**Career Mapper: AI-Powered Personal Career Mapping**

**1. Introduction**

1.1 **Project Overview**

CareerMapper is an innovative platform designed to provide personalized career mapping, guidance, and job recommendations based on individual interests, skills, and career goals. By leveraging the power of AI technology, specifically Google’s Generative AI model, CareerMapper aims to revolutionize the way individuals plan and develop their careers. The platform offers a user-friendly interface where users can input their data and receive tailored career suggestions, educational pathways, and insights into potential job roles and growth opportunities.

1.2 **Objectives**

* **Assist Students**: To help students explore various career options by analyzing their interests, skills, and aspirations. CareerMapper provides tailored career suggestions, helping students make informed decisions about their future educational and career paths.
* **Professional Development**: To provide working professionals with insights on potential career trajectories, identify skill gaps, and recommend learning paths. This aids professionals in advancing their careers, transitioning to new roles, or acquiring new skills to remain competitive in their field.
* **Support Job Seekers**: To aid job seekers in identifying transferable skills, exploring alternative career paths, and accessing job opportunities that align with their experience and aspirations. CareerMapper helps reduce the uncertainty and challenges associated with career transitions.

**2. Project Initialization and Planning Phase**

2.1. **Define Problem Statement**

Many individuals, including students, working professionals, and job seekers, struggle to navigate their career paths due to a lack of personalized guidance and insights into potential career opportunities. This often results in uncertainty, underemployment, or dissatisfaction with career choices. The absence of tailored career advice can lead to inefficient job searches and missed opportunities for professional growth.

2.2. **Project Proposal (Proposed Solution)**

CareerMapper proposes a solution using AI technology to analyze personal data—such as interests, skills, and goals—and generate tailored career recommendations and educational pathways. This approach aims to provide individuals with actionable insights and clear directions for their career development. By leveraging AI, CareerMapper can offer personalized and relevant career guidance, helping users make better-informed decisions and achieve their career objectives.

2.3. **Initial Project Planning**

* **Scope Definition**: Define the scope and objectives of the project, ensuring alignment with stakeholder expectations. This involves outlining the features and functionalities of CareerMapper, as well as the target audience and key deliverables.
* **Stakeholder Identification**: Identify key stakeholders, including students, professionals, educators, and employers, and gather their requirements. Understanding stakeholder needs and expectations is crucial for the success of the project.
* **Timeline and Milestones**: Establish a project timeline with clear milestones for development, testing, and deployment phases. This includes setting deadlines for each phase of the project and ensuring that the team adheres to the schedule to meet project goals.

**3. Data Collection Phase**

3.1. **Data Collection Plan and Raw Data Sources Identified**

* **Personal Information**: Collect data such as age, gender, and educational level. This basic information helps tailor career recommendations to the user's demographic profile.
* **Interests**: Gather information on hobbies and extracurricular activities. Understanding a user's interests is crucial for suggesting career paths that align with their passions and preferences.
* **Skills**: Record technical and soft skills. Skills data is essential for identifying suitable career roles and highlighting any skill gaps that need to be addressed for career advancement.

Since CareerMapper uses a pre-trained model (Google’s Bison model), the focus is on collecting user-specific data to tailor the model’s responses.

**4. Model Development Phase**

4.1. **Model Selection Report**

* **Selected Model**: Google Generative AI (PaLM) using the text-bison-001 model. This model is selected for its advanced natural language understanding capabilities, which are essential for generating personalized career recommendations.
* **Justification**: The Bison model is chosen for its high accuracy and relevance in understanding and processing natural language inputs. Its pre-trained capabilities allow for efficient deployment and robust performance in generating career guidance.
* **Capabilities**: The Bison model can handle complex queries, understand context, and generate detailed and relevant responses. This makes it well-suited for the CareerMapper application, where personalized and context-aware recommendations are critical.

4.2. **Initial Model Training Code and Model Validation and Evaluation Report**

Since the Bison model is pre-trained, the focus is on configuring it for our specific use case and validating its performance with user data.

CODE:

from dotenv import load\_dotenv

load\_dotenv()

import os

import streamlit as st

import google.generativeai as palm

api\_key = os.getenv("PALM\_API")

if not api\_key:

raise ValueError("PALM\_API key not found in environment variables")

palm.configure(api\_key=api\_key)

model\_name = 'models/text-bison-001'

st.set\_page\_config(page\_title="CareerMapper")

st.title("CareerMapper: AI-Powered Personal Career Mapping")

st.markdown("""

CareerMapper: AI-Powered Personal Career Mapping

CareerMapper is an innovative platform designed to provide personalized career mapping, guidance, and job recommendations based on individual interests, skills, and career goals. Leveraging the power of AI technology, CareerMapper aims to revolutionize career planning and development.

""")

def generate\_career\_pathways(user\_data):

prompt = f"""

role: system, content: Suggest good career options based on the data provided with proper explanation,

role: Example,

content:

Personal Information: [age:22, gender:male, educational level:UG],

Interests: [Hobbies:Playing football, coding, Maths],

Skills: [Skills:C++,PyTorch, ML],

Career choices:

1. Software Development

• Leverage Skills: Your proficiency in C++ and Python provides a strong foundation for software development.

• Potential Roles: You can explore roles like software engineer, backend developer, game developer (given your interest in football, you could explore sports game development), or full-stack developer.

• Growth Opportunities: The software development field offers ample growth opportunities, with potential to specialize in areas like AI, machine learning, or cybersecurity.

2. Machine Learning Engineer

• Build on Strengths: Your knowledge of PyTorch and ML is directly applicable to this role.

• Industry Demand: Machine learning is a rapidly growing field with high demand for skilled professionals.

• Potential Roles: You could work on developing ML models for various applications, such as image recognition, natural language processing, or predictive analytics.

3. Academic Research

• Explore Further: If you have a deep interest in mathematics or machine learning, you could consider pursuing higher studies (like a Masters or PhD)

• Potential Roles: You could work as a research assistant or pursue a career in academia after completing your advanced degree.

role:Query,content: Personal Information: [age:{user\_data[0]}, gender:{user\_data[1]}, educational level:{user\_data[2]}], Interests: [Hobbies:{user\_data[3]}], Skills: [Skills:{user\_data[4]}], suggest some Career choices with respect to above data with proper explanation:

"""

response = palm.generate\_text(model=model\_name, prompt=prompt)

return response.result

with st.form(key='career\_form'):

st.subheader("Personal Information")

age = st.number\_input("Age", min\_value=0, max\_value=100, value=20, step=1)

gender = st.selectbox("Gender", ["Male", "Female", "Other"], index=0)

education\_level = st.selectbox("Educational Level", ["UG", "PG", "PhD", "Other"], index=0)

if education\_level == "Other":

other\_education = st.text\_input("Please specify your education level")

st.subheader("Interests")

hobbies = st.text\_area("Hobbies (separate by commas)")

st.subheader("Skills")

skills = st.text\_area("Skills (separate by commas)")

submit\_button = st.form\_submit\_button(label='Submit')

if submit\_button:

if education\_level == "Other":

education\_level = other\_education

personal\_info = {

"age": age,

"gender": gender,

"education\_level": education\_level

}

interests = [hobby.strip() for hobby in hobbies.split(',')]

skills\_list = [skill.strip() for skill in skills.split(',')]

user\_data = [age, gender, education\_level, hobbies, skills]

career\_pathways = generate\_career\_pathways(user\_data)

st.subheader("Career Pathways")

st.write(career\_pathways)

**5. Deployment Phase**

5.1. **Deployment Strategy**

* **Infrastructure Setup**: Setting up the necessary infrastructure for deploying the CareerMapper platform. This includes configuring servers, databases, and ensuring scalability to handle user traffic.
* **Integration**: Integrating the AI model with the front-end application. Ensuring seamless communication between the user interface and the AI model for real-time career recommendations.
* **Monitoring and Maintenance**: Establishing monitoring tools to track the performance and reliability of the platform. Regular maintenance and updates to ensure optimal performance and address any issues that arise.

5.2. **User Testing and Feedback**

* **Beta Testing**: Conducting beta testing with a select group of users to gather feedback on the platform’s functionality and usability. Identifying any issues or areas for improvement based on user feedback.
* **User Feedback**: Collecting detailed feedback from users on the relevance and accuracy of the career recommendations. Using this feedback to make necessary adjustments and enhancements to the platform.
* **Iterative Improvements**: Implementing an iterative approach to improve the platform based on user feedback. Continuously refining the AI model and user interface to enhance the overall user experience.

**6. Launch Phase**

6.1. **Marketing and Promotion**

* **Marketing Plan**: Developing a comprehensive marketing plan to promote CareerMapper. This includes leveraging social media, online advertising, and partnerships with educational institutions and professional organizations.
* **User Onboarding**: Creating user onboarding materials to help new users understand and navigate the platform. Providing tutorials, guides, and customer support to ensure a smooth onboarding experience.
* **Launch Event**: Organizing a launch event to introduce CareerMapper to the public. This can include webinars, live demonstrations, and Q&A sessions to engage with potential users and stakeholders.

6.2. **Post-Launch Activities**

* **Performance Monitoring**: Continuously monitoring the performance and usage of CareerMapper. Using analytics tools to track user engagement, identify trends, and make data-driven decisions.
* **User Support**: Providing ongoing user support to address any issues or questions. Ensuring that users have access to resources and assistance to make the most of the platform.
* **Future Enhancements**: Planning for future enhancements and updates to CareerMapper. Incorporating new features, expanding the AI model’s capabilities, and staying aligned with evolving user needs and industry trends.

**7. Advantages & Disadvantages**

7.1. **Advantages**

* **Personalized Guidance**: CareerMapper offers highly personalized career recommendations based on individual user data. This helps users make more informed decisions about their career paths.
* **User-Friendly Interface**: The platform is designed to be intuitive and easy to use, allowing users to input their data and receive career suggestions with minimal effort.
* **Scalability**: Leveraging Google’s AI technology ensures that the platform can scale to accommodate a large number of users without compromising performance.

7.2. **Disadvantages**

* **Data Privacy Concerns**: Users might have concerns about the privacy and security of their personal data. Ensuring robust data protection measures is essential.
* **Dependence on Accurate Inputs**: The accuracy of the career recommendations heavily depends on the quality and accuracy of the user-provided data.
* **Limited by Pre-trained Model**: While the Bison model is powerful, it may have limitations in understanding niche or highly specialized career paths that require additional customization.

**8. Conclusion**

CareerMapper aims to revolutionize career planning and development by providing personalized career mapping and guidance using AI technology. By understanding users’ interests, skills, and aspirations, the platform offers tailored career suggestions, helping individuals make informed decisions about their career paths. With continuous improvements and user feedback, CareerMapper has the potential to become an essential tool for students, professionals, and job seekers navigating their career journeys.

**9. Future Scope**

* **Enhanced Personalization**: Integrate more advanced AI models to further enhance the personalization of career recommendations.
* **Expanded Data Sources**: Incorporate additional data sources, such as job market trends and industry demands, to provide more comprehensive career advice.
* **Mobile Application**: Develop a mobile application to increase accessibility and convenience for users on the go.
* **Partnerships and Collaborations**: Partner with educational institutions and professional organizations to expand the platform’s reach and resources.

**10. Appendix**

10.1. **Source Code**

The complete source code for the CareerMapper platform is available in the project's GitHub repository.

10.2. **GitHub & Project Demo Link**

* **GitHub Repository** : <https://github.com/Raghav-Kejriwal/CareerMapper>
* **Project Demo**: <https://youtu.be/m9U8SlD1fHs>