



TECHNICAL REPORT

CS-157C

NoSQL DATABASES

Flexi-Events

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Chapter 1

Overview & Motivation

Flexi-Events' goal is to create a platform where content creators, tech enthusiasts, and companies can host webinars and virtual conferences with a click of a button. This is a one-stop solution to create a single-day/multi-day event, search and register for events and increase your knowledge.

During Covid, many companies released video-conferencing tools to meet virtually. Let's say, a professor wants to give a talk on NoSQL. The professor would have to create a Google Meet Link and send the link to the participants. With Flexi-Events, you can set up the event with any "video-conferencing" tool and we will handle the registrations and everything.

As a student, we tend to attend webinars and information sessions via Handshake, LinkedIn, or just any random website. There is no all-in-one platform. This software is not a competitor to the event hosting brands but rather an aggregation platform for all events in the world that you can register to. For organizations, scheduling an event in Zoom, or in Teams depending on the use case becomes tedious. 2 different software and a huge learning curve for both of them. With this platform, we want to simplify event creation for organizers where they can host the virtual event, look at participants and analyze data and just relax as we take care of reminder emails and everything with it.

Chapter 2

Project Requirements

2.1 Functional Requirements

2.1.1 Actors

1. **Organizers:** These users login to the system and can host events. These events can be a single-day or a multi-day event. The organizers have the ability to set scheduled start and end times and also add specific details about the event.
2. **Participants/Users:** Users can search for events using keywords, register for the event and attend the events. Anonymous users can view events and register for the events.

2.2 Features

The following are some of Flexi-Event's main features:

2.2.1 Allowing users to search for events and Register for events

Users can search for events using keywords, enabling them to find relevant events based on their interests and preferences. The search functionality provides a streamlined way to discover and explore various events available on the platform. Additionally, users can register for events directly through the platform, simplifying the registration process and ensuring a seamless user experience.

2.2.2 Organizers to be able to create events

For event organizers, Flexi-Events provides the capability to create and set up events with specific details. Organizers can input essential information such as event title, date, time, and description. This feature allows organizers to customize and tailor their events according to their requirements, providing a personalized experience for attendees.

2.2.3 Import Conference Links to the Calendar

At this time of writing, we were able to use Zoom's conference API library to generate conference links on our webpage. This means that users are not required to create the meeting on Zoom but on our platform. One may see this as redundant, but the benefits will show when we start integrating more conference platforms such as Microsoft Office, Skype, Google Meets, etc. The point is, Flexi-Events would streamline the process of creating conferences by only using one window

2.2.4 Monitor All Participating Conferences

Instead of opening multiple windows from different conference websites, Flexi-Events concentrate all those processes into one page so users can see all the events that they can participate in with a calendar library. We achieve this by embedding a calendar into the user's page. We used React's react-big-calendar library and a time localizer formatter called moment to set up the time dynamically based on the user's location

2.2.5 Functional UI and I/O

In terms of functional processes, Flexi-Events employs a user-friendly interface that guides users through each step of the event search, registration, and creation processes. The platform facilitates seamless interaction between users and event hosts, providing a smooth and efficient experience for both parties.

In terms of input/output (I/O), users input their search keywords to find relevant events and provide registration information when signing up for an event. Event organizers input event details during the event creation process, including event title, date, time, and description. The output includes search results displayed to users based on their search queries, confirmation of successful event registration for attendees, and generated on-the-fly meeting links for organizers.

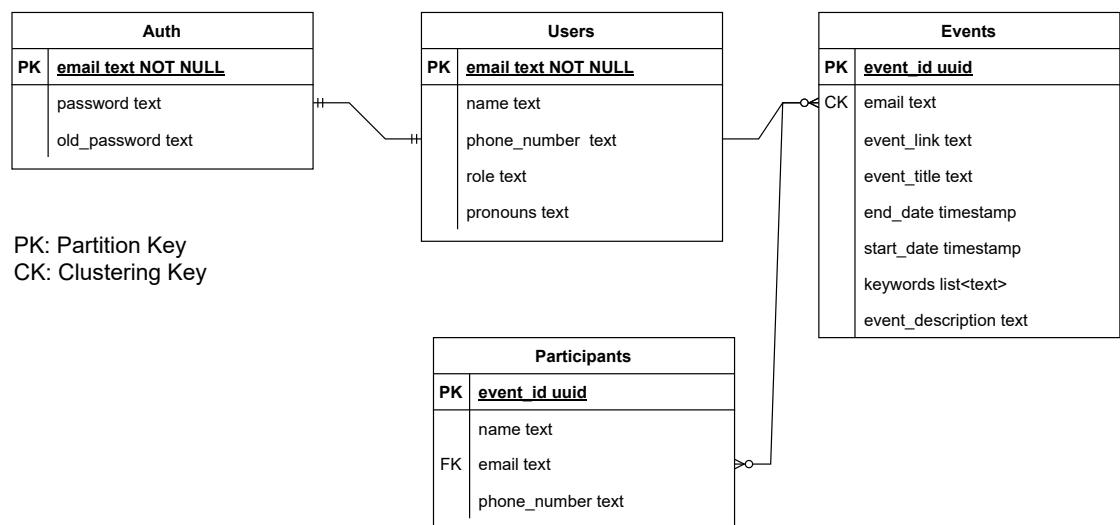
Chapter 3

Project Design

3.1 NoSQL Data Model

Below shows the NoSQL data model that was created for this project. **We have 4 column families:**

1. participants
2. events
3. users
4. auth



For the events table, we choose **email** as the partition key because we want to allow Cassandra to hash the email and **event.id** as the clustering key to sort them in the table.

In the true sense of Cassandra, below is how we envisioned Column families to work.

	Auth Column Family			Users Column Family			Events Column Family		
Row Key (email)	password	old_password	...	name	phone_number	...	event_id	event_title	...
mike.wu@flexievents.com									
...									

3.2 Data Instances

We created 10 data instances for each of your column families. The below screenshots show the populated instances.

3.2.1 Auth

email	old_password	password
Mitchell_Boyer@gmail.com		\$2b\$10\$WohUgQGz7ba48CRU7VRx.UIWnR3acXG7wxBOCj12cQy/EF8Z02q-
Leila7@yahoo.com		null
example@gmail.com		\$2b\$10\$AFCSWewieDmN23w/08ezrmz2plvh1lh9mGeKmhbj3c5NfC-
rohan@gmail.com	\$2b\$10\$5dGG95qJXSWRQYkwuehbnSuQwCHMnDlm4r4KHnGKA39YL43mnvi	\$2b\$10\$Sdq1rsnJ_ggfUvnmlNLSU0p823zCUFD/b13pkPq17HnThruXxe
Makayla43@yahoo.com		\$2b\$10\$Syj0mRqIg13RPk3J1M8Asu9e9rmH3vbf7c3Htx9pa0zrurbf7t1ew
Connor.Kulas@hotmail.com		null
Derek53@yahoo.com		\$2b\$10\$99m8kCFSwmt3m5jdnmxzTfP9nd/12.MG5mAKe0SCrdAx57gt12z
Magali.Hill@gmail.com		null
ken@gmail.com		\$2b\$10\$SHMyvT9nldIyz_cug/944edEzNHrQoWo.NAcn10h6irekhwy
Kaelyn.Franeck156@hotmail.com		null
Alta82@hotmail.com		\$2b\$10\$9GZf/ojePgrw_9b8rfu0g981DYR4P0m9cazbHmYO.HVs
Melba.Heller@gmail.com		null
karen@gmail.com		\$2b\$10\$555Dz3DWKqDRkm1nfPs..52e..33eIamIAvrygvK5IE9ydicL6
Carrie90@gmail.com		null
Derrick63@yahoo.com		\$2b\$10\$Cspw513HrpumTBznySR.WyGWIGabbV6ogJwlySyvH0JlronaziU
Abe_Kihn9@gmail.com		null
		\$2b\$10\$AtzrvICMrzX649achr@eFLCzV8zAE4FnCeXPkbzEQ40PPQDtsa

(16 rows)

3.2.2 Users

email	name	phone_number	pronouns	role
Mitchell_Boyer@gmail.com	Dr. Mindy Schimmel	1234567890	They/Them	Central Web Coordinator
Leila7@yahoo.com	Sheryl Durgan	1234567890	They/Them	Forward Research Specialist
Makayla43@yahoo.com	Ruth Mann	1234567890	They/Them	Investor Security Strategist
Connor.Kulas@hotmail.com	Sherri Howe	1234567890	He/Him	Global Branding Director
Magali.Hill@gmail.com	Kay Sipes	1234567890	They/Them	Investor Identity Planner
ken@gmail.com	Ken Ho	786699798	He/Him	CEO
Kaelyn.Franeck156@hotmail.com	Caroline Oberbrunner	1234567890	She/Her	Human Configuration Developer
Alta82@hotmail.com	Phyllis Haag	1234567890	She/Her	Central Markets Agent
Melba.Heller@gmail.com	Dr. Jim Abernathy	1234567890	She/Her	Senior Research Associate
kwang@gmail.com	Kwangoh Kang	1234567890	He/Him	CTO
Carrie90@gmail.com	Christine Wolf	1234567890	They/Them	Central Operations Planner
Derrick63@yahoo.com	Joan Schowalter	1234567890	They/Them	District Operations Facilitator

(12 rows)

3.2.3 Events

email	event_title	start_date	keywords
rohan@gmail.com	Neo4j Graph Database Workshop	2023-05-20 21:00:00.000000+0000	
rohan@gmail.com	Redis Hackathon	2023-05-28 20:15:00.000000+0000	["calling",
'redis', 'enthusiasts', 'developers', 'participate'	MongoDB Developer Conference	2023-05-18 15:00:00.000000+0000	["atte
rohan@gmail.com	NoSQL Database Summit	2023-06-09 20:00:00.000000+0000	
rohan@gmail.com	Cassandra User Meetup	2023-05-31 19:00:00.000000+0000	["join", "evening
'nosql', 'database', 'summit'			
rohan@gmail.com	'networking', 'knowledge', 'sharing', 'cassandra'		
kwang@gmail.com	Levitt SJ Spring Concert Series: Los Yesterday + Special Guest	2023-05-28 22:30:00.000000+0000	
kwang@gmail.com	Cycling Past 50	2023-05-25 19:00:00.000000+0000	
[native,'language','month','mti','investigating']	SJSU Commencement Ceremony	2023-05-25 23:30:00.000000+0000	
[native,'language','month','mti','investigating']			
kwang@gmail.com	Kwangoh Kang	2023-05-23 17:00:00.000000+0000	
kwang@gmail.com	Downtown Soundscapes	2023-05-22 22:30:00.000000+0000	["so
und', 'installation', 'concert', 'engages', 'sounds']			
kwang@gmail.com	Baseball SJ vs NEVADA !	2023-05-20 01:00:00.000000+0000	
['game', '#2', 'mountain', 'west', 'slate']			

(11 rows)

3.2.4 Participants

event_id	email	name	phone_number
23b487ba-f5aa-4b57-951b-b6ce761783df	Elmo_Kuvalis@hotmail.com	Marilyn Swaniawski	1234567890
23b487ba-f5aa-4b57-951b-b6ce761783df	Sam.Cummerata@gmail.com	Miss Marguerite Flatley	1234567890
0828a6cc-704c-4864-acab-2689e0e479fa	Alvis.Toro@hotmail.com	Vera Bergstrom-Kertmann	1234567890
0828a6cc-704c-4864-acab-2689e0e479fa	Brooke.Franey@hotmail.com	Warren Baumbach	1234567890
0828a6cc-704c-4864-acab-2689e0e479fa	Katarina_Wiegand2@yahoo.com	Dr. Johnathan Goyette	1234567890
0828a6cc-704c-4864-acab-2689e0e479fa	Wendy.Bergnaum@gmail.com	Ms. Leah Maggio	1234567890
0828a6cc-704c-4864-acab-2689e0e479fa	Sherina.Davis88@gmail.com	Elmer Gisanson	1234567890
08921c550-6b5e-4ec1-97a9-2fe348d7d1d1	Danielle.Doolley2@gmail.com	Dr. Hubert Gerhold	1234567890
08921c550-6b5e-4ec1-97a9-2fe348d7d1d1	Eldora_Mills@gmail.com	Stella Kutch	1234567890
08921c550-6b5e-4ec1-97a9-2fe348d7d1d1	Jefferey.Feeneley82@hotmail.com	Wade Hamill	1234567890
08921c550-6b5e-4ec1-97a9-2fe348d7d1d1	Tyson4@gmail.com	Josh Schaefer-Collins	1234567890
08921c550-6b5e-4ec1-97a9-2fe348d7d1d1	ElenoraAd2@gmail.com	Preston Mills	1234567890
cfa91b23-4165-4dc1-9368-fb0f5dc4b3ed	Karen80@gmail.com	Alberto Greenfelder	1234567890
cfa91b23-4165-4dc1-9368-fb0f5dc4b3ed	Shaniya.Davis88@gmail.com	Elmer Gisanson	1234567890
cfa91b23-4165-4dc1-9368-fb0f5dc4b3ed	Jefferey.Feeneley82@gmail.com	Dr. Hubert Gerhold	1234567890
d937d5c1-31dc-4ad4-97ed-620e6bb56184	Dora.Heidenreich@hotmail.com	Kathy Heidenreich	1234567890
d937d5c1-31dc-4ad4-97ed-620e6bb56184	Israel50@hotmail.com	Jay Towne	1234567890
d937d5c1-31dc-4ad4-97ed-620e6bb56184	Lilly8@gmail.com	Geoffrey Waters	1234567890
d237c12d-c036-4ae7-a858-63bcaca1994e	Evans.Cummerata@hotmail.com	Shaun Lesch	1234567890
461fd885-4610-41b4-aef7-2bc02ea2628	Nona_Kub@gmail.com	Cameron Kihn	1234567890

(25 rows)

Chapter 4

Technologies Used with Design Choices

4.1 Frontend Framework: React

React is a Javascript library developed by Facebook back in 2013. It is one of the most popular frontend libraries to date, sitting on top with Angular and Vue. Using React instead of vanilla Javascript helps to reduce code redundancy as React possess a huge library ecosystem within itself. Development was slow in the beginning due to a steep learning curve for this framework, but we were able to pick it up after weeks of self-practice. React also does not render the entire page when there are changes in the state component, it implements lazy load and only renders the changed component, improving the overall responsiveness of the site.

4.1.1 Design choice for UI: Material UI

The main reason for using MUI as our CSS framework was due to its large repository of plug-and-play components. Instead of rewriting a navigation bar or a form UI from scratch, we can simply import the relevant MUI components. MUI components also employ Material Design specifications, which enhances design consistency and visually pleasing UI. With MUI v5, the sx props also offer a clean solution to inline styles, further improving the development cycle for UI components. Furthermore, all MUI components have customizable properties such as themes and are responsive natively. MUI components also integrate seamlessly with any React ecosystem, reducing unpredictable behaviors and promoting consistent state management for each component. Overall, MUI is a reliable and systematic CSS framework that played a huge role in the rapid development of our front-end UI.

4.2 Backend Server: Node.js

Node JS is a common server-side runtime environment used in many React projects. Node JS is lightweight, scalable, and stable. Its event driver architecture is perfect for dynamic changes among the frontend components. Node JS also allows our team to write Javascript code on the server side, expanding the possible contribution of each team member. Node JS also has a vast library ecosystem, many of which are used in our project. In fact, our team utilized a Node JS framework called Nest JS for the backend due to its stable support for database integration and authentication.

4.2.1 Design choice for Backend: NestJS

NestJS is a powerful Node.js framework that provides a structured and efficient way to build scalable server-side applications. It is often considered an improvement over Express.js, the widely used minimalist framework for Node.js. NestJS offers a built-in dependency injection (DI) system, which simplifies the management of dependencies and promotes testability. The DI system automatically resolves and injects dependencies, reducing the boilerplate code typically associated with manual dependency management.

NestJS offers a robust and structured framework for building server-side applications, addressing many of the limitations and complexities often encountered with Express.js.

4.3 No SQL Database: Cassandra

As team 1, we are assigned to use the Cassandra database for this project

4.3.1 Design choice for Backend: A cloud Cassandra provider, Astra DB

AstraDB provides a centralized and shared database environment accessible to all team members, regardless of their physical location. It eliminates the need for each team member to set up and maintain their own local Cassandra instances, reducing the setup time and ensuring consistency across the team.

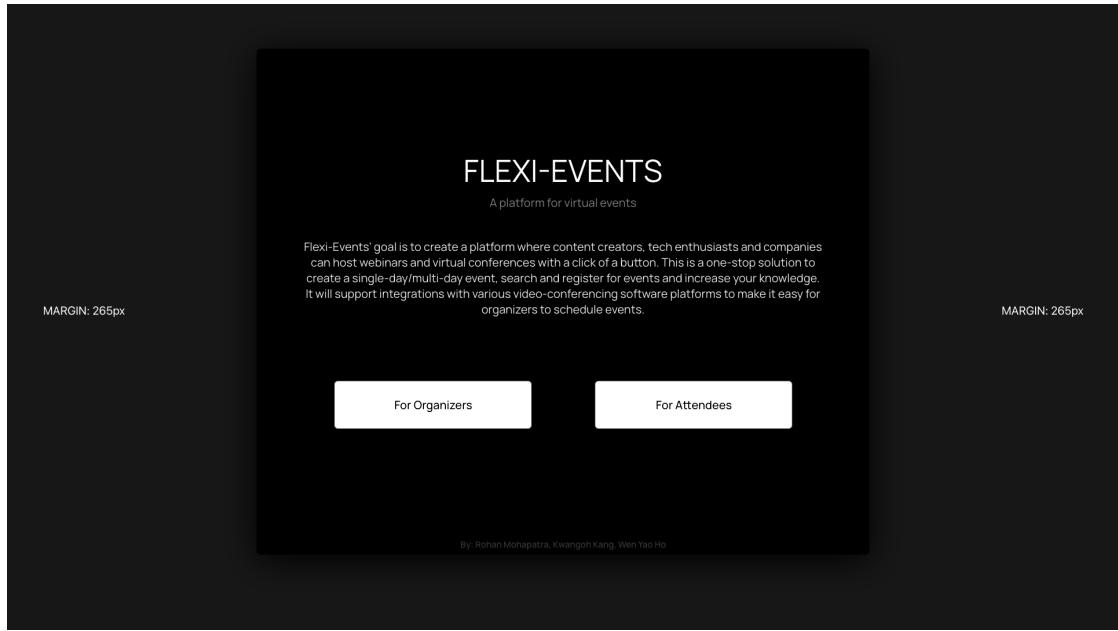
By using AstraDB (**a cloud variant of Cassandra**), teams can focus more on developing applications and analyzing data, rather than spending time on setting up and managing local Cassandra installations. It streamlines the development process, enhances productivity, and promotes seamless collaboration among team members, ultimately leading to faster and more efficient project execution.

Chapter 5

Proof of Concept

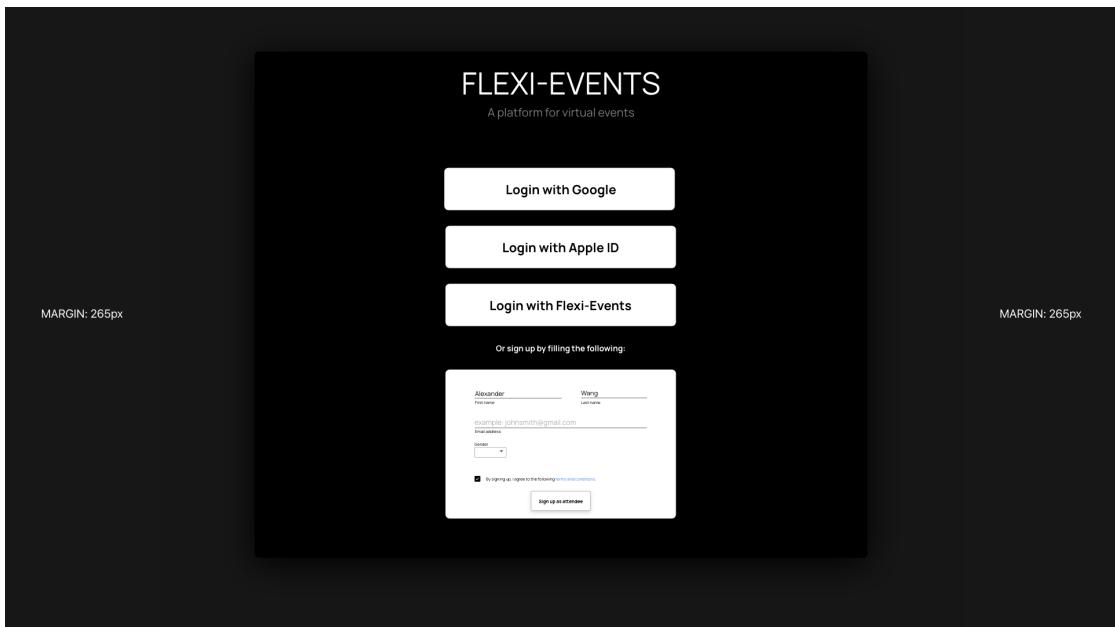
We used AdobeXD to create the MVP of our wireframe. The entire theme was made to be Uber-esque or Palantir-esque; using only black, white, and shades of gray for the product. Our end product has borrowed some design languages from our wireframe such as the dark theme and the general layout of the UI. However, the final look of our product is quite different from the screenshots below. We have added more colors to improve the readability of texts in our app. For each image below, we will briefly explain how it influenced our final product.

5.1 Landing page



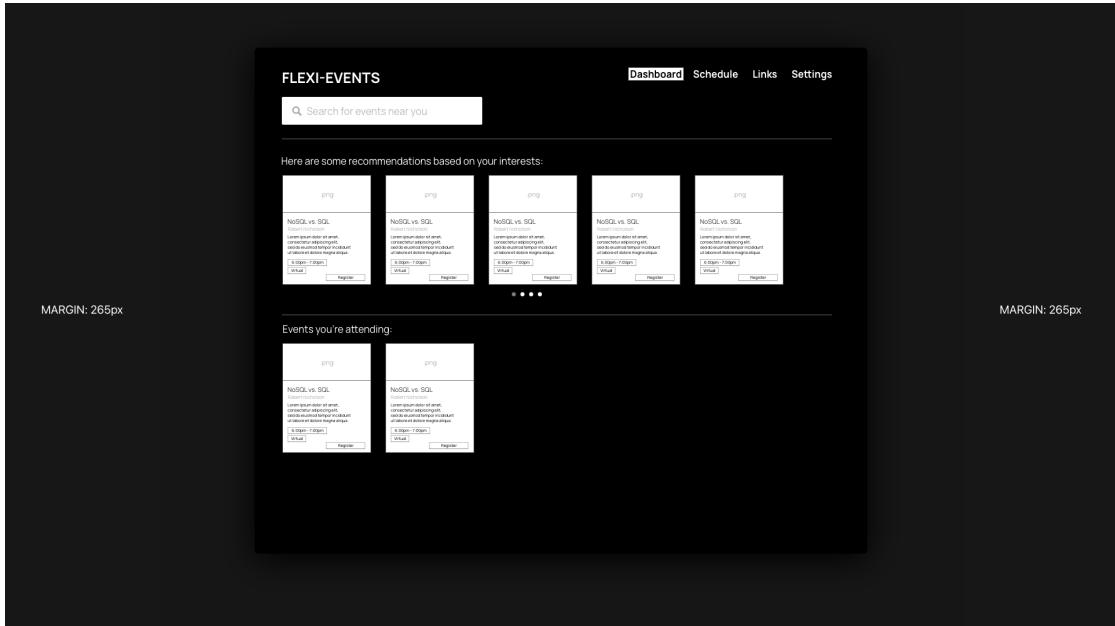
This is the landing page of Flexi-Events where users can sign up as an organizer or attendee. Still, as we develop the program, we find this unnecessary since there is not enough difference to create two accounts with different permissions. We ended up with a single-user account type.

5.2 Sign up and log-in page



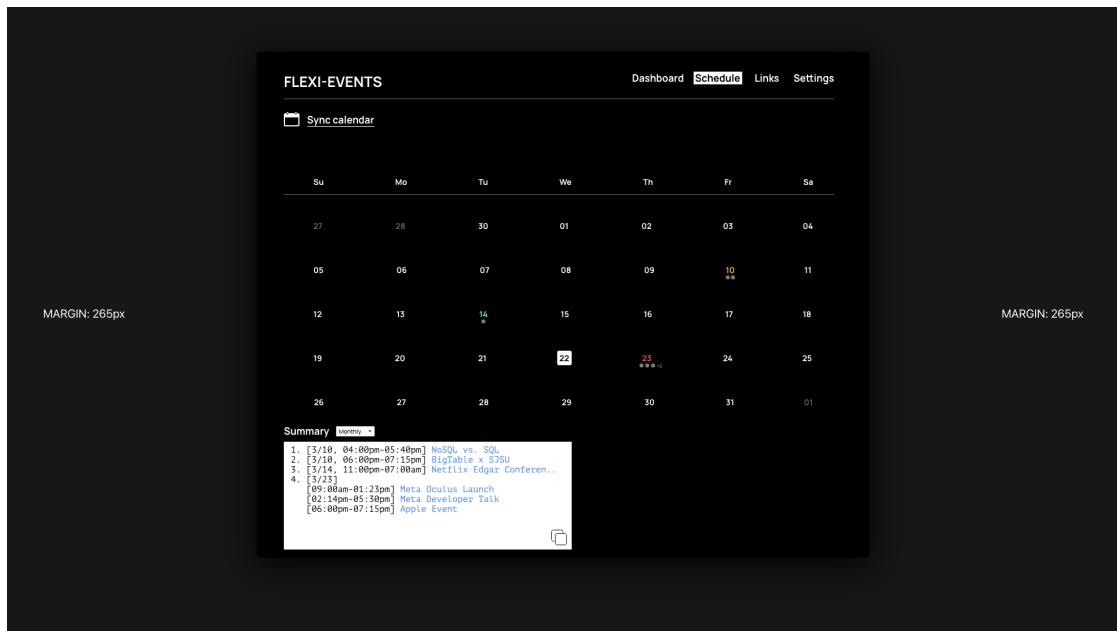
This is the sign-up page where users can create an account or log in. For our MVP, We did not implement Google or Apple login APIs due to time constraints, but we created an encrypted login system with the Cassandra database.

5.3 Dashboard where users can see lists of events they could and already registered



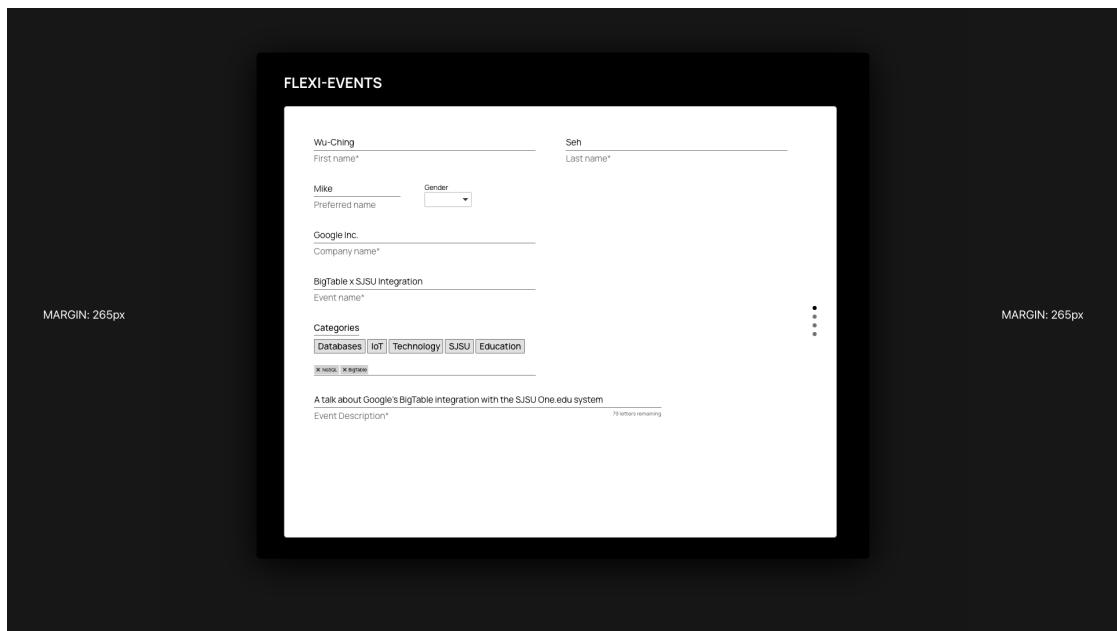
This feature above is still being developed but is considered non-essential since the user can still access their events through the calendar page instead of a designated dashboard page. This page is helpful for usability but is not essential to the entirety of the project.

5.4 Calendar for users to monitor their events



This is the core UI for our program since this is where users will spend the majority of their time in here monitoring and planning their own events and their participation in other events. The final calendar looks completely different from what was shown here, but the design language has been carried over as seen on the demo day.

5.5 Form for users to fill in details of events that want to host



Chapter 6

Development

6.1 Frontend

We used React's create-react-app library at the front end to bootstrap our React project. We also utilized Google's CSS Framework: MUI and SCSS to speed up the development process. The file structure for the front end was divided into two main folders: 1) pages and 2) components.

6.1.1 /pages

In /pages, each .jsx file represents a page in our web app. We have 13-page components at the time of writing. The styling of these pages is done with MUI and SCSS. Our 13-page components include

{about us, attendees, calendar, createEvent, createProfile, dashboard, home, login, organizers, profile, signUp, virtualEvent, zoomAuth}

6.1.2 /components

In /components, these .jsx files are functions that will be rendered inside of any page component mentioned above. Most of the styling of these components is done with MUI's inline sx props

6.2 Backend

6.2.1 Flexi-Events API

API Documentation is accessible & downloadable below

Click [here](#).

We use [Swagger OpenAPI configuration](#) to maintain API standards.

6.2.2 Custom authorization

We build a custom authorization scheme where every Organizer-related API concerning creation, deletion, and update is done via Access Token. This is to prevent unauthorized access and allowing only organizers to modify data.

```
14  @Apitags('auth')
15  @Controller('auth')
16  export class AuthController {
17    constructor(
18      private readonly authService: AuthService,
19      private jwtService: JwtService,
20    ) {}
21
22    private async generateAccessToken(email: string) {
23      return await this.jwtService.signAsync({ email: email });
24    }
25
26    @Post('login')
27    async login(@Body() authBody: Auth) {
28      const isLoginSuccessful = await this.authService.login(
29        authBody.email,
30        authBody.password,
31      );
32
33      if (isLoginSuccessful) {
34        return { accessToken: await this.generateAccessToken(authBody.email) };
35      }
36      throw new ForbiddenException('Password is incorrect');
37    }
38
39    @Post('signup')
40    async signUp(@Body() authBody: Auth) {
41      const isSignUpSuccessful = await this.authService.signUp(
42        authBody.email,
43        authBody.password,
44      );
45
46      if (isSignUpSuccessful) {
47        return { message: 'Signup successful' };
48      }
49      throw new BadRequestException('Email is already present');
50    }
}
```

`generateAccessToken()` does generate an access token using the provided email

`login(requestBody)` handles POST requests for login.

It calls the login method of the authorization Service to validate login credentials. If login is successful, it generates an access token and returns it. If login is unsuccessful, it throws a FobiddenException with an error message.

`signUp(requestBody)` calls the signUp method of the authorization Service to create a new user

Again, if signUp is successful, it returns a success message. If not, it throws a BadRequestException with an error message

6.2.3 Keyword Extraction

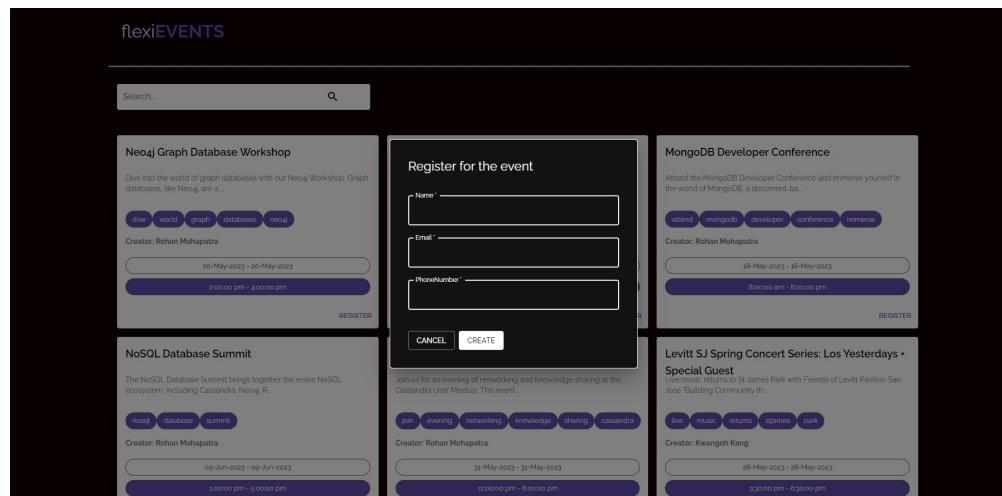
When an organizer creates an event with a description. Keywords are **auto-generated** from the description intelligently. This is an advanced feature and is accomplished by the following code.

```
async addEvent(event: any) {
  if (event.eventDescription) {
    const keywords = (extractor as any).extract(event.eventDescription, {
      language: 'english',
      remove_digits: true,
      return_changed_case: true,
      remove_duplicates: true,
    });
    event = { ...event, keywords: keywords.slice(0, 5) };
  }
  return await this.eventsRepository.addEvent(event);
}
```

6.3 Testing Run & App Features Explanation

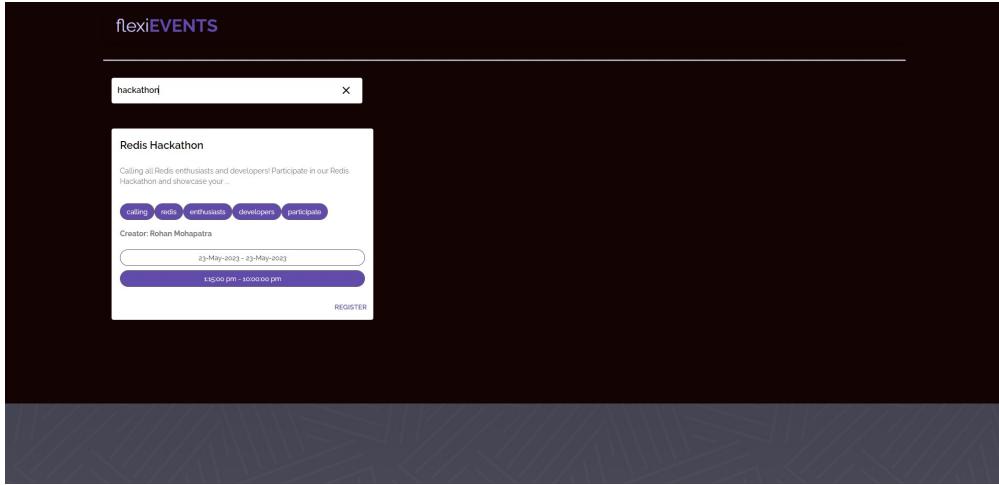
6.3.1 Create Operation: Attendees - Register for Event

Our app does not make account creation a mandatory step for attendees. Users are allowed to register for an event by entering their name, email, and phone number instead of going through the process of creating an email address and setting a new password. However, account creation is mandated for organizers.



6.3.2 Read Operation: Searching

Users can search the event by keywords & interests

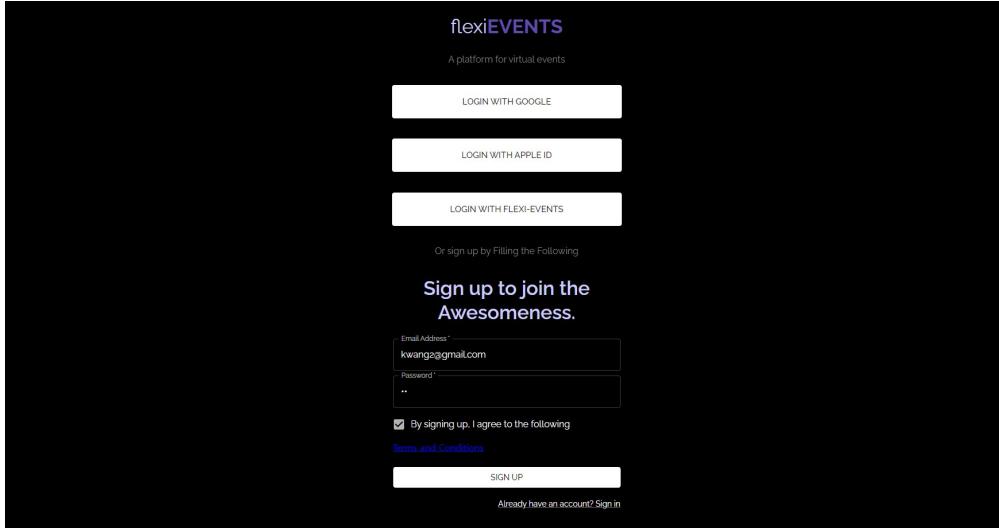


As the user searched 'hackathon' for the test run, one hackathon event is retrieved accordingly.

6.3.3 Create Operation: Organizers - Sign Up

For organizers, they can skip the signup process by logging in with their Google or Apple account, but we will be focusing on signing up with our local database. Users can sign up just like how they would do it on other websites. Our sign-up feature has input validation but did not employ an email verification library so it is susceptible to spam accounts.

First-time organizers can fill in their email addresses and password here:



As for now, 'Terms and Conditions' will be redirected to SJSU CS Dpt homepage. We thought about having chat GPT-generated terms for it but decided to leave it. Afterward, they will be redirected to a forms page to fill in their personal information.

The screenshot shows a dark-themed profile creation form. At the top, it says "flexiEVENTS" and "A platform for virtual events". Below that is the instruction "Create your profile.". A placeholder icon of a person is shown. The form contains four input fields: "Name" (Ian Kang), "Phone Number" (12345678), "Role at your organization" (Freshly graduating student), and "Pronouns" (He/Him). A "SAVE" button is at the bottom.

Name: Ian Kang

Phone Number: 12345678

Role at your organization: Freshly graduating student

Pronouns: He/Him

SAVE

Users can then go back to the home page and sign in with their newly created account to get access to their calendars.

6.3.4 Create Operation: Sign in & Create Events

Once the server responded properly, the homepage pops up and the users can sign in

The screenshot shows the flexiEVENTS homepage with a dark background. It features the "flexiEVENTS" logo, a brief description of the platform's purpose, and two buttons: "ORGANIZERS" and "ATTENDEES". Below this, a message states "Created with ❤ by Rohan Mohapatra, Kwangoh Kang and Wen Yao Ho".

flexiEVENTS

A platform for virtual events

Our goal is to create a one-stop platform where content creators and tech enthusiasts can host tech-related webinars and virtual conferences. Users can host, search, and register for events of their liking. We support integrations with various video-conferencing softwares and calendar softwares so that you won't miss a single event.

ORGANIZERS ATTENDEES

Created with ❤ by Rohan Mohapatra, Kwangoh Kang and Wen Yao Ho

The second part of the screenshot shows a "Sign in to create an event." form. It has fields for "Email" (kwang@gmail.com) and "Password" (displayed as dots). A "LOGIN" button and a link "Don't have an account? Signup now!" are at the bottom.

flexiEVENTS

A platform for virtual events

Sign in to create an event.

Email: kwang@gmail.com

Password: •••

LOGIN

Don't have an account? [Signup now!](#)

The screenshot shows the flexiEVENTS dashboard. At the top, there are navigation links: Dashboard, Profile, Aboutus, Sign In To Zoom, and Log Out. Below this is a section titled "My events:" containing five event cards:

- Levitt SJ Spring Concert Series: Los Yesterdays + Special Guest
- Cycling Past 50 May is National Bike Month, and M...
- SJSU Commencement Ceremony On May 25th, College of Science w...
- Downtown Soundscapes Sound Installation and Concert en...
- Baseball SJ vs NEVADA ! Game #2 of the Mountain West sl...

Below the event cards is a monthly calendar for May 2023. The calendar shows days from Sunday to Saturday. An event titled "Baseball SJ vs NEVADA !" is highlighted in blue for May 19th.

Then, users can create events through popped-up modal

The screenshot shows the flexiEVENTS dashboard with a modal window open for creating a new event. The modal has the following fields:

- Event Name:** Levitt SJ Spring Concert Series: Los Yesterdays + Special Guest
- Select Date & Time:** 2023-05-28 05:00 AM
- Start Date:** May 28 05:00 AM
- End Date:** May 28 05:30 AM
- Keywords:** live, music, returns, sjunes, park
- Event Link:** CREATE MEETING LINK

The background calendar view shows the same event "Baseball SJ vs NEVADA !" scheduled for May 19th.

Users can see the event is created successfully

The screenshot shows the flexiEVENTS event details page for the newly created event. The event title is "Levitt SJ Spring Concert Series: Los Yesterdays + Special Guest". The event details include:

- Description:** Live music returns to St James Park with Friends of Levitt Pavilion San Jose "Building Community through Music."
- Start Date:** Sun May 28 2023 15:30:00 GMT-0700 (서미 태평양 학계 표준시)
- End Date:** Sun May 28 2023 16:30:00 GMT-0700 (서미 태평양 학계 표준시)
- Keywords:** live, music, returns, sjunes, park
- Event Link:** CREATE MEETING LINK

At the bottom right, there is a "DELETE EVENT" button.

6.3.5 Delete Operation: Delete an event

Users can delete an event by clicking on the **Delete Event** button. This performs a delete operation on Cassandra

The screenshot shows the flexiEVENTS platform's event creation interface. At the top, there are navigation links: Dashboard, Profile, Aboutus, Sign In To Zoom, and Log Out. Below the header, the event title "Cassandra User Meetup" is displayed. The event details include:

- Description:** Join us for an evening of networking and knowledge sharing at the Cassandra User Meetup. This event is designed for developers, data architects, and database administrators interested in Cassandra, a highly scalable and distributed NoSQL database. Hear from industry experts, learn about the latest Cassandra features, and engage in discussions on best practices and use cases. Don't miss this opportunity to connect with the Cassandra community and expand your knowledge of distributed databases.
- Start Date:** Wed May 31 2023 12:00:00 GMT-0700 (Pacific Daylight Time)
- End Date:** Wed May 31 2023 18:00:00 GMT-0700 (Pacific Daylight Time)
- Keywords:** join, evening, networking, knowledge, sharing, cassandra
- Event Link:** CREATE MEETING LINK

At the bottom right of the event card, there are two buttons: "DELETE EVENT" and "ADD REGISTRATION".

Before deleting the event:

The screenshot shows the flexiEVENTS platform's event listing interface. At the top, there are navigation links: Dashboard, Profile, Aboutus, Sign In To Zoom, and Log Out. Below the header, the heading "My events:" is followed by a "CREATE EVENT" button. The event cards listed are:

- Neo4j Graph Database Workshop**: Dive into the world of graph...
- Redis Hackathon**: Calling all Redis enthusias...
- MongoDB Developer Conference**: Attend the MongoDB Dev...
- NoSQL Database Summit**: The NoSQL Database Sum...
- Cassandra User Meetup**: Join us for an evening of n...

After deleting the event:

The screenshot shows the flexiEVENTS platform's event listing interface after the "Cassandra User Meetup" event has been deleted. The "My events:" section now only lists the remaining four events: Neo4j Graph Database Workshop, Redis Hackathon, MongoDB Developer Conference, and NoSQL Database Summit.

6.3.6 Read Operation: Profile page

Users can have their profile page to access the registered information

The screenshot shows the flexiEVENTS platform's user profile interface. At the top, there are navigation links: Dashboard, Profile, Aboutus, Sign In To Zoom, and Log Out. Below the header, the heading "User PROFILE" is followed by the email address "kwang@gmail.com". The profile card displays the following information:

- Name:** Kwangoh Kang
- Email:** kwang@gmail.com
- Phone Number:** 1234567890
- Role:** CTO
- Pronouns:** Pronouns He/Him

6.3.7 Update Operation: Adding & deleting Keywords

When a user creates an event, we use a keyword extractor to create keywords for the event. The user can **add** a keyword or **remove** a keyword by using the GUI. This is an **update** operation that updates the keywords of an event.

The screenshots show three stages of updating event keywords:

- Initial State:** The event details page for "NoSQL Database Summit". The keywords input field contains "nosql", "database", and "summit".
- Adding a Keyword:** A new keyword "cassandra" has been added to the input field, highlighted with a red box.
- Removing a Keyword:** The keyword "cassandra" has been removed from the input field, highlighted with a red box.

Event Details:

Description: The NoSQL Database Summit brings together the entire NoSQL ecosystem, including Cassandra, Neo4j, Redis, and MongoDB, under one roof. This three-day conference is designed for database professionals, software engineers, and technology enthusiasts interested in exploring the diverse landscape of NoSQL databases. Attend insightful keynote speeches, attend deep-dive technical sessions, and participate in panel discussions with industry leaders. Network with peers, share experiences, and gain valuable insights into the latest trends and advancements in NoSQL technologies. Don't miss this opportunity to broaden your understanding of NoSQL databases and connect with the community driving innovation in this space.

Start Date: Fri Jun 09 2023 13:00:00 GMT-0700 (Pacific Daylight Time)

End Date: Fri Jun 09 2023 17:00:00 GMT-0700 (Pacific Daylight Time)

Keywords: nosql, database, summit, cassandra

Event Link: CREATE MEETING LINK

Registrations:

- Dr. Hubert Gerhold, Daniella.Dooley22@gmail.com
- Stella Kutch, Eldora_Mills@hotmail.com
- Danny Johns, Ray76@hotmail.com
- Miss Joanna Rempel, Rossie.Graham65@hotmail.com
- Herbert Zboncak, Rupert_Flatley-Sawayn@gmail.com

After removing a keyword,

NoSQL Database Summit

Description: The NoSQL Database Summit brings together the entire NoSQL ecosystem, including Cassandra, Neo4j, Redis, and MongoDB, under one roof. This three-day conference is designed for database professionals, software engineers, and technology enthusiasts interested in exploring the diverse landscape of NoSQL databases. Attend insightful keynote speeches, attend deep-dive technical sessions, and participate in panel discussions with industry leaders. Network with peers, share experiences, and gain valuable insights into the latest trends and advancements in NoSQL technologies. Don't miss this opportunity to broaden your understanding of NoSQL databases and connect with the community driving innovation in this space.

Start Date: Fri Jun 09 2023 13:00:00 GMT-0700 (Pacific Daylight Time)

End Date: Fri Jun 09 2023 17:00:00 GMT-0700 (Pacific Daylight Time)

Keywords: nosql, database, cassandra, Add keywords...

Event Link: CREATE MEETING LINK

DELETE EVENT

Registrations:

- Dr. Hubert Gerhold
Daniella.Dooley2@gmail.com
- Stella Kutch
Elodra_Mills@hotmail.com
- Danny Johns
Ray76@hotmail.com
- Miss Joanna Rempel
Rossie.Graham65@hotmail.com
- Herbert Zboncak
Rupert_Flatley-Sawayn@gmail.com

6.3.8 Update Operation: Creating a Zoom Link

For the MVP we only allow Zoom links, but during the creation of an event. We do not add the Zoom link by default but rather ask the user to Sign in to Zoom and then create a meeting link. **The Create Meeting Link** is an **update operation** on the existing event.

NoSQL Database Summit

Description: The NoSQL Database Summit brings together the entire NoSQL ecosystem, including Cassandra, Neo4j, Redis, and MongoDB, under one roof. This three-day conference is designed for database professionals, software engineers, and technology enthusiasts interested in exploring the diverse landscape of NoSQL databases. Attend insightful keynote speeches, attend deep-dive technical sessions, and participate in panel discussions with industry leaders. Network with peers, share experiences, and gain valuable insights into the latest trends and advancements in NoSQL technologies. Don't miss this opportunity to broaden your understanding of NoSQL databases and connect with the community driving innovation in this space.

Start Date: Fri Jun 09 2023 13:00:00 GMT-0700 (Pacific Daylight Time)

End Date: Fri Jun 09 2023 17:00:00 GMT-0700 (Pacific Daylight Time)

Keywords: nosql, database, cassandra, Add keywords...

Event Link: CREATE MEETING LINK

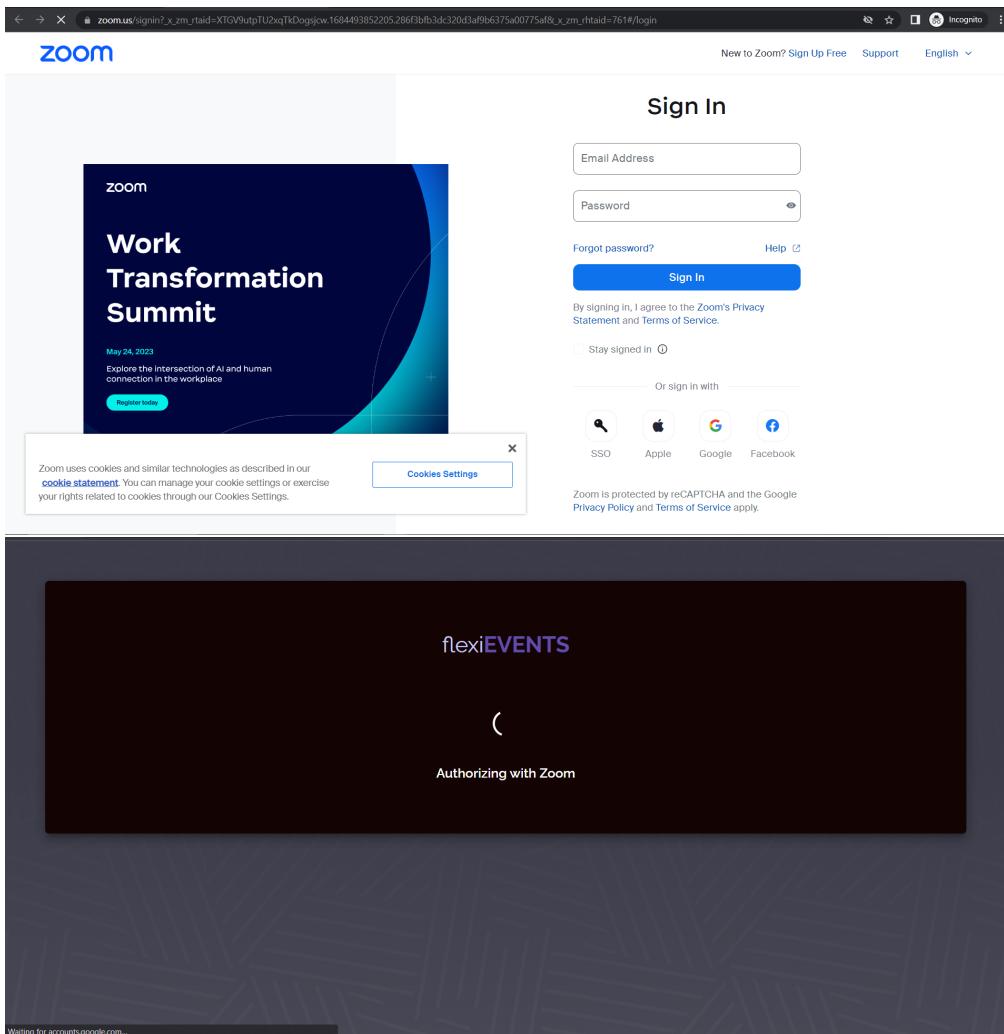
DELETE EVENT

Registrations:

- Dr. Hubert Gerhold
Daniella.Dooley2@gmail.com
- Stella Kutch
Elodra_Mills@hotmail.com
- Danny Johns
Ray76@hotmail.com
- Miss Joanna Rempel
Rossie.Graham65@hotmail.com
- Herbert Zboncak
Rupert_Flatley-Sawayn@gmail.com

⚠ You are not signed into Zoom! ✕

Signed into Zoom and being authorized by Zoom to use Flexi-Events



Clicking on create meeting updates the event with the Zoom link and shows up in the UI.

The screenshot shows the flexiEVENTS event creation interface. The top navigation bar includes "flexiEVENTS", "Dashboard", "Profile", "Aboutus", "Sign In To Zoom" (which is highlighted), and "Log Out".

The main content area shows an event titled "NoSQL Database Summit". The event details include:

- Description:** The NoSQL Database Summit brings together the entire NoSQL ecosystem, including Cassandra, Neo4j, Redis, and MongoDB, under one roof. This three-day conference is designed for database professionals, software engineers, and technology enthusiasts interested in exploring the diverse landscape of NoSQL databases. Attend insightful keynote speeches, attend deep-dive technical sessions, and participate in panel discussions with industry leaders. Network with peers, share experiences, and gain valuable insights into the latest trends and advancements in NoSQL technologies. Don't miss this opportunity to broaden your understanding of NoSQL databases and connect with the community driving innovation in this space.
- Start Date:** Fri Jun 09 2023 13:00:00 GMT-0700 (Pacific Daylight Time)
- End Date:** Fri Jun 09 2023 17:00:00 GMT-0700 (Pacific Daylight Time)
- Keywords:** nosql, database, cassandra
- Event Link:** [CREATE MEETING LINK](#)

On the right side, there is a "Registrations:" section listing several attendees with their names, email addresses, and profile icons. A success message at the bottom left of the event card says "Created Zoom Meeting invite!" with a green checkmark icon.

flexiEVENTS

Dashboard Profile Aboutus → Sign In To Zoom Log Out

6.3.9 About us page

This page can be used for backlogs & future announcement



flexiEVENTS

Dashboard Profile Aboutus → Sign In To Zoom Log Out

6.3.10 Testing the Calendar

We tested the calendar by parsing a .json file located in /pages/Dashboard/sameple_data.json where multiple instances of events were created and contained varying fields. Some are complicated, and some are simple to test if the calendar can store and render the information correctly when inserted into the database.

6.4 Startup the application

¹We follow a mono-repo architecture. The code is available on our GitHub [1](#).

6.4.1 Step-by-step procedure to start the backend

1. Step #1 - Clone the GitHub repository

¹<https://github.com/rohanmohapatra/CS157C-team1>

```
~/Work/nosql
↳ > git clone https://github.com/rohanmohapatra/CS157C-team1
Cloning into 'CS157C-team1' ...
remote: Enumerating objects: 1034, done.
remote: Counting objects: 100% (402/402), done.
remote: Compressing objects: 100% (224/224), done.
remote: Total 1034 (delta 204), reused 282 (delta 149), pack-reused 632
Receiving objects: 100% (1034/1034), 3.37 MiB | 12.94 MiB/s, done.
Resolving deltas: 100% (443/443), done.
```

2. Step #2 - Change the directory to code/service

```
~/Work/nosql
↳ > cd CS157C-team1

CS157C-team1 on ⚡ main
↳ > cd code/service

CS157C-team1/code/service on ⚡ main via ⚡ v16.20.0
↳ >
```

3. Step #3 - Install dependencies by running yarn

```
CS157C-team1/code/service on ⚡ main via ⚡ v16.20.0
↳ > yarn
➤ YN0000: - Resolution step
➤ YN0002: @redocly/cli@npm:1.0.0-beta.125 doesn't provide core-js (p66f2e), requested by redoc
➤ YN0002: @redocly/cli@npm:1.0.0-beta.125 doesn't provide react-is (paf5da), requested by styled-components
➤ YN0002: participation-service@workspace.. doesn't provide webpack (p60df8), requested by ts-loader
➤ YN0002: redoc@npm:2.0.0 [f14f3] doesn't provide webpack (p62211), requested by style-loader
➤ YN0000: | Some peer dependencies are incorrectly met; run yarn explain peer-requirements <hash> for details, where <hash> is the six-letter p-
prefixed code
➤ YN0000: | Completed in 0s 419ms
➤ YN0000: | Fetch step
➤ YN0000: | Completed in 0s 614ms
➤ YN0000: | Link step
➤ YN0007: bcrypt@npm:5.1.0 must be built because it never has been before or the last one failed
➤ YN0007: @nestjs/core@npm:9.4.0 [92706] must be built because it never has been before or the last one failed
➤ YN0000: | Completed in 13s 514ms
➤ YN0000: Done with warnings in 14s 714ms
```

4. Step #4 - Start the back-end service yarn start

```
CS157C-team1/code/service on 局长 via v16.20.0 took 15s
↳ yarn start
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [NestFactory] Starting Nest application ...
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [InstanceLoader] CassandraModule dependencies initialized +19ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [InstanceLoader] JwtModule dependencies initialized +0ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [InstanceLoader] HttpModule dependencies initialized +1ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [InstanceLoader] ConfigHostModule dependencies initialized +0ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [InstanceLoader] AppModule dependencies initialized +0ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [InstanceLoader] ZoomModule dependencies initialized +0ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [InstanceLoader] ConfigModule dependencies initialized +1ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [InstanceLoader] RegistrationModule dependencies initialized +0ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [InstanceLoader] AuthModule dependencies initialized +1ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [InstanceLoader] EventsModule dependencies initialized +0ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [InstanceLoader] UserModule dependencies initialized +0ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [RoutesResolver] AppController {/}: +46ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [RouterExplorer] Mapped {/, GET} route +2ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [RoutesResolver] RegistrationController {/events/:eventId/participants}: +1ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [RouterExplorer] Mapped {/events/:eventId/participants, GET} route +0ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [RouterExplorer] Mapped {/events/:eventId/participants/register, POST} route +1ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [RoutesResolver] EventsController {/events}: +0ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [RouterExplorer] Mapped {/events/createEvent, POST} route +1ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [RouterExplorer] Mapped {/events, GET} route +1ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [RouterExplorer] Mapped {/events/public, GET} route +0ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [RouterExplorer] Mapped {/events/search/public, POST} route +1ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [RouterExplorer] Mapped {/events/:eventId, GET} route +1ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [RouterExplorer] Mapped {/events/:eventId, DELETE} route +1ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [RouterExplorer] Mapped {/events/:eventId/addKeywords, POST} route +0ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [RouterExplorer] Mapped {/events/:eventId/deleteKeyword, POST} route +0ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [RouterExplorer] Mapped {/events/:eventId/createMeeting, POST} route +0ms
[Nest] 5869 - 05/18/2023, 8:36:34 PM    LOG [RoutesResolver] UserController {/users}: +0ms
```

6.4.2 Step-by-step procedure to start the front-end

- Step #1 - Once you cloned the GitHub repository, move to the following folder

PROBLEMS 6 OUTPUT DEBUG CONSOLE TERMINAL

- PS C:\Users\LEIAN\Desktop\CS157C-team1\code\flexi-events> dir

```
Directory: C:\Users\LEIAN\Desktop\CS157C-team1\code\flexi-events

Mode                LastWriteTime         Length Name
----              -----        -----
d----
```

Mode	LastWriteTime	Length	Name
d----	2023-05-17 오후 2:47		node_modules
d----	2023-05-16 오후 11:19		public
d----	2023-05-16 오후 11:19		src
-a----	2023-05-16 오후 11:19	221	jsconfig.json
-a----	2023-05-17 오후 2:47	703263	package-lock.json
-a----	2023-05-16 오후 11:19	1335	package.json

- PS C:\Users\LEIAN\Desktop\CS157C-team1\code\flexi-events>

- Step #2 - Once you reach the /flexi-events folder, command `npm install`

PROBLEMS 6 OUTPUT DEBUG CONSOLE TERMINAL

- PS C:\Users\LEIAN\Desktop\CS157C-team1\code\flexi-events> dir

```
Directory: C:\Users\LEIAN\Desktop\CS157C-team1\code\flexi-events

Mode                LastWriteTime         Length Name
----              -----        -----
d----
```

Mode	LastWriteTime	Length	Name
d----	2023-05-17 오후 2:47		node_modules
d----	2023-05-16 오후 11:19		public
d----	2023-05-16 오후 11:19		src
-a----	2023-05-16 오후 11:19	221	jsconfig.json
-a----	2023-05-17 오후 2:47	703263	package-lock.json
-a----	2023-05-16 오후 11:19	1335	package.json

- PS C:\Users\LEIAN\Desktop\CS157C-team1\code\flexi-events>

3. **Step #3** - Once you installed npm, command `npm start` to start the frontend



The screenshot shows a terminal window with the following interface elements:

- Top bar: PROBLEMS (6), OUTPUT, DEBUG CONSOLE, TERMINAL (underlined).
- Message area:
 - PS C:\Users\LEIAN\Desktop\CS157C-team1\code\flexi-events> `npm start`
 - > flexi-events@0.1.0 start
 - > react-scripts start
- Bottom right corner: A small square icon.

Chapter 7

Demo

Presentation & Demo was conducted on May 9th during the class time.

Presentation Slides:

The collage consists of several slides from the flexiEVENTS presentation:

- Why Flexi Events?**: A slide with a dark background and purple text. It explains the goal of creating a platform for content creators, tech enthusiasts, and companies to host webinars and virtual conferences.
- CS157C Term Project**: A slide with a dark background and white text. It lists the project details: Prof. Dr. Ching-seh (Mike) Wu, Team 1: Rohan Mohapatra, Kwangoh Kang, Wen Yao Ho.
- Architecture - CERN Stack**: A diagram showing the architecture flow: "You" → FlexEvents → Backend Server (Exposes Endpoints Built on NestJS) → DataStax Cassandra on Cloud. Below the diagram are icons for React Native, Node.js Express, Docker, and Cassandra.
- Material UI (by Google)**: A slide featuring the Material UI logo and a call-to-action: "Move faster with intuitive React UI tools". It includes a snippet of code for a Material UI component and a "Get started" button.
- Demo Time!**: A slide with a dark background and white text. It says "Demo Time!" and "Any questions?"
- Thank you!**: A slide with a dark background and white text. It says "Thank you!" and "Any questions?"

Chapter 8

Lessons Learned

8.0.1 Wen Yao Ho

I have gained significant insights from spending most of my time on front-end coding in React and MUI. Folder structure and writing clean code are very important, but I shouldn't confuse perfect code with good code. When I started chasing perfection in the code I write, I will never get anything done because perfection does not exist and will only paralyze my process.

I have also learned new version control commands and improved my overall understanding of branches and resolving Git conflicts. Our team encountered moderate git conflicts and spending the time to resolve them improved my understanding of the overall code-base as well

Most importantly, I think acknowledging the strong points of my teammates and letting them express themselves as freely as they want brings the most growth to the project. I aspire to be a project manager in the future and I think understanding each member's ability and shortcomings is crucial to delegating the right tasks and getting the project delivered on time

8.0.2 Kwangoh Kang

CS is quite a broad field and this project & this course in general, was a continuity of learning. It was not always easy to balance time between coursework and project work but the struggle was worth it. I mainly worked on frontend pages and a little bit of backend connection then learned a ton of new skills and tools applied such as Volta, API documentation, yarn, Git commands, etc.

Other than technologies and tools, A big thing I took from this time would be that I got more familiar with the workflow, and how these kinds of full-stack projects start and end. Also, more importantly, communication among team members again turned out to be crucial to the success of the project. People don't know what they don't know. Through having this full-stack experience, I was able to learn what I need to learn, what I was missing, what I need to focus on more during summer.

8.0.3 Rohan Mohapatra

As a team leader, I learned that everyone works at their own pace. Of course, there would be cases where a teammate would require initial help or would be trying to fix a bug. And with collaborative effort, we were able to accomplish a prototype that I feel is a good MVP.

I also wanted to try out a new framework that I had been following for NodeJs, especially for backend services. NestJS was very similar to Spring Boot with its dependency injection and auto-configuration. The connection to Cassandra was the hardest part as

the documentation is not as verbose as I expected. It took me time to set up the ORM mappers to models. Once the setup was done, running CRUD operations was a piece of cake.

During the creation of Cassandra's tables, I did have an issue with how to choose the partition and cluster keys. Because of the vast events that Cassandra would store, I had to come up with a good database design that was fully using the database's capability. Another thing that was initially wrong with my database design was that I assumed we could keep the user's profile and auth-related fields together. But this would be adding in more indexes and complexity. Breaking up the columns into different column families proved to be very beneficial and was fast.

Although we did not show the search functionality in the demo, I was very keen on implementing it because it was something that would better our MVP. Overall, I think I have become a better programmer to integrate Cassandra with NodeJS. Now I also understand where Cassandra can be used and not just blindly try to fit MongoDB in full stack projects.

Bibliography

- [1] “Node.js - wikipedia.” <https://en.wikipedia.org/wiki/Node.js>. Accessed: 2023-05-17.
- [2] “Enterprise-grade api at startup speed with nestjs – opscale.” <https://opscale.io/2021/09/10/build-enterprise-grade-api-at-startup-speed-with-nest-js/>. Accessed: 2023-05-17.
- [3] “Apache cassandra - wikipedia.” https://en.wikipedia.org/wiki/Apache_Cassandra. Accessed: 2023-05-17.
- [4] “Quick start – react.” <https://react.dev/learn>. Accessed: 2023-05-17.