Islamic University of Technology

Department of Computer Science and Engineering

Team System322 Project Report

Lab 2: Understanding and Modeling Organizational Systems

Submitted by:

Sadman Shaharier Mahim -220041133

Alfi Shahrin - 220041153

Nayeemul Hasan Prince - 220041125

Submitted to:

Md. Bakhtiar Hasan

Assistant Professor, IUT-CSE

Course Code : CSE 4408

Course Title : System Analysis and Design

Section : 1(A)

Date of Submission : May 23rd, 2025

1 .Organizational Context and System Scope

a) Summary of our Organizational Unit and its core function:

Our selected organizational unit is the Organization of Student Welfare (OSW) of Islamic University of Technology (IUT). OSW's core function is to ensure the well-being of every student by enhancing a favourable academic environment. It also plays a vital role in student engagement and community development within the university.

b) Restatement of the identified key problems

As identified in Lab 1, the primary issue is that the current student platform lacks practical utility. It fails to provide an efficient medium for students to express themselves collectively. This gap has led students to rely on unregulated and unofficial Facebook groups, which are not only distracting but also deteriorate the credibility and effectiveness of student voices.

c) System Scope Definition

In-Scope Aspects:

- User Authentication

  Users will only be able to use the forum if they have a valid IUT user account which is a standard issue for all IUT students.

- Forum-based issue reporting

  The issues and concerns regarding the university will be shared by students and voiced to the masses in a centralized manner on the forum.

- Post and comment system

  Users will be able to post on different sub-forums like F/Cafetaria, F/Transportation, etc.

- Voting mechanism

  Users will be able to upvote and downvote other users' posts and comments.

- Notifications

  Users will get notification updates regarding their posts and comments, including upvotes, replies and also if any post has been approved/banned.

- Moderation tools

  The admins and moderators will have their own tools and panel to manage the forum.

- Anonymous posting

  The students may sometimes feel discouraged to speak out, for this anonymous posting will be allowed, but then the anonymous posts will have to be approved manually by either the admin or one of the moderators.

Out-of-Scope Aspects:

- Private Messaging (DMs)

Our system won't facilitate private messaging to maintain transparency and reduce the risk of unmoderated or off-topic conversations.

- Monetization/Ads

This feature has been excluded so that the platform remains distraction-free and focused solely on student welfare.

- AI-generated Contents

AI-generated content has not been kept due to insufficient resources and to preserve the authenticity of student discussions.

d) Rationale for the Defined Boundary

The scope strictly focuses on the functionalities necessary to promote credible, constructive, and moderated discussions among students. By excluding private messaging, ads, and generative AI, the system ensures user attention remains on purposeful communication, aligning directly with OSW's mission to create a distraction-free, respectful, and academically supportive environment.
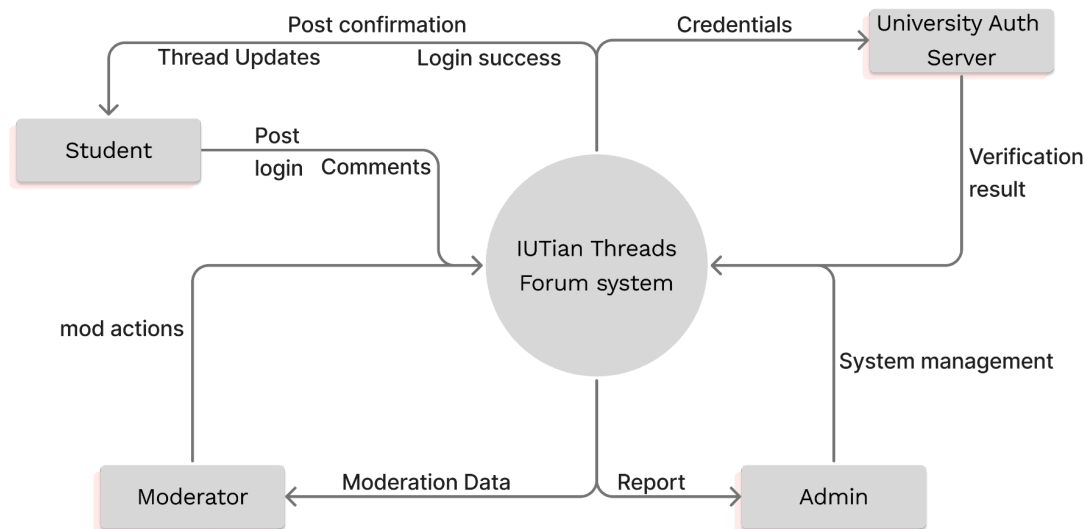
2. Context-Level Data Flow Diagram

Figure 1: Context Level Data Flow Diagram

The context-level DFD provides a high-level overview of the IUTian Threads system, modeling it as a single process interacting with external entities. It captures how data flows into and out of the system without detailing internal mechanisms.

External Entities:

- **Student**: Submits posts, comments, and votes.
- **Moderator**: Reviews and moderates flagged content.
- **Admin (OSW)**: Manages categories, roles, and views reports.
- **Authentication Server**: Verifies user identity during login and saves credentials.

Major Data Flows:

- Students send content (posts, comments) and receive updates and notifications.
- Moderators send moderation actions and receive flagged content summaries.
- Admins manage platform settings and receive usage reports
- Authentication server receives credentials and verifies credentials
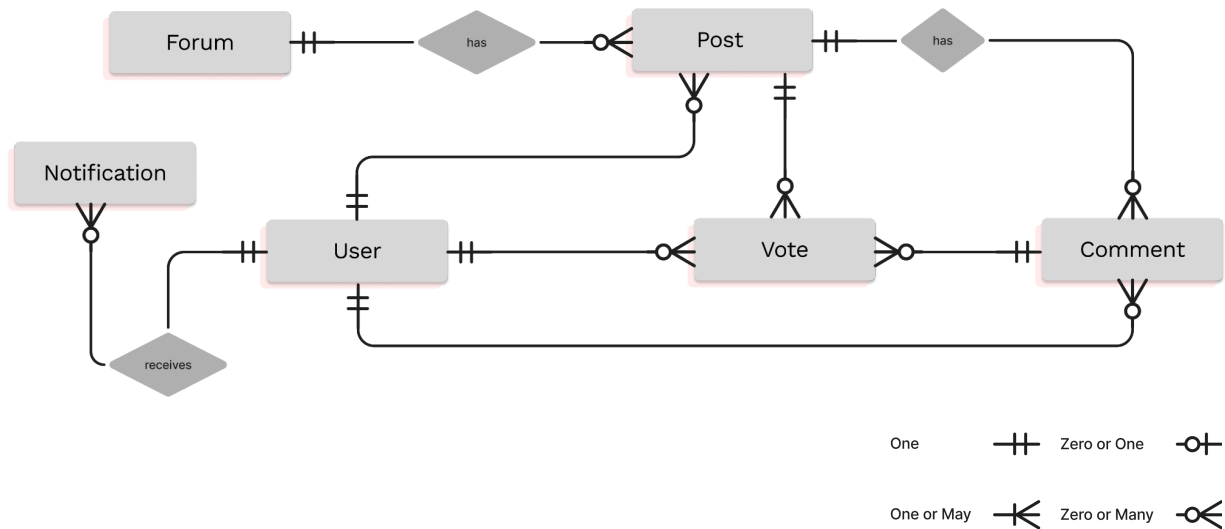
2. Preliminary E-R Diagram

Figure 2: Preliminary Entity-Relationship (E-R) Diagram

The E-R diagram maps the data structure of IUTian Threads using Crow's Foot notation. It identifies key entities, their attributes, and how they relate to one another.

Main Entities:

User: Represents all users on the platform (students, moderators, or admins). Each user can create multiple posts and comments, cast votes on posts, and receive notifications. Key attributes include user_id, name and role.

Forum: Serves as a container for related posts, such as "Academics" or "Clubs." One forum can contain multiple posts, allowing structured categorization of discussions.

Post: A content submission created by a user and posted under a forum. Each post can be commented on and voted on by users. It acts as the main discussion unit in the system.

Comment: A reply to a post. Each comment is authored by a user and linked to a single post. This allows threaded discussions within a post.

Vote: Represents a user's action of upvoting or downvoting a post. This entity resolves the many-to-many relationship between users and posts, capturing vote_type, post_id and user_id.

Notification: System-generated alerts sent to users based on activity (e.g., new comment, upvote, moderator action). A user can receive multiple notifications.

Key Relationships:

- A User can write many Posts, Comments, and Votes.
- A Forum contains many Posts (1:M).
- A Post can receive many Comments and Votes.
- A User can receive many Notifications (1:M).
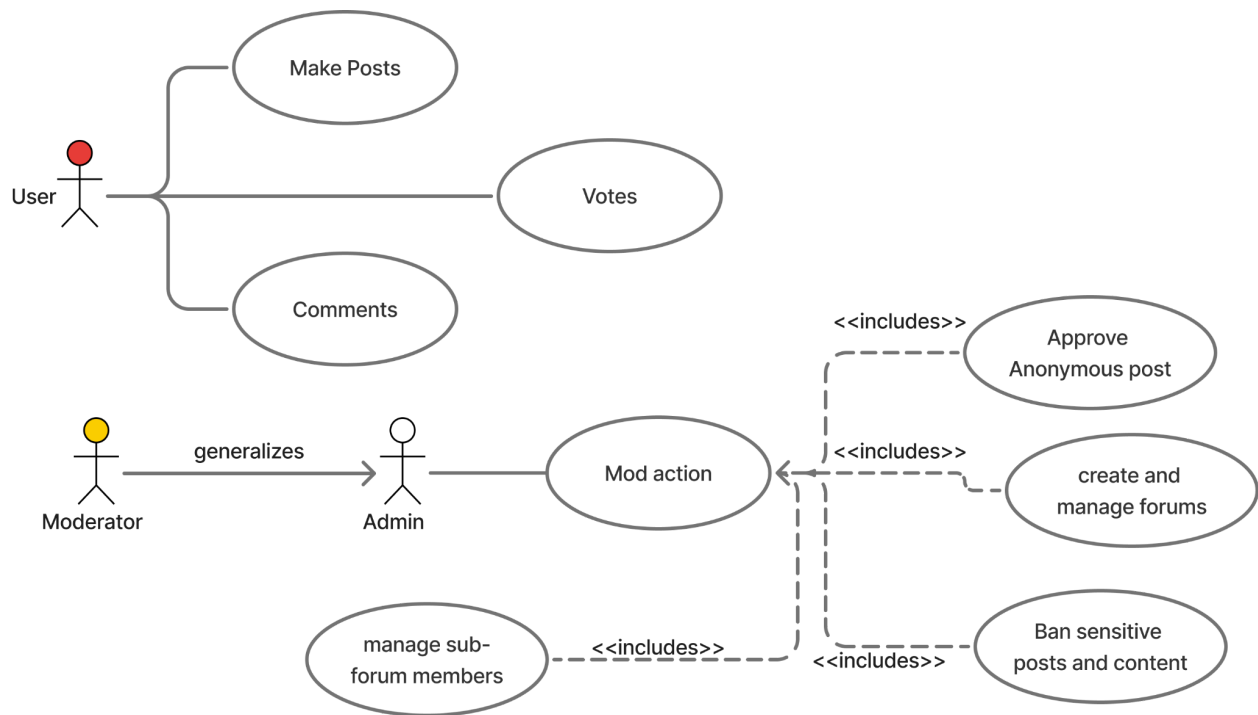
3. Use Case Diagram

Figure 3: Use Case Diagram

The Use Case Diagram for **IUTian Threads** models the interactions between various user roles and the key functionalities of the system. It emphasizes how users perform typical actions and how moderators and admins oversee and manage the forum environment.

Actors:

User: Represents the general student population. Can interact with content by posting, voting, and commenting.

Moderator: Has additional privileges to manage content through moderation actions.

Admin: Inherits all moderator capabilities and has extended authority to manage forums and system-level tasks.

Use Cases:

- Users can create posts to initiate discussions.
- Users can upvote or downvote content, influencing its visibility.
- Users can reply to posts to contribute to ongoing discussions.
- Actions by Moderators and Admins

    The general use case includes several specific Administrative Actions

    - **Approve Anonymous Post**: Moderators or admins must manually review and approve posts submitted anonymously.
    - **Manage Forums**: Admins can edit or create forums/categories to organize content.
    - **Ban Sensitive**: Admins or moderators can remove or block posts or users that violate content policies.

4. Management Levels and Organizational Culture Analysis

1. Management Levels (bottom to top)

a) Operational Control:

The operation control are the ones tasked with micromanaging the forums. They are the ones tasked with approving anonymous posts, flagging or removing posts/comments. They are to ensure discussions remain respectful and relevant to the thread.

b) Managerial Planning and Control:

They are the admins of the forums and deal with making and managing the sub-forums, analyzing and reviewing activity reports to improve platform engagement, making and removing new moderator accounts etc.

c) Strategic Management:

They are the university administration (preferably from the OSW) that oversees the forum. They review the long-term performance of the forum and approve changes to it's

structure. It is also in their duties to address the issues the students are reporting on the forums and ensure the students' well-being.

2. Organizational Culture
- As students of IUT must comply with all regulations set by the Organization of Student Welfare, they have limited opportunities to explore and adapt to new technological developments.
- The overall communication channel is mixed (formal and non-formal both).
- There is a strong preference for sticking to the manual system as it should remain aligned with the principles of the university.

Conclusion

This report introduces "IUTian Threads," a proposed forum for the students at IUT designed to centralize student expression and enhance well-being, replacing inefficient external communication channels. The system's core functionalities, including user authentication, issue reporting, and robust post/comment features with moderation and anonymous posting, are carefully scoped to foster focused and constructive dialogue. Architectural diagrams (DFD, E-R, Use Case) provide a clear vision, while an analysis of IUT's organizational culture guides its strategic implementation. Ultimately, IUTian Threads aims to create a more responsive and supportive academic environment by empowering student voices and strengthening the university community.