

Office Internal Communication Platform

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Abstract: The Office Internal Communication Platform is a bilingual, role-based collaboration system developed to centralize organizational communication on a locally controlled network. The system addresses fragmented messages, delayed notices, untraceable verbal instructions, disconnected meeting records, and dependence on public messaging services. It integrates administrator, department-head, and staff workflows with department, private, and custom-group chat, searchable message history, attachments, replies, reactions, pinned messages, read receipts, notifications, meetings, announcements, dashboards, profiles, and audit records. Security controls include role-based authorization, password hashing, forced password changes, login-attempt throttling, CSRF validation, prepared SQL statements, LAN HTTPS certificates, and activity logging. The resulting prototype demonstrates that a locally managed web platform can consolidate communication and coordination while retaining organizational control of accounts and records.

Keywords: office internal communication, real time chat, local area network, meetings, announcements.

INTRODUCTION

Office communication encompasses daily messages, departmental coordination, private discussions, scheduled meetings, official announcements, and shared files. When these essential activities are spread across paper notices, telephone calls, and unrelated public messaging applications, critical organizational information can easily be delayed, lost, or rendered difficult to trace. Traditional internal communication approaches introduce practical difficulties, as messages become separated across personal accounts, unrecorded verbal instructions, and physical bulletins, preventing employees from consistently locating the latest information or verifying whether critical updates have been read. Reliance on external public internet services further creates undesirable dependencies on external connectivity and provides very limited administrative control over organizational accounts and confidential records. Without centralized role-based access control and system-wide activity logging, organizations risk unauthorized access, and constant, redundant inquiries. By allowing administrators to retain total control over organizational data while granting department heads and staff role-tailored collaboration tools, the system streamlines administrative oversight and brings all internal communication, and audit histories into a single secure workspace.

PROBLEM

Traditional office communication creates several practical difficulties. Messages may be separated across personal accounts, verbal instructions, and paper notices, so employees cannot always locate the latest information or confirm whether it has been read. Meeting changes and urgent announcements may reach some employees late, while files and earlier conversations are difficult to retrieve. Public internet services also create dependence on

external connectivity and provide limited organizational control over accounts and records. Administrators may need separate tools to manage employees, departments, meeting schedules, announcements, notifications, and activity histories. Without role-based access and centralized records, unauthorized access, inconsistent information, weak accountability, and repeated inquiries can occur. A locally managed system is therefore required to bring communication, coordination, and administrative oversight into one secure workspace.

APPROACH

The system consists of three main user roles: Admin, Department Head and Staff. Both users must authenticate through the login process before accessing the system. After successful authentication, each user is directed to a role-specific dashboard.

Figure 1(a) the workflow begins with the user authentication process. The system verifies the submitted username and password credentials. If authentication fails, the user is redirected back to the sign-in page. Upon successful verification, the Administrator gains complete access to all system management modules. The Admin workflow encompasses total administrative oversight, allowing the user to manage user accounts, oversee department configurations, schedule and update organizational meetings, publish official announcements, initiate private and department chats, create custom group conversations, view comprehensive system activity logs, and manage individual profiles.

Figure 1(b) details the middle-tier supervisory workflow. After completing the credential verification process, Department Heads are provided with operational tools designed for departmental management and team coordination. Unlike administrators, Department Heads focus on managing department-level communication, scheduling and conducting departmental meetings, making announcements, creating user groups, initiating private or department chats, and auditing department activity logs to track ongoing tasks and communication histories.

Figure 1(c) represents the operational workflow for end-users. Once logged in, Staff members access a streamlined interface tailored for daily collaboration. Staff users can view scheduled meetings, access published company announcements, participate in private and department-wide chat rooms, view user group memberships, inspect relevant activity logs, and manage their personal user profiles.

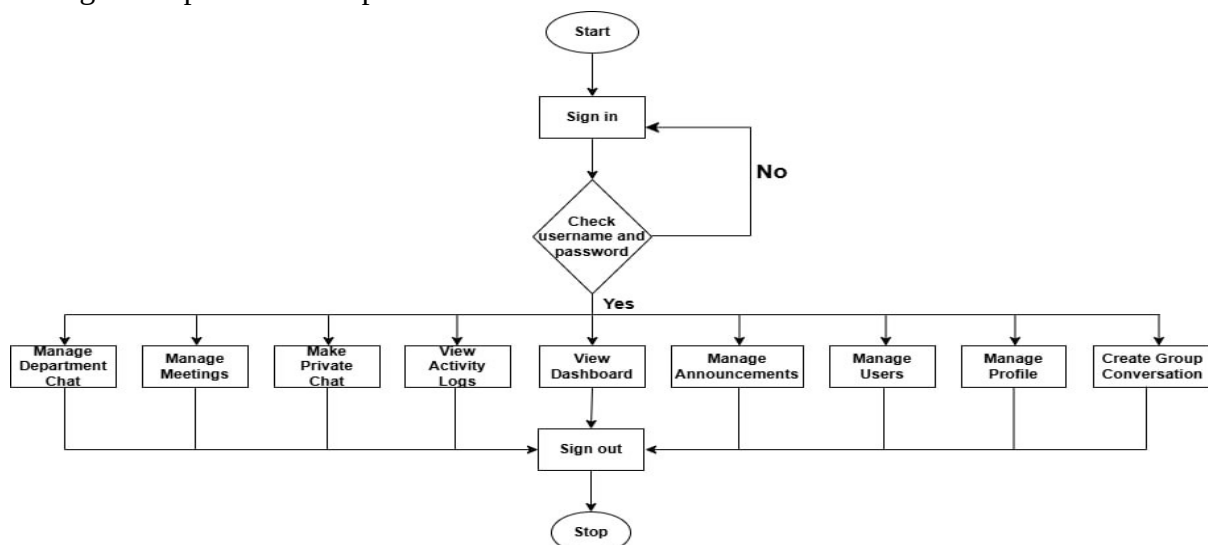


Figure1(a) System flow diagram for Admin

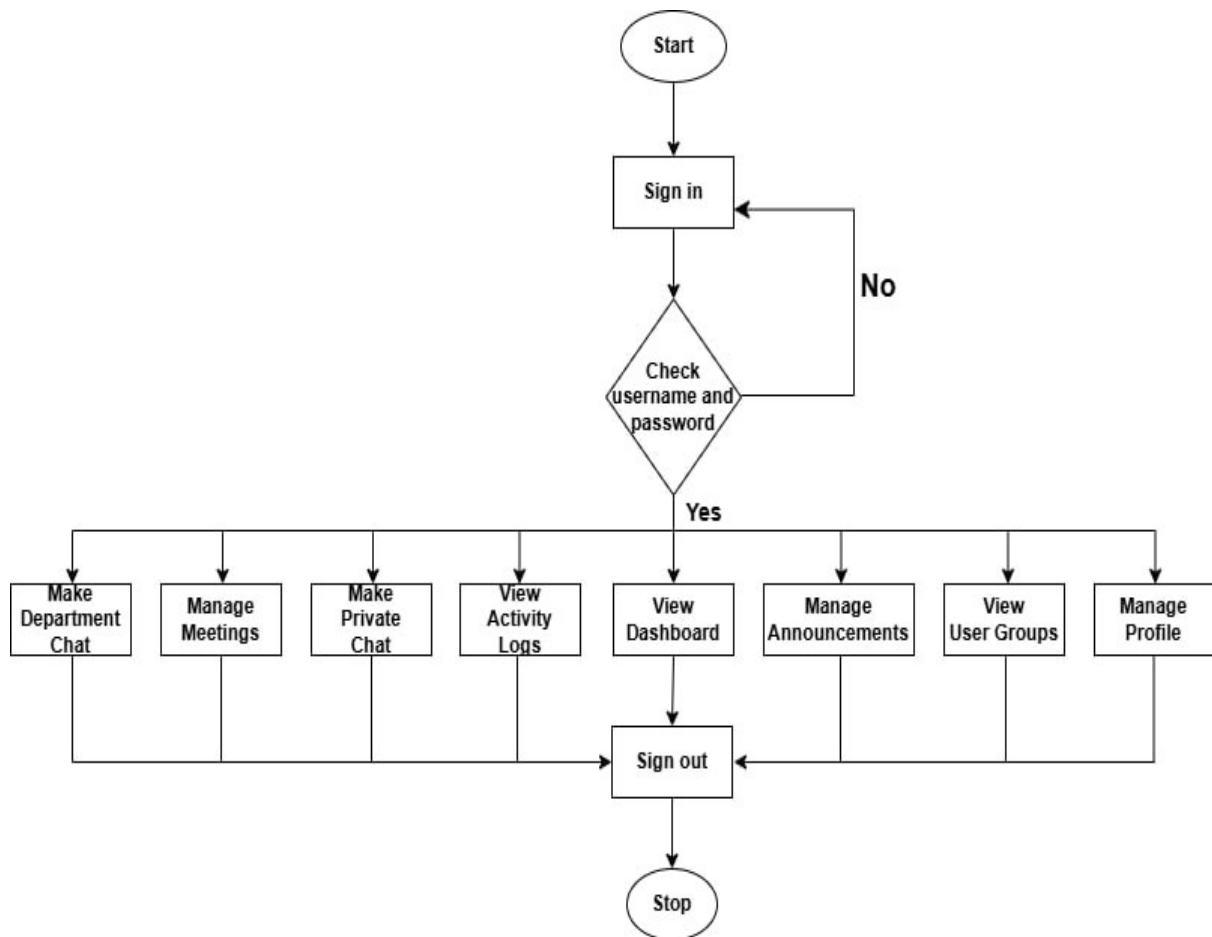


Figure1(b) System flow diagram for Department Head

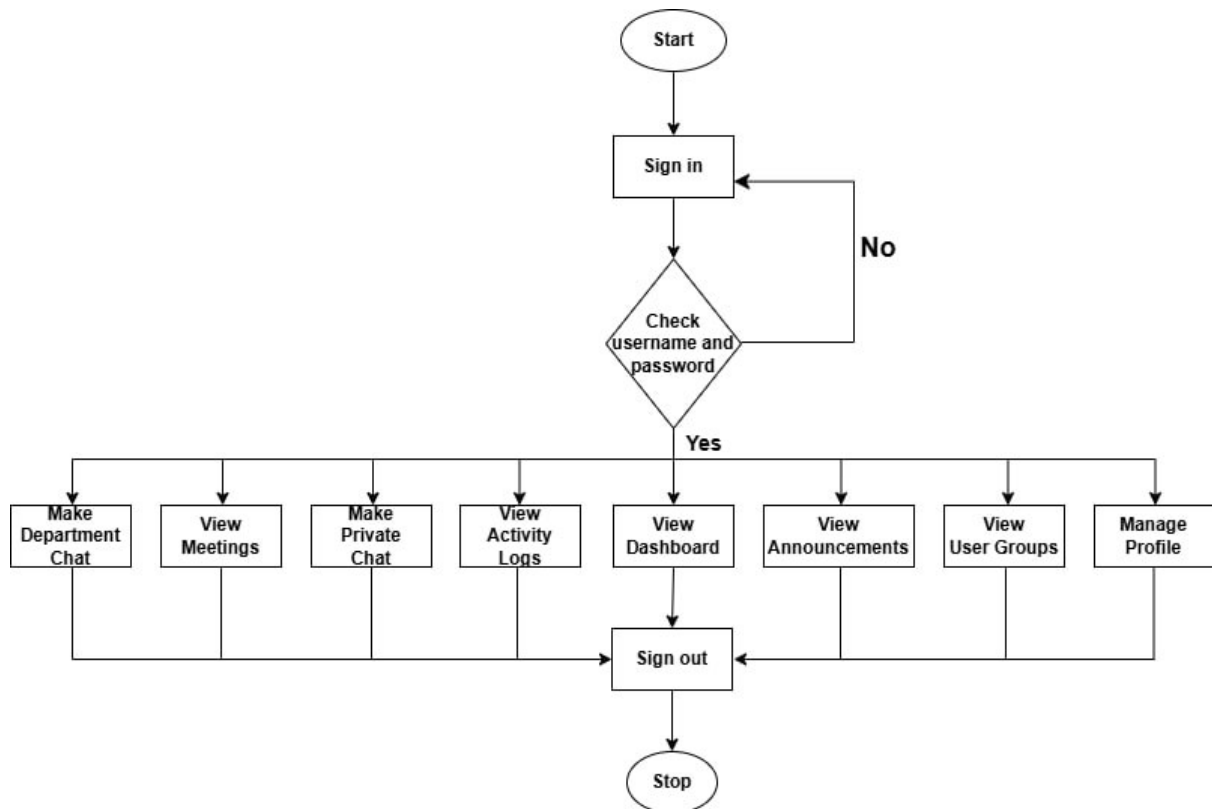


Figure1(c) System flow diagram for Staff

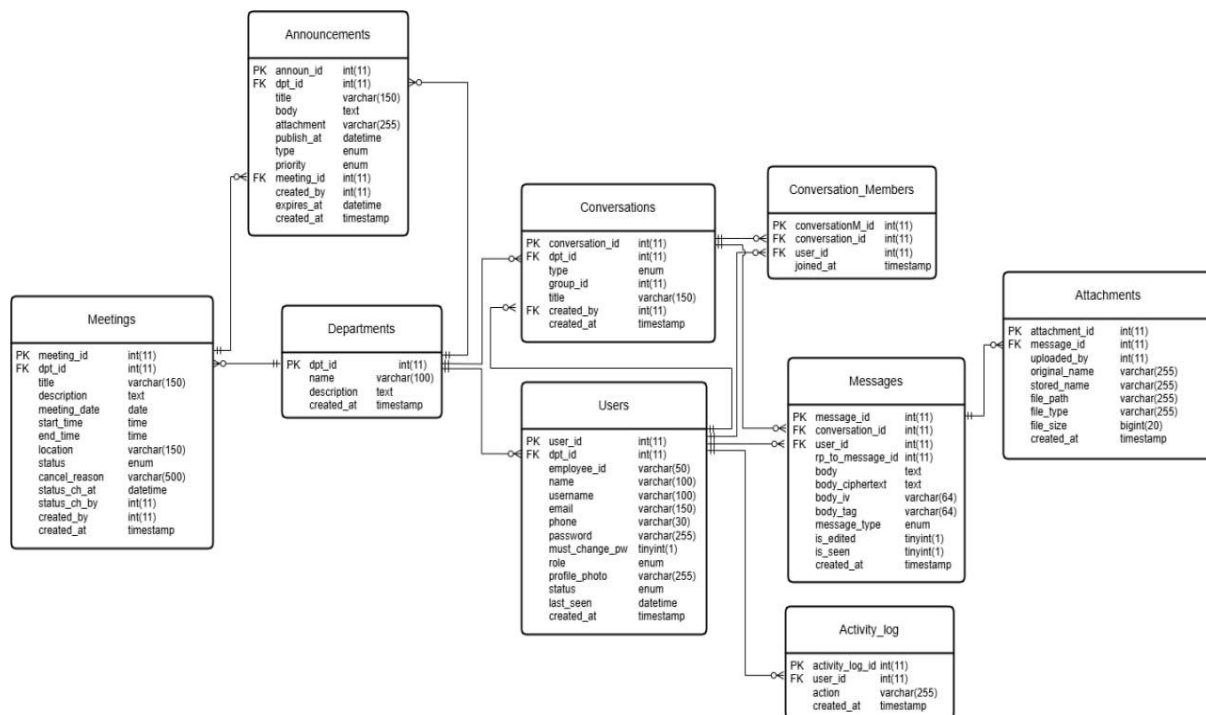


Figure 2. Database Architecture

Figure 2 presents the Entity Relationship Diagram (ERD) for the Office Internal Communication Platform. The diagram shows how the main database tables are organized and how they connect to one another. It supports clear data modeling by defining primary keys, foreign keys, and table relationships so related records stay consistent and can be queried efficiently. In this platform, the ER diagram includes the core tables used for user management, real-time messaging, meeting coordination, announcements, and activity auditing. The main tables include:

The main tables included in the Office Internal Communication Platform are:

- users stores user credentials, profile information, account status, and role assignments (Admin, Department Head, Staff).
- departments stores department names and organizational unit details
- conversations stores metadata for private, department, and custom-group chat sessions.
- conversation_members tracks users assigned to specific conversation channels.
- messages stores text content, reply links, edits, pins, reactions, and read receipts.
- attachments stores metadata and file paths for uploaded files and media within messages.
- meetings stores meeting titles, schedules, locations, cancellation reasons, and status tracking.
- announcements stores office-wide or targeted notices, priority levels, publication times, and expiration dates.
- activity_log stores system audit trails, user actions, login/logout history, and activity timestamps.

Each operational table is linked through primary and foreign keys to maintain referential integrity. Most messaging, meeting, and audit tables connect directly to user and department references.

Overall, Figure 2 provides the relational database foundation for secure messaging, task coordination, and administrative auditing in the system.

RESULTS

The completed system provides one workspace for office communication and coordination. The dashboard presents relevant summaries and recent information. Department, private, and custom group chats support real-time messages, attachments, replies, reactions, pins, read states, and call records. Meetings include scheduling, reminders, cancellation or completion statuses, and notifications. Announcements can be targeted, prioritized, scheduled, archived, and restored. Administrators can manage employees, departments, roles, account status, password resets, and activity-log exports. Global search and user profiles improve daily usability, while responsive English and Myanmar interfaces support desktop and mobile access. Project tests cover configuration, authentication, role restrictions, chat behavior, meetings, announcements, and local-network, real-time.

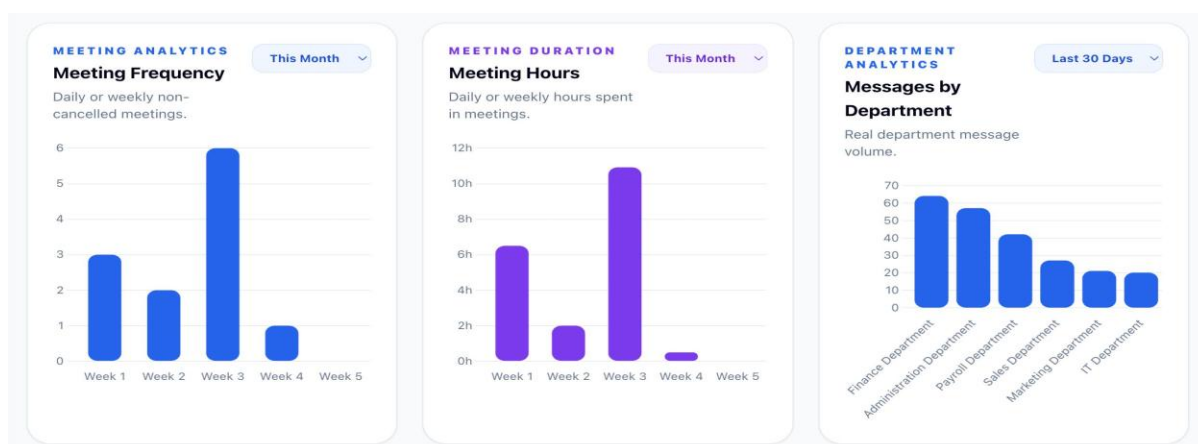


Figure 3. Report of the Office Internal Communication Platform

In Figure 3, displays the analytics report on the system dashboard, showing graphical representations of organizational communication metrics. The bar charts summarize meeting analytics—including meeting frequency and total meeting hours per week—as well as department analytics detailing message volume across different departments over the last 30 days.

Date Time	User	Username	Department	Action
2026-08-31 08:57:52	thet paing	admin		Login: admin signed in.
2026-08-28 12:38:26	thet paing	admin		Login: admin signed in.
2026-08-28 11:36:39	thet paing	admin		Login: admin signed in.
2026-08-28 11:36:28	thet paing	admin		Logout: admin signed out.
2026-08-26 10:50:44	thet paing	admin		Login: admin signed in.
2026-08-26 10:50:41	thet paing	admin		Logout: admin signed out.
2026-08-26 10:50:26	Aye Mg	ayemgg	Administration Department	Logout: ayemgg signed out.
2026-08-26 10:49:36	thet paing	admin		Department message sent by thet paing.
2026-08-26 10:49:25	thet paing	admin		Department message sent by thet paing.
2026-08-26 10:42:14	Aye Mg	ayemgg	Administration Department	Department message sent by Aye Mg.
2026-08-26 10:41:47	Aye Mg	ayemgg	Administration Department	Department message sent by Aye Mg.
2026-08-26 10:40:14	thet paing	admin		Login: admin signed in.
2026-08-26 10:40:07	thet paing	admin		Logout: admin signed out.
2026-08-26 10:39:00	Aye Mg	ayemgg	Administration Department	Login: ayemgg signed in.
2026-08-26 10:33:05	thet paing	admin		Private message sent by thet paing to user ID 26.
2026-08-26 10:30:04	thet paing	admin		Login: admin signed in.
2026-08-26 10:29:11	Aye Mg	ayemgg	Administration Department	Login: ayemgg signed in.
2026-08-25 14:25:49	thet paing	admin		Meeting created: yr on Aug 25, 2026 at 2:30 PM
2026-08-25 14:25:19	thet paing	admin		Meeting deleted: project overview
2026-08-25 14:08:35	thet paing	admin		Meeting created: project overview on Aug 25, 2026 at 2:10 PM
2026-08-25 13:35:34	Aye Mg	ayemgg	Administration Department	Login: ayemgg signed in.
2026-08-25 13:34:07	thet paing	admin		Login: admin signed in.
2026-08-25 10:41:40	thet paing	admin		Screen share ended: With Aye Mg
2026-08-25 10:41:38	thet paing	admin		Screen share started: With Aye Mg
2026-08-25 10:39:27	Aye Mg	ayemgg	Administration Department	Private message sent by Aye Mg to user ID 1.

Figure 4. Activity Logs of the Users

In Figure 4, illustrates the User Activity Log interface, which provides system administrators with an audit trail of user actions. The structured log records timestamps, user names, account types, departments, and specific actions such as user logins, logouts, department message transmissions, meeting creations or deletions, and real-time screen-sharing events.

CONCLUSION

The Office Internal Communication Platform converts scattered office communication into a centralized and organized LAN workflow. Role-based administration, real-time department and private chat, custom groups, meetings, announcements, notifications, search, audit records, bilingual presentation, and responsive design address the main limitations of disconnected manual and public communication methods. The present system is intended for a trusted office network and still depends on proper server, certificate, browser, and database configuration. Future development can add automated backup and recovery, stronger key management, TURN server support for more complex networks, native mobile applications, advanced reporting, calendar integration, and broader accessibility options.

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