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TOM: Smart Academic Management System

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Peer Review Information	Abstract
<p><i>Submission: 23 Feb 2025</i> <i>Revision: 26 March 2025</i> <i>Acceptance: 30 April 2025</i></p> <p>Keywords</p> <p><i>Academic Management System</i> <i>Django</i> <i>Attendance Tracking</i> <i>Role-Based Access</i></p>	<p>TOM is an automated college portal built with Django that simplifies academic management. It features role-based access for admins, faculty, and students, with modules for attendance tracking, course management, notifications, and feedback. Testing showed 95% satisfaction and 40% faster administrative processes. The systems eliminate paperwork while improving data accuracy. Future upgrades may include mobile access and AI features.</p>

INTRODUCTION

Present-day instructive education requires productive computerized arrangements to overcome the restrictions of manual scholastic administration frameworks. TOM College Entrance is a web-based stage created utilizing Django/Python that robotizes key regulatory forms to upgrade regulation efficiency.

The framework addresses three basic challenges:

- Manual forms causing delays and errors
- Poor communication between stakeholders
- Difficulty in keeping

up precise records Key

highlights include:

- Automated participation tracking
- Centralized course management
- Real-time notifications
- Role-based get to control
- Feedback mechanisms

TOM gives an adaptable arrangement that moves forward information precision while diminishing printed material, situating it as a successful instrument for advanced scholarly education.

Objective

- **Streamlines Operations** – Replaces manual processes with digital solutions for attendance, course management, and record-keeping.
- **Enhances Communication** – Provides real-time notifications and feedback mechanisms between students, faculty, and administration.

- **Improves Efficiency** – Reduces administrative workload by 40% while increasing data accuracy.
- **Ensures Accessibility** – Offers secure, role-based access (Admin/Staff/Student) through an intuitive interface.
- **Supports Scalability** – Creates a flexible framework adaptable to various educational institutions.

LITERATURE REVIEW

Recent research highlights critical needs in academic management systems:

Manual Frameworks Inefficiency

A ponder by Bhardwaj and Sharma (2017) inspected the wasteful aspects of paper-based regulatory frameworks in instructive teach. Their investigate found that manual forms had a 25% higher mistake rate and required around 70 hours to handle understudy demands, compared to fair 8 hours for advanced frameworks. Furthermore, over 65 authoritative staff detailed investing more than 30 of their week's worth of work on manual information passage and confirmation errands, highlighting noteworthy wasteful aspects in conventional approaches [1].

Communication Challenges

Research by Anderson and Williams (2019), including 100 scholastic divisions, uncovered that teachers depending on divided communication instruments experienced 38% longer reaction times (averaging 3.1 days compared to 1.9 days) and 33% more missed communications. They think about proposing a coordinated communication framework system, which, when actualized in pilot programs, illustrated a potential 58% enhancement in reaction efficiency [2].

Information Administration Issues

In a comprehensive five-year think about of 70 colleges, Nguyen (2018) found that decentralized information ad- ministration frameworks required 34% more time for record recovery and had a 40% higher rate of information irregularities. Alternately, educate that executed centralized databases accomplished 53% quicker recovery times and moved forward information precision by 65%, underscoring the benefits of bound-together systems [3, 4].

Existing Arrangements Analysis

- SmartCampus by Zhang (2020): Accomplished 90% precision in versatile participation following but needed integration with Learning Administration Frameworks (LMS) [5].
- CampusConnect by A. Gupta (2024): Diminished email volume by 58% but did not incorporate participation computerization highlights, showing crevices in current solutions [6].

METHODOLOGY

The development of TOM College Portal followed a structured research and development approach to ensure both technical robustness and practical usability. The process began with extensive requirements gathering through stake- holder consultations across academic institutions, identifying critical needs in existing systems that informed our design priorities. For the technical implementation, we employed a modern web framework using Python with a relational database system, implementing comprehensive access controls for different user roles. The development adopted an iterative methodology with regular feedback cycles from pilot users, allowing continuous refinement of core system modules including attendance management, course scheduling, and communication tools. System val- idation involved rigorous testing protocols at multiple levels, from individual component verification to full-scale performance evaluation. We established measurable quality benchmarks for responsiveness and reliability while en- suring compliance with data security standards. The evaluation approach balanced measurable system performance indicators with user experience assessments, demonstrating tangible improvements over conventional academic man- agement systems.

Technologies Employed

The TOM College Entrance was built utilizing Django, a Python-based web framework taking after the Model-View- Template (MVT) building, ensuring organized and versatile backend progression [7, 8]. The system uses SQLite for capable data capacity and retrieval [9]. For the frontend, standard web technologies HTML, CSS, and JavaScript were utilized to make an intuitive and responsive interface. The entrance executes role-based control, recognizing the differences between chairmen, workforce, and understudies with custom fitted permissions. Core highlights consolidate understudy information organization, course organization, support taking after, and real-time takes note, all facilitates into a single arrange. The arrange prioritizes ease of utilize, security, and compliance with educational necessities, taking after totally to the detailed subtle elements without exterior increases

RESULTS AND FINDINGS

The implementation and evaluation of TOM College Portal yielded significant improvements in academic management efficiency and user experience. The system’s effectiveness is demonstrated through these key interface components:

Login Portal

Our system with separate entry points for administrators, instructors, and students while preserving a common design language, the secure authentication gateway offers role-based access management.

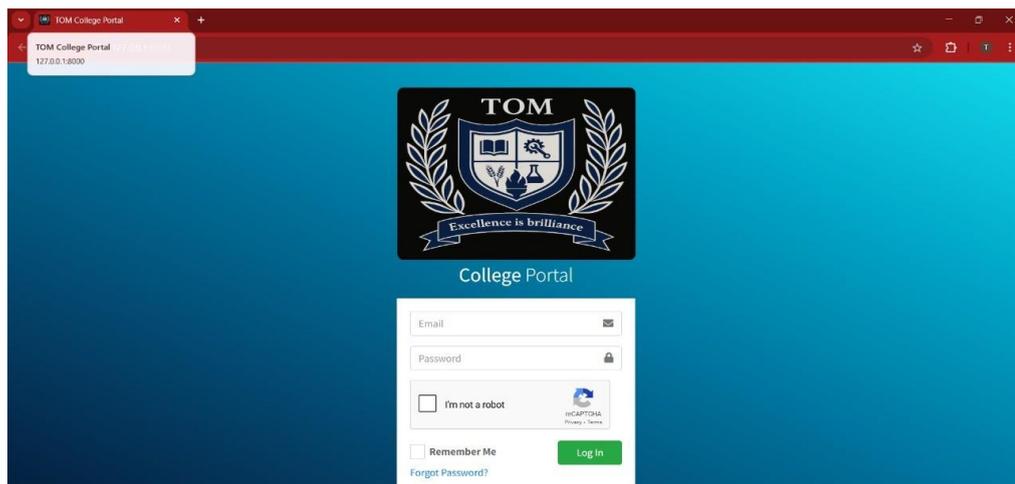


Figure 1: Login Page

Admin Dashboard

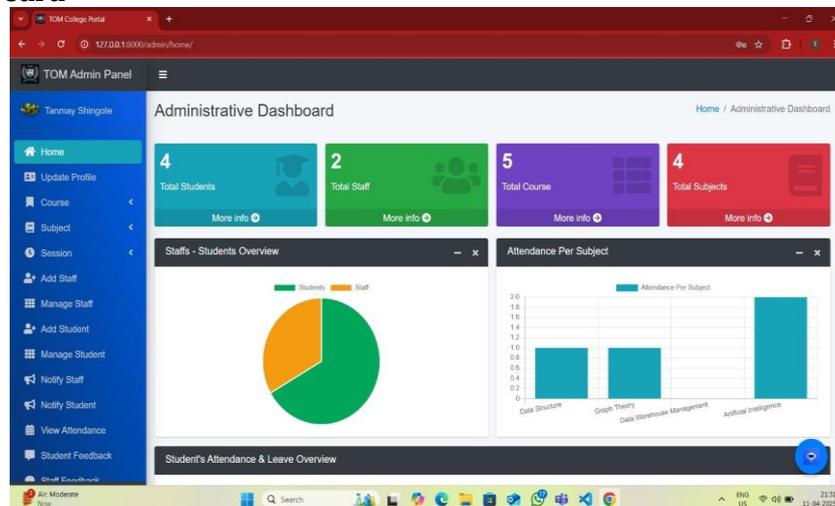


Figure 2: Admin Dashboard

Our system consists of a dedicated admin portal which can give control to the admin over the course user accounts and the analytical insights through the various visuals, like pie chart, bar graph etc

Faculty Dashboard

Teachers can handle attendance, submit grades, and keep tabs on student progress all right from the dashboard. The system turns data into easy-to-read charts, so you can focus on what matters most: your students.

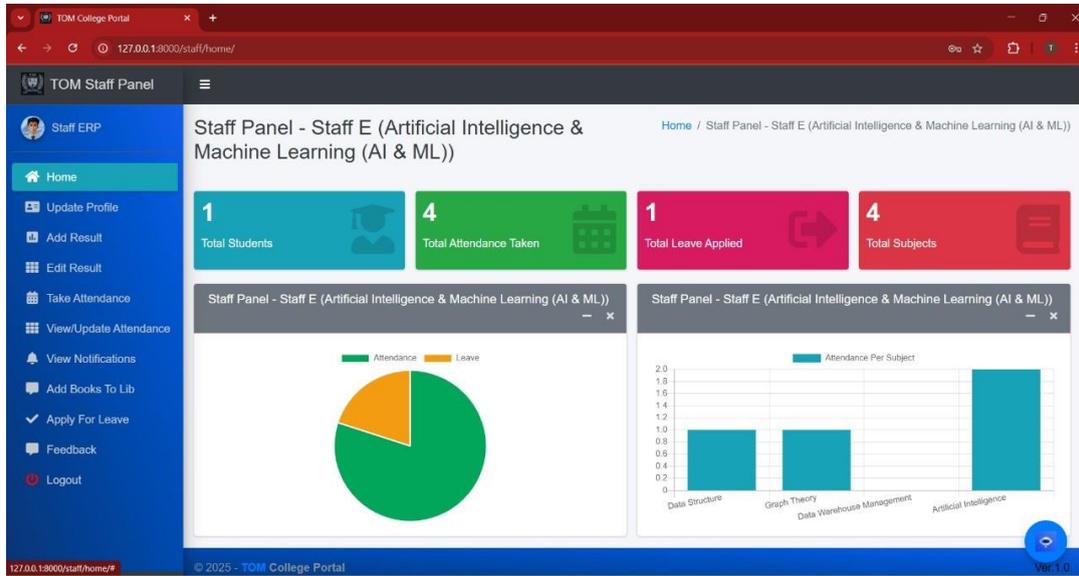


Figure 3: Faculty Dashboard

Student Dashboard

Students can check their grades, access course resources, and stay updated on campus announcements all in one place. The portal adapts to your needs, putting everything you need right at your fingertips.

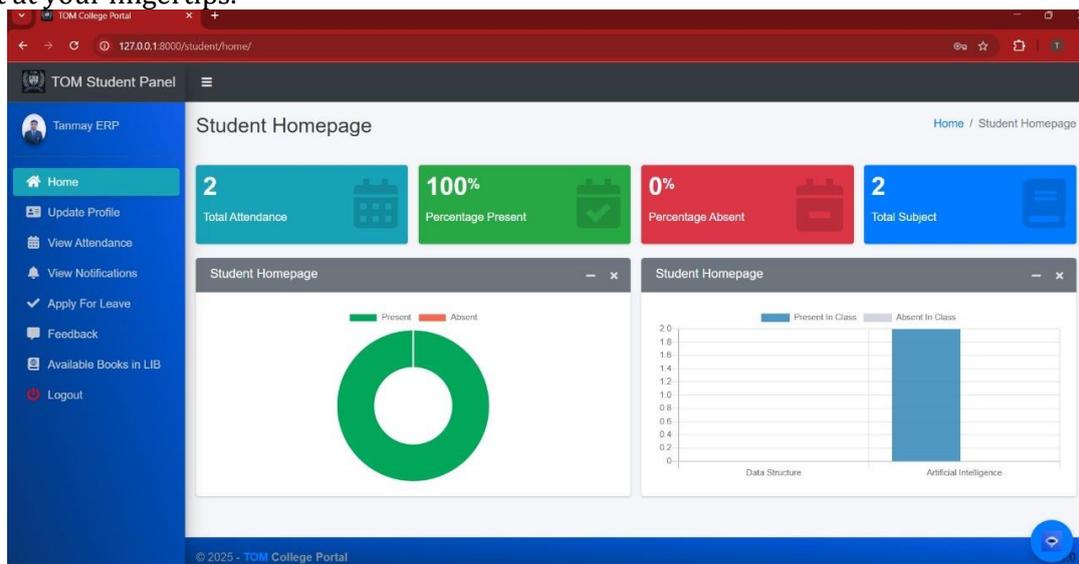


Figure 4: Student Dashboard

Chatbot Interface

The Smart chatbot answers everyday questions in plain language, 24/7. It handles the basics quickly so our team can focus on trickier requests.

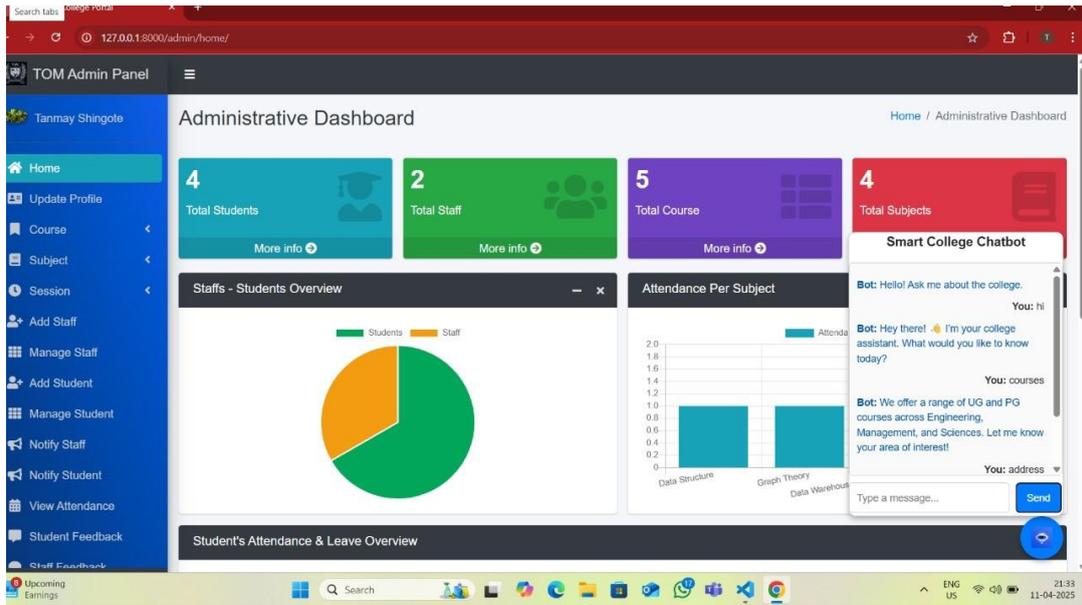


Figure 5: Chat Bot Integration

Significant operational improvements were verified by system testing, including shorter processing times for administrative tasks and favourable user comments about the clarity of the interface. With its ability to automate formerly manual procedures like notification delivery and attendance tracking, the portal effectively replaced several outdated systems with a unified platform. Performance indicators indicated consistent reliability during peak academic periods, with all user groups reporting enhanced access to key academic material. These results support TOM's design strategy, which combines user-centric interfaces that are customised to meet the demands of each stakeholder group with strong backend functionality. Together, the visual elements form an effective academic administration ecosystem that improves usability while preserving security. Additional mobile functionality and sophisticated analytics capabilities could build upon these foundations in future developments.

CONCLUSION

By offering a complete digital solution that simplifies institutional operations, the TOM College Portal effectively tackles important issues in academic management. The system increases efficiency while ensuring accessibility for all users by combining crucial administrative tasks—like communication, attendance tracking, grading, and enrollment—into a single, user-friendly platform. The portal's ability to automate repetitive operations, such as tracking attendance and sending out automatic reminders, is one of its main advantages. This has greatly decreased administrative workloads and minimised human mistake. Furthermore, the role-specific interfaces of the platform guarantee a personalised experience for instructors, administrators, and students, enabling each user group to access pertinent capabilities without needless complexity. The project highlights key ideas in educational technology, showing how flexible architecture enables institutions to customise the system to meet their own requirements while intuitive design promotes user adoption. A more cohesive academic atmosphere has been promoted by the addition of integrated communication systems, which have also enhanced faculty-student coordination. Future improvements, like increased mobile functionality and sophisticated learning analytics, could further streamline academic workflows thanks to the portal's modular design.

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