

# BlackVortex

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# Problem Statement

Students often face the challenge of staying productive on their own while also working well in groups. In self-study, the lack of structure leads to isolation, distractions, low motivation, procrastination, and goals that aren't broken into clear steps. In group work, notes, reminders, and discussions are scattered across different platforms, creating confusion and lost information. What's missing is a central hub that brings together planning, motivation, and collaboration. Without it, students remain disorganized, unmotivated, and less effective in achieving their goals.

# Proposed solution

A central AI-powered platform for students, combining personal productivity with group collaboration.

## Personal Productivity

- Study timers and AI-powered planning to track focus and turn goals into actionable steps.
- Automated reminders and a personal notes vault for quick access to assignments and tasks.

## Group Collaboration

- Shared notes with RAG-based Q&A for instant knowledge support.
- Group reminders, agendas, and progress dashboards to keep everyone aligned.
- **Gamified leaderboards** to boost engagement and accountability.

## AI Study Companions

- **Goal Planner:** Breaks large objectives into achievable milestones.
- **Knowledge Q&A:** Provides instant clarifications using shared resources.
- **Motivation & Reminder:** Sends nudges and tips to maintain consistent study habits.

# Solution Overview

Self-study is disorganized and group work fragmented. Our AI-powered platform unifies productivity, collaboration, gamification, and study support.

## Key Components:

- **Personal Productivity:** Study timers, AI goal planning, reminders, private notes vault.
- **Group Collaboration:** Shared notes with RAG-based Q&A, group reminders, agendas, dashboards, gamified leaderboards.
- **AI Study Companions:** Goal Planner, Knowledge Q&A, and Motivation Agents for planning, instant support, and focus.

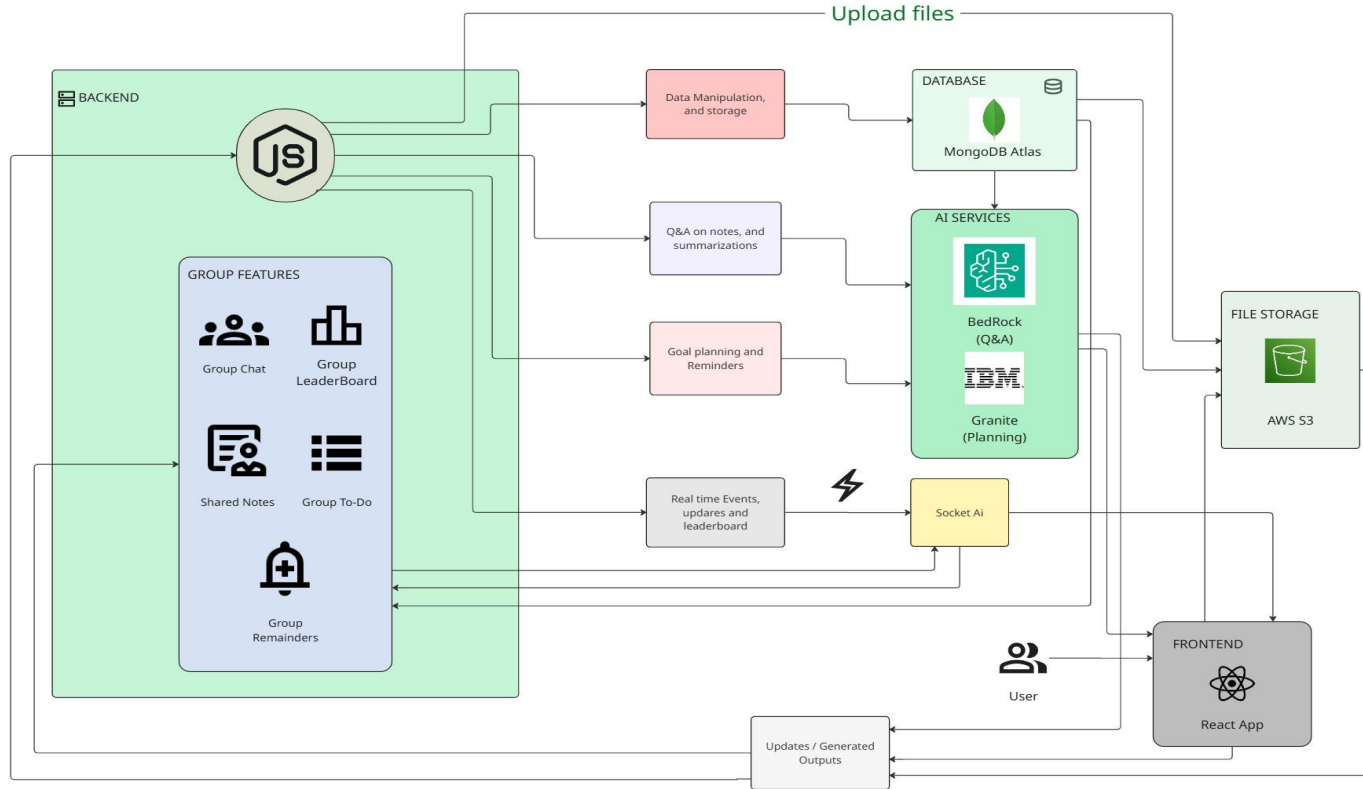
## Scope & Functionality:

Collects study data, schedules, and resources; processes them with AI + retrieval; delivers personalized planning, reminders, motivation, and insights.

## Purpose:

- **Students:** More structure, motivation, efficiency.
- **Groups:** Centralized collaboration, less duplication, stronger accountability.
- **Institutions:** Better outcomes, engagement, consistency.

# Architecture Blueprint



# Role of Gen AI in the solution

**Intelligent Goal Planning (Amazon Bedrock)** – Summarizes group notes and supports conversational queries for clarifications and task planning.

**Knowledge Q&A (Amazon Bedrock + RAG)** – Bedrock models, combined with Retrieval-Augmented Generation, answer academic queries using shared notes, uploaded materials, and trusted resources.

**Motivation & Nudging (Amazon Bedrock)** – Bedrock powers a conversational motivation agent that sends adaptive reminders, focus tips, and encouragement to sustain consistency.

**Collaborative Notes & Q&A (IBM Granite LLM)** – Granite LLM models analyze student goals and schedules to generate structured, step-by-step study roadmaps.

# Technology Used

**Frontend (UI):** React.js → interactive and responsive dashboard for personal and group study management.

**Backend (API Layer):** Node.js + Express.js → handles requests, business logic, and AI model integration.

**Database:** MongoDB → stores student profiles, notes, reminders, group progress, and leaderboards

**File Storage:** AWS S3 → stores documents, images, and large study resources securely.

## GenAI Models:

- **Amazon Bedrock** → goal planning, reminders, motivational nudges, and RAG-based knowledge Q&A.
- **IBM Granite LLM** → collaborative note summarization, conversational Q&A, and natural language task planning.



# Novelty and Uniqueness

**Personal + Group Fusion** – Unlike Notion/Google Docs (notes only) or Discord/WhatsApp (chat only), our platform combines personal productivity and group collaboration in one hub.

**AI Study Companion** – With Amazon Bedrock for planning/motivation and IBM Granite LLM for contextual notes/Q&A, students get personalized guidance beyond static planners.

**Seamless Collaboration** – Our system auto-organizes notes, agendas, and reminders with RAG-powered retrieval, unlike scattered manual tools.

**Gamified Accountability** – Leaderboards and shared dashboards foster healthy competition and peer motivation, missing in traditional productivity tools.

**Dynamic Personalization** – Students get tailored reminders, study paths, and AI nudges aligned with their goals, habits, and group dynamics.

# Thank You!

Thank you for your time and interest.