

BIT : A gamified education platform intended to make education **fun** and helps foster **consistent study habits**



BIT

Team: NaN

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Introduction

In today's fast-paced academic environment, students often face significant challenges that hinder their ability to achieve their full potential. A common issue is the need for more motivation to study, compounded by the distractions that arise when using social media for collaboration. Additionally, a disorganized schedule can further derail their academic progress. Addressing these problems is crucial for fostering an effective and enjoyable learning experience.

At BIT, we are dedicated to creating sustainable study habits and promoting meaningful collaboration among students. These elements are key to nurturing lifelong learners. Our platform is designed by students, for students, to provide a fun and effective way to reach study goals. With BIT, students can "Achieve their study goals **Bit By Bit**," empowering them to overcome distractions, stay motivated, and maintain an organized schedule. We aim to revolutionize how students learn and collaborate, making education more engaging and successful.

Scope of Project

The scope of the BIT project is to develop a comprehensive platform that addresses the key challenges faced by students in their academic pursuits. The project will focus on the following areas:

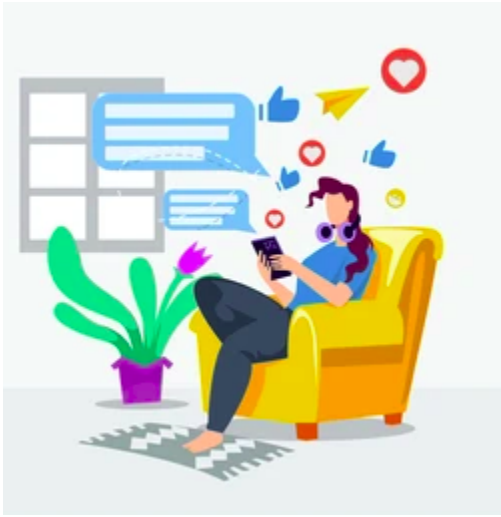
1. Enhancing Motivation to Study:



- Implement features that provide personalized motivational content and reminders.
- Introduce gamification elements such as rewards, badges, and leaderboards to make studying more engaging and enjoyable.
- Develop a progress-tracking system to help students visualize their achievements and stay motivated.

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2. Minimizing Distractions During Collaboration:



- Create a dedicated space for academic collaboration that minimizes non-academic distractions typical of social media platforms.
- Integrate tools for real-time collaboration, such as resource sharing, discussion boards, and study group features.
- Implement focus modes and distraction-free settings to help students maintain concentration during study sessions.

3. Organizing Schedules Effectively:



- Develop a user-friendly scheduling tool that allows students to plan and organize their study time efficiently.
- Incorporate reminders and alerts to keep students on track with their study plans and deadlines.
- Provide templates and guides for creating effective study schedules tailored to individual needs.

By addressing these focus areas, BIT aims to create a supportive and engaging environment where students can overcome the common barriers to academic success. Our goal is to help students "Achieve your study goals Bit By Bit" and cultivate a community of motivated, organized, and lifelong learners.

Key Features

- **User Authentication:** BIT offers secure login and sign-up options including Google oAuth to simplify access. It also offers basic functionality such as session control with json web tokens, forgot password, and email verification using JavaMail
- **Goal Planner:** A Board that tracks current goals, goals that are in progress, and goals that are completed to better track the progress of a student's academic goals
- **Forums:** Forums that are integrated with an LLM that being llama2 which helps students make their queries, the queries are saved and the forum questions can be made public or private to a particular group. The public forums have the option to give discussion threads or threads of comments based on the responses of the LLM. The LLM gives real-time query responses which are better evaluated via the upvotes, downvotes, and discussions by fellow peers. The number of upvotes received for the queries would help students gain certain amounts of points
- **Study Tracker:** A **study tracker** is essentially a focus time tracker that tracks how long a student studies and the timer records that time based on the number of study sessions successfully completed per day a student can track their progress as well as gain points.
- **Groups:** A **group** is essentially a study group where students can share resources such as study materials of different formats, as well as tutorial videos, images, codes, etc. The students can also make posts where they write about different topics as well as the option to upvote and downvote the posts to promote engagement. They would also have added features such as commenting on the posts and nested commenting. We also propose a real-time chat where students can host discussions about various topics and as an optional feature we want to incorporate a whiteboard feature to draw out different ideas they might have.
- **Market Place:** Using the points earned by the students, they can purchase various robot avatars to show their progress.
- **Leaderboard:** The students earn XP with their various academic achievements such as small goals completed, these XP helps them earn ranks in the leaderboard which helps in encouraging greater consistency and sticking to their study goals. Being unable to complete study sessions over a long time would also get a student penalized with the loss of XP.

Users and their Roles

There are mainly three types of users:



Student

The **student account** is the general-purpose account that every user would be able to register as and login to. This account would be able to make use of all the key features including their profile and the ability to modify some of their personal information and add profile pictures if necessary. The user would be able to deactivate their account and or delete their account if needed with a 30-day waiting period.



Admin

The **admin account** or the special administrator account has some specialized access, this user cannot be created, and can only be added by a dedicated superuser. The admin portal has the following roles:

- 1) Add goals to help the students earn XP
- 2) Help in answering questions based on the system
- 3) Help in adding new avatars and organizing the marketplace
- 4) Ban users based on reports



Developer

The **developer account** is a separate type of account that is also added by the superuser or any **developer account** with a special privilege. This account intends to view the logs of different activities to see if there are any failures while maintaining the principle of least privilege to avoid violations of a student's privacy, it also aims to monitor the system performance if possible alongside the different logs.

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The admin account intends to be an internal system that would be used by the team at BIT to help make the user's encounters much smoother.

The **admin** and **developer** accounts are separate portals that would have separate access which the users wouldn't directly have access to.

Use Cases of the System

1. User Authentication

- Actors: Student, Admin, Developer
- Description: Users can securely sign up and log in to the BIT platform using various authentication methods, with students having access to Google OAuth and standard login, while admins and developers use a separate login portal without Google OAuth.
- Preconditions: The user must have a valid email address and access to the internet.
- Postconditions: The user is authenticated and granted access to the platform based on their role.
- Main Flow:
 - Student:
 1. Student navigates to the student login/sign-up page.
 2. Student selects the authentication method (standard login or Google OAuth).
 3. The system verifies credentials.
 4. Upon successful authentication, the student is redirected to their dashboard.
 - Admin and Developer:
 1. Admin/Developer navigates to the dedicated admin/developer login page.
 2. Admin/Developer enters their credentials (standard login only).
 3. The system verifies credentials.
 4. Upon successful authentication, the admin is redirected to the admin portal, and the developer is redirected to the developer portal.

Exceptions: Invalid credentials, network issues, account not verified.

2. Goal Planner

- Actors: Student, Admin
- Description: Students can create, track, and complete academic goals using a goal planner.
- Preconditions: The user must be authenticated.
- Postconditions: Goals are saved, tracked, and updated as completed.
- Main Flow:
 1. Student accesses the Goal Planner from the dashboard.
 2. Student creates new goals and set deadlines.
 3. Student marks goals as in progress or completed.
 4. System updates the progress tracker.

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Exceptions: Invalid goal data, system errors.

3. Forums

- Actors: Student, Admin
- Description: Students can post queries, engage in discussions, and receive responses from peers and LLM.
- Preconditions: The user must be authenticated.
- Postconditions: Queries and responses are saved and displayed on the forum.
- Main Flow:
 1. Student navigates to the Forums section.
 2. Student posts a query or respond to an existing one.
 3. LLM generates a response and displays it.
 4. Other students upvote, downvote, and comment on the responses.

Exceptions: Inappropriate content, LLM errors.

4. Study Tracker

- Actors: Student
- Description: Students can track their study sessions and monitor their focus time.
- Preconditions: The user must be authenticated.
- Postconditions: Study sessions are recorded, and progress is tracked.
- Main Flow:
 1. Student starts a study session using the Study Tracker.
 2. The system records the duration of the study session.
 3. The student completes the session, and the system updates the tracker.
- Exceptions: Timer malfunction, session interruption.

5. Groups

- Actors: Student, Admin
- Description: Students can create and join study groups, share resources, and engage in discussions.
- Preconditions: The user must be authenticated.
- Postconditions: Groups are created, resources shared, and discussions held.
- Main Flow:
 1. Student creates or joins a study group.
 2. Student shares resources and participates in group discussions.
 3. System updates group activity logs.

Exceptions: Group conflicts, inappropriate content.

6. Market Place

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- Actors: Student, Admin
- Description: Students can use earned points to purchase avatars and other rewards.
- Preconditions: The user must be authenticated and have sufficient points.
- Postconditions: Items are purchased, and points are deducted.
- Main Flow:
 1. Student navigates to the Market Place.
 2. Student selects items to purchase.
 3. The system deducts points and updates the student's inventory.

Exceptions: Insufficient points, transaction errors.

7. Leaderboard

- Actors: Student, Admin
- Description: Students can view their rank and progress on the leaderboard.
- Preconditions: The user must be authenticated.
- Postconditions: Leaderboard is updated with the latest rankings.
- Main Flow:
 1. Student accesses the Leaderboard from the dashboard.
 2. The system displays current rankings and XP points.
 3. Student tracks their progress and rank against peers.

Exceptions: Data synchronization issues.

8. Admin Functions

- Actors: Admin
- Description: Admins can manage goals, monitor user activities, ban users, and manage the marketplace.
- Preconditions: Admin must be authenticated.
- Postconditions: Admin tasks are executed, and system integrity is maintained.
- Main Flow:
 1. Admin logs into the admin portal.
 2. Admin performs tasks such as adding goals, banning users, and updating the marketplace.
 3. System logs admin activities and updates relevant sections.

Exceptions: Unauthorized access, system errors.

9. Developer Functions

- Actors: Developer
- Description: Developers can monitor system logs, check for errors, and ensure system performance.
- Preconditions: The developer must be authenticated.

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- Postconditions: System logs and performance metrics are reviewed.
- Main Flow:
 1. The developer logs into the developer portal.
 2. Developer reviews system logs and performance metrics.
 3. The developer addresses any issues and maintains system integrity.

Exceptions: Unauthorized access, system errors.

By covering these use cases, the BIT platform aims to provide a comprehensive and user-friendly experience that supports students in achieving their academic goals, fostering motivation, reducing distractions, and maintaining an organized study routine.

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Technology

Frontend:

- ReactJs
- Tailwind CSS

Backend (Springboot)

- Spring Web
- Lombok
- Spring Data MongoDB
- Hibernate

Database

- MongoDB
- PostgreSQL

Containerization

- Docker

Build Tools

- Maven

AI Tools

- Ollama
- Llama2