Project Plan for Bangkit 2023 Product-based Capstone

Team ID : C23-PS170

Team Member :

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Final Selected Themes:
Food Accessibility, Agribusiness, and Food Security

Title of the Project:
Mbako

Excecutive Summary/Abstract:

Agricultural sector is the driver of local economic growth. In Setieng sub district of Wonosobo regency, most people are Garangan tobacco farmers and their lives depend on it. Garangan tobacco is a seasonal tobacco commodity that is burned. Its price can be three times more expensive than the common tobacco because of its taste and rarity. However, farmers rarely sell Garangan Tobacco directly to consumers. They usually sell it to middlemen at much lower prices because they don't have a wide connection to the consumer and need money immediately. Besides that, Garangan tobacco has low, medium, and high quality. The older the Garangan tobacco, the more expensive it is. An expert can classify it based on its color and thickness. But it is difficult for newbie consumers to classify which tobacco is good or bad so they trust it to the middleman and buy it in retail. Mbako is a mobile application used for Garangan tobacco auction with a classification feature. It can solve both farmer's and consumer's problems. It will answer the questions such as "What is the quality of this Garangan tobacco", "What is the highest price for farmer's Garangan tobacco", and "How can farmers reach out to consumers directly".

How did your team come up with this project?

Our team wants to build a platform supporting local product or wisdom. Fortunately, our team member had previously surveyed Garangan tobacco, a local commodity in Wonosobo Regency. Garangan Tobacco is possible to be classified from its image and local farmer once had an idea to sell it in auction. Therefore, we have an idea to make an Android app for Garangan tobacco auction with a classification feature. But, there are many obstacles that we think might happen there isn't much research about it. After some discussion, we determined ourselves to do a project with this idea.

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Project Scope & Deliverables:

Week	Responsibility	Task	Deliverables
1	Machine Learning	Data Collection and Cleaning	Collected and cleaned dataset for model training
		Model Selection and Training	Trained models on cleaned dataset
	Mobile Development	Mobile App Designing on Figma	Storyboard and user flow
	Cloud Computing	Cloud Server Setup	Setup cloud server for model deployment
			Evaluation report of different models, trained models on cleaned dataset
2	Machine Learning	Model Conversion	Saved Model
	Mobile Development	Preparing Android Studio Environment, Implementing UI Designs on Android Studio	App Mockup
	Cloud Computing	Model Deployment	Deployed model on cloud server
			Developed mobile app with integrated ML model
3	Machine Learning	Model Development and Deployment	Selected model with better accuracy
	Mobile Development	Mobile App Development and Integration with ML Model	Developed mobile app with integrated ML model

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	Cloud Computing	Server API Development and Monitoring	Developed server API for mobile app integration, monitoring report of server performance
			Developed server API for mobile app integration, monitoring report of server performance
4	Machine Learning	Documentation and Project Management	Project documentation and ML model documentation, daily progress report and task tracking
	Mobile Development	Finalizing Software works	Application file
	Cloud Computing		
	Machine Learning / Mobile Development / Cloud Computing	Project Presentation and Final Testing	Final testing report of app functionality and server performance, project presentation

Project Schedule:
Our project schedule will make use of a Gantt chart, from the pre-production stage through finalization stage. Here is the link to the chart:

https://docs.google.com/spreadsheets/d/1nndH5Mo7PQ-eVA6JAv1SjiE7HP6IIc07aDNMLjoRtaE/edit?usp=sharing

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

1. Machine Learning
    a. Tensorflow
    b. Tensorflow.lite
    c. Mobilenet/other pre-trained model
2. Mobile Development
    a. Android Studio
    b. Glide
    c. Retrofit
3. Cloud Computing
    a. App Engine
    b. Firestore

Based on your knowledge and explorations, what will your team need support for?

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We need specific mentors for Cloud Computing on clouding android application, Mobile Development on building android app, Machine Learning on building the model. We need a kind of letter of assignment for data gathering to the tobacco farmer community.

Based on your knowledge and explorations, tell us the Machine Learning Part of your Capstone!

Our capstone project's machine learning component centers around the auto-classification functionality for the quality of Garangan tobacco, which can be accessed by the user by uploading images of the product from the seller. We plan to use CNN-based image classification and a pre-trained model to develop this feature.

Based on your knowledge and explorations, tell us the Mobile Development Part of your capstone?

Our team uses the Android Studio IDE and native Kotlin to develop the mobile application that we will make. We also use several libraries, such as retrofit made by Square to do Networking to Web API and the RoboPOJOGenerator plugin in Android Studio to generate model classes automatically. Then we also use Glide to load images. Here we attach the library link that we will use: https://github.com/bumptech/glide.

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

We will use the Flexible environment from App Engine to Deploy the Application and the machine learning model to Google Cloud Platform so that we can configure the backend service when needed. And lastly We will be using Firestore to create the database environment (Creating Cloud firestore in native mode apply region to the project and connect the firestore to the application.

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

There is no dataset of Garangan tobacco with its quality on the internet. We need to gather data directly from the farmers or sellers. We'll use data augmentation too.

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

This project will be targeted to output a minimum value proposition (MVP) of a Garangan tobacco classification. Then we will build the auction system. If this project is selected as one of the incubator funding recipients, the application will be developed with more local tobacco kinds.