Outfit Buddy – The AI-Powered Sustainable Stylist

Outfit Buddies - Team 2

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One-page Problem Brief

1. **Persona**
   Meet **The Busy Professional**. They have a packed Outlook calendar, value their appearance or not, but suffer from decision fatigue. They often wear the same 20

2. **Problem (Pain Points)**

   - **Context Disconnect:** Dressing incorrectly for the weather or occasion (e.g., wearing canvas sneakers in the rain or casual wear to a client meeting).
   - **Wardrobe Inefficiency:** "I have nothing to wear" syndrome, despite a full closet.
   - **Sustainability Gap:** High-quality clothes sit unused for years instead of being donated to someone in need.

3. **Solution (Target Outcome) Outfit Buddy** is a context-aware web application that functions as a personal AI stylist.

   - It syncs with **Outlook Calendar** and **Local Weather Services**.
   - It utilizes an **AI agent** to proactively suggest optimal outfits (e.g., "It's rainy and you have a dinner date $\rightarrow$ Wear the leather loafers, not the canvas shoes.")
   - It provides personalized "**Shop**" recommendations based on the user's preferred styles.
   - It reduces decision fatigue and makes the shopping experience easier and more tailored.
   - It promotes circular fashion through the "**Your Impact**" feature, identifying unworn items for donation.

4. **Success Signals**

   - **Speed:** Reduces morning routine time by providing instant, pre-validated choices.
   - **Utility:** Ensures you're well-dressed for any occasion and maximizes the overall use of your wardrobe.
   - **Impact:** Helps users identify donation centers for unused clothing, promoting recycling and sustainability.
   - **Psychology:** Reducing decision-making anxiety and helping you feel confident and comfortable in your favorite clothes.

Architecture Sketch

System Architecture & Tech Stack The solution is built on a robust Hybrid Cloud Architecture, strategically leveraging the best features of Microsoft Azure and Google Firebase to minimize costs while maximizing performance.
CODE: https://github.com/iosifidis/outfit-buddy
URL: https://white-grass-0a295f903.3.azurestaticapps.net

1. **Core Components (Architecture Diagram)**

   - **Frontend & Hosting:**
     - Built with **Next.js** (React framework) to deliver a fast, server-side rendered (SSR) or statically generated user interface.
     - Hosted on **Azure Static Web Apps**, which provides global availability, native SSL security, and automated CI/CD pipelines via **GitHub** Actions.

   - **Identity & Security:**
     - **Firebase Authentication** handles secure user management (Email/Password & Anonymous login), fully integrated with Azure's authorized domains to ensure safe sessions.

   - **Data & Storage:**
     - **Cloud Firestore (NoSQL)** serves as the primary database, storing the wardrobe inventory with complex metadata (e.g., `warmth_rating`, `formal_rating`, `last_worn_date`).

2. **Application Logic & Data Flow (Sequence Diagram)**

   - **Context Awareness:** Instead of static data, the app consumes external **Weather APIs** and integrates with **Outlook Schedule** to understand the user's daily context.

   - **AI & Recommendation Engine:**
     - The application logic aggregates the user's inventory and external context.
     - It applies **custom filtering algorithms** to exclude items unsuitable for the weather.
     - It **ranks** the remaining items based on formality (schedule) and rotation frequency (last worn date) to suggest the optimal outfit.
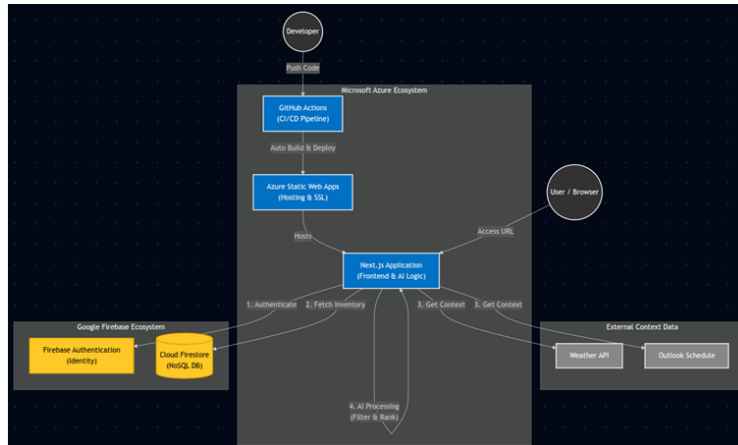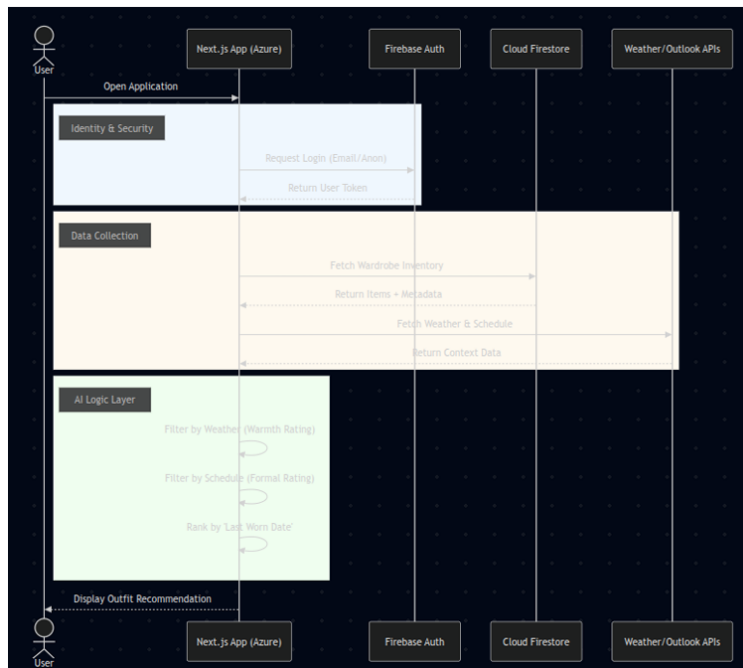
Figure 1: **System Architecture Diagram**

Figure 2: **Data Flow Diagram**

Demo Walkthrough: The "Outfit Buddy" Experience

- **Dashboard & Context Awareness:** Upon logging in, the user sees a personalized dashboard. The app immediately recognizes the context:

- **Weather:** 13°C and rainy in Thessaloniki.

- **Calendar:** A scheduled "Dinner Date" at 6:00 PM.

- **AI Stylist:** Instead of the user browsing aimlessly, the AI Agent provides a curated outfit suggestion.

- **The Suggestion:** A **White Silk Blouse** paired with **Black Wool Trousers** and **Black Leather Loafers**.

- **The Logic:** The AI chose "Wool" and "Leather" for warmth and rain protection, avoiding the canvas sneakers. It selected the blouse to match the formality of the "Dinner Date".

  1. **Smart Wardrobe Management:** When adding new items, the "**Scan with AI**" feature automatically tags attributes. Each piece is rated on three scales: **Formal, Warmth, and Relaxed** (0–10), enabling the recommendation engine to make smart decisions.

  2. Outfit Buddy provides **purpose-driven shopping suggestions**.Instead of encouraging unnecessary purchases, the AI recommends only items that fill true gaps in your wardrobe aligns them with your established personal style, and

  3. **Sustainability ("Your Impact"):** The app tracks utility. In the "Your Impact" section, it highlights items like the "Beige Trench Coat" that haven't been worn recently, prompting the user with a direct "**Find Donation Center**" button to encourage sustainable habits.