Project Plan
Product-based Capstone Project

Team ID **: C242-PS352**

Team Member **:**

1. (ML) M184B4KX0608 – Aqima Adalahita – Andalas University - Active
2. (ML) M184B4KY2810 – Muhammad Faiz Al-Dzikro – Andalas University - Active
3. (ML) M184B4KY2830 – Muhammad Fariz – Andalas University - Active
4. (CC) C002B4KX1459 – Fawwazti Rasendria – Bandung Institute of Technology - Active
5. (CC) C184B4KY2974 – Muhammad Nouval Habibie – Andalas University - Active
6. (MD) A184B4KY3178 – Nabil Rizki Navisa –Andalas University - Active
7. (MD) A184B4KY2200 – Khalied Nauly Maturino – Andalas University - Active

Project Plan
Product-based Capstone Project

Final Selected Themes:

Fusion Unleashed: Art, Entertainment, and Media Transformation

Title of the Project:

Outfyt: Smart OOTD Recommendation App for Your Perfect Style

Executive Summary/Abstract:

In today's fast-paced world, many individuals struggle with daily outfit decisions that need to balance multiple factors, including scheduled activities, and personal style preferences. This challenge often leads to decision fatigue, time wastage, and occasionally inappropriate clothing choices for specific occasions. Our project addresses this problem by developing an intelligent outfit recommendation system that considers contextual factors such as schedule, time, season, and personal color, while incorporating personal.

Key research questions include:

1. How can this application provide relevant and accurate outfit recommendations based on the user's schedule, time, season, and personal color?
2. What role do the machine learning, cloud, and mobile development learning paths play in developing this application?
3. How can this solution reduce daily decision fatigue, time wastage, inappropriate outfit choices, and other related issues while ensuring that outfit selections align with user preferences and situational needs?

Our solution provides users with suitable outfit recommendations for various activities, ensuring their style is appropriate and they can choose clothing easily through an innovative mobile application. This project reflects our team's passion for merging technology with everyday challenges, creating a solution that saves time and helps users build confidence in their style choices.

How did your team come up with this project?

Our team identified this project through shared personal experiences and observations of daily challenges. As busy individuals, we often faced the morning struggle of choosing appropriate outfits while considering various factors like weather and daily activities. Through discussions and observation, we discovered this was a common pain point for many people, especially for young generations like Gen Z who are sensitive about fashion and self-expression through outfit choices.

Project Plan
Product-based Capstone Project

Project Scope & Deliverables:

Week	Task Description	Responsibilities	Deliverables
1	Project Setup and Planning	• Define project goals and objectives • Set up version control (Git) • Create initial project structure in Android Studio • Outline GCP services needed for compute, storage, and database	• Project plan document • Git repository initialized • Initial cloud architecture diagram
	UI/UX Design	• Design wireframes and mockups in Figma • Finalize UI elements based on the app's main feature (AI outfit recommendation)	• Completed Figma designs • Design approval from the team
2	Development Setup and GCP Configuration	• Set up Android Studio environment • Integrate necessary libraries (Retrofit, TensorFlow Lite) • Configure GCP services for compute (App Engine, Cloud Functions, or VM), storage (Cloud Storage), and database (Firestore or Cloud SQL) • Assign GCP access permissions to the Cloud Computing team only • Use Google Cloud Pricing Calculator to estimate costs	• Development environment ready • Libraries integrated • GCP project configuration with minimum cost estimate
	Core Feature Development	• Develop XML layouts based on Figma designs • Create basic navigation and activity structure • Add app icon to make the app visually distinct	• Initial app layout and navigation structure completed • Custom app icon added

Project Plan
Product-based Capstone Project

3	Backend and API Integration	• Develop REST API for data management using GCP (e.g., Cloud Functions or App Engine) • Implement Retrofit in the app for API calls • Create networking calls to interact with the API	• Functional API calls established • Data fetching implemented
	ML Model Development and Integration	• Build and train a custom TensorFlow model on Google Cloud (not using TensorFlow Hub or AutoML) • Use TensorFlow Lite to convert and integrate the model into the app • Implement the ML model on-device to recommend outfits based on user preferences • Ensure that the AI workflow is the app's main feature, allowing users easy access to the recommendation functionality	• Custom-trained ML model converted to TensorFlow Lite • On-device model for outfit recommendations • Basic workflow for AI feature access
4	Testing, Debugging, and Documentation	• Conduct unit testing and user testing to ensure the app's main features (including AI/ML functionality) are stable and meet project goals • Debug and fix identified issues • Create documentation, including app instructions, usage of GCP, and AI/ML workflow	• Test reports • Debugged app ready for deployment • User and technical documentation
	Finalization and APK Release	• Optimize and finalize app • Generate APK for release • Prepare a final project report • Present project outcomes and key insights	• Downloadable APK file • Final project report • Project presentation with outcomes

Project Plan
Product-based Capstone Project

Project Schedule:

Week	Tasks	Mon	Tue	Wed	Thu	Fri
1	Project Setup and Planning					
	UI/UX Design					
2	Development Setup and GCP Configuration					
	Core Feature Development					
3	Backend and API Integration					
	ML Model Development and Integration					
4	Testing, Debugging, and Documentation					
	Finalization and APK Release					

Milestones:

- End of Week 1: Project setup completed, initial designs approved.
- End of Week 2: Development environment and initial core feature structure ready.
- End of Week 3: Functional API calls and initial ML model integrated.
- End of Week 4: Final testing, debugging, and APK release.

Based on your team's knowledge, what tools/IDE/Library and resources that your team will use to solve the problem?

To solve the problem, we may use some of these tools or resources:

1. Android Studio
2. Kotlin

Project Plan
Product-based Capstone Project

3. XML
4. Retrofit
5. Figma
6. Google Calendar API
7. Cloud Run
8. Cloud Storage
9. Firestore
10. Google Colab
11. Pandas
12. Tensorflow
13. Matplotlib
14. Scikit Learn
15. Room database
16. Numpy

Based on your knowledge and explorations, what will your team need support for?
For our help, we need some of these kind of support:

1. Mentors
2. Data
3. GCP Credit

Based on your knowledge and explorations, tell us the Machine Learning Part of your Capstone!
For our capstone's machine learning component, we will train a recommendation model using TensorFlow, incorporating user style preferences, weather, and scheduling data to generate personalized outfit suggestions. We'll utilize transfer learning with pre-trained image classification models, finetuned for fashion items, and deploy via TensorFlow.js for real-time mobile responsiveness.

Based on your knowledge and explorations, tell us the Mobile Development Part of your capstone?
The mobile development aspect of our capstone will involve building a native Android app using Kotlin in Android Studio with XML for layout design. The app will integrate machine learning models for real time outfit recommendations and utilize REST APIs for backend connectivity, ensuring a smooth and intuitive user experience.

Project Plan
Product-based Capstone Project

Based on your knowledge and explorations, tell us the Cloud/Web/Frontend/Backend Part of your capstone?

The cloud part includes deploying the backend API on Google Cloud Run using Node.js, utilizing Cloud SQL for database management and Cloud Storage for datasets and model storage. Integrate the Google Calendar API for scheduling activities to outfit recommendations and create a private API with authentication to ensure secure access. We also plan to make use of Google Cloud Vision API for users' face recognition upon signing up to extract a personalized color palette as part of the outfit recommendation criteria.

Based on your team's planning, is there any identifiable potential Risk or Issue related to your project?

The limitation in obtaining datasets related to our project to train the model may decrease the accuracy of the model, potentially resulting in irrelevant or less accurate recommendations. To overcome this, we will further explore data sources, possibly collecting data through user surveys, or creating synthetic data to complement existing datasets. In addition, inappropriate selection of resources on cloud computing can also be a problem. Therefore, we will choose carefully what resources to use so that they are not wasted.

Any other notes/remarks we should consider on your team's application

-