Project Banyan: An AI Powered Project Management Tool for Efficient Task Breakdown

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Introduction

- We aim to develop a user-friendly web application that breaks down complex project ideas into smaller and more manageable subtasks and goals based on the Agile methodology.
- After prompting users for an idea (initiative) they wish to explore and develop, our application uses the advanced language model GPT-4 to generate epics and stories for project development.
- The application provides users with a visual representation of the project development steps in the form of a tree, where each node can be expanded to provide more granular information about the tasks involved in the project.

Ultimately, this project will enable project managers to streamline the project planning process and enhance productivity by providing a clear and structured roadmap for accomplishing tasks.

Background

- Our tree structure is based on the Agile framework, which is is widely used in software development projects and is known for its flexibility and ability to adapt to changing requirements.
- The use of ChatGPT in project initiation is a novel idea and will provide a unique solution to project planning.
- Our project will be primarily useful for project managers who are starting a large scale project from scratch and wish to break it down into smaller tasks and visualize the full workflow.

Front-End

The web application built with React.js has the following pages:

- **Signup/Login:**
  From the home page, the user can go to a signup or login page, authenticating their session using JSON web tokens.
- **Dashboard:**
  This page allows the user to create new projects and access and delete current projects (Fig. 4). Projects are displayed as boxes with the project's name on it. Clicking a project will take you to the tree page, where the user is able to edit and customize the project.
- **Prompt:**
  The user is redirected to this page from the dashboard if the user creates a new project. The user fills in the prompt and description for the project they wish to create, which are sent to the GPT-4 model to generate a tree for the project.
- **Tree:**
  This page displays a particular project as an expandable and collapsible tree with detailed breakdowns (Fig. 5). Users can edit nodes, expand a node to break it down further, trim nodes, and save the edited tree to the database.

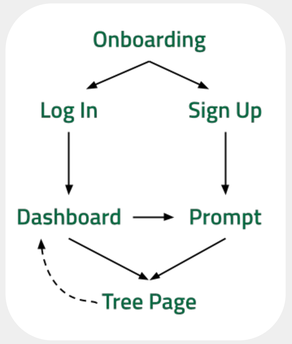

Figure 1: User flow

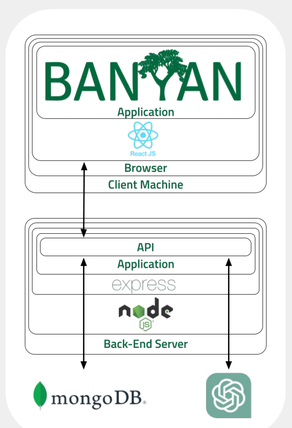

Figure 2: Architecture Overview

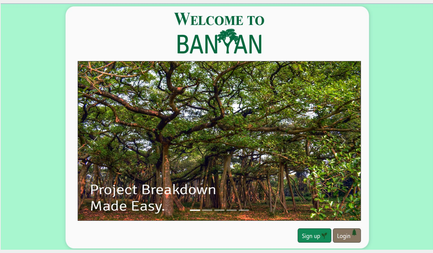

Figure 3: Onboarding page

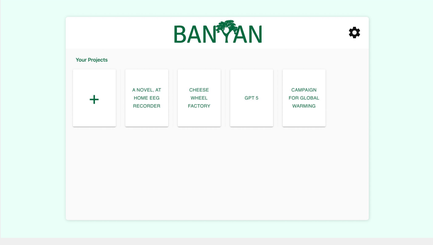

Figure 4: Dashboard page

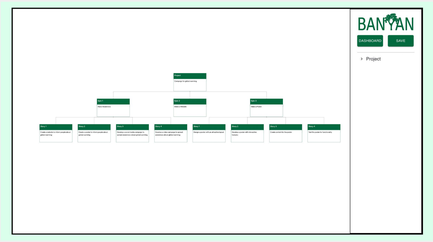

Figure 5: Tree page

Back-End

The application runs on an Express.js server that incorporates a MongoDB database per the Model-View-Controller architectural pattern. This helps manage the following functionalities:

- Make API calls to OpenAI's GPT-4 language model to break down user stories or tasks into smaller stories and tasks
- Manage creation and authentication of users
- Handle task breakdown tree structure and functionality
- Manage multiple project trees for a particular user

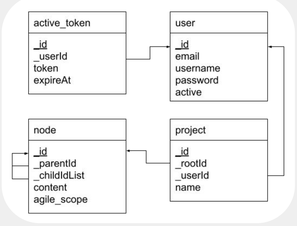

Figure 6: Database Schema

Future Work

Prospective further developments include features for Jira integration, roadmaps, and project insight.

Conclusion

We have developed an AI-powered tool that enables fast project breakdown and management with an intuitive UI and a flexible database.