SMART INDIA HACKATHON 2024

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- ***Problem Statement ID :*** SIH1781
- ***Problem Statement Title :*** AI-Enhanced Career Guidance System for Personalized Career Pathways
- ***Theme :*** Smart Education
- ***PS Category :*** Software
- ***Team Name :*** Tech Titans

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DETAILED IDEA

PROBLEM STATEMENT

Traditional career guidance often fails to offer personalized recommendations, leading to career dissatisfaction and missed opportunities. Students and professionals struggle to align their unique abilities and aspirations with suitable paths, exacerbated by rapid industry changes and a demand for specialized skills. Current methods are outdated, lacking real-time insights into job trends and emerging roles. This gap in tailored guidance results in unemployment, career mismatches, and skill gaps. Leveraging AI and data analytics can address these issues by providing dynamic, personalized career advice that adapts to evolving job markets.

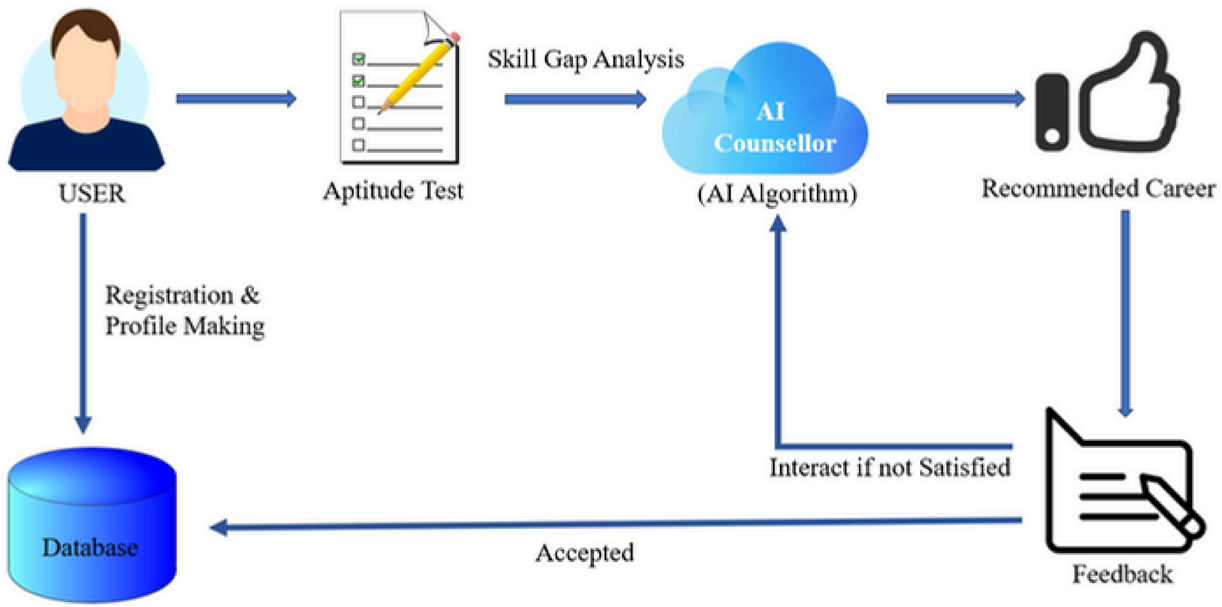

Fig. Detailed System Overview

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TECHNICAL APPROACH

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Technical Language

Python

- Backend Development
- AI Model Implementation
- NPL

JavaScript

- Frontend Development
- Handling User Interactions

HTML / CSS

- Building User Interface

SQL

- Database Management

Libraries

Frontend (User Interface)

- React.js

Backend (API & Server)

- Flask / Django

Data Processing & Preprocessing

- Scikit - Learn

Natural Language Processing

- SpaCy

Machine Learning Models & Algorithms

- Scikit - Learn

Algorithms

Career Prediction Models

- Logistic Regression
- Smart Vector Machines
- K- Means Clustering
- Neural Networks

Recommendation Systems

- Cosine Similarity
- Content Based Filtering

Data Preprocessing

- Min - Max Scaling
- Z - Score Normalization

NLP

- Tokenization, Lemmatization, Named Entity Recognition
- BERT

Salary Prediction

- Linear Regression
- Time Series Forecasting

Feedback Collection

- VADER / Text Blob

Personality Assessment

- BERT based Text Classification

FEASIBILITY AND VIABILITY

Analysis of Feasibility

- ***Technological Feasibility :*** AI, ML, NLP, APIs enable feasible career path matching technology.
- ***Market Feasibility :*** Strong demand for personalized career guidance and upskilling solutions, especially in the post-pandemic landscape.
- ***Economic Feasibility*** : Low-cost development via open-source AI, high ROI from users.

Potential Challenges and Risks

- ***Data Privacy :*** Managing sensitive user data (aptitude, personal history, career aspirations).
- **Algorithm Bias :** Risk of AI reinforcing societal biases in career recommendations.
- **User Engagement :** Ensuring users trust and actively engage with AI-based career guidance.
- **Scalability :** Handling large user bases without compromising performance.
- **Implementation Costs :** Upfront costs for training models and maintaining AI infrastructure

Strategies

- **Comprehensive data protection:** Strong encryption, anonymization ensure data security and GDPR compliance.
- **Fairness and objectivity:** Diverse datasets, regular audits ensure unbiased, fair AI model training.
- **Personalized experience:** Interactive interfaces, real-time feedback, personalized insights build trust, engagement.
- **Flexible infrastructure:** Cloud infrastructure scales with demand, ensures performance monitoring, optimization.
- **Phased approach:** Begin with MVP, scale gradually, seek partnerships for cost efficiency.

IMPACT AND BENEFITS

Potential Impact on Target Audience

- ***Student :*** Personalized guidance enhances strengths, fills skill gaps, boosts career confidence.
- ***Professionalas :*** *Real-time skill evaluation, reskilling guidance, predictive paths enhance transitions.*
- ***Employers :*** Talent alignment reduces recruitment costs, boosts retention, improves satisfaction.

Benefits of the Solution

- ***Social :*** Enhanced satisfaction, work-life balance, better access for underserved communities.
- ***Economic :*** Increased productivity, lower unemployment, reduced costs, boosts innovation, entrepreneurship.
- ***Environmental :*** Lower carbon footprint, sustainable careers, efficient training resource use.

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RESEARCH AND REFERENCES

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2)	Hossain Faruque, Sakir ; Akter Khushbu, Sharun ; Akter, Sharmin	A Natural Language Driven Career Prediction System for Computer Science and Software Engineering Students	ETASR	2024	https://ui.adsabs.harvard.edu/abs/2024arXiv240518139H/abstract
3)	Masurah Mohamad; Suraya Masrom; Ali Selamat	Student Career Recmmendation System Using Content Based Filtering Method	IEEE	2022	https://ieeexplore.ieee.org/abstract/document/9918766/
4)	H. Al-Dossari; F. A. Nughaymish; Z. Al-Qahtani; M. Alkahlifah; A. Alqahtani;	A Machine Learning Approach to Carrear Path Choice for Information Technology Graduates	ETASR	2020	http://etasr.com/index.php/ETASR/article/view/3821
5)	lakshmi prasanna; DR.D.Haritha;	Smart Career Guidance and Recommendation System	IJEDR	2019	http://etasr.com/index.php/ETASR/article/view/3821

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