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Sangam: A Role-Based, Campus-Exclusive College Social Network for Unified College Communication

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Abstract: *In most colleges, official communication is scattered across notice boards, departmental WhatsApp groups, emails, and word of mouth. Students often miss notices, event details, and committee updates, and committees have no way to gauge real interest before an event. To address this, this paper presents the College Social Network, a web-based platform limited to the campus community. The system provides enrollment-verified login, role-based accounts with visible authority badges, one-way broadcast groups, two-way discussion groups, tracked "Ask a question" threads, and an event "Join" action. Outsiders such as parents, alumni, and prospective students get read-only access to the public feed. A review of six related works shows that existing campus platforms depend on administrator-managed registration and basic roles, and that role-based access control is the accepted foundation for managing user privileges. The proposed system combines these ideas in one verified, role-based, and trackable platform*

Keywords: College Social Network, Role-Based Access Control, Verified Membership, Campus Communication, Broadcast Groups, Community Q&A

I. INTRODUCTION

On a typical college campus, communication is spread across notice boards, several departmental WhatsApp groups, emails, and personal contact. Students frequently miss information about events, competitions, and committee activities simply because it is distributed over too many channels. There is no single official and verifiable platform where students, teachers, committees, and the college can share updates and interact directly. Existing tools were not built for structured, role-based, verifiable campus communication.

Researchers and student developers have proposed campus-specific networks as an alternative to public social media [2], [3], [4], [6]. Du et al. [2] argue that public platforms are disconnected from real campus activity and cannot give strict privacy protection to the institution. Other work shows that structured community Q&A can reduce staff workload in large classes [5], and that role-based access control (RBAC) is a flexible, easy-to-administer way to manage who may do what in a web application [1].

The proposed College Social Network builds on these findings. It is a web-based system restricted to verified members of one college. It consolidates official communication into a single feed, allows two-way interaction between students and committees, gives the institution visibility into student interest, and still permits limited one-way access to outsiders.

It is planned as a two-semester diploma final-year project: literature survey, requirements, and design in the first semester, and development and testing in the second.

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II. METHODOLOGY

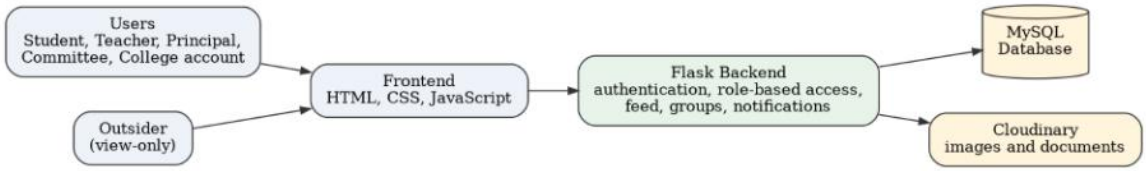


Fig. 1. Proposed system architecture (block diagram)

A. Requirement Analysis

Identified the main challenges in campus communication: scattered notices, no tracked way to ask questions, and no visibility of student interest in events.

Defined the core requirements: enrollment-number login, role badges, broadcast and discussion groups, a filterable feed, tracked questions, event "Join," notifications, and outsider view-only access.

Compared existing solutions (notice boards, WhatsApp, email, and the six related works [1]–[6]) to find gaps in verification, roles, tracked Q&A, and engagement visibility.

B. System Design

Designed the architecture around User, Role, Group, Post, Question, and Notification modules (Figure 1).

Prepared use case, data flow, and entity-relationship diagrams to show the interactions (Section III).

Emphasis is placed on a single filterable feed and a mobile-friendly interface for easy access.

C. Database and Backend Development

Create a MySQL database for users, roles, groups, posts, replies, and the enrollment whitelist.

Implement enrollment-verified authentication and role-based access control in a Flask backend.

Build routes for feed, groups, "Ask a question," "Join," and notifications, with images and documents stored on a cloud media service (for example, Cloudinary) and referenced from MySQL.

D. Frontend Development

Develop the interface using HTML, CSS, and JavaScript for the feed, forms, and group pages.

Integrate filters by department and committee, and role badges on every post and profile.

Provide a **public view-only version** of the feed and committee messages for outsiders, with no login.

E. Verification and Access Control Mechanism

Every new account is checked against the college's enrollment whitelist before it is created.

The College (admin) account creates and manages committee accounts, so committee authority cannot be self-assigned.

Role-based access control [1] ensures only the owning committee or department can post in broadcast groups.

F. Testing and Validation

Perform functional testing of role-based access, enrollment verification, and outsider restrictions with sample accounts.

Run a usability pilot with a sample set of college users to check navigation and engagement.

Check that outsiders cannot post or message and that private data stays protected.

G. Deployment and Maintenance

Deploy the platform for actual use within the college.

Collect continuous feedback for bug fixing and feature enhancement.

Document the outcomes and update the platform as more committees and departments join.

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III. MODELING AND ANALYSIS

The design of the **College Social Network** uses conceptual models and analysis to make sure the system meets the identified requirements. This section presents the models and analysis done at the design stage.

Use Case Modeling

1) Actors:

Student: Views the feed, joins events, asks questions, and posts in discussion groups.
Teacher / Principal: Posts official updates and answers questions.
Committee Head / Member: Runs broadcast groups, announces events, and answers questions.
College (admin) account: Creates and manages committee accounts and the enrollment whitelist.
Outsider: Views the public feed and broadcast messages only.

2) Use Cases:

Register and log in with an enrollment number.
View and filter the main feed by department or committee.
Post in broadcast or discussion groups (subject to role).
Ask a question on a post and track the reply.
Join an event or team post.
Receive notifications for replies and new posts.
Manage committee accounts and groups.

B. Data Flow Diagram (DFD)

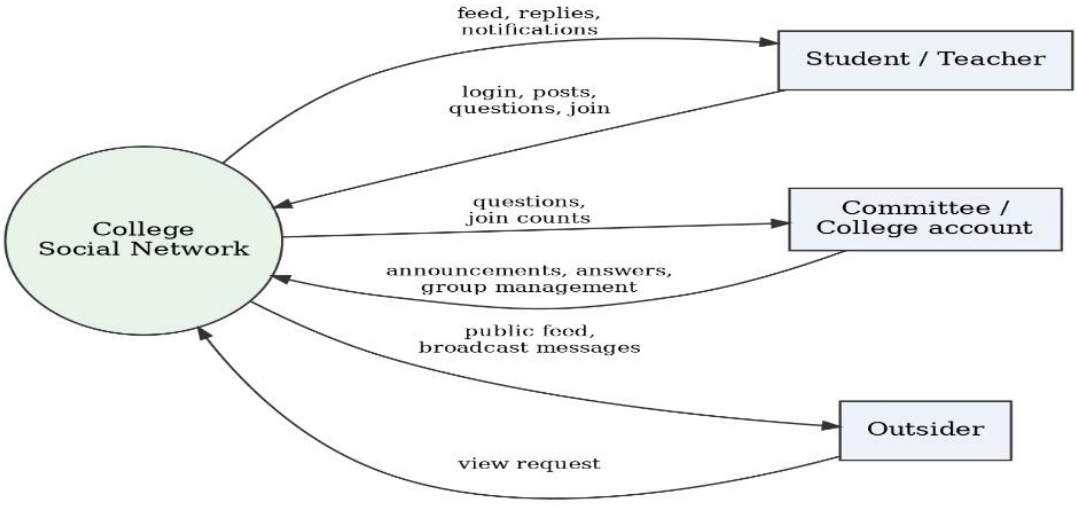


Fig. 2. Context-level data flow diagram (DFD Level 0)

Level 0 (Context Diagram): Shows the platform exchanging data with three external entities: members (students and teachers), committees and the college account, and outsiders.
Level 1: Expands into detailed flows: login request → enrollment check → role assignment → feed and group access → post, question, or join → notification to the relevant users.

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C. Entity Relationship (ER) Modeling

Key entities include:

User (User_ID, Enrollment_No, Name, Role_ID).

Role (Role_ID, Role_Name, Badge).

Group (Group_ID, Type [broadcast or discussion], Owner_ID).

Post (Post_ID, Author_ID, Group_ID, Content, Timestamp).

Question / Reply (Question_ID, Post_ID, Asker_ID, Reply, Replier_ID).

Join_Action (Join_ID, Post_ID, User_ID) and **Notification** (Notification_ID, User_ID, Message).

The model keeps roles and enrollment records separate from user accounts and so keeps the design free of redundant data.

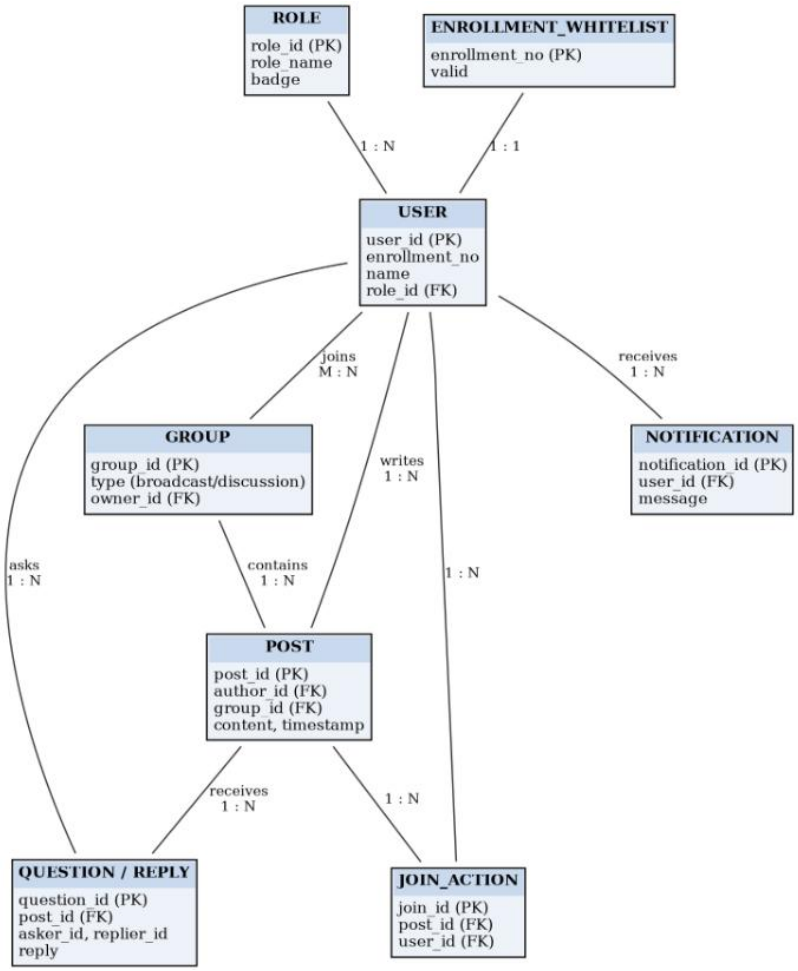


Fig. 3. Entity-relationship diagram

D. Key System Analysis

1) Functional Analysis:

The system supports verified registration, role-based posting, group communication, tracked Q&A, event joining, and notifications as core functions.

Broadcast groups let only the owning committee or department post, so official messages stay clean.

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2) Security Analysis:

Enrollment whitelisting keeps the platform internal to the college.

Role-based access control [1] limits each account to the actions its role allows, which also guards against misuse by insiders.

Outsiders get read-only access and no messaging rights.

3) Expected Performance:

MySQL queries and media stored on a cloud service are expected to keep the feed responsive for one college's user base.

This will be measured during the pilot in the next semester.

E. Comparative Analysis

Compared with the related campus platforms in the literature [2], [3], [4], [6] and with the informal channels now in use, the proposed system shows:

TABLE I: Comparison of the Proposed System with Existing Campus Communication Channels

Feature	**Notice boards / WhatsApp**	**Related work [2], [3], [4], [6]**	**Proposed system**
Verified membership	None	Admin approval or admin registration [4], [6]	Enrollment-number whitelist
Roles	None	Student, staff, admin [4], [6]	Student, Teacher, Principal, Committee Head, Committee Member, College
Authority badges	No	Not described	Shown on every post and profile
Posting control	Anyone	Central admin approval of every post [4]	Delegated by role; broadcast groups owned by committees
Group types	Informal groups	Group components [2], admin-targeted notices [6]	One-way broadcast and two-way discussion
Tracked Q&A on notices	No	Not attached to notices [5]	"Ask a question" on every post with tracked replies
Interest tracking for events	No	Event listings [6]	"Join" action visible to committees
Outsider access	Physical notice board only	Not implemented [2]	Public read-only view

IV. CONCLUSION

The College Social Network is a digital solution aimed at replacing scattered campus communication with one verified, role-based platform. By combining enrollment-verified login, authority badges, broadcast and discussion groups, tracked questions, event joining, and read-only outsider access, it addresses gaps that the reviewed campus platforms leave open. The analysis and design show that the system is technically feasible and realistic to build within the two-semester timeline of this diploma final-year project.

Future enhancements may include a mobile app, direct one-to-one chat between students and committees, analytics dashboards for event engagement, and expanded role and badge tiers as more committees and departments join the platform. Features seen in related work, such as tagging, recommendation [2], and a chatbot [6], are also possible extensions.

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