Machine Learning based Student and Parents Companion application

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Abstract

India’s growing unemployment crisis, coupled with its rigorous education curriculum, presents a critical challenge: despite abundant talent and knowledge, many individuals struggle to translate academic learning into practical, job-ready skills. A significant disconnect exists between the education imparted in schools and colleges and the evolving demands of the workforce, leaving graduates underprepared for real-world career expectations.

Additionally, students completing their 10th grade often face uncertainty regarding subject selection, while parents encounter difficulties in researching suitable career paths for their children. Without adequate guidance, young learners risk making uninformed decisions that affect their academic and professional trajectories.

This project integrates advanced machine learning techniques to bridge these gaps, offering a comprehensive digital platform an application, software, or website that provides personalized educational insights, skill development recommendations, and career guidance. By leveraging AI-driven recommendations, real-time industry trends, and curated learning pathways, the platform empowers students and parents to make informed decisions, aligning education with practical job requirements and enhancing employability in a dynamic workforce.

1. Problem Statement

Challenges Faced by Parents:

In India, after students complete their 10th-grade education, parents especially those in smaller cities and villages struggle to guide their children in choosing the right academic stream. Due to limited exposure to various career paths and job markets, they often lack access to reliable information about trending skills and practical learning opportunities.

Challenges Faced by Local Small and Medium Businesses (SMBs):

Local SMBs face difficulties in finding skilled talent, as there is no streamlined platform connecting them with potential interns or trainees. This disconnect hinders businesses from accessing fresh talent while limiting students' exposure to practical work experiences.

Challenges Faced by Students (16+ and 18+):

- **Students aged 16+** often lack guidance on trending skills that align with their interests and career aspirations, making it hard for them to prepare for future job opportunities.
- Students aged 18+ struggle to acquire hands-on, practical knowledge related to the subjects they studied, leaving them underprepared for real-world professional demands.

Proposed Solution:

To bridge these gaps, I propose developing an integrated application that serves as a **career guidance and skill-building platform**. This solution will:

- **Assist parents** in making informed decisions about suitable academic streams for their children.
- **Provide students** (16+) with insights into trending skills that align with their interests and industry demands.
- **Help students** (18+) gain practical knowledge through internship opportunities and industry exposure.
- **Connect SMBs** with schools, colleges, and students, enabling businesses to access a talent pool while offering hands-on learning experiences.

By centralizing career guidance, skill development, and internship opportunities, this application will empower students, parents, and SMBs, fostering a more informed and job ready workforce.

2. Market and Customer Needs Assessment

2.1 Market Analysis

The current job and internship market is saturated with platforms catering primarily to college graduates and professionals seeking corporate employment. Hundreds of applications, such as LinkedIn, Indeed, and Internshala, serve as job-searching tools, but they primarily focus on connecting talent pools with large companies and established organizations.

However, these platforms overlook two key demographics:

- Parents and students aged 16+ who need career guidance but lack exposure to job markets, trending skills, and practical learning opportunities.
- Local SMBs that struggle to find young talent for apprenticeships, internships, and skill-based roles, as there is no dedicated platform connecting them with nearby students and educational institutions.

Market Gap & Opportunity

- While large corporations have well-defined hiring processes and access to recruitment platforms, small and medium businesses (SMBs) often operate in fragmented local ecosystems with limited outreach. They require skilled young individuals but lack direct access to students eager to acquire practical experience.
- On the other hand, parents and students aged 16+**,** especially in smaller cities and rural areas, face difficulty in choosing the right academic streams and acquiring market-relevant skills. Most educational guidance comes from informal sources, often lacking comprehensive and up-to-date career information.

No existing platform offers a unified solution that connects parents, students, local SMBs, and educational institutions in a structured way. This presents a high-value market opportunity where our application can:

- Guide parents and students (16+) in selecting suitable academic streams and identifying trending skills that match their interests.
- Offer internship and apprenticeship opportunities to students (18+) through direct SMB connections.
- Provide local businesses access to young talent, helping bridge the gap between education and employment.

By targeting untapped audiences and focusing on local business networks, our application stands out from traditional job search platforms. It creates a community-driven ecosystem where students, parents, schools, and SMBs can collaborate seamlessly, fostering practical skill development and career readiness for the next generation.

2.2 Customer Segmentation

Our application is designed to address critical gaps in career guidance, skill development, and talent acquisition, particularly in Tier 2 and Tier 3 cities where access to structured opportunities is limited. The primary target audience includes parents, students, small and medium businesses (SMBs), schools, and colleges, all of whom face unique challenges in navigating education and employment.

1. Parents (Career Guidance & Cost-Efficient Education)

- Many Indian parents invest heavily in private schools and colleges, often unaware that a better approach is skill acquisition after formal education rather than excessive spending on initial schooling.
- Due to a lack of exposure, parents in smaller cities struggle to choose the right academic stream for their children.
- Our app can provide affordable alternatives, guiding parents on the importance of practical skills and trending career paths through regionally relevant information in multiple languages to ensure accessibility.

2. Students (Skill Development & Internship Opportunities)

- **16+ Students (Career Research & Exposure):**
    - Often first-generation learners in their families, these students need clear guidance on available career paths and skills trending in the job market.
    - Our platform will provide structured career exploration, helping students research skills and connect directly with SMBs and corporate internship opportunities.
- **18+ Students (Practical Learning & Job Readiness):**
    - Indian education focuses heavily on theoretical knowledge, but students lack hands-on experience in real-world applications.
    - The app will facilitate internships and apprenticeships, ensuring they can apply their knowledge in practical settings and gain industry insights.

3. SMBs (Talent Acquisition & Local Hiring)

- Small and medium businesses struggle to find skilled talent, often losing out to large corporations with better hiring pipelines.
- Unlike traditional job platforms that cater to corporate hiring, our app will directly connect SMBs with schools and colleges, allowing them to offer internships and job opportunities to students before they graduate.
- This initiative not only helps SMBs access a skilled workforce, but also strengthens local economies by retaining talent within smaller cities.

4. Schools & Colleges (Industry Collaboration & Practical Learning)

- Educational institutions primarily provide theoretical knowledge, leaving students unprepared for industry-specific demands.
- Our platform will act as a bridge between schools, colleges, and businesses, enabling collaborations for internships, workshops, and industry exposure.
- This partnership-driven approach will create a stronger learning ecosystem, ensuring students graduate with both academic credentials and market-relevant skills.

Conclusion

Unlike existing career guidance or job-searching apps that primarily focus on corporate hiring, our solution targets an overlooked yet critical segment: parents and 16+ students, alongside local SMBs, schools, and colleges. By creating a regionalized, skill-oriented, and internship-driven ecosystem, we can empower students with career clarity, help parents make informed educational decisions, and enable SMBs to access fresh, skilled talent, fostering a sustainable employment model in India's smaller cities.

3. Target Specification

3.1 Core Functionality and Design

User-Friendly Interface:

- Intuitive UI/UX design ensuring smooth navigation and accessibility.
- Multilingual support with an auto-detect language feature for personalized experiences.
- Multilingual Translation: Use mBART (a multilingual sequence-to-sequence model) for regional language support.
- Dynamic profiles for students, parents, and educators, incorporating marks, interests, skills, goals, and learning patterns.
- Profile Matching: K-Means Clustering to group students based on marks, interests, and skills for personalized insights.
- Adaptive interface based on user preferences, device compatibility, and accessibility needs (e.g., voice assistance, screen reader support).

Search Engine:

- Integrating SearXNG, an open-source meta-search engine, while enhancing its ranking algorithm to prioritize education and career-related queries.
- Smart filtering to refine searches based on academic level, skills, and aspirations.
- Search Enhancement: Use BM25 (Okapi) for ranking search results efficiently.
- Personalized search recommendations powered by AI-driven analytics.
- Keyword Expansion: Apply TF-IDF to improve relevance by suggesting related terms.
- Data visualization & insights for institutions—trends on student preferences, in-demand skills, and industry requirements.

CNN Model (Document Scanner):

- AI-powered OCR (Open-source optical Character Recognition) integrated into the image scanner for accurate document digitization.
- Auto-categorization of scanned documents into relevant profile sections (transcripts, certifications, skill assessments).
- Handwriting recognition for older or non-digital records.
- Handwriting Recognition: Implement CRNN (Convolutional Recurrent Neural Network) for handwritten notes.
- Security features like encrypted document storage & verification

Recommendation System Model:

- AI-driven career roadmap generator, suggesting education paths, internships, scholarships, and job opportunities.
- Skill assessment engine based on coursework, projects, and extracurricular activities.
- Continuous learning recommendations, suggesting relevant courses or skill improvement programs.
- Parent & mentor advisory system, offering progress insights and next steps based on student trajectories.

- Course & Job Matching: Use Collaborative Filtering (Surprise Library – SVD Model) to recommend education paths and internships.
- Skill Assessment: Apply Random Forest Classifier to analyse student progress and suggest relevant courses.

Additional Features:

- Gamification & engagement tools (progress tracking, badges, leaderboards).
- Learning Path Generator: Implement Decision Trees for easy interpretation of study/career progression.
- Mentorship & networking platform to connect students with professionals.
- Student-Mentor Matching: Use Graph-based Neural Networks for personalized mentorship recommendations.
- AI-assisted college application builder with automated suggestions based on academic profile and interests.
- College Application Assistant: Use BERT-based embeddings for refining essays and recommendation letters.
- Collaborative learning feature where students can share insights, projects, and study materials.

3.2 Performance Requirements

Speed & Efficiency

- The search engine must return results within milliseconds, ensuring a seamless user experience.
- Matching algorithms should operate with low latency, generating real-time education, internship, and career recommendations without delays.
- Implement efficient caching & indexing techniques to optimize response times.

Reliability & Uptime

- Ensure 99.9% uptime, supported by redundant infrastructure and auto-recovery mechanisms to maintain uninterrupted platform availability.
- Implement failover systems and load balancing to prevent downtime due to system overloads or technical failures.
- Conduct regular performance audits and predictive maintenance to proactively address potential issues.

Scalability

- The platform must scale horizontally to accommodate a growing user base without compromising speed or responsiveness.
- Ensure elastic computing capabilities, allowing dynamic resource allocation based on demand spikes.
- Implement cloud-based serverless architecture or containerized deployment (e.g., Kubernetes) for efficient scalability.

Quality of Recommendations

- AI-driven recommendation models must maintain high precision & recall, ensuring relevance to industry trends and individual user profiles.
- Conduct continuous model fine-tuning, incorporating real-time feedback loops for better personalization.
- Establish transparency in recommendations, offering users insights into why specific results were suggested.
- Ensure bias-free recommendations, addressing fairness in career and education paths for diverse user needs.

4. External search

Developing advanced machine learning models from scratch can be complex and resource-intensive. Instead, leveraging pre-trained models and fine-tuning them through transfer learning allows for more efficient adaptation to our specific use case.

For our student and parent companion application, we can integrate open-source deep learning models along with robust collaborative filtering, K-Nearest Neighbors (KNN), and other machine learning techniques to power our recommendation engine.

Key Libraries & Model Selection

We will utilize existing open-source ML libraries to streamline development:

- Surprise Library – Provides optimized implementations of collaborative filtering models (KNN Basic, KNN Baseline) for personalized recommendations.
- Implicit Library – Implements matrix factorization techniques (Bayesian Personalized Ranking) ideal for internship and course suggestions.
- LightFM – Combines content-based and collaborative filtering methods, offering a balance between accuracy and scalability for education path recommendations.
- Scikit-learn – Used for simpler ML models such as KNN classification, decision trees, and random forests, enabling flexible predictive analytics.

Advantages of Using Pre-trained Models

- Efficiency – Avoids reinventing the wheel, reducing development complexity.
- Customization – Fine-tune existing models using transfer learning to adapt them to our dataset.
- Scalability – Open-source implementations ensure adaptability across diverse user bases.
- Community Support – Leverages well-maintained libraries with extensive documentation and updates.

By integrating these existing models and libraries, we can enhance recommendation accuracy and ensure optimal user experience with minimal computational overhead.

4.1 Benchmarking

In our model, we conducted an extensive external search to understand the landscape of job recommending applications and related services. This search included:

1. Analysis of existing platforms

Understanding the strengths and functionalities of existing job and professional networking platforms helps refine the unique value of our proposed application.

1. Naukri.com

- One of India's largest job portals, offering personalized job recommendations based on user resumes.
- Features resume scoring and optimization tools to enhance applicant visibility.
- Provides a salary insights feature, helping users compare compensation trends.

2. LinkedIn

- A global professional networking platform connecting job seekers, employers, and industry experts.
- Offers profile-based job recommendations and skill endorsements.
- Serves as a hub for industry news, discussions, and mentorship opportunities.

3. Indeed

- A comprehensive job search engine, allowing job seekers to apply directly.
- Employers can post job listings, manage applications, and assess candidates.
- Integrates company reviews and salary estimates, aiding in job selection.

4. Internshala

- Primarily focused on internships and entry-level job opportunities for students.
- Offers certified skill development courses to enhance employability.
- Features internship rankings and employer reviews to help users find quality opportunities.

Key Takeaways for Our Platform

- Most existing platforms focus on job matching, while gaps remain in career guidance, skill development, and educational alignment.
- Our platform can differentiate by bridging education with employment, offering AI-driven career recommendations, mentorship, and real-time learning insights.
- Enhancing personalized search capabilities and integrating student-parent decision support tools will set our solution apart.

4.2. Exploration of ML models and deep learning models

To create an AI-driven student and parent companion application, we integrate machine learning (ML) and deep learning (DL) models to enhance personalized recommendations, search functionality, and document processing.

1. Collaborative Filtering Model

- Utilized for recommendation systems, particularly in job and internship matching.
- Inspired by models used in social networking and matchmaking platforms to predict relevant career opportunities based on user preferences and interactions.
- Implemented using Surprise Library (SVD, KNN Baseline) or Implicit (ALS, BPR) for improved personalization.

2. mBART-50 Model (Multilingual Translation)

- A pre-trained multilingual sequence-to-sequence model that supports major Indian languages (Hindi, Gujarati, Bengali, Marathi, Malayalam, Tamil, Telugu).
- Enables dynamic language adaptation across regional users, ensuring accessibility for students and parents.
- Fine-tuneable for context-aware translation of career guidance materials and platform communication.

3. K-Means Clustering Model (Profile Matching)

- Groups students based on academic performance, interests, and skills, offering personalized education paths.
- Alternatives such as Spectral Clustering or DBSCAN can be explored for handling high-dimensional data.
- Enhances career guidance by segmenting users into clusters, aligning their strengths with suitable job markets.

4. SearXNG (Open-Source Metasearch Engine)

- Aggregates query searches from multiple sources, providing refined results on career paths, internships, and skill development resources.
- Can be customized to prioritize education and employment-related queries over generic search results.
- Utilizes BM25 ranking and TF-IDF keyword expansion for optimized search experiences.

5. Random Forest Classifier Model (Student Progress Analysis)

- Evaluates student progress and provides course recommendations based on past academic performance and engagement trends.
- Offers high interpretability, enabling easy visualization of career trajectories and learning patterns.
- Alternative models such as XGBoost can be considered for enhanced predictive accuracy.

6. CNN Model (Document Recognition & OCR)

- Implements Convolutional Neural Networks (CNNs) for efficient document digitization and classification.
- Integrates Tesseract OCR or CRAFT for text extraction from scanned academic records and certificates.
- Enhances handwriting recognition using CRNN (Convolutional Recurrent Neural Network) for processing non-digital transcripts.

4.3. Safety and security Features:

1. Search Engine Data Protection

- Integration of SearXNG, an open-source meta-search engine, ensures privacy-focused searches without user tracking or profiling.
- Child Lock System for students under 18 years, restricting access to inappropriate or non-educational content.
- AI-based content filtering using Natural Language Processing (NLP) to block unsafe search results and flag harmful content.

2. Document Security & Encryption

- End-to-End Encryption (E2EE) ensures secure document uploads, protecting academic results and personal information from unauthorized access.
- Secure Hashing & Authentication (SHA-256) for password-protected document access, ensuring verified user interactions.
- Role-Based Access Control (RBAC) so that only authorized users (students, parents, and mentors) can view and edit documents.
- Cloud Backup with Zero-Knowledge Encryption ensures safe storage while preventing service providers from accessing user data.

3. Platform Safety & User Identity Protection

- Two-Factor Authentication (2FA) for login verification to prevent unauthorized account access.
- Anonymous Mode for users who prefer privacy when browsing education and career-related content.
- Fraud & Spam Detection Algorithms leveraging Machine Learning to detect fake profiles, misleading job postings, and phishing attempts.
- Activity Monitoring & Alerts to notify users of suspicious login attempts or unauthorized changes to their profiles.

4.4. Integration with schools, colleges and SMBs:

Building a strong educational-employment ecosystem requires strategic collaboration between schools, colleges, SMBs, and large enterprises to create internship opportunities, career pathways, and real-world learning experiences.

1. Connecting Schools and Colleges to SMBs

- Establish partnerships with local SMBs to provide internships, apprenticeships, and project-based learning opportunities.
- Work with educational institutions to integrate internship programs directly into their curriculum, ensuring students gain hands-on industry experience alongside academic learning.
- Develop a structured internship framework, outlining expectations for mentorship, skill-building, and real-world application.
- Introduce AI-powered internship matching, using student profiles, academic performance, and interests to recommend relevant SMBs for engagement.

2. Connecting Parents with SMBs

- Utilize parental assessments to align internship recommendations with students' strengths, interests, and career aspirations.
- Provide interactive career workshops, allowing parents to engage with SMBs and understand emerging job market trends.
- Implement a parent-student advisory system, offering real-time insights on skill gaps, internship opportunities, and career development.
- Ensure data-driven internship recommendations by integrating machine learning models to map student preferences to industry demands.

3. Connecting 18+ Students with Large Companies and SMBs

- Develop APIs for job recommendation platforms (such as LinkedIn, Naukri, Indeed, Internshala) to enhance student access to industry-specific job openings and internships.
- Enable direct SMB-student interactions through networking events, virtual mentorship sessions, and industry-driven seminars.
- Design an AI-powered job placement engine, analysing student qualifications, employer preferences, and job trends to streamline recruitment.
- Foster collaboration between enterprises and universities, creating company-sponsored skill development programs tailored to industry-specific needs

5.Constraints and Regulations

1. Data privacy and security

Ensuring compliance with India's data protection laws is critical to safeguarding user privacy, personal data, and sensitive information within the platform.

Applicable Regulations:

Information Technology (IT) Act, 2000 & IT (Amendment) Act, 2008:

- Governs digital transactions, cybersecurity, and sensitive personal data (SPDI) handling.
- Requires companies dealing with SPDI to implement and maintain reasonable security practices, protecting user data from breaches.
- Defines penalties for cyber fraud, unauthorized data access, and privacy violations.

Personal Data Protection Bill (PDPB), 2019 (Pending enactment):

- Aims to establish a comprehensive data protection framework for India.
- Grants users the right to access, correct, and delete personal data stored by service providers.
- Mandates data localization, requiring certain categories of personal data to be stored within Indian servers.

Digital **Personal Data Protection Act (DPDP), 2023** *(Expected to replace PDPB once enacted):*

- Introduces stringent consent mechanisms, ensuring that users have control over how their data is collected and used.
- Requires explicit consent for sensitive personal data processing, reinforcing privacy rights.
- Defines accountability measures for businesses, including reporting data breaches to authorities.

2. Age Restrictions:

Ensuring compliance with age restrictions is crucial for job search platforms and online services, particularly when handling educational guidance, internships, and employment opportunities.

Age Verification & Identity Confirmation

- Implement secure age verification systems using government-issued ID validation or digital authentication methods.
- Utilize AI-driven identity checks to prevent fraudulent registrations and ensure compliance with legal hiring age requirements.

Age-Based Access Controls

- Under 16: Limited access to general career guidance, skill-building resources, and educational recommendations.
- 16–18: Internship and apprenticeship opportunities with strict parental consent requirements.
- 18+ Users: Full access to job search, career pathways, and employment-related features.

Compliance with Legal Frameworks

- Adhere to India's Child Labor (Prohibition & Regulation) Act, 1986, ensuring internship roles for students comply with labour laws.
- Align with IT Act, 2000 provisions for safe digital experiences for minors.
- Ensure GDPR & Digital Personal Data Protection (DPDP) Act compliance for international users.

3. Payment Processing:

- PCI-DSS (Payment Card Industry Data Security Standard) Compliance: Secure handling, encryption, and storage of payment data.
- **Safe Transactions:** Tokenization, two-factor authentication (2FA), and encrypted payments.
- **Fraud Prevention:** AI-powered fraud detection, real-time monitoring, and risk alerts.

6.Monetization Strategies for a parent and students companion app:

1. Subscription-Based Model (Freemium Approach)

- First-time users: Enjoy a 10-day free trial with access to selected premium features to experience the full potential of the app.

Basic features (free for under-18 students):

- Verify school ID to create a profile and explore basic career suggestions tailored to their interests.
- Access to an AI-powered search engine for educational queries and career guidance.

Premium Features (Monthly or Yearly Subscription):

- Exclusive course deals with local SMB institutes offering discounts for certified programs.
- Personalized career counselling with experts in various fields for deeper insights.
- Priority customer support for a seamless and enhanced user experience.

2. In-App Purchases & Microtransactions

- One-time purchases for specialized career assessments, personality tests, resume-building tools, or mock interviews with professionals.
- Paid skill-enhancement modules that complement school education (coding, finance literacy, design, etc.)

3. Advertisements & Sponsored Content

- Partner with universities, ed-tech brands, and career platforms for non-intrusive, relevant ads.
- Sponsored scholarships, internship offers, and student development programs from reputed organizations.

4. Affiliate & Partnership Programs

- Collaborate with online certification providers, bookstores, and skill-learning platforms for commission-based referrals.
- Tie-up with software vendors and student-friendly services for exclusive discounts and shared revenue.

5. Institutional & Corporate Bulk Plans

- Schools, universities, and educational bodies can purchase bulk subscriptions for their students.
- Corporate-sponsored career development workshops for students looking for internships or entry-level jobs.

6. Events & Community-Based Monetization

- Virtual networking events with professionals, charged premium seats for live Q&A sessions.
- Subscription-based masterclasses from top educators and industry experts.

By combining subscription**,** affiliate marketing**,** and **engagement-driven revenue streams**, the app can maximize accessibility while sustaining profitability.

7.Final Product Prototype:

The Parent and Student Companion Application is designed to bridge the gap between education and the job market, ensuring students align their academic knowledge and interests with real-world career opportunities. The platform aims to make Indian education more practical and job-seeking less daunting through AI-driven insights and personalized recommendations.

Key Features:

1. User Profile Creation

Comprehensive Profile Setup: Users can create detailed profiles including:

- Academic Performance: Marks per subject, coursework, learning preferences.
- Skill Mapping: Past experience, self-assessments, certifications.
- Project Showcase: Upload personal projects, research work, and extracurricular activities.
- Career Interests: Users can define long-term career aspirations, preferred industries, and educational pathways.
- Government ID & Document Upload: Secure submission of academic results, certificates, and verified credentials.

2. Smart Career & Education Matching

- AI-driven career pathway recommendations based on student interests and learning patterns.
- Internship matching system connects students with SMBs and corporate opportunities.
- Skill-gap analysis suggests personalized upskilling programs aligned with industry demands.

3. Multilingual & Inclusive User Experience

- mBART-powered multilingual translation, ensuring accessibility across multiple Indian languages.
- Adaptive UI supporting regional content, accessibility features (voice input, screen readers), and parent-friendly guidance dashboards.

4. AI-Powered Search Engine & Learning Resources

- SearXNG-based search engine delivers career insights, job postings, educational opportunities, and relevant study materials.
- Smart query optimization ranks educational and employment resources based on user preferences.

5. Secure & Encrypted Document Management

- End-to-End Encryption (E2EE) ensures secure document uploads.
- Role-Based Access Control (RBAC) restricts unauthorized access, ensuring privacy for students and parents.
- Automated document categorization for transcripts, certifications, and college applications using OCR & CNN models.

6. Recommendation Engine for Skill Development

- Collaborative filtering models (Surprise, Implicit, LightFM) suggest personalized courses, workshops, and job openings.
- Industry trend mapping ensures users receive recommendations that match current market demands.
- Real-time progress tracking helps students refine their learning paths effectively.

7. Interactive Mentorship & Community Engagement

- Student-Mentor matching algorithm connects students with industry professionals based on shared interests.
- Community forums for peer-to-peer learning, project collaborations, and career advice.
- Parent advisory panel providing structured career insights based on industry-relevant data.

8. Integrated Payment & Subscription Model

- PCI-DSS compliant payment processing, ensuring secure transactions for premium features, certification courses, and mentorship programs.
- Freemium model with access to core features, while advanced insights and tailored counselling can be accessed through premium plans.

App Flow:

1. User Registration & Profile Setup

- Sign-up/Login: Users register via email, phone number, or government ID verification.
- Profile Creation: Students and parents input academic details, career interests, skills, and achievements.
- Document Upload: Users securely upload certificates, transcripts, and identity documents.

2. AI-Powered Career & Education Guidance

- Interest & Skill Assessment: The system analyses academic performance and interests.
- Career Pathway Suggestions: AI recommends education tracks, internships, and jobs.
- Parental Advisory System: Parents receive insights on guiding students based on industry trends.

3. Search Engine & Learning Resources

- SearXNG-powered search engine provides information on careers, colleges, scholarships, and skill development courses.
- Smart Filters & Query Ranking optimize search results based on user profile preferences.

4. Internship & Job Matching

- Internship Database: Students access local SMB and enterprise internship programs.
- Job Portal Integration: API-based connection to platforms like LinkedIn, Naukri, and Indeed.
- Employer Connections: Companies can directly post opportunities and mentor students.

5. Document Recognition & Skill Verification

- OCR & CNN models extract information from academic records and certifications.
- Automated Document Sorting ensures transcripts and credentials are organized securely.

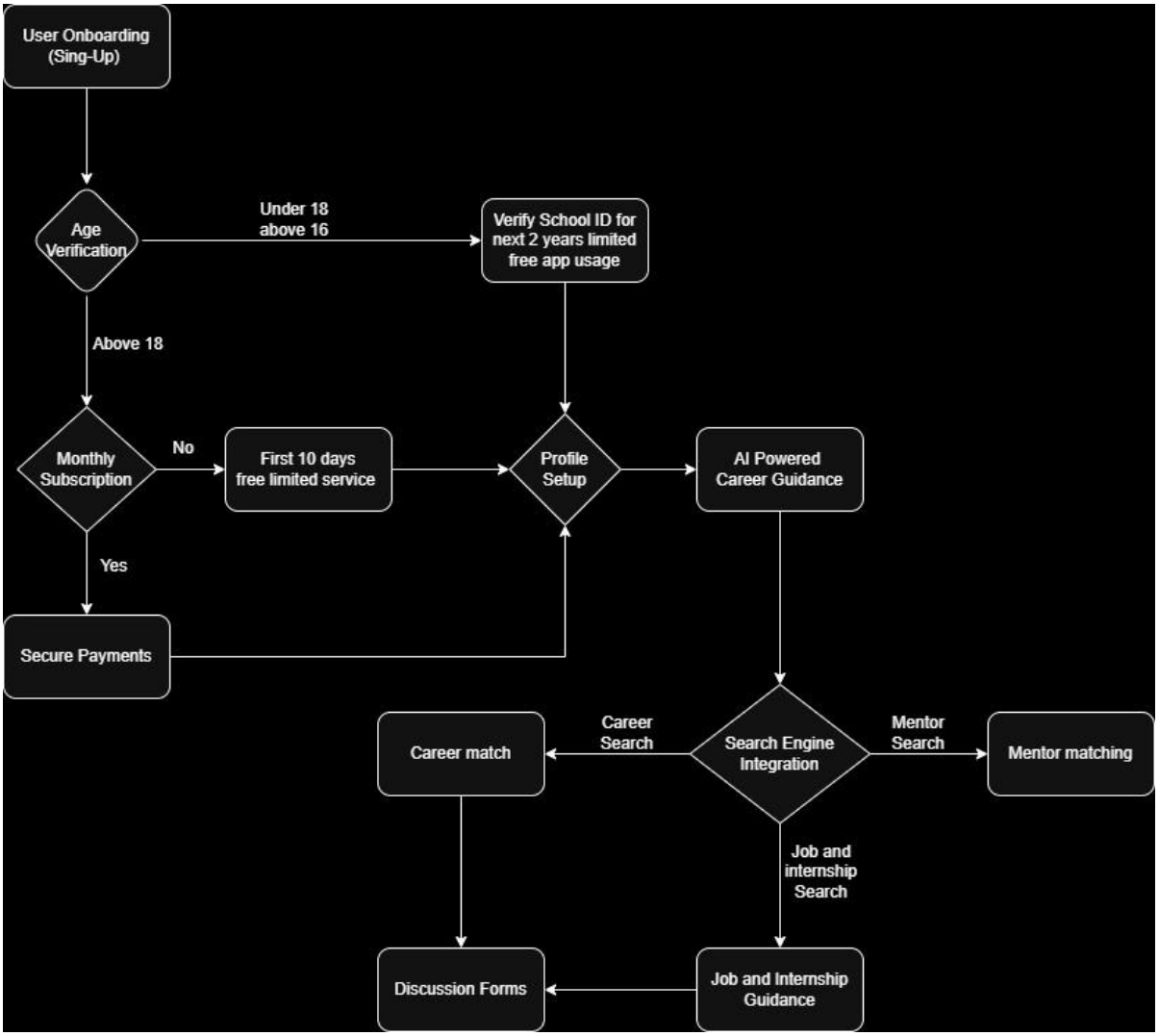
6. Mentorship & Community Engagement

- Student-Mentor Matching: AI suggests mentors based on career alignment.
- Discussion Forums & Peer Learning: Students and parents share insights.

7. Secure & Compliant Payment Processing

- PCI-DSS compliant payments for career counselling, certification courses, and mentorship programs.
- Freemium model: Basic features are free, while premium services offer advanced career insights.

App Flow Diagram:



8. Conclusion

The Parent and Student Companion App is designed to bridge the gap between academic learning and real-world skill development, making Indian education more practical and career-oriented. Traditionally, students struggle to find a career path post-schooling due to a lack of exposure to industry demands. Many make choices based on peer influence rather than informed decisions, leading to misaligned career trajectories.

This app revolutionizes the way students prepare for the job market, offering internships, mentorships, and AI-driven career guidance tailored to their interests and academic strengths. Unlike existing solutions, it uniquely involves parents in early career planning, ensuring students receive structured support and exposure to industry-relevant skills.

By targeting foundational education gaps and practical learning, the app transforms job-seeking into an informed, confident process, reducing uncertainty and helping students step into careers with the right experience and expertise.