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Smart Career Guidance Kiosk Machine

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Abstract - *Career guidance plays a crucial role in shaping students' academic and professional futures, as early career decisions strongly influence long-term employability and personal development. However, a significant gap exists in the availability of structured career counselling facilities in rural and semi-urban regions. Many students face difficulties in making informed academic and career choices due to limited access to professional counsellors, unreliable internet connectivity, language barriers, and lack of awareness regarding diverse and emerging career opportunities. As a result, students often select unsuitable educational pathways, which may lead to academic dissatisfaction, dropouts, unemployment, or underemployment.*

To address these challenges, this paper presents the Smart Career Guidance Kiosk for Rural Students, a low-cost, offline, and multilingual system designed to provide accessible and self-guided career counselling. The proposed kiosk operates as a standalone embedded system using locally hosted software and an offline career dataset, thereby eliminating dependency on continuous internet connectivity. The system collects essential user inputs such as education level, academic stream, interests, and existing skill sets, and processes them using a rule-based weighted recommendation algorithm to generate personalized career guidance.

The rule-based approach ensures transparency and explainability of recommendations, allowing students to understand the reasoning behind suggested career options. A simple and user-friendly interface is provided to support students with varying levels of digital literacy. Additionally, multilingual support and offline text-to-speech functionality enable inclusive access for students from different linguistic backgrounds and those with limited reading ability.

The kiosk is intended for deployment in rural schools, Gram Panchayat offices, NGOs, and community learning centres, where access to professional career counselling services is minimal. Experimental testing of the implemented system demonstrates reliable offline performance, fast response time, stable operation, and effective generation of career recommendations. The results indicate that the proposed system can serve as a practical and scalable solution for improving career awareness and supporting informed educational and professional decision-making among rural students.

***Key Words*: Smart Career Guidance, Rural Students, Offline Kiosk System, Career Recommendation, Skill-Based Analysis, Multilingual Application**

1. INTRODUCTION

Career guidance is a fundamental component of the educational ecosystem, as it supports students in understanding their abilities, identifying suitable academic pathways, and planning long-term professional goals. Early career-related decisions significantly influence an individual's future employability, job satisfaction, and personal development. Students who receive appropriate guidance are more likely to select educational programs aligned with their interests and skills, thereby improving academic performance and reducing the likelihood of course changes or dropouts.

Despite its importance, structured career counselling services are unevenly distributed, with a pronounced shortage in rural and semi-urban regions. Students in these areas often lack access to trained career counsellors, career assessment tools, and updated information about available educational and professional opportunities. In many cases, students rely on informal advice from family members, peers, or local teachers, which may not accurately reflect current industry requirements or the student's individual aptitude. This situation leads to uninformed career decisions, which can result in academic dissatisfaction, unemployment, or underemployment.

The problem is further intensified by the rapid expansion of career options across various domains such as information technology, healthcare, engineering, design, management, and emerging interdisciplinary fields. Modern career landscapes require students to possess not only academic knowledge but also specific technical, creative, and soft skills. Without structured guidance, rural students may remain unaware of these opportunities or the pathways required to pursue them.

Existing career guidance platforms are predominantly internet-based and designed for urban populations. These platforms typically require continuous network connectivity, modern computing devices, and a certain level of digital literacy. In rural areas, internet connectivity is often unreliable or unavailable, and access to personal computers

or smartphones may be limited. Additionally, many existing platforms are developed primarily in English, creating language barriers for students who are more comfortable using regional languages. As a result, a large segment of the rural student population is unable to benefit from these systems.

Professional career counselling services offered by private institutions are generally concentrated in urban centres and involve high costs, making them inaccessible to economically disadvantaged rural students. Furthermore, these services often require appointments and physical visits, which may not be feasible for students living in remote locations. Consequently, the absence of affordable, accessible, and localized career guidance solutions continues to widen the career awareness gap between urban and rural students.
To address these challenges, this paper proposes the Smart Career Guidance Kiosk for Rural Students as an offline, multilingual, and self-guided career counselling solution. The proposed system is designed as a standalone embedded kiosk that hosts a locally running application and an offline career dataset. By eliminating dependency on internet connectivity and human counsellors, the kiosk enables independent access to career guidance in rural environments.

The system guides students through a step-by-step process in which they select their education level, academic stream, interests, and existing skills. Based on these inputs, a rule-based weighted recommendation algorithm analyzes suitability and generates personalized career suggestions. The recommendations are presented through a simple graphical interface along with optional audio guidance, ensuring accessibility for students with varying levels of literacy and technical proficiency.

The primary objective of the proposed system is to improve career awareness, support informed educational planning, and reduce uninformed career choices among rural students. By providing an affordable and scalable solution, the Smart Career Guidance Kiosk aims to contribute to inclusive education and promote equitable access to career counselling services.

2. LITERATURE SURVEY

In recent years, there has been a growing need for personalized career guidance systems to help students make informed decisions, particularly in areas where access to professional counsellors is limited. With the rise of intelligent systems and AI, several researchers have explored methods to provide automated, data-driven career recommendations. This review discusses key contributions in this domain.

Intelligent Career Guidance System by Mohiuddin et al. (2025)

This study introduces an intelligent career guidance system leveraging machine learning techniques for personalized recommendations. The system analyzes students' skills, interests, and education levels to suggest suitable career paths. The focus on ML enables adaptive guidance that improves as more data is collected, making it relevant for offline kiosks that aim to provide personalized suggestions.

Intelligent Career Guidance System using Machine Learning by Sneha H. S. et al. (2022)

Sneha et al. proposed a model that automates career predictions using machine learning. The system considers student input and evaluates potential career options based on predictive algorithms. This approach demonstrates the effectiveness of ML in guiding students toward informed career choices and highlights the potential for offline implementation in rural areas.

Smart Career Assistance Portal Using AI by Sameeha Afrin A. et al. (2025)

This portal integrates AI with real-time industry insights, dynamically uploading career recommendations. The system emphasizes the importance of connecting career guidance with market demands, providing students with relevant, actionable advice. Such real-time insights can be adapted to offline kiosks through preloaded datasets for rural deployment.

Design and Implementation of a Career Guidance Portal by Kritika Vishwakarma & Peeyush Kumar Pathak (2025)

The authors focus on a portal embedded with digital libraries and skill assessment tools. This study underscores the value of personalized assessment in career guidance, aligning well with the SCGK's objective of providing step-by-step, self-guided counselling.

Unlocking Futures: A Natural Language Driven Career Prediction System by Sakir H. Faruque et al. (2024)

This research introduces an NLP-based system for career prediction, enabling students to interact in natural language to receive guidance. Although primarily an online solution, its methodology offers insights into designing user-friendly interfaces and adaptive recommendation algorithms suitable for kiosk implementation.

AI Career Guidance Tool – IEEE Conference Paper by Joshi et al. (2024)

The paper presents an AI-based career guidance platform evaluated in a controlled environment. It highlights the feasibility of automated guidance systems and their potential to scale across multiple locations, a core aspect of deploying SCGK in rural regions.

AI-powered Career Guidance System – IEEE Conference Paper by El-Khalili et al. (2025)

This work discusses recent advancements in AI driven career guidance systems, emphasizing structured data utilization and recommendation accuracy. The study supports the design of offline kiosks that rely on well-structured datasets and rule-based scoring for effective decision support.

Summary:

These studies collectively emphasize the growing importance of AI and machine learning in career guidance, the value of structured and adaptive recommendation systems, and the need for user friendly interfaces. They provide a foundation for the Smart Career Guidance Kiosk, which combines offline accessibility, multilingual support, and a rule-based weighted scoring algorithm to deliver personalized guidance in rural settings.

3. PROPOSED WORK

3.1 Proposed System

The Smart Career Guidance Kiosk for Rural Students is proposed as an offline, self-guided career counselling system specifically designed to address the limitations of existing career guidance mechanisms in rural and semi-urban regions. The system is developed with the objective of providing structured, reliable, and easily accessible career information to students who lack access to professional counsellors and internet-based guidance platforms. By combining embedded hardware with locally hosted software, the proposed system functions as a complete standalone solution that can be deployed in resource-constrained environments.

The proposed kiosk is designed to support students after the completion of their 10th and 12th standard education, a critical stage where students are required to make important academic and career-related decisions. The system assists students in exploring suitable career paths by analysing multiple parameters, including their education level, academic stream, interests, and existing skills. This multi-parameter analysis ensures that career recommendations are personalized and relevant to individual users rather than generic or one-size-fits-all suggestions. At the core of the proposed system is a locally hosted career database that stores structured information about various career options. Each career entry includes detailed attributes such as career description, eligibility criteria, required educational qualifications, recommended courses, skill requirements, certifications, potential job roles, salary ranges, and relevant institutions. The structured nature of the dataset enables the system to provide comprehensive guidance that goes beyond merely listing career names. Students are informed about the academic pathways and skill development requirements associated with each career option, which supports informed decision-making.

The system interacts with users through a step-by-step guidance flow implemented using a simple and intuitive graphical user interface. Students are guided through a sequence of input screens where they select their education level, academic stream, areas of interest, and existing skills. This structured interaction reduces confusion and ensures that all relevant inputs are collected before generating career recommendations. The interface is intentionally designed with minimal complexity, large buttons, and clear labels to accommodate students with varying levels of digital literacy.

To ensure accessibility for a diverse rural population, the proposed system supports multiple Indian languages. Users can select their preferred language at the beginning of the interaction, and all interface elements, instructions, and outputs are presented accordingly. In addition to text-based interaction, the system incorporates offline text-to-speech functionality that provides audio guidance and career descriptions. This feature is particularly beneficial for students with limited reading ability or those who are more comfortable receiving information through audio.

Career recommendations are generated using a rule-based weighted scoring algorithm that evaluates the suitability of each career option based on predefined parameters. The algorithm assigns weights to factors such as interest match, skill match, academic eligibility, and user preference. By computing a composite score for each career, the system ranks career options and presents the most suitable ones to the user. This rule-based approach ensures transparency and explainability, allowing users to understand why specific careers are recommended. Unlike black-box machine learning models, the explainable nature of the algorithm enhances trust and makes the system suitable for educational guidance.

The proposed system is deployed as a physical kiosk using embedded hardware. The embedded computing unit hosts the operating system, application software, and career database, ensuring that all processing occurs locally. The kiosk includes a display unit for visual interaction and an audio output device for voice guidance. The hardware configuration is selected to balance performance, cost, and power consumption, making the kiosk suitable for long-term deployment in rural environments.

One of the key strengths of the proposed system is its complete independence from internet connectivity. All data storage, processing, and recommendation logic are handled locally within the kiosk. This design choice ensures reliable operation even in areas with poor or no network coverage. Additionally, offline operation improves data privacy, as no personal information is transmitted to external servers.

Overall, the proposed Smart Career Guidance Kiosk serves as an integrated solution that combines affordability, accessibility, and intelligent decision support. By providing localized, multilingual, and offline career guidance, the system aims to bridge the career awareness gap between urban and rural students and promote informed educational and professional planning.

3.2 Existing System

Existing career guidance systems available to students are primarily based on online career portals, private counselling services, and web-based assessment platforms. These systems are generally designed for users who have reliable internet connectivity, access to digital devices, and sufficient digital literacy. While such platforms are widely used in urban environments, they present several limitations when applied to rural and semi-urban contexts.

Most existing career guidance platforms require continuous internet connectivity to function effectively. Career assessments, interest tests, and recommendation engines are typically hosted on remote servers and rely on real-time data exchange. In rural areas, internet connectivity is often unreliable, slow, or completely unavailable. Even in locations where limited connectivity exists, high latency and frequent network interruptions negatively affect user experience. As a result, rural students are unable to consistently access or benefit from these online systems.

Another major limitation of existing systems is their language dependency. The majority of career guidance platforms are developed primarily in English, with limited or no support for regional languages. Rural students who are more comfortable using their native languages face difficulties understanding interface elements, instructions, and career descriptions. This language barrier significantly reduces system usability and discourages adoption among rural users.

Professional career counselling services offered by private institutions represent another form of existing system. These services typically involve one-on-one counselling sessions conducted by trained professionals. Although such services can provide personalized guidance, they are usually concentrated in urban areas and involve high consultation fees. For many rural students, traveling to urban centres and paying for counselling services is not financially feasible. Furthermore, these services often require appointments and scheduled visits, which may not be practical for students living in remote locations.

Some educational institutions offer limited career guidance through school counsellors or teachers. However, due to high student-to-teacher ratios and lack of specialized training, teachers are often unable to provide detailed and individualized career counselling. Additionally, institutional guidance is typically limited to traditional career paths and may not cover emerging or interdisciplinary fields.

Many existing systems also lack self-guided mechanisms. Students are often required to depend on external counsellors or facilitators to interpret assessment results and explain career options. This dependency increases operational cost and reduces scalability. Moreover, existing platforms rarely provide standalone deployment options that can operate without network connectivity.

Another important drawback of current systems is the absence of integrated offline solutions. Most platforms are designed as web-based applications and cannot be deployed as independent units in rural schools, Panchayat offices, or community centres. Without an offline alternative, career guidance remains inaccessible to a large segment of the rural population.

Due to these limitations, rural students frequently rely on informal sources of guidance such as family members, peers, or local community members. While well-intentioned, such guidance is often based on limited information, personal experiences, or societal expectations rather than objective assessment of the student's aptitude and interests. This situation contributes to uninformed career choices, academic dissatisfaction, and higher dropout rates.

The shortcomings of existing systems highlight the need for a dedicated career guidance solution that is offline, low-cost, multilingual, and self-guided. The proposed Smart Career Guidance Kiosk is designed to address these gaps by providing localized and accessible career counselling specifically tailored for rural environments.

3.3 Methodology

The development of the Smart Career Guidance Kiosk for Rural Students follows a structured and systematic methodology that emphasizes offline functionality, usability, reliability, and accessibility. The methodology is designed to ensure that the system meets functional requirements while remaining simple to deploy and maintain in rural environments. The overall methodology is divided into multiple stages, each addressing a specific aspect of system development.

1. Requirement Analysis

The first stage involves identifying and analysing both functional and non-functional requirements of the system. Functional requirements define what the system should do, while non-functional requirements define how the system should perform.

Functional requirements include collecting user inputs, processing career-related data, generating personalized recommendations, supporting multiple languages, and providing audio guidance. Non-functional requirements include offline operation, low response time, reliability, ease of use, and low hardware cost. This stage ensures that the system objectives are clearly defined and aligned with the needs of rural students.

2. System Design and Architecture

Based on the identified requirements, the overall system architecture is designed. The system is conceptualized as a self-contained kiosk that integrates embedded hardware with a locally hosted web application. The architecture follows a modular approach, separating user interface, application logic, and data storage.

This modular design simplifies development, testing, and future enhancement. It also ensures that individual components can be modified without affecting the entire system.

3. Hardware Selection and Configuration

An embedded computing platform is selected to serve as the core processing unit of the kiosk. The hardware must support stable operation, low power consumption, and compatibility with the chosen software stack.

Peripheral components such as display and speaker are selected to enable visual and audio interaction. Storage media is used to host the operating system, application software, and offline dataset.

The hardware is configured to automatically boot into kiosk mode, ensuring ease of use and preventing unauthorized access.

4. Dataset Collection and Organization

Career-related data is collected from publicly available educational resources and institutional websites. The collected data is carefully reviewed and organized into a structured JSON-based database.

Each career entry contains multiple attributes, including description, eligibility, required education, recommended courses, skills, certifications, job roles, salary range, and institutions. The dataset is organized hierarchically based on education level and domain, enabling efficient retrieval.

5. User Interaction Design

The user interaction flow is designed to be simple and intuitive. Users are guided through a sequence of steps: selecting education level, academic stream, interests, and skills.

Each step is presented on a separate screen to minimize confusion and reduce cognitive load. Large buttons, clear labels, and minimal text are used to improve usability.

6. Career Recommendation Algorithm

A rule-based weighted scoring algorithm is implemented to analyze user inputs. Each parameter is assigned a weight based on its importance. Suitability scores are calculated for each career option, and careers are ranked accordingly.

This approach ensures transparent and explainable recommendations.

7. Software Development

The frontend is developed using React with Vite for fast rendering and responsive design. JavaScript is used for implementing application logic. The system runs in Chromium kiosk mode on Raspberry Pi OS.

8. Multilingual and Audio Integration

Multiple Indian languages are supported. Offline text-to-speech functionality provides voice guidance.

9. Testing and Validation

The system is tested under offline conditions. Functional testing verifies feature correctness, while performance testing evaluates response time and stability.

10. Deployment Preparation

The kiosk is prepared for deployment in rural schools, NGOs, and Panchayat offices. Startup automation ensures that the system launches automatically on power-up.

3.4 Project Plan and Architecture

1. Project Plan

The Smart Career Guidance Kiosk for Rural Students is planned as a low-cost, scalable, and self-contained solution aimed at providing structured and accessible career guidance in rural and semi-urban environments. The project plan

focuses on delivering a system that is technically reliable, easy to use, and independent of continuous internet connectivity. Special emphasis is placed on simplicity of deployment, affordability, and long-term sustainability.

The project planning process begins with identifying the primary goals of the system, which include enabling independent career exploration, improving awareness of diverse career opportunities, and supporting informed educational planning. These goals are translated into functional objectives such as offline operation, multilingual support, user-friendly interface design, and accurate career recommendation.

The project is organized into multiple phases to ensure systematic development and quality control. The initial phase involves requirement gathering and analysis, where interactions with students and educators help identify key challenges faced during career decision-making. This phase also defines system constraints related to hardware cost, power consumption, and ease of maintenance.

The second phase focuses on system design, including the selection of hardware components, operating system, frontend framework, and data storage format. Design decisions are guided by factors such as compatibility, stability, and community support. The chosen architecture ensures that the system can be easily replicated and deployed at multiple locations.

The third phase involves dataset preparation. Career-related information is collected, verified, and structured into a consistent format. Emphasis is placed on ensuring that each career entry contains sufficient detail to guide students beyond superficial understanding. Data consistency checks are performed to avoid incomplete or contradictory information.

The fourth phase covers software development, where the user interface, recommendation logic, and multilingual features are implemented. Parallel to this, hardware integration is carried out by configuring the embedded system and connecting peripheral devices such as display and speaker.

The fifth phase consists of system testing and validation. Functional testing verifies that each module operates correctly, while integration testing ensures that hardware and software components work together seamlessly. Performance testing evaluates response time, stability, and offline behaviour.

The final phase includes documentation and preparation for deployment. User manuals, installation guidelines, and maintenance procedures are prepared. This phased project plan ensures timely completion, reduces development risks, and improves overall system quality.

2. System Architecture

The system architecture is designed using a modular and layered approach to ensure reliability, scalability, and ease of maintenance. The architecture consists of four primary layers: user interaction layer, application logic layer, data storage layer, and hardware layer.

The user interaction layer provides the graphical interface through which students interact with the system. It presents input forms, navigation controls, and result displays. Multilingual support is implemented at this layer, allowing users to select their preferred language. The interface is designed to be visually simple, with large buttons and minimal text, ensuring usability for students with limited digital literacy.

The application logic layer contains the core processing components of the system. It validates user inputs, manages application flow, and executes the career recommendation algorithm. This layer acts as the central coordinator between the user interface and the data storage layer. All decision-making processes occur within this layer.

The data storage layer consists of an offline JSON-based database that stores structured career information. The database is stored locally on the embedded system. Data retrieval operations are optimized to ensure fast access and minimal latency.

The hardware layer includes the embedded computing unit, display device, audio output device, and storage media. The embedded system hosts the operating system, application software, and database. The display enables visual interaction, while the speaker provides audio guidance.

When a user submits input, the user interaction layer sends the data to the application logic layer. The application logic layer processes the input, retrieves relevant career information from the data storage layer, and generates ranked recommendations. The results are then sent back to the user interaction layer for display and audio output.

This architecture ensures complete offline operation, fast response time, and stable performance. The modular design also supports future enhancements such as dataset expansion and algorithm improvement without major architectural changes.

4. RESULT

The Smart Career Guidance Kiosk for Rural Students was successfully implemented and evaluated under offline operating conditions to verify its functionality, stability, and suitability for rural deployment. The evaluation focused on assessing the system's ability to collect user inputs, generate personalized career recommendations, support multilingual interaction, and operate reliably without internet connectivity.

Multiple test scenarios were created to represent students with different education levels, academic streams, interests, and skill combinations. These scenarios were used to verify whether the system produced career recommendations that aligned logically with the provided inputs. The system consistently generated relevant career suggestions corresponding to selected parameters, indicating correct functioning of the rule-based recommendation algorithm.

The kiosk was operated continuously for extended durations to observe system stability. During testing, the system did not exhibit crashes, unexpected behaviour, or significant performance degradation. The interface remained responsive, and transitions between screens occurred smoothly.

Language switching functionality was tested by changing the interface language at different stages of interaction. The system correctly updated all interface elements and output text according to the selected language. Audio guidance was synchronized with the displayed content, ensuring consistent multimodal feedback.

The system was also evaluated for offline performance by operating it in an environment without any network connection. All features, including data retrieval, recommendation generation, and audio output, functioned correctly. This confirms that the kiosk does not depend on external servers or online services.

Overall, the results demonstrate that the Smart Career Guidance Kiosk fulfils its intended objectives of providing accessible, reliable, and offline career guidance suitable for rural environments.

4.1 React Web Interface

The React-based web interface plays a critical role in ensuring effective user interaction. The interface is designed to be simple, intuitive, and visually uncluttered. Each stage of the career guidance process is presented on a separate screen, allowing users to focus on one task at a time.

Large buttons, clear labels, and consistent layout are used throughout the interface to reduce cognitive load. This design approach is particularly important for users who have limited experience with digital systems. Navigation between screens is straightforward, with minimal steps required to progress through the guidance flow.

Multilingual support is implemented within the interface, allowing users to select their preferred language at the beginning of the session. All subsequent screens, instructions, and output results are displayed in the selected language. This feature significantly improves accessibility for rural students.

The interface loads quickly and responds promptly to user input. Fast rendering and smooth transitions enhance user experience and reduce frustration during interaction.

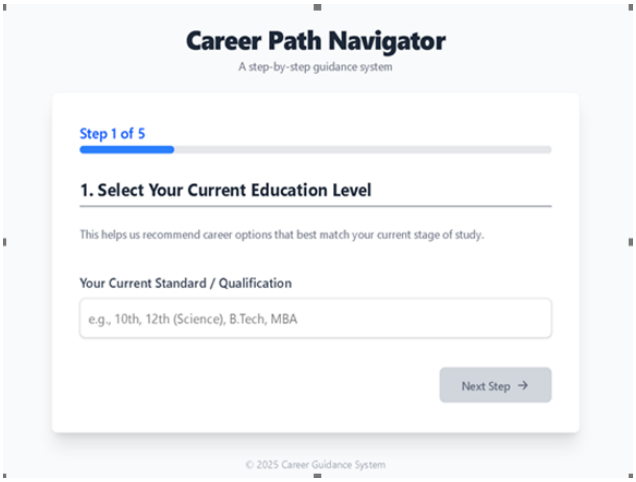

Fig.1 Output-1

4.2 Output

The system generates personalized career recommendations immediately after processing user inputs through the rule-based weighted scoring algorithm. The output is presented in a structured and organized manner, making it easy for students to understand and interpret the results.

The output typically includes a ranked list of suitable career options along with supporting information such as career description, required education level, and recommended courses. In some cases, additional details such as key skills or certifications are also displayed to provide a clearer understanding of the career pathway.

All output data is retrieved from the offline JSON-based career database stored locally within the kiosk. Since the

database is accessed locally, data retrieval and processing are fast and reliable. The system presents results in both text and audio formats, allowing students to either read or listen to the guidance.

The consistency of output across multiple test scenarios indicates correct functioning of the recommendation algorithm and dataset structure. The system avoids presenting contradictory or irrelevant career options, thereby maintaining the reliability of guidance.

The output presentation is designed to support independent exploration. Students can scroll through multiple recommended careers and review information for each option at their own pace. This encourages deeper understanding and helps students make informed decisions about their future education and career paths.

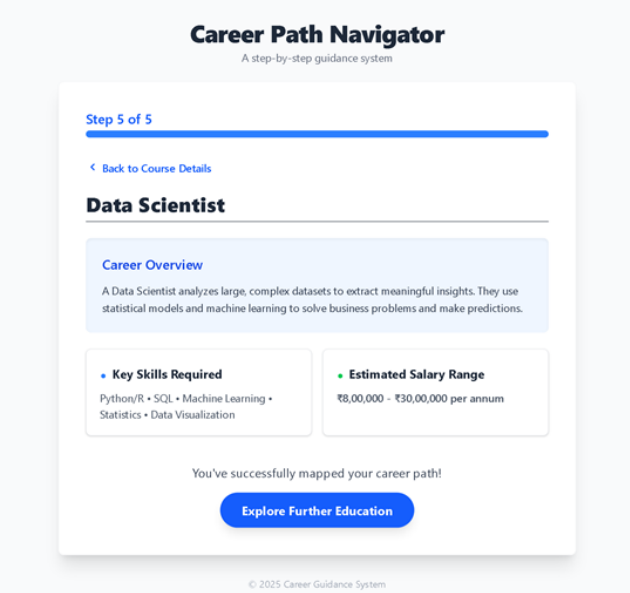

Fig.2 Output-2

5. CONCLUSION

The Smart Career Guidance Kiosk for Rural Students has been successfully designed and implemented as a low-cost, offline, multilingual, and self-guided career counselling system aimed at addressing the critical shortage of structured career guidance in rural and semi-urban regions. The project focuses on providing accessible and reliable career information to students who otherwise have limited exposure to professional counselling services and online career guidance platforms.

The system integrates embedded hardware with a locally hosted web application and an offline career database to deliver personalized career recommendations based on education level, academic stream, interests, and existing skills. By employing a rule-based weighted scoring algorithm, the system generates explainable and transparent recommendations that allow students to understand the basis of suggested career options. This approach is particularly suitable for educational environments where clarity and trust are essential.

One of the key strengths of the proposed system is its complete independence from internet connectivity. All data storage, processing, and recommendation logic are performed locally within the kiosk. This design choice ensures reliable operation in rural areas with poor or no network coverage and eliminates dependency on external servers. Additionally, offline operation improves data privacy, as no personal information is transmitted outside the system.

The inclusion of multilingual support and audio guidance significantly enhances accessibility for rural students from diverse linguistic backgrounds and for those with limited reading ability. The simple and intuitive user interface further ensures that students with varying levels of digital literacy can interact with the system independently.

Experimental evaluation under offline conditions demonstrates that the kiosk operates reliably, provides fast response, and generates relevant career recommendations. The system remains stable during extended operation and supports smooth language switching and user interaction. These results indicate that the Smart Career Guidance Kiosk is practical for real-world deployment in rural schools, Gram Panchayat offices, NGOs, and community learning centres.

Overall, the project successfully meets its academic, technical, and social objectives. It demonstrates that embedded systems combined with intelligent yet explainable software logic can be effectively used to deliver essential educational services in underserved regions. The Smart Career Guidance Kiosk offers a scalable and sustainable model for extending career guidance to rural populations and has the potential to contribute significantly to improving career awareness, reducing uninformed career choices, and supporting inclusive education across India.

Future Scope

The Smart Career Guidance Kiosk for Rural Students provides a strong foundation for delivering offline and accessible career guidance. Several enhancements can be incorporated in future work to further improve the functionality, intelligence, and impact of the system.

One major area of improvement is the expansion of the career dataset. Currently, the system utilizes a structured offline database containing a limited set of representative career

options. In future versions, the dataset can be expanded to include a larger number of careers across traditional, professional, vocational, and emerging domains. Additional attributes such as detailed course syllabi, entrance examination information, internship opportunities, and career progression pathways can also be incorporated. A larger dataset will enable more comprehensive guidance and increase the relevance of recommendations.

Another important enhancement involves the integration of artificial intelligence and machine learning techniques. While the current system employs a rule-based weighted scoring algorithm, future versions can incorporate supervised or hybrid learning models that adapt based on historical usage patterns and feedback. Machine learning models can learn relationships between user profiles and successful career outcomes, thereby improving recommendation accuracy over time. However, such models can be implemented while retaining explainability to maintain user trust.

Periodic internet-based update mechanisms can be introduced in future versions. Although the system is designed to operate offline, occasional internet connectivity can be used to download updated datasets, new career information, and software patches. This approach ensures that the kiosk remains current while preserving offline functionality for daily operation.

A mobile application version of the system can be developed to extend accessibility beyond physical kiosks. A lightweight mobile app operating on similar logic and dataset structure can allow students to access career guidance from personal devices while maintaining offline support.

Integration with government education and skill development schemes represents another significant future enhancement. Linking recommended careers with relevant government training programs, scholarships, and skill certification schemes can provide students with actionable pathways rather than only informational guidance. This integration can strengthen the practical usefulness of the system.

Advanced voice interaction capabilities can also be introduced. Future versions may support speech-to-text input, allowing students to answer questions verbally. Natural Language Processing (NLP) techniques can enable conversational interaction, making the system more user-friendly and inclusive.

Additional analytics features can be incorporated to support educational planning. Aggregated and anonymized usage data can provide insights into popular career interests, skill gaps, and regional trends. Such information can assist educators and policymakers in designing targeted training programs.

Security and data management can also be enhanced by incorporating encryption for locally stored data and secure update mechanisms. While the system currently does not store personal data, future versions may include optional user profiles, which would require stronger data protection measures.

Overall, these future enhancements will make the Smart Career Guidance Kiosk more intelligent, scalable, and impactful. By progressively incorporating advanced technologies while retaining its core offline and low-cost design philosophy, the system can evolve into a comprehensive career guidance platform for rural and underserved communities.

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