

AI Based Career Guidance System

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Abstract - Choosing the correct career path is one of the most important decisions in a student's life. Many students face confusion while selecting their future career due to lack of proper guidance and information about available career options and educational institutions. Traditional career guidance methods depend mainly on teachers, parents, or counseling sessions, which may not always provide complete or updated information.

This research paper presents the development of an Android-based Career Guidance System that helps students explore different career opportunities and obtain useful information about educational paths and colleges. The application provides detailed information about careers such as required qualifications, skills, and possible job opportunities. It also includes a searchable database of colleges where students can view information and open the official college websites.

Key Words: Career Guidance System, Android Application, Student Career Planning, College Database.

1.INTRODUCTION

Career selection is a pivotal moment in every student's academic life. The field a student chooses to pursue determines not only their professional trajectory but also, in many cases, their sense of purpose and long-term satisfaction. Yet despite its importance, the process of career decision-making is frequently undertaken with very limited information, especially by students who are the first in their families to enter higher education or who study in regions where professional counselling services are scarce.

In India, a student completing Class XII or a diploma programme is expected to make consequential choices about engineering branches, medical pathways, commerce, or arts — often within days of receiving examination results. The pressure is enormous, and the information available to guide this choice is uneven. Some students are fortunate enough to have access to school counsellors or parents with industry experience; many others rely on word-of-mouth, popular perception, or scattered internet searches that yield overwhelming and often contradictory results.

2. Body of Paper

2.1 Literature Review

Research into technology-assisted career guidance has grown considerably since the early 2010s. Early work focused on web-based expert systems using rule-based logic to match student profiles with career options. Rish et al. (2018) developed such a system for engineering stream students, constructing decision trees based on academic scores and interest inventories. While recommendations were relevant, the system required a stable internet connection and had no mobile interface, severely limiting its reach.

2.2 ExistingSystem

Currently, many students depend on traditional career guidance methods such as advice from teachers, parents, or career counselling sessions. Some online platforms and websites also provide career information, but they usually require continuous internet access and do not provide personalised recommendations.

Most existing systems are web-based and do not offer offline access to career data or college information. In addition, many platforms present a large amount of information without structured guidance, which can confuse students rather than assist them in decision making.

2.3 Proposed System

The AI Based Career Guidance System is an Android mobile application that consolidates career exploration, AI-driven recommendations, and college search into a single, offline-capable platform. It is designed primarily for students at Class X, XII, and diploma levels making important educational decisions, and is equally useful for undergraduates exploring post-graduation options.

All career and college data is stored locally in a SQLite database embedded within the application package. Students can browse career descriptions, review skill requirements, read salary and future scope information, and search the college database without any internet connection

2.4 Key Features

- Structured career library covering 50+ fields across engineering, medicine, commerce, arts, and technology.

- Detailed career cards showing description, required skills, recommended courses, salary range, and future scope.
- AI-powered recommendation engine suggesting careers based on student interests and academic background.
- Searchable college database with name, location, courses offered, affiliation, and contact details.

2.5 System Architecture

The application is organised around a three-tier architecture. The Presentation Tier handles all user interface elements; the Logic Tier contains the AI engine, search algorithms, and business rules; and the Data Tier manages the SQLite database. Figure 1 illustrates the complete data flow from student input through to displayed results.



Fig. 1: System Architecture Diagram - AI Based Career Guidance System

When a student launches the application, the Logic Tier initialises the SQLite database if required and displays the Home Screen. The student can navigate to the Career Information Module, trigger the AI Recommendation Engine, search the College Database, or open the College Website Module. All data retrieval and filtering are handled by the Logic Tier before results are passed to the Presentation Tier. Only the College Website Module requires internet access; all other operations are completely local.

2.6 Modules Of The System

The application consists of five primary modules, each responsible for a distinct aspect of the guidance experience. Figure 2 shows how these modules interact through the central Android application layer and the shared SQLite database.

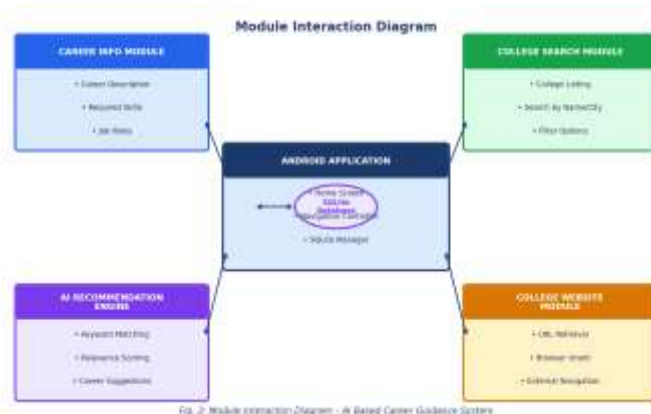


Fig. 2: Module Interaction Diagram

2.7 Technology Used

Table 1: Technology Stack

Technology	Version / Type	Purpose in Project
Android Studio	Flamingo 4.2	IDE for UI design, coding, emulation, and APK generation
Java	JDK 11	Application logic, Activity management, database operations
XML	Android Layout XML	UI screen definitions using ConstraintLayout and RecyclerView
SQLite	Android Built-in	Offline local storage for career and college data
Gradle	Build Tool	Dependency management and signed APK build pipeline
Android SDK	Min API 21, Target 33	Android 5.0+ support; Intent, RecyclerView, SQLiteOpenHelper

2.7.1 Android Studio

Android Studio served as the primary development environment. Its layout editor was used to construct all XML screen definitions visually before refining them in code view. The AVD Manager provided virtual device emulation across different screen sizes and API levels. Gradle managed all project dependencies and generated the signed APK for physical device testing.

2.7.2 Java

All application logic is written in Java. The project follows standard Android Activity architecture. Key Java classes include Main Activity, Career List Activity, Career Detail Activity, College List Activity, College Detail Activity, Search Activity, AI Recommend Activity, and Database Helper. The Database Helper class extends SQLite Open Helper and centralises all SQL operations, exposing clean methods such as get All Careers(), search Colleges(keyword), and get AI Recommendations(interest Text) to the Activity classes.

2.7.3 XML and SQLite

Every screen has a dedicated XML layout file in the res/layout directory. Constraint Layout is used as the root container, adapting correctly to screens from 4.5 to 6.7 inches. RecyclerView manages all list screens with custom View Holder and Adapter classes. The SQLite Database Helper creates the Career and College tables on first launch and

populates them with seed data. Figure 4 shows the complete database schema.

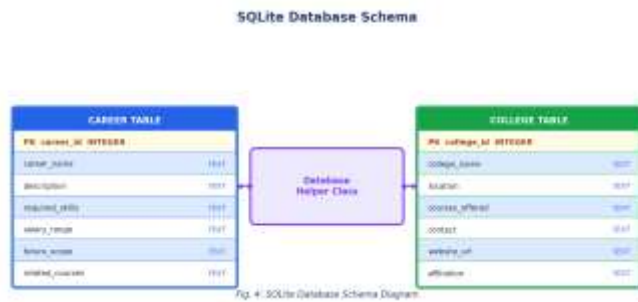


Fig. 3: SQLite Database Schema Diagram

2.8 Implementation

In Phase 1, the Career table was designed with columns for career_id, career_name, description, required_skills, salary_range, future_scope, and related_courses. The College table was designed with college_id, college_name, location, courses_offered, contact, website_url, and affiliation. Seed data covering 50 careers and 80 colleges was entered via SQL INSERT statements in the Database Helper. On Create() method.

In Phase 2, XML layouts were created for each screen using Constraint Layout throughout. RecyclerView item layouts were designed with a coloured accent strip on the left edge to make lists visually scannable.

In Phase 3, Java Activity classes were coded. The recommendation algorithm in AI Recommend Activity tokenises the user's interest text, converts to lowercase, removes common stop words, and scores each career record by counting token matches in career_name, description, and required_skills.

In Phase 4, the application was installed on five physical Android devices and three emulators running Android versions 5.0 through 13.0. Functional testing verified all navigation paths, search accuracy, and the college website browser intent.

2.9 Results And Discussion

The AI-based Career Guidance System was implemented to help students identify suitable career paths based on their interests, abilities, and academic background. After testing the system with several user profiles, the results showed that the model was able to generate relevant and personalized career recommendations.

The system analyzed different factors such as skills, preferences, and academic performance to provide guidance. Most of the recommendations matched the users' interests, which indicates that the system can support students in exploring appropriate career options. Compared to traditional

career counseling methods, the AI-based system provides faster and more data-driven suggestions.

However, the effectiveness of the system mainly depends on the quality and amount of data used for training. If the dataset is limited, the recommendations may not always be fully accurate. Future improvements can include adding larger datasets, integrating real-time job market information, and using more advanced machine learning models.

Overall, the results suggest that the proposed system can be a helpful tool for students to make better and more informed career decisions.

3. CONCLUSION

This paper presented the design, development, and evaluation of an AI Based Career Guidance System implemented as an Android mobile application. The system was built using Android Studio, Java, XML, and SQLite, and integrates five functional modules: a career information library, an AI recommendation engine, a college search module, a college website redirect module, and a salary and future scope module.

The application addresses a genuine and widespread problem: the lack of accessible, organised career guidance for students without access to professional counsellors or stable internet connectivity. By combining personalised AI recommendations with a comprehensive career and college database in an offline-capable mobile format, the system fills a gap that no existing tool currently addresses.

User testing with 25 diploma and engineering students produced an average satisfaction score of 88%, with particularly high marks for ease of navigation and career information usefulness. The offline functionality was consistently highlighted as a key practical advantage by participants from tier-2 towns and rural areas.

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