

Theory Of App Development



Team AlumNITD

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1 Problem Statement





FOR THE NIT DELHI STUDENTS

No Centralized
Alumni Network

Limited Alumni-
Student
Interaction

No Direct Job &
Internship
Referrals

Inefficient Event
& Donation
Management

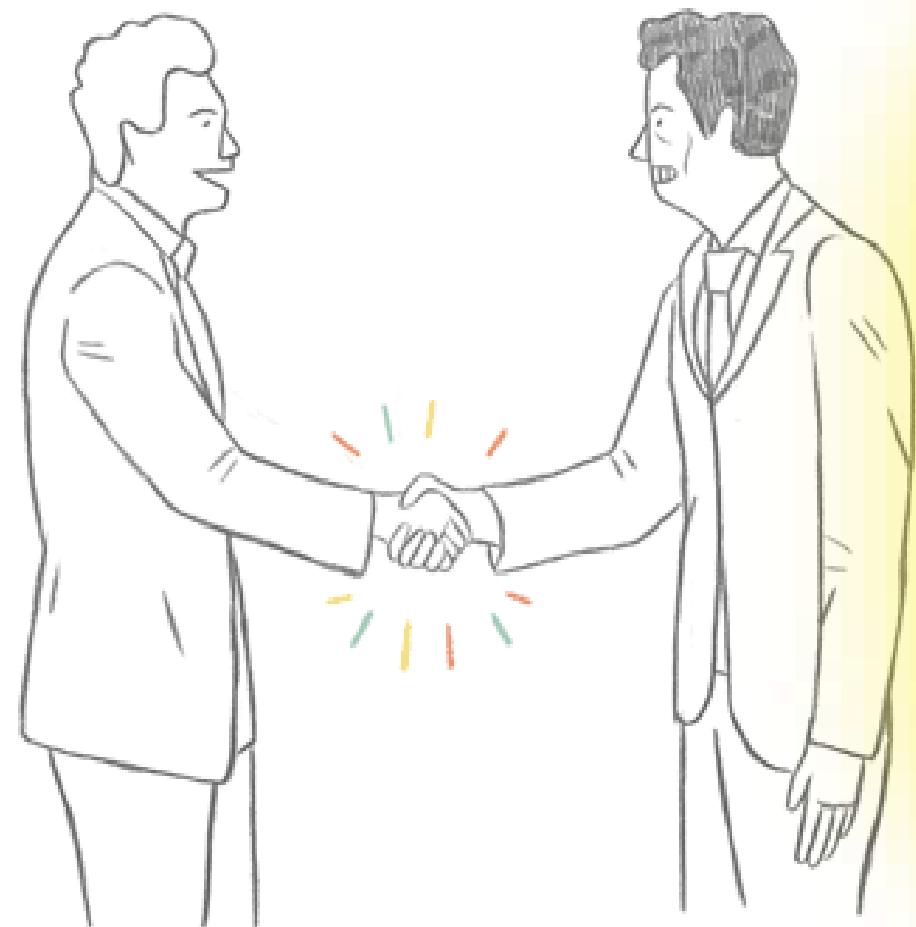
Untapped
Alumni Potential

2 What is AlumNTD?





Alum**NITD**



Alum**NITD**

is an AI-powered **alumni networking**
app for **NIT Delhi**, connecting
students, alumni, and faculty.



3 Core Features

User Management & Access Control

✓ User Registration & Login

✓ Profile Management

✓ Verification System

01

Networking & Community Building

✓ Advanced Search & Filters

✓ Nearby Alumni Map

✓ Direct Messaging & Chat

✓ Alumni Forums

✓ Time Capsule Section

02

Career & Placement Assistance

✓ Job & Internship Board

✓ Alumni Hiring & Referral System

03

Events & Engagement

✓ Event Management System

✓ Donation And Fundraising

✓ Push Notifications & Alerts

04

Admin Dashboard & Analytics

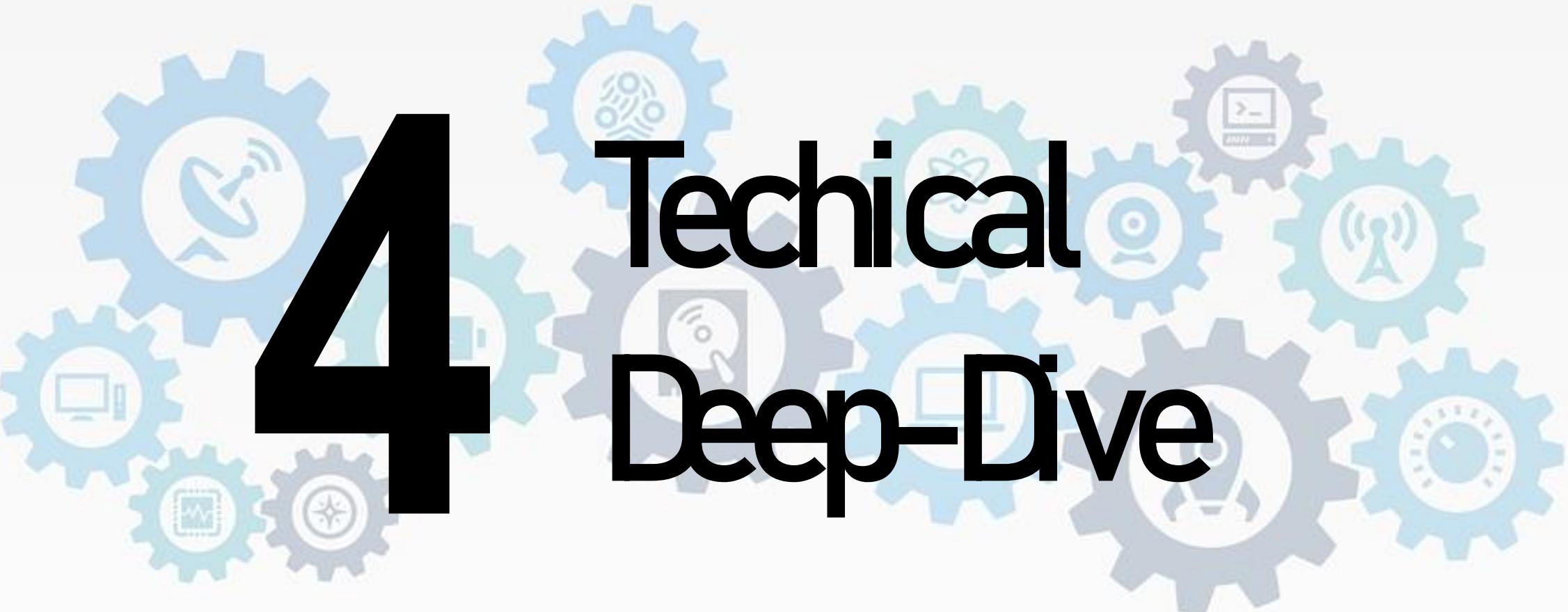
✓ Centralized Control Panel

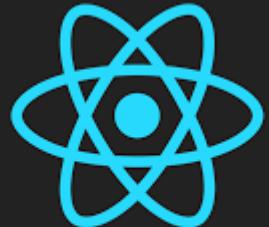
✓ Data Insights & Analytics

05



4 Technical Deep-Dive





React Native

For building high-performance cross-platform mobile apps with native capabilities.



For building high-performance cross-platform mobile apps with native capabilities.

For building high-performance cross-platform mobile apps with native capabilities.

express

For building high-performance cross-platform mobile apps with native capabilities.





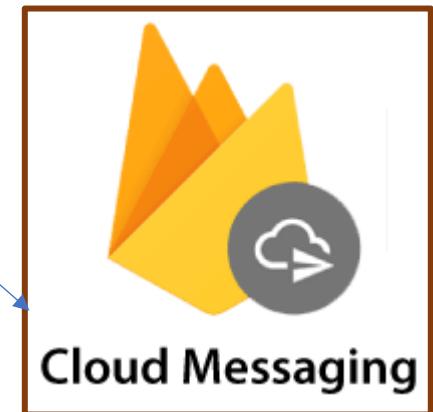
Implemented Firebase Authentication for secure, flexible sign-in via email, phone, and social logins, with seamless Firebase integration.

Used Cloud Firestore, a scalable NoSQL database, for real-time, offline-supported data management and complex querying.



Integrated Firebase Cloud Messaging with React Native Notifee to deliver rich, reliable cross-platform push notifications.

Combined Firebase Realtime Database and Socket.io for low-latency, two-way communication in live discussion forums.

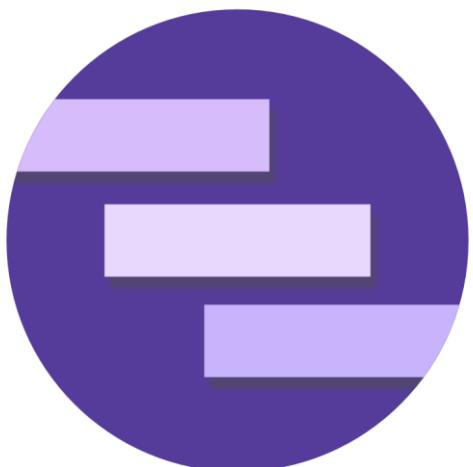




Customizable and privacy-focused map service used to show live alumni locations.



GitHub Actions – For automated deployment pipelines.

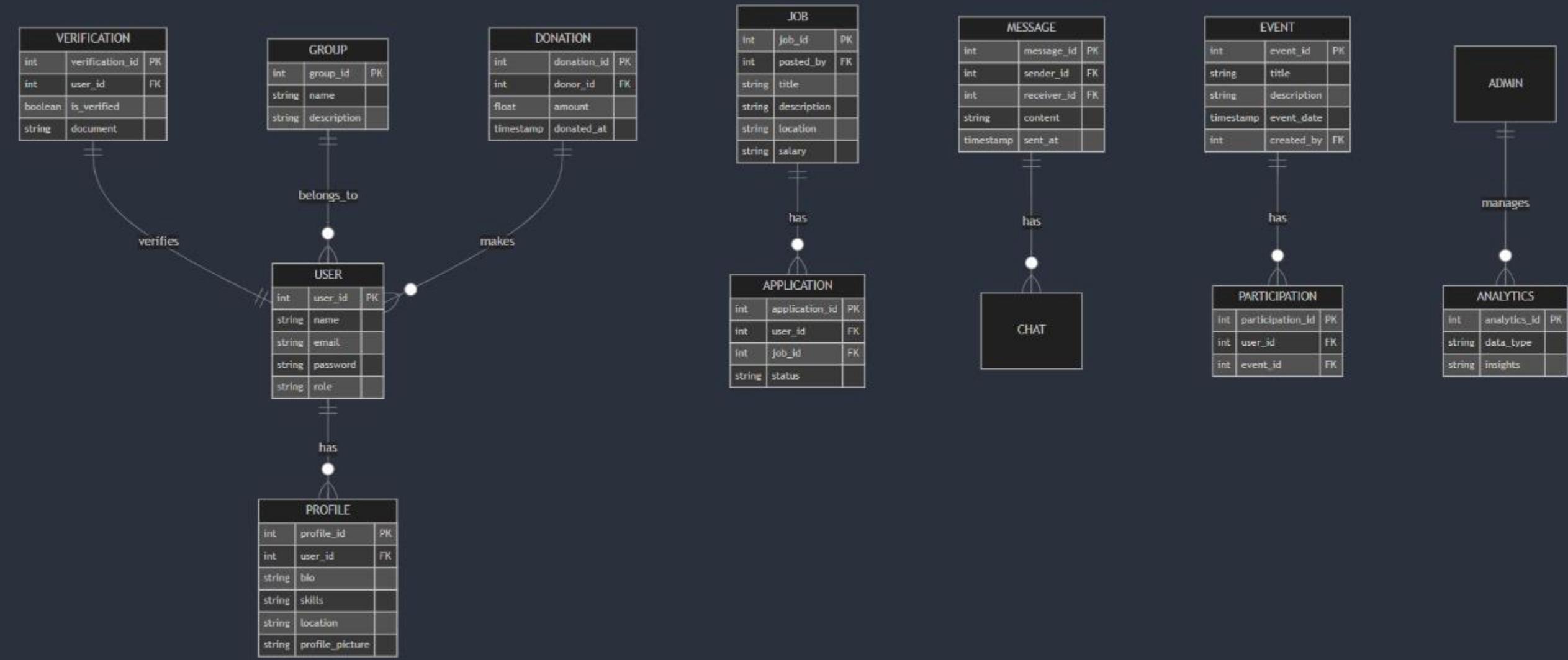


Advanced notification handling and customization on React Native apps.



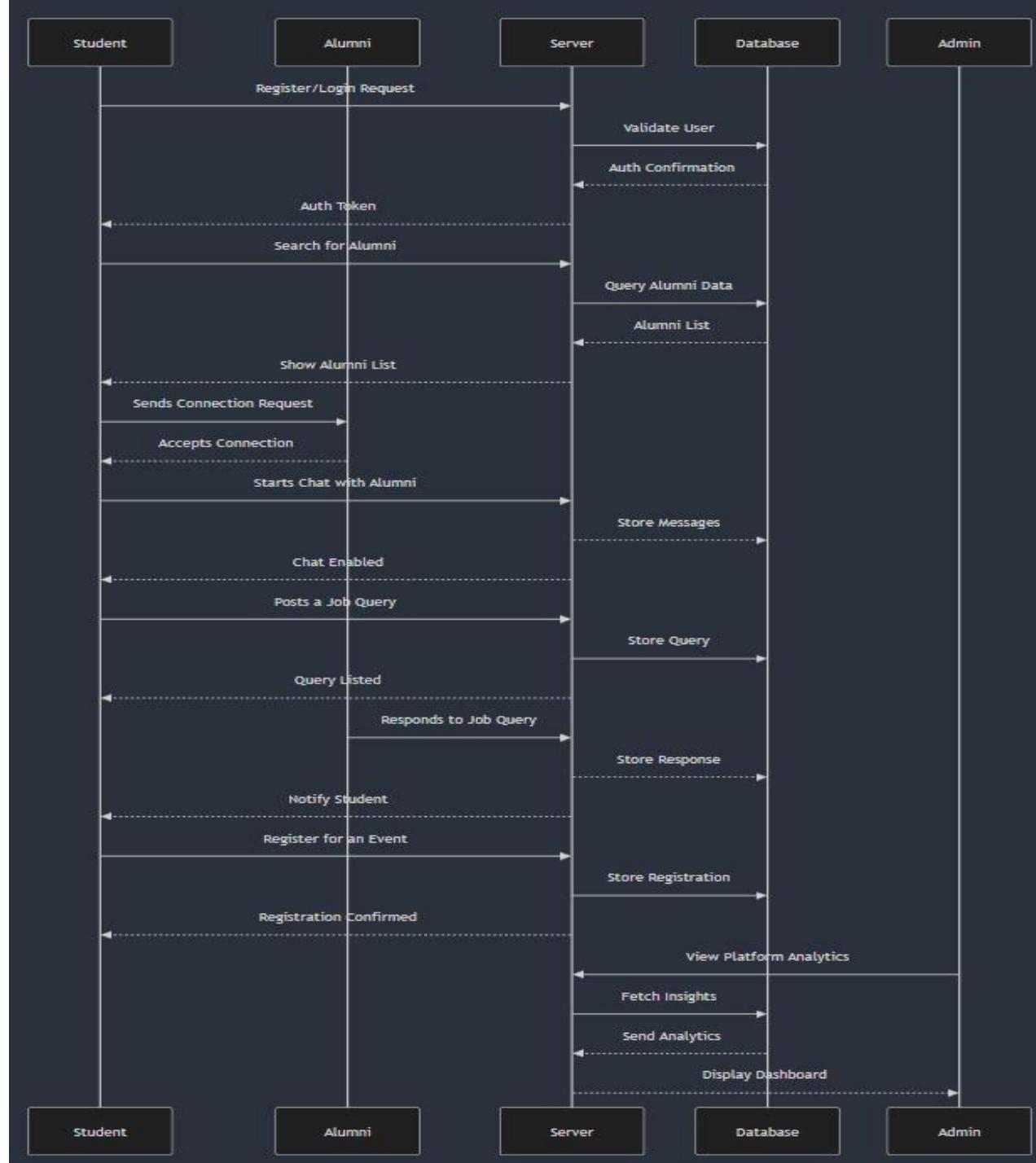
5

Entity- Relationship Diagram



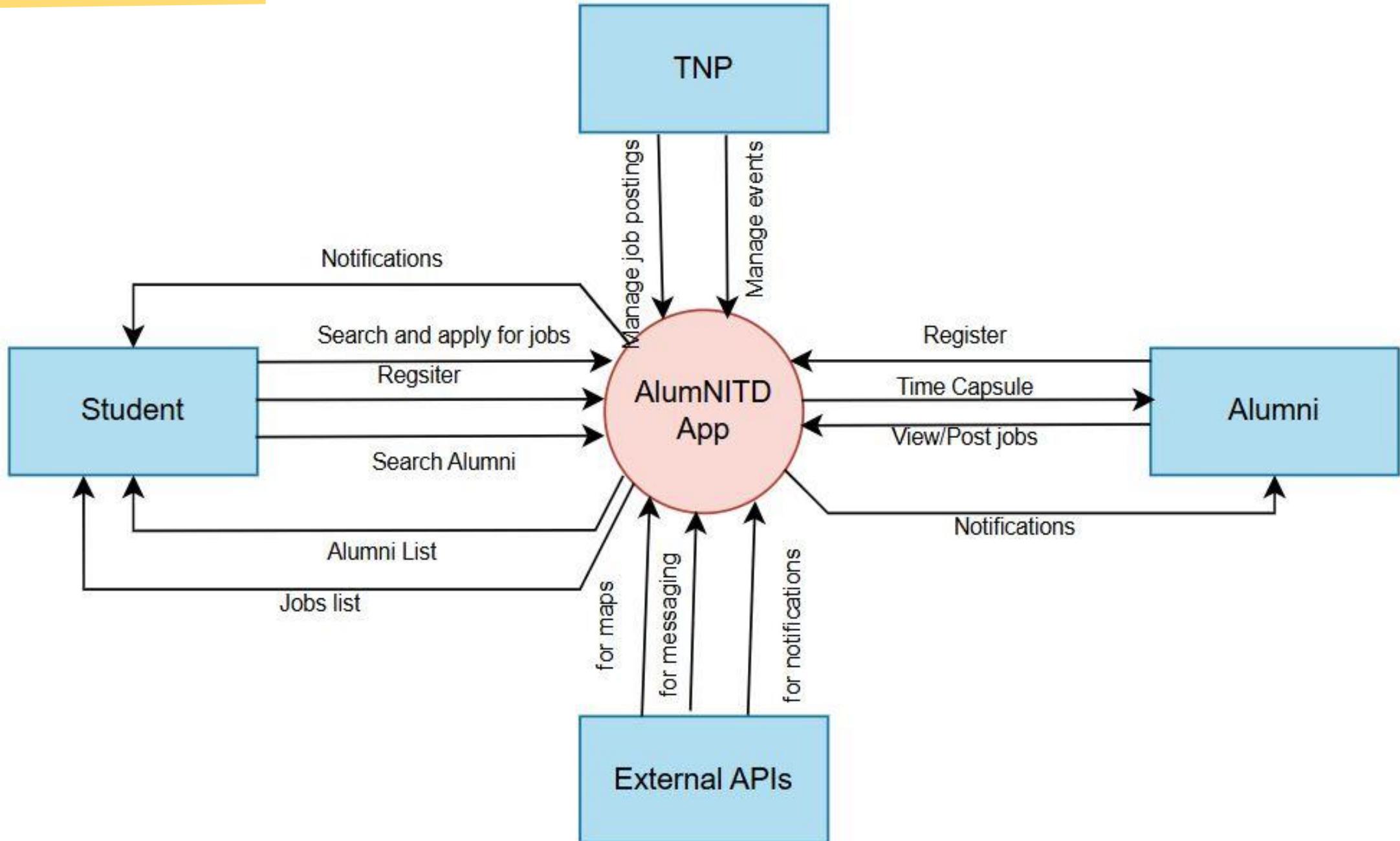


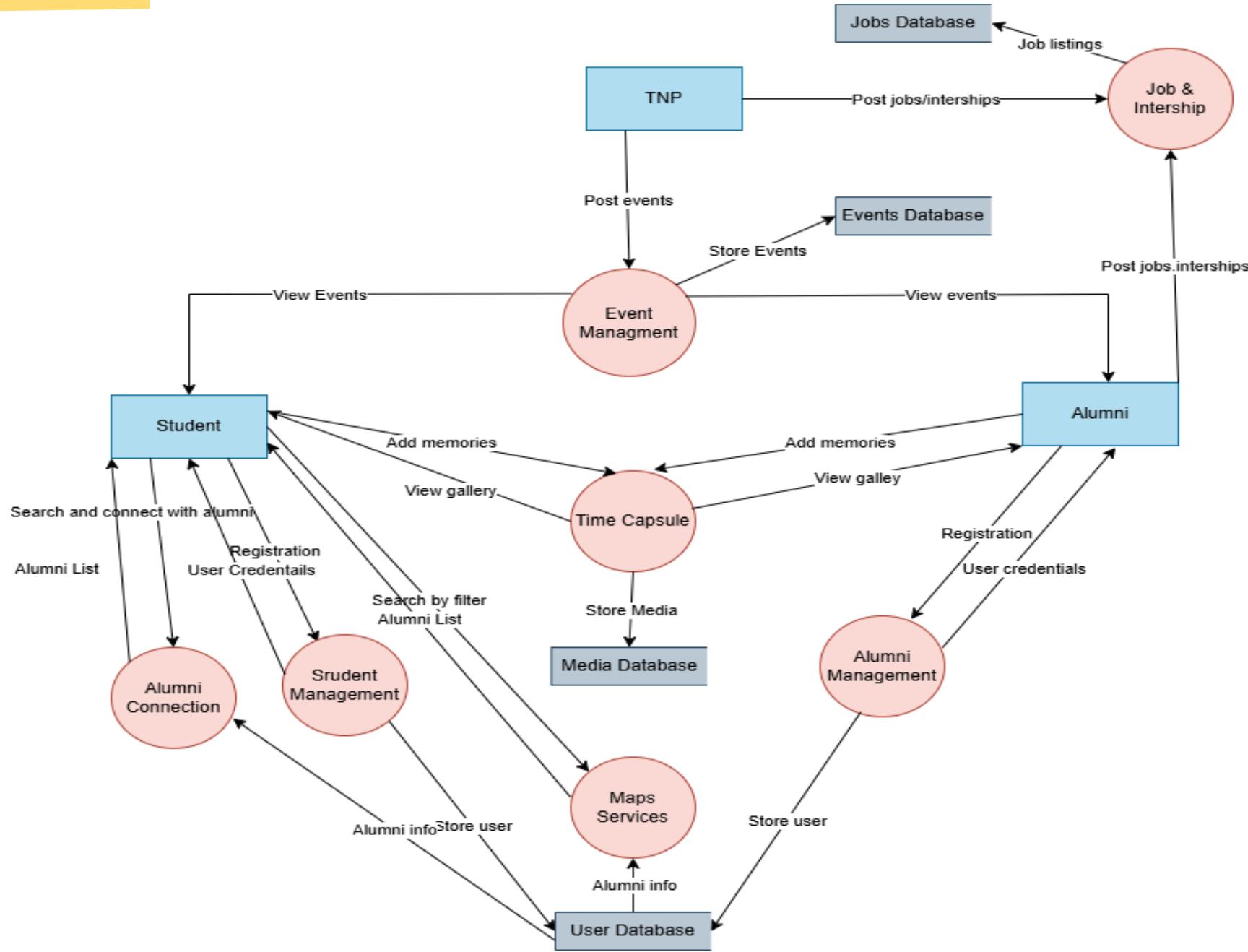
6 Sequential Diagram?





7 Data Flow Diagram?







8 Timeline And Roadmap



Week 1-4

Learning and Planning



Week 8-11

Advanced Features



Week 5-7

Core Feature
Development

Week 12-15

Testing and
Optimization



LEARNING AND PLANNING

- **React Native:** Components, navigation, and state management.
- **Node.js:** REST/GraphQL API basics.
- **Prisma:** Database interaction.
- **PostgreSQL/MongoDB:** Schema design and queries.

Week 1-2 Technology Familiarization

- Set up **user authentication** with JWT.
- Build basic APIs for:
 - User registration and login.
 - Role-based access (student, alumni, admin).
 - Profile management.

Week 4 Backend Foundation

Week 3 Initial Setup

- React Native app with basic navigation.
- Backend with **Node.js** and **Express.js**.
- Prisma ORM connected to **PostgreSQL/MongoDB**.
- Sketch **database schema** for user profiles, messages, jobs, and events.
- Create **wireframes** for key app screens using Figma or similar tools.



Core Feature Development

- Implement APIs :
Messaging (one-on-one and group chat).

Job and internship board (post, view, and apply).

Events and announcements.

Google Maps API

Week 5-6 Backend Expansion

- Connect the React Native app with backend APIs.
- Test authentication, profile management, and job board features.

Week 8 Backend Integration

Week 7 Frontend Foundation

- Develop the app's UI for:
User registration, login, and profile management.
- Job board interface (posting and searching jobs).
- Events and announcements.
- Map Feature



- Build chat functionality with using Socket.IO android.
- Implement group chat creation and message history storage.

Week 9 Messaging Systems

- Add search and filter options for: Alumni profiles.
- Job and internship posts.
- Use Elasticsearch or similar tools for efficient searching.

Week 11 Advanced Search and Filter

Week 13 Map Integration



Week 10 Push Notifications

- Set up **Cloud Messaging** for push notifications.
- Add notifications for new jobs, messages, and events.

Week 12 Admin Dashboard

- Build an admin interface to: Manage users (add, edit, remove).
- Post events and announcements.
- Moderate content on the platform



Testing and Optimization

- Conduct integration testing for app-backend communication.
- Identify and resolve bugs in functionality

Week 14

Testing



Week 16

Deployment



Week 15

Performance
Optimization

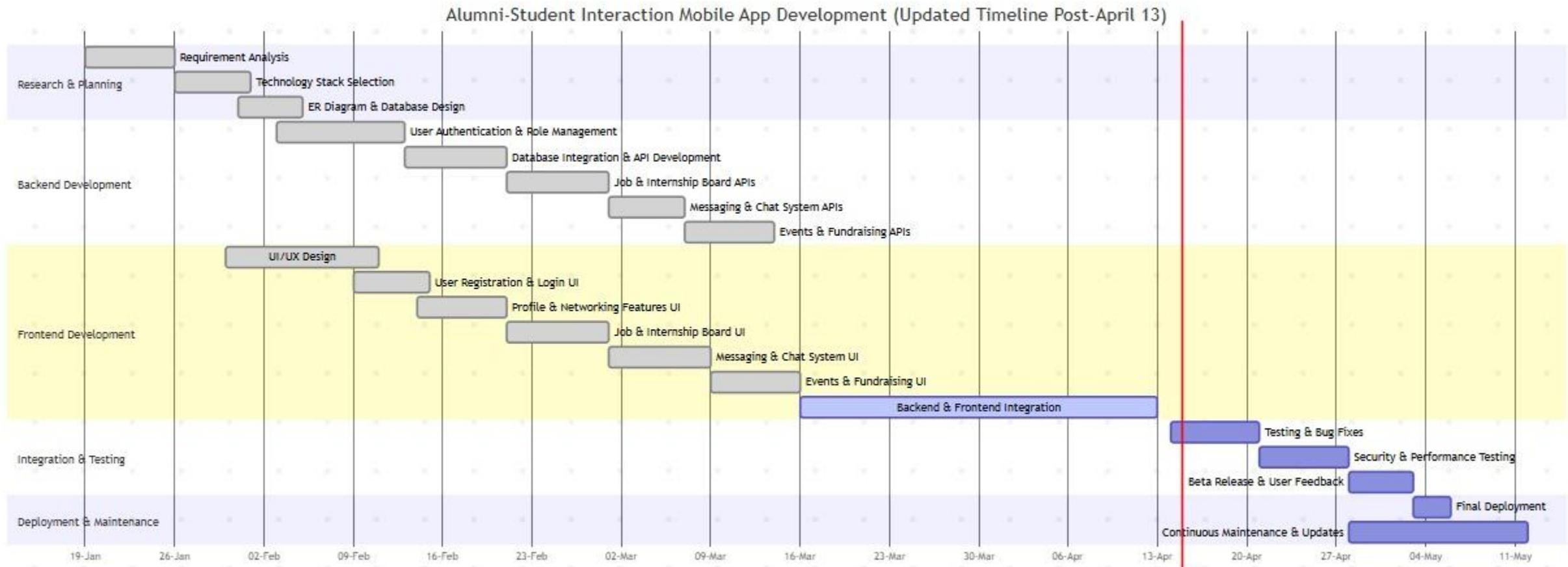
- Optimize API responses (e.g., pagination for large data).
- Improve app performance (lazy loading and caching).
- Address app size and responsiveness issues.

Week 17

Final Touches

- Implement minor UX improvements based on team testing.
- Write comprehensive technical documentation:
 - API documentation.
 - Codebase structure and setup instructions.
 - Deployment process.

GANTT CHART

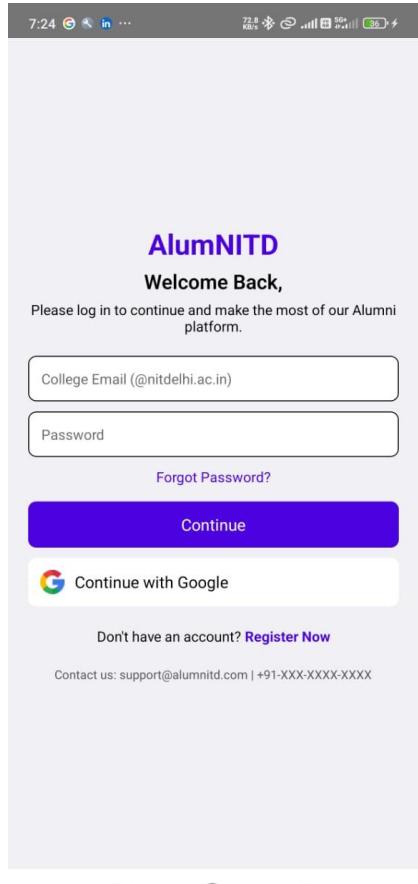




9 Screens

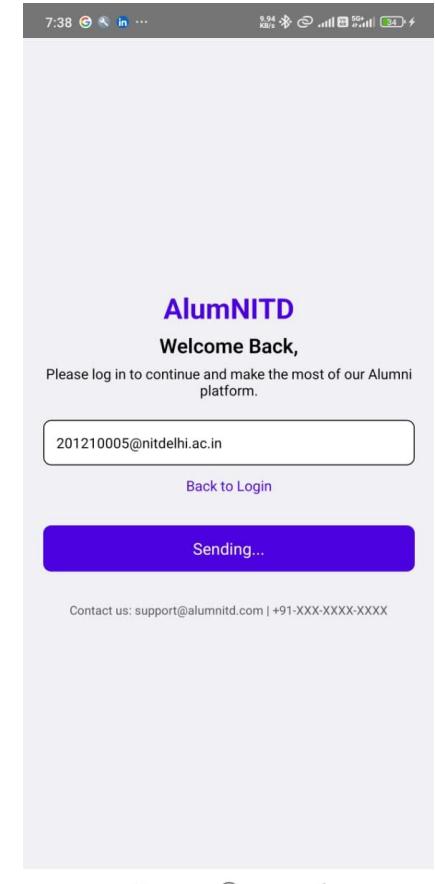


Secure Authentication



The screenshot shows the "Create Account" screen. It has a back navigation button and the title "Create Account" with the sub-instruction "Join our community today". There are several input fields: "Full Name" (placeholder "Enter your full name"), "College Email" (placeholder "yourname@nitdelhi.ac.in"), "Password" (placeholder "Create a password"), "Confirm Password" (placeholder "Confirm your password"), "Role Selection" (placeholder "Select your role"), "Graduation Year" (placeholder "Select graduation year"), and "Location" (placeholder "Enter your location"). Below these fields are two buttons: a green "Use My Current Location" button and a large purple "Register" button. At the bottom, there is a link "Already have an account? [Login Here](#)".

The screenshot shows a password creation screen with a back navigation button. It contains two input fields: "Create a password" and "Confirm Password", both with placeholder text "Create a password" and "Confirm your password". Below these are dropdown menus for "Role Selection" (placeholder "Select your role") and "Graduation Year" (placeholder "Select graduation year"). Further down are "Location" (placeholder "Enter your location") and a green "Use My Current Location" button. At the bottom is a large purple "Register" button. A note at the bottom right says "Contact us: support@alumnitd.com | +91-XXX-XXXX-XXXX".



Profile



← Edit Profile

Profile Settings



Change Profile Picture

Full Name

Ayush Priyadarshi

Email

221210027@nittdelhi.ac.in

Phone Number

6202079657

Location

Enter your location



Bio/About Me

An engineer by passion, I'm currently pursuing my B.Tech. in Computer Science and Engineering at NIT Delhi (Graduating 2026). I am deeply interested in building scalable software solutions and enhancing user experience through Android applications and intelligent systems.

I am currently working as an Android Developer Intern at Tech Mahindra, where I contribute



← Edit Profile

LinkedIn Profile URL

www.linkedin.com/in/ayush-priyadarshi-9481b9282

Github Profile URL

<https://github.com/geekAyush123>

Education

Institution Name

NIT DELHI

Degree/Program

B.Tech.

Graduation Year

2026

Field of Study

Computer Science and Engineering

Work Experience

Company Name

Tech Mahindra



← Edit Profile

Company Name

Tech Mahindra

Job Title

Android Developer

Start Date

19/5/2025

End Date

2/8/2025

Description

Worked on Android development projects focused on optimizing performance, improving UI/UX, and integrating third-party APIs to enhance user experience.

Skills

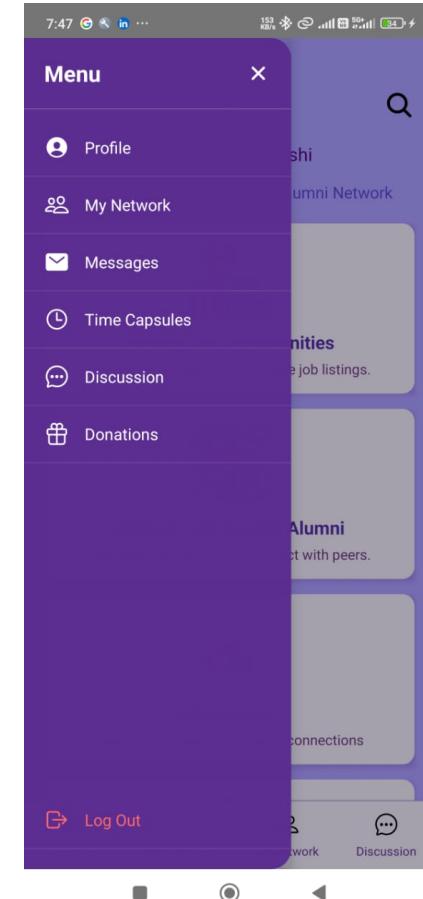
Type to search skills

Java X JavaScript X TypeScript X

Machine Learning X NoSQL X

Save Changes

Home Page



Search Bar



← Search Alumni

Alumni Search

Find and connect with alumni

Kevin



Kevin Hurley

Pune

Firebase Django React

Kevin

SWE at Google.

Narela, Narela Tehsil, Delhi, India

React Java JavaScript

Kevin Lam

Delhi

TensorFlow C++ Cybersecurity

Filter by

Education

Career

Location



← Search Alumni

Filter by

Education

Career

Location

Search career filters...

abc company blackrock

clearwater flipkart google.

mercari.inc tech mahindra

android developer sde - lv 2

sde lev 2 swe angular

aws blockchain c# c++

cloud computing cybersecurity

data analysis devops django

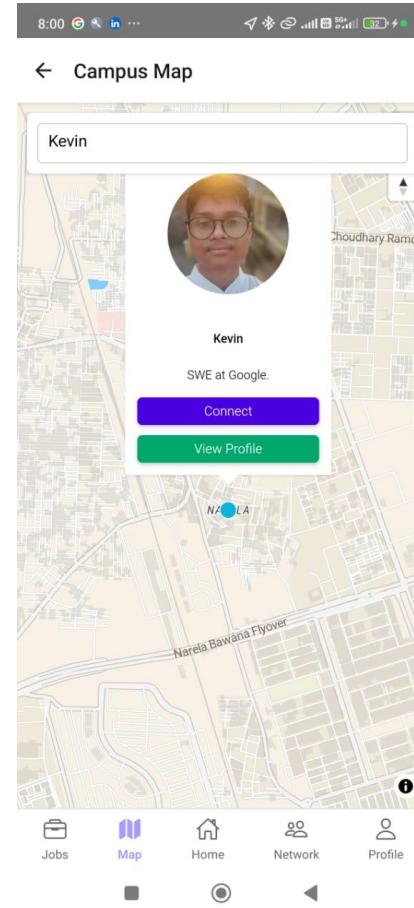
docker firebase flutter

golang java javascript

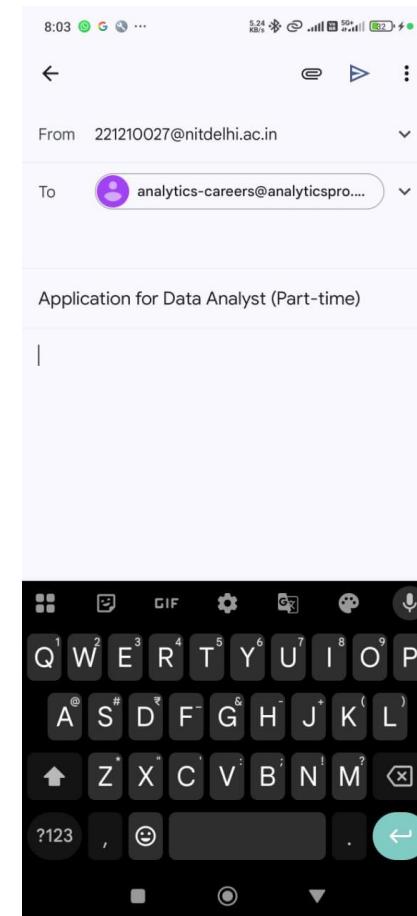
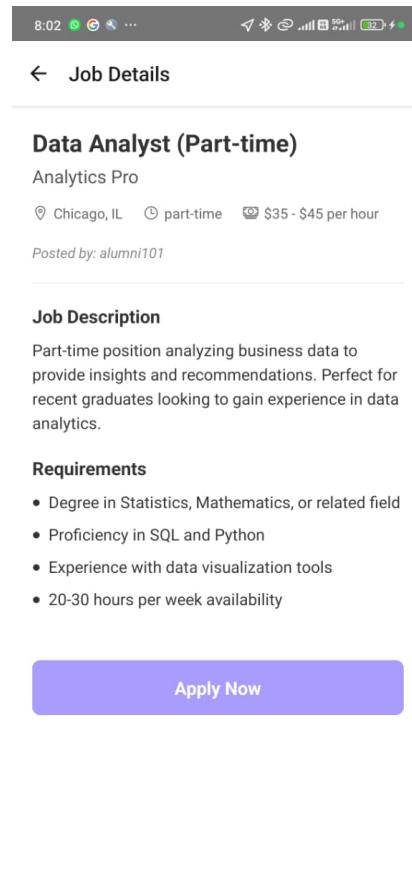
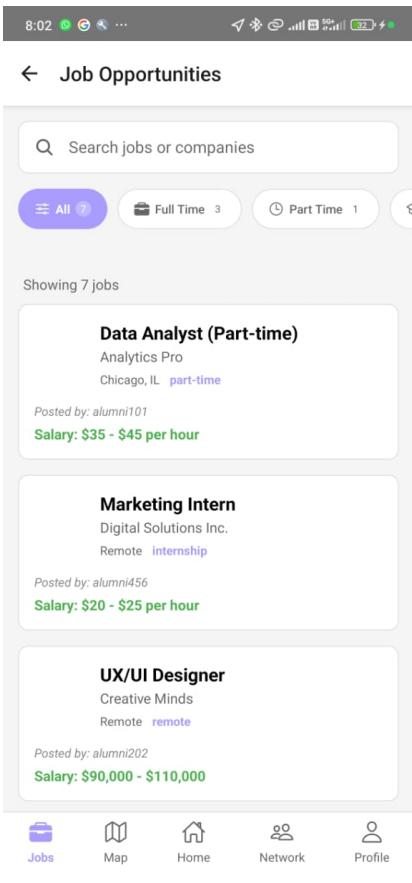
kotlin kubernetes

machine learning node.js nosql

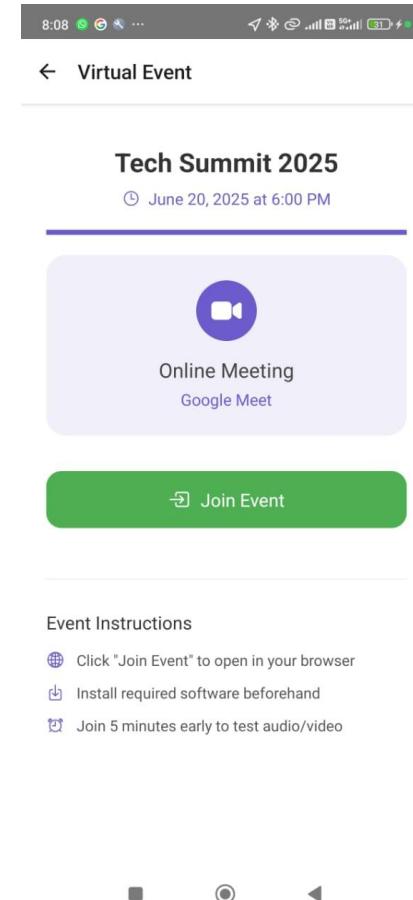
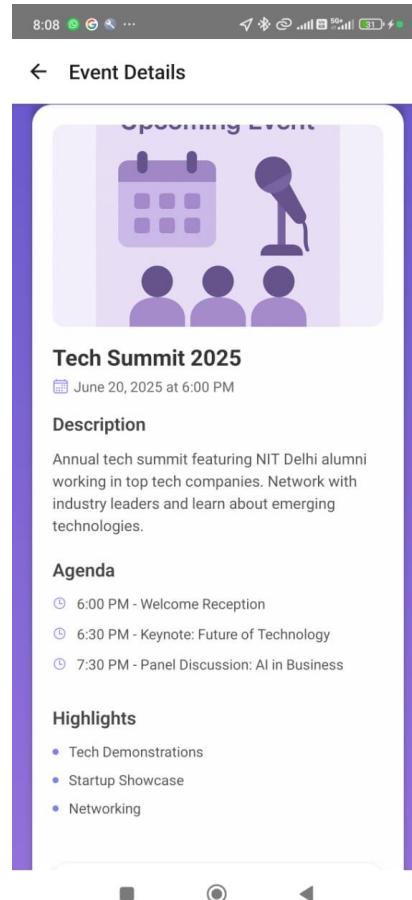
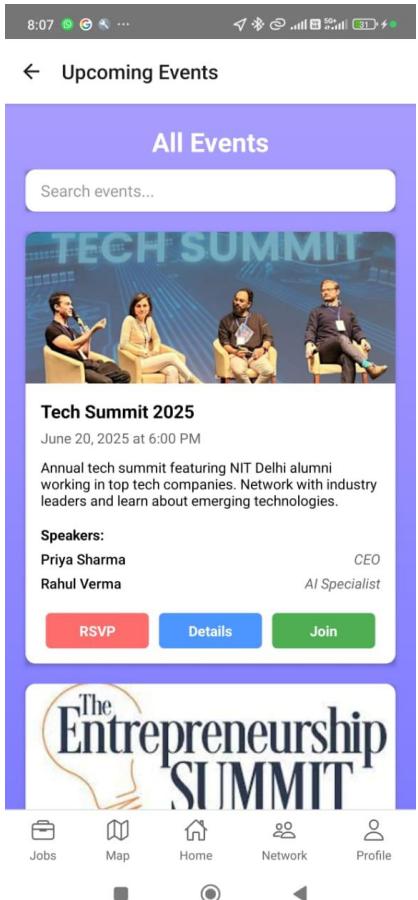
Maps



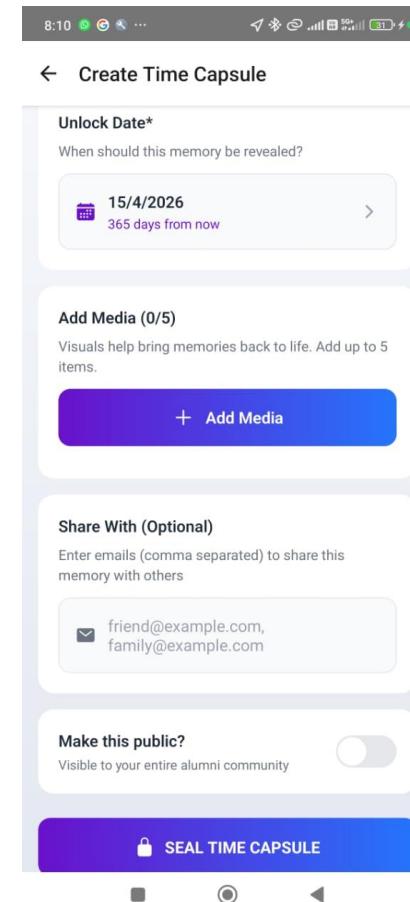
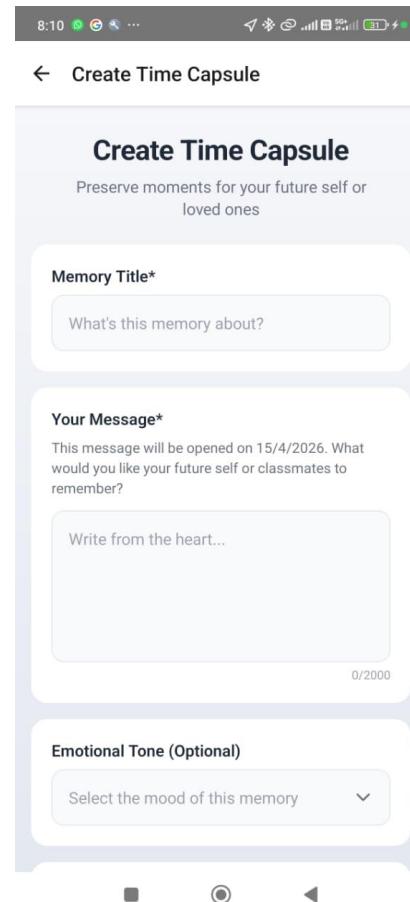
Job Opportunities



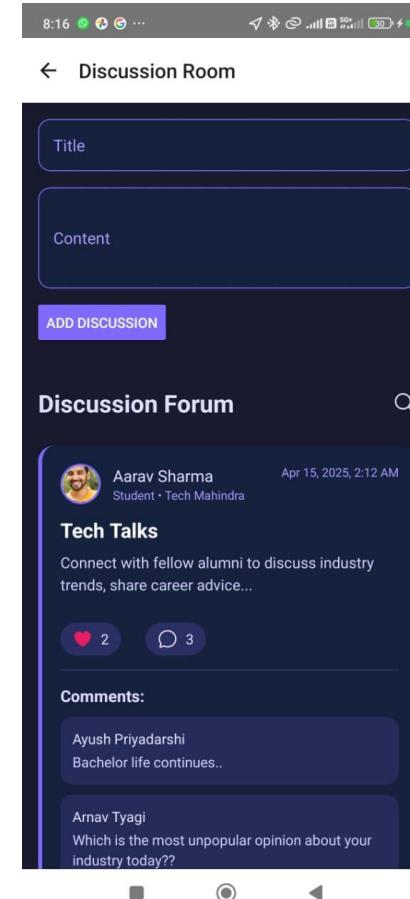
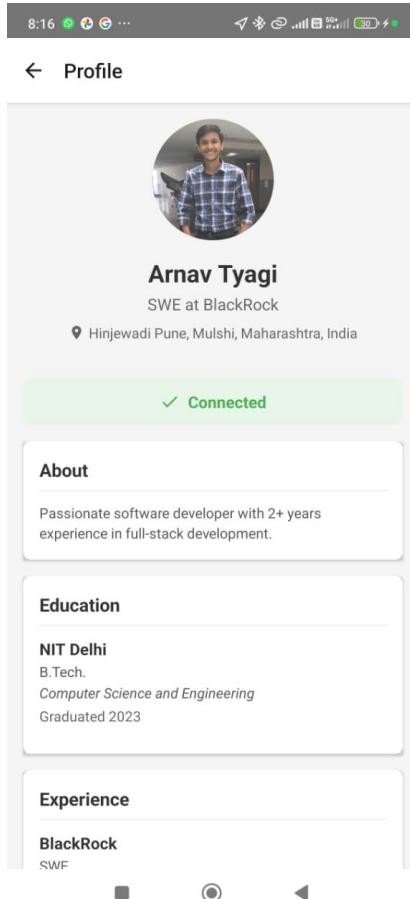
Events



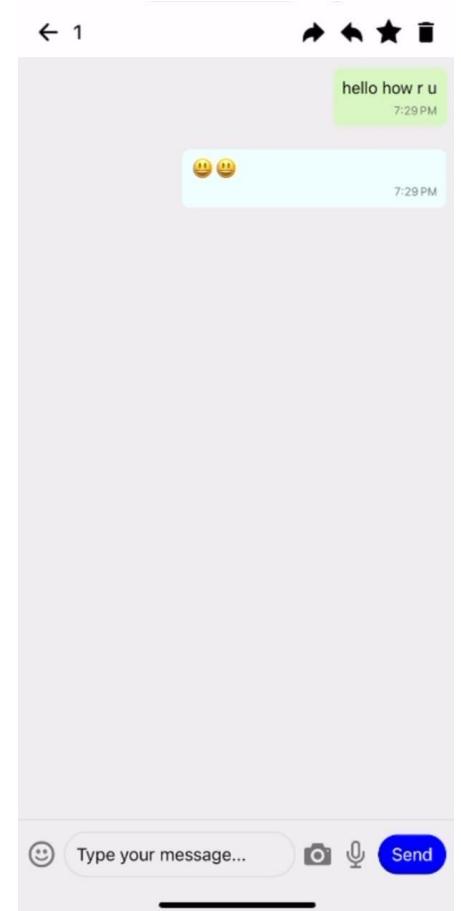
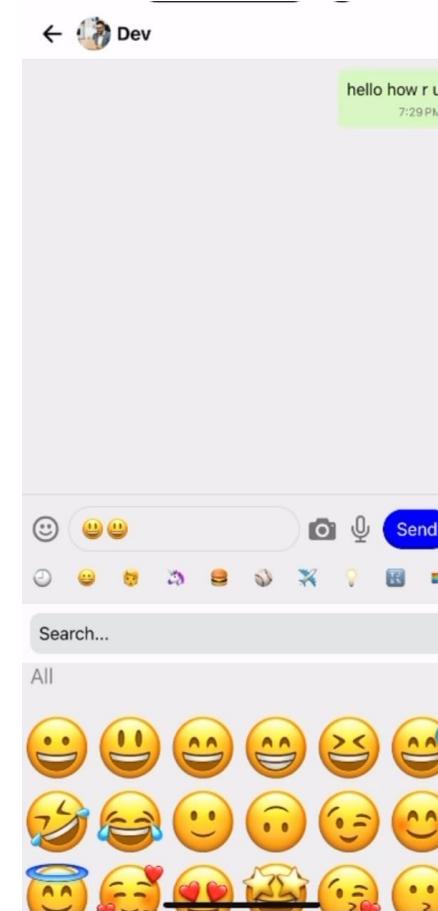
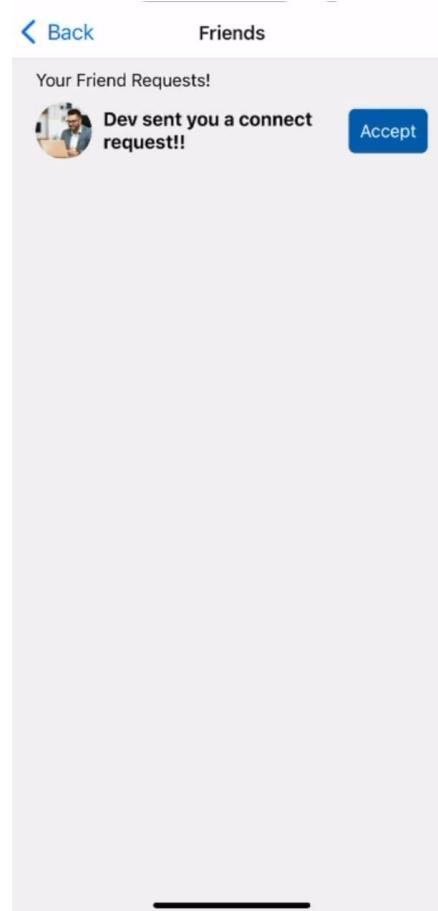
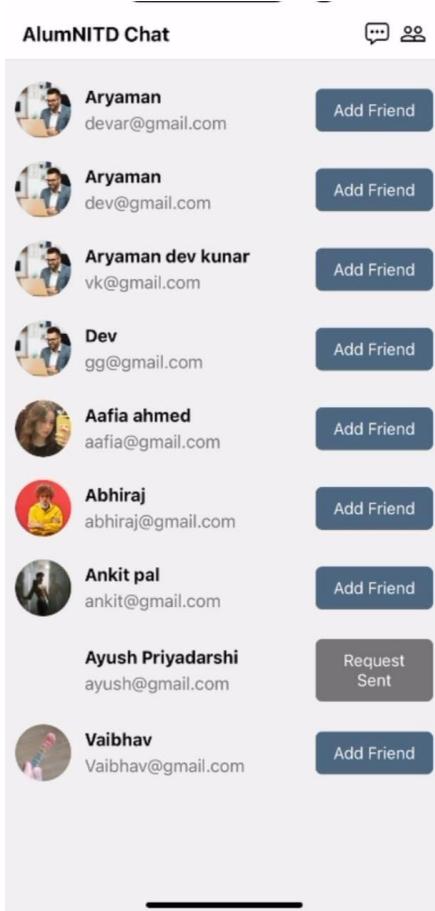
Time Capsule



Networks & Discussions

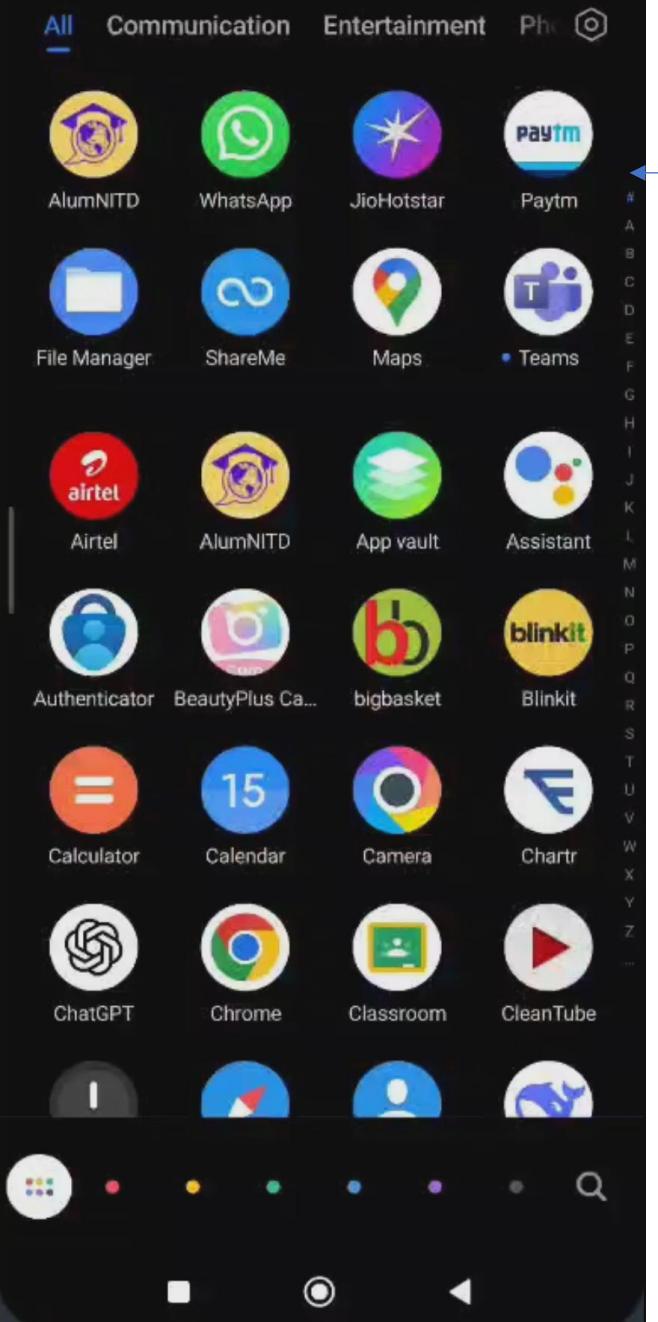
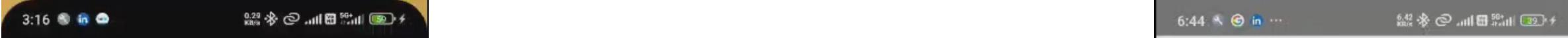


Messages



10

"See It in Action: The
Alumni App Experience

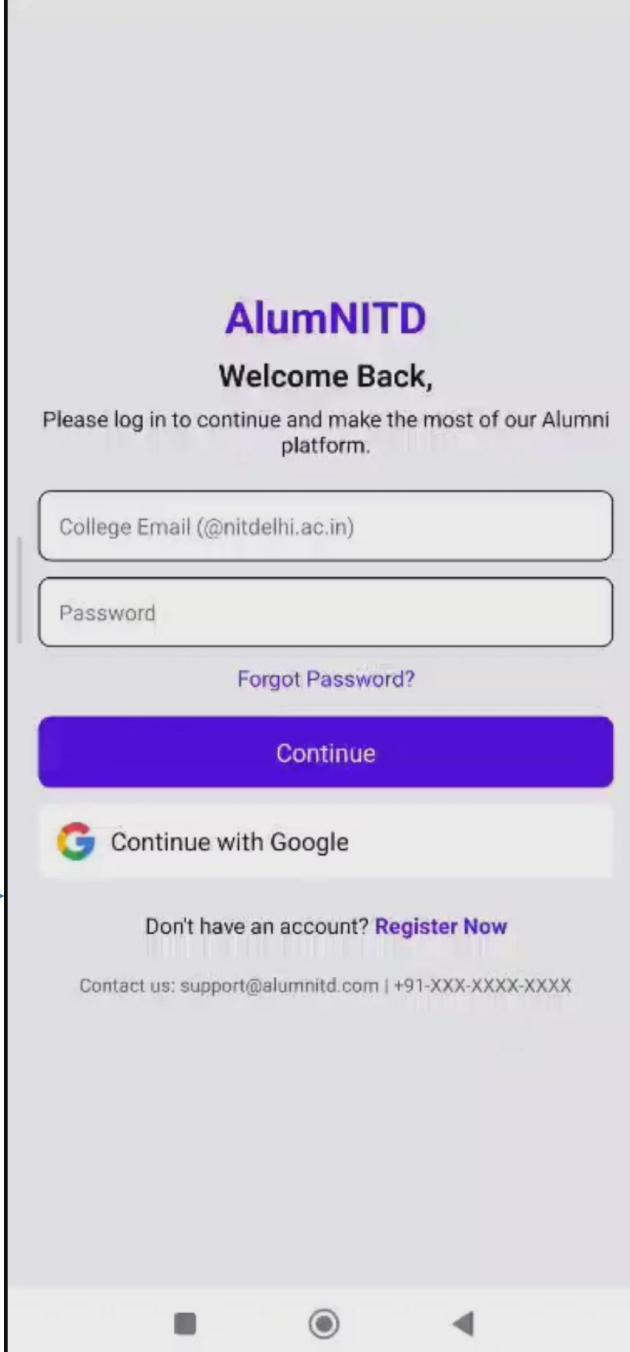


New User



AlumNITD

Existing User



11 Behind the Scenes



Users

The screenshot shows the Google Cloud Firestore interface. The left sidebar lists collections: connectionRequests, connections, events, jobs, timeCapsules, user_donations, and users. The users collection is selected, indicated by a grey background. The main area displays documents under the users collection. One document, with ID 06eWSGQ20Q1SSHE8e3I8, is expanded to show its fields:

- bio: "Reduce use whatever group read term hear."
- company: ""
- degree: ""
- education
 - degree: "BEng"
 - endDate: ""
 - fieldOfStudy: "Physics"
 - graduationYear: "2010"
 - institution: "NIT Delhi"
 - email: "lisa33@nitdelhi.ac.in"
- experience
 - company: "Ramirez-Mcmillan"
 - description: "Standard provide black touch difference. Civil Mrs"

Time Capsules

The screenshot shows the Google Cloud Firestore interface. On the left, the navigation bar indicates the path: home > timeCapsules > 10Syz8FNf7Hk0. On the right, there is a "More in Google Cloud" button and a three-dot menu icon.

The main area displays a hierarchical view of documents. The "timeCapsules" collection contains several documents, one of which is selected and expanded:

- (default)
- + Start collection
- connectionRequests
- connections
- events
- jobs
- timeCapsules >
- user_donations
- users

The selected document is "10Syz8FNf7Hk03676p8i". Its fields are listed below:

- + Add document
- + Start collection
- + Add field
- coverStyle: "classic"
- creationDate: April 15, 2025 at 5:07:35 AM UTC+5:30 (timestamp) (edit) (trash)
- creatorEmail: "191210023@nitdelhi.ac.in"
- creatorId: "RVWYLuqXIMeT8YsByLk0BVAo0L2"
- emotionalTone: "Nostalgic"
- isPublic: false
- mediaUrls
- message: "Hello"
- recipients
- status: "deleted"
- title: "Hello"
- unlockDate: April 15, 2026 at 5:07:07 AM UTC+5:30
- viewerRv

Jobs and Internships

The screenshot shows the Google Cloud Firestore interface. On the left, there's a sidebar with a navigation bar at the top: a home icon, a 'jobs' icon, and the document ID 'pqHFnBW3gDnk'. Below this, there are several collections: 'connectionRequests', 'connections', 'events', 'jobs' (which is selected and has a dropdown arrow), 'timeCapsules', 'user_donations', and 'users'. The main area shows the 'jobs' collection with a table header: a document icon, the word 'jobs', a 'Start collection' button, and three vertical dots. Underneath are two documents: one with ID 'GluPPaRgpMeBD3081nVD' and another with ID 'NvdfPKh5ko8tZdwN9Kvj'. The right side of the screen displays the detailed view for the document with ID 'pqHFnBW3gDnkA8934DvY'. It includes fields like 'company' (Cloud Systems), 'contactEmail' (devops-hiring@cloudsystems.com), 'description' (Help us build and maintain our cloud infrastructure. Automate deployment processes and ensure system reliability and security.), 'location' (Austin, TX), 'postedBy' (alumni303), and 'postedDate' (2023-06-10). A section titled 'requirements' lists four items: 'Experience with AWS or Azure', 'Knowledge of CI/CD pipelines', 'Infrastructure as code (Terraform, CloudFormation)', and 'Containerization experience (Docker, Kubernetes)'. There are also three vertical scroll bars on the right side of the document view.

(default)	jobs	⋮
+ Start collection	+ Add document	+ Start collection
connectionRequests	GluPPaRgpMeBD3081nVD	company: "Cloud Systems"
connections	NvdfPKh5ko8tZdwN9Kvj	contactEmail: "devops-hiring@cloudsystems.com"
events	P2MjYzK059YA5IMFgK21	description: "Help us build and maintain our cloud infrastructure. Automate deployment processes and ensure system reliability and security."
jobs	S2IyF0PW5JvssXgKhU7E	location: "Austin, TX"
timeCapsules	aUSvvKB73LqvV4vqAqwJ	postedBy: "alumni303"
user_donations	pqHFnBW3gDnkA8934DvY	postedDate: "2023-06-10"
users	yv2K3yPKcwj3FqVTdalV	▼ requirements

- 0 "Experience with AWS or Azure"
- 1 "Knowledge of CI/CD pipelines"
- 2 "Infrastructure as code (Terraform, CloudFormation)"
- 3 "Containerization experience (Docker, Kubernetes)"

Events

The screenshot shows the Google Cloud Firestore interface. On the left, the sidebar lists collections: (default), connectionRequests, connections, events (selected), jobs, timeCapsules, user_donations, and users. The main area shows the 'events' collection with a document named 'Nield0vynlS6F2KqqmrS'. This document contains fields: agenda, attendees, dateTime, description, engagementRate, and highlights.

Navigation bar: Home > events > Nield0vynlS6F2...

More in Google Cloud ▾

(default)	events	Nield0vynlS6F2KqqmrS
+ Start collection	+ Add document	+ Start collection
connectionRequests	Nield0vynlS6F2KqqmrS	+ Add field
connections	j0GqhD4tkRzaJAc7CuzT	- agenda
events	kPD1ub1X1A1JtEBg1Ifk	0 "6:00 PM - Welcome Reception"
jobs	vPrVgkulFmj9kKAn00K9	1 "6:30 PM - Keynote: Future of Technology"
timeCapsules		2 "7:30 PM - Panel Discussion: AI in Business"
user_donations		attendees: 150
users		dateTime: "June 20, 2025 at 6:00 PM"
		description: "Annual tech summit featuring NIT Delhi alumni working in top tech companies. Network with industry leaders and learn about emerging technologies."
		engagementRate: "90% (+15%)"
		- highlights
		0 "Tech Demonstrations"
		1 "Startup Showcase"

Connection Requests

The screenshot shows the Google Cloud Firestore interface. The left sidebar lists collections: (default), connectionRequests, connections, events, jobs, timeCapsules, user_donations, and users. The connectionRequests collection is selected. A specific document, "4VRcgSl3v8bNUM0lNwvT", is viewed. The document contains the following fields:

- createdAt: April 15, 2025 at 6:01:47 AM UTC+5:30
- fromUserId: "RVWYLuqXIMeT8YsByLk0BVA0o0L2"
- fromUserJobTitle: "SWE"
- fromUserName: "Arnav Tyagi"
- fromUserProfilePic: "https://res.cloudinary.com/dqdhnkdz0/image/upload/..."
- status: "pending"
- toUserId: "84rgZ10o0lXQOTZWBDnQaZ0iPk02"

At the top right, there is a "More in Google Cloud" button.

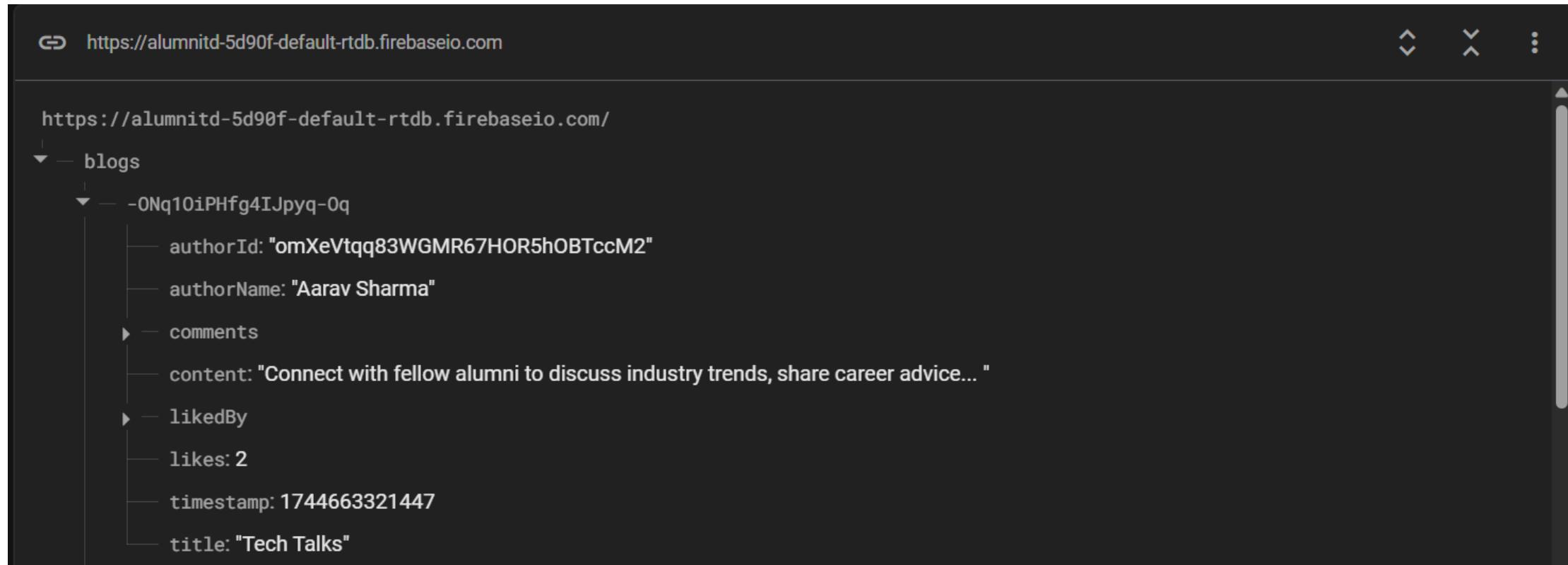
Connections

The screenshot shows the Google Cloud Firestore interface. The left sidebar lists collections: (default), connectionRequests, connections (selected), events, jobs, timeCapsules, user_donations, and users. The main area shows the 'connections' collection with a document 'x5VUxGnKPgo33yF0660m'. This document has fields: createdAt (April 15, 2025 at 6:45:24 AM UTC+5:30), status ('accepted'), and users (array containing two elements: 'RVWyLuqXlMeT8YsByLk0BVAo0L2' and 'h2DniAQyJRe2ADR5nPMOf8yOyHI3').

connections > x5VUxGnKPgo33yF0660m

(default)	connections	x5VUxGnKPgo33yF0660m
+ Start collection	+ Add document	+ Start collection
connectionRequests	x5VUxGnKPgo33yF0660m	+ Add field
connections		createdAt: April 15, 2025 at 6:45:24 AM UTC+5:30
events		status: "accepted"
jobs		users
timeCapsules		0 "RVWyLuqXlMeT8YsByLk0BVAo0L2"
user_donations		1 "h2DniAQyJRe2ADR5nPMOf8yOyHI3"
users		

Discussion Forum(Realtime Database)



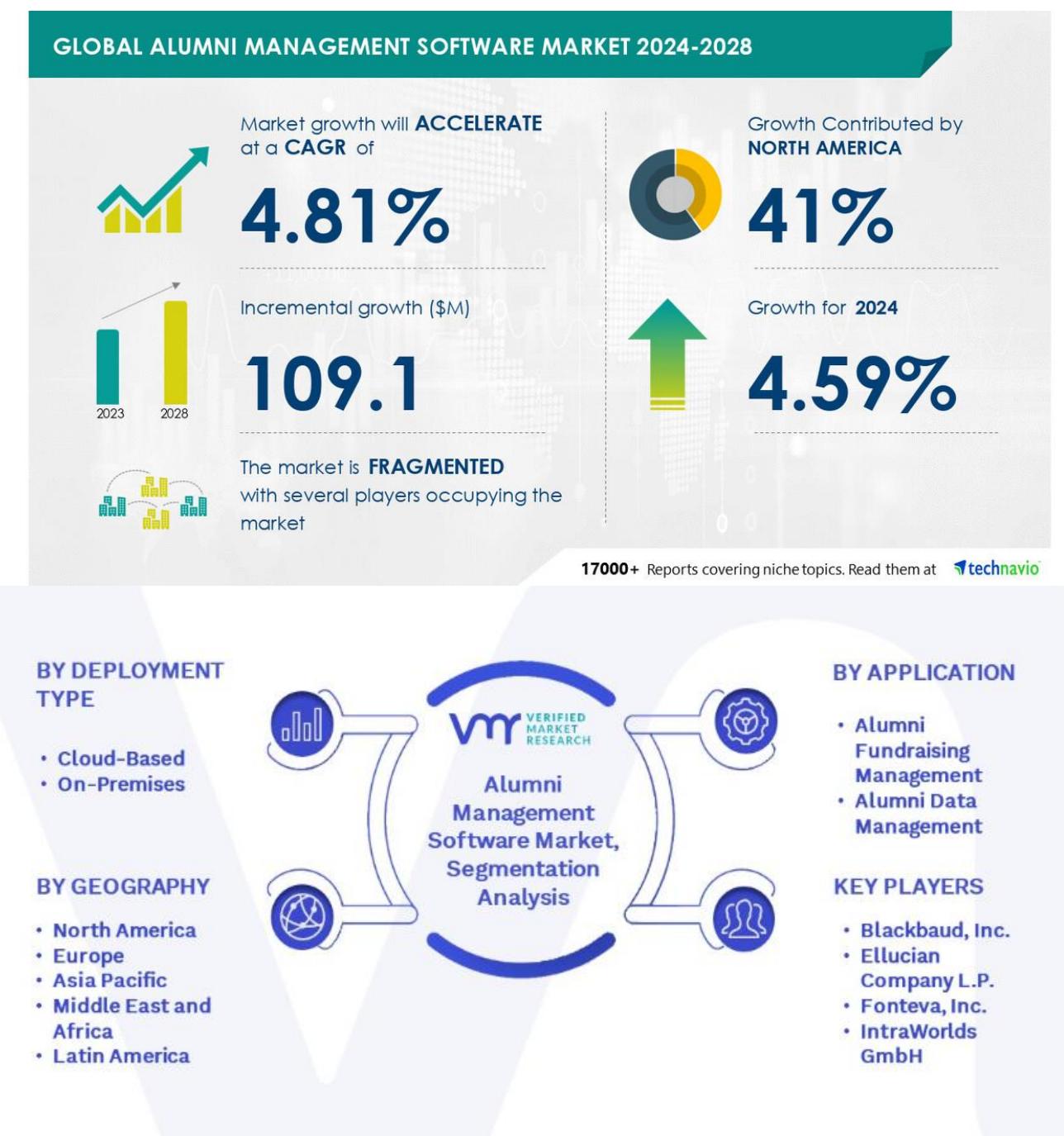
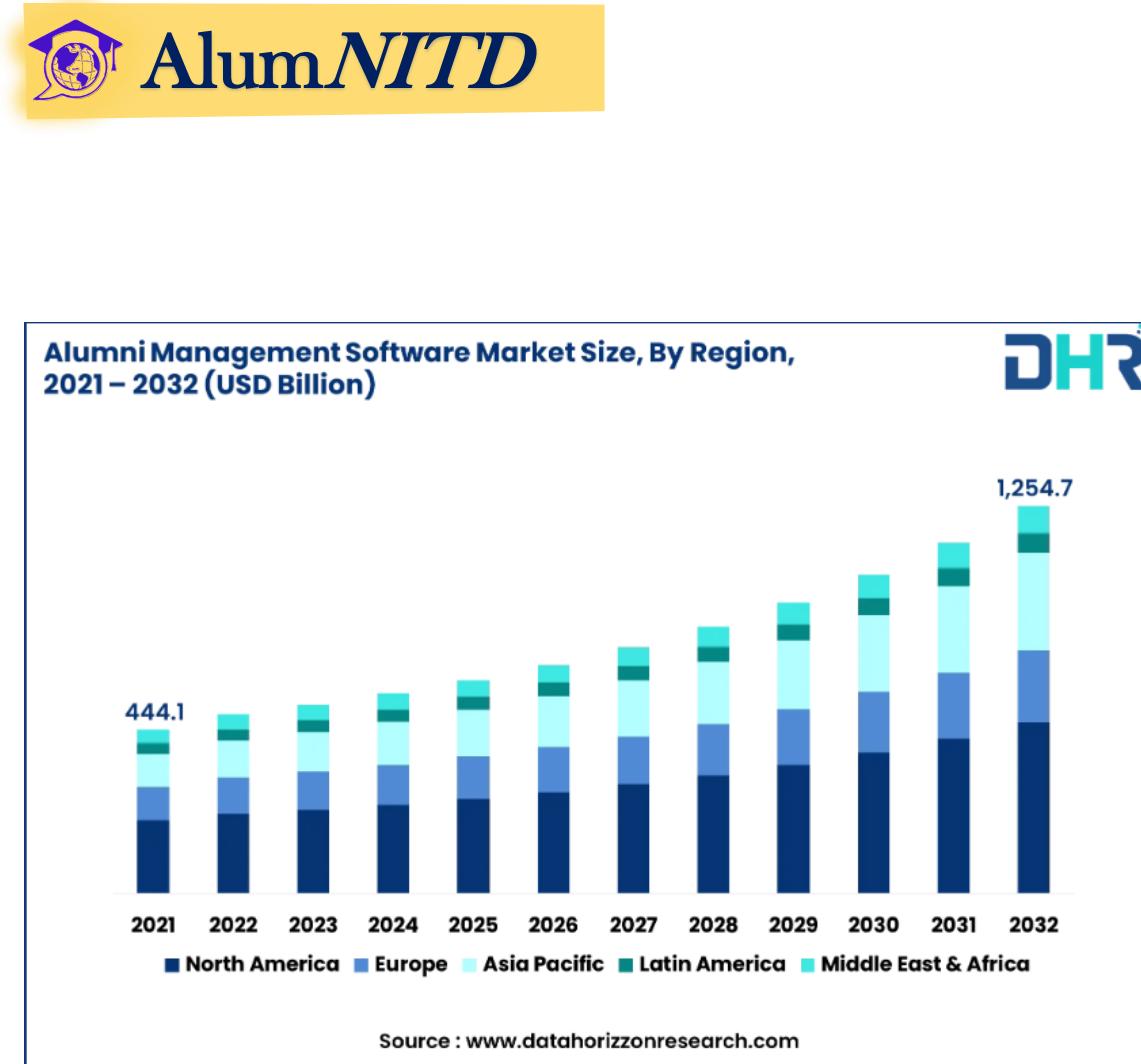
The screenshot shows the Firebase Realtime Database interface with a dark theme. At the top, the URL `https://alumnitd-5d90f-default-rtbd.firebaseio.com` is displayed. Below the URL, the database structure is shown under the path `https://alumnitd-5d90f-default-rtbd.firebaseio.com/`. The `blogs` node is expanded, revealing a single child node `-ONq10iPHfg4IJpyq-0q`. This node contains the following data:

- `authorId: "omXeVtqq83WGMR67HOR5h0BTccM2"`
- `authorName: "Aarav Sharma"`
- `comments` (indicated by a right-pointing arrow)
- `content: "Connect with fellow alumni to discuss industry trends, share career advice... "`
- `likedBy` (indicated by a right-pointing arrow)
- `likes: 2`
- `timestamp: 1744663321447`
- `title: "Tech Talks"`



12 Market Analysis

A collage of red text words related to market analysis, including: VOLUME, SKILL, RESEARCH, INFORMATION, SEAF, PRACTICE, METRIC, COMP, INTEGRATION, TOOLS, REPORTING, DATA, ANALYTICS, OLAP, SOFTWARE, CLOUD, BEHAVIOR, VISUALIZATION, INTELLIGENCE, MARKET, ON-SITE, SECTION, RESOURCES, ESTIMATING, COMPLEX, AFFIC, and EFFIC.



13 Impacts And Benefits



Stronger Alumni Network

Bridges the gap between students, alumni, and faculty, fostering long-term engagement and collaboration.

Career Growth & Opportunities

Connects students with mentors, job opportunities, and industry insights from experienced alumni.

01

02

Efficient Knowledge Sharing

Enables discussions, resource sharing, and expert guidance through chat and direct messaging.

03

Boosted Placement & Internship Support

Strengthens the Training & Placement (TNP) cell with real-time job postings, referrals, and alumni-led hiring.

04

Enhanced College Reputation

Bridges the gap between students, alumni, and faculty, fostering long-term engagement and collaboration.

05



Thank you for your
time and
attention! 🎓

Let's build a stronger, more
connected NIT Delhi family
together