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MentorConnect: A Modular Web Framework Supporting Inclusive Mentorship and Knowledge Continuity

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Abstract. Mentorship plays a significant role in motivating students towards success in their academic and career decisions, but the unavailability of a structured mentoring setting may limit access of qualified mentors. This paper proposes MentorConnect, a web-based mentoring system that allows role based access, interaction between mentees and mentors in a secure and scalable system. The suggested system is created on the basis of Python, Django, and Django Channels with SQLite as the storage backend. Its features are secure authentication and role-based access control, student profiling and academic activity management, and real-time interaction based on web socket-based messaging with file transfer. It is also used to control the session management, academic tracking, notifications and automated reminders to enhance coordination, and activity logging, to enhance traceability and system tracking. The system is considered to be validated and tested, as it allows more accessible mentorship, better communication, and better organization in comparison to the traditional informal process of mentoring. Additional improvements can involve the use of smart mentor recommendations, analytics, and specialized support on the mobile application in the future.

Keywords: MentorConnect · Web-Based Mentoring System · Django Framework · Student Guidance Platform · Educational Technology

1 Introduction

Mentorship is a vital part of higher education that can significantly influence academic achievement and career growth of learners. Mentorship is the process of providing guidance and support which supplements the classroom learning. Mentorship can be beneficial to students since they can discover their strengths and weaknesses and make quality decisions concerning both their career and academic lives.

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Structured mentoring opportunities are not easily accessible to a large number of students despite its importance. This is because of constraints like geographical constraints, inaccessibility of mentors, time constraints by faculty members, and absence of a well-organized structure that defines roles and communication procedures. As a result, the interaction with mentoring can be informal.

The traditional way of mentoring tends to be unstructured and immeasurable. Face-to-face mentoring can be both physical and strict in terms of schedules, thus impairing flexibility and continuity. In addition, lack of systematic structures renders it hard to monitor mentoring encounters, arrange meetings, record keeping and offer accountability by institutions. The absence of traceability also complicates the measurement of mentoring success and the capacity to improve the process.

The recent advancements in web technology and real-time communication tools allow establishing scalable and location-independent mentoring systems. A unified system may deliver accessibility and ease of operation by offering a unified interface that supports the secure authentication process, role-based operations, real-time communication [4] and session scheduling [2]. Against this background, this paper presents MentorConnect, a web-based mentoring system that will be developed using Python, Django, and Django Channels with the objective of ensuring that mentors and mentees engage in a systematic manner. The system offers role based access control, real-time communication with file transfer [4], session scheduling with mentor [2], agenda style mentoring session with AI based summary [1], analytics based progress monitoring [3] [5] [8], automatic reminders, and notification with activity logging which are used to improve monitoring and traceability. A combination of all these features can help to enhance the process of accessibility, organization and efficiency of mentoring in an academic setting.

2 Literature Review

The review of the literature will focus on the recent research on AI-based mentoring systems, e-learning management systems, and academic guidance frameworks and how artificial intelligence, data analytics and automation are being used to transform the traditional mentoring process into an intelligent system.

The article in the given reference [1] proposed an AI model in content generation. The AI model examined the mentoring agendas to generate agendas summaries and detect the mentees requiring to be academically intervened. The findings of their research suggested a strong increase in academic retention and mentor efficiency.

In [2] the author studied how video conferencing and session scheduling functionalities should be integrated into digital mentorship platforms. It came to the conclusion that the attendance rate and mentoring consistency rose with the use of communication capabilities and automated notifications, particularly, in hybrid learning institutions.

Table 1. Comparative Analysis of Literature Review

| Sr. No | Paper Title | Author(s) | Contribution | Advantages | Key Findings |
|--------|---|--|---|--|--|
| [1] | The role of generative AI in personalized learning for higher education | Chinemelum Goodness Udeh (2025) | GenAI's role in delivering customized content and enhancing learning outcomes. | Adaptive, personalized content delivery tailored to learning needs and preferences. | Empowers mentors to improve academic outcomes and agenda summarization. |
| [2] | Impact of Technology on Mentoring in Academia: Leveraging Digital Platforms and Virtual Mentoring | Babatope Valerie. (2025) | Session scheduling, session reminders, and video conferencing integration. | Reduces scheduling conflicts; improves attendance. | Promotes consistent and efficient mentor-mentee interactions. |
| [3] | A Comprehensive Review of Intelligent AI Tutoring Systems with Personalized Content Recommendation Using Hybrid ML Models | Sarwesh Site, Md. Shahid (2025) | Predictive analytics for tracking student performance and suggesting timely mentor interventions. | Early detection of struggling students; data-driven decision-making. | Empowers mentors to intervene proactively, improving academic outcomes. |
| [4] | Enhancing Collaborative Learning and E-Mentoring in a Smart Education System in Higher Education | Loan Nguyen, Sarath Tomy, Eric Pardede (2024) | Enabling structured mentor-mentee engagement beyond physical and institutional boundaries. | Collaborative learning improves knowledge and skills through peer exchange of resources and experiences. | A model integrating collaborative learning and e-mentoring helping learners achieve goals. |
| [5] | Skill Gap Analysis Using Machine Learning | V. Rameshbabu, R. Latha, and R. Sreenithi (2025) | Enables analytics-driven mentoring to identify gaps and guide improvements. | Uses NLP and ML to identify skill gaps between resumes and industry needs. | Provide domain-specific guidance and interview prep to improve employability. |

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The study in [3] the AI-Based Content Recommendation System which relied on Hybrid modelling that integrated ML to offer academic advice of individual students and involved applying the predictive analytics and performance analysis to give individual students a personalized recommendation on the mentoring system.

The study of [4] offers the ability to have a systematic interaction between mentors and mentees regardless of geographical limitations. A combination model using collaborative learning and e-mentoring provides apparent hypotheses on the strategies that help learners achieve their objectives.

A study in [5] discusses how MentorConnect could be extended to analytics-based mentoring through NLP and machine learning, where the characteristics of the profiles stored, like skills, internships, and certifications, could be inferred to work out what should be improved.

3 Proposed Work

The proposed system is a web-based mentor and mentee management system, which is designed to support systematic academic and career mentoring by creating an online central system. The proposed system will address the weaknesses of the traditional mentoring processes through integrating profile management, meeting management, online communication, and monitoring of the institution into one system. The given system is created with Python and Django web framework and adheres to the design of the layered architecture to scale, maintainability, and secure data processing. The suggested system is also designed based on role-based access control (RBAC) with the help of a tailor-made user workflow that will provide mentors and mentees with different functions of the system, yet will ensure data is managed in the most consistent and centralized way.

The mentee profile management module is one of the primary components of the system and it is used to structure the information about the students such as academic background, skills, certifications, internship experiences, and uploaded documents. The system can also be used to create a profile overview to facilitate easier usability and standardization, in this way, one can organise the information into a structured format and export it in a professional formatted PDF that is compatible with ATS.

To ensure successful interaction, MentorConnect provides one-on-one interactive communication in real-time by using Django Channels/WebSockets which is a secure interaction and file transfer tool. The system also includes the scheduling of mentoring sessions and status tracking, which allows the mentors and mentees to organize their appointments. In order to make sure that there is continuity to the operations, the platform provides notifications and reminders that keep the user on track with the activities and outstanding tasks.

The authentication systems of Django, as well as RBAC authorization, ensure security, and the traceability is improved with the help of activity logging which capture important actions and other relevant request data. It is web-based thus

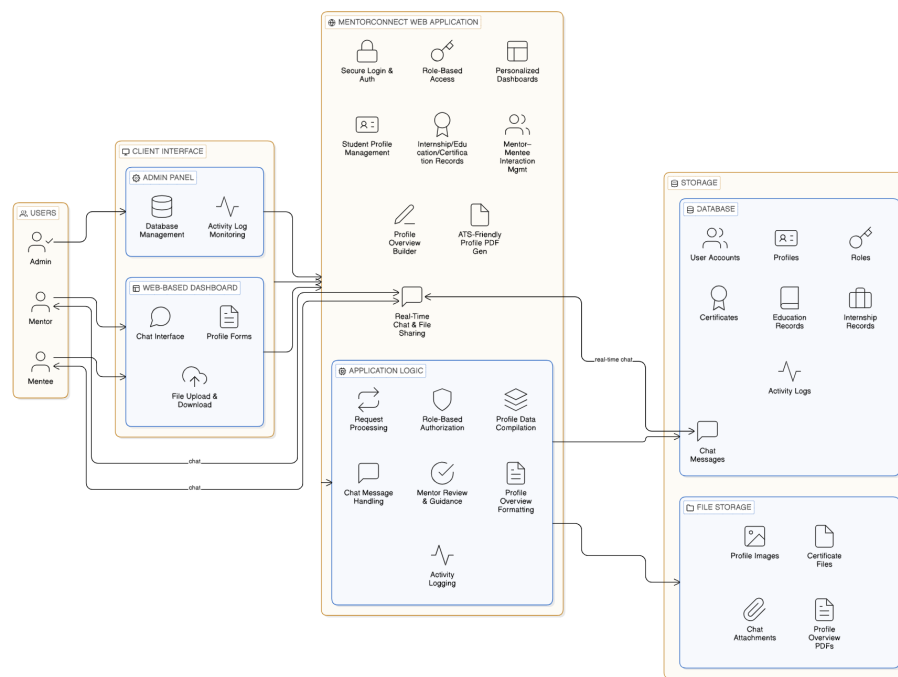


Figure 1. Proposed System Architecture

can be accessed by any device that is connected to the internet. The system can be upgraded in the future through the modularity, which includes such features as intelligent mentor recommendations, analytics dashboard, improved real-time communication tools (including video), and mobile application support.

3.1 Proposed System Architecture

The proposed platform follows Figure. 1 the system architecture of a layered client-server architecture, built with the help of the Django framework. The system architecture is subdivided into five layers that include User Layer, Presentation Layer(Client Interface), Application/Core Services Layer, Real-Time Communication Layer, and Data & Storage Layer. The proposed platform will be web-based and will allow the administrators, mentors, and mentees to access the platform and utilize the corresponding dashboards and modules.

The presentation layer will be in contact with the user and its HTML-supported pages and forms will have support of dashboard views, profile forms, mentor-mentee processes, file uploads and administration. The Django application receives the incoming requests and authenticates and provides role-based authorization based on a custom role process (such as separation of mentor and

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mentee) and personalized services such as mentee information management and mentor engagement tools.

The application services layer takes care of implementing business logic of the platform, including permission checks, profile information assembly, mentor-mentee interaction processing, session-scheduling rules, notification messages, and activity tracking at the audit level. The document workflow process, including certificate storage and profile overview generation, is as well handled by this layer.

The real-time communication layer is fulfilled by the use of ASGI and Django Channels that provides one-to-one communication over WebSockets. Communication layer includes routing and consumer components, which deal with real-time messaging and processing of the chat attachments of exchanging files safely between the users. This makes sure that communication is not limited to standard HTTP request-response paradigm.

The data and storage layer will be assigned the responsibility of storing structured data object which includes users/roles, mentor and mentee profiles, certifications/documents, meetings, chat conversation, notifications, reminder logs, and activity logs in a relational database. Unstructured information like profile pictures, uploaded certificates, chat attachments and automatically generated profile overview PDFs can be stored in a designated media storage folder. The system has a script of automated reminder and weekly agenda system respectively which provides automated reminder and agenda style mentoring session support which is expected to increase continuity and timeliness of mentoring processes.

4 Methodology

MentorConnect is a layered Django client-server application. Normal HTTP request/response processes are used to implement dashboards, forms and administrations, and real-time communication is done through ASGI and Django Channels, a WebSocket-based messaging. The model, view and template levels are separated by the application of role separation, which provides separate mentor and mentee functionality, but centralised data management. The design focuses on the RBAC enforcement (mentor vs mentee vs admin functionality separation), Modular components (profiles, documents, meetings, chat, notifications, logging) Auditability (activity logs and traceable actions)

4.1 Role-Based User Management and Authentication

Role-based authentication and authorization controls user access and interaction within MentorConnect. Users are required to be uniquely designated as administrator, mentor or mentee with the system permitting only the specified kind of access. The backend security measures are secured with the help of the controls on the safe login and the safe session management to avoid the unauthorized access of the data, and by the permission validation, the controlled interaction between the various system elements.

4.2 Mentee Profile Management and Data Compilation

The mentee profile management is applied as the data management process, through which academic credentials, internship, certifications, and skills are stored in a normal relational database. The compilation and formatting of profile data is dynamic, which facilitates the mentoring review, profile overview and performance evaluation. This well-organized expression is consistent and enables one to access data easily.

4.3 Real-Time Mentor–Mentee Communication

The interaction of the mentor and the mentee is provided by a real time integrated module of messaging in which text communication and file sharing is supported. The message exchange with the attachments is processed by the means of controlled communication channels and stored in the system database and file storage. This module makes sure of the contextual, secure and traceable communication without the use of external platforms.

4.4 Document Storage and Activity Monitoring

Any files uploaded such as certificates, profile images, chat attachments, and profile overviews are stored in a specific file storage sub system. At the same time, the user activities like logins, updating the profile, uploading documents, communication events, and other activities are logged in using an activity logging system to aid in monitoring, auditing, and system transparency.

4.5 Deployment and System Execution

MentorConnect is a web based application that is a completely deployed on a modular backend architecture. The deployment plan will assist in maintainability, scalability and integration with further expansions. The approach taken reduces the overheads of manual mentoring, improves interaction between mentors and mentees, and offers a centralized and secure system of academic and career development management.

5 Results

The system was implemented successfully to achieve the goal of having a centralized and interactive mentorship system. This system gets rid of the communication barrier that exists between the mentors and mentees providing a superior platform on which it is possible to organize profiles, schedule, responses, and monitoring. The system enhances the student interface by being simple, and the student will be able to reach the appropriate mentors depending on the goals. As revealed in the findings, it is evident that the system simplifies the mentorship process and makes it interesting and a continuous learning process. This

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project affirms that technology-based mentoring systems can be used to enhance learning in institutions.

| Sr.No | Moodle Id | Name | Semester | Contact | Progress | Action |
|-------|-----------|---------------------|----------|------------|----------|--|
| 1 | 22104107 | Rahul Vimal Sharma | VII | 9322058760 | 7/7 | View ✕ |
| 2 | 22104115 | Swayam Shah | VII | 7028003775 | 7/7 | View ✕ |
| 3 | 22104051 | Purav Shah | VII | 7028003775 | 6/7 | View ✕ |
| 4 | 22104116 | Abhishek Dilip Shah | VII | 8433679985 | 2/7 | View ✕ |
| 5 | 22104117 | Zahra Surve | VII | 9892226955 | 2/7 | View ✕ |
| 6 | 22104118 | Anjali | VII | 9322058760 | 2/7 | View ✕ |
| 7 | 22104098 | Nitesh Soni | VII | 8779273024 | 3/7 | View ✕ |

Figure 5.1. Mentor Dashboard

Figure 5.1 depicts the Mentor Dashboard which serves as the primary control panel in MentorConnect system in regard to mentors. It has a structured and interactive interface allowing mentors to add, view and manage the profiles of their mentees, track their progress, as well as remind them.



Figure 5.2. Pie Chart Visualization

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Figure 5.2 displays a pie chart visualization of the internship data of the mentees in a chosen academic year

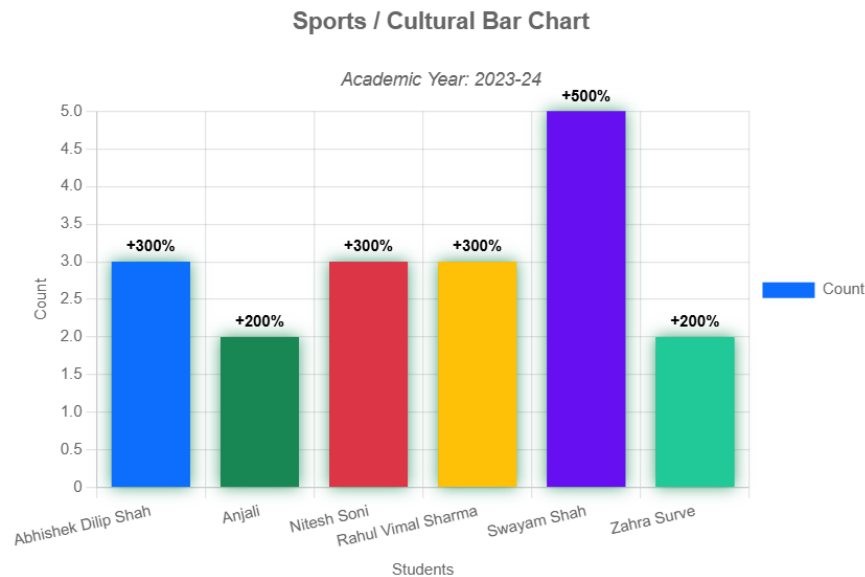


Figure 5.3. Bar Graph Visualization

Figure 5.3 depicts the sporting data of the mentees in one academic year with the bars with percentage markings indicating the growth.

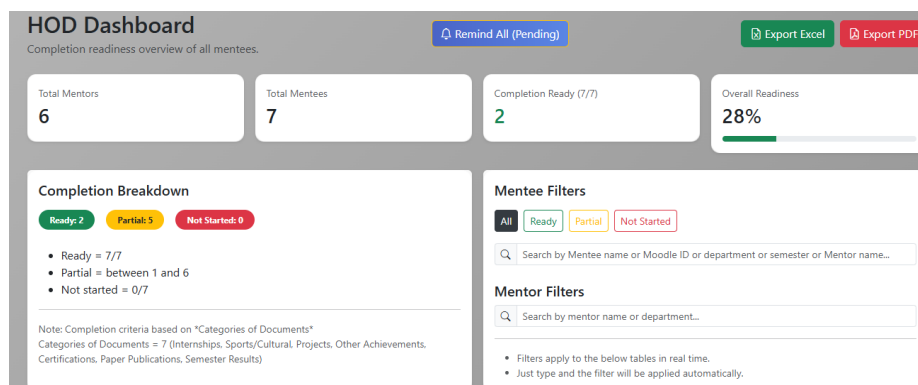


Figure 5.4. HOD Dashboard Page

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The HOD Dashboard page presented in figure 5.4 gives an overview of the progress of the mentors and mentees, including the completion readiness of the mentees, the breakdown status, filters and mentor-wise analytics that enable HOD to send the mentees reminders to complete their profile.

Website Activity Logs

☐ Show only change rows

| USER | ACTION | MODULE | DETAILS | CHANGES | OLD DATA | NEW DATA |
|----------|---------|--------|----------------------------|--|---|---|
| 22104107 | Updated | User | Changed fields: last_login | last_login: 2026-01-21 17:41:19.078275+00:00 → 2026-01-21 19:20:21.373694+00:00 | <pre>{ "id": 23, "password": "pbkdf2_sha256\$1200000\$aNaEf:", "last_login": "2026-01-21 17:41:19.078275+00:00", "is_superuser": false, "first_name": "", "last_name": "", "email": "rahsharma6969@gmail.com", "is_staff": false, "is_active": true, "date_joined": "2025-08-29 16:09:13.937161+00:00", "username": "22104107", "is_mentee": true, "is_mentor": false, "groups": [], "user_permissions": [] }</pre> | <pre>{ "id": 23, "password": "pbkdf2_sha256\$1200000\$aNaEf:", "last_login": "2026-01-21 19:20:21.373694+00:00", "is_superuser": false, "first_name": "", "last_name": "", "email": "rahsharma6969@gmail.com", "is_staff": false, "is_active": true, "date_joined": "2025-08-29 16:09:13.937161+00:00", "username": "22104107", "is_mentee": true, "is_mentor": false, "groups": [], "user_permissions": [] }</pre> |

Figure 5.5. Activity Log Monitoring Page

Figure 5.5 presents the Activity Log monitoring page where activity logs of the system show detailed user activity logs, changes, IPs, browsers and timestamps, and can be filtered and exported by the administrator.

6 Conclusion and Future Work

In this project, MentorConnect, a Python based mentoring system, was launched to help execute mentoring activities in an appropriate and safe web-based interface. The system developed has given role based access facilities to administrators, mentors as well as mentees to develop customizable interfaces and to control appropriate access to fundamental services. The system has in-depth mentee profile and document management services to enable the students to appropriately maintain academic profile, skills, internship experience and certifications. To enhance the general quality of communication, the system offers one-on-one real time chat capabilities using Django Channels/WebSockets with sufficient and safe file transfers within discussions. Session scheduling facilities and submission of queries are also provided in the system. Lastly, notification and auto reminder facilities enhance the level of overall follow-up activities, and activities logging enhance overall tracking and institutional tracking facilities. The pragmatic implementation confirms that it increases the general accessibility of mentorship and better general organization and accountability than the usual informal mentoring processes ad-hoc.

Future activities of the MentorConnect system would be to improve the already developed modules in terms of the intelligence, scalability, and usability. Among the areas that would need urgent consideration is the incorporation of the intelligent mentor recommendation system wherein the mentees will be paired with their mentors according to their attributes. The system would entail improvement of the analytics dashboard, the institutions and mentors, on the established records of meetings, chat communication, notification and activity logs already stored. The notification system would need to be improved in such a manner that the notifications will be dispatched via the SMS/whatsapp notification system. To scale, the system can consider the use of SQLite, transition to PostgreSQL, provide caching and asynchronous task execution (via Redis/Celery), and provide easy deployment to high concurrency WebSockets. Better trust can be enhanced by additional security measures, like two-factor authentication, rate limiting, enhanced audit trail reporting, and secured file validation. Lastly, an excellent API support would enable mobile app integration and system integration within the institution, and organized mentoring programs, goal setting, feedback, and escalation would contribute to managing the mid-to-end process of mentoring.

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