Campus Connect: Admission and Analytics Platform

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Abstract:
Admission processes in educational institutions often involve a large number of student queries related to courses, eligibility, fees, and procedures. When these enquiries are handled manually or through unstructured communication channels, it can lead to delayed responses, mismanagement, and lack of proper monitoring. To address this problem, this project presents a web-based Admission Enquiry Management System that provides a centralized and role-based platform for handling student admission queries in an organized and efficient manner.The proposed system is developed using HTML and CSS for the front end, and Django (Python) for the backend, and is designed around a layered administrative control model. It supports four distinct user roles: Principal, Head of Department (HOD), Teacher, and Student. Students can register and submit admission-related enquiries through the system. These enquiries are automatically routed department-wise and allocated to teachers. HODs manage and assign teachers within their departments, while the principal acts as the super administrator with complete system oversight and control over HOD account creation.The system ensures structured query handling, secure role-based access, and transparent monitoring of the entire enquiry lifecycle. By digitizing and automating the admission enquiry process, the platform reduces manual workload, improves response time, enhances communication efficiency, and provides better administrative control. This system aims to support educational institutions in managing admission interactions more effectively and in delivering timely and organized information to prospective students.

Key Words: Admission Enquiry System, Role-Based Access Control, Web Application, Django Framework, Educational Management System, Query Management, Layered Administration, Student Enquiry Platform.

I. INTRODUCTION

The admission process is one of the most important operational activities in any educational institution. It serves as the first point of interaction between prospective students and the institution. Students usually have multiple queries related to courses offered, eligibility criteria, fee structures, admission procedures, important dates, and departmental information. In many institutions, these enquiries are still handled through manual methods such as physical visits, phone calls, emails, or unstructured messaging platforms. Such approaches often lead to delayed responses, poor tracking of queries, duplication of efforts, and lack of transparency in communication. As the number of applicants increases, managing these enquiries efficiently becomes a significant challenge. With the rapid advancement of web technologies and information systems, there is a growing need to shift from traditional, manual enquiry handling to structured, digital platforms. Web-based systems provide the ability to centralize information, automate workflows, and enable real-time

interaction between users. In the context of educational administration, digital platforms can significantly improve the efficiency, reliability, and accessibility of admission-related services. However, many existing solutions either lack proper role separation or do not provide sufficient administrative control, which can result in mismanagement of queries and security concerns.

An effective admission enquiry platform must support multiple user roles and clearly defined responsibilities. Institutional hierarchies such as Principal, Head of Department, and Teachers play different roles in managing academic and administrative information. At the same time, students require a simple and reliable interface to raise queries and receive accurate responses. A role-based system not only improves operational clarity but also ensures data security, accountability, and proper monitoring at each level.

This project proposes a web-based Admission Enquiry Management System that follows a layered administrative control structure. The system is developed using HTML and CSS for the user interface and Django (Python) for the backend, and supports four main roles: Principal, HOD, Teacher, and Student. The principal oversees the entire system and manages HOD accounts, HODs manage teachers and departmental allocation, teachers handle department-wise enquiries, and students submit admission-related questions. By integrating structured query management with role-based access control, the proposed system aims to streamline the admission enquiry process, reduce manual workload, improve response efficiency, and enhance overall administrative coordination within educational institutions.

II. BACKGROUND

A. Traditional and Technology-Based Admission Enquiry System

Traditionally, admission enquiries in educational institutions have been handled through manual and semi-manual processes such as physical enquiry desks, telephone calls, emails, and face-to-face interactions. Students or parents visit the campus or contact the institution to ask questions related to courses, eligibility, documents, fees, and admission timelines. While this approach allows direct communication, it heavily depends on human availability and record keeping. Enquiries are often noted on paper, spreadsheets, or scattered email threads, making them difficult to track, manage, and analyze. As the number of applicants increases, institutions face problems such as delayed responses, lost queries, lack of accountability, and inconsistent information delivery.With the growth of information technology, many institutions have adopted basic digital tools such as websites, online forms, and email-based enquiry handling. These systems allow students to submit queries online and receive responses remotely. Some institutions use simple enquiry forms integrated into their websites, where submitted questions are forwarded to a general administrative email or stored in a database. Although this improves accessibility and reduces physical workload, such systems often lack structured workflows, proper role distribution, and centralized control. Queries may not be automatically routed to the correct department, and monitoring the status of each enquiry becomes difficult.

More advanced technology-based systems introduce web portals with login mechanisms, databases, and dashboard interfaces. These platforms allow institutions to store enquiry records digitally and provide limited administrative access. However, many of these solutions are either too generic or focus only on data collection rather than full lifecycle management of enquiries. They often do not reflect the real hierarchical structure of educational institutions, where responsibilities are distributed among principals, HODs, and teachers. As a result, there remains a need for a more structured, role-based, and layered admission enquiry system that aligns with institutional workflows and provides efficient monitoring and control

B. Limitations of Existing Systems

Despite the availability of traditional and technology-based admission enquiry methods, several limitations are still present in most existing systems. Manual approaches such as physical enquiry counters, phone calls, and emails do not support continuous tracking and structured management of queries. Information is often scattered across different platforms or recorded informally, which increases the chances of lost enquiries, repeated questions, and inconsistent responses. These methods also place a heavy workload on administrative staff and make it difficult to analyze enquiry trends or measure response efficiency.

Even many web-based enquiry platforms mainly focus on collecting questions rather than managing the complete enquiry lifecycle. Common limitations observed in existing systems include:

- Lack of clear role based control, resulting in poor separation of responsibilities among principal authorities, departments, and teachers.
- Absence of automated department-wise routing, causing delays and misallocation of student queries.
- Limited monitoring and reporting features, making it difficult for higher authorities to oversee enquiry handling performance.
- Poor scalability and organization when the number
- of students and enquiries increases.
- Insufficient transparency for students, who often cannot track the status of their submitted queries.
- Weak security and access control mechanisms, increasing the risk of unauthorized data access or misuse.

Because of these issues, current solutions often fail to provide an efficient, accountable, and institution-oriented enquiry management process. This highlights the need for a centralized admission enquiry system that supports layered administration, automated query allocation, and continuous monitoring to improve both student experience and institutional management.

C. Domain and Context Dependency Challenges

Admission enquiry management in educational institutions is highly domain- and context-dependent because it involves different academic departments, administrative hierarchies, and user responsibilities. Each department handles specific types of queries related to its courses, eligibility criteria, infrastructure, faculty, and career scope. A general or non-context-aware system often fails to route enquiries correctly, leading to delays, miscommunication, and inaccurate responses. For example, a query related to engineering admissions should be addressed by the appropriate department faculty, while policy-related or institutional queries may require higher-level administrative attention.

Another major challenge is the hierarchical nature of educational institutions. Principals, HODs, and teachers perform different functions and require different access privileges. Many existing systems do not properly model this layered structure and treat all administrative users similarly. This reduces accountability, weakens monitoring capabilities, and makes it difficult to control workflows effectively. Without contextual role awareness, systems cannot enforce proper authority boundaries, nor can they provide meaningful oversight to higher-level administrators.

Additionally, admission processes vary across institutions depending on size, departments offered, admission policies, and regulatory requirements. A useful admission enquiry system must therefore be flexible and adaptable to different institutional contexts. It should understand departmental boundaries, user roles, and operational workflows. Systems that are not designed with these contextual factors in mind often become rigid, error-prone, and inefficient. These challenges emphasize the need for a domain-aware, role based admission enquiry management system that aligns with institutional hierarchy, supports department-specific query handling, and provides structured oversight. Incorporating layered administrative control and contextual routing of enquiries ensures accurate communication, improved accountability, and more effective management of admission-related interactions.

III. LITERATURE SURVEY

Lin Hao proposed the *Design of a Management Information System for International Continuing Education of Higher Vocational Colleges*, which focuses on developing a modular management information system to support student management, admissions, faculty coordination, and payroll operations. The system emphasizes structured data management, workflow automation, and modular architecture to enhance administrative efficiency in international education programs. The study highlights how centralized platforms can streamline academic and administrative activities, support informed decision-making, and improve coordination among different institutional units. However, the work primarily concentrates on management automation and does not deeply explore layered role-based enquiry handling or hierarchical query flow control.

Swati Nikam et al. presented an *Admission Enquiry Chatbot* to automate responses to repetitive admission-related questions. Their system uses Natural Language Processing techniques to provide instant answers regarding courses, eligibility, fees, and deadlines. The study shows that automated enquiry platforms significantly reduce administrative workload and improve response time. Similarly, A. Kousar Nikhath et al. developed *An Intelligent College Enquiry Bot using NLP and Deep Learning*, which applies NLP and LSTM-based deep learning models to handle college-related and admission queries. The system demonstrates improved interaction quality and automated support for students, parents, and faculty.

Anshul Kumar Mandal et al. proposed an *AI-Based Enquiry Chatbot Using Natural Language Processing*, highlighting the importance of intelligent virtual assistants in educational websites. Their chatbot focuses on enhancing institutional communication, providing real-time responses, and improving user experience. These studies clearly establish the importance of digital enquiry systems in academic environments and demonstrate how automation can improve service delivery.

Sangeeta Kumari et al. further extended this idea in *Enhancing College Chat Bot Assistant with Richer Human Computer Interaction and Speech Recognition*, where both text-based and voice-based interactions were introduced. The work emphasizes solving admission-time congestion at enquiry counters and improving accessibility for remote users..

Summary of Reviewed Studies

The reviewed literature shows a clear transition from manual enquiry handling to digital, automated, and intelligent platforms. Educational management information systems demonstrate the importance of centralized web-based solutions for institutional coordination. Admission and college enquiry chatbot systems prove that automation and NLP-based interfaces significantly improve response efficiency and user satisfaction. IEEE research on role-based access control further establishes the necessity of layered

administrative models to ensure accountability, security, and effective system governance.

However, important gaps still exist. Most enquiry-focused systems emphasize automated answering mechanisms but lack structured hierarchical control, department-wise query allocation, and multi-level administrative oversight. On the other hand, many educational management systems focus on records and operations rather than enquiry lifecycle management. Very few systems integrate role-based layered administration with centralized admission enquiry handling.

These gaps motivate the development of the proposed Admission Enquiry Management System, which combines structured web-based enquiry handling with a layered administrative control model involving Principal, HOD, Teacher, and Student roles. The proposed system aims to provide not only an enquiry interface but also a complete institutional workflow for monitoring, allocation, and resolution of admission-related queries.

IV. THEORETICAL BACKGROUND

A. Web-Based Admission Enquiry Data Acquisition and Management Framework

The theoretical foundation of the proposed Admission Enquiry Management System begins with a web-based data acquisition and management framework. This framework is responsible for collecting, organizing, and maintaining enquiry-related information submitted by students and managing it through structured administrative workflows. Instead of using physical enquiry desks or unstructured communication tools, the system provides a centralized digital platform where all admission-related queries are formally registered and processed.

Students act as the primary data sources in the system. Through a web interface developed using HTML and CSS, students can register, log in, and submit admission enquiries. These enquiries may include questions related to courses, eligibility criteria, fee structures, documentation, and admission procedures. Once submitted, each enquiry is converted into a structured digital record containing the student details, department category, enquiry description, time stamp, and current status.

The Django-based backend framework forms the core of the data management layer. It handles request processing, form validation, data storage, and secure transmission of information between system components. The framework ensures that every enquiry is systematically stored in the database, enabling real-time access, update operations, and long-term tracking. This centralized management of enquiry data forms the foundation for structured processing, monitoring, and administrative control. By automating enquiry collection and organizing it within a formal system architecture, this framework eliminates manual record keeping, reduces information loss, and establishes a reliable base for further role-based processing, departmental allocation, and administrative analysis.

B. Role-Based Access Control and Layered Administrative Modeling

A key theoretical component of the proposed system is the application of Role-Based Access Control (RBAC) combined with layered administrative modeling. RBAC is a widely accepted framework in information systems that regulates access to system resources based on predefined user roles rather than individual identities. This approach improves system security, simplifies management, and clearly defines responsibilities within an organization.

In the Admission Enquiry Management System, four distinct roles are defined: Principal, Head of Department (HOD), Teacher, and Student. Each role is associated with specific permissions and operational boundaries. The Principal functions as the super administrator with authority over the entire system, including creating HOD accounts, monitoring overall enquiry activity, and overseeing institutional

workflows. HODs operate at the departmental level, where they manage teacher accounts, assign teachers, and supervise departmental enquiries. Teachers are responsible for handling, responding to, and updating the status of queries allocated to their departments. Students act as end users who submit enquiries and track responses.

This layered administrative structure models the real organizational hierarchy of educational institutions. Instead of flat administrative systems, the layered approach enforces authority separation, accountability, and controlled data visibility. Each level only accesses functions and information relevant to its responsibility. For example, students cannot view administrative dashboards, and teachers cannot create higher-level administrative accounts.

From a theoretical perspective, this structure supports secure system design, controlled workflow execution, and operational transparency. It also enables efficient monitoring, since higher authorities can oversee lower-level operations without interfering in routine tasks. The RBAC-based layered model ensures that enquiry data flows in a controlled manner across institutional levels, forming the backbone of a structured and reliable admission enquiry platform.

C. Department-Wise Query Allocation and Workflow Modeling

Another important theoretical component of the proposed system is department-wise query allocation combined with structured workflow modeling. Admission enquiries in educational institutions are not uniform in nature; they are typically related to specific departments, such as engineering, management, science, or arts. Therefore, an effective enquiry management system must not only collect queries but also intelligently route them to the appropriate operational units.

In the proposed system, once a student submits an enquiry, it is categorized based on department or enquiry type. The backend framework processes this information and assigns the query to the relevant department. The Head of Department oversees this allocation process by managing teacher assignments and ensuring that departmental queries are distributed appropriately among teachers. This mechanism transforms the enquiry system from a simple submission platform into an organized workflow-driven system.

Workflow modeling defines how an enquiry progresses through different stages, such as **submitted, assigned, under review, responded, and closed**. Each transition is controlled by role-based permissions. Students can submit and view enquiry status, teachers can update responses and progress, HODs can supervise departmental handling, and the Principal can monitor the entire workflow. This structured progression ensures that every enquiry follows a predictable and traceable lifecycle.

From a theoretical standpoint, workflow-based allocation improves accountability, reduces response delays, and enables systematic monitoring. It ensures that queries do not remain unattended, responsibilities are clearly assigned, and performance metrics such as response time and resolution rate can be evaluated. This theory supports the design of a system that not only communicates information but also governs how institutional processes are executed.

D. Administrative Monitoring, Reporting, and Decision Support Mechanism

The final theoretical component of the proposed system is the administrative monitoring and decision-support framework. Beyond enquiry collection and allocation, an effective admission enquiry platform must provide higher authorities with tools to supervise operations, evaluate performance, and support informed decision-making. This theoretical layer focuses on transforming raw enquiry data into meaningful administrative insights.

In the proposed system, all enquiry records, user activities, and workflow updates are stored in a centralized database. This enables real-time monitoring of system operations at different administrative levels. The Principal can view institution-wide enquiry statistics, departmental activity, response trends, and overall

system performance. Similarly, HODs can monitor department-specific queries, teacher workload distribution, and resolution progress. This continuous visibility strengthens accountability and ensures that institutional policies are being followed.

Reporting mechanisms allow the system to generate structured summaries such as enquiry volume by department, response turnaround time, unresolved query lists, and user activity logs. These reports provide valuable feedback for improving admission processes, reallocating resources, and identifying frequently asked questions. Over time, such analytical outputs support strategic planning and service optimization.

From a theoretical perspective, integrating monitoring and decision-support mechanisms bridges the gap between operational execution and administrative governance. It ensures that the system not only functions as a communication tool but also serves as a management instrument that enhances institutional control, transparency, and continuous improvement.

V. SYSTEM OVERVIEW

The Admission Enquiry Management System follows a structured workflow that starts from student enquiry submission and ends with administrative monitoring and response management. The system integrates web-based user interfaces, role-based administrative modules, backend processing, and centralized data storage to manage admission-related queries in a systematic and transparent manner. Each module works together to ensure secure access, proper query routing, timely responses, and effective institutional oversight. The overall design focuses on reliability, scalability, and ease of use.

A. Student Enquiry and User Interaction Layer

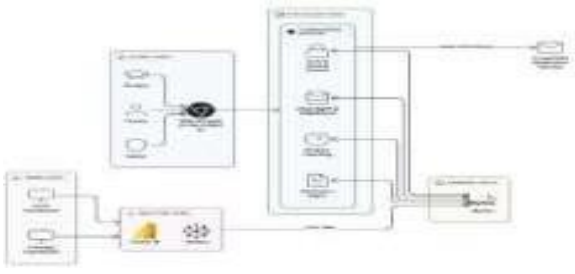
The system begins at the user interaction layer, where students act as the primary source of enquiry data. Through a web-based interface developed using HTML and CSS, students can register, log in, and submit admission-related queries. These enquiries may include questions regarding courses, eligibility criteria, admission procedures, documentation, or fee structures.

Once submitted, each enquiry is digitally recorded along with relevant details such as student information, department category, time stamp, and query description. This layer ensures that all enquiries are formally captured, securely transmitted, and made available for further processing. It forms the foundation of the entire system by enabling easy access, structured data entry, and transparent communication.

B. Role-Based Access and Administrative Control Layer

All system operations are governed through a Role-Based Access Control (RBAC) mechanism. This layer defines and enforces permissions for the four user roles: Principal, Head of Department (HOD), Teacher, and Student. Each role is associated with specific responsibilities and authorized actions.

The principal functions as the super administrator and oversees the entire system, including the creation of HOD accounts and monitoring of institutional enquiry activities. The HOD manages departmental operations, creates teacher accounts, and supervises department-level queries. Teachers handle allocated enquiries by reviewing and responding to student questions. Students are restricted to submitting enquiries and viewing responses. This layer ensures security,accountability, and proper workflow control throughout the system. Fig:- 1 System Architecture



C. Backend Server and Data Management Layer

The backend server acts as the central processing unit of the system and is implemented using the Django framework. It handles user authentication, role verification, enquiry processing, and workflow coordination. All requests from the user interface are validated and processed by the backend before being forwarded to the database.

The backend is directly connected to a centralized database that stores student profiles, administrative records, enquiry details, and system logs. This persistent storage supports real-time data retrieval, enquiry tracking, report generation, and long-term institutional analysis. The backend layer ensures secure data handling, consistent system behavior, and reliable interaction between all modules.

D. Query Routing and Workflow Management Engine

The query routing and workflow management engine represents the operational core of the system. Once an enquiry is submitted, this module categorizes it based on department and enquiry type. It then routes the query to the appropriate department under HOD supervision and allocates it to teachers for handling.

This engine defines the lifecycle of an enquiry, such as submitted, assigned, under review, responded, and closed. Each stage transition is controlled through role-based permissions. By modeling structured workflows, this module ensures that no query remains unattended, responsibilities are clearly defined, and progress can be continuously monitored.

E Administrative Monitoring and Reporting Module

The monitoring and reporting module provides higher authorities with real-time visibility into system operations. The Principal and HODs can access dashboards showing enquiry volume, departmental workload, pending queries, and response performance.

The system generates structured reports that help administrators evaluate institutional efficiency, identify frequently asked questions, and optimize enquiry handling strategies. This layer transforms operational data into meaningful administrative insights, supporting decision-making and continuous improvement.

F. User Dashboard and Notification Layer

The user dashboard serves as the interaction and feedback layer for all roles. Students can track enquiry status and view responses. Teachers can manage assigned queries and submit replies. HODs and the Principal can monitor activities through administrative dashboards.

Notification mechanisms ensure that users are informed about important events such as new enquiries, query assignments, and response updates. This layer improves responsiveness, transparency, and overall user engagement.

Summary

The overall system architecture integrates web-based user interaction, role-based administrative control, structured workflow management, centralized data processing, and institutional monitoring into a unified framework. This structured design enables efficient enquiry handling, secure access control, real-time monitoring, and scalable system operation, making the platform suitable for modern educational institutions.

Technology Suite Used

The Admission Enquiry Management System is built using a simple and scalable web technology stack:

- **Frontend:** HTML and CSS are used to design user-friendly interfaces for students and administrators.
- **Backend:** Django (Python) is used to handle authentication, role-based access, enquiry processing, and workflow control.
- **Database:** SQLite is used to store user details, enquiries, and system records**.**
- **Security:** Django's built-in authentication manages secure login and role authorization.
- **Database:** Firebase for storing sensor data, animal profiles, and health history.
- **Communication:** HTTP-based client–server architecture enables data exchange between users and the system.

his combination ensures strong performance, easy scalability, and smooth integration for future system expansion.

VI. METHODOLOGY

Phase 1: User Registration and Role Assignment

The first phase focuses on system initialization and access control. The Principal creates HOD login credentials, and HODs create teacher accounts. Students register themselves through the web portal. Each user is assigned a specific role (Principal, HOD, Teacher, Student), which determines system access and permissions. This phase establishes a secure and layered administrative structure.

Phase 2: Enquiry Submission and Collection

In this phase, students submit admission-related enquiries through the web interface. These queries may include questions about courses, eligibility, fees, or admission procedures. Each enquiry is stored in the centralized database along with student details, department category, time stamp, and status. This phase ensures structured data collection and formal registration of all queries.

Phase 3: Query Processing and Department Workflow

The submitted enquiries are processed by the backend server. The system categorizes queries and routes them to the appropriate department. HODs oversee departmental enquiries and ensure that they are properly assigned to teachers. This phase defines the enquiry workflow and ensures that each query reaches the correct operational authority.

Phase 4: Role-Based Handling and Response Generation

In this phase, teachers review assigned enquiries and submit responses through their dashboards. The system updates the enquiry status as under review, responded, or closed. Students can view replies and track progress. Role-based permissions ensure that only authorized users can update or manage enquiries.

Phase 5: Monitoring, Reporting, and Decision Support

The final phase focuses on administrative monitoring and analysis. The Principal and HODs track overall system activity, view departmental performance, monitor pending queries, and generate reports. These insights support better decision-making, workload management, and continuous improvement of the admission enquiry process.

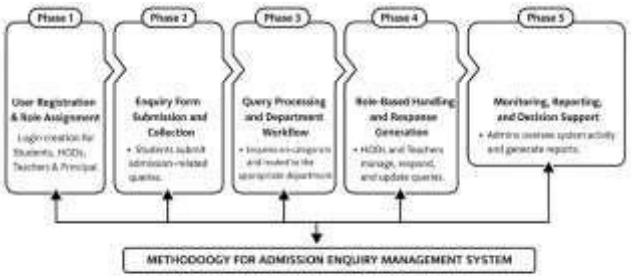


FIG:-Methodology Diagram

VII. MATHEMATICAL MODEL OF THE SYSTEM

The mathematical model represents how the Smart Animal Health Monitoring System collects sensor data, processes health parameters, predicts animal conditions, and generates alerts. The system is described using basic sets, functions, and classification models.

A. System Representation

The complete system **S** can be represented as:

$\boldsymbol{S} = \{\boldsymbol{I}, \boldsymbol{F}, \boldsymbol{O}\}$

- **I** → Input set (sensor data)
- **F** →Set of processing functions
- **O** → Output set

2. *Input Set*

The input set consists of all data provided by users and administrators:

$$\boldsymbol{I = \{ U, Q, R \}}$$

where:

U → User data (Student, Teacher, HOD, Principal details)

Q → Enquiry data (query text, department, time, status)

R → Role information (permissions and access level) Each enquiry can be represented as:

$$\boldsymbol{Q} = \{ \boldsymbol{q\_id}, \boldsymbol{q\_text}, \boldsymbol{dept}, \boldsymbol{u\_id}, \boldsymbol{t}, \boldsymbol{s} \}$$

Where:

q_id → Enquiry ID

q_text → Enquiry description

dept → Department

u_id → User ID

t → Timestamp

s → Status of enquiry

3. *Processing Functions*

The system applies the following main functions:

1. Authentication and Role Validation

$$\boldsymbol{F}_1(\boldsymbol{U}) \rightarrow \boldsymbol{U}_r$$

Where U_r is the authenticated user with verified role.

2. Enquiry Processing and Storage

$$F_2(Q) \rightarrow Q_s$$

Where Q_s is the validated and stored enquiry record.

3. Query Routing and Allocation

$$F_3(Q_s, R) \rightarrow A$$

Where A is the allocated enquiry mapped to a department and teacher.

4. Response Handling

$$F_4(A) \rightarrow R_e$$

Where R_e is the response generated by the teacher.

5. Monitoring and Reporting

$$F_5(Q_s) \rightarrow M$$

Where M represents monitoring data and system reports.

4. *Output Set*

The final output of the system is:

$$O = \{ R_e, S_u, Rep \}$$

Where:
R_e → Teacher responses
S_u → Updated enquiry status
Rep → Administrative reports and system summary.

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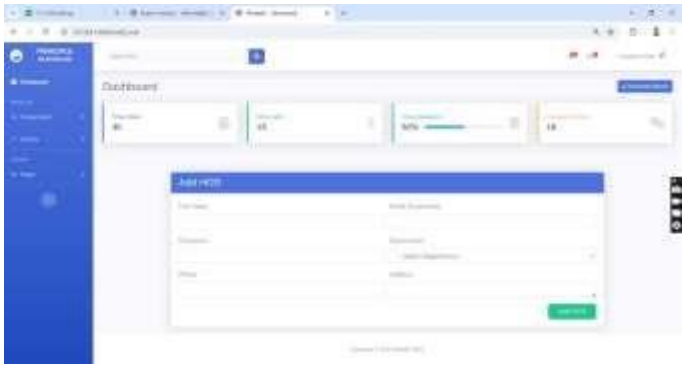
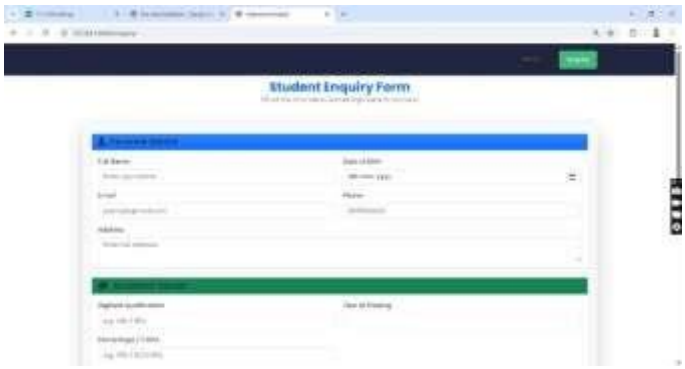
VIII. RESULTS AND DISCUSSION





IX. CONCLUSION AND FUTURE WORK

This project presented a web-based Admission Enquiry Management System designed to provide a structured and role-based platform for handling student admission queries. By introducing layered administrative control through Principal, HOD, Teacher, and Student roles, the system ensures proper enquiry routing, secure access, and transparent monitoring. The proposed system reduces manual workload, improves response efficiency, and centralizes admission-related communication. The implementation using HTML, CSS, and Django provides a reliable and scalable solution that supports organized enquiry processing and effective institutional management.

Future Scope

In the future, the system can be enhanced by integrating an AI-based chatbot to provide instant responses to common admission queries and reduce dependency on manual replies. Additional features such as email/SMS notifications, analytics dashboards, and mobile application support can further improve accessibility and user engagement.

The platform can also be extended to handle complete admission workflows, document uploads, and application tracking, making it a comprehensive digital admission management solution for educational institutions.

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