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AI Skill bridge Agent: An Intelligent Career Guidance and Skill Recommendation System

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Abstract: *In the digital era, choosing the right career and developing relevant skills are essential for students, graduates, and working professionals. However, identifying suitable career opportunities, understanding skill gaps, and finding reliable learning resources can be challenging and time-consuming.* ***AI SkillBridge Agent – Intelligent Career Guidance and Skill Recommendation System*** *is designed to provide personalized career guidance based on users' educational backgrounds, interests, existing skills, and career goals. The system recommends suitable career options with match percentages, identifies skill gaps, and provides step-by-step learning roadmaps, courses, certifications, internships, and useful online resources. It also aims to help users improve their resumes by providing suggestions for better presentation of their skills and qualifications. The proposed system covers multiple professional domains and focuses on providing relevant, category-specific recommendations. This project aims to simplify career planning, support informed decision-making, and help users develop industry-relevant skills through a user-friendly application.*

Key Word: *Artificial Intelligence, Career Guidance, Skill Recommendation, Skill Gap Analysis, Career Roadmap, Resume Improvement, Flutter Application.*

I.INTRODUCTION

In the digital era, choosing a suitable career and developing the right skills have become important for students, graduates, and working professionals. Many individuals face difficulties in identifying suitable career opportunities, understanding the skills required for different professions, and finding reliable learning resources. Traditional career guidance methods may not always provide personalized recommendations according to an individual's education, interests, skills, and career goals.

This project presents the development of AI SkillBridge Agent – Intelligent Career Guidance and Skill Recommendation System. The main objective of this project is to provide a centralized platform that helps users explore suitable career paths and improve their professional skills. The system analyzes user-provided information and recommends relevant career options, career-match percentages, skill-gap analysis, and step-by-step learning roadmaps.

The proposed application also aims to provide useful courses, certifications, internships, job opportunities, and online learning resources according to the selected career domain. Additionally, it includes the planned facility for resume uploading and improvement suggestions to help users present their qualifications and skills effectively.

Through this project, we aim to simplify career planning, reduce the effort required to search for learning opportunities, and help users make informed career decisions. The application is designed to provide a user-friendly experience and support career development across multiple professional domains.

II. LITERATURE REVIEW

The literature on career guidance and skill recommendation systems provides valuable insights into how technology can support career planning and professional development. Traditional career guidance methods help individuals explore suitable professions, but they may not always provide personalized recommendations based on a person's education, interests, skills, and career goals.

Advancements in Artificial Intelligence and Machine Learning have created new opportunities for developing intelligent career guidance systems. These technologies can analyze user-provided information, identify relevant career options, and recommend skills required for different professional roles. Recommendation systems also help users discover suitable courses and learning resources based on their interests and career objectives.

Another important area is skill-gap analysis, which helps individuals understand the difference between their existing skills and the skills required for their desired careers. Structured learning roadmaps can guide users through the process of acquiring relevant knowledge and improving their professional abilities. Resume analysis and improvement tools

can further assist users in presenting their qualifications and skills effectively.

Despite these advancements, challenges remain in providing accurate, updated, and domain-specific recommendations. Some systems may offer generalized suggestions or limited learning resources for certain career categories. Therefore, AI SkillBridge Agent aims to integrate career recommendations, skill-gap analysis, learning roadmaps, courses, internships, and resume improvement support into a single user-friendly application.

III. MODULES

1. **User Profile Module:**
   This module allows users to enter and manage their personal details, educational background, institute name, existing skills, interests, and career goals. The information is used to provide personalized career guidance.

2. **Skill Assessment Module:**
   This module helps users assess their current skill levels, such as beginner, intermediate, or advanced. It collects information about their technical and professional skills to support career recommendations.

3. **Career Recommendation Module:**
   This is the core module of the system. It recommends suitable career options based on the user's education, interests, skills, and goals. It also displays career-match percentages to help users compare different opportunities.

4. **Skill Gap Analysis Module:**
   This module identifies the difference between the user's existing skills and the skills required for a selected career. It helps users understand which skills they need to improve or learn.

5. **Learning Roadmap Module:**
   This module provides step-by-step learning roadmaps according to the selected career category. It recommends relevant skills, courses, certifications, and learning resources to support professional development.

6. **Resume Assistance Module:**
   This module aims to allow users to upload their resumes and receive suggestions for improving their content, skills presentation, and professional profile.

7. **Learning Resources and Opportunities Module:**
   This module provides relevant online courses, educational websites, YouTube resources, internships, and job opportunities based on the user's selected career path.

8. **Dashboard Module:**
   The dashboard provides a centralized interface for accessing the user's profile, skill assessment, career recommendations, learning roadmaps, and other important features of the application.

9. **Admin and System Management Module:**
   This module can support future administrative features for managing career categories, learning resources, user information, and system updates to maintain the quality and relevance of recommendations.

IV.DESIGN CONSIDERATIONS

The design of the AI SkillBridge Agent was guided by key considerations such as usability, accuracy, scalability, security, and reliability. The main objective is to develop a user-friendly application that provides personalized career guidance and skill development recommendations.

Usability: The application is designed with a simple and intuitive interface so that students and professionals can easily enter their details, assess their skills, explore career options, and access learning roadmaps.
Accuracy and Relevance: Career recommendations and learning resources should be relevant to the user's educational background, interests, existing skills, and selected career category. Category-specific recommendations help avoid unrelated or generalized suggestions.

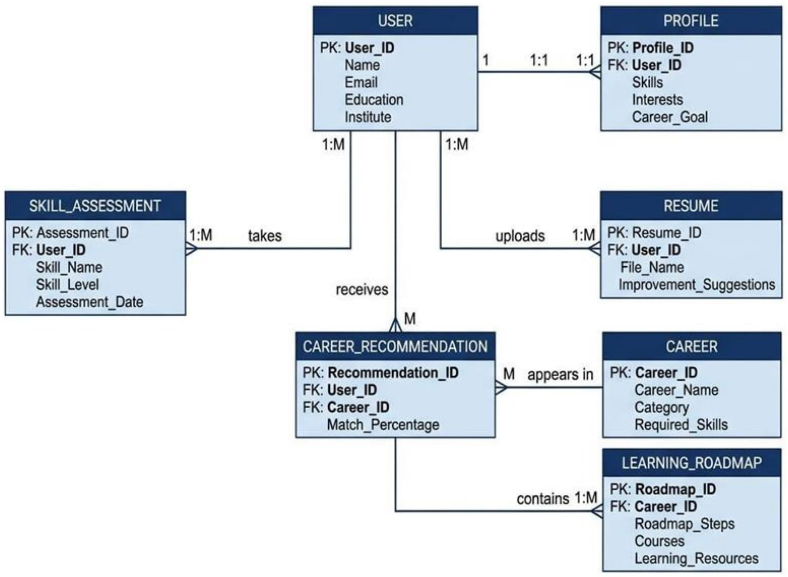
Scalability: The system is designed to support multiple career domains and additional features in the future. Its modular structure allows career categories, learning resources, and recommendation methods to be improved independently.

Security and Privacy: User profile information and uploaded resumes must be handled carefully. Appropriate validation and secure file handling help protect personal information and reduce unauthorized access.

Reliability: The application should provide consistent recommendations, clear navigation, and relevant learning resources. Proper testing helps identify errors and improve the reliability of the system.

Maintainability: The application is developed using Flutter, with separate modules for profile management, skill assessment, career recommendations, and learning roadmaps. This structure makes future updates and improvements easier.

College Project: **'AI SkillBridge Agent – Intelligent Career Guidance and Skill Recommendation System'**



V. DEVELOPMENT METHODOLOGY

The development of the AI SkillBridge Agent follows a step-by-step approach to build a user-friendly and reliable career guidance application.

Requirements Gathering: The project requirements were identified by considering the needs of students, graduates, and job seekers. Key features include skill assessment, career recommendations, learning roadmaps, and resume assistance.

Application Development: Flutter is used to develop the application interface, including user profiles, skill assessment screens, dashboards, and career recommendation pages.

Recommendation System: User-provided education, interests, skills, and career goals are used to suggest suitable career options and identify skill gaps.

Integration and Testing: The application modules are integrated and tested to identify errors, verify navigation, and ensure that career recommendations and learning resources are relevant.

Evaluation and Improvement: The application is reviewed to improve usability, recommendation quality, and reliability. Future updates may include additional career categories, learning resources, and advanced AI features.

VI. TESTING AND VALIDATION

Testing and validation are important parts of the AI SkillBridge Agent development process to ensure the application works correctly and provides relevant career recommendations .Functional Testing: Individual modules, such as user profiles, skill assessment, career recommendations, and learning roadmaps, are checked to verify their functionality.

Integration Testing: The interaction between different modules is tested to ensure smooth navigation and proper data flow throughout the application.Recommendation Testing: Career suggestions, match percentages, skill-gap analysis, and learning resources are checked for relevance to the user's skills, interests, and career goals.

User Acceptance Testing: The application interface and features are reviewed to identify usability issues and improve the overall user experience.Performance Testing: The application's responsiveness, navigation, and handling of user inputs are evaluated to identify errors and improve reliability.

These testing activities help identify problems, improve application quality, and ensure that the AI SkillBridge Agent meets its intended objectives.

VII. SYSTEM ARCHITECTURE

The AI SkillBridge Agent follows a modular application architecture designed to provide personalized career guidance and skill development recommendations. The user interacts with the Flutter front end to enter personal details, assess skills, and explore career options. The application processes this information through the recommendation logic, which identifies suitable careers and calculates match percentages. The system also provides skill-gap analysis, career-specific learning roadmaps, courses, and online resources. Resume assistance supports users in improving their professional profiles. The application modules work together to provide a simple and centralized career guidance experience.

Fig. System Architecture: User → Flutter Front End → Profile and Skill Assessment → Career Recommendation Engine → Skill Gap Analysis → Learning Roadmap and Resources. The Resume Assistance Module connects with the User Profile and Resume Input.

VIII. CONCLUSION

In conclusion, the AI SkillBridge Agent is designed to simplify career planning and skill development by providing personalized career guidance. The system recommends suitable career options based on users' education, interests, skills, and career goals. It also provides career-match percentages, skill-gap analysis, learning roadmaps, courses, and useful online resources through a user-friendly Flutter application.

The main advantage of the system is that it brings multiple career guidance features together in one platform, helping users identify suitable career paths and improve their professional skills. However, the quality of recommendations depends on the accuracy of user inputs and the relevance of available career information. In the future, the system can be enhanced with advanced AI-based recommendations, improved resume analysis, updated job and internship listings, and additional learning resources. Overall, AI SkillBridge Agent aims to support informed career decisions and help users prepare for future professional opportunities.

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