CODEHUB WEBSITE
WITH SPECIALIZED AI BOT

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Abstract:
This project explains how to create a customized CodeHub website that is powered by artificial intelligence (AI). The website uses artificial intelligence (AI) algorithms to provide users with a personalized experience by identifying relevant code repositories, examining user behavior, and making suggestions.

The project's goals, techniques, particulars of implementation, results, conversations, conclusions, and next steps.

This project looks into the features and design of an AI-powered, personalized CodeHub website. This platform aims to alleviate the problem of information overload on traditional code repositories by utilizing AI algorithms to recommend pertinent projects, assess user activity, and offer customized learning materials. This paper examines the project's goals, layout, key features, and anticipated outcomes.

In millions of repositories spanning a wide range of computer languages and fields, one important portal for sharing and collaborating on code is CodeHub. Its vast repository environment, however, can be challenging for users to navigate, which could lead to information overload and make it harder for them to locate relevant projects and resources. This issue is made worse by the one-size-fits-all strategy of traditional code repositories, which disregards the preferences and learning styles of specific users.

1 Introduction:

With its groundbreaking platform, Code Hub, developers can now engage, cooperate, and manage their code repositories in a way that is completely new in the dynamic world of software development and collaboration. Motivated by GitHub's unmatched success, Code Hub aims to offer a recognizable yet improved experience, meeting modern demands in the quickly evolving technology landscape.

CodeHub is a well-designed platform that emerged from a deep understanding of the difficulties developers encounter in the contemporary software development ecosystem. It is not just another clone of GitHub. The idea behind CodeHub was to create a user-friendly, feature-rich, highly collaborative platform that blends the greatest aspects of version control with the latest developments in artificial intelligence.

The secret sauce at CodeHub is the integration of artificial intelligence. In contrast to conventional code repositories, CodeHub's AI Bot makes individualized recommendations for tasks, problems, and partners based on user behaviour. This guarantees that in the vast field of coding, developers will not only find what they need, but will also come across fresh and pertinent opportunities.

The AI Bot analyses enormous datasets of user interactions using machine learning algorithms to find trends and preferences. Because of this dynamic approach to personalization, the suggestions change as the user does, to accommodate their evolving needs and interests.

With CodeHub, you can experience cutting-edge features like automated testing workflows, intelligent code suggestions, and smart project boards. With the support of AI, these features seek to streamline the development process so that programmers can concentrate on what they do best—write excellent code.

CodeHub is a community-driven space that thrives on the combined creativity and intelligence of developers, rather than just a platform. CodeHub provides a platform for mentorship opportunities, meaningful interactions, and knowledge sharing through forums, discussion boards, and community driven events.

We invite developers from all backgrounds to join us as we set out on this journey with CodeHub and help shape the direction of collaborative coding in the future. CodeHub is intended to be your go-to tool for coding, regardless of your level of experience. It will grow with you and help you realize your coding goals.

The world of coding is now more than just a repository when you use CodeHub; it's a dynamic, customized experience made just for you. Greetings from the future of group coding.

2 Literature Survey:

SURVEY FROM REFERENCE [1]:
From article [1], we found the history, technology, and applications of chatbots. We have understood that chatbots can be helpful and efficient, but they also have limitations. One challenge is that chatbots may not be able to understand natural language well, that we have faced.

SURVEY FROM REFERENCE [2]:

- **Rendering:**

Understand the fundamentals of Server-side Rendering (SSR), Static Site Generation (SSG), and Incremental Static Regeneration (ISR) in Next.js. This will help you choose the most suitable approach for your website's content and user experience (https://nextjs.org/docs).

- **Routing:**

Learn how to define routes using pages and layouts, including dynamic routing for flexible URLs (https://nextjs.org/docs/pages/building-your-application/routing).

- **Data Fetching:**

Data fetching methods: Explore how to fetch data on the server-side during build time (SSG) or at request time (SSR) using getStaticProps and getServerSideProps functions.
(https://nextjs.org/docs/pages/building-your-application/data-fetching)

SURVEY FROM REFERENCE [3] & [4]:
The two source links present in Reference [4] and [5] and the article of Reference [3] helped to make the integration between Lang Chain, Alan AI Virtual Studio and NEXT js.

- **Conversion of python file to json file:**

Article [3] provides how to change the python code to Json file which helps to integrate the AI assistant into the web framework.
To change the format of the generative AI from python to dialogue script language using Alan AI studio, Lang Chain modules of Python [4] have been used.

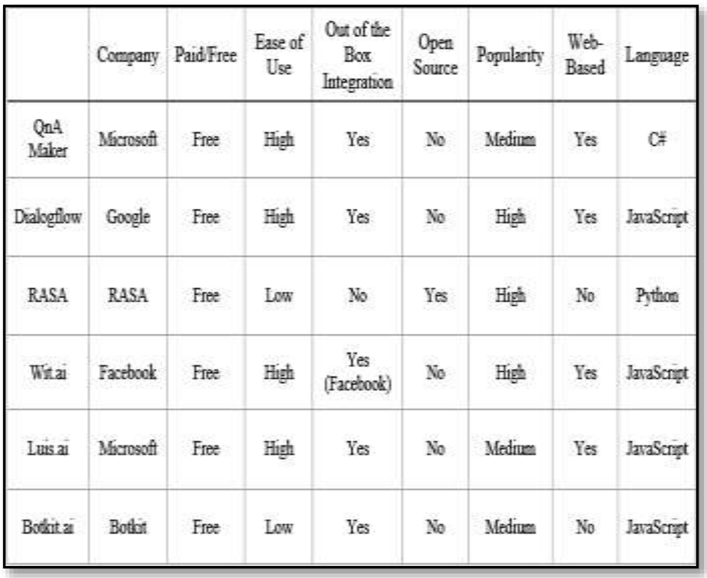
SURVEY FROM REFERENCE [5]:

- **Updating the log in terms of customization in the model:**

Whenever the model gets customized in Alan AI studio [5], the log will automatically updated in that platform. The history of the conversations will be saved in the backend.

SURVEY FROM REFERENCE [6]:

TABLE 1: COMPARISON OF COMMON CHATBOT FRAMEWORKS



	Company	Paid/Free	Ease of Use	Out of the Box Integration	Open Source	Popularity	Web-Based	Language
QnA Maker	Microsoft	Free	High	Yes	No	Medium	Yes	C#
Dialogflow	Google	Free	High	Yes	No	High	Yes	JavaScript
RASA	RASA	Free	Low	No	Yes	High	No	Python
Wit.ai	Facebook	Free	High	Yes (Facebook)	No	High	Yes	JavaScript
Luis.ai	Microsoft	Free	High	Yes	No	Medium	Yes	JavaScript
Botkit.ai	Botkit	Free	Low	Yes	No	Medium	No	JavaScript

Table 1 shows comparison among some common chatbots and their frameworks. Also it depicts if the chatbot had been an open-source integration or not.

SURVEY FROM REFERENCE [7]:
The Open AI reference generates a completion for the parameters and prompt that are supplied.

• **Request Body:**

Model: The model's ID to be used. To view every model you have accessible, use the List models API. You can also read descriptions of each model in our Model overview.

Prompt: The prompt or prompts to produce completions for, represented as a string, array of strings, token array, or array of arrays of tokens.
Because the model learns to recognize <|endoftext|> as a document separator during training, it will create as though it is the start of a new document in the absence of a prompt.

max_tokens: The most tokens that can be produced throughout the completion. The prompt's token count plus max_tokens cannot be greater than the context of the model.

React:
1. Component-Based Architecture.
2. Sections as Elements.
3. Components of Class and Function.
4. Routing of File Systems.

Next.js:
1. The ability to reuse.
2. Common Elements.
3. States and Props.
4. Dynamic Routes.
5. The arrangement. Routes for APIs.
6. JavaScript XML, or JSX.
7. Rendering on the server side and static.
8. Integrated React with ease.

In conclusion, components are essential to Next.js and React apps. While Next.js extends this idea across the entire application by treating pages as components and offering further functionality for server-side rendering, routing, and API handling, React components provide a modular and reusable method to creating user interfaces.

3 Methodology:

The development method for the AI-powered website CodeHub is explained in this paper. CodeHub uses Next.js as the entire tech stack, React for the front end, and OpenAI's pre-trained models to offer a customised code sharing and learning experience.

3.1 Prerequisites and examination:

- Requirement analysis, a crucial step in the software development life cycle, comprises gathering, documenting, and assessing stakeholder needs and expectations to define the features and functionalities of a software system. This method ensures that the final product meets the desired objectives and serves as the foundation for the entire development process.
- Interface: It should be user-friendly, responsive, and compatible with a range of gadgets.
- Efficient Code Management: Code execution and version control are necessary for code management.

3.2 ESSENTIAL FUNCTIONALITIES:

1. User administration: This comprises registration, login, access control, and profile management.
2. Code Execution: An integrated code editor with code completion, syntax highlighting, and real-time error checking.
3. Educational Resources: Comprehensive availability of handpicked manuals, documents, and records.

3.3 Technology Stack:

A project's technology stack is the assembly of databases, frameworks, libraries, programming languages, and other tools required for the creation and operation of software. Together with the front-end and back-end components, it also comprises all middleware and infrastructure elements.

3.3.1 Front End:

ReactJS: A popular JavaScript package for making dynamic and responsive user interfaces.
Next JS: It is a React framework that uses server-side rendering and static website construction to improve performance and SEO.

3.3.2 Back End:

Next JS is a React framework that uses server-side rendering and static website development to improve performance and SEO.

3.3.3 AI-ENGINE:

OpenAI API: It Uses OpenAI's pre-trained models, like GPT-4 and Whisper, to generate code and offer personalised recommendations. Alan Studio: Python generated

3.3 ESSENTIALS BUT NOT FUNCTIONAL:

1. Security: Code protection, user authentication, and safe data storage.
2. Performance: Effective code execution and a responsive user interface.
3. Scalability: The capacity to handle an increase in the number of users and the volume of data.
4. Availability: Minimal downtime and high uptime.
5. Maintainability: A modular codebase facilitates future updates and easy maintenance.

3.4 NEED OF THE USER:
Users can expect personalised recommendations for relevant repositories, instructional resources, and other content based on their coding habits and areas of interest.

3.5 AGILE DEVELOPMENT:

- ➢ A gradual, iterative process that incorporates quick feedback loops and ongoing development.
- ➢ Managing project scope and feature prioritization through the use of sprints and user stories.
- ➢ Utilizing Jira for task management and Kanban boards for workflow visualization.

3.6 TESTING AND QUALITY ASSURANCE:

- ➢ Unit testing with frameworks such as Jest for individual code modules.
- ➢ Testing of integration to make sure various parts function as a unit.
- ➢ Comprehensive testing to verify user procedures and features.
- ➢ The pipeline for continuous integration and delivery (CI/CD) automates builds, tests, and deployments.

4 Proposed Approach:

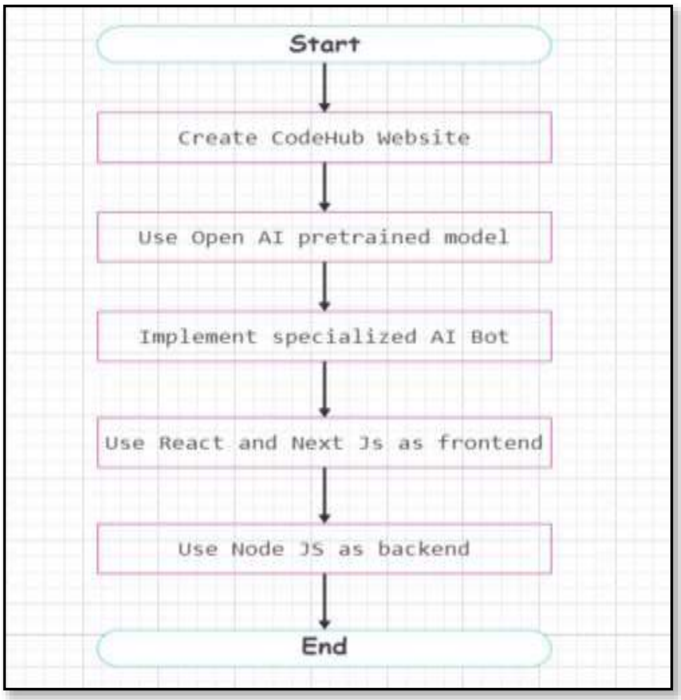

Start
Create CodeHub Website
Use Open AI pretrained model
Implement specialized AI Bot
Use React and Next Js as frontend
Use Node JS as backend
End

FIG 1: FLOWCHART OF PROPOSED SYSTEM

The steps shown in this flowchart includes:
□ **Start:** The process begins at the top of the flowchart, labelled "Start".
□ **Create a Website:** Creating a website, like the CodeHub platform might involve signing up
for an account and selecting a website template or building one from scratch.
□ **Use OpenAI Pretrained Model:** Once the website is created, the flowchart suggests
leveraging an OpenAI pretrained model.
□ **Implement Specialized AI Bot:** The next step involves implementing a specialized AI bot
which is custom-designed for the specific needs of the website being created.
□ **Choose Backend and Frontend Technologies:** The flowchart then splits into two paths,
where the left path indicates using Node.js for the website's backend. The right path indicates
using React and Next.js for the website's frontend.
□ **End:** Once the backend and frontend are configured, the flowchart reaches the endpoint labelled "End".

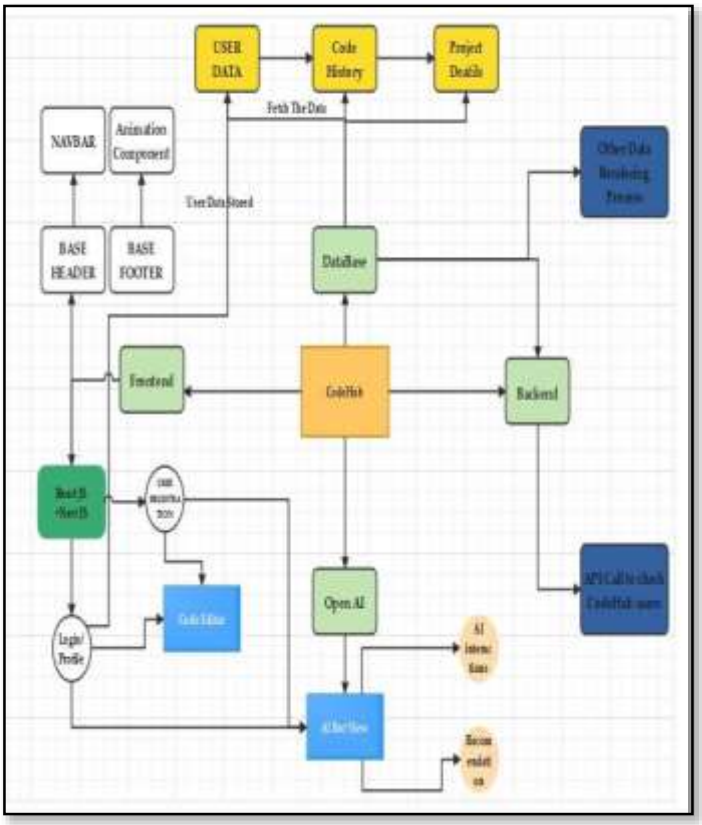


FIG 2: DATA FLOW DIAGRAM OF PROPOSED SYSTEM

5 Conclusions:

Features akin to GitHub, CodeHub is a web-based platform designed to empower developers of all skill levels. It also has an integrated AI-powered assistant and an interactive code editor. This website seeks to enhance the coding experience by promoting code version control and collaboration, as well as intelligent support and interactive learning.

IMPORTANT CHARACTERISTICS:

- Code Version Control: Similar to GitHub, CodeHub allows users to collaborate on projects, branch out, and monitor changes made to their code.
- Integrated AI Assistant: Easily accessible from within the code editor, the AI assistant provides real-time assistance with a range of activities such as code generation, syntax error correction, and code completion.
- Interactive Code Completion: By anticipating the next line of code based on context, the AI assistant provides recommendations that cut down on writing time and improve code quality.
- AI-powered Debugging: The assistant scans code for potential issues and provides suggestions for debugging and troubleshooting. With CodeHub's integrated interactive tutorials and learning features, users may acquire new skills while working on projects.

6 References:

[1] Begel, A., DeLine, R., & Zimmerman, T. Social media for software engineering. In Proc. FoSER 2010, IEEE Computer Society (2010), 33—38.

[2] Next.js Source Link: https://nextjs.org/docs

[3] https://link.springer.com/article/10.1007/s12599-023-00834-7

[4]https://python.langchain.com/docs/modules/agents/agent_types/openai_assistants/

[5] https://alan.app/docs/

[6] Chatbot Magazine (2019). A Visual History of Chatbots. Retrieved March 9, 2019 from: https://chatbotsmagazine.com/a-visual-history-of-chatbots-8bf3b31dbfb2

[7] Open AI Reference: https://api.openai.com/v1/completions

[8] Website Source Link: https://codehub-nextjs.vercel.app/