

# Career Guidance System

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## Step 1: Prototype Selection Abstract

### - ABSTRACT:

Career choice has a pivotal role in college students' life planning. In today's world choosing the right career is the toughest decision. Today many students are confused about their future. They do possess some skills but they are not able to identify their abilities and a proper domain. Different people suggest different career options but at last, the student has to select their career. In this project, we have focused on this problem of the student using machine learning. With the help of machine learning, we will help the student to decide which is the best career option and domain for them using different machine learning techniques. This project will help the student to get directed towards a specific domain as per their skills.

### - Problem statement:

Most of the students do not get the proper guidance or are not very clear about what they would like to pursue in their life in terms of their careers.

Our proposed system takes inputs from students, which will process it and gives two job fields. We will be using various ML models for classification and prediction. We want the student not to get confused between so many fields. This model makes it easy for the student by recommending two fields that are most suitable for them based on their input.

## - Introduction:

Career guidance can be described as a process through which students become familiar with various career options, job opportunities and are prepared for those opportunities. Career counselling is the approach that will allow the student to understand his options, find his best skills and get acquainted with the world of work in order to make choices about employment, education and life.

Competition in today's society is heavily multiplying day by day. It is too hard in the present day to face the technical world. So as to compete and reach the goal of students, they need to be planned and organized from the initial and final stages of their education. Hence, it is important to perpetually assess their performance, establish their interests and assess how close they're to their goal and assess whether or not they are within the right path that directs towards their target. This helps them in improving themselves, motivating themselves to a better career path if their capabilities are not up to the mark to reach their goal and pre evaluate themselves before going to the career peak point. Not only that, recruiters while recruiting people into their companies evaluate candidates on different parameters and draw a final conclusion to select an employee or not and if selected, finds a relevant stream and career area to student. There are many types of roles like Database administrator, Business Process Analyst, Developer, Testing Manager, Networks Manager, Data scientist and so on. All these roles require some prerequisite knowledge in them to be placed in them. So, recruiters analyze candidates' performance in skills, talents and interests and place the candidate in the right job role suited for them. These kinds of prediction systems make their recruitment tasks very easy because as the inputs are given, recommendation is done based on inputs. Though, the career counselors may assist the students many times it would be difficult for them to completely understand the inclination of the students, academics and thus the counseling process may be limited. Also, not all students would be privileged to avail of such facilities. Globally there are some attempts in this area, but we need to work on this area for our students. To tackle this problem, we will be using machine learning technique named Decision Tree.

## **- Market Analysis:**

The career counselling market is on the cusp of a revolution, driven by the increasing demand for personalized, data-driven, and accessible career guidance. Our Career Counsellor App, powered by machine learning (ML), aims to capitalize on this trend by providing a cutting-edge, AI-driven platform that connects individuals with certified career counsellors. This assessment highlights the market need for such an app, identifying key gaps and opportunities in the current market.

**Growing Demand for Personalized Career Guidance:** The modern job market's complexity, with rapidly evolving technologies and industries, has created a high demand for personalized career counselling services. Individuals are seeking tailored guidance on navigating changing job roles, acquiring new skills, and exploring emerging fields.

**Limited Access to Quality Counselling:** Many regions, particularly rural areas and underserved communities, lack access to professional, high-quality career counselling services. This creates a significant opportunity for a digital solution that can bridge this gap.

**Increasing Adoption of AI-powered Solutions:** The COVID-19 pandemic has accelerated the adoption of AI-powered solutions for career development, with individuals seeking data-driven insights and personalized recommendations to support their career growth.

**Shortage of Specialized Counselling Services:** There is a shortage of specialized career counselling services that cater to emerging fields, such as AI, data science, and sustainability, as well as non-traditional career paths in the creative industries, technology, and the gig economy.

## **- Market Opportunity:**

Our Career Counsellor App, powered by machine learning, is poised to capitalize on the growing demand for personalized, data-driven career guidance, addressing the following market gaps:

**Personalization:** Leveraging ML to provide tailored career recommendations and guidance based on individual strengths, interests, and career aspirations.

**Accessibility:** Offering high-quality career counselling services to underserved communities and rural areas through a user-friendly, mobile-first platform.

**Specialization:** Providing specialized counselling services for emerging fields and non-traditional career paths, leveraging ML to stay up-to-date with industry trends and job market demands.

**Human Touch:** Combining AI-driven insights with human expertise, ensuring that individuals receive comprehensive, empathetic, and actionable career guidance.

**Specialized Counselling Services:** Offering specialized counselling services for emerging fields and non-traditional career paths.

By leveraging machine learning and human expertise, our Career Counsellor App is poised to revolutionize the career counselling market, providing individuals with personalized, data-driven, and accessible career guidance.

### **- Target Market Segments:**

Our target customers for the Career Counsellor App are individuals seeking personalized, data-driven, and accessible career guidance. The following characteristics define our ideal customer:

**Students:** High school and college students seeking guidance on academic and career choices.

**Young Professionals:** Early-career professionals looking to transition into new roles or industries.

**Career Changers:** Individuals seeking to pivot into new careers or industries.

**Educational Institutions:** Schools and colleges looking to provide career counselling services to their students.

**Industry:** Open to exploring various industries, with a focus on emerging fields such as AI, data science, and sustainability.

**Goals:** Seeking personalized career guidance, career advancement, and professional development.

**Values:** Prioritizes accessibility, convenience, and data-driven insights in their career development journey.

## **- Business Opportunities:**

### **1. Personalized Career Recommendation Services:**

- Opportunity: Develop tailored career guidance solutions using ML algorithms to analyze individual skills, interests, and career goals.
- Implementation: Offer subscription-based services, where students and early professionals can receive career suggestions and detailed career paths based on predictive analytics and personalized assessment reports.
- Expansion: Introduce specialized packages for different stages in a user's career—school students, college students, and professionals seeking career changes.

### **2. Rural and Underserved Community Outreach:**

- Opportunity: Provide accessible, remote career counselling services for rural and underserved areas with limited access to professional guidance.
- Implementation: Develop a mobile-friendly platform with minimal data requirements, catering to these communities.
- Expansion: Partner with local educational institutions, NGOs, and government programs to enhance reach and credibility.

### **3. AI and ML-Powered Career Counselling Tools for Schools and Colleges:**

- Opportunity: Market AI-driven career guidance tools that schools and universities can use to support students' career planning.
- Implementation: Create a customizable version of the app for educational institutions to use as part of their career development programs.
- Expansion: Offer institution-wide subscriptions, allowing schools to provide this service to their students, with added features such as trend analysis, skill-gap reports, and targeted career workshops.

### **4. Specialized Guidance for Emerging Career Paths:**

- Opportunity: Address the demand for career counselling in high-growth areas like AI, data science, and sustainability.

- Implementation: Develop modules focused on emerging fields, integrating job role expectations, prerequisite skills, and current industry trends.
- Expansion: Partner with industry experts to provide niche career workshops, certification guidance, and internship pathways.

#### **5. AI-Powered Virtual Career Counselling Assistant:**

- Opportunity: Offer virtual career counselling that combines AI with a human touch, meeting the demand for scalable yet empathetic guidance.
- Implementation: Launch a chatbot-driven virtual assistant that answers career questions, recommends resources, and provides personalized career insights.
- Expansion: Integrate this virtual assistant with existing messaging platforms, allowing users to access guidance within their preferred social or communication apps.

#### **6. On-Demand Career Counselling and Mentorship Marketplace:**

- Opportunity: Build a marketplace that connects users with certified career counsellors and mentors from diverse fields.
- Implementation: Allow users to book sessions with counsellors for in-depth guidance and support, with reviews, ratings, and niche expertise listed on the platform.
- Expansion: Partner with industry professionals and alumni networks to offer mentoring in specific career tracks or roles.

#### **7. Data Analytics and Insights Platform for Industry Trends:**

- Opportunity: Provide real-time industry data insights for educational institutions and professionals to stay informed of job market trends.
- Implementation: Launch a data analytics module that tracks job openings, skill demand, and industry growth in various fields, available as a premium service.
- Expansion: Offer quarterly reports and webinars on industry trends, with insights on in-demand skills and career transitions.

## 8. Corporate Partnerships for Employee Career Development:

- Opportunity: Collaborate with companies looking to guide employees in internal career growth or role transitions.
- Implementation: Offer a B2B service enabling companies to provide ML-driven career guidance tools for employee development and retention.
- Expansion: Expand into large organizations with structured HR programs by tailoring the app for skill-gap analysis, internal career mobility suggestions, and training recommendations.

By developing these targeted services and products, the app can meet growing market needs while capturing diverse customer segments, creating both social impact and business growth.

## - Business Model:

### 1. Free Model:

- **Basic Free Access:** Offer basic features and content for free to attract a wide user base.

### 2. Subscription Plans:

- **Monthly/Annual Subscriptions:** Offer tiered subscription plans with varying levels of access to features, content, and counselling services.
- **Family/Group Plans:** Provide discounted subscription options for families or groups, encouraging more users to subscribe.

### 3. Advertising:

- **Targeted Ads:** Integrate targeted advertising for career-related products and services, such as resume writing services, job boards, or educational courses.
- **Sponsored Content:** Allow companies to sponsor content or features within the app, such as career advice articles or webinars.

#### 4. Partnerships and Affiliates:

- **Educational Institutions:** Partner with universities, colleges, or online learning platforms to offer their courses or certifications through the app, earning commissions on enrollments.
- **Recruitment Agencies:** Collaborate with recruitment agencies to offer job placement services or premium job listings, earning referral fees.

#### 5. Data and Insights:

- **Market Research:** Aggregate anonymized data to provide insights and trends on career preferences and job market conditions, and sell these insights to educational institutions or recruitment firms.
- **Benchmark Reports:** Offer detailed career benchmarking reports for a fee, including analysis of skills, salaries, and industry trends.

#### 6. Certification Programs:

- **Career Certification:** Develop and offer certification programs for users who complete specific career training or development modules, charging a fee for certification and course materials.

#### - Final Product Prototype:

Career counselling app is an application for the students and early freshers who have just entered into a working industry and need wide knowledge of Career path, Growth and Skill Development, Career Resources, leading growth and trends in industry.

#### **\*How app will work**

- **Sign-Up:** Collect essential details like full name, email address, phone number, and password.
- **Profile Information:** Their education qualification and basic details regarding their career path.



After Sign-In user will be asked to select if they want to get a Free access or Subscription-based access.

#### **Free Access:**

- Basic Free Access such as exploring education career path and blueprints.
- Personality test that will show them their strong points and weaknesses.

#### **Subscription-based access.**

- Subscription-based access will have all the free access along with Personality test and Series of questions related to the field and interest user provides so that it will be the user input for our model to determine the interests of the user and our Machine Learning model that has been trained with huge number of live data that research team has come up with.
- Subscription-based will have access to career path, List of all the Trending Careers, Full Market Researched Industry Report, Available Jobs in Market, Salary Trend
- Detailed Report of the tests given and a final career path ways that will help you choose according to your interest and data that user has provided.
- User can contact us for 1 on 1 session in-case they need more assistance where in our app will help them contact to one of the agencies that we have tie up with.

## - Machine Learning Build-ups:

Code - <https://github.com/Dheeraj1002/Career-Counselling-Service>.

## - Loading the dataset

```
from sklearn import model_selection
from sklearn.ensemble import BaggingClassifier
from sklearn.tree import DecisionTreeClassifier
import pandas as pd
import numpy as np

# Load the data
data = pd.read_csv('C:\\Users\\Admin\\Downloads\\dataset9000.csv')
dataset = pd.read_csv('C:\\Users\\Admin\\Downloads\\dataset9000.data', header = None)
```

data.head()

	Database Fundamentals	Computer Architecture	Distributed Computing Systems	Cyber Security	Networking	Software Development	Programming Skills	Project Management	Computer Forensics Fundamentals	Technical Communication	AI ML	Software Engineering
0	Professional	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested
1	Professional	Poor	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested
2	Professional	Beginner	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested
3	Professional	Average	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested
4	Professional	Intermediate	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested	Not Interested

We currently offer a focused selection of career options, but there's potential to expand by adding tailored career paths and detailed insights based on each student's field of study or industry. This would allow students to explore paths that align closely with their college major or specific area of expertise, helping them make informed career choices that fit their unique qualifications and interests."

```
dataset.head()
```

	Database Fundamentals	Computer Architecture	Distributed Computing Systems	Cyber Security	Networking	Development	Programming Skills	Project Management	Computer Forensics Fundamentals	Technical Communication	AI ML	Software Engineering	Business Analysis	Communication
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	2	1	1	1	1	1	1	1	1	1	1	1	1	1
9	3	1	1	1	1	1	1	1	1	1	1	1	1	1
9	5	1	1	1	1	1	1	1	1	1	1	1	1	1
9	6	1	1	1	1	1	1	1	1	1	1	1	1	1

Numeric grades given to data

- Not interested: 1

- **Poor:** 2
- **Beginner:** 3
- **Average:** 5
- **Intermediate:** 6
- **Excellent:** 7
- **Professional:** 9

This scale can help convert qualitative assessments into quantitative values, useful for machine learning models or data analysis tasks where numerical data is required.

#### - Building the Model

```
# Building the DecisionTreeClassifier Model
# Set the seed for reproducibility
seed = 5
kfold = model_selection.KFold(n_splits=15)

# Initialize the base classifier
base_cls = DecisionTreeClassifier()

# Number of base classifiers
num_trees = 50

# Bagging classifier
model = BaggingClassifier(estimator=base_cls,
                          n_estimators=num_trees,
                          random_state=seed)

# Evaluate the model with cross-validation
results = model_selection.cross_val_score(model, X, Y, cv=kfold)
print("Accuracy:", results.mean() * 100)
```

Accuracy: 82.35294117647058

Achieving 82% sets a solid baseline for further enhancements. You can explore hyperparameter tuning, feature engineering, or trying different algorithms to improve the accuracy even further.

## - Final output

```
# Make predictions on new data (e.g., X_test or any new sample)
new_data = [[3, 3, 3, 9, 2, 2, 1, 1, 1, 1, 7, 3, 2, 1, 1, 2, 5]] # Replace this with your new input data, shaped as [n_samples, n_features]
predictions = model.predict(new_data)
# Output the predictions
print("Predictions for new data:", predictions)
```

Predictions for new data: ['Cyber Security Specialist']

```
dataset['Database Fundamentals'].unique()
```

array([9, 1, 2, 3, 5, 6, 7], dtype=int64)

In conclusion, developing a website with a graphical user interface (GUI) to collect user inputs and utilize a predictive model for role prediction is a promising initiative. By leveraging frameworks like Flask or Django, along with proper model serialization and a user-friendly interface, you can create an accessible and efficient tool. This application not only enhances user interaction but also showcases the practical implementation of machine learning in real-world scenarios. With thorough testing, robust error handling, and ongoing maintenance, this project can provide valuable insights and aid users in their decision-making processes.

## - **Business Plan cost:**

### 1. Initial Setup Costs

- **Business Registration and Legal Fees**
- **Website Development:**
  - Basic Website
  - Advanced Features (e.g., booking system, user accounts)
- **Branding and Marketing Materials**

### 2. Operational Costs

- **Office Space** (if applicable):
  - Rent: per month (depends on location)

- Utilities: per month
- **Equipment:**
  - Computers and Software
  - Office Supplies
- **Communication:**
  - Phone and Internet

### **3. Marketing and Advertising**

- **Online Marketing** (SEO, social media ads)
- **Networking Events and Workshops**
- **Print Advertising** (flyers, brochures)

### **4. Personnel Costs**

- **Salaries or Fees for Counsellors:**
  - Part-time
  - Full-time
- **Training and Development:**

### **5. Software and Tools**

- **Career Assessment Tools**
- **CRM Software**
- **Project Management Tools**

### **Revenue Streams:**

1. **Individual Counselling Sessions:** Charge per session
2. **Group Workshops:** Charge per participant.
3. **Subscription Models:** Monthly or annual subscription for access to resources.
4. **Corporate Partnerships:** Offering services to businesses for employee career development.

## **- Conclusion:**

This business plan outline provides a comprehensive view of the potential costs involved in starting and running a career counselling service. We can Adjust these estimates based on specific circumstances and local market conditions to develop a more tailored financial plan. Additionally, consider pricing strategy and expected client base to project potential revenues accurately.

## **Operating Plan for Career Counselling Service**

### **1. Services Offered**

- Individual career counselling sessions (in-person or virtual).
- Group workshops on resume writing, interview preparation, and job searching.
- Career assessment tools and resources.
- Online courses on various career-related topics.
- Corporate workshops and training sessions.

### **2. Daily Operations**

- **Client Management:**
  - Use a CRM system to schedule appointments, track client progress, and manage follow-ups.
  - Maintain client confidentiality and data security protocols.
- **Session Delivery:**
  - Conduct individual counselling sessions (30-60 minutes) either in-person or via video conferencing.
  - Prepare customized career plans based on client assessments and discussions.
- **Marketing Activities:**
  - Post regular content on social media platforms (e.g., tips, success stories).

- Monitor and respond to inquiries via the website and social media channels.
- Organize monthly workshops and webinars.

### 3. Technology and Tools

- **Website:** A user-friendly platform for booking sessions, accessing resources, and client communication.
- **CRM Software:** To manage client information, appointments, and marketing campaigns.
- **Video Conferencing Tools:** For virtual counselling sessions (e.g., Zoom, Microsoft Teams).
- **Career Assessment Tools:** Tools and platforms for assessing client skills and preferences.

### 4. Financial Management

- **Budgeting:** Regularly review the budget to track expenses and revenues. Adjust marketing strategies based on performance.
- **Billing and Payments:** Use an online payment system for client payments (e.g., PayPal, Stripe).
- **Financial Reports:** Generate monthly and quarterly financial statements to assess profitability.

### 5. Performance Monitoring

- **Client Feedback:** Regularly collect feedback through surveys to assess client satisfaction and improve services.
- **Key Performance Indicators (KPIs):**
  - Number of sessions conducted per month.
  - Client retention rate.
  - Revenue growth over time.
  - Social media engagement metrics.

### 6. Continuous Improvement

- Stay updated on industry trends and best practices in career counselling.

- Attend workshops and training to enhance counselling skills and knowledge of market trends.
- Regularly evaluate and update services based on client needs and feedback.

## **Conclusion**

This operating plan outlines the essential components needed to run a successful career counselling service. By focusing on client management, staff roles, technology, and continuous improvement, can create a robust framework that supports growth and adapts to changing market conditions.

- The End