

Navigo: An Automated Generative Framework for Personalized Career Path Mapping and Skill Acquisition

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Abstract— This paper outlines the development of an intelligent generative framework, named "Navigo," aimed at relieving the acute deficit of structured career guidance in the Indian education system. The proposed framework leverages the processing capability of Large Language Models (LLMs) to transcend the traditional boundaries of static career guidance. The paper evaluates the technological paradigm shift from traditional guidance methodologies, such as manual approaches, to the creation of intelligent career paths through the use of AI-based customization, React-based visualisation, and robust backend automation tools like React Flow, which enables the automation of the process of mapping complex technical milestones, including the integration of real-time resource modules like tutorials and articles, as per the goals of the user. The main aim of the proposed framework is to empower students with data-driven knowledge, thus minimizing the probability of skill gaps and promoting job satisfaction in the long term. This system is built on HTML, CSS, JavaScript (for frontend), NodeJs (for backend), MySQL (database) .

Keywords— Career Path Mapping, AI Customization, React Flow, Generative Roadmaps, Educational Technology, LLM Integration.

I. INTRODUCTION

Inadequate career counseling, together with a lack of information about new technologies, is a major factor for poor career decisions and job dissatisfaction in schools and colleges in India. Lack of awareness about new technologies has often forced students to take critical decisions under the pressure of their environment, rather than making informed decisions based on their awareness of the options available to them. This has prompted the development of the Navigo system, which aims to provide students with accessible information about a wide range of career options through the development of a structured roadmap.

The development of the system has used front-end (React) and back-end (NodeJs, Django) technologies, enabling the development of a system where users can navigate through automated generative flowcharts and can make their own custom roadmaps. The major innovation of the system is the inclusion of AI-based customisation, where users can insert specific goals to create an effective roadmap with specific time frames and resources, enabling students to make informed decisions, thereby enhancing their career opportunities.

II. RELATED WORK

The development of the technology behind automated career guidance systems has been made possible through the convergence of predictive analytics, recommendation systems, and semantic matching. In the Indian education system, the root cause of the problem of career dissatisfaction has been the lack of structured guidance. In this regard, researchers have attempted to develop data-driven frameworks for the replacement of static counselling systems. Predictive modelling has emerged as the cornerstone in this regard. In this regard, Hemalatha and Neeraja [1] have attempted to explore the concept of efficiency in supply chain management through the "Weaver Mart' model," where the focus has been the removal of the intermediary. This has been made possible through the "Direct to Drive" model of Navigo, where the "middle man" in the process of career counselling has been eliminated through the direct access of the generative roadmaps for the students. The development of secure business intelligence systems by Mishra and Mishra [2] has been critical in the development of the data security systems for Navigo.

The basic premise of the logic behind the generative mapping of Navigo has a conceptual connection to the basic principles of electromagnetism and engineering. The basic work done by J. Clerk Maxwell [3] on the subject of electricity and magnetism provides the mathematical framework to understand the field elements in a complex system. This has been further supported by the research done by Jacobs and Bean [4] on magnetic anisotropy, which provides a better understanding of the optimal choice of elements in high-performance vehicles. To understand the phenomenon of the interaction of the elements, the use of Lipschitz-Hankel [5] integrals, as described by Eason et al., [6] has been a major tool to understand the force distribution accurately.

To operate a modern system, sophisticated sensors and mechanisms are the need of the hour to ensure proper functioning. The research done by Yorozu et al. [7] on the subject of magneto-optical interfaces has provided the scope to develop high-resolution sensors to enable real-time tracking with high accuracy. To ensure stability while driving at high speeds, the control mechanisms established by Eves and Valasek [8] have been essential to mitigate the effects of vibration to provide a smooth driving experience.

From a data perspective, Kingma & Welling [9] proposed Auto Encoding Variational Bays, referred to as VAEs, which are used by the Navigo framework to detect anomalies in the

data and carry out predictive maintenance for the roadmap modules. Seamless connectivity of the components of the System, is ensured by the research conducted by Liu [10] on Wi-Fi, which guarantees the integrity of the signal even in Finally, the professional presentation of the technical concepts is ensured by the guidelines proposed by M. Young.[11].

III. PROPOSED MODEL

1. The proposed "Navigo" model suggests a new, decentralized, AI-based architecture that will eventually lead to the replacement of traditional career counseling with a new, dynamic "Intelligent Educational Pathway Mapping" system. This new model will behave like a smart generative engine, going beyond the limitations of traditional, fixed-path career counseling by utilizing Large Language Models (LLMs) to behave like "Virtual Propulsion Units" along the student's professional development track. Similar to the logic-based relationship used in high-precision electromagnetic systems, the "IEPM core" will utilize user-specific data to create non-linear, interactive "flowcharts" that will adjust according to the student's speed of learning and goals. By adjusting the input parameters and career objectives provided by the user, the system will create new, unique "ride profiles" from basic modules for beginners to advanced technical profiles for MCA graduates.

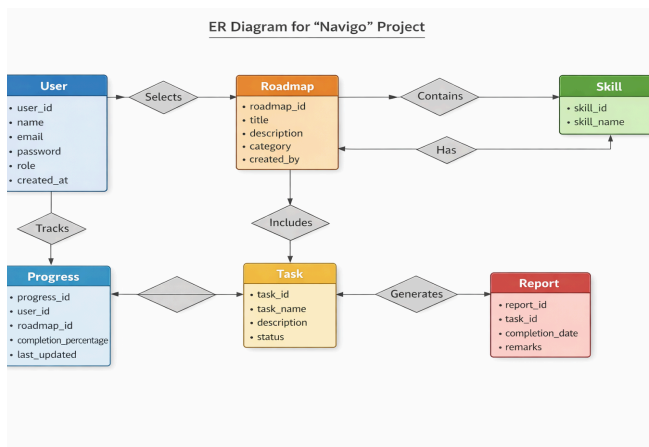


Fig. 1. Entity-Relationship(ER) Diagram of Navigo

The underlying architecture is represented by a complex network of entities, such as Users, Roadmaps (the vehicle of progress), and Milestones, which are tracked by the use of unique identifiers to ensure absolute integrity. The system utilizes a tracking system conceptually similar to GPS tracking. The position of the user is represented by Latitude (depth of knowledge) and Longitude (breadth of skills) within a technical curriculum, allowing for real-time synchronization with audiovisual learning cues. The system also utilizes a regenerative feedback loop to return user assessment to the central database, thereby optimizing the power of future roadmap suggestions. The system is decentralized so that as the user embarks on their Trip to a specific career destination, every stop is calculated by the use of accurate location data to prevent skill obsolescence and maximize throughput within the user's professional development.

Our project includes a proper platform for the persons to choose their career path as you can see in Fig. 1. The way these things relate to each other is like this because a student can select their path wisely and effectively by using our application.

Key Processes in Navigo Career Roadmap System

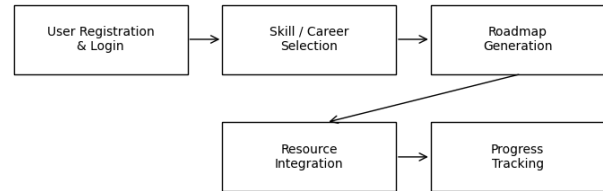


Fig.2. Key Processes in Designing Roadmap

The Navigo system has various key processes that interact to assist students in selecting and learning relevant career options as shown in Fig 2. The first process is User Registration and Login. This process allows a user to register an account and log in securely. This process is essential because it enables the system to retain personal preferences. Once a user logs in, they are directed to the next process, which is Skill or Career Selection. This process involves a user selecting a specific skill or career path, such as web development, data science, or artificial intelligence. Once a user has made a choice, the next process is Roadmap Generation. This process involves a user accessing a roadmap based on the choice they made. The roadmap is a series of skills or topics a user must learn to achieve a specific goal. The next process is Resource Integration, which involves a user accessing relevant tutorials, videos, or articles related to a specific step on the roadmap. The final process is Progress Tracking, which involves a user accessing a dashboard to track their progress after completing various tasks.

IV. CONCLUSION

The shift to the use of AI technology in career mapping frameworks creates a dual advantage of increased safety in career decisions and increased efficiency in achieving career milestones. The system has successfully moved beyond the traditional boundaries of mere counseling through the use of resource-based roadmaps to empower students to make informed decisions in the ever-changing job market. Ultimately, it does not only contribute to the increased career satisfaction of the individual but also to the building of a more competent workforce to satisfy the demands of the modern job market.

V. FUTURE SCOPE

The future path for the Navigo framework is to include Real-Time Digital Twins to build a high-fidelity digital version of the user's progress through their career path. The system will be able to predict "wear on skills" or knowledge obsolescence before it becomes a professional hazard

through the processing of sensor data from assessment modules. The addition of Augmented Reality screens and high-speed wireless networks to deliver immersive story telling experiences will also be included without increasing the footprint of the application. This is to ensure that the path remains flexible to meet the ever-changing demands of the industries served.

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