

GOOGLE SERVICES USED IN THE PROJECT:



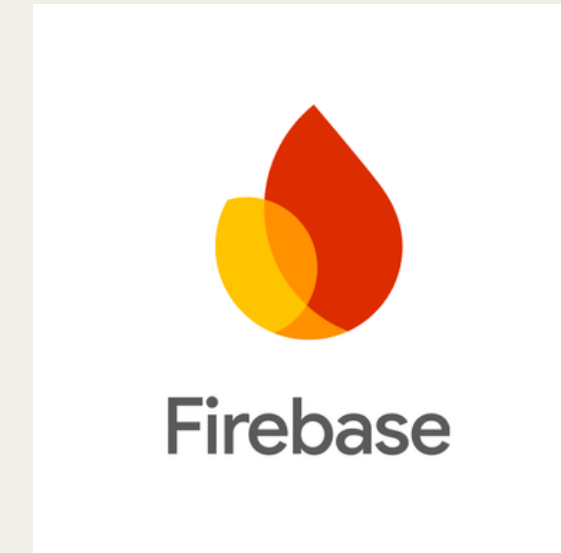
gemini-1.5-flash

In our web application, we integrated Google's **Gemini 1.5 Flash** model to help users find nearby e-waste recycling centers based on their location. The model processes user queries and retrieves relevant data to suggest the best recycling centers, ensuring proper disposal of electronic waste.



Google-Search Engine API

we integrated the **Google Search Engine API** to help users find the **best product comparisons** across **different** electronic **brands**. This feature ensures that users make informed purchase decisions, ultimately leading to **long-term** usage and **reducing** e-waste.



Firebase Auth

To ensure a **secure** and seamless **login experience**, our web application integrates **Firebase Authentication** with **Google Sign-In**. This allows users to sign in, validate their identity, and access personalized features without the hassle of creating a new account.

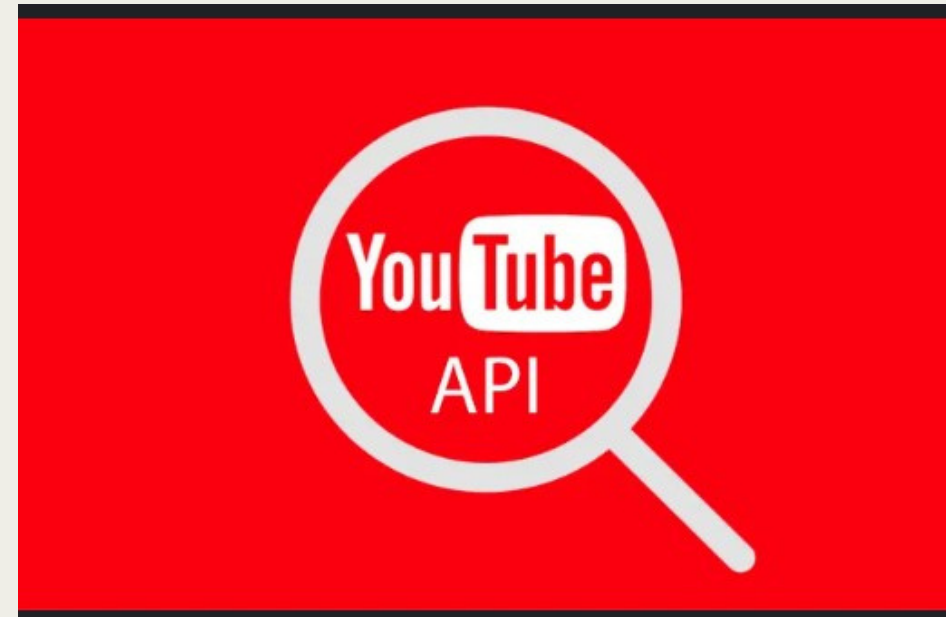


Google Services Used in the project:



Gemma 2B

we integrated and fine-tuned the **Gemma 2B model** to identify the best recycling steps for **electronic products**. The model provides refined and accurate **disposal guidelines**, ensuring responsible e-waste **management**.



YouTube API

To help users make **informed purchasing** decisions, we integrated the **YouTube API** into our project. This allows users to find trusted product reviews and comparisons within their budget, ensuring they choose the **best, long-lasting products** — ultimately **reducing e-waste generation**.



Firestore- Database

To ensure **seamless interaction** and data storage, we **integrated Firestore- Database** in our project. This enables real-time data synchronization and easy interaction between individual and organization pages, allowing **smooth relational mapping**.

More Google Tools Used:



Google Colab

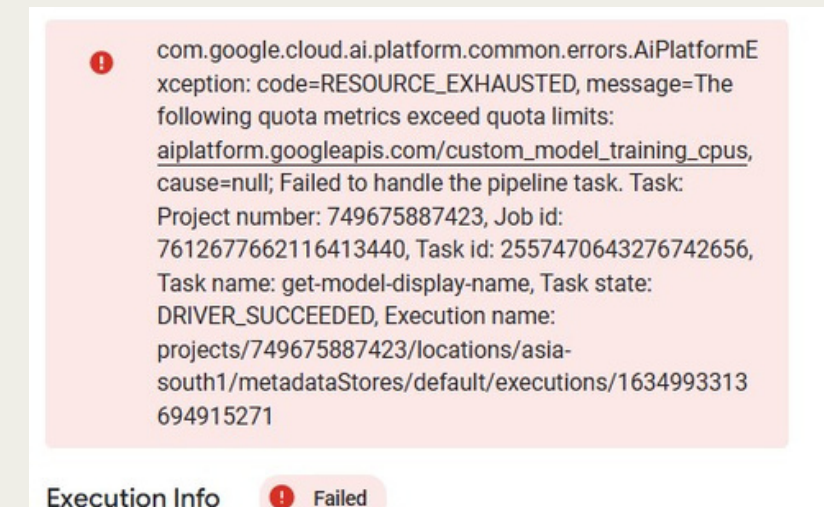
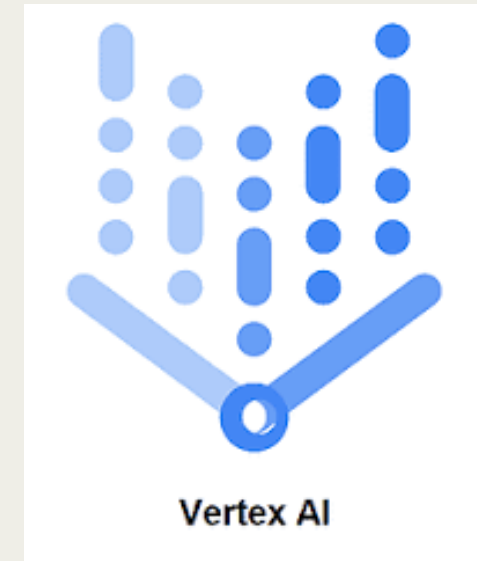
To enhance the **accuracy** and relevance of our **AI model**, we fine-tuned the **Gemma 2B** model using **Google Colab**. This allowed us to leverage **GPU** acceleration and high **RAM** availability, ensuring efficient training on our custom dataset for recycling and product selection.



Cloud Buckets

To **efficiently store** and manage **static files**, CSV datasets, and other essential resources, we integrated **Google Cloud Buckets** into our project. This provided secure, scalable, and high-performance storage, ensuring seamless access to required files.

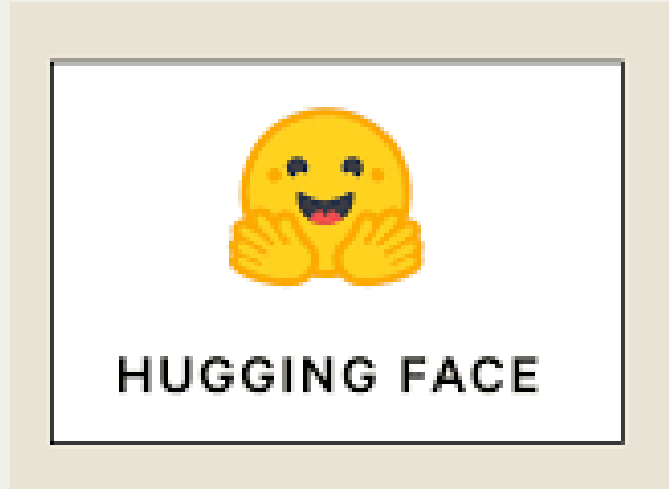
Tried & Failed



Vertex AI's AutoML

We explored **Google Cloud Vertex AI's AutoML** to train a model for e-waste recycling recommendations and product longevity predictions. The **dataset** was fully **prepared** and uploaded in the **big Query**, but the model **training failed** due to **quota limitations** in the **trial period** of **Google Cloud**.

Other Tools Used



Hugging Face

To make our **fine-tuned Gemma 2B** model easily accessible, we uploaded it to **Hugging Face**. This provided a **centralized model repository**, allowing others to download and use the model. However, due to the **unavailability** of the Hugging Face **Inference API** for Gemma 2B, we couldn't directly integrate it into our project for real-time inference.



Git & Github

To **efficiently** manage our **project's development** and **collaboration**, we used Git for **version control**. This allowed us to track changes, **collaborate seamlessly**, and **maintain code integrity** throughout the project lifecycle.