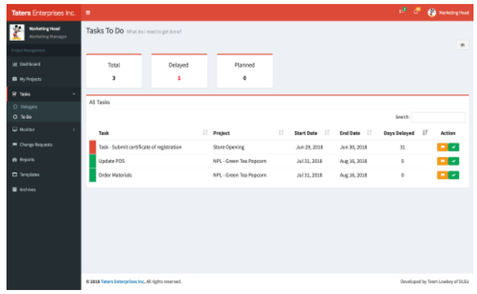
Screen Name: 7.1 Delegate Task (View All) Screen
File Name: taskDelegate.php
Description: By default, the delegate task screens shows tasks you need to delegate within 2 days or less. However, there is an option available for the user to view all. When the delegate button is clicked it will show all the possible people that they can delegate the task to. To see the workload assessment of the a person in their team, the user can simply click on the name of the user and a modal with the workload assessment will appear.
Layout:



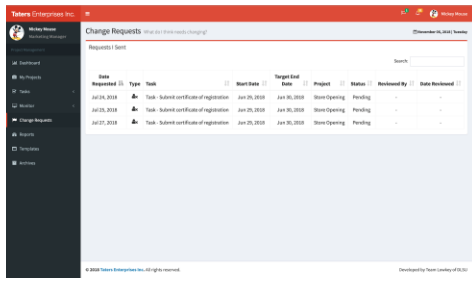
Screen Name: 8.0 Tasks To Do Screen
File Name: taskTodo.php
Description: All delayed tasks, and tasks due in 2 days that are assigned to the user can be viewed in this screen. The user can either mark the task as done or submit a request for change in performer or date 2 days before the deadline.
Layout:



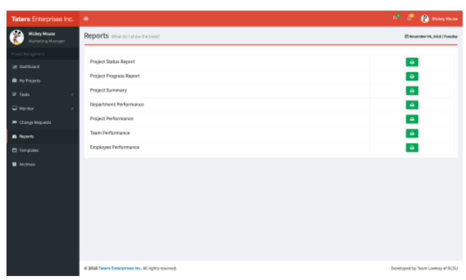
Screen Name: 8.1 Tasks To Do (View All) Screen
File Name: taskTodo.php
Description: By default, the task to do screens shows tasks that are delayed and/or tasks due in 2 days. However, the user can choose to view all the tasks by clicking the view all button. The user can either mark the task as done or submit a request for change in performer or date.
Layout:



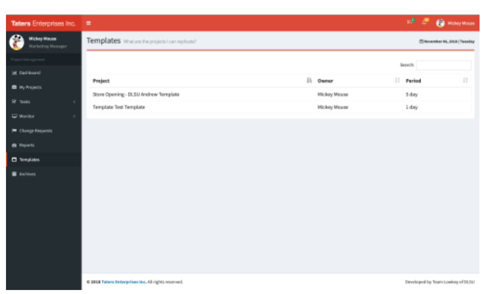
Screen Name: 9.0 Change Requests Screen
File Name: rfc.php
Description: All change requests that involves the user such as, the request they submitted or an employee seeking for their approval can be seen in this page.
Layout:



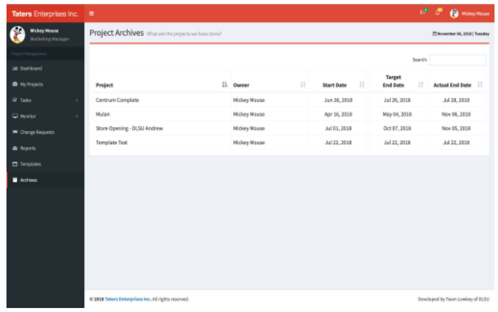
Screen Name: 10. Reports Screen
File Name: reports.php
Description: This screen shows all reports that the system can generate for the user.
Layout:



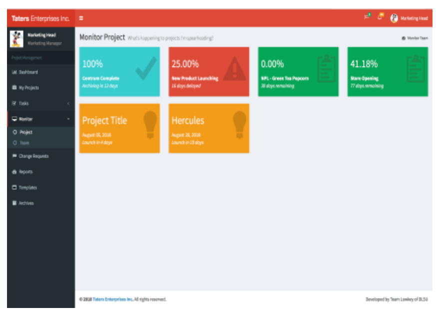
Screen Name: 11. Templates Screen
File Name: templates.php
Description: All project templates can be seen here and used by a user.
Layout:



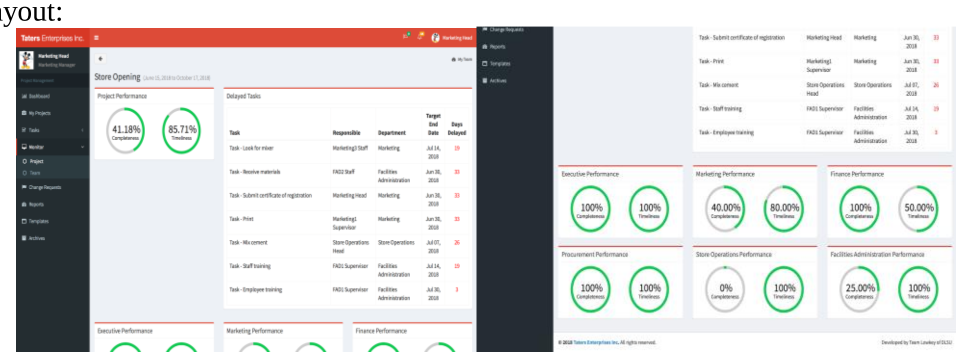
Screen Name: 12. Archives Screen
File Name: archives.php
Description: All archived projects can be seen in the archives page.
Layout:



Screen Name: 13. Project Monitor Screen
File Name: monitorProject.php
Description: This page lets the user monitor all projects that he owns. The user can click on any of the projects in the page and they will be redirected to the monitor department screen.
Layout:



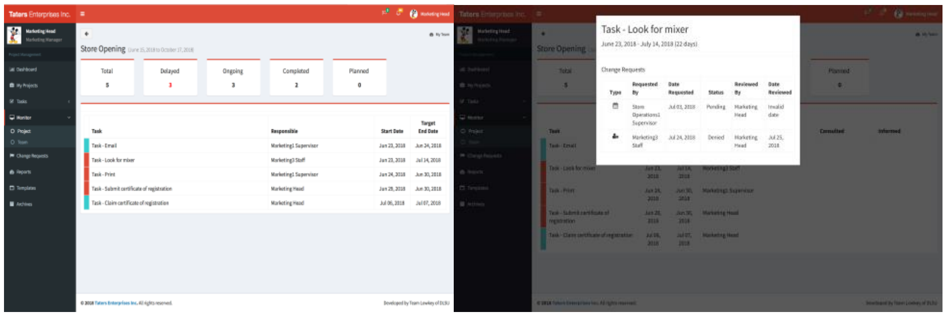
Screen Name: 13.1 Monitor Department Screen
File Name: monitorDepartment.php
Description: The monitor department screen shows the overall progress of the project, tasks that are delayed, and the departments involved in the project. From this page, it will navigate the user to the monitor department details screen.
Layout:



Screen Name: 13.2 Monitor Department Details Screen
File Name: monitorDepartmentDetails.php
Description: In this screen the user can see all the tasks assigned to the department he chose in the previous screen. It also shows the number of delayed, ongoing, completed,

and planned tasks. The user can click on any of the tasks shown to be able to see the history of that task, such as the delegate and RFC history.

Layout:

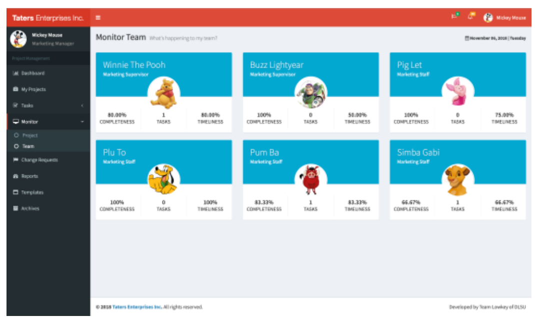


Screen Name: 14.0 Monitor Team Screen

File Name: monitorTeam.php

Description: Monitor team can only be viewed by department head or the supervisors. It shows all employees directly under him. The user can choose an employee and they will be redirected monitor member screen.

Layout:

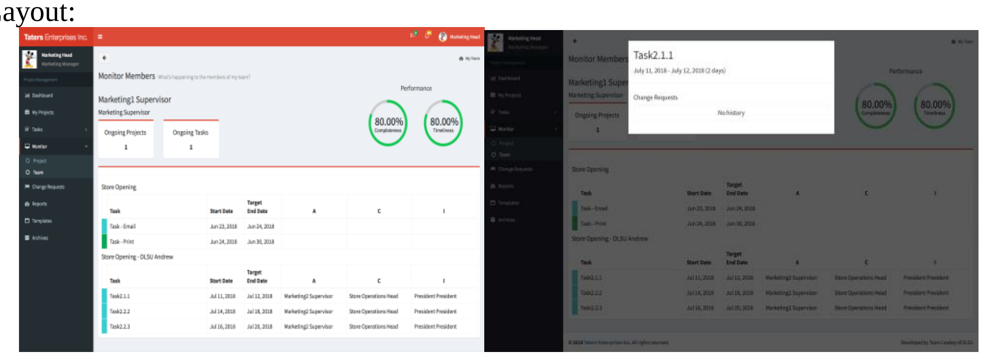


Screen Name: 14.1 Monitor Members Screen

File Name: monitorMembers.php

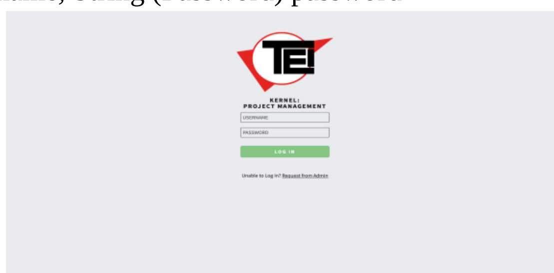
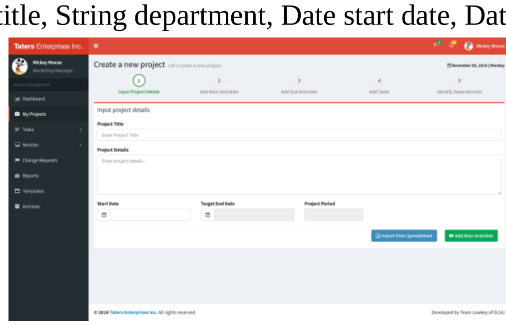
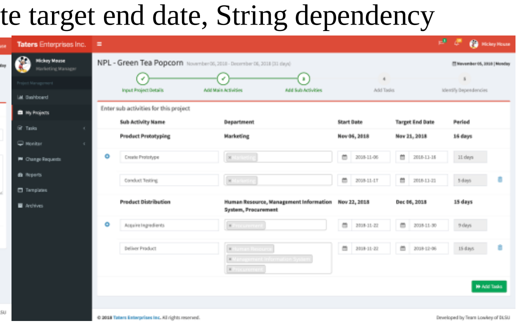
Description: This screen shows all tasks wherein the chosen employee is responsible. It also shows the status of those tasks and also the overall performance of that employee. The user can click on any of the tasks shown to be able to see the history of that task, such as the delegate and RFC history.

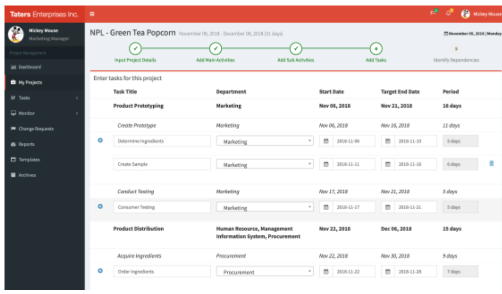
Layout:

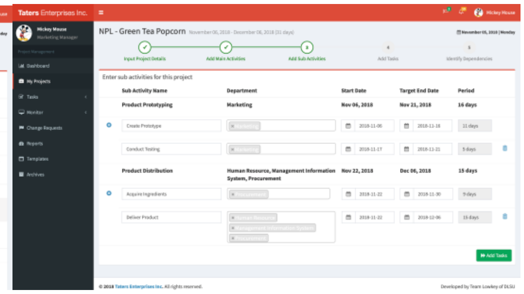


6.4 Form Specifications

This section focuses on the screens wherein a form is present by detailing the purpose of the form, the data needed to complete a form and a transaction, the users who may encounter the screen, and how often it is submitted through the system.

Form Name: Login Description: User has to input their registered username and password in order to gain access to the system. Prepared By: All users Used By: All users Volume and Frequency: Once every time a user needs to access their account. Layout: String username, String (Password) password 
Form Name: Create New Project Description: Creating a new project can be done through this page. All fields are required to have an input to be able to proceed to the next step, which is adding main activities. Adding main activities, sub activities, and tasks are all required fields, the last step is to identify the dependencies of each tasks, if there are any. Prepared By: Executives, Department Heads, and Supervisors Used By: Executives, Department Heads, and Supervisors Volume and Frequency: Once every time a user desires to create a new project for the company, or for their team. Layout: String project title, String project details, Date start date, Date target end date, String main activity title, String department, Date start date, Date target end date, String sub activity title, String department, Date start date, Date target end date, String tasks title, String department, Date start date, Date target end date, String dependency 





Form Name: Request for Change

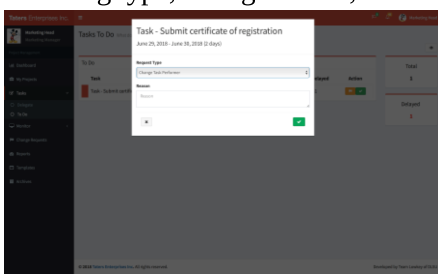
Description: All users in the company can request for a change either for a performer or for a date.

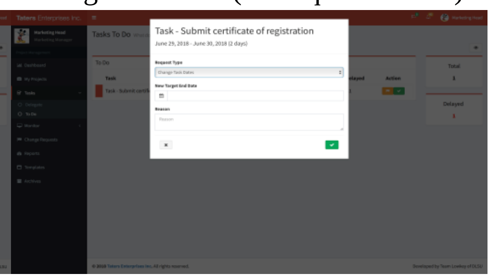
Prepared By: All users

Used By: All users

Volume and Frequency: Once as needed

Layout: String type, String Reason, Date new target end date (for request in date)





Form Name: Upload Document

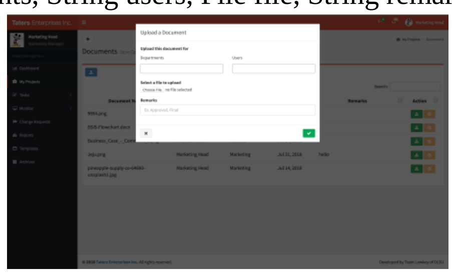
Description: Lets the users upload documents in a specific project.

Prepared By: All users

Used By: All users

Volume and Frequency: Once as needed

Layout: String departments, String users, File file, String remarks



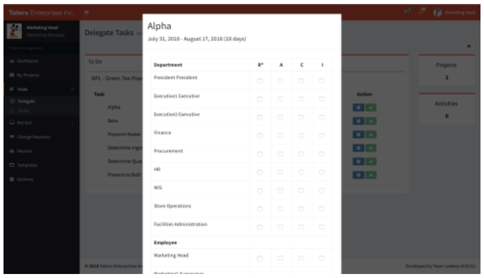
Form Name: Delegate Task

Description: This form lets either the department head or the supervisor delegate task to their employees or to another department as Responsible, Accountable, Consulted or Informed.

Prepared By: Department Heads and Supervisors

Used By: Department Heads and Supervisors

Volume and Frequency: Every time a project has been created and they are tagged to

delegate the task Layout: INT role 

6.5 Report Specifications

This section focuses on screens that produce report, specifically the organization of multiple entries of data into a table. Each report has a name, description, specific purpose, the users who may encounter the screen, and how often they may encounter it.

Report Name: Department Performance Report Description: This report shows the performance assessment of all the departments of TEI. It also includes all the projects that a department is involved and its corresponding timeliness and completeness. Prepared By: President Used By: President Volume and Frequency: Once as needed Layout: Letter size paper, String data type for all output *(Refer to Appendix R for Actual Printouts)*
Report Name: Project Status Report Description: The Project Status Report shows all tasks that were planned, tasks that were accomplished either last week or last month depending on the interval that the user chose, problems encountered (tasks that are delayed), risks (pending change requests and tasks that needs to be delegated), and tasks that are upcoming next week or month. Prepared By: President, and Heads and Supervisors involved in a project Used By: President, and Heads and Supervisors involved in a project Volume and Frequency: Once as needed Layout: Letter size paper, String data type for all output *(Refer to Appendix R for Actual Printouts)*
Report Name: Project Progress Report Description: Depending on the interval that was chosen, this report will generate a weekly or monthly progress report of a specific project. All the main activities will be

shown as well as its current progress and last week or month's progress. Tasks accomplished within the week or month will also be shown in this report. Prepared By: President, and Heads and Supervisors involved in a project Used By: President, and Heads and Supervisors involved in a project Volume and Frequency: Once as needed Layout: Letter size paper, String data type for all output *(Refer to Appendix R for Actual Printouts)*
Report Name: Project Summary Report Description: This report gives an overview of what happened with the project. It shows the timeliness of the overall project and all the departments included in the project. It also includes the members of the project, their department, the total number of tasks assigned to them and their timeliness. Prepared By: President, and Heads and Supervisors involved in a project Used By: President, and Heads and Supervisors involved in a project Volume and Frequency: Once every project has been completed Layout: Letter size paper, String data type for all output *(Refer to Appendix R for Actual Printouts)*
Report Name: Project Performance Report Description: This reports generates the performance metrics of a project and all the departments involved in a project in terms of its completeness and timeliness. All delayed tasks are also shown in a table format. Prepared By: President, and Heads and Supervisors involved in a project Used By: President, and Heads and Supervisors involved in a project Volume and Frequency: Once as needed Layout: Letter size paper, String data type for all output *(Refer to Appendix R for Actual Printouts)*
Report Name: Team Performance Report Description: Team Performance Report shows the performance metrics of all the user's subordinates. It also shows the number of projects and tasks a certain person is currently handling and also the number of delayed task per user. Prepared By: Department Heads and Supervisors Used By: Department Heads and Supervisors Volume and Frequency: Once as needed Layout: Letter size paper, String data type for all output *(Refer to Appendix R for Actual Printouts)*
Report Name: Employee Performance Report Description: This report is generated for the user itself for them to be able to see how they are performing in terms of their timeliness and completeness. A project breakdown with all their tasks and specific project performance can also be seen in this report.

Prepared By: Anyone

Used By: Anyone

Volume and Frequency: Once as needed

Layout: Letter size paper, String data type for all output *(Refer to Appendix R for Actual Printouts)*