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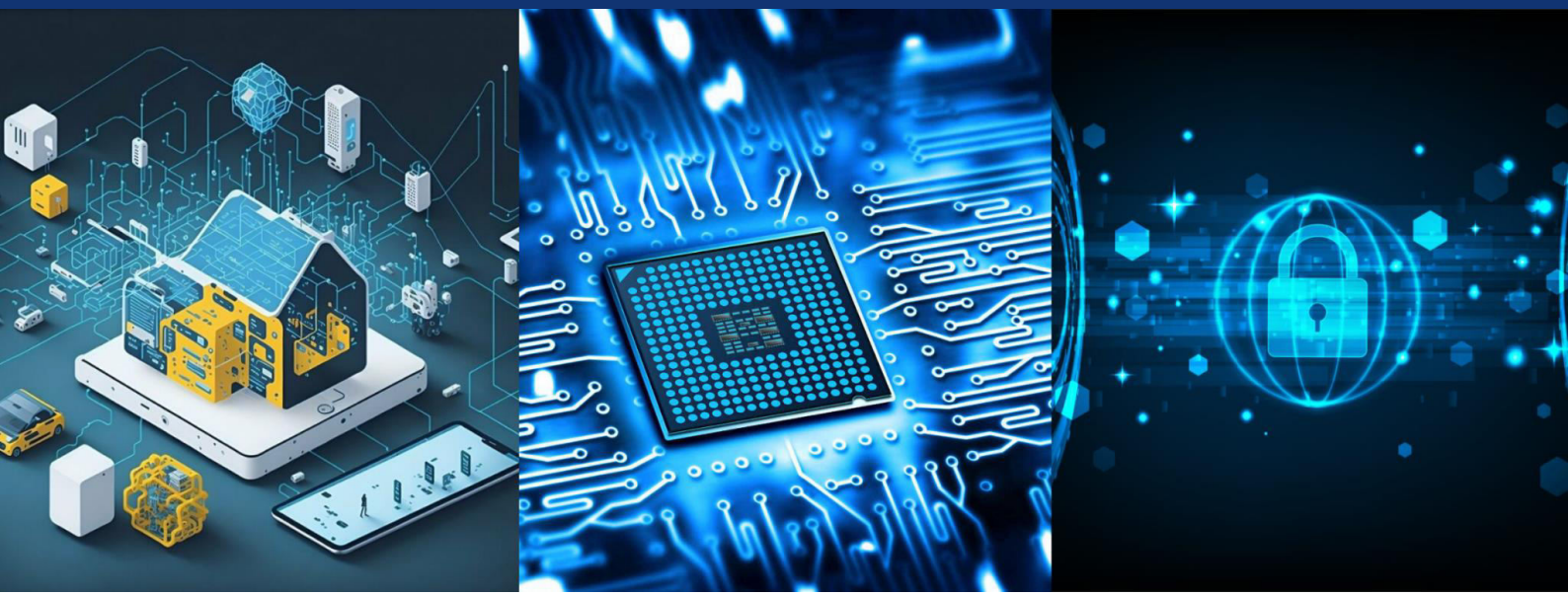

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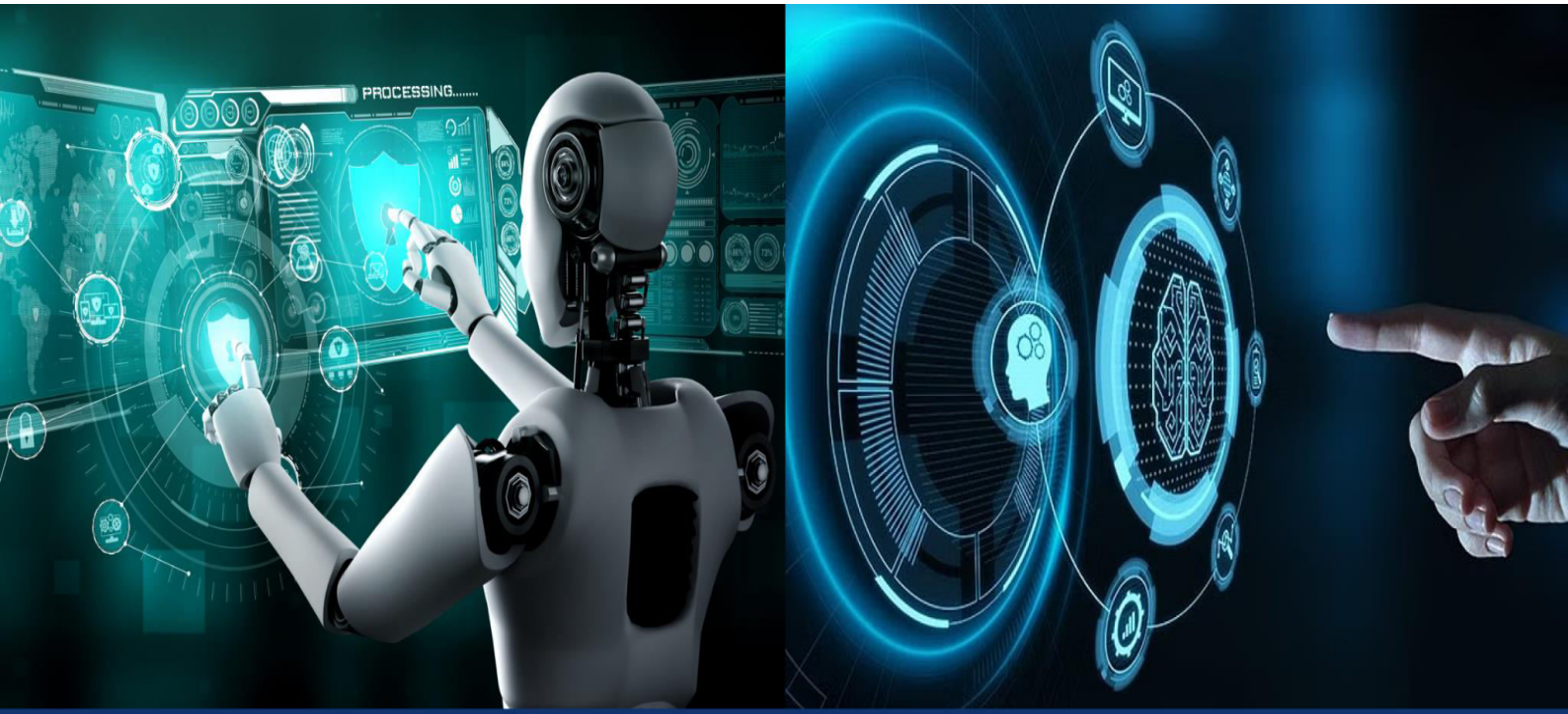

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To Implement an Intelligent Job Portal Analytics and Recommendation System Using Machine Learning

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ABSTRACT: The Smart Job Portal Analytics and Recommendation System is designed to enhance the traditional job search process using Artificial Intelligence and Machine Learning techniques. The system provides intelligent features such as resume evaluation, salary prediction, skill gap analysis, and personalized job recommendations. It analyzes user profiles and job market data to offer data-driven insights that improve employability. The platform also includes city-wise demand analysis and an AI chatbot for real-time interaction. This system bridges the gap between job seekers and recruiters by providing accurate, efficient, and personalized solutions, making the recruitment process faster and more effective..

KEYWORDS: Artificial Intelligence, Job Recommendation System, Machine Learning, Natural Language Processing, Resume Analysis, Skill Gap Detection, Salary Prediction, Data Analytics.

DOMAIN: Artificial Intelligence and Machine Learning

I. INTRODUCTION

The rapid advancement of technology and digital transformation has significantly reshaped the global employment landscape. Organizations increasingly demand specialized skills, while job seekers face challenges in identifying suitable opportunities that align with their qualifications and career goals. Traditional job portals, although widely used, primarily function as information repositories and lack intelligent mechanisms to guide users effectively. One of the major limitations of existing systems is their reliance on keyword-based search and filtering techniques, which often result in irrelevant job recommendations. Additionally, candidates frequently lack awareness regarding industry-specific skill requirements, leading to skill mismatches and reduced employability. Recruiters, on the other hand, encounter difficulties in efficiently screening large volumes of applications. To address these challenges, this research proposes a Smart Job Portal Analytics and Recommendation System that integrates AI-driven methodologies to enhance both job search and recruitment processes. The system employs Machine Learning algorithms for predictive analytics and Natural Language Processing for resume parsing and evaluation. It provides features such as skill gap identification, salary prediction, and personalized job recommendations based on user profiles. The primary objective of this work is to develop an intelligent platform that transforms traditional job portals into data-driven decision-support systems. By offering personalized insights and predictive capabilities, the system aims to improve job matching accuracy, reduce recruitment time, and enhance overall user experience.

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II. LITERATURE REVIEW

"AI-Based Job Recommendation System Using Machine Learning Algorithms" This study focuses on improving job matching accuracy using machine learning techniques. It analyzes user profiles, skills, and preferences to provide personalized job recommendations. The system reduces irrelevant job listings and enhances user satisfaction by suggesting suitable opportunities.

"Resume Analysis Using Natural Language Processing" This research uses NLP techniques to extract important information such as skills, education, and experience from resumes. It helps in matching resumes with job descriptions effectively and automates the screening process, improving recruitment efficiency.

"Skill Gap Analysis for Career Development" This paper identifies the gap between candidate skills and job requirements. It compares user profiles with industry demands and suggests improvements. The system helps users upgrade their skills and improve employability.

"Salary Prediction Using Machine Learning" This study predicts salary based on factors like experience, skills, and job role using regression models. It provides accurate salary insights and helps users make better career decisions.

"Intelligent Job Portal with Personalized Recommendation" This research proposes an AI-based job portal that provides personalized job suggestions. It improves job matching accuracy and reduces search time, enhancing the overall user experience.

III. METHODOLOGY

A.EXISTING SYSTEM

Existing job portals provide fundamental functionalities such as job listing, resume submission, and application tracking. These systems rely on keyword-based matching algorithms to connect job seekers with available opportunities. Recruiters manually review applications or use basic filtering tools to shortlist candidates. Although these systems have simplified the job search process, they lack advanced analytical capabilities and do not provide personalized guidance to users.

B. DISADVANTAGES

1.Absence of intelligent recommendation systems
2.Lack of resume evaluation mechanisms
3.No predictive insights such as salary estimation
4.Inefficient matching based on keyword search
5.Limited personalization
6.Time-consuming manual recruitment process

C. PROPOSED SYSTEM

The proposed system introduces an AI-driven framework that integrates multiple intelligent modules to enhance the recruitment process. The ATS Resume Checker evaluates resumes using NLP techniques and provides feedback for improvement. The Salary Prediction module employs regression models to estimate expected salaries based on user attributes. The Skill Gap Analysis module identifies missing skills by comparing user profiles with job requirements. The Job Recommendation Engine uses similarity-based matching and machine learning techniques to suggest relevant job opportunities. Additionally, the City-wise Demand Analysis module provides insights into regional job market trends. The system continuously learns from user interactions, improving its predictive accuracy and recommendation quality over time.

D. ADVANTAGES

1.Personalized job recommendations based on user profile
2.Automated resume analysis with improvement suggestions
3.Accurate salary prediction using user data
4.Identification of skill gaps for career growth
5.Faster and more efficient recruitment process

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E. DESIGN OF THE SYSTEM

The proposed system is designed using a layered architecture to ensure efficiency and scalability. It consists of frontend layer, backend layer, database, and machine learning.

Frontend Layer

Provides user interface for registration, login, and job search.

Backend Layer

Handles application logic, user requests, and system processing.

Database Layer

Stores user profiles, resumes, and job-related data securely.

Machine Learning Module

Performs tasks like salary prediction and skill gap analysis.

Recommendation Engine

Suggests suitable jobs based on user data and preferences.

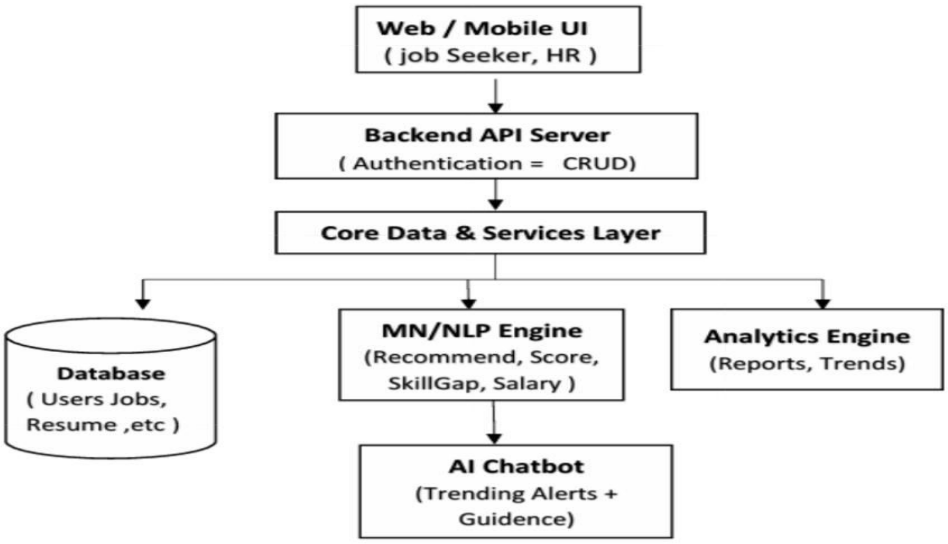

Fig.1 shows the architecture of the Unlike traditional systems, the proposed model integrates multiple AI-driven features into a single platform. Existing systems rely on static keyword matching, whereas the proposed system utilizes machine learning algorithms for dynamic and personalized recommendations.The integration of resume analysis, salary prediction, and skill gap detection significantly enhances the system's capability to provide comprehensive career guidance.

IV. IMPLEMENTATION

MODULE DESCRIPTION

1. User Module

This module manages user registration, login, and profile creation. It allows users to securely access the system and update their personal and professional details.

2. Resume Analysis Module

This module evaluates user resumes using Natural Language Processing (NLP). It analyzes content, identifies keywords, and provides suggestions to improve resume quality.

3. Salary Prediction Module

This module estimates the expected salary using Machine Learning models. It considers factors like skills, experience, and job role to provide accurate predictions.

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4. Skill Gap Module

This module identifies missing skills by comparing user profiles with job requirements. It helps users understand what skills they need to improve.

5. Recommendation Module

This module suggests relevant job opportunities based on user data. It uses intelligent algorithms to provide personalized job recommendations.

6. Analytics Module

This module provides insights and reports based on user activity and job market data. It helps users make better career decisions.

7. Database Module

This module stores and manages all system data, including user profiles, resumes, and job listings. It ensures data security and efficient retrieval.

V. RESULT

The proposed system was evaluated based on its ability to provide accurate job recommendations and predictive insights. Experimental results indicate that the system significantly improves job matching accuracy compared to traditional keyword-based systems.

The resume analysis module effectively identifies missing keywords and provides actionable suggestions. The skill gap analysis module helps users understand industry requirements and improve their profiles. The salary prediction model provides realistic estimates based on user inputs. User feedback highlights improved satisfaction due to personalized recommendations and real-time insights.

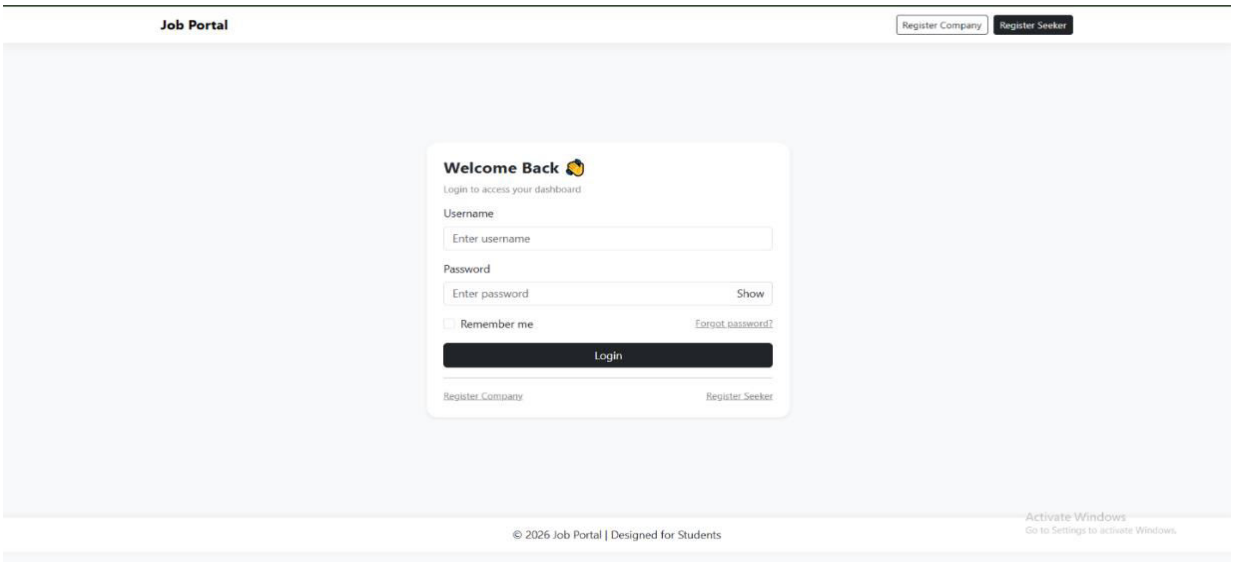

Figure No:1 Login page

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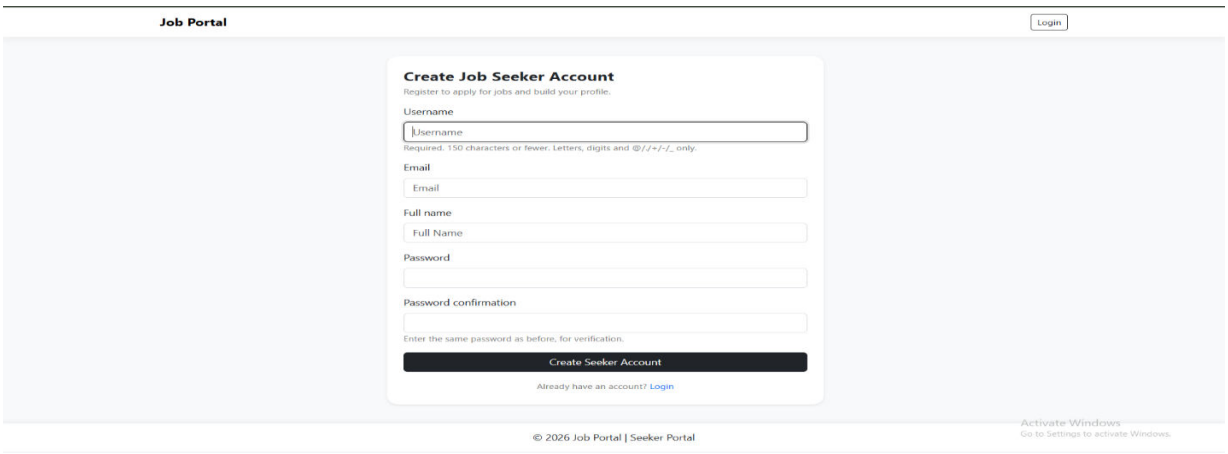

Figure No:2 Job Seeker Account

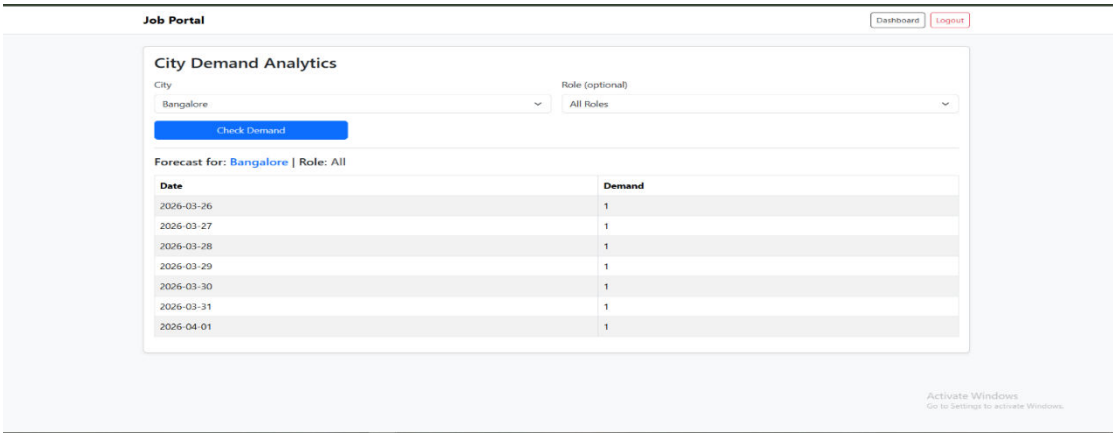

Figure No:3 City Demand Analytics

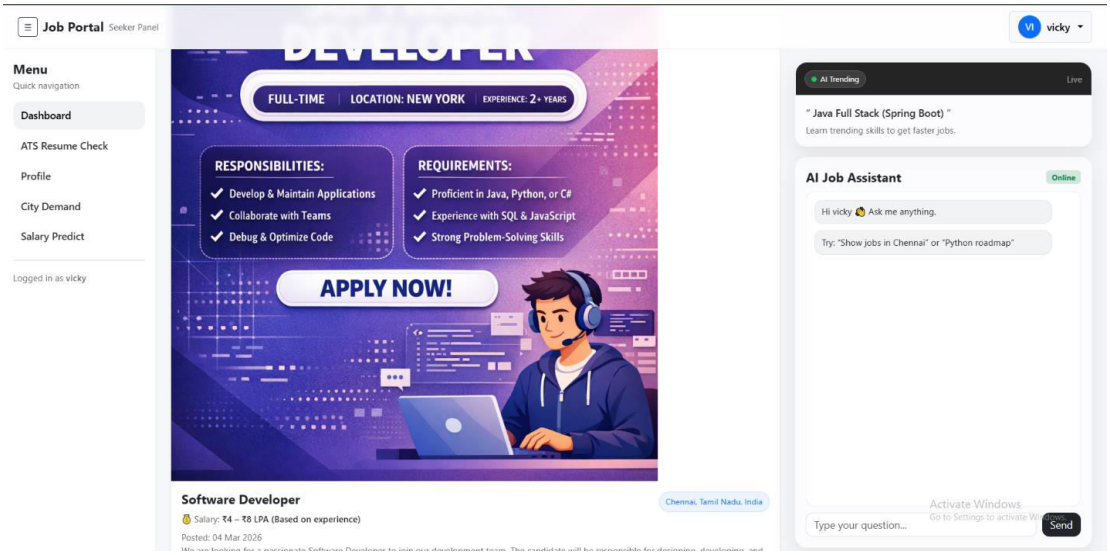

Fig No:4 Job Portal Seeker Panel

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VI. CONCLUSION

The proposed Smart Job Portal System enhances the recruitment process by using Artificial Intelligence and Machine Learning techniques. It provides intelligent features such as resume analysis, job recommendation, salary prediction, and skill gap identification. The system helps The system can be improved by adding advanced technologies such as deep learning for better accuracy in predictions and recommendations. Real-time job market analysis can be included to provide updated information. A mobile application can be developed for better accessibility. Additionally, integrating an advanced AI chatbot can offer improved guidance and user interaction.

VII.FUTURE ENHANCEMENT

The proposed system can be further improved by integrating advanced technologies such as deep learning models for more accurate job recommendations and resume analysis. Real-time data processing can be added to provide up-to-date job market trends. The system can also include an online learning platform to help users improve their skills. Integration with mobile applications can enhance accessibility. Additionally, implementing advanced AI chatbots with better interaction capabilities can provide more personalized guidance. These enhancements will make the system more efficient, intelligent, and user-friendly in the future. The system can be improved by adding advanced technologies such as deep learning for better accuracy in predictions and recommendations. Real-time job market analysis can be included to provide updated information. A mobile application can be developed for better accessibility. Additionally, integrating an advanced AI chatbot can offer improved guidance and user interaction.

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