# Chapter 4 Development Process

## 4.1 Agile Backlog and Scrum Process Overview

An Agile backlog is simply a list of tasks or features that need to be completed during a project. In our context of P.A.C.E project this backlog includes all the work that needs to be done such as building feaures, continuous updating of pages for better optimization etc. The backlog is organized by priority, i.e. the most important or urgent task will be completed first. So, this concept of prioritization is implemented using the SCRUM Methodology, an agile framework that promotes iterative development (Sprints) i.e. project is build and improved in small, repeated cycles where each cycle focuses on delivering a working version of the product. For example, like a login page followed by other pages one by one. The tasks were prioritized according to their importance and complexity in the project. By using this agile backlog and scrum process we can ensure that the final product aligns with user expectations.

## 4.2 Prioritization and sprint Planning

Prioritization plays a key role in ensuring that the most important features were delivered first. During this the researcher focused on tasks that had the highest impact on the user experience like Donation page, user dashboard analytics and Transcation management as they are core functionalities needed for users to engage with the plat form. During the development user authentication and dashboard analysis and donation management were prioritized as they are the core functionalities for the website.

This process ensured that every feature aligned with the overall goals of the platform and that each sprint delivered meaningful progress one after another.

## 4.3 Technology Stack: React, Node and Database Systems

The P.A.C.E system utilizes a modern technology stack to ensure better performance and energy efficiency. In the context of web development energy efficient means designing and building website in such a way that it uses less energy to perform the same tasks. The website development is a 2-phase process which includes front end- The part of website that user see and interact with. It includes everything the user experiences directly like buttons, images and navigations etc. Backend-This is the actual functionality that make the frontend works properly. It handles the data, server and database.

Before Finalizing the technology stack several other web technologies were researched, including angular, vue.js for front end and MongoDB, PostgreSQL for backend.

**Frontend:**

After evaluating those all options react was chosen for the frontend development due to its performance and efficiency in building dynamic, interactive user interfaces. The main reason to prefer to react is for its virtual DOM, which enhances performance by updating only the parts of the webpages that need to be changed. This is essential for real time updates in P.A.C.E system. React also have component-based feature which is each part of code can be separated using components which can be reusable at any part of the development and makes the maintenance easier.

**Backend:**

For the backend node.js is chosen due to its light weight and efficient framework that enables quick API calls like POST, GET etc for real time data exchange. It allows the user to communicate smoothly between the front and backend.

**Database:**

Before choosing the database directly, other databases like Firebase, MongoDB were reviewed. The decision is taken based on the data flow that will be used for this website. As the Websites stores data like user profiles, donation related data, volunteer activity data, Dashboard etc. So, to deal with this type of data we need relational Database with most suitable features.

Supabase which uses PostgreSQL was selected over the other databases because it supports Structured Query Language (SQL) and provides a more organized data flow. Some of the advantages are

* Relational Database
* Built-in Real-Time Support
* Self-Hosting Flexibility
* Ease of Use

During this Development process there was a comparison between using of Traditional CSS (Cascading Style Sheet) and Tailwind CSS Framework. I choose Traditional CSS over Tailwind framework for its greater control over design. While tailwind css provides a quick way to style elements using predefined classes, the researcher choosed traditional css because it offers full control over the design and layout. With normal css we can easily create custom styles and ensure flexibility in how elements are presented. In a long run normal css allows for complex designs and customized looks.