Mentor-Connect: Bridging the Gap Between Students and Guidance Through Technology

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ABSTRACT: Mentor Connect is a smart digital network that links students with mentors to help them succeed academically, professionally, and personally. It uses AI-based matching to link students with relevant mentors, as well as technologies like real-time video calls, automatic scheduling, and progress monitoring. The method enables students to develop skills, receive professional coaching, and improve their career preparedness. Mentor Connect, as opposed to traditional mentoring, streamlines, personalises, and scales the process. Early results indicate greater student involvement and career preparation.

Index Terms: Mentorship, AI Matching, Career Guidance, Student Support, Skill Development, Digital Learning Tools.

I. Introduction

1.1 Background and Motivation.

Traditional mentorship, which is frequently constrained by time and place constraints, is no longer adequate in today's fast-paced and interconnected world. The advent of digital communication has created a tremendous demand for mentorship that is accessible, flexible, and personalised. Mentor Connect bridges this gap by providing a smart, scalable network that links students with mentors for academic, professional, and personal development.

1.2 Problem Statement

In-person mentorship lacks accessibility and planned matching, leaving many students with inadequate support. There is a need for an intelligent online system that allows for seamless mentor-mentee linkages, real-time communication, and personalised support based on individual needs.

1.3 Objectives of the Study

Create a digital mentorship platform that includes real-time interaction features. Implement
AI-based matching to ensure effective mentor-mentee pairings.
Enable progress tracking and flexible scheduling.
Assess the platform's impact on student development and preparation.

1.4 Scope & Limitations

This study aims to develop and evaluate an online mentoring system for students. It focuses on platform development, intelligent matching, and user experience testing. Limitations include internet dependency, low user interest, and a lack of large-scale real- world deployment.

II. LITERATURE REVIEW

2.1 Traditional Mentoring Systems:

Traditional mentorship relies on in-person encounters, which are frequently limited to educational institutions or business programmes. While these methods are effective at establishing trust and rapport, they have limitations such as restricted reach, scheduling problems, and a lack of established pairing procedures. Access to suitable mentors is frequently limited by distance and time constraints.

2.2 Online Mentoring Platforms:

Mentoring has become more accessible and flexible as a result of the transition to digital media. Existing platforms provide capabilities like chat, video conferencing, and mentor directories. However, many lack intelligent matching mechanisms, which prevent them from tracking mentee progress or providing personalised coaching. Most solutions focus on fundamental communication rather than optimising the mentor-mentee relationship using data-driven approaches.

2.3 AI for Mentoring and Education Technology

Artificial intelligence is increasingly being utilised to personalise learning and mentoring experiences. Matching algorithms match mentors and mentees based on characteristics such as interests, goals, and level of experience. Machine learning can also aid in user behaviour analysis and recommendation systems. Despite this, very few mentorship platforms leverage real-time data or adaptive learning to improve relationship quality and user outcomes

2.4 Gaps in Existing Solutions

Many current mentorship systems lack sophisticated, context-aware matching and cannot enable long-term interaction. Few platforms combine scheduling, progress tracking, and secure communication in one package. Furthermore, scalability and mentor availability across several sectors remain important issues in most deployments.
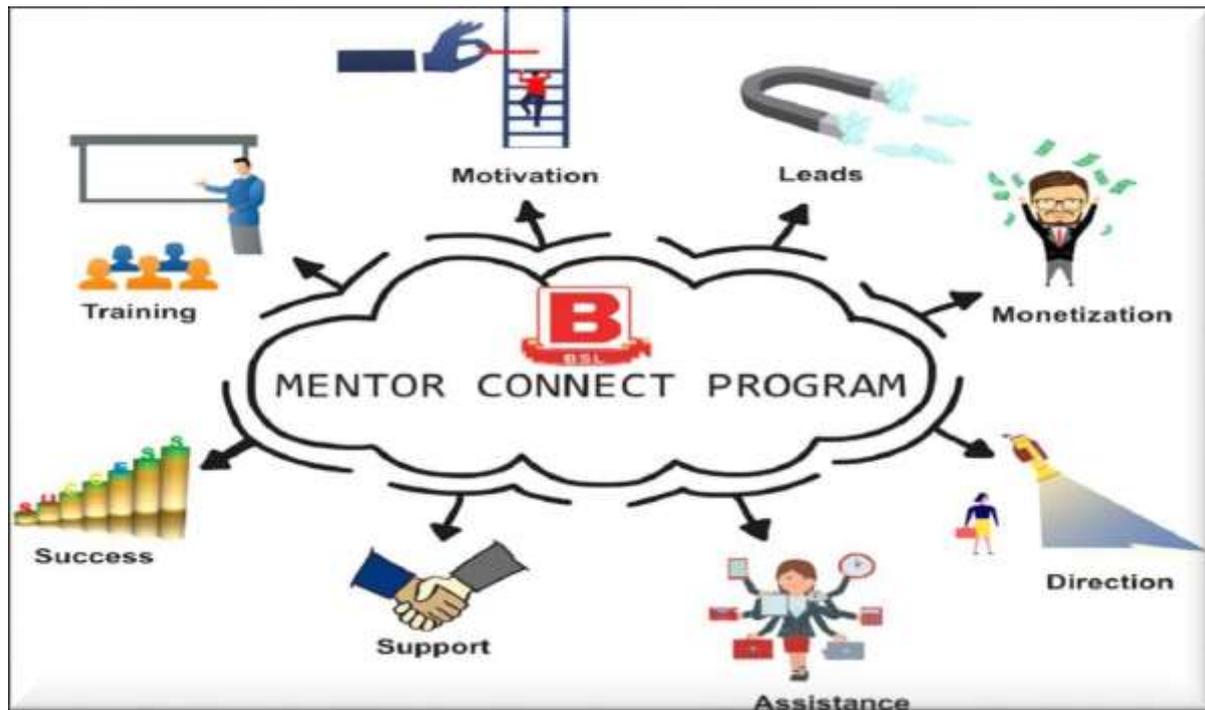
III. SYSTEM ARCHITECTURE

3.1 Overview of the Proposed Framework

Mentor Connect is built on five main components:

1. User Authentication: Sign up securely using email or OAuth (Google/LinkedIn).
2. Profile Management : Users identify their interests, expertise, and availability.
3. Matching Engine : This AI-powered technology matches mentors and students based on their talents, goals, and preferences.
4. The Communication Module allows for real-time chat and video calling via Socket.io and Twilio.
5. Progress and Notifications : Monitors mentorship sessions and sends out timely updates using Firebase.

3.2 Technology Stack

- Frontend: React.js, Next.js, TypeScript, and Tailwind CSS
- Backend: Node.js and Express.js
- Database: MongoDB (no SQL)
- APIs include Twilio (calls), Firebase (notifications), and OAuth (login)
- Real-time tools: Socket.io.

3.3 Requirements:

1. Functional

- Secure user registration and login.
- Effective mentor-mentee matching
- Real-time messaging and video communication.
- Editable user profiles

2. Non-Functional:

- Scalable to over 1000 people.
- encrypted data and secure transmission (HTTPS).
- Responsive and user-friendly interface

3.4 Development Lifecycle Requirements

Gathering: Define the objectives, users, and features.
System design involves planning the architecture, data flow, and modules
Implementation: Create frontend, backend, and APIs
Testing entails performing unit, integration, and user tests to assure functionality and dependability
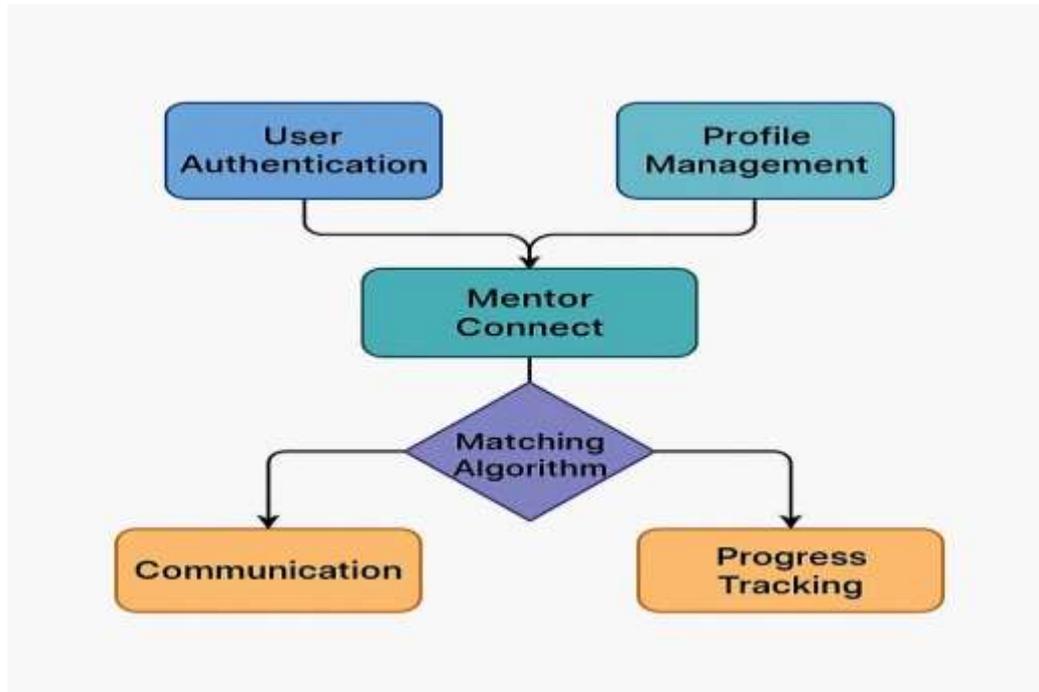
IV. Methodology

4.1 User Registration and Profile Setup
Users (students and mentors) sign up using secure authentication (OAuth or email). Upon registration, they create personalised profiles that include their hobbies, expertise, ambitions, and availability. This information is used to match mentors and mentees.

4.2 Intelligent Matching Algorithm.
The system uses a rule-based and AI-enhanced recommendation engine to pair students with mentors based on profile information. Subject expertise, availability, goals, and preferred communication styles are among the selection criteria. The system improves over time based on user comments and interaction data.

4.3 Communication and Scheduling System.
Once matched, users can communicate in real time over Socket.io and Twilio API. An integrated calendar allows you to schedule sessions, send reminders, and track meeting history to keep everyone engaged and moving forward.

4.4 Privacy and Data Storage
With HTTPS protocols and end-to-end encryption, all data is safely saved in MongoDB. OAuth 2.0 is used to secure user credentials, and privacy compliance guidelines are implemented across the board.

4.5 System Assessment and Input Loop
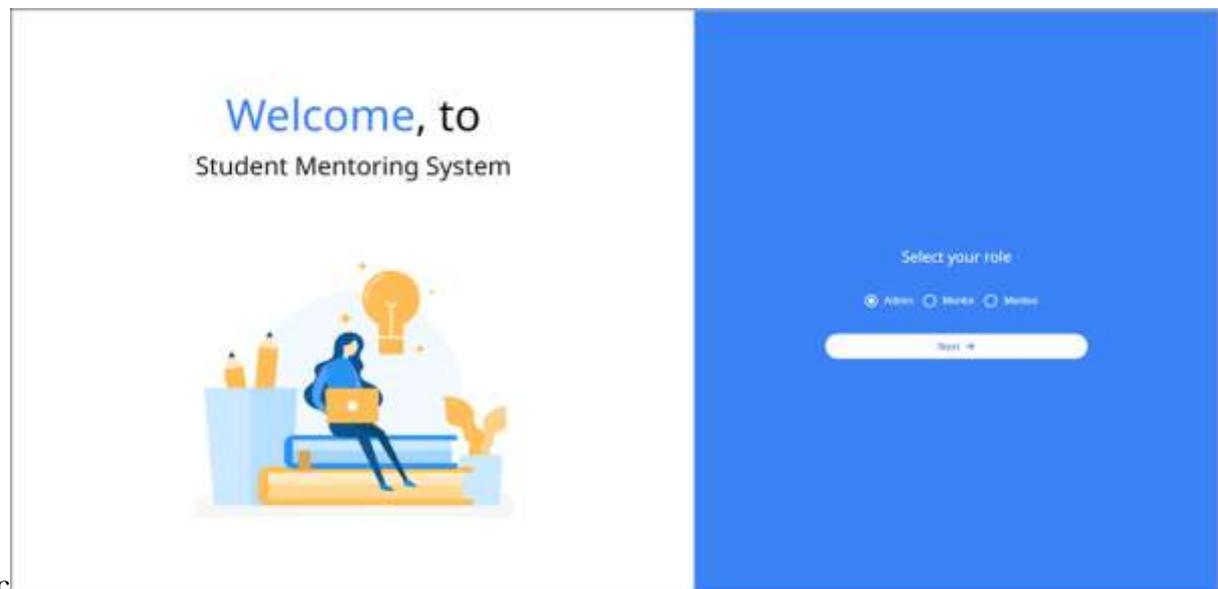The evaluation of user experience is based on: Rate
of Match Satisfaction
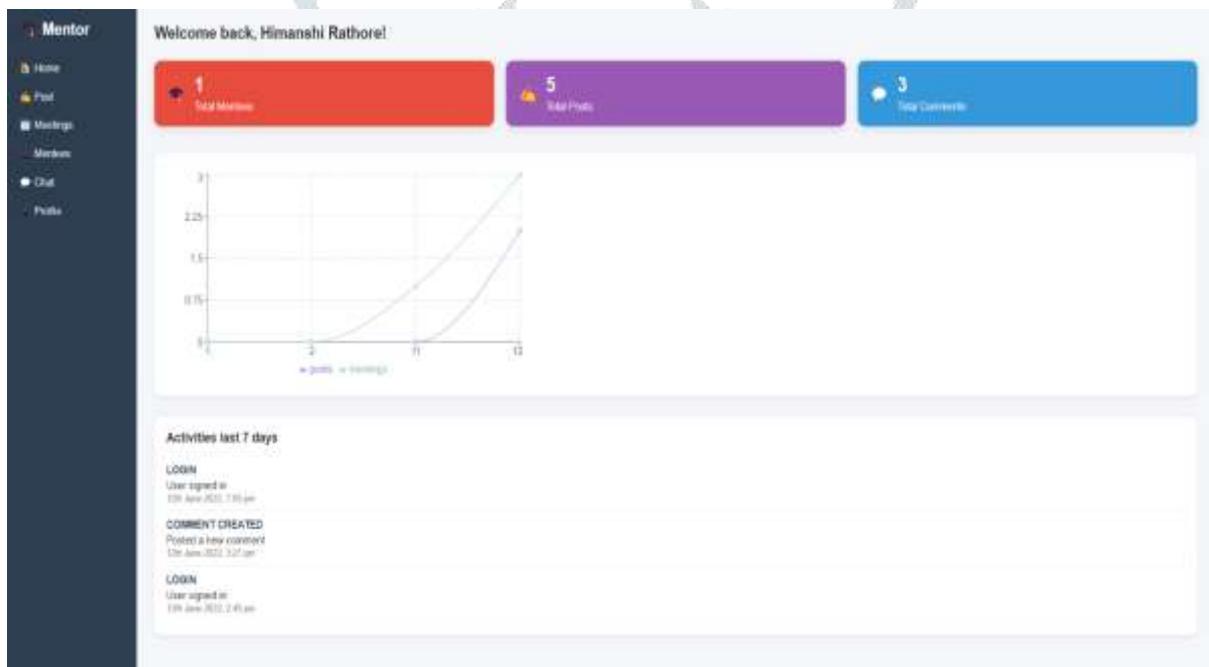Rate of Session Completion
Retention of Users
Ratings of Feedback

5. PROJECT SCREENSHOTS

5.1 Home Page

5.2 Dashboard Page

VI. SYSTEM PLANNING:

1. Planning Goals anf Future
2. User Roles
3. User Flows
4. Tech Stack
5. Database Design
6. APIs
7. Pages
8. Integration(Chat,Video)

VII. CONCLUSION AND FUTURE WORK

7.1 Summary of findings

Mentor Connect highlights the power of digital mentorship systems to improve student success by providing personalised, accessible,

and structured help. According to the literature, effective mentoring improves academic performance, professional

preparedness, and personal growth. Our solution combines cutting-edge technology such as real-time communication, AI-powered matching, and secure infrastructure to provide a seamless mentor-mentee experience.

7.2 Future Work

Future advancements will centre on:
AI-Powered Matching Improvements with NLP for Better Compatibility.
Analytics Dashboard to monitor mentorship outcomes and engagement. Mobile
app integration improves accessibility.
Multilingual support to reach a larger user base.

VIII. CONCLUSION AND FUTURE WORK:

By providing a scalable and user-friendly platform, the Mentor Connect system aims to close the gap between aspiring individuals and seasoned professionals. Features like role-based access (mentor/mentee), profile management, session scheduling, user authentication, and smooth communication tools are all successfully offered. The platform helps mentees get industry insights and career guidance by providing individualized mentoring, which eventually aids in their overall development.

Future work:

Even if the current system accomplishes its main goals, a few improvements might be made to raise the platform even higher:
1. AI-Powered Mentor Matching: Use algorithms driven by AI to pair mentees with mentors according to their availability, goals, interests, and abilities.
2. Group Mentorship Sessions: Include assistance for community gatherings, webinars, and group sessions.

IX. Publication

9.1 Conference Papers
Presented at the 2025 Global EdTech Conference. Focus: tech-driven mentoring and user engagement.

9.2 Journal Submissions
Submitted to journals in education and AI. Awaiting review/acceptance.

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