REQUIREMENTS ANALYSIS DOCUMENT
for
Brainstorming Application

Report #1

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1. Introduction

In the era of digital collaboration and innovation, ideathons and workshops have become essential environments for generating creative solutions and fostering teamwork. However, the management of such events remains a significant challenge.

The proposed **Brainstorming Application** is designed to overcome these challenges by providing an organized, AI-assisted, and real-time collaborative platform that supports the **6-3-5 brainstorming method**.

The system ensures effective idea generation, balanced team participation, and seamless integration of **OpenAI's ChatGPT** for idea suggestion and summarization.

1.1 Purpose of the System

The purpose of the Brainstorming Application is to facilitate ideathons and workshops by offering a structured platform for idea management and team collaboration.
 The system aims to:

- Enable Event Managers to create, organize, and oversee brainstorming events and participants.

- Support structured brainstorming sessions using the 6-3-5 method, ensuring equitable idea contribution from all participants.

- Utilize ChatGPT integration for AI-driven idea generation and automatic summarization.

- Provide real-time collaboration across **web and mobile platforms**, ensuring accessibility for all participants.

1.2 Scope of the System

The system will serve as a **web and mobile application** designed for ideathons, workshops, and other creative group activities. It will include:

- Role-based access for **Event Managers**, **Team Leaders**, and **Team Members**.

- CRUD operations for events, topics, participants, and teams.

- Implementation of the **6-3-5 brainstorming workflow**, including round timing, idea submission, and idea passing.

- Integration with ChatGPT for generating new ideas and summarizing brainstorming results.

- Real-time synchronization to support multi-user collaboration.

- Secure authentication, authorization, and data management through RESTful APIs.

The system is **not** intended to replace general-purpose project management or messaging tools; rather, it focuses on facilitating structured and creative ideation sessions.

1.3 Objectives and Success Criteria of the Project

Objectives:

- To design and develop a platform that streamlines the organization and execution of brainstorming events.

- To enhance creativity and collaboration through AI-assisted brainstorming.

- To provide an intuitive and responsive interface that simplifies participation for all user roles.

- To ensure real-time interaction and synchronization between users during sessions.

Success Criteria:

- The system allows multiple teams to conduct brainstorming sessions simultaneously without latency issues.

- All user roles can perform their assigned functions accurately according to the access rules.

- ChatGPT integration successfully generates and summarizes ideas.

- The system remains stable and synchronized throughout multi-round 6-3-5 sessions.

- All session data is automatically stored and accessible for review or export.

1.4 Definitions, Acronyms, and Abbreviations

6-3-5 Method: A structured brainstorming technique where six participants each contribute three ideas in five rounds.

Event Manager: The user responsible for managing events, topics, participants, and teams.

Team Leader: The user who manages a single team, moderates brainstorming sessions, and interacts with ChatGPT.

Team Member: A participant who contributes ideas during brainstorming sessions.

ChatGPT: An AI model by OpenAI used for idea generation and summarization within the.

CRUD: Create, Read, Update, Delete – basic database operations supported by the system.

RDBMS: Relational Database Management System used to store event and brainstorming data.

API: Application Programming Interface, enabling communication between the frontend and backend.

1.5 References

1. Problem Statement: *Brainstorming Application for Ideathons and Workshops*, Project Specification Document.

2. 6-3-5 Brainstorming Method – P. Rohrbach (1969), *Creativity and Innovation Management*.

3. OpenAI API Documentation – https://platform.openai.com/docs.

4. Course Template: *CSE443 - Requirements Analysis Document Template*, Gebze Technical University, 2025.

1.6 Overview

This document presents a comprehensive analysis of the proposed Brainstorming Application. Section 2 describes the **current system** and existing problems in traditional brainstorming environments.

Section 3 outlines the **proposed system**, including **functional and non-functional requirements**, as well as **system models** such as use cases, class diagrams, and user interface mock-ups.

Finally, the glossary provides key terminology for consistent understanding throughout the project documentation.

2 Current system

Ideathons and workshop-style brainstorming at our target organizations are currently run with a loose combination of spreadsheets (participant lists, idea tables), cloud docs (free-form notes), timer apps, and messaging tools (coordination/announcements).

The 6-3-5 method is emulated manually by copying rows/cells between sheets or forwarding documents among participants. Session timing is handled by a facilitator who broadcasts start/stop messages and tries to keep teams synchronized.

Pain points observed

- **Process drift:** 6-3-5 constraints (6 participants, 3 ideas, 5 rounds) are inconsistently enforced; rounds overrun, idea counts vary, and "passing" of ideas breaks when files are locked or duplicated.
- **Fragmented tooling:** Ideas, participants, teams, and topics live in separate tools with no single source of truth; version conflicts and lost edits are common.
- **Limited visibility & control:** Event managers cannot monitor all teams' timers, round status, or participation health in real time; interventions are reactive.
- **Weak role management:** Access is document-link based rather than role-based; accidental visibility of other teams' ideas occurs.
- **No robust audit/reporting:** Summaries are compiled manually after sessions; there is no built-in export, audit trail, or consistent metrics across events.
- **Scalability & reliability issues:** Running many teams simultaneously stresses ad-hoc workflows; latency and file locks cause round desynchronization.
- **AI support missing:** There is no integrated, context-aware idea suggestion or automated summarization; facilitators rely on ad-hoc prompts outside the session.
- **Security/compliance gaps:** Authentication is informal (shared links); data residency, retention, and IP ownership around submitted ideas are unclear.

These limitations motivate a unified platform that makes 6-3-5 sessions predictable, observable, auditable, and AI-assisted.

3 Proposed system

The **Brainstorming Application** is a web and mobile platform that provides a single, role-based environment to **plan, run, and analyze** 6-3-5 brainstorming sessions across multiple teams in parallel, with **real-time synchronization** and **integrated ChatGPT** for ideation and summarization.

It centralizes event entities (Topics, Participants, Teams), enforces the method's rules (participants/ideas/rounds/timing/idea passing), and generates persistent records and exports.

System scope & boundaries

- **In-scope:** Event/participant/topic/team management; 6-3-5 session orchestration (timers, idea capture, passing, round transitions); live dashboards; AI idea generation and session summaries; reporting & export; authentication/authorization; multi-device real-time collaboration.
- **Out-of-scope:** Generic chat/project management; long-term backlog grooming; external SSO/HR sync (future work); offline-first operation; non-6-3-5 ideation frameworks (may be extensible later).
- **Primary users:** Event Managers, Team Leaders, Team Members (participants).
- **External dependencies:** OpenAI API for AI features; push notification services for mobile; RDBMS for persistence; real-time transport (e.g., WebSocket).
- **Key constraints/assumptions:** Stable network connectivity during sessions; organizations accept role-based access; teams can meet the 6-3-5 participant requirement; AI outputs are advisory and curated by humans.

Success posture

- Deterministic session flow with guaranteed capture of every idea.
- Observability for managers (status, timers, participation) across all teams.
- Reliable artifacts (summaries, exports, logs) for post-event reporting and IP continuity.

3.1 Overview

The system is organized into cooperating subsystems and services that together deliver structured, real-time, AI-assisted brainstorming:

A. Event & Directory Management

- CRUD for Topics, Participants, Teams; role assignment and membership.
- Consistency validations (e.g., a team must have six active members before session start).

B. Session Orchestrator (6-3-5 Engine)

- Round lifecycle: start/pause/resume/end, five-minute countdown, automatic next-round transition.
- Idea capture UI enforcing **exactly three ideas** per participant per round.
- Deterministic **idea passing** between participants at each transition.
- Privacy scoping so only active team members see current round ideas.

C. Real-Time Sync Layer

- Low-latency propagation of timers, submissions, and state to all team clients (web/mobile).
- Resilience features (replay/auto-save) to prevent idea loss on transient disconnects.

D. AI Integration (ChatGPT)

- Contextual prompts for **idea suggestions** during a session (Team Leaders / Event Managers).
- Post-session **summarization** that highlights themes, clusters, and notable concepts.
- Guardrails (rate limiting, fallbacks) to keep the core session functional if AI is unavailable.

E. Reporting & Audit

- Team and event-level dashboards; completed session views.
- Export to PDF/CSV; immutable logs of rounds, timestamps, and user actions.

F. Security & Access Control

- Authentication (e.g., JWT) and fine-grained authorization aligned with roles.
- Data protection and compliance features (ownership terms, retention policies).

G. Clients

- **Web app:** dashboards and full facilitation controls.
- **Mobile app:** streamlined round participation, notifications, and idea input.

High-level workflow

1. Event Manager configures topics/teams → 2) Team Leader starts session → 3) Participants submit 3 ideas in timed rounds → 4) System passes ideas to next participant and advances rounds → 5) Optional AI assistance during ideation →

6) Session ends; AI summary generated → 7) Reports/exports produced and archived.

3.2 Functional requirements

3.2.1. Entity and Data Management (CRUD Operations)

- **FR-100**: The system shall allow an Event Manager to create a new Topic by providing a title and description.
- **FR-101**: The system shall allow an Event Manager to register a new Participant by providing personal and contact information and assigning an initial role.
- **FR-102**: The system shall allow a User to register as a Participant by providing personal and contact information.
- **FR-103**: The system shall allow an Event Manager to create a Team and assign the initial team name.
- **FR-104**: The system shall allow the Team Leader to create a Team and assign the initial team name.
- **FR-105**: The system shall display the list of all Topics to all authenticated users during event setup and brainstorming sessions.
- **FR-106**: The system shall display the full roster of Participants to the Event Manager for complete oversight of the event roster.
- **FR-107**: The system shall display restricted participant views (e.g., team members only) to the Team Leader for team management.
- **FR-108**: The system shall allow a Team Member to view the composition and members of their own assigned Team for collaboration awareness.
- **FR-109**: The system shall allow an Event Manager to update the title, description, and status (open, closed, archived) of any existing Topic.
- **FR-110**: The system shall allow an Event Manager to edit a Participant's contact information, status, and assigned role (Team Leader or Team Member).
- **FR-111**: The system shall allow an Event Manager to assign registered Participants to an existing Team.
- **FR-112**: The system shall allow an Event Manager to modify the membership and designated Team Leader of any Team.
- **FR-113**: The system shall allow an Event Manager to remove an obsolete Topic from the system.
- **FR-114**: The system shall allow an Event Manager to remove a Participant from the event roster.

- **FR-115**: The system shall allow an Event Manager to disband a Team at the end of a session or event.

3.2.2. 6-3-5 Brainstorming Method Implementation

- **FR-200**: The system shall enforce that a 6-3-5 Session requires six team members for an active round to start.
- **FR-201**: The system shall enforce that a Team Member can submit exactly three unique ideas per Round.
- **FR-202**: The system shall provide a dedicated input interface for Team Members to submit their three ideas per Round.
- **FR-203**: The system shall default the timer for each round of a 6-3-5 session to five minutes.
- **FR-204**: The system shall allow the Team Leader to manually start, pause, resume, or end a brainstorming session for their team.
- **FR-205**: The system shall allow the Event Manager to manually start, pause, resume, or end any active brainstorming session across all teams.
- **FR-206**: The system shall display a countdown timer and reminders during a brainstorming session to manage round timing and facilitate transitions.
- **FR-207**: The system shall automatically transition the session to the next Round upon the expiration of the five-minute timer.
- **FR-208**: The system shall automatically pass the set of three ideas generated in the previous Round to the next designated participant at the start of the subsequent round to stimulate building on previous concepts.
- **FR-209**: The system shall restrict the visibility of ongoing ideas to only the Team Members currently participating in the active session to maintain focus and session privacy.
- **FR-210**: The system shall automatically save and document all ideas submitted during a session to ensure no creative input is lost.

3.2.3. Role-Based Access Control and Reporting

- **FR-300**: The system shall grant the Event Manager complete control over the creation, editing, and deletion of all event entities (Topics, Participants, Teams).
- **FR-301**: The system shall display aggregated idea reports, key concepts, and trends across all teams to the Event Manager to oversee creative progress.
- **FR-302**: The system shall allow the Event Manager to generate comprehensive summaries.
- **FR-303**: The system shall allow the Event Manager to export session data for external review and recordkeeping.

- **FR-304**: The system shall allow the Team Leader to initiate and moderate the 6-3-5 sessions for their assigned team.
- **FR-305**: The system shall provide the Team Leader access to their team's ongoing and historical ideas.
- **FR-306**: The system shall allow the Team Member to submit exactly three unique ideas during the active rounds of a session.
- **FR-307**: The system shall allow the Team Member to view the team's ideas from the current and previous rounds.

3.2.4. Integration of ChatGPT AI Capabilities

- **FR-400**: The system shall allow the Team Leader and Event Manager to prompt ChatGPT to generate new ideas based on the current topic context or existing team ideas.
- **FR-401**: The system shall allow the Team Leader and Event Manager to send all submitted ideas from a session to the ChatGPT API for summarization.
- **FR-402**: The system shall display the generated summary from the ChatGPT API, highlighting key concepts and trends, for easy review.
- **FR-403**: The system shall provide a seamless conversational UI element for users to interact with the ChatGPT assistant to refine or expand on AI-generated suggestions.

3.2.5. Real-Time Collaboration and Synchronization

- **FR-500**: The system shall synchronise all brainstorming data (e.g., new idea input, round timer status) across web and mobile clients to ensure consistency.
- **FR-501**: The system shall provide real-time updates for all active team members during a session.
- **FR-502**: The mobile application shall provide a touch-based interface for the input of three ideas during an active round.
- **FR-503**: The system shall send push notifications to mobile application users to remind them of session start times and round transitions.

3.2.6. Reporting and Documentation

- **FR-600**: Event Managers shall be able to view completed sessions, including all submitted ideas and their summaries.
- **FR-601**: The system shall allow exporting session summaries and idea reports in downloadable formats such as PDF or CSV.

- **FR-602**: The system shall log all session-related data, including rounds, ideas, timestamps, and user activity, for auditing purposes.

3.2.7. Authentication and Security

- **FR-700**: The system shall complete the authentication process using a JWT mechanism and validate user credentials when a user attempts to log in.
- **FR-701**: The system shall store all user roles and permissions using encryption and shall enforce access constraints on all subsequent transactions throughout the duration of the user's authenticated session.
- **FR-702**: The system shall verify the user's authorization level before executing any event, team, or participant management operation, and shall return an "Access Denied" response immediately if the user is unauthorized.

3.3 Nonfunctional requirements

3.3.1 Usability

- **NFR-100:** The system shall provide guided workflows for setting up and running the 6-3-5 brainstorming sessions to facilitate adoption by non-technical users.
- **NFR-101:** The web application shall employ a responsive design to ensure optimal display and usability on desktops and tablets.
- **NFR-102:** The mobile application shall provide touch-based interfaces for idea entry and navigation to optimize for on-the-go participation.
- **NFR-103:** The user interface shall provide dashboards for Event Managers to administer events and participants at a glance.

3.3.2 Reliability

- **NFR-200:** The system shall maintain an uptime of 99.5% during scheduled event hours to ensure continuous collaboration.
- **NFR-201:** The system shall automatically save all submitted ideas to the database immediately upon submission to prevent data loss due to unexpected session termination or disconnection.
- **NFR-202:** The system shall implement rate-limiting and fallback mechanisms for the external ChatGPT API to ensure core session functionality remains available if the external service fails or is unavailable.

3.3.3 Performance

- **NFR-300:** The system shall maintain real-time synchronization and updates of session progress and idea submissions within 500 milliseconds across web and mobile clients.
- **NFR-301:** The system shall scale smoothly to support a minimum of 20 concurrent teams (120 active participants) running simultaneous 6-3-5 sessions without performance degradation.
- **NFR-302:** The system shall apply rate-limiting to all requests made to the external OpenAI ChatGPT API to ensure service continuity and manage resource consumption.
- **NFR-303:** The system shall load key user interfaces, such as the Event Manager dashboard and the team brainstorming workspace, within 3 seconds under normal operating load.

3.3.4 Supportability

- **NFR-400:** The system shall generate and store detailed session logs and audit trails including idea submission timestamps and user activities for every round to facilitate auditing and debugging.
- **NFR-401:** The architecture shall support modifiable code components and APIs to allow for future integration of new AI models or brainstorming methodologies.

3.3.5 Implementation

- **NFR-500:** The backend APIs shall be designed as RESTful services or GraphQL endpoints for CRUD and session management operations.
- **NFR-501:** The system shall utilize a relational database management system (e.g., PostgreSQL, MySQL) to structure relationships between event entities.
- **NFR-502:** The system shall implement real-time communication layers via WebSocket, SignalR, or Firebase Realtime Database to enable collaborative session updates.
- **NFR-503:** The system shall integrate with the OpenAI's ChatGPT API for advanced language processing.
- **NFR-504:** The system shall be available as both a web application and a mobile application to ensure accessibility and real-time collaboration.

3.3.6 Interface

- **NFR-600:** The system shall employ a responsive design for the web application, supporting optimal usability and layout across desktops and tablets.
- **NFR-601:** The mobile application shall be optimized for on-the-go participation using intuitive touch-based interfaces for idea entry and navigation.

- **NFR-602:** The system shall provide a seamless conversational UI element for users to interact with the ChatGPT assistant.
- **NFR-603:** The system's Backend APIs shall be designed as RESTful services or GraphQL endpoints to facilitate CRUD and session management operations.
- **NFR-604:** The system shall integrate with the OpenAI ChatGPT API using an authenticated connection for language processing features.

3.3.7 Packaging

- **NFR-700:** The system shall be delivered as a web application accessible via standard internet browsers.
- **NFR-701:** The system shall be packaged and deployed as a mobile application to ensure accessibility.
- **NFR-702:** The mobile application package shall integrate necessary components to enable push notifications to remind users about session timings.
- **NFR-703:** The system's deployment architecture shall facilitate scaling to handle concurrent teams and growing user registration.

3.3.8 Legal

- **NFR-800:** The system shall ensure compliance with applicable data privacy and protection regulations (e.g., GDPR, CCPA) regarding the collection and storage of participant personal and contact information.
- **NFR-801:** The system shall establish clear Intellectual Property (IP) ownership terms for all ideas generated and submitted by participants during the brainstorming sessions.
- **NFR-802:** The system shall ensure adherence to the Terms of Service and data usage policies of the integrated OpenAI ChatGPT API to avoid legal or service violations.

3.4 System models

3.4.1 Scenarios

Scenario 1: createNewTopic

- **Participating Actor Instances:**
    1. emma: EventManager
- **Flow of Events:**
    1. Emma logs into the Brainstorming Application.
    2. She navigates to the "Topics" section and selects the option to create a new topic.

3. Emma enters the topic title "Sustainable Packaging Solutions" and provides a detailed description.
4. She confirms the creation, adding the new topic to the event.
5. The topic is now visible to all authenticated users for the upcoming event.

Scenario 2: registerParticipant

- **Participating Actor Instances:**
    1. emma: EventManager
    2. john: Participant
- **Flow of Events:**
    1. John accesses the registration page and fills out the form with his personal and contact information.
    2. Emma reviews the new registration in the participant management dashboard.
    3. She updates John's role, assigning him as a "Team Member."
    4. John receives an email confirmation of his successful registration and role assignment.
    5. Emma verifies John now appears in the official participant list with the correct role.

Scenario 3: createTeam

- **Participating Actor Instances:**
    1. emma: EventManager
    2. alice: TeamLeader
- **Flow of Events:**
    1. Emma navigates to the Team Management section for the event.
    2. She initiates the creation of a new team named "Creative Innovators."
    3. Emma assigns Alice as the "Team Leader" and selects five other participants to be "Team Members."
    4. Alice receives a notification that she has been assigned to lead the "Creative Innovators" team.
    5. Emma confirms the team's composition and finalizes its creation.

Scenario 4: startBrainstormingSession

- **Participating Actor Instances:**
    1. alice: TeamLeader
    2. teamMembers[5]: TeamMember

- **Flow of Events:**
    1. Alice accesses her team dashboard and initiates a new 6-3-5 brainstorming session.
    2. All six participants (Alice and the five team members) join the virtual session workspace.
    3. Alice starts the first five-minute round and presents the designated topic.
    4. Each of the six participants submits exactly three unique ideas related to the topic.
    5. Once the round ends, Alice confirms all ideas are submitted and the system prepares for the next round.

Scenario 5: manageRoundTransition

- **Participating Actor Instances:**
    1. alice: TeamLeader
    2. teamMembers[5]: TeamMember
- **Flow of Events:**
    1. Alice announces the end of the current round as the timer expires.
    2. The system automatically passes each participant's set of three ideas to the next team member in sequence.
    3. Each participant reviews the new set of ideas they received and adds three more ideas, building upon the previous concepts.
    4. Alice initiates the next round, ensuring all participants are ready to continue.
    5. The team repeats this process until all five rounds are completed.

Scenario 6: generateAIideas

- **Participating Actor Instances:**
    1. alice: TeamLeader
    2. chatgpt: AI assistant
- **Flow of Events:**
    1. During a session, Alice decides to use the AI assistant to spark creativity.
    2. She prompts ChatGPT to generate new ideas based on the current topic and the ideas already submitted by the team.
    3. ChatGPT analyzes the context and generates three new, relevant ideas.
    4. Alice reviews the AI-generated suggestions for quality and relevance.
    5. She shares the selected AI ideas with her team to inspire further discussion.

Scenario 7: summarizeSession

- **Participating Actor Instances:**
    1. emma: EventManager
    2. chatgpt: AIassistant
- **Flow of Events:**
    1. After a brainstorming session is complete, Emma requests an AI-powered summary.
    2. She prompts ChatGPT to review all ideas submitted by a specific team.
    3. ChatGPT processes the data and generates a structured summary, highlighting key themes and unique concepts.
    4. Emma reviews the generated summary for accuracy and key insights.
    5. She saves the summary as part of the official event documentation.

Scenario 8: viewTeamIdeas

- **Participating Actor Instances:**
    1. bob: TeamMember
    2. alice: TeamLeader
- **Flow of Events:**
    1. Bob, a team member, wants to review ideas from earlier rounds for inspiration.
    2. He navigates to his team's dashboard and accesses the repository of submitted ideas.
    3. Bob views the ideas generated by his teammates in the previous rounds.
    4. He uses these insights to help formulate his next set of contributions.
    5. Alice, as Team Leader, can also view the idea history to monitor the team's progress.

Scenario 9: exportSessionReport

- **Participating Actor Instances:**
    1. emma: EventManager
- **Flow of Events:**
    1. Emma navigates to the "Reports" section of her dashboard.
    2. She selects the completed brainstorming session she wishes to document.
    3. Emma chooses to export the full report, selecting "PDF" as the format.
    4. The system generates the report, which is then downloaded to her local device.

5. She distributes the exported report to key stakeholders and event organizers.

Scenario 10: loginAuthentication
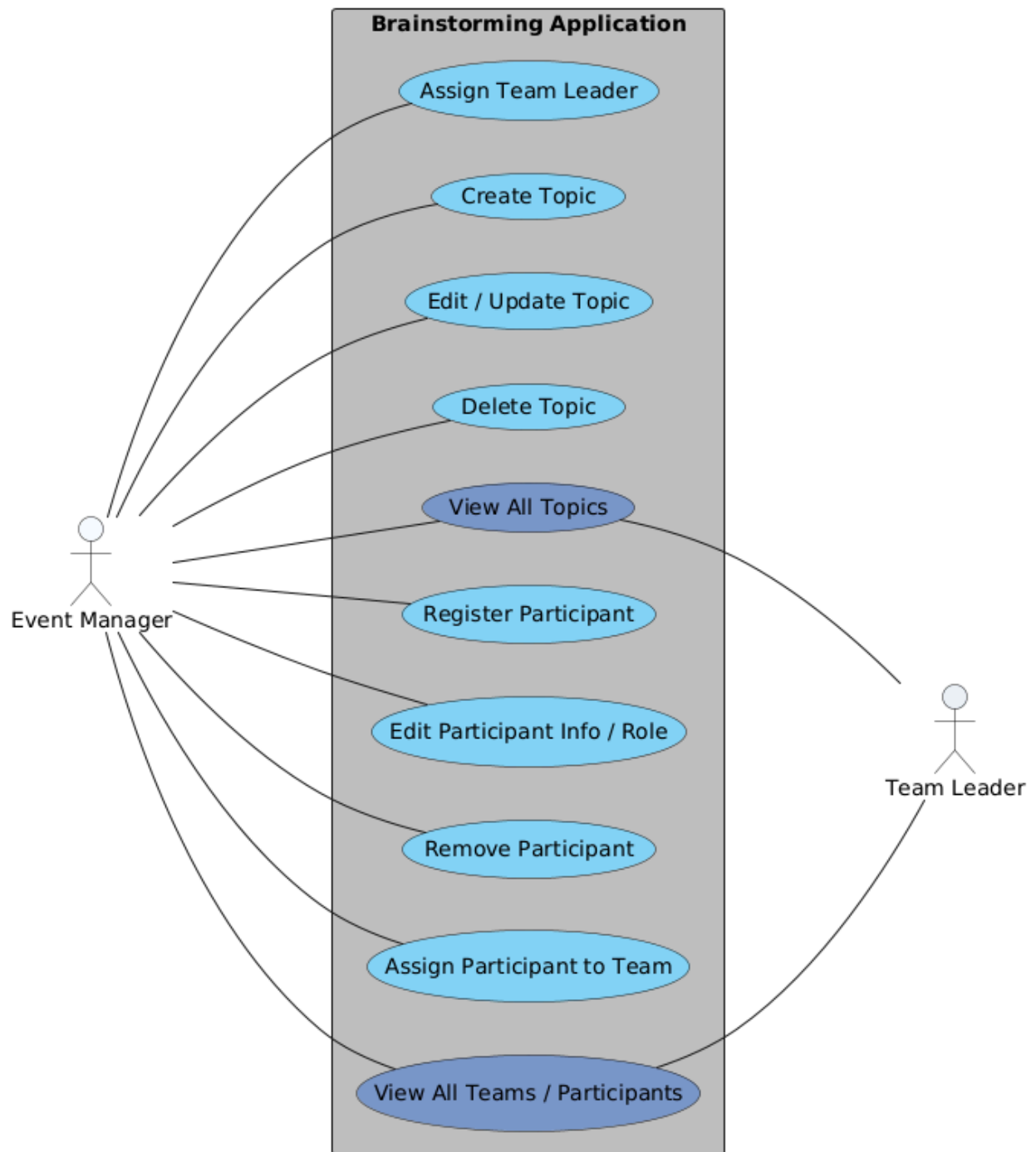
- **Participating Actor Instances:**
  1. john: User
- **Flow of Events:**
  1. John opens the Brainstorming Application and is presented with the login page.
  2. He enters his registered email address and password.
  3. The system validates his credentials against the database.
  4. Upon successful authentication, John is redirected to his personalized dashboard, which displays functionalities based on his assigned role (Team Member).
  5. If login fails, an error message is displayed, and he can attempt to re-enter his credentials or use the "Forgot Password" link.

3.4.2 Use case model

Use Case Diagram - Event Manager (Topic & Participant Management)

Brainstorming Application

- Assign Team Leader
- Create Topic
- Edit / Update Topic
- Delete Topic
- View All Topics
- Register Participant
- Edit Participant Info / Role
- Remove Participant
- Assign Participant to Team
- View All Teams / Participants

Event Manager

Team Leader

Use Case Diagram - Event Manager (AI, Reporting & Auditing)

Brainstorming Application

- Prompt ChatGPT for Idea Generation
- Send Ideas to ChatGPT for Summarization
- View AI Summaries
- Generate Aggregated Reports
- Export Session Data
- View Completed Sessions
- Audit Logs and Session History

Event Manager

Team Leader
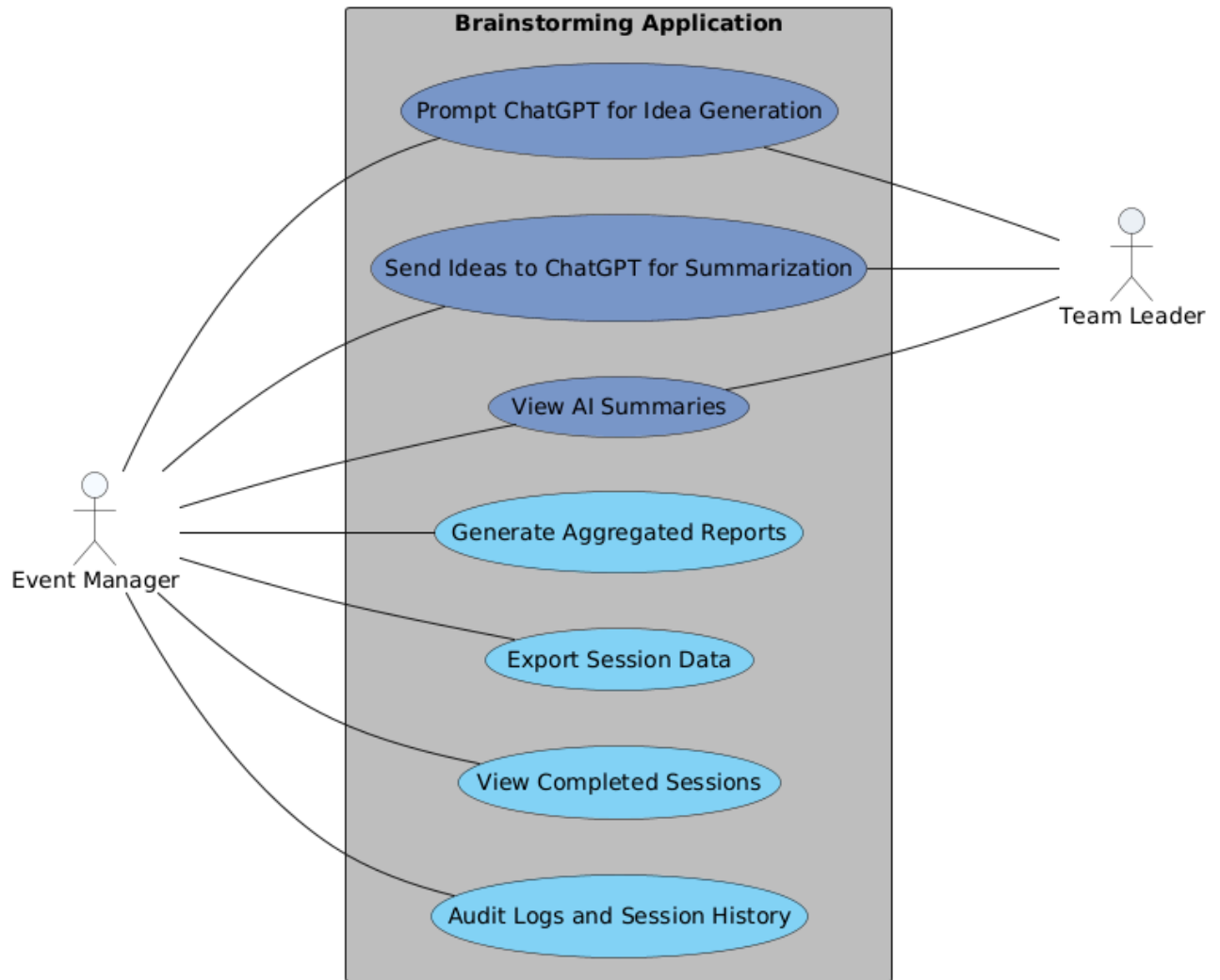
Use Case Diagram - Team & Session Management (with Team Member)

3.4.3 Object model

User
- -userId: String
- -firstName: String
- -lastName: String
- -email: String
- -passwordHash: String
- -role: UserRole

UserRole (E)
EventManager
TeamLeader
TeamMember

► Manages
An Event Manager (User) manages one or more Events.

Has Participants

Event
- -eventId: String
- -eventName: String
- -eventDescription: String

▲ Led by (TeamLeader)

▲ Has (TeamMember)
For 6-3-5, a Team has 6 members.

Contains

Team
- -teamId: String
- -teamName: String

Participates in

BrainstormingSession (C)
- -sessionId: String
- -status: SessionStatus
- -startTime: DateTime
- -endTime: DateTime

Submitted by

Contains

Discusses

Composed of
A 6-3-5 session has 5 rounds.

Topic
- -topicId: String
- -title: String
- -description: String
- -status: TopicStatus

SessionStatus (E)
NotStarted
Active
Paused
Completed

Round
- -roundId: String
- -roundNumber: int

Contains
6 members * 3 ideas/round = 18 ideas per round.

TopicStatus (E)
Open
Closed
Archived

Idea
- -ideaId: String
- -ideaText: String
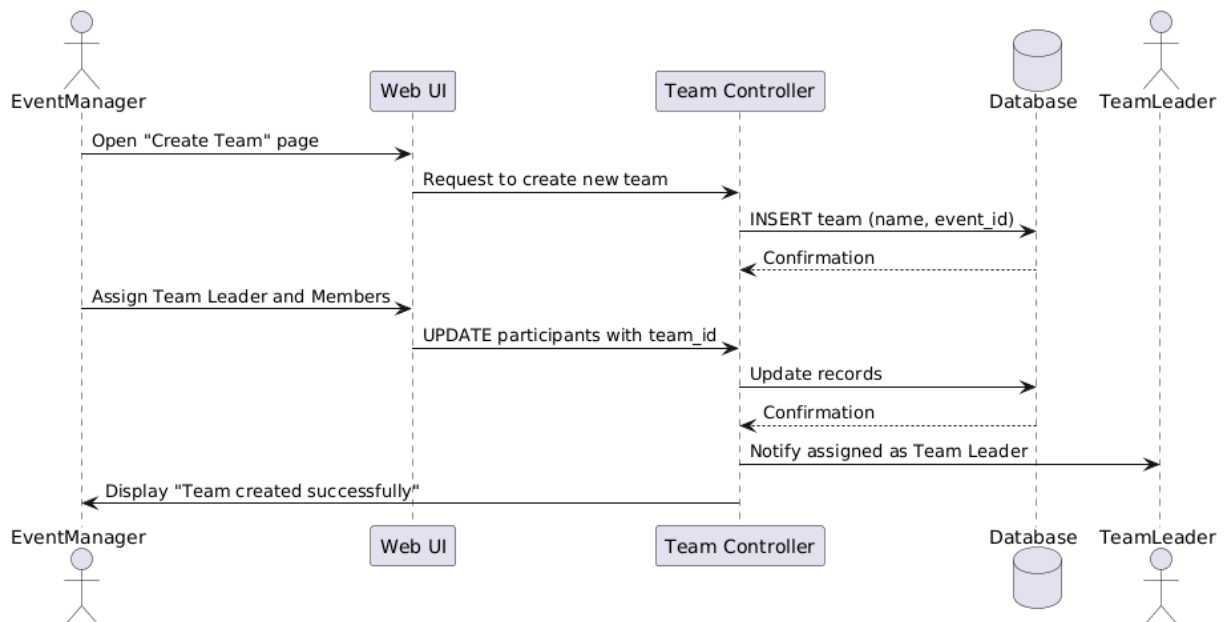- -timestamp: DateTime
- -aiAnnotation: String
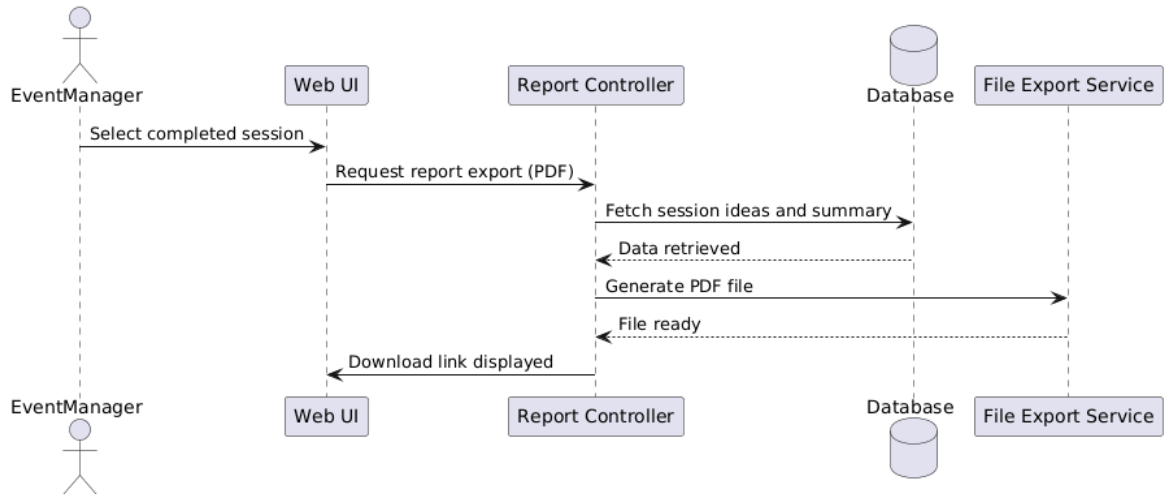
3.4.4 Dynamic model
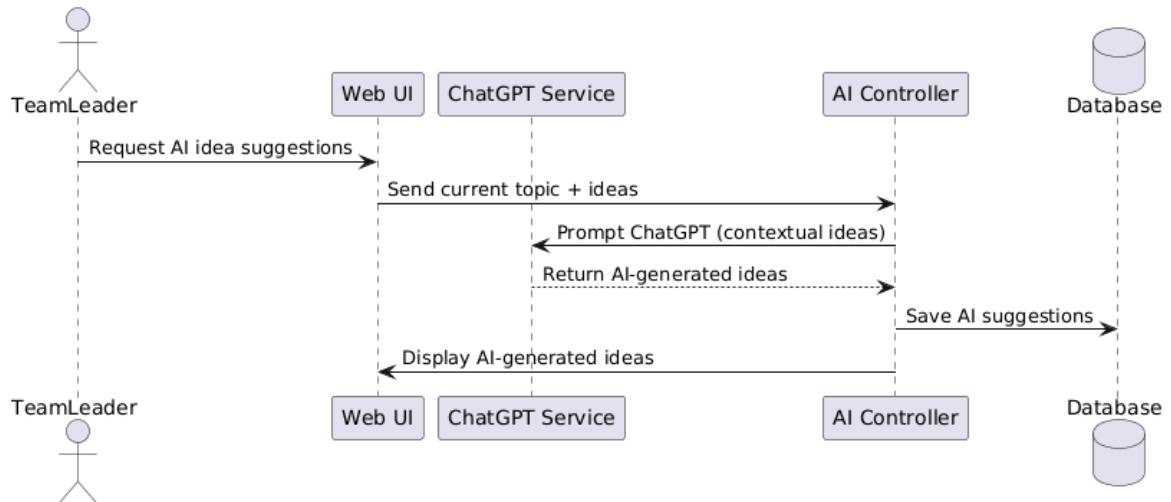
Sequence Diagrams:
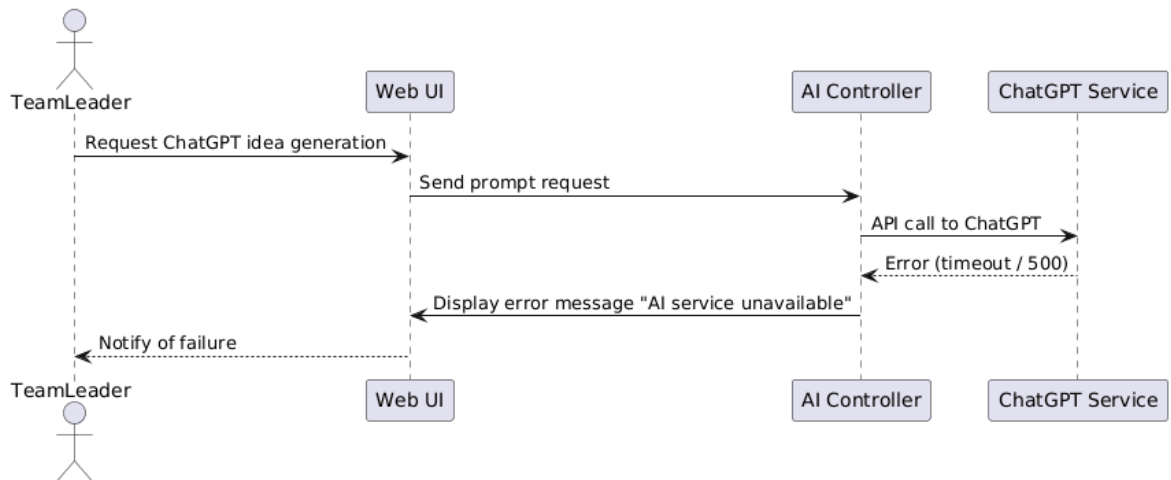- **Create New Topic:**
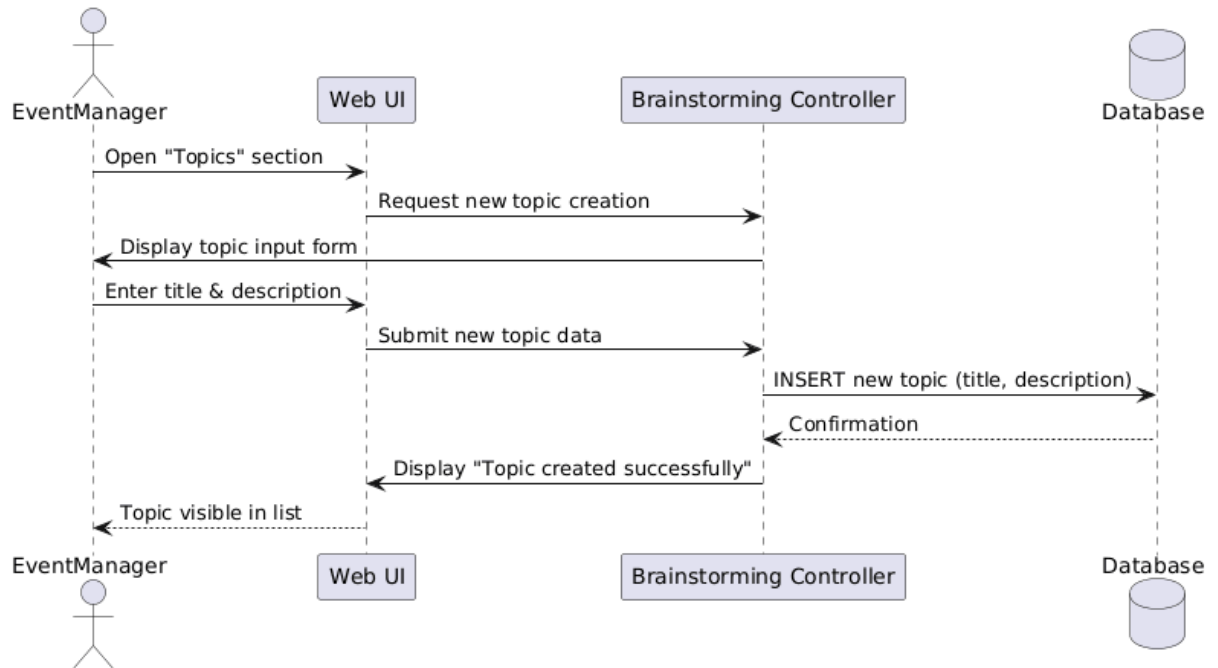
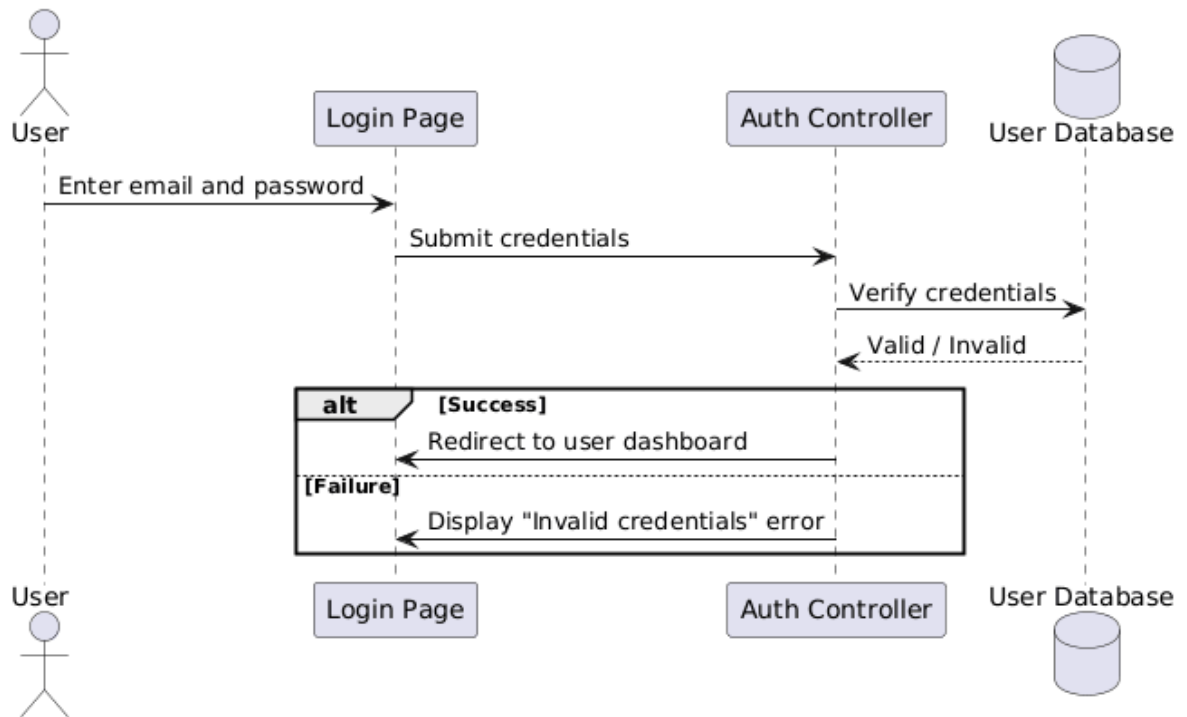- **Create Team:**

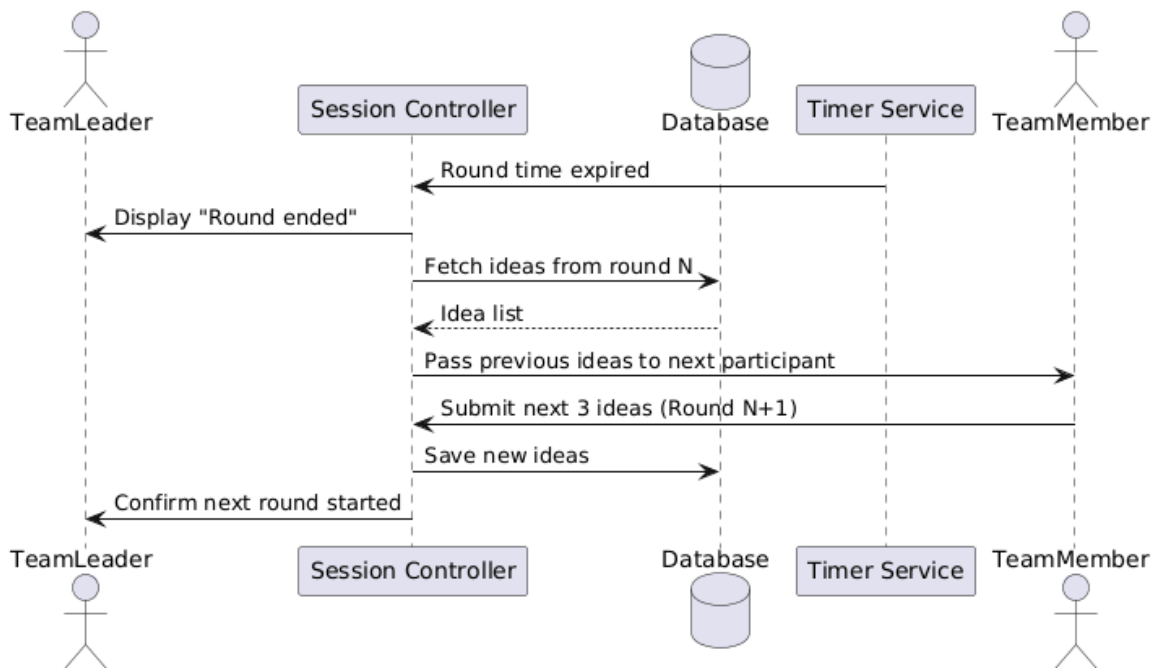- **Export Session Report:**

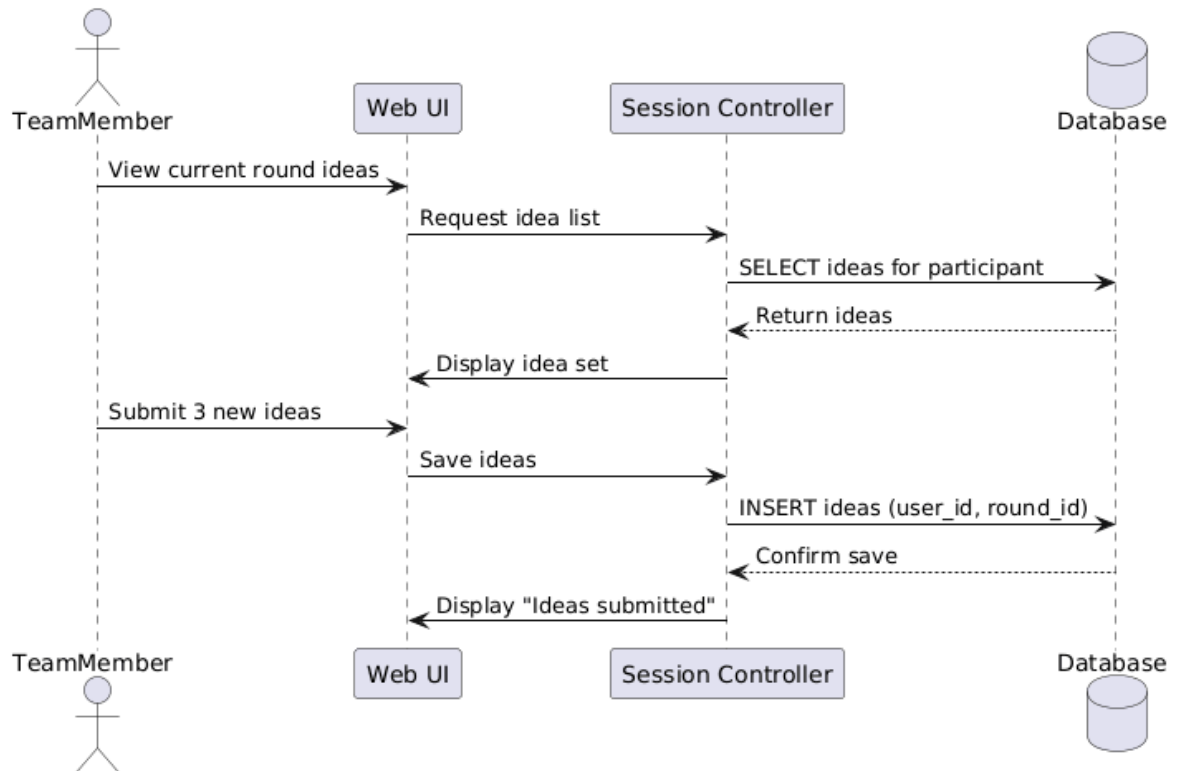- **Generate AI Ideas:**

- **Handle AI Error:**

- **Login Authentication:**

- **Manage Round Transition:**

- **Participate In Session:**

- **Register Participant:**
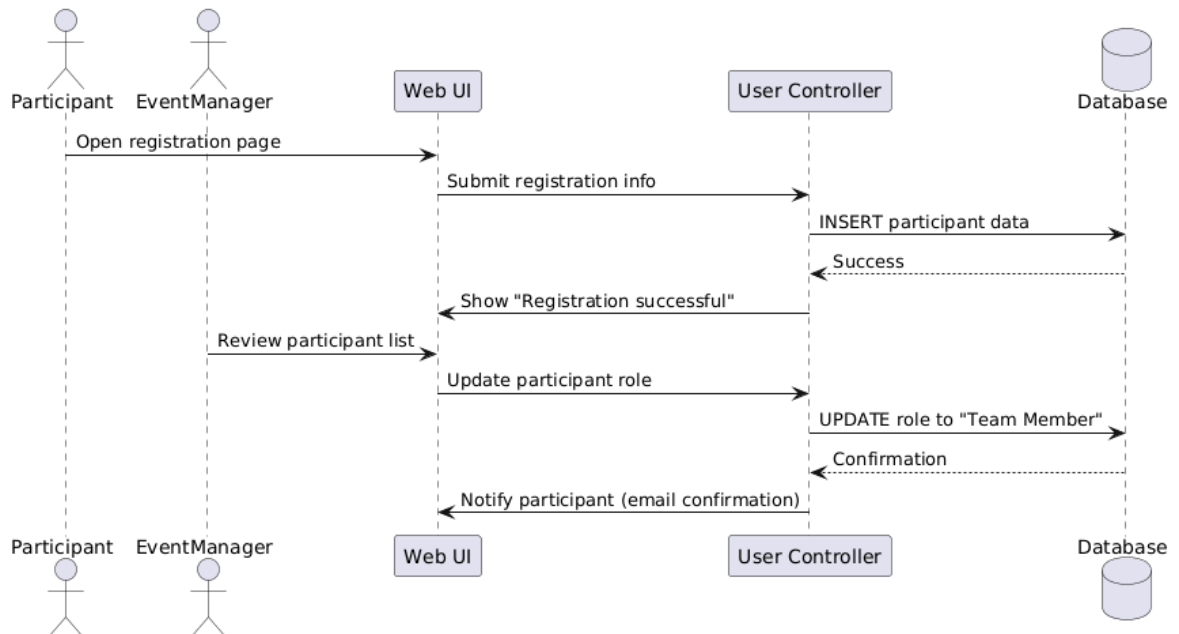
- **Start Brainstorming Session:**
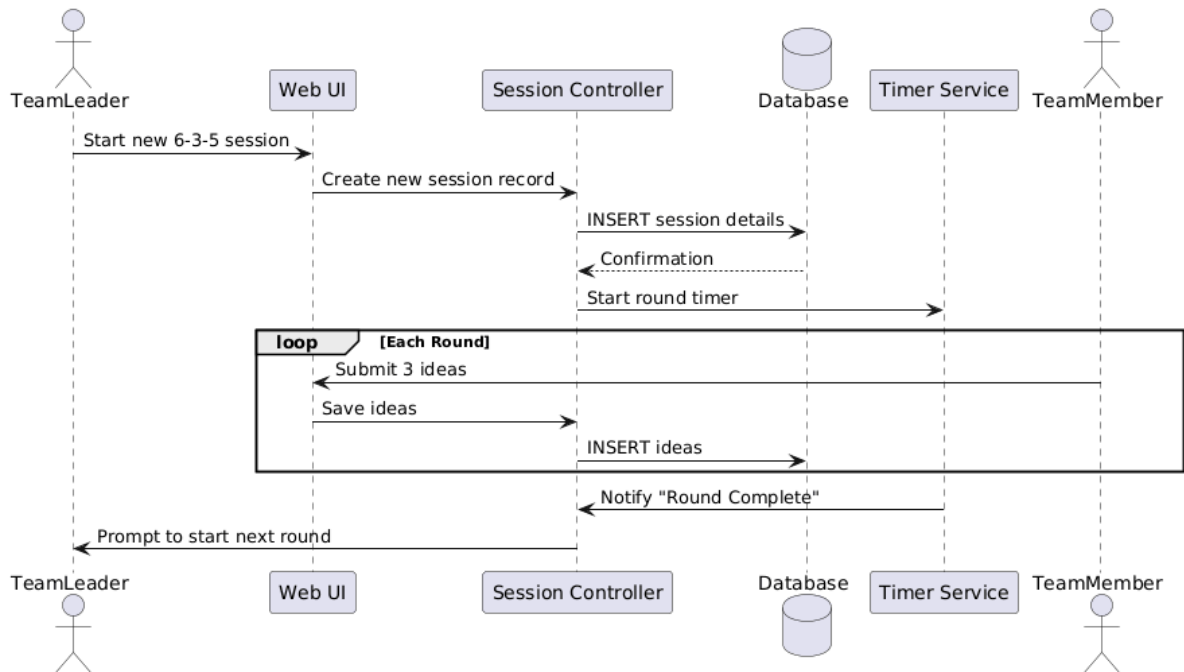
- **Summarize Session:**

- **View Team Ideas:**

Activity Diagrams:

6-3-5 Brainstorming Session Flow

- "Team Leader" starts the session
- "System" creates session record
- "System" starts Round 1
- 5 Rounds Completed? [Yes] / [No]
- "System" starts 5-minute timer
- "Members (Parallel)" submit 3 ideas
- Time expires OR all members submit
- "System" saves all submitted ideas
- "System" passes ideas to the next participant
- "Team Leader" (or system) ends the session
- "System" updates session status to "Completed"
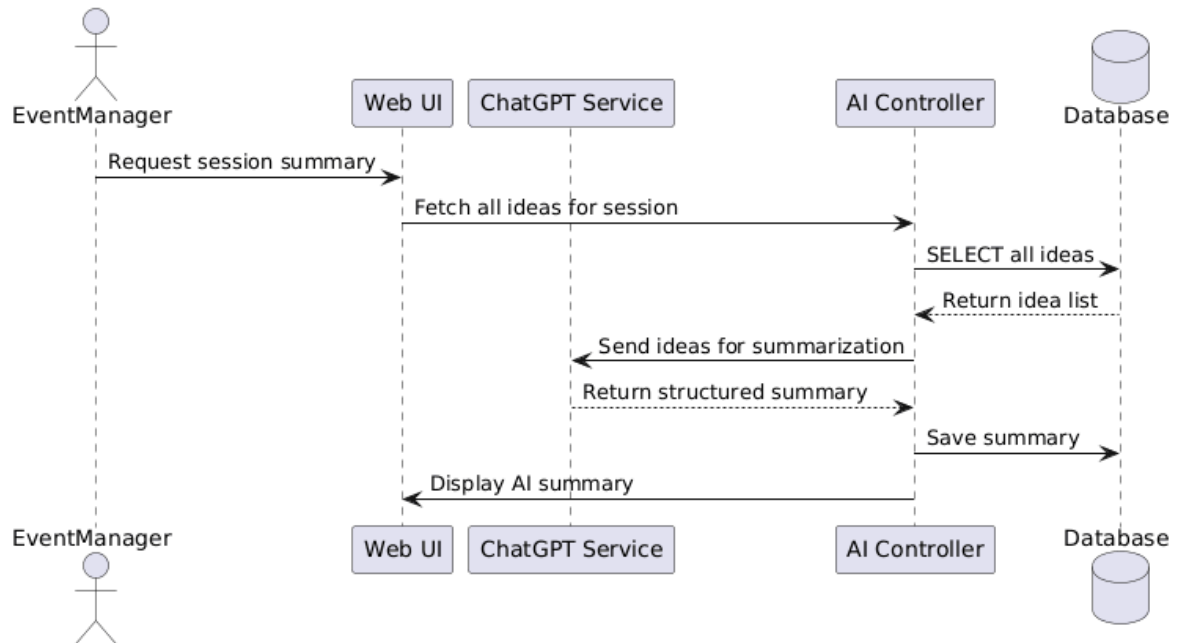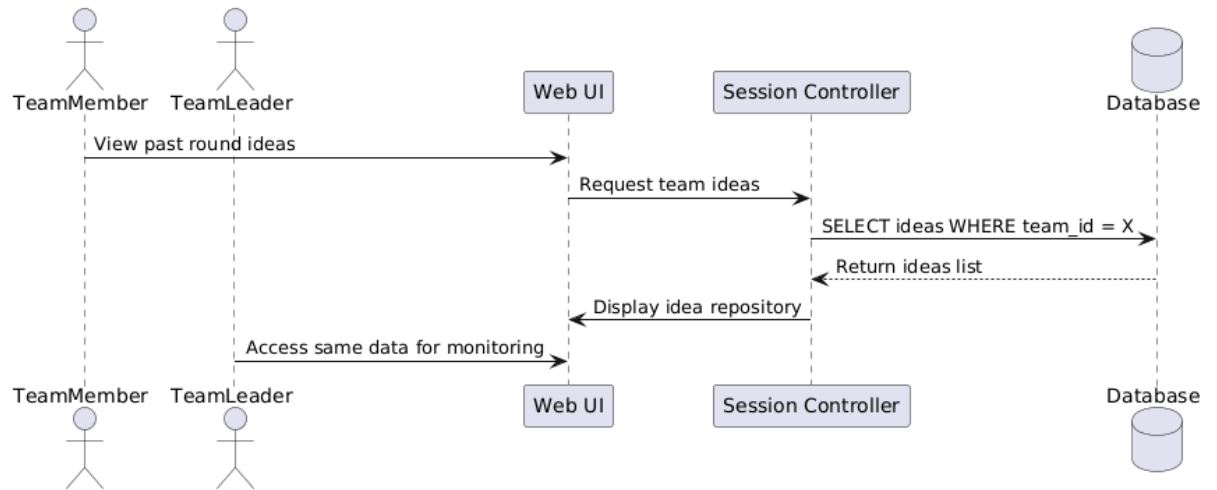
User Login (Authentication) Flow

```
                    ●
                    │
                    ▼
        ┌───────────────────────────┐
        │ User enters email and password │
        └───────────────────────────┘
                    │
                    ▼
      ┌─────────────────────────────────────┐
      │ "System" submits credentials for verification │
      └─────────────────────────────────────┘
                    │
                    ▼
[Yes, Success]  ⟨ Credentials valid? ⟩  [No, Failure]
      │                                         │
      ▼                                         ▼
┌─────────────────────────────────┐   ┌──────────────────────────────┐
│ Redirects user to their role-based dashboard │   │ Displays "Invalid credentials" error │
└─────────────────────────────────┘   └──────────────────────────────┘
      │                                         │
      ▼                                         ▼
      ◉                               ┌──────────────────────┐
                                      │ Remains on login page │
                                      └──────────────────────┘
                                                │
                                      ◉
```
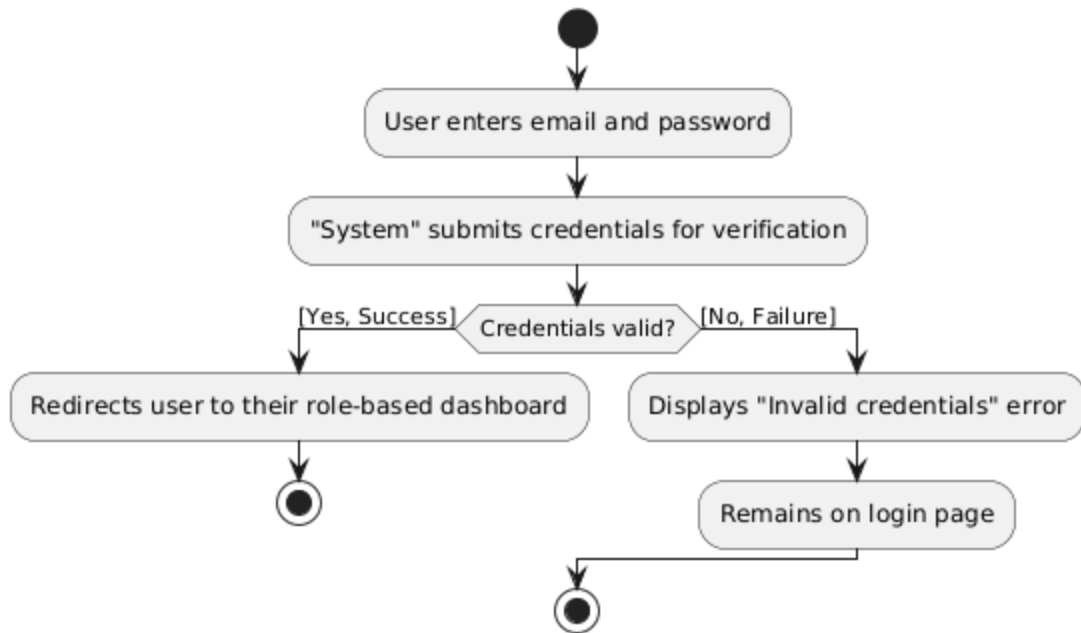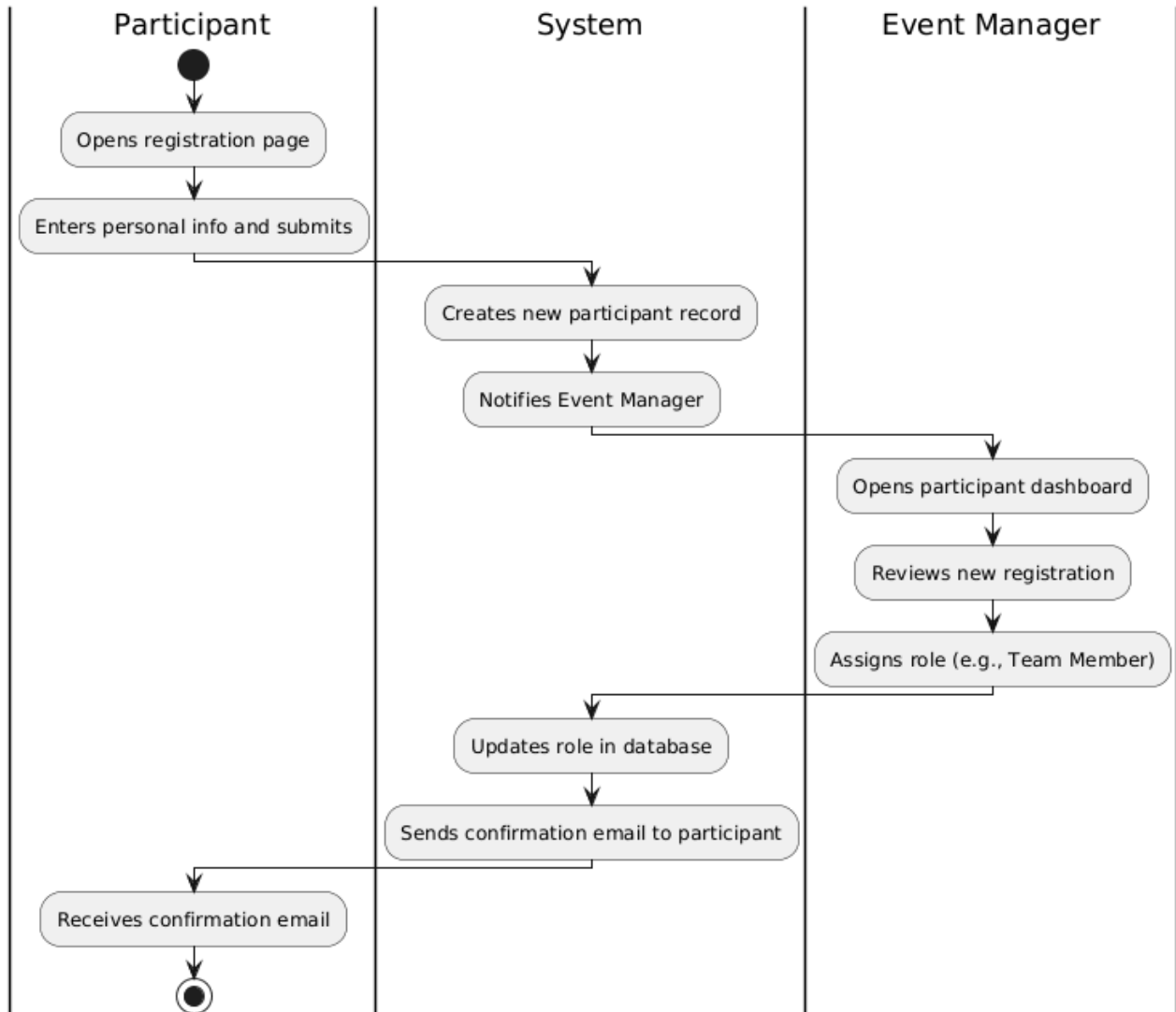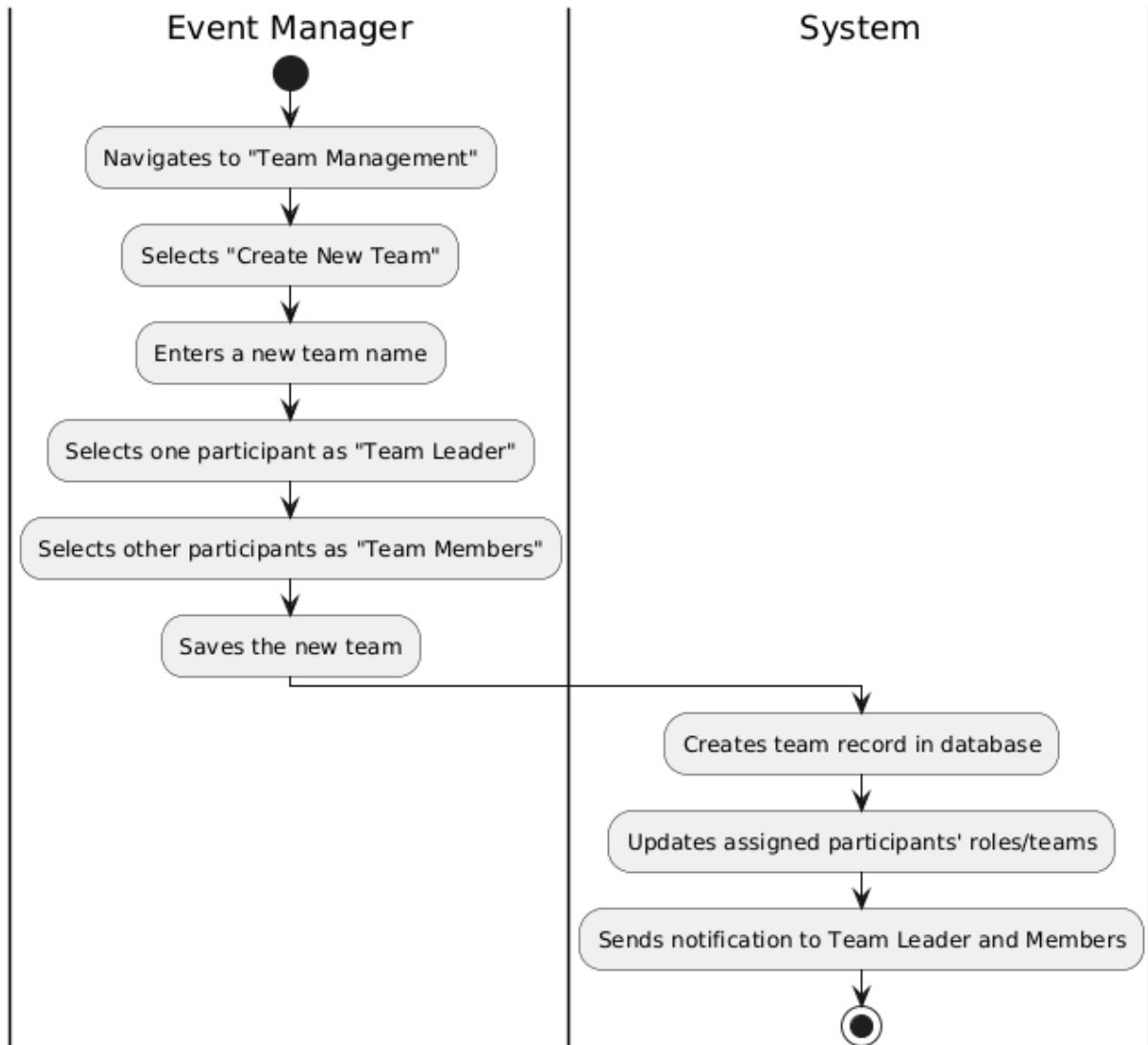
AI (ChatGPT) Interaction Flow (with Error Handling)
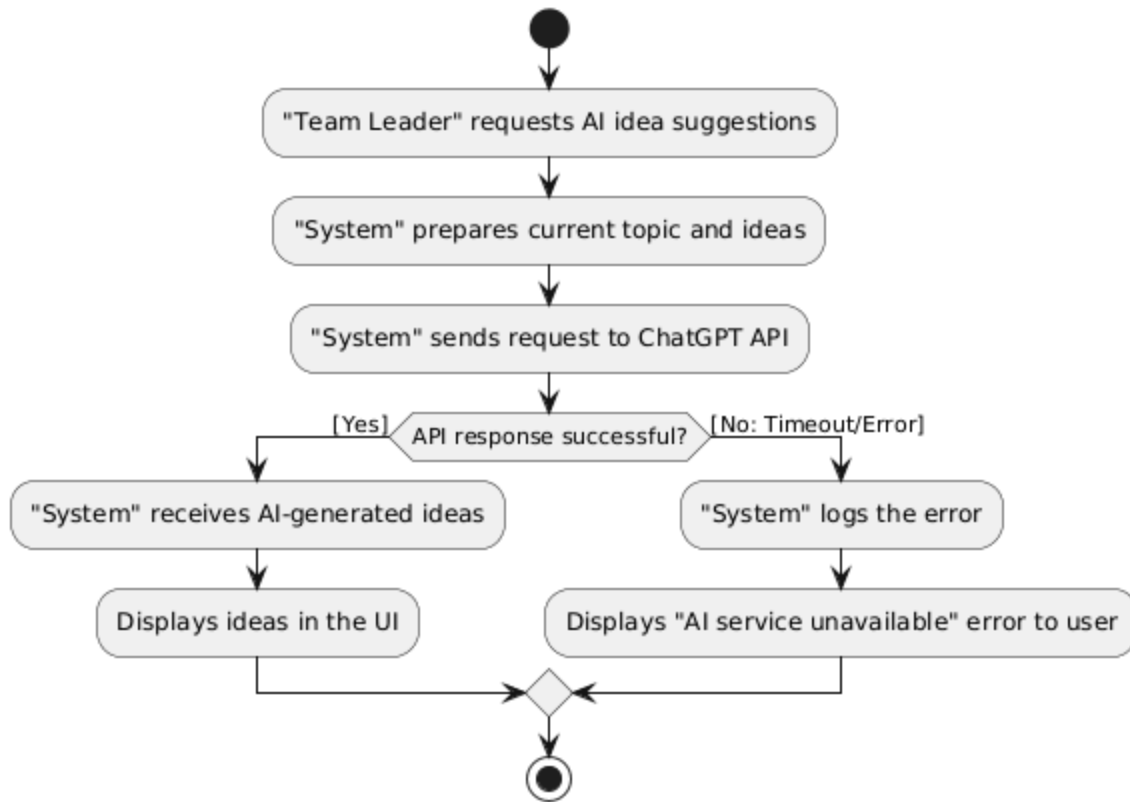
User Registration and Management Flow

Participant	System	Event Manager

Participant:
- ● (start)
- Opens registration page
- Enters personal info and submits

System:
- Creates new participant record
- Notifies Event Manager

Event Manager:
- Opens participant dashboard
- Reviews new registration
- Assigns role (e.g., Team Member)

System:
- Updates role in database
- Sends confirmation email to participant

Participant:
- Receives confirmation email
- ◉ (end)

Team Creation and Member Assignment Flow

Event Manager	System
●	
Navigates to "Team Management"	
Selects "Create New Team"	
Enters a new team name	
Selects one participant as "Team Leader"	
Selects other participants as "Team Members"	
Saves the new team	
	Creates team record in database
	Updates assigned participants' roles/teams
	Sends notification to Team Leader and Members
	◉

AI Session Summarization Flow

- User (Event Manager or Team Leader) selects a completed session
- Selects "Summarize with AI"
- "System" fetches all ideas for the session from database
- "System" sends all ideas to ChatGPT API for summarization

API response successful?

[Yes]
- "System" receives structured summary
- "System" saves summary to database
- Displays summary to user

[No: Timeout/Error]
- Displays "Summarization failed" error

3.4.5 User interfaces and Mock-ups
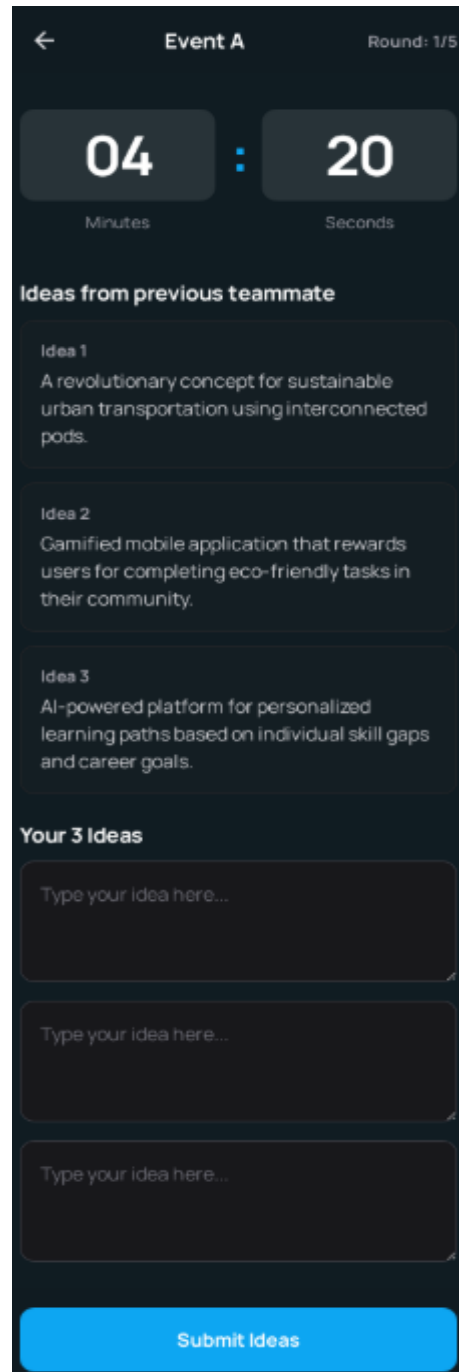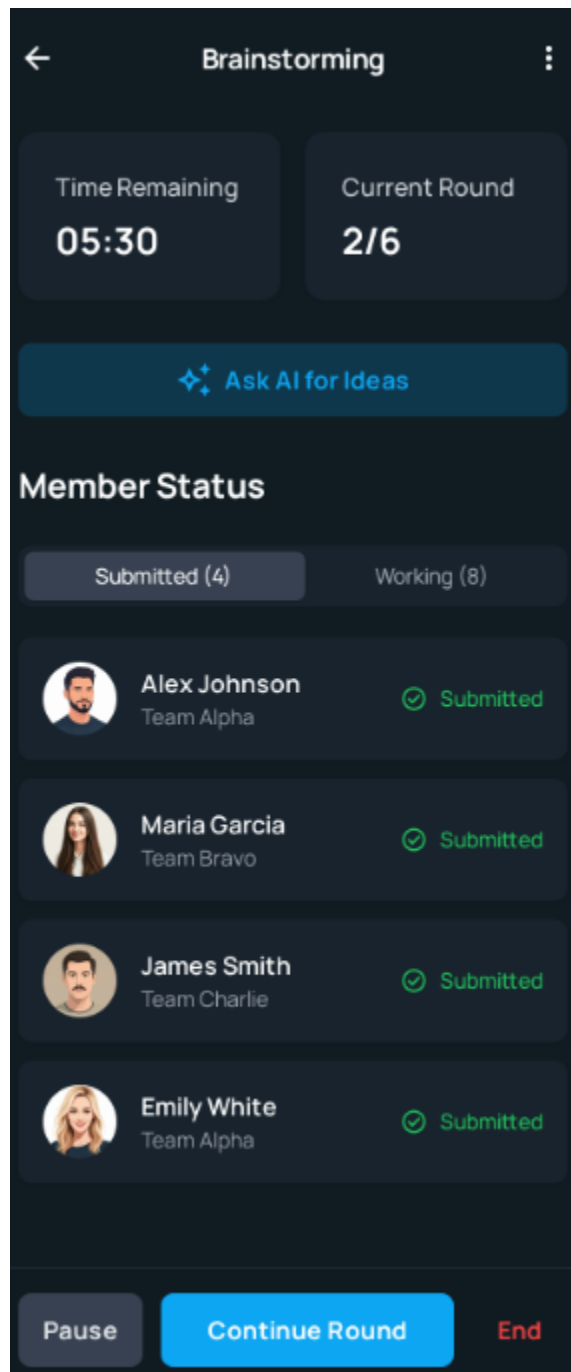
Welcome back, John!

Total Participants	Active Teams
124	**15**

Completed Sessions	Generated Ideas
8	**452**

Last Session Summary (AI-Generated)

The session focused on 'Q4 Marketing Strategies', yielding strong engagement around digital outreach. Key themes included influencer partnerships and content personalization.

View Details

Latest Activity

👤 New participant **Alex Smith** just registered.
2 minutes ago

💡 Team **Innovators** submitted 5 new ideas.
1 hour ago

📅 Session '**Q4 Marketing**' has ended.
3 hours ago

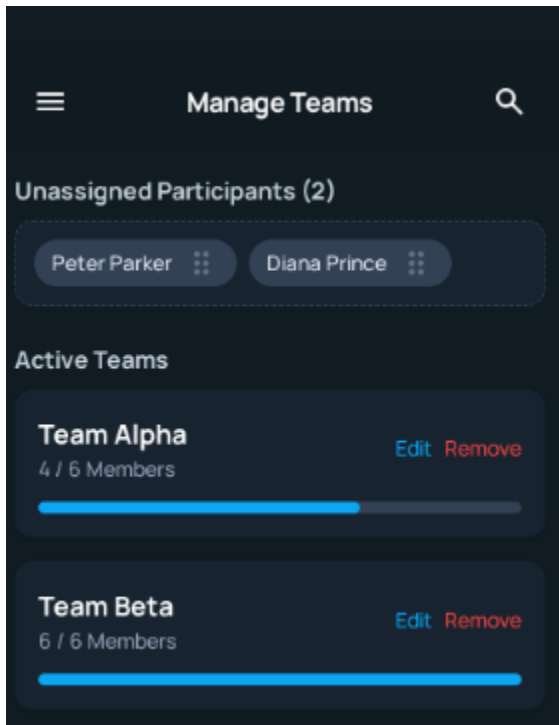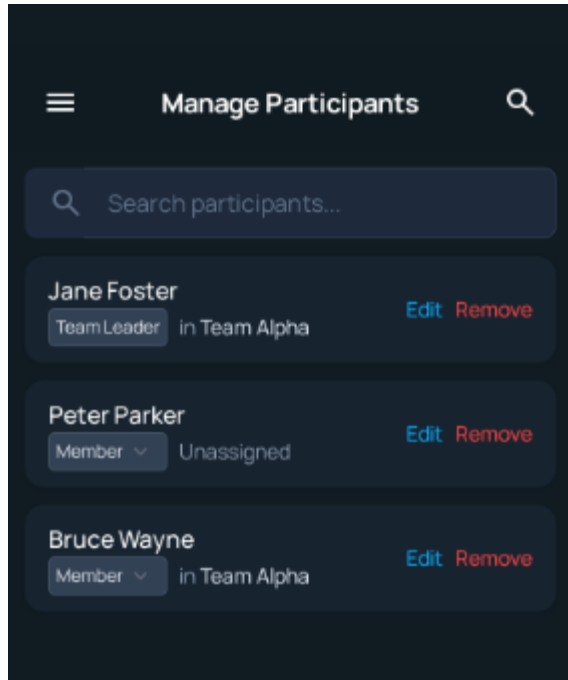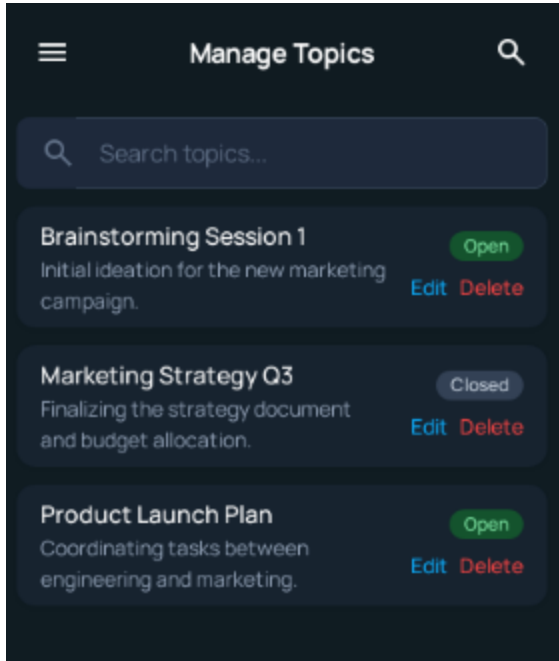---

Welcome Back!

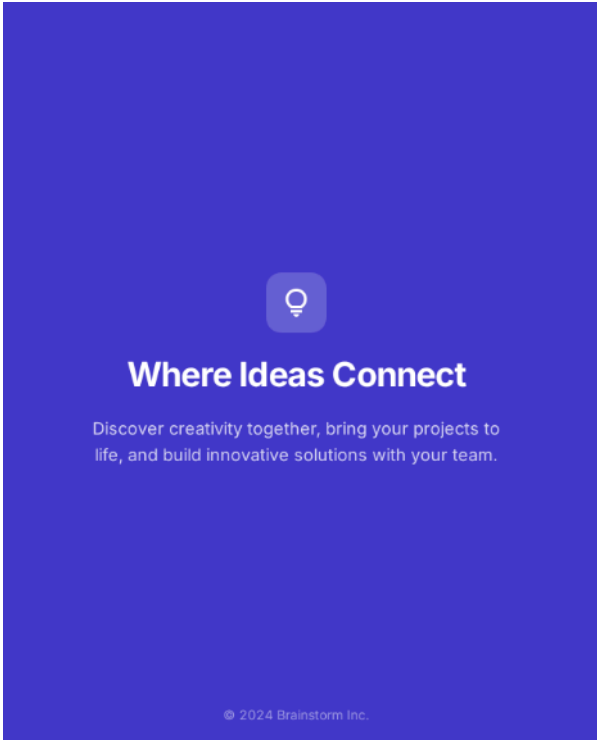Log in to manage your events.

Email

✉️ you@example.com

Password

🔒 Enter your password 👁

Forgot Password?

Login

Don't have an account? **Sign up**

Manage Topics

Search topics...

Brainstorming Session 1
Open
Initial ideation for the new marketing campaign.
Edit Delete

Marketing Strategy Q3
Closed
Finalizing the strategy document and budget allocation.
Edit Delete

Product Launch Plan
Open
Coordinating tasks between engineering and marketing.
Edit Delete

Manage Participants

Search participants...

Jane Foster
Team Leader in Team Alpha
Edit Remove

Peter Parker
Member ˅ Unassigned
Edit Remove

Bruce Wayne
Member ˅ in Team Alpha
Edit Remove

Manage Teams

Unassigned Participants (2)

Peter Parker ⋮⋮   Diana Prince ⋮⋮

Active Teams

Team Alpha
Edit Remove
4 / 6 Members

Team Beta
Edit Remove
6 / 6 Members

Brightspark

Welcome back
Please enter your details to sign in.

Email

name@company.com

Password

Enter your password

◯ Remember me   Forgot Password?

Sign In

Don't have an account? **Sign up**

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Where Ideas Connect

Discover creativity together, bring your projects to life, and build innovative solutions with your team.

Brainstorm   Dashboard   Sessions   Teams   🔔   ⚙️

Dashboard
Welcome to your general session overview.

+ Start New Session

Total Participants
1,204
+5.2%

Active Teams
15
+2

Completed Sessions
89
+8.1%

Ideas Generated
2,456
+12%

Weekly Idea Generation
421 This Week +15.3%

Tue   Thu   Sat
Mon   Wed   Fri   Sun

Recent Activities

John Doe added a new idea.
2 minutes ago

"Q4 Marketing" session completed.
1 hour ago

Jane Smith joined the team.
3 hours ago

Zoe commented on "Mobile App" idea.
Yesterday

Mike added 3 new ideas.
2 days ago

Latest AI-Generated Session Summary

The last session focused on marketing strategies. Noteworthy ideas included using gamification to boost social media engagement and personalized email campaigns to enhance customer loyalty.

View Full Summary →

Marketing Slogans
Round 2

00	14	32
Hours	Minutes	Seconds

⏸ Pause   ▷ Resume   ☐ End Session

◆ **Marketing Strategy Brainstorm**   End Session   👤

Your Ideas

Time Remaining

04	:	32
Minutes		Seconds

Write one idea per box.

Write the first thing that comes to mind...

Another great idea...

+ Add New Idea

Submit Ideas

Previous Teammate's Ideas

Alice Johnson 2 min ago
We could leverage social media influencers for our new marketing campaign.

Bob Williams 1 min ago
Let's create a referral program for our product to incentivize existing customers.

Zoe Miller Just now
We should create short video content on TikTok to reach a younger audience.

Q3 2024 Marketing Strategies

Session Date: October 24, 2023 | Participants: 12

Export Report

💡 Key Themes

Social Media Growth (8 ideas)   Content Innovation (6 ideas)   Partnership Opportunities (5 ideas)

User Engagement (9 ideas)

✦ AI Session Summary

The session focused on defining marketing strategies for the third quarter of 2024. Key discussion topics included increasing organic growth on social media channels, developing innovative content formats, and establishing potential brand partnerships.

Participants emphasized the importance of increasing user engagement, especially through video content and interactive campaigns. Prominent ideas centered around data-driven targeting and personalized marketing messages. Consequently, it was decided to launch pilot projects in these areas.

All Ideas

Collaborate with influencers to reach new audiences.

Ayşe Yılmaz   Social Media

A campaign featuring user-generated content (UGC).

Mehmet Kaya   Engagement

Launch a podcast series to showcase our industry expertise.

Zeynep Demir   Content

Co-launch a product with tech startups.

Can Öztürk   Partnership

Produce short, educational videos for TikTok and Instagram Reels.

Elif Sönmez   Social Media

Host a monthly webinar to engage with potential customers.

Barış Aksoy   Engagement

Manage Your Teams

Organize participants into brainstorming groups.

Available Participants

🔍 Find a participant...

👤 Alexia Smith	☐
👤 Ben Carter	☑
👤 Chloe Davis	☐
👤 David Evans	☑

Add to Team

Active Teams

Alpha Innovators
5 / 8 Members

✏️ 🗑️

Beta Builders
8 / 8 Members

✏️ 🗑️

Creative Crew
3 / 6 Members

✏️ 🗑️

Brainstorming Topics

🔍 Search by topic title or keyword...

TOPIC	STATUS	LAST UPDATED		
Q4 Marketing Campaign Ideas Brainstorming session for the upcoming quarterly market...	Open	2 days ago	✏️ Edit	🗑️ Delete
New Mobile App Features Collecting ideas for the next major release of our mobile ...	Open	5 days ago	✏️ Edit	🗑️ Delete
Website Redesign Project Initial thoughts and concepts for the complete overhaul ...	Closed	1 month ago	✏️ Edit	🗑️ Delete
Annual Team Offsite Locations Gathering suggestions for next year's company retreat.	In Progress	1 week ago	✏️ Edit	🗑️ Delete

‹ 1 2 3 ... 8 9 10 ›

4. Glossary of Terms

- **6-3-5 Method:** *A structured brainstorming technique where six participants each contribute three ideas in five rounds.*
- **API:** *Application Programming Interface, enabling communication between the frontend and backend.*
- **ChatGPT:** *An AI model by OpenAI used for idea generation and summarization within the system.*
- **CRUD:** *Create, Read, Update, Delete – basic database operations supported by the system.*
- **Event Manager:** *The user responsible for managing events, topics, participants, and teams.*
- **RDBMS:** *Relational Database Management System used to store event and brainstorming data.*
- **Team Leader:** *The user who manages a single team, moderates brainstorming sessions, and interacts with ChatGPT.*
- **Team Member:** *A participant who contributes ideas during brainstorming sessions.*

5. Traceability

This section provides a bidirectional traceability matrix linking functional and nonfunctional requirements to project objectives, system components, and validation artifacts. It ensures that every requirement is implemented, tested, and aligned with the project goals defined in **Section 1.3**.

5.1 Traceability Overview

Traceability within the Brainstorming Application connects:

- **Objectives ↔ Requirements ↔ Scenarios ↔ Validation**
- Each **Functional Requirement (FR)** and **Nonfunctional Requirement (NFR)** is traced to at least one **Objective**, **Scenario**, and **Use Case Model** component.
-

5.2 Functional Requirements Traceability Matrix

Req. ID	Related Objective(s)	Related Scenario(s)	Use Case / Control Object	Verification Method
FR-100 – FR-115	O1 (Event setup & management)	createNewTopic, registerParticipant, createTeam	EventManagerControl	UI test + CRUD database validation
FR-200 – FR-210	O2 (Implement 6-3-5 method)	startBrainstormingSession, manageRoundTransition	BrainstormSessionControl	Timer + flow simulation tests
FR-300 – FR-307	O3 (Role-based access & reporting)	exportSessionReport, viewTeamIdeas	AccessControlManager	Role-access functional tests

FR-400 – FR-403	O2 + O4 (AI-assisted creativity)	generateAIideas, summarizeSession	ChatGPTIntegrationControl	API integration test + mock responses
FR-500 – FR-503	O4 (Real-time collaboration)	manageRoundTransition, startBrainstormingSession	SyncServiceControl	WebSocket latency tests
FR-600 – FR-602	O1 + O3 (Reporting & archiving)	exportSessionReport	ReportManager	Data export & file format tests
FR-700 – FR-702	O5 (Security & authorization)	loginAuthentication	AuthControl / JWT Service	Penetration + access tests

5.3 Nonfunctional Requirements Traceability Matrix

NFR ID	Requirement Type	Supported FRs	Validation Criteria / Metric
NFR-100 – 103	Usability	FR-100 – FR-210	Heuristic evaluation + user feedback
NFR-200 – 202	Reliability	FR-200 – FR-503	99.5% uptime monitor + auto-save tests
NFR-300 – 303	Performance	FR-500 – FR-503	< 500 ms sync delay + load benchmark

NFR-400 – 401	Supportability	FR-600 – FR-602	Log integrity and maintainability review
NFR-500 – 504	Implementation	All FRs	Code review + API integration test
NFR-600 – 604	Interface	FR-100 – FR-403	UI consistency across devices
NFR-700 – 703	Packaging	FR-500 – FR-602	Deployment and mobile build tests
NFR-800 – 802	Legal	FR-700 – FR-702	GDPR / API policy compliance audit

5.4 Objective-to-Requirement Mapping

Objective (Section 1.3)	Mapped Requirements
O1 – Streamline event management	FR-100 – FR-115, FR-300 – FR-303

| O2 – Enhance creativity via 6-3-5 | FR-200 – FR-210, FR-400 – FR-403 |

| O3 – Enable AI-assisted brainstorming | FR-400 – FR-403, NFR-401 – 503 |

| O4 – Provide real-time collaboration | FR-500 – FR-503, NFR-300 – 303 |

| O5 – Ensure security & data integrity | FR-700 – FR-702, NFR-800 – 802 |

5.5 Traceability Summary

All functional and nonfunctional requirements are mapped to objectives, scenarios, and verification methods. This matrix ensures:

- Every requirement supports a measurable goal.
- Each use case and control object aligns with user needs.
- Testing and validation phases can directly trace back to project intentions.