

Santa's Helper

figure 9 :App Icon

Team Members:

Jose Tavarez Novas (136167) COE
Fernando J. La Menza Escalante (115575) CS
José L. Mojica Meléndez (113900) COE
Joshua J. Perez Guzman (127310) COE
Derek González Fuentes (146539)CS
Adrián X. Torres González (100148)COE

Professor:

Joanne Brenes Catinchi

ELECTRICAL & COMPUTER ENGINEERING AND COMPUTER SCIENCE DEPARTMENT



Introduction:

Santa's Helper is a mobile and web-based application designed to assist users in organizing, planning, and managing Christmas gift shopping efficiently. The app allows users to create and track gift lists for family and friends, set budgets, receive personalized gift recommendations, and manage shopping progress. It also includes reminders and notifications to help users stay on schedule.

This app is designed to cater to a variety of users, from busy professionals to families, organized planners, and even small business owners. Each group benefits from features tailored to their needs, such as gift tracking, budget management, and reminders, making holiday shopping stress-free and efficient.

Problem and Solution

The holiday season often brings joy but also stress and chaos. Families face challenges like not knowing what gifts to buy, managing budgets, and keeping track of shopping lists. Lost or forgotten lists, overspending, and disorganization can lead to unnecessary stress, wasted time, and conflicts during a time meant for celebration.

The Santas Helper app simplifies holiday shopping by helping users create and manage gift lists, track budgets, and monitor purchase progress. Users can add recipients, assign gifts with prices and links, and receive notifications for better deals. The app also features Wishlist sharing to coordinate with others and reminders for deadlines to stay organized. By centralizing everything in one place, the app makes holiday shopping easier, stress-free, and more efficient

Technology

The Santa's Helpers application is developed natively for the Android platform using Android Studio and the Java programming language. The system architecture relies on Firebase as the core backend service, utilizing Firebase Authentication for secure user login and Cloud Firestore as a real-time NoSQL database to manage structured user data such as family members, gift lists, and budget tracking. Communication between the app and Firebase occurs directly, eliminating the need for a custom backend server and enabling real-time synchronization and offline support.

To enhance functionality, the app integrates the Rapid API platform to consume external data and provide dynamic features such as real-time gift recommendations. GitHub was used for version control and team collaboration, ensuring a consistent and well-managed codebase throughout development. This technology stack and architecture enable a secure, scalable, and responsive mobile application tailored to holiday shopping needs.



User Interface

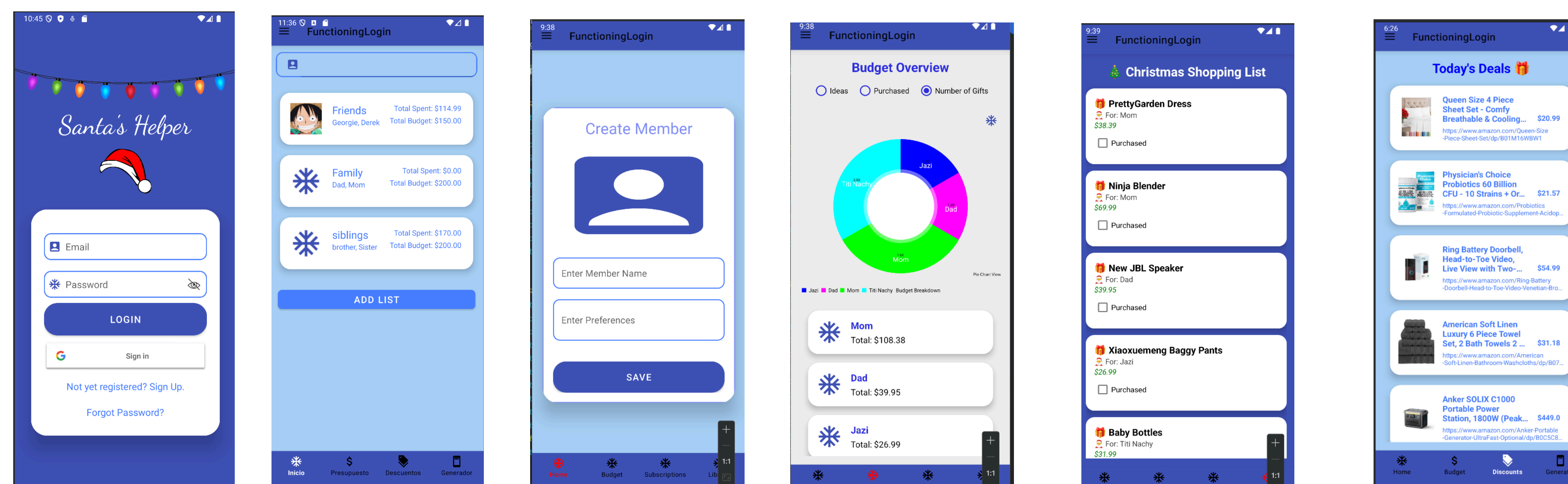


Fig. 1: Login

Fig. 2: Home Page

Fig. 3: Create member

Fig. 4: Budget overview

Fig. 5: the shopping list

Fig. 8: Deals/Discount

Future Work

As future development continues, we plan to expand the capabilities of Santa's Helper beyond basic holiday shopping features. One of the primary goals is to implement wishlist importation from online retailers, allowing users to sync gift ideas directly from e-commerce platforms like Amazon or Walmart. Additionally, another feature under consideration is the use of voice-assisted gift entry, providing a more convenient and accessible way to manage shopping lists while multitasking.

Looking further ahead, we plan to support cross-platform compatibility, bringing the app to iOS and potentially a web version, so users can access their data from any device. The inclusion of AI-powered gift suggestions based on recipient preferences and budget history could also enrich the user experience. Finally, we are exploring multi-language support, which will make the app accessible to a broader, global audience, especially during worldwide holiday seasons. These improvements will help position Santa's Helpers as a complete, intelligent holiday planning assistant.

Conclusion

The Santas Helper app aims to address the common challenges of holiday shopping by providing an organized, user-friendly platform to facilitate needs and expenses. By leveraging technologies like Firebase and AWS, and following an Agile methodology, we have laid a strong foundation for developing a solution that meets user needs for gift tracking, budget management, and stress-free planning

References

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Architecture

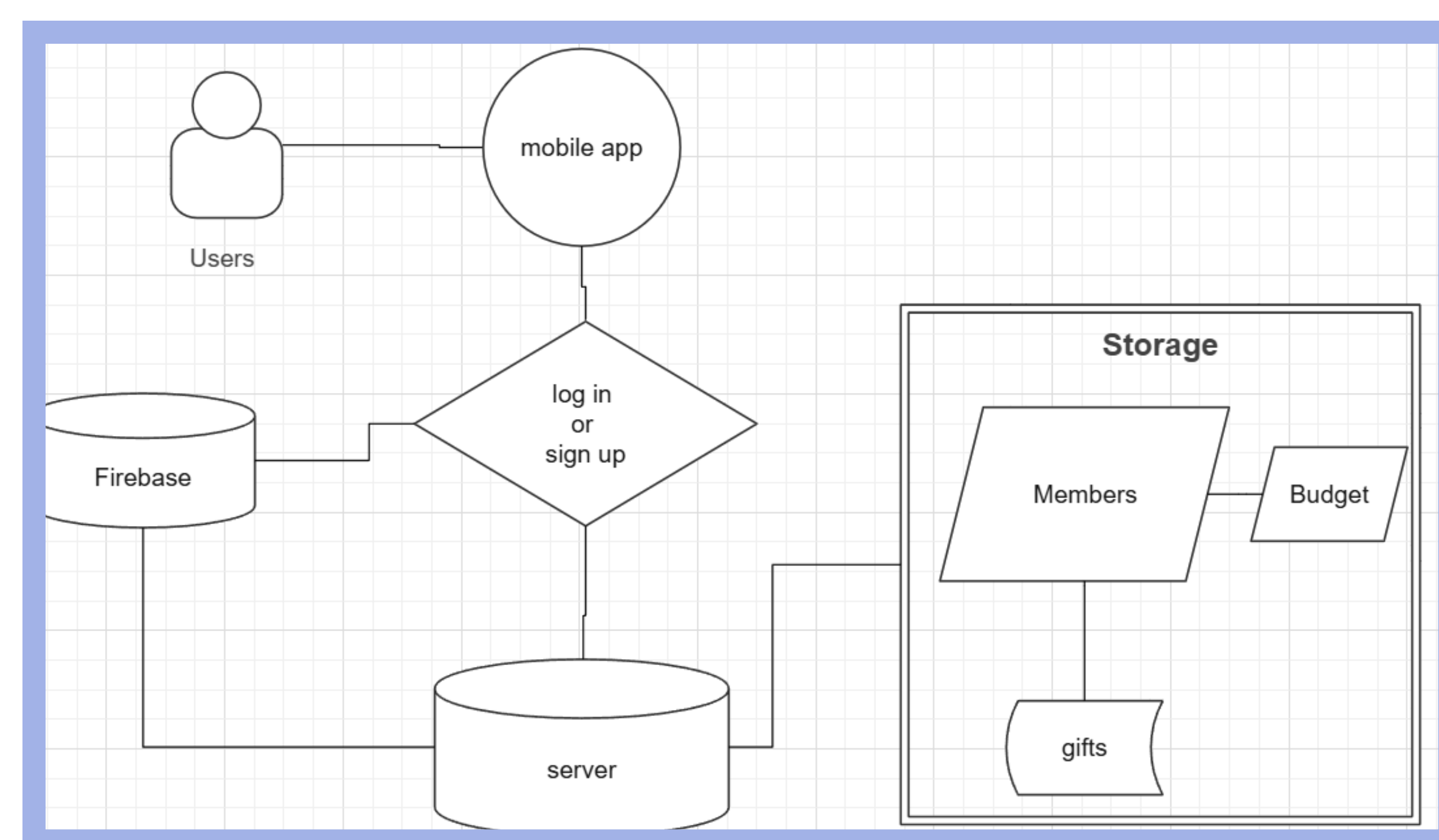


Fig. 9: Architecture

The app follows a modular, Firebase-integrated architecture designed for real-time responsiveness and simplicity. Upon launch, users interact with a mobile interface that connects to Firebase for authentication and data storage. Once logged in, each user accesses their personalized environment stored under a unique user ID in Firebase's Realtime Database. This environment contains structured data for gift lists, members, and budgets. The app ensures that all views — such as member profiles, gift previews, and total budget displays — are always synced with the cloud database. Changes made by the user, like editing a gift or deleting a list, are instantly reflected in the UI through active database listeners.

Firebase Authentication manages sign-up and login flows, while Firebase Realtime Database handles persistent storage. The architecture is loosely modeled around MVVM principles: data classes and database logic are decoupled from UI fragments, improving maintainability. The always-synced gift and budget previews help users manage shopping in real time, reducing redundancy and allowing seamless cross-navigation across core sections like Home, Discounts, and Generator. This architecture supports scalability and ensures that all gift planning activities remain connected, accurate, and fast.

Database schema

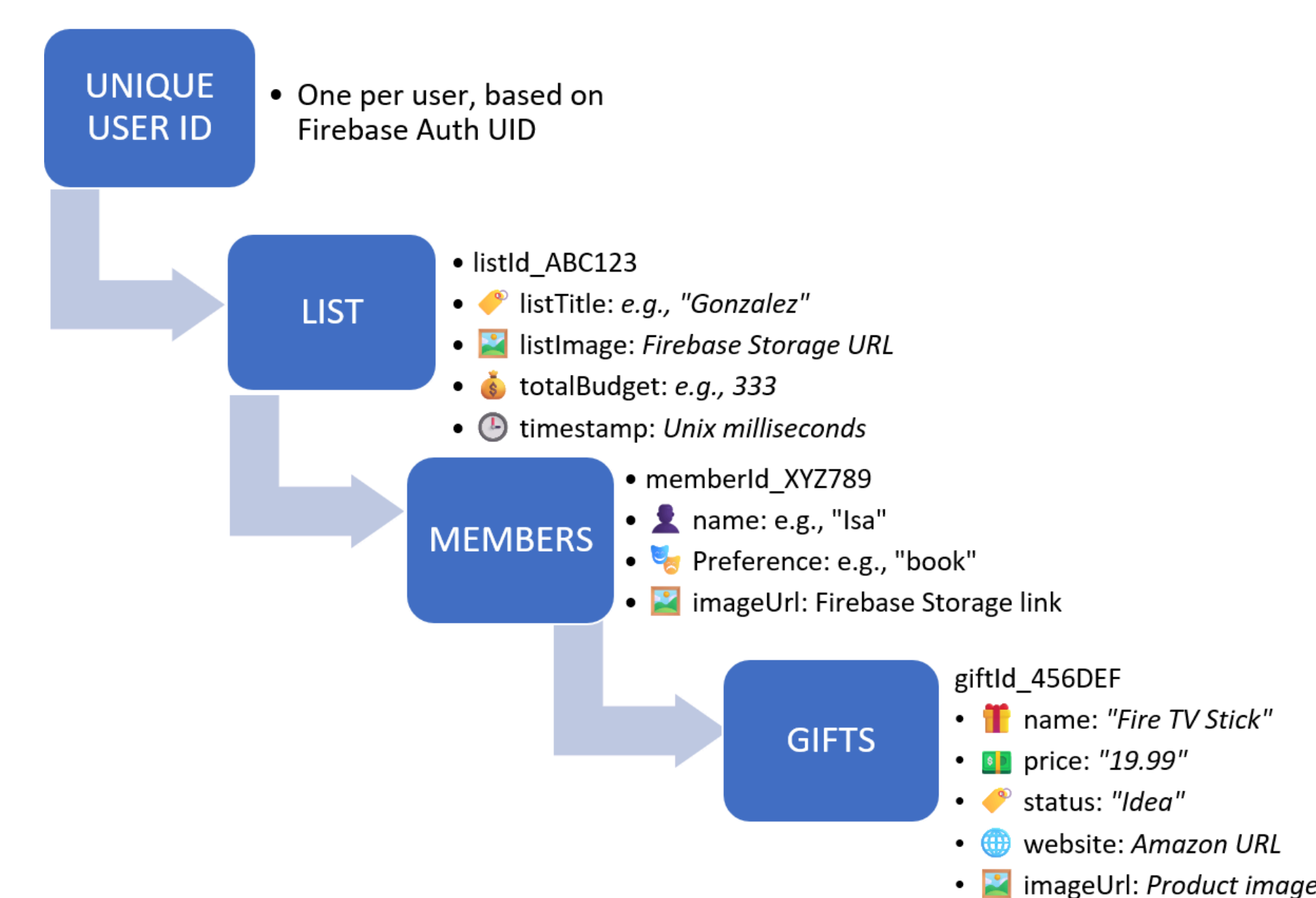


Fig. 10: Database Schema

The mobile application is powered by a Firebase Realtime Database structured for scalability and real-time synchronization. At the top level, each authenticated user is identified by their unique Firebase UID, under which their personal data is stored in a node called Unique User ID. Within this user node exists a lists collection, where each list contains metadata such as the listTitle, optional listImage, totalBudget, and a timestamp for sorting.

Each list contains a members node, which holds all individuals associated with that list. Every member stores data like name, preference, and an optional imageUrl for personalization. Nested within each member is a gifts collection, where each gift includes attributes such as name, price, status (like "Idea" or "Bought"), notes, a website link, and a product imageUrl. This well-structured hierarchy enables dynamic UI rendering and real-time syncing across all views in the app — including shopping summaries, budget tracking, member gift previews, and more — providing a seamless and personalized holiday planning experience.

