COMP3900 -Computer Science Project

Project Proposal

Project Title: *ESG Management System (Web Application) for FinTech Industry*

Project Number: *P13*

Submission Date: *Sunday Week 3 @ 11:59pm*

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1. Background

Problems Being Solved:

The background for the ESG management system for the FinTech industry contains the escalating global emphasis on sustainable development.

In general, investors are the world are increasingly gravitating towards “greener” finance, and corporations are integrating sustainable business ethics into their core practices. This shift is shown by global initiatives such as the United Nations Environment Programme, The International Financial Reporting Standards, and The Paris Agreement, among others.

These initiatives reflect a collective movement towards net-zero emissions and responsible/ethical investments, showing that the project is indeed urgent and relevant.

Our ESG Management System aims to address a crucial gap in the FinTech industry by providing a comprehensive web application designed to manage Environmental, Social, and Governance (ESG) data for sustainable investing.

This tool will enable users to analyse companies’ ESG performance, facilitating informed investment decisions based on up-to-date sustainability criteria. Our project’s is even more significant due to the increasing demand for transparent and accessible ESG data—which is vital for investors aiming to align their portfolios with sustainable long-term development goals.

The significance of our project is amplified by the growing demand for transparent ESG data. In an era where investors are keen on aligning portfolios sustainably, the availability of accurate ESG information is paramount. Our ESG Management System aims to meet this demand, fostering a more ethical financial landscape.

Existing Systems:

1. <u>Bloomberg Terminal ESG Data Functionality</u>

Bloomberg's terminal offers extensive ESG data and analytics, which provides investors with detailed insights into companies' sustainability practices. Drawbacks:

> Bloomberg's service is notably expensive, limiting access for smaller investors or FinTech startups with constrained budgets.
>
> Additionally, while Bloomberg offers a wide range of data, the complexity and sheer volume of information can be overwhelming for users without advanced training in navigating the terminal. For users mainly concerned with ESG data, a webapp that focuses purely on this would be ideal.

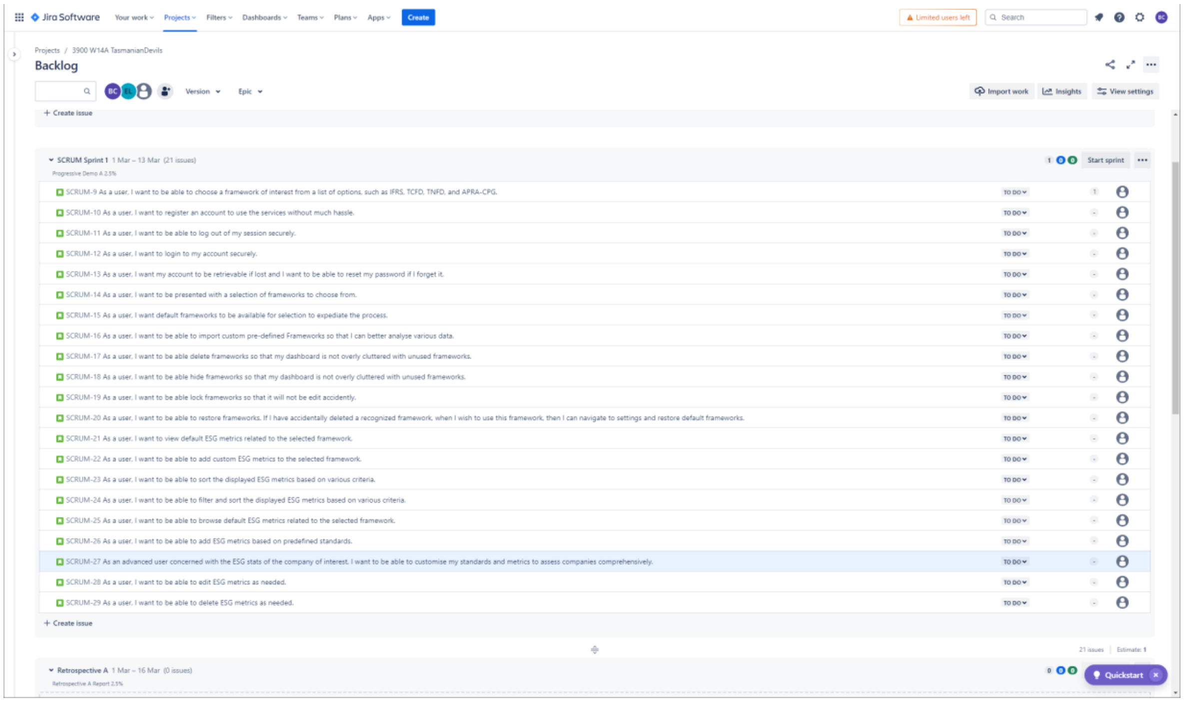
2. **<u>MSCI ESG Research Tools</u>**

MSCI is another leader in providing ESG metrics and analysis, offering tools that assess companies' sustainability practices. While MSCI's tools are widely respected for their thoroughness and the depth of their ESG analysis, they share a common drawback with Bloomberg:

> *Accessibility*. MSCI's services are primarily tailored to large institutional investors, leaving a gap in the market for tools that cater to smaller entities or individual investors. Furthermore, the MSCI framework may not offer the flexibility needed for users to adjust ESG metrics and weights according to specific standards or stakeholder needs, a feature that is central to the proposed ESG Management System project.

2. User Stories and Sprints

Sprint1: User Registration and Framework, metric selection



Requirement 1. Account management: users can register/create, and log in.

User Story #1: User Registration

As a user, I want to register an account to use the services without much hassle.

<u>Acceptance Criteria</u>

1. As a new user, I should be able to easily navigate to the registration page from any visitor page.
2. The registration page should take essential inputs such as username, email address and password.
3. The username should be unique.
4. The email address should be validated and not associated with any existing account.
5. As the user, I would like some form of confirmation about my successful registration.
6. After registration I would like to be automatically logged in for this session and redirected to the home page.

User Story #2: Logging out

As a user, I want to be able to log out of my session securely.

Acceptance Criteria

1. Given that I am logged into the system, when I navigate to the logout option, then I should be logged out of my account.
2. Upon logging out, I should be redirected to the login page.
3. After logging out, my session should be terminated, and I should no longer have access to any authenticated features or data.
4. If I attempt to access any authenticated features or pages after logging out, I should be redirected to the login page.

User Story #3: User Login

As a user, I want to login to my account securely.

Acceptance Criteria

1. The login page should be easily accessible from any visitor page.
2. The login page should prompt for username/email and password.
3. Failed login should trigger an error message, successfully login should redirect me to the home page.
4. Given that I am on the login page, when I enter valid credentials (username/email and password) and click the login button, then I should be authenticated and logged in to the system.

Points of Novelty

Optional Extra Security Features: Users have the option to enable and set up extra security features such as additional authentication for new device logins and security questions for password reset. This adds an extra layer of security tailored to user preferences.

User Story #4: User Password Reset (Forgot Password)

As a user, I want my account to be retrievable if it is lost and I want to be able to reset my password if I forget it.

Acceptance Criteria

1. There should be a 'Forgot Password' option visible on the login page for me to reset password.
2. Given that I am on the login page, when I click on the "Forgot Password" link, then I should be redirected to the password reset page.
3. The password reset page should prompt me to enter my registered email address.
4. If I enter a valid email address associated with an existing account and click the "Reset Password" button, then I should receive a password reset link via email.
5. The password reset link should be unique and valid for a limited time period (e.g., 24 hours) to ensure security.
6. If I enter an invalid or non-existent email address, I should receive an appropriate error message indicating that the email address is not recognised.
7. The password reset link should direct me to a secure password reset page where I can enter a new password.
8. The password reset page should enforce password strength requirements (e.g., minimum length, complexity) to ensure security.
9. Once I enter a new password and confirm it, clicking the "Reset Password" button should update my password in the system.
10. After successfully resetting my password, I should receive a confirmation message indicating that my password has been changed.
11. If the password reset link expires before I use it, I should receive a notification indicating that the link has expired, and I should be prompted to request a new password reset email.

Requirement 2. Selecting Framework:

Users should be able to choose a framework of interest from a list of Frameworks (Options include but not limited to IFRS, TCFD, TNFD, APRA-CPG).

User Story #5: Framework selection page

As a user, I want to be presented with a selection of frameworks to choose from.

Acceptance Criteria

1. Given that I am logged into the ESG Management System, when I navigate to the framework selection page, I should be able to see a list of available frameworks.
2. The list of frameworks should include options such as IFRS, TCFD, TNFD, and APRA-CPG, among others.
3. Each framework option should be clearly labelled and accompanied by a brief description or tooltip to aid users in their decision-making process.
4. Users should be able to easily scroll through the list of frameworks and click on a specific framework to select it as their framework of interest.

User Story #6: Default framework

As a user, I want default frameworks to be available for selection to expediate the process.

Acceptance Criteria

1. Given that I am on the framework selection page, I should see default frameworks preloaded in the list of available frameworks.
2. The default frameworks should cover a wide range of commonly used frameworks such as IFRS, TCFD, TNFD, and APRA-CPG.
3. Each default framework should come with a predefined set of metrics and indicators relevant to environmental, social, and governance (ESG) factors.
4. Users should have the option to select a default framework as their framework of interest with a single click.

User Story #7: Custom framework import

As a user, I want to be able to import custom pre-defined Frameworks so that I can better analyse various data.

Acceptance Criteria

1. Given that I am logged in to the system, when I navigate to the select framework page, then I should see an option to import a custom framework that fits the format.

2. Given that I can import a custom framework, when I am in the process of importing it, then I should be able to customise its information. (e.g. name, desc, files imported etc)
3. Given that I have imported a custom framework, when I proceed to other areas of the application, my imported framework should be saved and available.
4. Given that I have imported a custom framework, when I proceed to analyse metrics, then I should be able to add/browse/adjust metrics akin to recognised frameworks.

<u>Questions</u>

1. Should there be a common framework structure, to provide ease of integration for a variety of included and custom frameworks?
2. Should the process of importing frameworks require the input of data into an existing template, or should it include the importation of a file structure? (e.g. JSON)
3. Should framework importation exist on its own page, or be nested in an existing page, or even hidden in the settings/configuration?

<u>Notes</u>

- Importation of frameworks will most likely require an existing format/structure common among all frameworks and accepted by the project.
- Importing frameworks should have a unique ui for users to include framework identifiers (e.g. name, desc) in the event of similar frameworks, allowing them to be distinguished.
- Upon success of framework importation, a confirmation pop up should appear. Likewise, on failure to import a specific error message should appear.
- All metrics should be compatible with all frameworks

<u>Tasks</u>

- Implement ui component to provide user option to import a framework
- Adjust backend to possess common functionality for an undefined number of frameworks
- Include documentation on appropriate file/framework structures and how to import them
- Appropriate tests via blank/dummy frameworks to ensure importation works
- Include functionality for importing a framework via some defined structure

User Story #8: Delete framework

As a user, I want to be able delete frameworks so that my dashboard is not overly cluttered with unused frameworks.

Acceptance Criteria:

1. Given that I have selected a framework, when I no longer wish to use this one, then I can delete it from my framework selection.

User Story #9: Hide framework

As a user, I want to be able hide frameworks so that my dashboard is not overly cluttered with unused frameworks.

Acceptance Criteria:

1. Given that I have a specific framework, when I no longer currently need it but will use it in the future, then I can hide this custom framework temporarily instead of having to permanently delete it and re-add it later (either by restoring defaults or re importing it)

User Story #10: Lock framework

As a user, I want to be able lock frameworks so that they will not be edited accidentally.

Acceptance Criteria:

1. Given that I have selected a framework, when I want to ensure I do not edit/delete this framework, then I can “lock” the framework from being changed.

User Story #11: Restore framework

As a user, I want to be able to restore frameworks. If I have accidentally deleted a recognised framework, when I wish to use this framework, then I can navigate to settings and restore default frameworks.

Acceptance Criteria:

1. Given that I have accidentally deleted a recognised framework, when I wish to use this framework, then I can navigate to settings and restore default frameworks.

Questions for User Stories Set #8 - #11:

1. Will users have a separate page to hide/delete/edit frameworks, or will these options be nested inside of the framework selection page?
2. Will users have the option to add an imported framework as a default or recognised framework, and so is able to be restored via settings instead of importing?
3. Will the deletion of custom frameworks remove all trace of it from the application, or will an inactive remnant of the import remain for visual/record keeping purposes?
4. Should some frameworks be exempt from being able to be deleted, e.g. default/recognised frameworks, or flagged custom frameworks?
5. Should users have the option to mass delete frameworks (e.g. reset all)?

Notes for User stories User Stories Set #8 - #11:

1. Deletion should be straightforward to ensure the user is aware of what they are deleting. Furthermore, a popup asking them to confirm their deletion should be present to prevent accidental deletions.
2. The hiding of frameworks from view should naturally be able to be unhidden via some settings or configurator, so as not to clutter the workspace.
3. The user should have an option to flag or "lock" certain frameworks, to prevent them from being deleted/edited.
4. Users should have the option to mass un-lock/lock frameworks

Tasks for User Stories Set #8 - #11:

1. Introduce a UI component to allow users to view which frameworks can be deleted/locked and their lock/un-lock status
2. Introduce a UI component to view hidden components
3. Adjust the backend to prevent the display of deleted/hidden frameworks
4. Adjust the backend to prevent locked frameworks from being deleted
5. Introduce functionality that allows frameworks to be locked/deleted
6. Include error handling to inform users when they attempt to delete a locked framework
7. Include functionality to allow frameworks to be hidden/unhidden

Requirement 3. Browse Metrics:

Users should be able to browse ESG metrics related to the selection Frameworks (each should have some default metrics. Make sure you have default metrics covering E, S, and G for each pillar and should be more than ten under each framework).

User Story #12: Default ESG Metrics Display

As a user, I want to view default ESG metrics related to the selected framework.

Acceptance Criteria:

1. Given that I am on the metrics browsing page, when I select a framework, then I should see default ESG metrics displayed for each pillar (Environmental, Social, Governance).
2. The default metrics should cover a wide range of factors relevant to environmental, social, and governance aspects, ensuring comprehensive coverage.
3. Each default metric should be clearly labelled and accompanied by a brief description to provide context and aid understanding.
4. Users should be able to easily scroll through the list of default metrics and view additional details or tooltips for each metric if needed.
5. The default metrics display should be visually organised and intuitive, facilitating easy browsing and selection.

User Story #13: Custom Metric Addition

As a user, I want to be able to add custom ESG metrics to the selected framework.

Acceptance Criteria:

1. Given that I am on the metrics browsing page, when I select a framework, then I should see an option to add custom ESG metrics.
2. The added custom metric functionality should allow me to input the details of the new metric, such as name, description, and category (E, S, or G).
3. Upon adding a custom metric, it should be seamlessly integrated into the list of available metrics for the selected framework.
4. Users should be able to edit or delete custom metrics as needed, providing flexibility and customisation options.
5. The system should validate user inputs to ensure that the added custom metrics adhere to specified criteria and standards.

User Story #14: Metric filtering

As a user, I want to be able to sort the displayed ESG metrics based on various criteria.

Acceptance Criteria:

1. Given that I am on the metrics browsing page, I should see options to filter metrics by category (Environmental, Social, Governance) and keyword search.
2. The filtering options should allow me to quickly narrow down the list of displayed metrics based on my specific criteria.
3. Users should be able to sort the metrics alphabetically, by relevance, or by other relevant criteria to facilitate easier browsing.
4. The filtering functionality should be intuitive and responsive, providing immediate feedback upon selection.

User Story #15: Metric sorting

As a user, I want to be able to filter and sort the displayed ESG metrics based on various criteria.

Acceptance Criteria:

1. Users should be able to sort the metrics alphabetically, by relevance, or by other relevant criteria to facilitate easier browsing.
2. The sorting functionality should be intuitive and responsive, providing immediate feedback upon selection.

User Story #16: General function of metrics

As a user, I want to be able to browse default ESG metrics related to the selected framework.

Acceptance Criteria:

1. Given that I have chosen a default framework, I should be given an option to browse and select default ESG metrics that are related to the framework.
2. I want to see at least 10 default metrics to choose from for each framework.
3. I want each default metric to cover the ESG (Environmental, Social and Governance) clearly.
4. I want to see the option to add / delete custom ESG metrics.

Questions:

1. Will users have a separate page to view / edit / delete ESG metrics?
2. Will users be able to reorganise how the ESG metrics are placed visually?
3. Will users have the option to add an imported ESG metric as a default or recognised framework, so that it is able to be restored via settings instead of importing again?
4. Will the deletion of custom ESG metrics remove all trace of it from the application, or will an inactive remnant of the import remain for visual/record keeping purposes?
5. Should some ESG metrics be exempt from being able to be deleted, e.g. default/recognised ESG metrics, or when it is custom flagged?
6. Should users have the option to reset / delete all the ESG metrics?

Notes

1. A popup should be shown when users try to delete a metric or when trying to delete all the metrics.
2. Users should be able to lock or flag metrics to prevent them from being deleted.
3. Users should be able to toggle metrics on and off in the settings.
4. Users should be able to order the view of the metrics in the settings.

Tasks

1. A separate page should be created in the settings to edit ESG metric settings.
2. Stored ESG metrics should have the toggle property.
3. There should be a way to custom order the ESG metrics through drag and drop or through clicking them in order.
4. Users should have the option to give/remove custom flags to the ESG metrics
5. Users should be able to lock/unlock the ESG metrics
6. Deleted ESG metrics are hidden
7. Error messages must be shown if ESG metrics are deleted.

Requirement 4. Add Metrics:

Users should be able to add ESG metrics based on defined standards or needs.

User Story #17: Add ESG Metrics Based on Defined Standards

As a user, I want to be able to add ESG metrics based on predefined standards.

<u>Acceptance Criteria:</u>

1. Given that I am on the "Add Metrics" page, when I select a predefined standard (e.g., GRI, SASB, TCFD), then I should see a list of metrics associated with that standard.
2. The list of metrics should be organised by category (Environmental, Social, Governance) for clarity.
3. Users should be able to select individual metrics or groups of metrics from the predefined standards to add to their analysis.
4. Upon selecting metrics, they should be seamlessly integrated into the user's metric dashboard for further analysis.

Points of Novelty

Flexibility: The standards and their usage are highly flexible and customisable based on the user's individual interests.

User Story #18: Edit ESG Metrics

As a user, I want to be able to edit ESG metrics as needed.

<u>Acceptance Criteria:</u>

1. Given that I am on the metric dashboard, I should see options to edit individual metrics.
2. The edit functionality should allow me to modify the name, description, category, or other details of the selected metric.
3. Upon editing metrics, the changes should be reflected in real-time on the user's metric dashboard.

User Story #19: Delete ESG Metrics

As a user, I want to be able to delete ESG metrics as needed.

<u>Acceptance Criteria:</u>

1. Given that I am on the metric dashboard, I should see options to delete individual metrics.
2. Users should be able to delete metrics they no longer need, removing them from their analysis.

3. Upon deleting metrics, the changes should be reflected in real-time on the user's metric dashboard.

Sprint 2: Design Metrics Analysis and visualisation align with portfolio management.

Note that these are just some preliminary requirements and user stories our group has added. More will follow Sprint 1 completed and align with spec.

User Story #1: Watchlist feature

User Story:
As a user, I want to be able to add tickers to a watchlist, so that I can reference it another time.

Acceptance Criteria:

1. Given that I am logged into the system, When I navigate to the watchlist page, Then I should see an option to add tickers.
2. Given that I am on the watchlist page, When I enter a valid ticker symbol and click "Add", Then the ticker should be added to my watchlist.
3. Given that I am on the watchlist page, When I enter an invalid or duplicate ticker symbol and click "Add", Then I should see an error message indicating the issue.

Questions:

1. Question 1: Will there be a limit to the number of tickers a user can add to the watchlist? / Ask product clients.

Notes:

1. Ensure that the watchlist is accessible from the main navigation menu for easy access.
2. Whenever adding a ticker, a pop-up of confirmation should appear to provide feedback to the user.
3. Error message pop-up window:
4. Invalid ticker not found.
5. Exceeding limit on watchlist.
6. Empty search.

Tasks:

1. Implement UI component for adding tickers to the watchlist.
2. Implement backend logic to handle adding tickers to the watchlist.
3. Implement error handling for invalid or duplicate ticker symbols.
4. Test the functionality to ensure it works as expected.

5. Update documentation with instructions on how to use the watchlist feature.

Sprint 3: Portfolio Management and User Personalisation

Note that these are just some preliminary requirements and user stories our group has added. More will follow Sprint 1 and 2 completed and align with spec.

User Story #1: Enterprise accounts

As an employer from the company, I want all my employees to use the website by using their company email to register the accounts so that employees behave as company entity.

Acceptation Criteria:

Users should be able to choose account type as either enterprise account or individual account on the sign-up page.

1. During registration, after the user select to register as a company account, if the users write the correct company email and input the passwords twice, he should be able to receive the email after clicking send code.
2. If the verification code is correct, the new account is now created as company account.
3. Any email that has already been register as company account will not be able to register as personal account
4. The company account is differentiated by its ending in email. For example, any account register as company account by using ...@ad.unsw.edu.au

Tasks:

Design the Account Type Selection Feature

1. Create a sign-up page that includes an option for users to choose between "Enterprise Account" and "Individual Account."
    a. Ensure the UI/UX design is intuitive and clearly distinguishes between the two account types.
    b. Implement Enterprise Account Registration
2. Develop the backend logic to handle enterprise account registration.
    a. Validate the user's input for the company email address and ensure it follows the required format (e.g., ...@ad.unsw.edu.au).
    b. Implement a mechanism to send a verification code to the provided company email address.
3. Store the verification code securely and associate it with the pending enterprise account.
    a. Verify Email and Create Accounts

4. Develop a mechanism to verify the entered verification code against the stored code for enterprise accounts.
    a. Once the verification code is confirmed, create the enterprise account in the system and associate it with the verified email address.
    b. Implement error handling for invalid or expired verification codes.
    c. Prevent Duplicate Email Registration
5. Implement a check to prevent email addresses already registered as enterprise accounts from being used to create individual accounts.
        a. Testing and Validation
6. Write unit tests to validate the registration logic for both enterprise and individual accounts.
        a. Conduct integration testing to ensure the sign-up page, email verification, and account creation process work together seamlessly.

Points of Novelty

The company is a different legal entity from the individuals. It has different kind of legal responsibilities and being obligated to different legal terms.

1. Company accounts is own by the company and thus can be managed by the company.
2. In the future, if there are any kind of novel functions to be added, company entities, or government entities or personal entity may have different level of accesses to those contents.

User Story #2: Edit Profile

As a user, I want to be able to edit my personal details (username, photo, email, password) in the settings.

<u>Acceptation Criteria:</u>

1. New usernames must be unique.
2. Emails must be validated and not associated with any existing account.
3. Implement a user profile settings page, which allows the user to edit their personal details.

User Story #3: Edit Dashboard

As a user, I want to customise my dashboard from the settings.

<u>Acceptation Criteria:</u>

1. User settings page should include obvious bottom to allow the users to change the outlook of the dashboard
2. Allows the user to change its colour et al.
3. Editing features will be grouped into 2 distinct categories: user profile and dashboard settings, where each category will have its own editing screen and will have the option to return to the dashboard.

User Story #4: Logout the current account

As a user, I want to navigate through the settings and be able to log out the current account.

<u>Acceptation Criteria:</u>

1. Implement the log out feature which can successfully logout the user

<u>Questions:</u>

1. Should there be options to choose default frameworks such as IFRS, TCFD, TNFD, APRA-CPG in the settings?
2. Should there be a separate editing screen, or should common editing features be in a side menu?

Points of Novelty

Users will be able to customise available features more easily with distinct setting pages.

User Story #5: Help guide, labels with hover information popup

As a lay user new to the field of ESG evaluation, I need guidance when it comes to building my own standards from a pool of metrics.

<u>Acceptance Criteria</u>

1. The system should provide templates with a predefined selection ESG metrics and weighting
2. When selecting predefined standards, the system should offer a list of recognised ESG frameworks such as Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB), or Task Force on Climate-related Financial Disclosures (TCFD).
3. For each ESG metric, the system should provide a message prompt that explains the significance and usage of that metric.

Points of Novelty

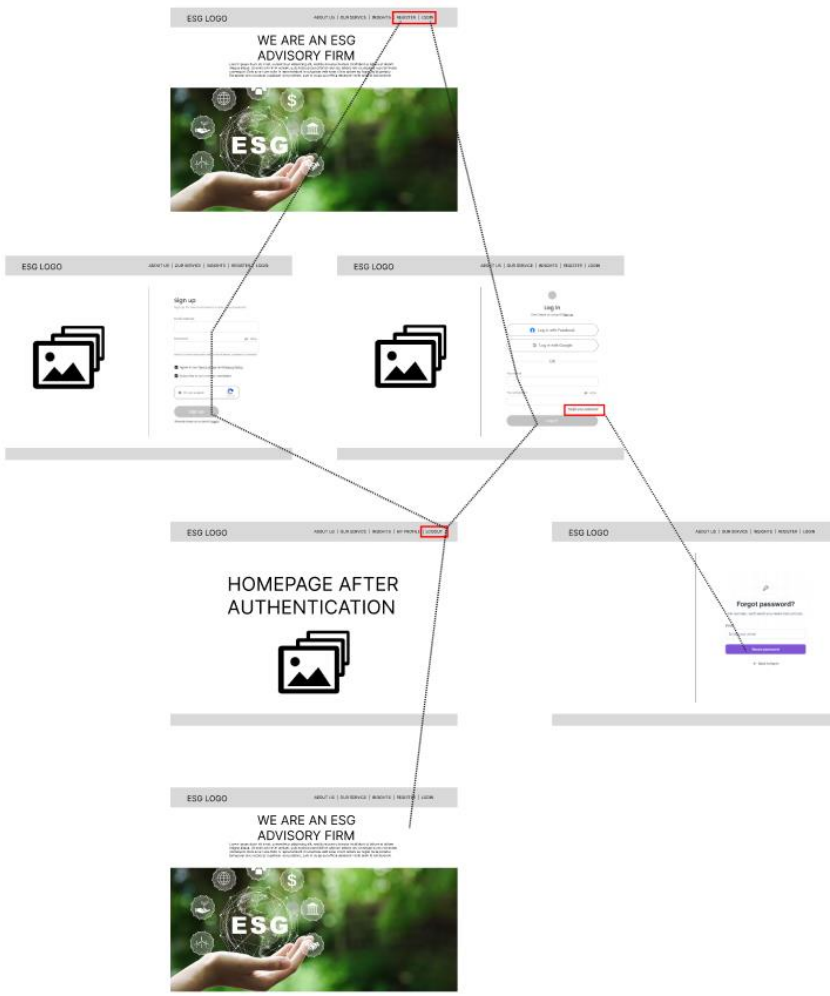
User Friendliness: Inexperienced users can get on board quickly with our predefined templates and guided metric selection process, and mistakes can be easily undone.

3. Interface and Storyboards for user stories

Storyboard #1: Account management

Users can register/create, and log in.

- **User Story #1:** As a user, I want to register an account to use the services without much hassle.
- **User Story #2:** As a user, I want to be able to log out of my session securely.
- **User Story #3:** As a user, I want to login to my account securely.
- **User Story #4:** As a user, I want my account to be retrievable if it is lost and I want to be able to reset my password if I forget it.



Storyboard #2: Select Framework

Users should be able to choose a framework of interest from a list of Frameworks (Option include but not limited to IFRS, TCFD, TNFD, APRA-CPG).

- **User Story #5:** As a user, I want to be presented with a selection of frameworks to choose from.
- **User Story #6:** As a user, I want default frameworks to be available for selection to expediate the process.
- **User Story #7:** As a user, I want to be able to import custom pre-defined Frameworks so that I can better analyse various data.
- **User Story #8:** As a user, I want to be able delete frameworks so that my dashboard is not overly cluttered with unused frameworks.
- **User Story #9:** As a user, I want to be able hide frameworks so that my dashboard is not overly cluttered with unused frameworks.
- **User Story #10:** As a user, I want to be able lock frameworks so that they will not be edited accidentally.
- **User Story #11:** As a user, I want to be able to restore recognised frameworks

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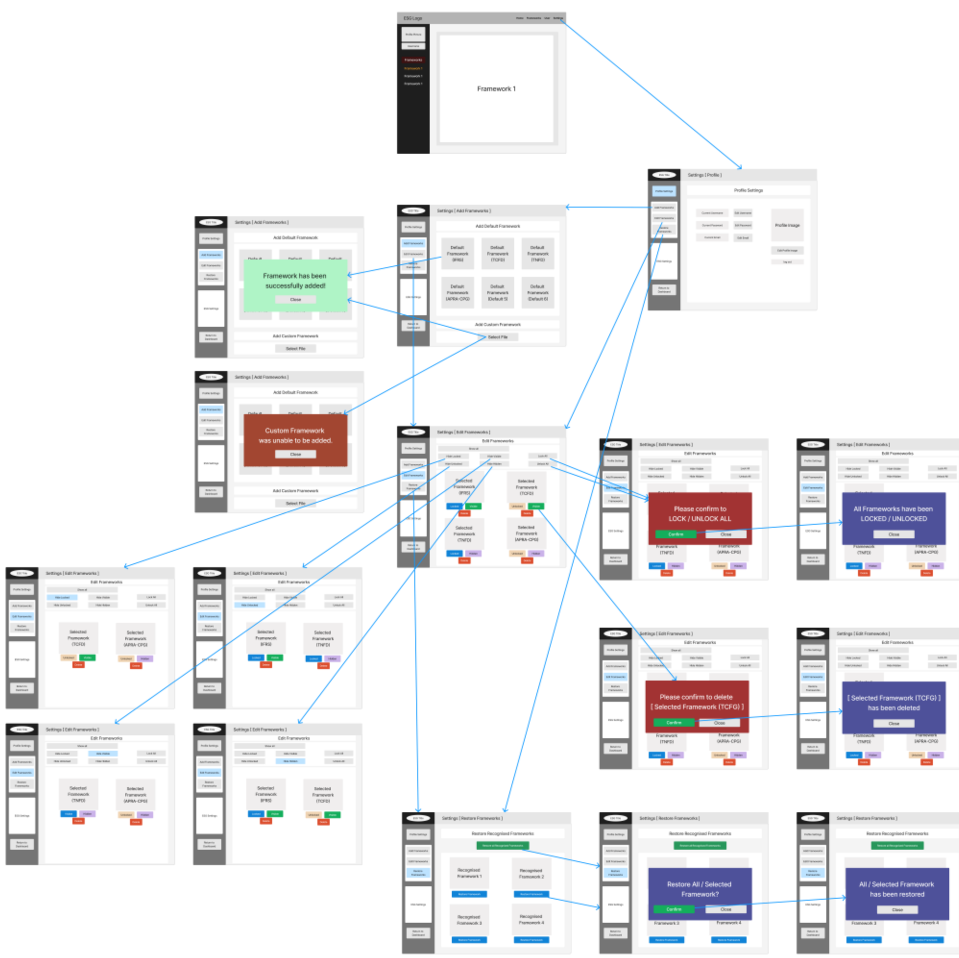

Storyboard #3: Browse Metrics

Users should be able to browse ESG metrics related to the selection Frameworks (each should have some default metrics. Make sure you have default metrics covering E, S, and G for each pillar and there should be more than ten under each framework).

- **User Story #12:** As a user, I want to view default ESG metrics related to the selected framework.
- **User Story #13:** As a user, I want to be able to add custom ESG metrics to the selected framework.
- **User Story #14:** As a user, I want to be able to sort the displayed ESG metrics based on various criteria.
- **User Story #15:** As a user, I want to be able to filter and sort the displayed ESG metrics based on various criteria.
- **User Story #16:** As a user, I want to be able to browse default ESG metrics related to the selected framework.

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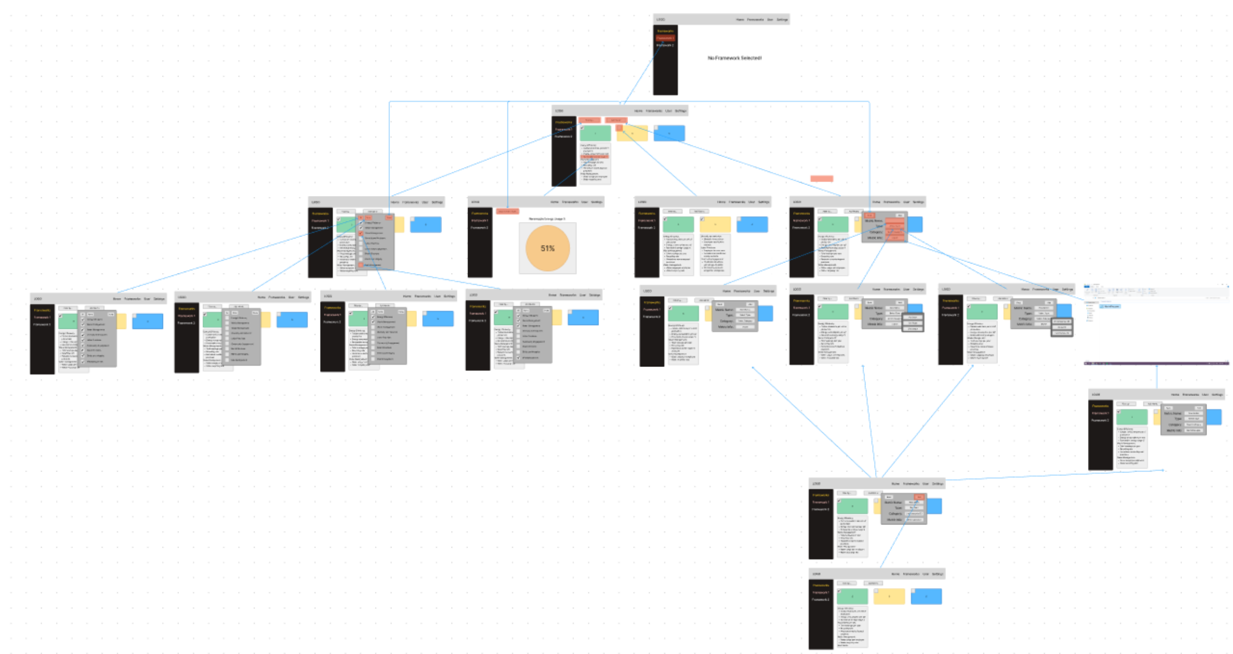

Storyboard #4: Add Metrics

Users should be able to add ESG metrics based on defined standards or needs.

- **User Story #17:** As a user, I want to be able to add ESG metrics based on predefined standards.
- **User Story #18:** As a user, I want to be able to edit ESG metrics as needed.
- **User Story #19:** As a user, I want to be able to delete ESG metrics as needed.

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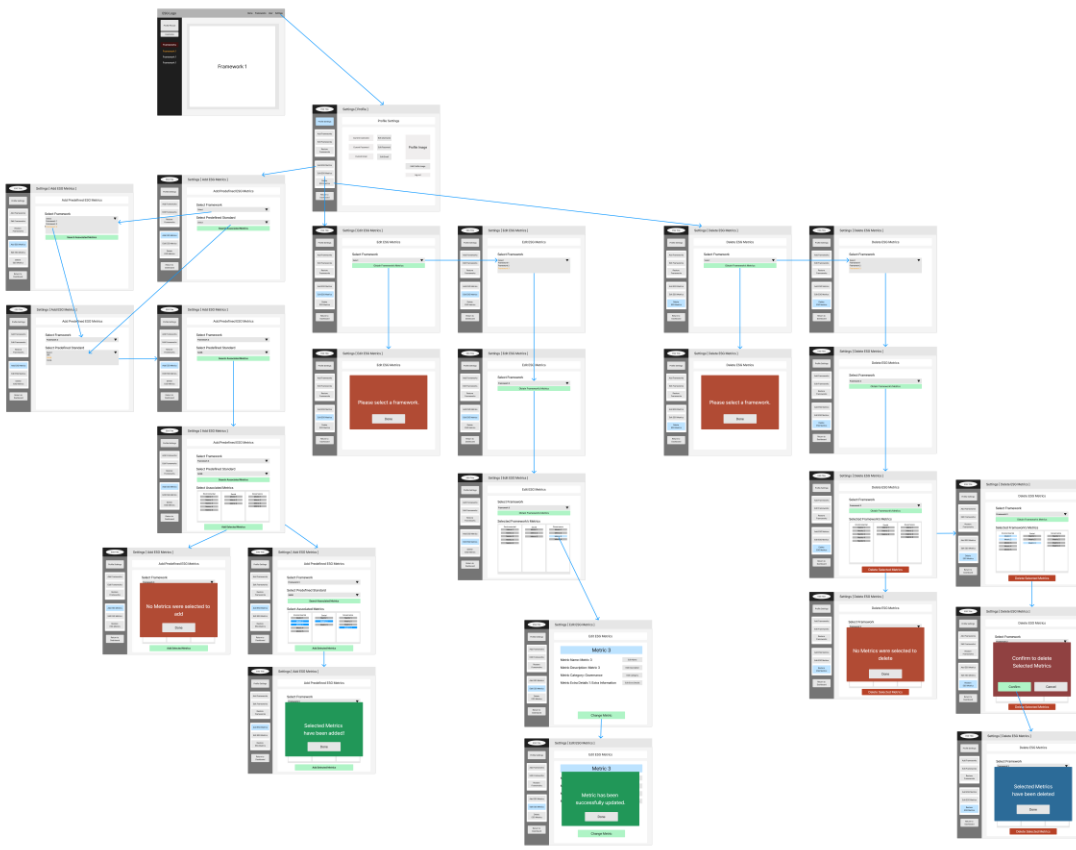
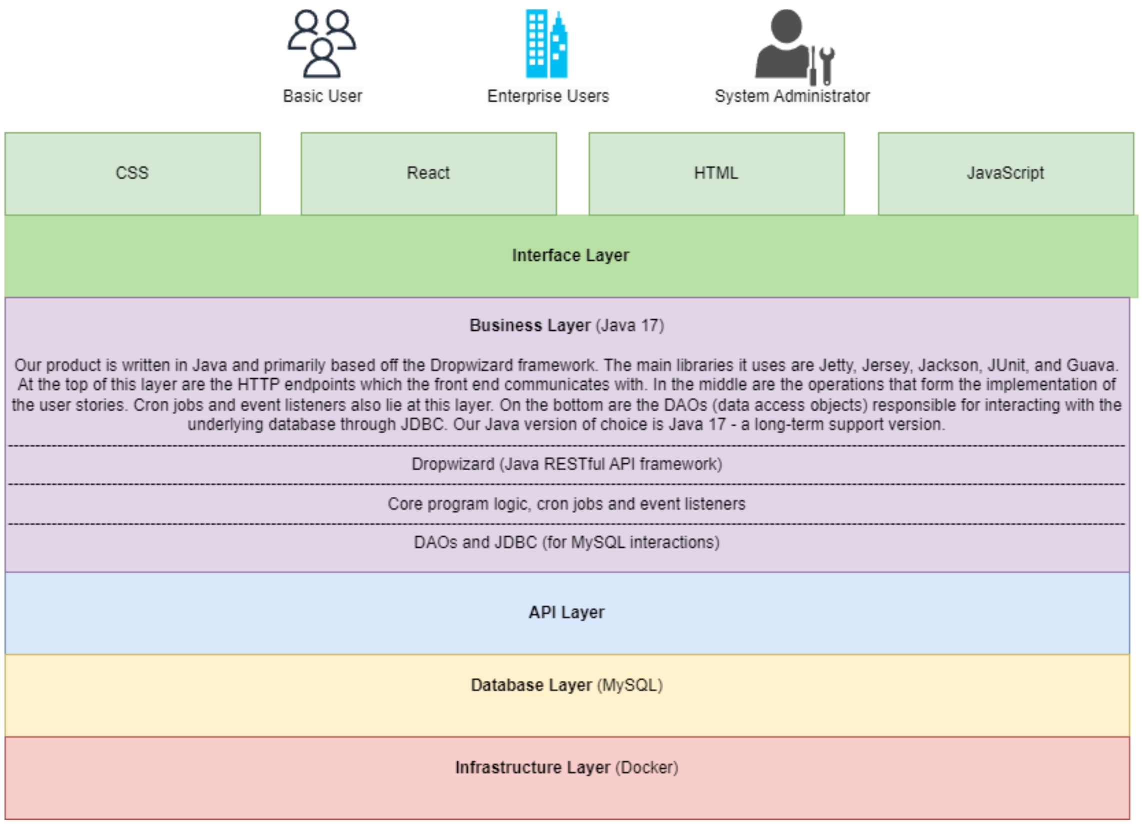


4. System Architecture Diagram



User types & Interactions:

1. Basic Users (Consultants/Investors):

Basic users are primarily focused on analysing companies' ESG (Environmental, Social, Governance) performance through various matrices. They interact with the system through the front end, where they can access and analyse data related to ESG performance. Basic users have read-only access to the system and cannot modify the default framework or manage users.

2. Admin:

Admin users have the highest priority in the system and are responsible for designing the default framework and managing users. They interact with the system through the front end and have access to administrative functionalities, such as user management, system configuration, and customisation of the default framework. Admin users have full control over the system's settings and configurations.

3. Enterprise Users:

Enterprise users are employees of organisations who want easy management for their settings. They can register as enterprise accounts to access the system and analyse companies' ESG performance through various matrices. Enterprise users interact with the system similarly to basic users but may have additional features or capabilities tailored to enterprise needs, such as group management or collaboration tools.

Interface layer:

React JS will be used predominantly for the front-end implementation. Material UI and Flowbite React UI libraries will be utilised to satisfy user interface requirements. CSS will be used to complement UI features.

Business layer:

Our product is written in Java and primarily based off the Dropwizard framework. The main libraries it uses are Jetty, Jersey, Jackson, JUnit, and Guava. At the top of this layer are the HTTP endpoints which the front end communicates with. In the middle are the operations that form the implementation of the user stories. Cron jobs and event listeners also lie at this layer. On the bottom are the DAOs (data access objects) responsible for interacting with the underlying database through JDBC. Our Java version of choice is Java 17 - a long-term support version.

Database layer & Infrastructure layer

MySQL Server Container encapsulates the MySQL server software along with its dependencies and configuration settings. The container is responsible for handling database operations, storing data, and serving client requests. Within the MySQL server container, one or more databases are created to store data. A database is a collection of tables, indexes, views, and other database objects. Each database is identified by a unique name and contains one or more tables, which hold the actual data.

The database schema defines the structure of the database, including tables, columns, data types, constraints, and relationships between tables. It acts as a blueprint for organising and storing data efficiently. The schema is designed based on the application's data model and requirements.

The infrastructure layer in Docker encompasses the runtime environment, tools, and services necessary for building, running, and managing containerised applications

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