**Database Narrative**

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CS – 499 Computer Science Capstone

June 6th, 2021

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During my computer science journey, I have had the opportunity to work on several different projects that have enhanced my technological skills. A particular project that I wanted to better enhance, and further perfect is ‘My Chat Application’. This artifact, which I created about 8 months ago, is the only project I have created for my colleagues. This application was built using MongoDB, Socket.io and Node.js. It was not a production level application, but rather, assisted with getting familiar with these types of technologies in an amusing and creative way and it allowed our team to communicate with one another. This application enhanced my knowledge on web clients, servers and databases.

Graphical user interface, application, Word

Description automatically generatedBefore enhancing the project, the Chat Application contained a JavaScript file, HTML file, and its dependencies. The JavaScript file called server.js contained all the backend code, which included the set up for MongoDB to store all the sent and received messages in a cluster and Socket.io to handle all the inputs and outputs of the application. The HTML file called index.js contained all the frontend code, which included the client connection to the User Interface. This allowed the user to see the title, chat messages, and text area to submit a new message. The application had minor errors with the database logging in the correct timestamp and some downsides like not having CSS, which made the application look dull. One of its major downsides was, that this application did not have the ability to login, instead each user would have to enter their name in order to send a message. This issue meant users could use any name to send a message and the rest of the users would never know who truly sent the message.

One of the major enhancements to this project was translating it to a React framework. My current company is working on translating all their own projects into React and Redux, so being able to apply my current knowledge and expand my skills for my career, is essential. Another enhancement made to this project was switching my database from MongoDB to using Firebase. Firebase is a “Backend-as-a-Service – BaaS…” and its grown “up into a next-generation app-development platform on Google Cloud Platform. (Karpinski, J., Aguirre, K. C., Chun, P. S., Johnson, A. B., Manipula, M., & Gomila, J.)” It is a real-time database, and “Real-time data is the way of the future. (Karpinski, J., Aguirre, K. C., Chun, P. S., Johnson, A. B., Manipula, M., & Gomila, J.)” My current employer has different developers cross training in Firebase. Being able to translate my application into using a Firebase database has been very interesting and beneficial to my skills. Per Esplin, “When you connect your app to Firebase, you’re not connecting through normal HTTP. You’re connecting through a WebSocket. (Karpinski, J., Aguirre, K. C., Chun, P. S., Johnson, A. B., Manipula, M., & Gomila, J.)” They are much faster than HTTP because all of the data syncs automatically through a single WebSocket.

Graphical user interface, application, Teams

Description automatically generatedWithin this week, I have learned many new skills. I focused on learning about React hooks and Firebase’s ability to authenticate with Google, its real-time data streams, and its cloud database. I created a React project, which I have become more familiar with. I learned how to create a new firebase project by following the Firebase Documentation, which provided a step-by-step process. I learned how to add the imports, hooks, and initialize the firebase project in the application. While continuing to learn about Firebase, I learned that I could allow users to authenticate via Google by enabling the feature on Firebase and adding the Firebase SDKs to my project. According to Firebase documentation, “The easiest way to authenticate your users with Firebase using their Google Accounts is to handle the sign-in flow with the Firebase JavaScript SDK” (Google, 2021). Additionally, I learned to enable Cloud Firestore, which is the database being used on Firebase.

A screenshot of a computer

Description automatically generated with medium confidencePreviously the HTML file included code that would be displayed on the UI (user interface), but since has completely changed. The HTML currently has minimal code and serves as a way to connect the root component, called App, to the rest of the application. There was no CSS file in the previous version of my artifact, but this week, I have focused on implementing the CSS style sheet to reflect a dark mode chat application for this new enhanced version. As for JavaScript files, the previous version contained a server.js file, which helped set up MongoDB and Socket.io for the backend. The new enhanced version does not include either, instead, it contains an index.js file that renders the App component with the ‘root’ id, allowing the HTML file to display the application on the UI. I’ve also included an additional JavaScript file within the functions folder, which is a cloud function that will run every time a user creates a new document (message) and will check for profanity. If user does not follow guidelines, then they will be banned from the application.

My original goals, which were to translate my application into a React framework and transfer my database from MongoDB to Firebase, have been met. I have also expanded the design and functionality of my artifact by allowing the users to login using Google Authenticate and added some security logic to protect again any foul language. I learned more on how to implement a framework and for this application, only used the main App component, instead of splitting each JavaScript function into different components. I also learned more about hooks, which I’ve been slowly gaining more knowledge on. “They let you use state and other React features without writing a class” (Anderson, 2021). Hooks were helpful features when trying to implement Firebase on this project. Throughout the application, I used the feature ‘useAuthState’ and ‘useCollectionData’, which are part of the react-firebase-hooks. “Using a combination of hooks and context makes it easy to access user sessions anywhere in your React application. (McMahen, 2019)"

A screenshot of a computer

Description automatically generated with medium confidenceMy biggest challenge, throughout this week, was learning how to grant ‘read’ permissions on the Cloud Firestore. I kept running into “Insufficient Permissions Errors”. This error would not allow me to update any messages on my application. I was able to see the UI, log in using Google, type in a message, but when I would try to send the message, the app would generate an error. Several articles I found indicated it was as simple as turning the rules coding from ‘false’ to ‘true’. However, it was not an actual fix, since that would leave my application vulnerable. After reviewing the Firebase documentation on handling errors and additional examples from GitHub, I was able to properly code the rules so that Firestone would allow me (and future users) to send a message via the Chat Application, as long as I was previously authenticated with Google.

Being able to enhance this artifact has allowed me to gain more knowledge on React and proper skills with Firebase. I had to reference Google for several step-by-step processes to be able to use Firebase, but after this week, I can proudly say I have gained insightful knowledge and that my coding skills have grown. Expanding on this project has allowed me to continue practicing and evolving my database skills. I have selected this artifact for my ePortfolio to showcase and portray an accurate picture of myself and my skills, thus far, attained.

# Works Cited

Anderson, S. (2021). *Introducing Hooks*. React. (n.d.). https://reactjs.org/docs/hooks-intro.html.

Google. (2021). *Authenticate Using Google Sign-In with JavaScript  |  Firebase*. Google. https://firebase.google.com/docs/auth/web/google-signin.

Google. (2021). *Set up and manage a Firebase project using the Management REST API*. Google. https://firebase.google.com/docs/projects/api/workflow\_set-up-and-manage-project.

Google. (2021). *Get started with Cloud Firestore  |  Firebase*. Google. https://firebase.google.com/docs/firestore/quickstart.

Karpinski, J., Aguirre, K. C., Chun, P. S., Johnson, A. B., Manipula, M., & Gomila, J. (n.d.). *Firebase - Wiki*. Golden. https://golden.com/wiki/Firebase-EWP.

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*Using Firebase with React Hooks*. Ben McMahens Blog RSS. (2019, March 30). https://benmcmahen.com/using-firebase-with-react-hooks/#:~:text=Using%20a%20combination%20of%20hooks,to%20access%20the%20session%20object.