

# AI-Powered Smart Job Applying Assistant - Project Documentation

## Prototype Development

### 2.1 Overview

The prototype is a small-scale implementation to validate the product idea. This assistant automates job applications by parsing resumes, matching skills with job descriptions, and providing job suggestions.

### 2.2 Resume Parsing Module

Utilizes Natural Language Processing (NLP) to extract relevant skills and qualifications from a user-uploaded resume.

```
import spacy
from spacy.matcher import Matcher

nlp = spacy.load("en_core_web_sm")
matcher = Matcher(nlp.vocab)

matcher.add("SKILL", patterns=[[{"ENT_TYPE": "ORG"}], [{"ENT_TYPE":
"PRODUCT"}]])

def parse_resume(resume_text):
    doc = nlp(resume_text)
    matches = matcher(doc)
    skills = [doc[start:end].text for match_id, start, end in matches]
    return skills
```

## 2.3 Job Matching Module

Compares resume content with job descriptions using TF-IDF vectorization and cosine similarity.

```
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.metrics.pairwise import cosine_similarity

def match_jobs(resume, job_descriptions):
    texts = [resume] + job_descriptions
    vectorizer = TfidfVectorizer()
    tfidf_matrix = vectorizer.fit_transform(texts)
    similarities = cosine_similarity(tfidf_matrix[0:1], tfidf_matrix[1:])
    return sorted(range(len(job_descriptions)), key=lambda i:
similarities[0][i], reverse=True)
```

## 2.4 Optional UI Prototype

You may use Streamlit for a basic web interface or Android XML mockups for mobile layout.

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## **Step 3: Business Modelling**

Using the Business Model Canvas framework:

### **3.1 Customer Segments**

- Job seekers (freshers, experienced)
- Career switchers
- Small & medium businesses (SMBs)
- Recruiting firms

### **3.2 Value Proposition**

- Saves time by automating job applications
- Smart resume matching
- Multi-platform job tracking

### **3.3 Channels**

- Mobile app stores
- Job boards
- LinkedIn and Google Ads

### **3.4 Customer Relationships**

- Email support
- In-app guidance
- Tutorials and FAQ

### **3.5 Revenue Streams**

- Freemium model: ₹499, ₹999, ₹1499 monthly plans
- Sponsored job listings
- Affiliate marketing from job boards

### **3.6 Key Activities**

- Resume parsing
- Job matching algorithm development
- App/web platform development
- Customer support

### **3.7 Key Resources**

- AI/ML models
- Cloud infrastructure (AWS/GCP)
- App and website
- Customer service team

### **3.8 Cost Structure**

- Development: ₹15-30 Lakhs
- Monthly Operations: ₹30,000
- Marketing, infrastructure, and support

### **References:**

- <https://www.investopedia.com/terms/b/businessmodel.asp>
  - <https://alcorfund.com/insight/18-business-model-example-explained/>
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## Step 4: Financial Modelling with Machine Learning & Data Analysis

### 4.1 Market Identification

- Target: Indian job seekers, especially recent graduates and tech workers
- According to the Indian Staffing Federation, the job search market in India is projected to reach USD 10 billion by 2025

### 4.2 Financial Equation

Assuming:

- Unit price = ₹999
- Cost per user = ₹150
- Fixed cost = ₹30,000/month

Let  $x$  = number of premium users per month

Revenue function:

$$R(x) = 999x - (150x + 30000)$$
$$\Rightarrow R(x) = 849x - 30000$$

Break-even point:

$$R(x) = 0 \Rightarrow 849x = 30000 \Rightarrow x \approx 36 \text{ users/month}$$

### 4.3 Market Forecasting (Time Series)

If real data is unavailable, simulate data or scrape using Google Trends or LinkedIn statistics. Apply a regression or ARIMA model for forecasting:

```
from statsmodels.tsa.arima.model import ARIMA
```

```
# Simulated data
data = [100, 120, 150, 170, 200]
model = ARIMA(data, order=(1,1,1))
model_fit = model.fit()
predictions = model_fit.forecast(steps=3)
```

**References:**

- <https://www.analyticsvidhya.com/blog/2021/10/a-comprehensive-guide-to-time-series-analysis/>
- <https://www.analyticsvidhya.com/blog/2021/10/machine-learning-for-stock-market-prediction-with-step-by-step-implementation/>

**4.4 Sample Market Trends**

- <https://www.ibef.org/industry/real-estate-india/infographic>
  - <https://www.ibef.org/blogs/india-to-become-the-edtech-capital-of-the-world>
  - <https://www.ibef.org/industry/biotechnology-india/infographica>
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**Final Website Prototype:**

<https://preview-ecf69622--pixel-pal-job-seeker.lovable.app/>

**Final App Prototype:**

<https://preview-06e6aa59--pixel-pal-job-seeker.lovable.app/>