

CAREER GUIDANCE AND SKILL GAP ANALYZER**Gayathri V**

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ABSTRACT

The Career Guidance and Skill Gap Analyzer is a web-based application developed to assist students in selecting suitable career paths based on their skills, academic performance, and interests. Many students face confusion in choosing the right career due to lack of proper guidance and awareness about industry requirements. This system addresses that problem by providing an efficient and user-friendly platform for career analysis.

The application collects user inputs such as skills, marks, and interests, and processes them using JavaScript logic to recommend appropriate career options. It also performs skill gap analysis and presents the results through graphical visualization, helping students identify areas for improvement. Additionally, the system provides a structured learning roadmap, high-demand job roles, and course recommendations with their advantages and disadvantages.

The project is developed using HTML, CSS, and JavaScript with modern UI/UX design principles to ensure an interactive and responsive user experience. Overall, this system helps students make informed career decisions and improve their skills to meet industry demands.

Keywords:

Career Guidance, Skill Gap Analysis, Career Recommendation System, Web-Based Application, Student Career Planning, Skills Assessment, Data Visualization, Learning Roadmap, Job Roles, UI/UX Design

I. INTRODUCTION

In today's rapidly evolving digital world, choosing the right career path has become a major challenge for students. With the emergence of new technologies and job roles, students often lack awareness about the skills required for different careers. As a result, many students make decisions without proper guidance, leading to confusion and mismatched career choices.

The Smart Career Guidance and Skill Gap Analyzer is developed to address this issue by providing a structured and efficient solution. This web-based application helps students identify suitable career options based on their skills, academic performance, and interests. The system analyzes user input and recommends appropriate career paths using predefined logic. In addition to career recommendations, the system performs skill gap analysis to identify areas where improvement is needed. It also provides a learning roadmap, high-demand job roles, and course suggestions to support skill development.

The project is designed using HTML, CSS, and JavaScript with modern UI/UX principles, ensuring a user-friendly and interactive experience. This system aims to simplify career decision-making and help students align their skills with industry requirements.

Students and job seekers often experience confusion when choosing a career path due to the absence of proper guidance and limited awareness of industry requirements. Many individuals lack clarity about the skills needed for specific job roles and struggle to identify the gap between their existing abilities and required competencies. Existing platforms typically provide only general information without personalization, making it difficult for users to receive accurate recommendations. Additionally, learning paths are not well structured, forcing users to depend on multiple sources for career guidance and skill development. This fragmented approach is time-consuming and inefficient, highlighting the need for a unified system that can provide personalized career guidance, skill gap analysis, and structured learning support within a single platform.

III. EXISTING SYSTEM

The existing system for career guidance is largely manual and unstructured, relying on teachers, peers, online resources, and personal assumptions. Current platforms mainly focus on basic career suggestions, job listings, or

separate learning resources, lacking integration and personalization. As a result, users often receive generic information that does not align with their individual skills or interests. These systems do not provide automated analysis, skill gap identification, or interactive roadmaps, which are essential for effective career planning. The absence of graphical representation further reduces clarity, making it difficult for users to assess their performance. Consequently, the existing approach leads to inefficient decision-making, increased confusion, and reduced accuracy in career selection.

EXISTING SYSTEM – CAREER GUIDANCE & SKILL GAP ANALYZER

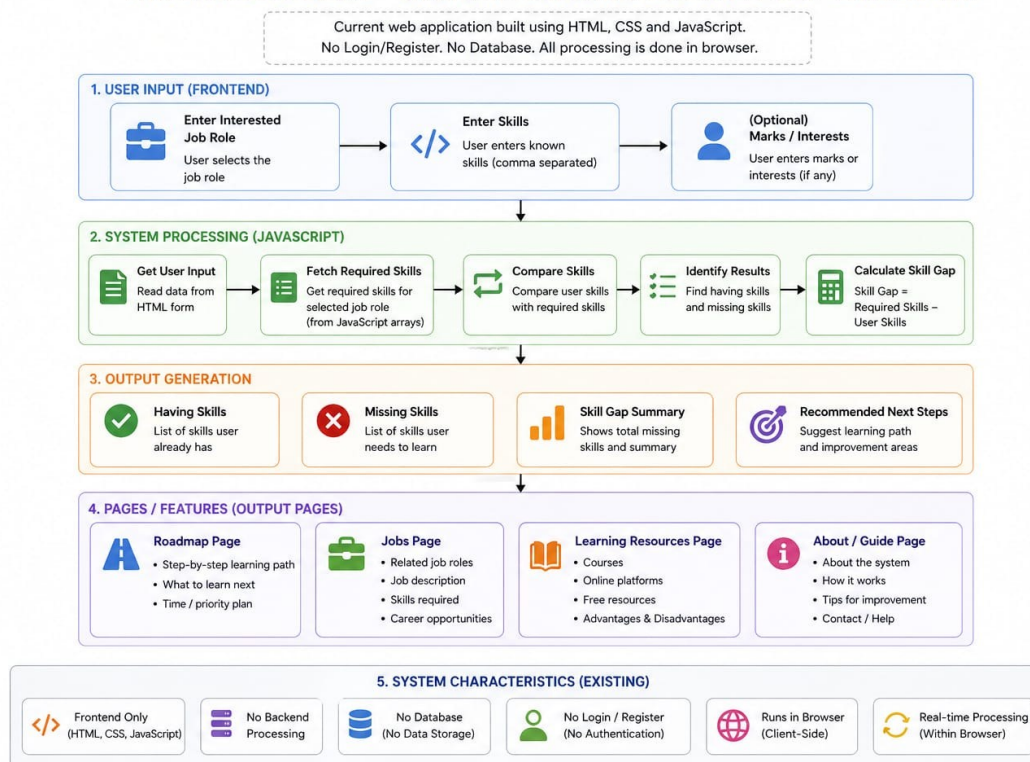


Fig 1 : Block Diagram of Existing System

IV. SYSTEM ARCHITECTURE

The Smart Career Guidance and Skill Gap Analyzer follows a modular architecture to ensure efficient working of the system. It is a web-based application where all processing is done on the client side using HTML, CSS, and JavaScript.

The system starts with the Input Module, where the user enters details such as skills, marks, and interests. This data is then sent to the Processing Module, which analyses the input using JavaScript logic.

Based on the analysis, the system generates suitable career options through the Career Recommendation Module. After that, the Skill Gap Analysis Module compares the user's current skills with required skills and identifies areas for improvement.

The results are displayed in the Dashboard using charts and lists. Additional modules like Roadmap, Jobs, and Courses provide further guidance. The Navigation Module manages movement between different pages.

CAREER GUIDANCE & SKILL GAP ANALYZER

WORKFLOW DIAGRAM (Frontend Based – HTML, CSS, JavaScript)

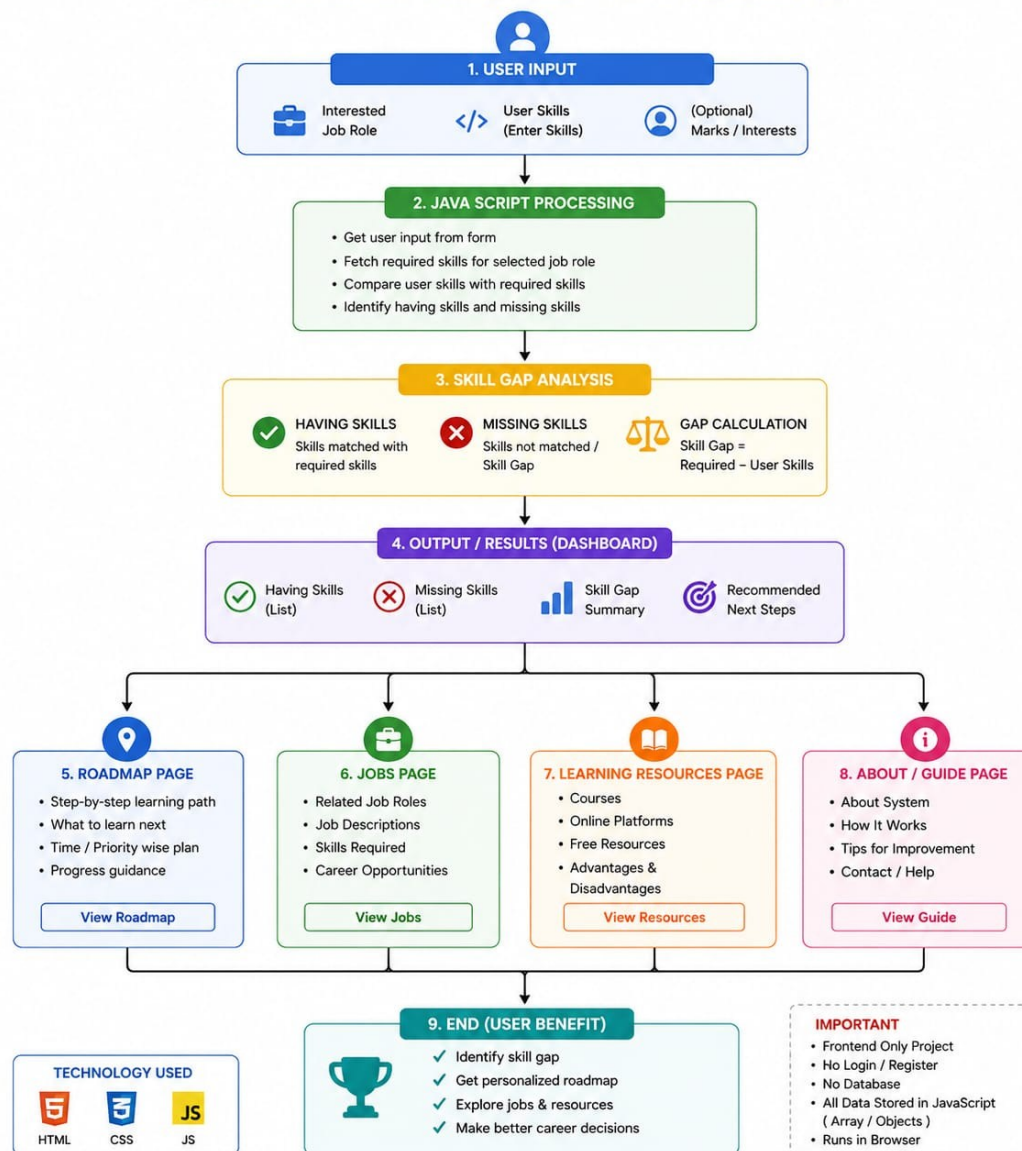


Fig 2 : WorkFlow Diagram

SYSTEM EXECUTION FLOW

The system execution flow describes the step-by-step working of the Smart Career Guidance and Skill Gap Analyzer. The user opens the application and enters details such as skills, marks, and interests in the input form. The system validates the entered data to ensure correctness. The input data is processed using JavaScript logic. The system analyzes the user’s skills and matches them with suitable career roles. Career recommendations are generated and stored for further use. The system performs skill gap analysis by comparing current skills with required skills. The results are displayed on the dashboard using charts and lists. The user can view additional guidance through the roadmap, jobs, and courses pages

V. MODULE DESCRIPTION

The system is composed of several functional modules that work together to deliver accurate and efficient results. The input module collects and validates user data, ensuring that it is suitable for further processing. The data processing module acts as the core of the system, analyzing user inputs and applying logical operations to match skills with career requirements. Based on this analysis, the career recommendation module suggests appropriate career paths tailored to the user's profile. The skill gap analysis module identifies missing or weak skills and prepares data for visualization. The visualization module presents this information in graphical form, enhancing clarity and understanding. The roadmap module provides structured learning steps and tracks user progress, while the jobs module offers insights into high-demand roles in the industry. The courses module recommends suitable learning resources, including their advantages and limitations. Together, these modules ensure a comprehensive and user-friendly system.

VI. IMPLEMENTATION

The system is implemented as a web-based application using HTML, CSS, and JavaScript. User inputs such as skills, marks, and interests are processed using client-side logic to generate career recommendations and skill gap analysis. The results are displayed through charts and dashboards, and data is handled using localStorage to ensure smooth and efficient performance.

VII. METHODOLOGIES:

The Smart Career Guidance and Skill Gap Analyzer is developed using different methodologies to ensure proper design, development, and performance of the system.

Modular Development

The system is divided into different modules such as input, processing, recommendation, and output. Each module performs a specific function, making the system easy to develop and maintain.

Incremental Development

The project is developed step by step. First, the user interface is created, then the logic is implemented, followed by integration and testing. This helps in identifying and correcting errors at each stage.

User-Centered Design

The system is designed by focusing on user needs. The interface is simple, easy to use, and interactive, which improves the overall user experience.

Client-Side Processing

All operations are performed using JavaScript in the browser. This reduces complexity and provides faster response without the need for a backend server.

Data-Driven Approach

The system uses user input such as skills, marks, and interests to generate accurate career recommendations and analysis.

Testing-Based Development

Continuous testing is carried out during development to ensure the system works correctly and efficiently.

PERFORMANCE & TESTING

The system is designed and optimized for high speed, efficiency, and responsiveness to ensure smooth operation under different workloads and user demands. Performance optimization techniques such as efficient coding practices, reduced processing delays, and streamlined data handling are implemented to enhance overall system execution. The responsive design also ensures that the application functions effectively across various devices and screen sizes, providing a seamless user experience. To verify system reliability, comprehensive testing methodologies are applied. Unit testing is conducted to evaluate individual modules and components independently, ensuring that each function performs according to expected requirements. Integration testing is then carried out to confirm that all modules interact correctly when combined, maintaining proper data flow and system coordination. In addition, debugging plays a crucial role in identifying and resolving syntax errors, logical issues, runtime exceptions, and performance bottlenecks. Continuous debugging and testing improve system

stability, reduce failures, and guarantee accurate results. Through these processes, the final system achieves robust, error-free, and dependable performance suitable for real-time applications.

TESTING METHODS

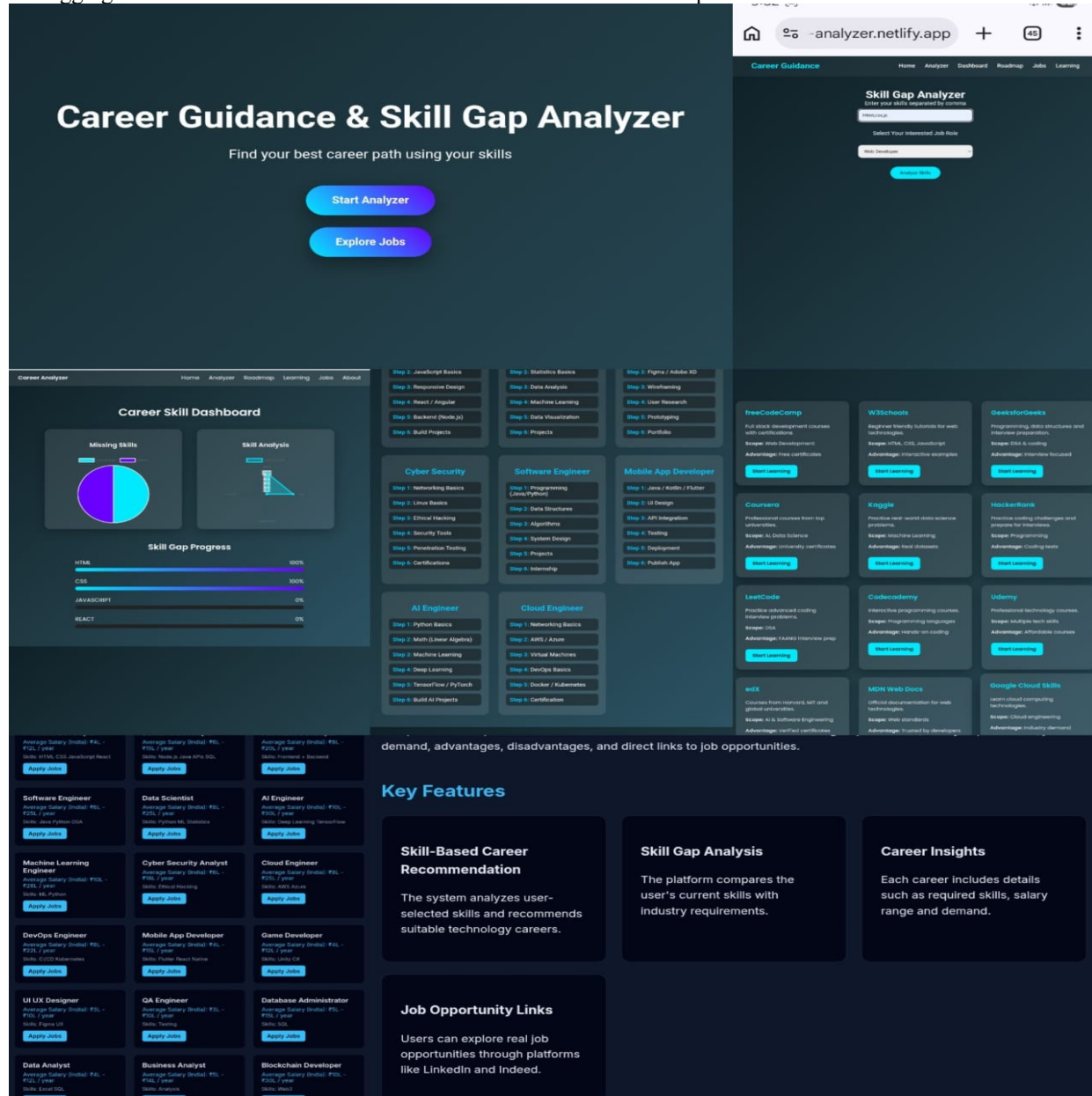
Unit Testing: Each module is tested individually to ensure it works correctly.

Integration Testing: Combined modules are tested to verify proper interaction between components.

System Testing: The 32complete system is tested to ensure it meets all functional requirements.

User Acceptance Testing: The system is tested from the user’s perspective to confirm usability and satisfaction.

Debugging: Errors are identified and fixed to ensure smooth and reliable performance.



VIII.CONCLUSION

The Career Guidance and Skill Gap Analyzer provides an effective solution for students and job seekers by offering personalized career recommendations based on their skills, interests, and academic performance. It helps users identify skill gaps and provides structured learning roadmaps, job insights, and course recommendations to support career development. The system’s user-friendly interface and interactive features enhance user

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engagement and understanding. By integrating multiple functionalities into a single platform, it reduces dependency on traditional methods and improves decision-making efficiency. Overall, the project demonstrates how technology can be used to bridge the gap between academic learning and industry requirements, ultimately supporting professional growth and future success.

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