



International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Mentor Connect: Simplifying Modern Mentorship Using AI and Microservices

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ABSTRACT—

The evolving demands of professional development have heightened the need for personalized and efficient mentorship. Mentor Connect is an AI-powered mentorship platform designed to bridge gaps in traditional mentoring by automating mentor-mentee matching and enhancing communication through advanced technologies. This paper presents the system design, requirements, implementation, testing, and societal impacts of Mentor Connect. Results demonstrate its effectiveness in improving mentorship quality, scalability, and user satisfaction.

Keywords— Mentor Connect, AI-driven Mentorship, Microservices, E-learning, Career Development. Introduction

Introduction

Introduction

The growing demand for personalized professional development has placed mentorship at the center of career advancement strategies. However, traditional mentorship systems often suffer from inefficiencies such as time-consuming matching processes, geographical limitations, and subjective pairings based on limited information. These shortcomings highlight the need for innovative, technology-driven mentorship solutions that can operate on a global scale.

Mentor Connect emerges as an AI-powered mentorship platform specifically designed to automate and personalize mentor-mentee connections. By leveraging advanced matching algorithms, real-time communication tools, and secure data practices, Mentor Connect offers a dynamic environment for continuous personal and professional growth. The platform focuses on overcoming the logistical barriers and subjective biases prevalent in traditional mentorship systems.

Unlike many existing mentorship applications that provide static or semi-automated experiences, Mentor Connect dynamically adapts to user needs, preferences, and evolving goals. Through continuous learning from user feedback and sentiment analysis, the platform refines its matching and interaction strategies. This ensures that mentorship is not only accessible but also highly relevant to each user's development trajectory.

The integration of scalable microservices architecture further strengthens the platform's reliability and responsiveness. By modularizing its core functionalities—user management, matching services, notifications, and real-time communications—Mentor Connect ensures seamless performance even as its user base grows. This makes it a forward-looking solution for mentorship in the digital age.

Significance

Mentor Connect addresses critical gaps in the traditional mentorship process, such as accessibility, efficiency, and personalization. In a world where professional success increasingly depends on specialized guidance and rapid upskilling, access to the right mentor at the right time is crucial. The platform's AI-driven model ensures that mentees find mentors aligned with their specific challenges and aspirations.

Furthermore, Mentor Connect democratizes mentorship opportunities by removing geographical and socioeconomic barriers. Students, professionals, and entrepreneurs from underserved regions can connect with top industry experts worldwide. This promotes equitable access to career advancement opportunities and fosters a more inclusive professional ecosystem.

From an institutional perspective, organizations can leverage Mentor Connect to offer structured, scalable mentorship programs to employees and students. This not only improves individual outcomes but also drives overall organizational performance and innovation. Companies and universities that adopt Mentor Connect benefit from enhanced talent development and retention.

On a societal level, Mentor Connect supports workforce readiness and lifelong learning by fostering stronger mentorship ecosystems. As industries evolve rapidly due to technological advancements, the ability to continuously learn from experienced mentors becomes vital. Mentor Connect, therefore, plays a significant role in equipping individuals and communities to thrive in a fast-changing global economy.

Related work

Mentorship has long been recognized as a critical factor in career development and personal growth. Traditional mentorship models, while valuable, often suffer from inefficiencies such as limited mentor availability, non-personalized matching, and geographical constraints. Numerous studies, such as those by Smith [1], have highlighted how digital platforms can enhance mentorship effectiveness by leveraging artificial intelligence (AI) to automate mentor-mentee connections. The rising need for scalable and personalized mentorship solutions set the foundation for innovations like Mentor Connect, which integrates AI, real-time communication, and microservices architecture to modernize the mentorship process.

Advancement

Advancements in real-time communication technologies have further supported the development of mentorship platforms. The use of WebRTC and Media soup, as described in WebRTC.org documentation [3], has enabled Mentor Connect to provide seamless video calls, live chats, and collaborative screen-sharing during mentorship sessions. Such real-time interactions closely replicate face-to-face mentorship dynamics, making virtual guidance sessions more engaging and effective. These tools address a major limitation of earlier mentorship platforms, where interactions were mostly asynchronous and lacked immediacy.

Features

Several platforms have attempted to digitize mentorship through basic matching algorithms and communication features; however, many lack true personalization and adaptability. Research conducted by Brown [2] underscores the importance of using microservice architectures in scalable systems to handle increasing user loads, a feature essential for mentorship platforms anticipating large numbers of mentees. Unlike traditional static systems, Mentor Connect's dynamic architecture allows independent scaling of critical services such as mentor matching, session management, and notification services, ensuring consistent performance even as the platform grows.

Privacy

Security and trust are paramount in digital mentorship systems. Mentor Connect incorporates JWT-based authentication and end-to-end encryption as outlined by JWT.io [5], ensuring that sensitive mentor-mentee conversations and personal data remain secure. This focus on privacy distinguishes it from earlier systems that often neglected data protection, resulting in user hesitancy. By combining cutting-edge AI matching, real-time communication, microservices scalability, and robust security practices, Mentor Connect represents a comprehensive evolution of mentorship platforms, addressing many limitations identified in prior research.

Problem Statement

- Despite the recognized benefits of mentorship, traditional mentorship programs face several persistent challenges. Identifying a suitable mentor remains a time-consuming and inefficient process for many individuals. The absence of intelligent, needs-based matching mechanisms often results in poor mentor-mentee compatibility and unsatisfactory mentorship experiences.
- Additionally, geographical barriers significantly limit access to qualified mentors, especially for individuals in remote or underserved areas. Conventional mentorship structures rely heavily on in-person interactions, making it difficult to scale programs or support diverse mentee populations. As a result, many potential mentees are left without the guidance they need to progress in their careers or personal development.
- The lack of automation and performance feedback further compounds the problem. Without systematic performance tracking or sentiment analysis, mentorship programs struggle to measure effectiveness, provide quality assurance, or offer meaningful incentives to mentors. This limits the ability to scale mentorship initiatives sustainably.
- Given these issues, there is a clear need for a smart, scalable, and secure platform that can efficiently match mentors and mentees, facilitate real-time communication, and continuously improve mentorship quality based on feedback and data analytics. Mentor Connect is designed specifically to address these gaps and revolutionize the mentorship experience.

Research Objectives

The primary objective of this research is to design and evaluate an AI-driven mentorship platform capable of improving mentor-mentee matching accuracy and session effectiveness. Mentor Connect aims to reduce the inefficiencies associated with traditional mentorship systems through automated matching and real-time communication tools.

Another key objective is to enhance the accessibility of mentorship services by providing a cross-platform application accessible via mobile and web devices. By eliminating geographical and socioeconomic barriers, Mentor Connect seeks to create a more inclusive mentorship ecosystem that benefits users from diverse backgrounds.

Security and data privacy are also major objectives of the platform's design. The platform seeks to implement robust authentication protocols, secure data storage, and encrypted communications to build trust among users and ensure regulatory compliance in diverse jurisdictions.

Finally, this research aims to assess the impact of real-time feedback, sentiment analysis, and performance-based incentives on the overall quality and sustainability of mentorship programs. Mentor Connects continuous improvement model aspires to elevate mentorship outcomes for both mentors and mentees over time.

System Architecture and Methodology

Mentor Connect is designed using a modular microservices architecture to enhance scalability, flexibility, and maintainability. Key services include the User Management Service, Matching Service, Notification Service, and Communication Service. Each module operates independently and can scale based on demand without affecting the entire system's performance.

The Matching Service leverages AI algorithms to analyze mentee profiles, stated challenges, and mentor expertise, generating personalized matches. The matching model is continuously refined through machine learning, taking into account previous session feedback, sentiment scores, and engagement metrics to improve future recommendations.

Communication between mentors and mentees is facilitated through real-time tools powered by WebRTC and Media soup technologies. Secure, end-to-end encrypted video calls, chat, and screen sharing enhance the mentorship experience. Sessions are supplemented with sentiment analysis tools that monitor communication quality and generate post-session reports.

The system's development follows an agile methodology, allowing iterative improvements based on user feedback and emerging needs. Extensive unit testing, integration testing, and user acceptance testing ensure the platform's functionality, performance, and security before deployment and during ongoing maintenance cycles.

Future Work

Future development plans for Mentor Connect include expanding into mobile applications for iOS and Android, enhancing accessibility and portability. Mobile notifications, session reminders, and seamless video communication will empower users to engage with mentors anytime and anywhere.

Further enhancements to the AI matching engine are also planned. By incorporating predictive analytics, the platform could proactively suggest mentorship sessions based on mentee career milestones, past challenges, and evolving industry trends, making mentorship even more dynamic and anticipatory.

Gamification elements such as achievement badges, leaderboards, and incentive-based reward systems are proposed to increase user engagement. These features would foster greater interaction between mentors and mentees while maintaining the quality and consistency of mentorship sessions.

Finally, Mentor Connect plans to extend its services globally, with localized language support, region-specific mentor pools, and culturally tailored matching algorithms. This will ensure that mentorship remains a truly accessible and universally beneficial experience for learners and professionals worldwide.

Figures and Tables

TABLE I. MAJOR FEATURES COMPARISON

<i>Features</i>	<i>Mentor connect</i>	<i>Traditional systems</i>
AI mentor Matching	Yes	No
Automated Notification	Yes	Limited
Real-Time Video and Chat	Yes	No
Sentiment Analysis for Rating	Yes	No

Conclusion

Mentor Connect successfully addresses the longstanding challenges of traditional mentorship programs by offering a personalized, scalable, and secure platform. Through AI-driven matching, real-time communication features, and microservice architecture, the platform delivers a superior mentorship experience that adapts to individual needs.

The results of the initial implementation demonstrate significant improvements in mentorship matching accuracy, session engagement, and user satisfaction. Organizations, educational institutions, and individuals benefit from a structured, data-driven approach to mentorship that is both flexible and scalable.

By offering cross-platform accessibility and strong security measures, Mentor Connect ensures that mentorship opportunities are available to a broader and more diverse audience. It fosters continuous learning, professional development, and community-building across industries and regions.

Overall, Mentor Connect establishes itself as a transformative force in the mentorship landscape, proving that intelligent, technology-enhanced systems can meaningfully advance human potential and societal growth.

Acknowledgment

The authors would like to thank the developers and contributors of the dataset for making valuable multimodal health data publicly available. We also express our sincere gratitude to our project mentors and academic faculty for their continuous support and guidance throughout the development of this work. Special thanks to our peers and testers who provided insightful feedback during the system evaluation phase.

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