



LEARNING PATH DASHBOARD FOR ENHANCING SKILLS

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ABSTRACT – *Choosing the right skills and learning resources has become a major challenge for students due to the rapid growth of technology and the increasing demand for industry – specific knowledge. Most learners spend considerable time searching across different platforms to identify suitable courses, certifications, and career paths. To address this problem, this paper presents an AI-Powered Learning Path Dashboard for Enhancing Skills, a web-based application that provides personalized learning guidance based on the user's interests and career objectives. The system is developed using Python and Streamlit, while SQLite is used for managing user information. A Large Language Model (LLM) integrated through the Groq API analyzes user inputs and generates customized learning roadmaps, recommended skills, project ideas, certification suggestions, career opportunities, estimated learning duration, and AI-based learning flowcharts. The application combines*

these features into a single interactive dashboard, enabling learners to access all recommendations in one place. By providing structured and personalized guidance, the proposed system reduces the effort required to plan a learning journey and helps users focus on acquiring relevant skills for their desired careers. The developed application demonstrates that AI-based recommendation systems can improve learning efficiency, support informed career planning, and encourage continuous skill development.

KEYWORDS: *Personalized Learning, Learning Path Dashboard, Skill Enhancement, Career Guidance, Large Language Model (LLM), Streamlit, Python, SQLite.*

INTRODUCTION

The rapid growth of digital technologies has significantly changed the way students acquire knowledge and develop professional skills. With the increasing availability of online courses, tutorials, and certification programs, learners have access



to a vast amount of educational content. However, selecting the right learning resources and following a structured path toward a specific career remains a major challenge. Most existing learning platforms provide general course recommendations without considering the learner's current knowledge, career aspirations, or individual learning needs. As a result, students often spend considerable time searching for suitable resources and may struggle to build the skills required for industry-oriented careers.

To overcome these challenges, this paper proposes an AI-Powered Learning Path Dashboard for Enhancing Skills, a web-based application that provides personalized learning recommendations based on the user's interests and career goals.

The system is developed using Python, Streamlit, And SQLite while a Large Language Model (LLM) integrated through the Groq API generates customized learning roadmaps, skill recommendations, project ideas, certification suggestions, career opportunities, estimated learning duration, and AI-generated learning flowcharts. By combining these features into a single interactive dashboard, the proposed system simplifies the learning process, supports informed career planning, and helps learners systematically enhance

their skills according to current industry requirements.

LITERATURE SURVEY

The increasing demand for technical skills has encouraged researchers to develop intelligent learning systems that help learners identify suitable educational resources and career paths. Traditional online learning platforms provide access to a large collection of courses and certifications but often fail to offer personalized guidance based on an individual's interests and career objectives. Recent advancements in Artificial Intelligence (AI), Natural Language Processing (NLP), and Large Language Models (LLMs) have made it possible to build educational applications that understand user requirements and generate customized learning recommendations. These technologies enable learners to receive structured learning roadmaps, skill recommendations, and career guidance, making the learning process more organized, efficient and aligned with current industry needs.

RELATED WORK

Several studies have explored AI-based recommendation systems to improve personalized learning and career guidance. Earlier approaches mainly relied on rule-based systems and collaborative filtering



techniques to recommend courses based on user preferences or previously completed content. More recent research has focused on applying Large Language Models to generate adaptive learning paths and provide intelligent educational support. Although many online learning platforms offer recommendation features, they generally provide only course suggestions and do not generate complete learning roadmaps, certification guidance, project recommendations, and career predictions. These limitations highlight the need for a more comprehensive learning support system that integrates Ai-driven recommendations with an interactive dashboard to guide learners throughout their skill development journey.

EXISTING SYSTEM

Existing learning platforms such as Coursera, Udemy, and LinkedIn Learning provide learners with a wide range of educational resources and certification programs. However, these platforms primarily recommend courses based on user activity or popular content and often lack personalized guidance tailored to individual career goals. Learners must independently search for suitable resources, decide the order of learning, and identify relevant projects and certifications. This process can be time-consuming and may lead to confusion, making it difficult for users to

develop a clear and effective learning plan for achieving their desired career objectives.

PROPOSED SYSTEM

The proposed AI-Powered Learning Path Dashboard for Enhancing Skills is designed to provide personalized learning recommendations through an intelligent web-based platform. Developed using python, Streamlit, SQLite and the Groq Large Language Model (LLM) API, the system analyzes the user's selected skills and career goals to generate customized learning flowcharts. All recommendations are presented through an interactive dashboard, allowing users to access structures learning guidance in one place. By providing personalized and real-time recommendations, the proposed system simplifies career planning, supports continuous skill development, and helps learners prepare for industry-oriented careers more effectively.

SYSTEM ARCHITECTURE

The proposed Learning Path Dashboard for Enhancing Skills follows a client-server architecture that integrates an interactive web interface with an Ai-based recommendation engine. The system begins when a user registers or logs into the application and enters the desired skill and career goal through the web interface. The



application server validates the user input and forwards it to the Groq Large Language Model (LLM) API for processing. Based on the given information, the ai model generates personalized learning recommendations, including a learning roadmap, recommended technical skills, project ideas, certification suggestions, career opportunities, estimated learning duration, and an AI-generated learning flowchart. The generated results are then returned to the application server and displayed on the user's dashboard. User information and generated recommendations are stored in the SQLite database for future access and efficient data management.

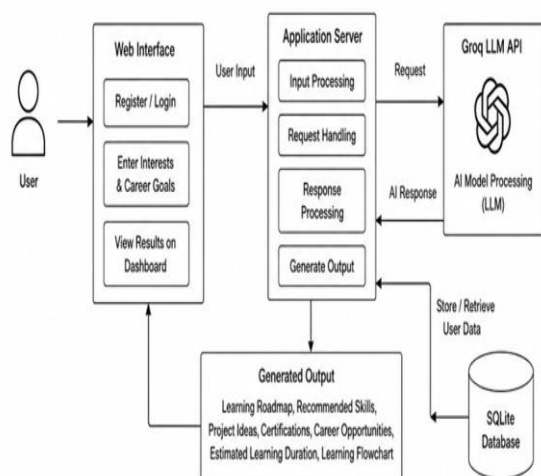


Fig 1: System Architecture

METHODOLOGY DESCRIPTION

The proposed Learning Path Dashboard for Enhancing Skills adopts a systematic

methodology to provide personalized learning recommendations and career guidance based on the user's interests and professional goals. The process begins with user registration and secure authentication, after which the user logs into the application and enters the skill they wish to learn along with their desired career role. The application validates the input and forwards it to the Groq Large Language Model (LLM) API, which analyzes the information and generates a personalized learning roadmap. Based on the user's requirements, the system recommends the technical skills to be acquired, project ideas, certification programs, career opportunities, estimated learning duration, and an AI-generated learning flowchart that presents the learning sequence in a structured manner. The application is developed using Python and the Streamlit framework, while SQLite is used to store user details and manage application data efficiently. The generated recommendations are displayed through an interactive dashboard, allowing users to access all learning-related information in a single platform. By combining an intuitive user interface with AI-based recommendation capabilities, the proposed system helps learners identify appropriate learning resources, organize their learning process, and make informed career decisions. This methodology reduces the



time required to search for relevant educational content, supports continuous skill development, and provides a scalable solution for personalized learning and career planning.

RESULTS AND DISCUSSION



Fig 2: Home Page

The home page serves as the entry point of the application, introducing the main features of the learning path Dashboard and providing users with options to register, log in, or recover their account credentials.

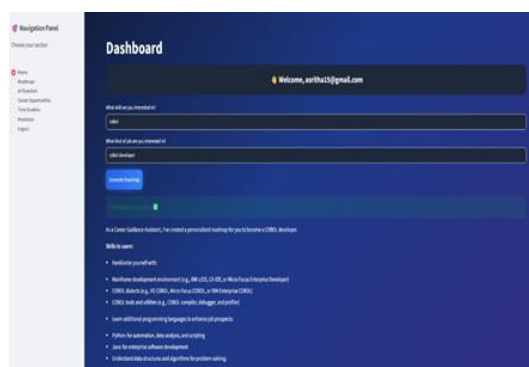


Fig 3: Dashboard Page

The dashboard allows users to enter their preferred skill and target career role, after

which the system generates personalized learning recommendations based on the provided inputs.

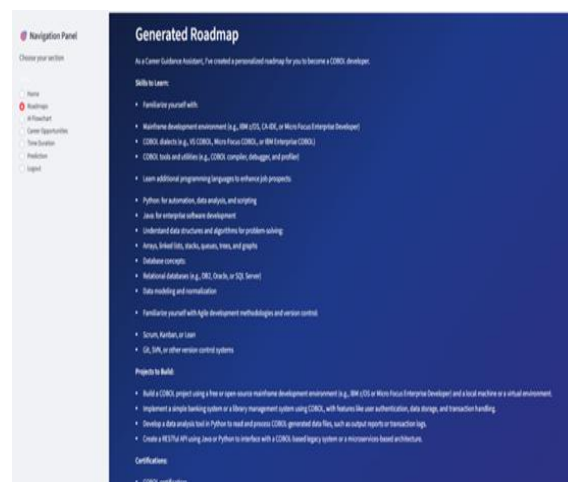


Fig 4: AI-Generated Learning Roadmap

This page presents a structured learning roadmap that outlines the recommended skills, projects, certifications, and learning resources required to achieve the selected career goal.

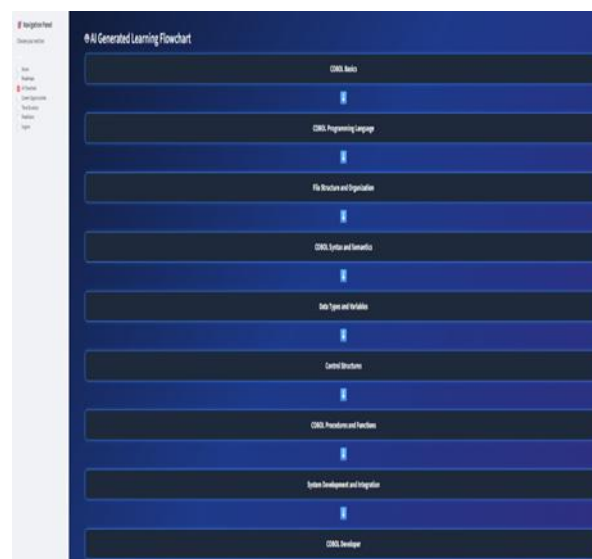


Fig 5: AI-Generated Learning Flowchart



This AI-generated learning flowchart visually illustrates the recommended sequence of topics, enabling users to follow a clear and organized learning progression.

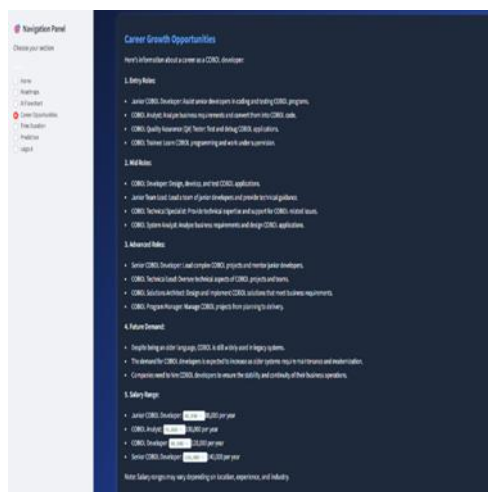


Fig 6: Career Opportunities Page

This page provides information about career opportunities related to the selected domain, including job roles, required skills, future demand, and expected salary ranges.

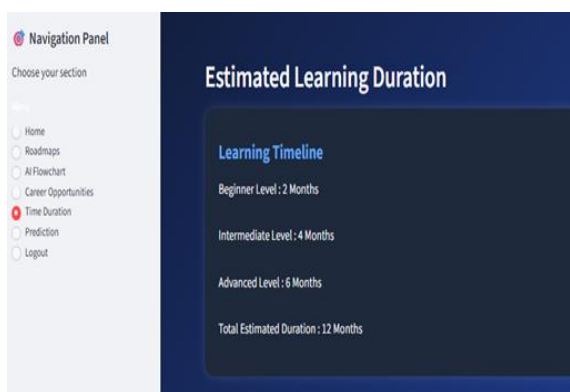


Fig 7: Estimated Learning Duration Page

The estimated learning duration page presents an approximate timeline for completing beginner, intermediate, and

advanced learning stages, helping users plan their learning schedule effectively.

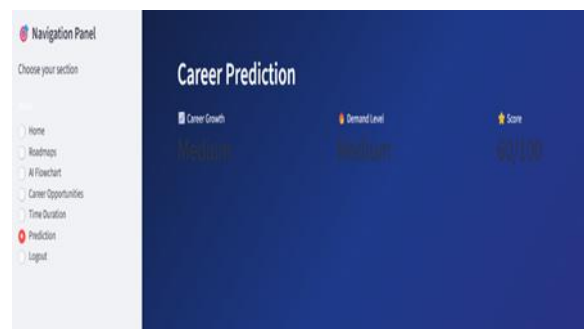


Fig 8: Career Prediction Page

The career prediction page evaluates the selected career path by presenting indicators such as career growth potential, market demand, and an overall suitability score to assist users in making informed career decisions.

CONCLUSION

The proposed Learning Path Dashboard for Enhancing Skills provides a simple and effective solution for personalized learning and career guidance. It generates customized learning roadmaps, skill recommendations, and career insights based on user preferences. The system helps learners plan their learning journey efficiently and supports continuous skill development.

FUTURE SCOPE

The system can be enhanced by integrating more online learning platforms and real-time job market data. Future versions may



include adaptive recommendations based on user's learning progress and performance. Developing a mobile application and supporting multiple languages will further improve accessibility and user experience.

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