



# JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)

An International Scholarly Open Access, Peer-reviewed, Refereed Journal

## Rural Career Assistant: “A Multilingual Career Guidance System for Underserved Communities in India”

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Year: 3rd Year

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Project Logo:

### Abstract

In rural areas of India, students often face significant challenges in accessing structured career guidance due to poor digital literacy, limited local support, and language barriers. To address this, we present “Rural Career Assistant” — a multilingual, offline desktop application built using Python's Tkinter library. This system allows students to enter their qualification, interest, or stream and receive personalized career suggestions along with a step-by-step roadmap for achieving their goals. It includes features such as regional language translation (English, Hindi, Punjabi), local college recommendations based on state and district, and a fun career quiz to help indecisive students explore their potential. Unlike generic AI tools, this solution is customized for low-resource settings and is designed to function without internet, making it highly accessible in remote regions. The project aims to bridge the gap between rural talent and professional opportunities through an intuitive and user-friendly platform.

### Keywords:

Rural Career, AI Assistant, Multilingual, Tkinter Project, Python

## 1. Introduction

In India, career guidance remains a major challenge for students from rural and semi-urban backgrounds. These students often lack access to professional mentors, structured career resources, or high-speed internet, making it difficult to make informed decisions about their future. While urban students benefit from platforms like ChatGPT, LinkedIn, or dedicated career websites, these platforms are largely internet-dependent and usually available only in English, making them inaccessible to many rural learners.

To address these gaps, this project introduces "Rural Career Assistant" — a user-friendly, offline, and multilingual career guidance application. Built using Python and Tkinter, the system provides personalized career suggestions based on a student's qualification, stream, or interest, along with step-by-step career roadmaps, a quiz-based career predictor, and localized college/training institute suggestions. It is especially tailored to run on low-resource hardware and supports languages such as Hindi and Punjabi.

## 2. Objectives

The main objectives of this research are:

- To design and develop a career guidance system that works offline and is suitable for low-end computers commonly used in rural India.
- To enable career selection based on user input like stream, qualification, or interest.
- To support multilingual interaction (English, Hindi, Punjabi) to make the system more inclusive.
- To provide step-by-step career roadmaps that are easy to understand and optionally translated into the user's language.
- To offer access to free learning resources such as SWAYAM, NSDC, and YouTube tutorials.
- To integrate a state/district/field-wise college locator feature.
- To include an interactive quiz module that helps undecided students identify suitable career paths.

## 3. Problem Statement

Students in rural India face a severe lack of access to structured career guidance. Challenges include poor internet connectivity, language barriers, low digital literacy, and limited awareness of opportunities. Traditional platforms like ChatGPT or government portals, while powerful, are either inaccessible offline or available only in English. Thus, there is a need for an offline, easy-to-use, multilingual system that helps rural students explore career options and local training opportunities.

## 4. Detailed Technology Stack

- Language: Python 3.10
- GUI: Tkinter
- Data Handling: Pandas
- Translation: Googletrans
- UI Media: Pillow for image rendering
- Browser Integration: webbrowser for opening learning platforms
- File Storage: CSV files for career, roadmap, and college data

## 5. Comparison with Existing Systems

Feature	Rural Career Assistant	ChatGPT / Web Tools
Offline Access	✓ Yes	✗ No
Local Language Support	✓ Hindi, Punjabi	☐ Limited (English Only)
Low-End PC Compatibility	✓ Yes	✗ No
Local College Recommendations	✓ Yes	✗ No
Step-by-step Career Guidance	✓ Yes	☐ Indirect

## 6. Limitations

- Requires initial setup with Python and dependencies.
- Google Translate may occasionally return inaccurate translations.
- Data is currently static (CSV), not live.
- UI is functional but basic — improvements can be made for better experience.

## 7. Literature Review

Career guidance systems have evolved significantly in recent years, driven by the widespread use of artificial intelligence (AI), mobile apps, and web platforms. Popular tools such as NCS Portal (National Career Service), MeraCareerGuide, and AI-powered platforms like ChatGPT and LinkedIn Career Explorer have enabled many students to explore and understand career paths using smart recommendations and global datasets.

However, these tools often assume consistent internet access, English language proficiency, and high literacy levels, which are not always available in rural and underserved regions of India. Research shows that a significant portion of the rural population lacks digital literacy or access to digital devices that can handle heavy online platforms or apps.

This research addresses these challenges by proposing an inclusive, lightweight, and practical solution: a desktop-based career assistant that works offline, in multiple Indian languages, and is tailored for use by students in rural and low-resource environments.

## 8. System Design

The proposed system, Rural Career Assistant, is a desktop-based application developed using Python and its standard GUI library Tkinter. It is designed to run offline on low-end computers, making it ideal for rural schools, community centers, and public computer labs.

### Technology Stack:

- Python 3.10
- Tkinter (GUI)
- Pandas (Data handling)
- Googletrans (Translation)
- CSV files (Data storage)
- Pillow (Images)
- Webbrowser (Open links)

### Folder Structure:

```
RuralCareerAssistant/  
├── main.py  
├── careers.csv  
├── roadmaps.csv  
├── colleges.csv  
├── logo.png  
└── requirements.txt
```

### System Modules:

- Language Selector
- Qualification & Interest Input
- Career Suggestion Engine
- Career Roadmap Viewer
- Free Resources Module
- College Finder
- Career Quiz
- GUI Layout

## 9. Features

- Career Suggestion Engine
- Step-by-Step Career Roadmaps (Multilingual)
- Free Resource Links (SWAYAM, NSDC, Coursera)
- College/Institute Finder (State/District/Field-based)
- Career Quiz
- Multilingual Support (English, Hindi, Punjabi)
- Offline-First Desktop Application

### 10. Results and Output

Sample Outputs (screenshots to be added):

- Home Screen (GUI Interface)
- Career Suggestions
- Career Roadmap Display
- Free Learning Resources
- College Filtering System
- Career Quiz Result

Example Use Case:

Input: Qualification: Science, Interest: Health

Output: Careers - Doctor, Nurse, Pharmacist

Colleges: Local medical colleges (based on location filters)

Future improvements:

- Mobile App Version
- AI Chatbot Integration
- Offline Translation
- More Regional Languages
- Voice Input
- Progress Tracker
- Mentor Connect Portal

### 12. Screenshots (Placeholders)

Figure 1: Home Screen UI

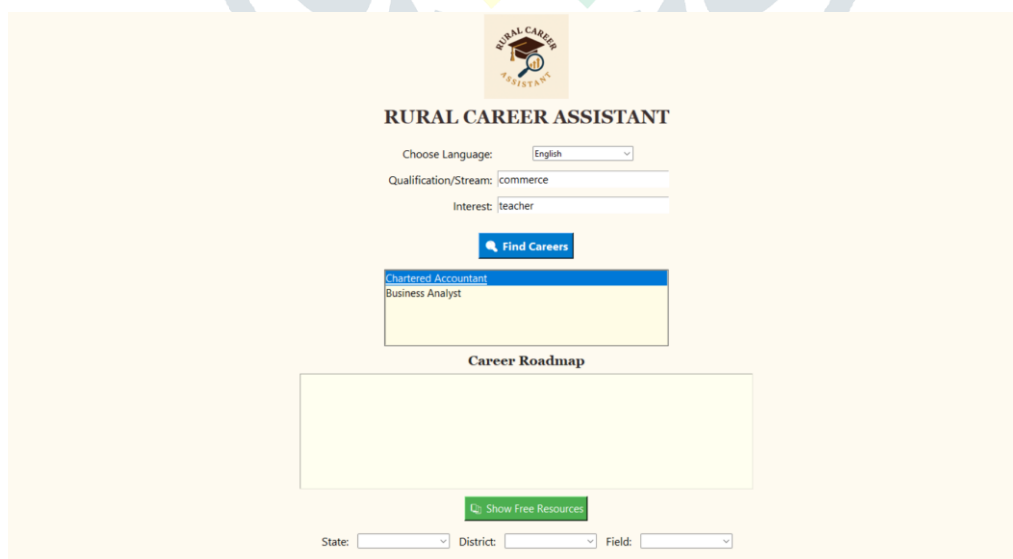


Figure 2: Career Suggestions List

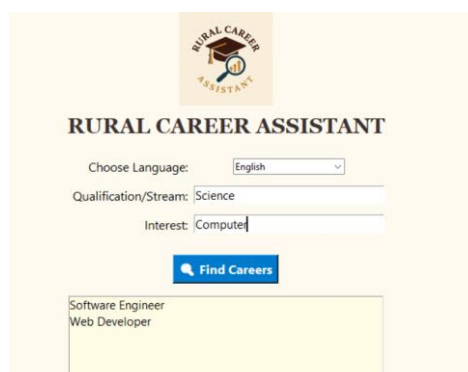


Figure 3: Career Roadmap Display (translated)

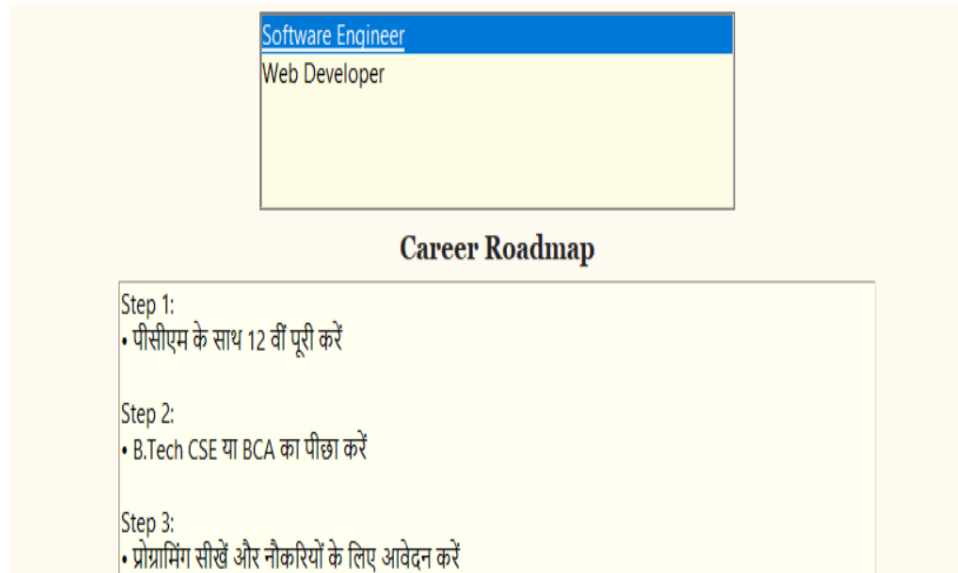


Figure 4: College Filtering Output

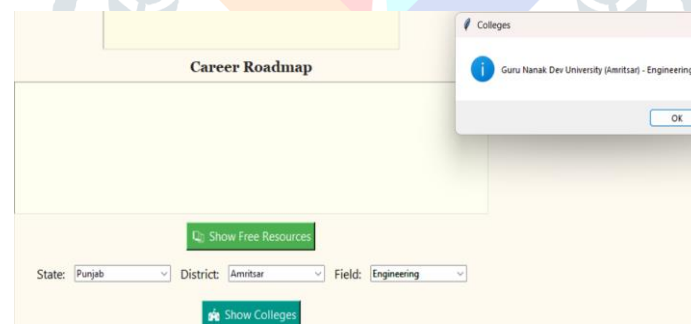
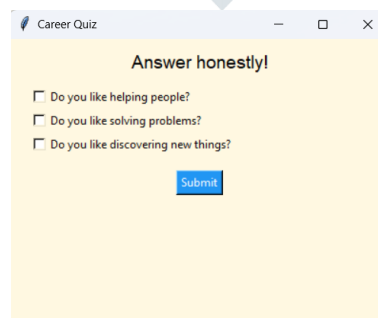


Figure 5: Career Quiz Result Popup



## 11. Conclusion

The Rural Career Assistant project successfully demonstrates how technology can be leveraged to address the lack of structured career guidance in rural and underserved communities. By offering an offline, multilingual, and interactive career support system, the application bridges the gap between ambition and awareness among students who have limited access to the internet, mentors, or career counselors.

## 12. References

1. National Career Service (NCS) Portal, <https://www.ncs.gov.in>
2. SWAYAM Online Learning Platform – Ministry of Education, <https://swayam.gov.in>
3. Googletrans Python Library – <https://pypi.org/project/googletrans/>
4. Tkinter GUI Programming – Python 3 Documentation, <https://docs.python.org/3/library/tkinter.html>
5. Pandas Python Library – <https://pandas.pydata.org/>
6. NSDC (National Skill Development Corporation), <https://www.nsdcindia.org>
7. Skill India Digital Portal, <https://www.skillindiadigital.gov.in>