

Project Plan for Bangkit 2023 Product-based Capstone

Team ID : C23-PS455

Team Member : (Please adjust according to your team members)

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Final Selected Themes:

Human Healthcare and Living Wellbeings ▾

Title of the Project:

SCANTION

Executive Summary/Abstract:

According to the World Health Organization (WHO) reports, cancer is one of the world's leading causes of death globally and is responsible for about 10 million deaths annually. Cancer is responsible for around one in every six deaths worldwide. Between 2008 and 2030, global cancer fatalities are expected to rise by 45%. Skin cancer is the fifth most prevalent type of cancer and one of the most dangerous, with a dramatic spike in mortality due to a lack of awareness about signs and prevention.

Lately, to identify skin cancer, dermatologists have to begin with the evaluation of suspicious lesions with the naked eye, followed by dermoscopy (magnifying lesions microscopically), and finally, biopsy. The patient might move on to further stages and this would take time. To solve this problem, our team wants to provide an application that can help users to identify skin cancer that is more exact, less expensive, and faster by simply uploading images to our application.

How did your team come up with this project?

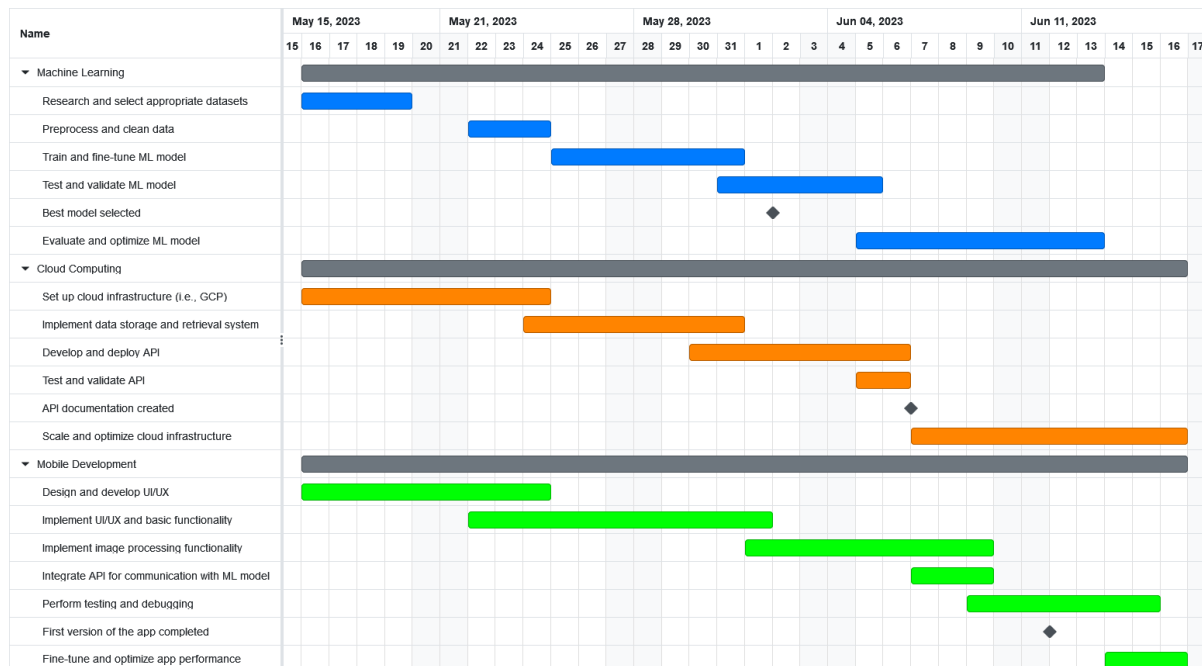
Our team is working on an application that aims to provide early detection of skin cancer. It is a well-known fact that many people are not aware of their skin health, and our team believes that this application can help bridge that gap. Our application uses the principle of image detection, powered by a machine learning model, to analyze uploaded images and generate a classification of the skin cancer detected. To use the application, the user simply takes a picture of their skin and uploads it. Within seconds, the application provides a result that indicates if there is any evidence of skin cancer. If the application detects skin cancer, it also provides sufficient information about the type and classification of the cancer detected. This information can then be used by the user to seek appropriate medical attention and take necessary steps to prevent further complications. Overall, our team believes that this application can play a vital role in educating and empowering people about their skin health and help in the early detection of skin cancer, potentially saving lives.

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Project Scope & Deliverables:

Role	Task	Target	Time
Cloud Computing	Deploy Virtual Machine (GCP)	Make Virtual Machine	7 Days
	Make a API for data	Connect to Android	2 Weeks
Machine Learning	Collecting dataset	Dataset image skin cancer	7 Days
	Training Dataset	With >85% accuracy	3 weeks
Mobile Development	Design interface	Wireframe, Mockup, Prototype	7 Days
	Make android app	Can use the app properly without any error	3 Weeks

Project Schedule:



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

1. List of tools
 - a. VSCode
 - b. Tensorflow
 - c. Android Studio
 - d. Figma
 - e. Google Cloud Platform
 - f. Kaggle
 - g. Adobe Photoshop (For Logo)
 - h. Android Device or Android Virtual Device/AVD (for testing)
 - i. Laravel Framework
2. Dataset resources
 - a. <https://www.kaggle.com/datasets/suraighuwalewala/ham1000-segmentation-and-classification>
3. Paper/journals/articles
 - a. <https://doi.org/10.1016/j.bea.2022.100069>
 - b. <https://doi.org/10.1016/j.bspc.2022.104186>
 - c. <https://doi.org/10.1016/j.ijleo.2022.170337>

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

- Budget:
 1. GCP Voucher : \$ 200
 2. Emergency Cost : \$250
- Data
 1. API Indonesia's Hospital
 2. Skin Cancer Dataset
- Mentor for technical code for machine learning, mobile development, and cloud computing
- Mentor for business

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

Our team will build a machine learning model based on deep learning (CNN Method) to detect skin cancer and generate the classification type of skin cancer (Melanoma or non-Melanoma).

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

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We will build an Android Application using Kotlin and Android Studio. The application will communicate with a server through a RESTful API implementation to retrieve information, such as user data and classification results. To design the app's UI/UX, we will utilize Figma to create detailed wireframes and interactive prototypes.

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

We will build a few API for database personal information and list of hospitals or clinics, probably we will use a third party for the hospitals API. For the framework we will use laravel framework. We might use the google cloud services especially the compute engine where we build the Virtual Machine and cloud SQL.

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

Here are a few other potential risks or issues that could arise during the development and deployment of a SCANTION:

Privacy and Security Risks: Handling sensitive medical data could present significant privacy and security risks, especially if the data is not properly secured. The application must be designed with strict privacy controls and data encryption to protect sensitive information.

Bias in Data: There is a risk that the data used to train the machine learning model may be biased. For instance, if the data is collected from a specific geographic region or demographic group, the model may not be accurate for other populations. This could lead to misdiagnosis or delayed treatment.

Model Accuracy: The accuracy of the machine learning model is crucial for the application's success. There is a risk that the model may not be accurate enough to provide reliable diagnoses, especially for more complex cases. Inaccurate diagnoses could lead to incorrect treatment recommendations or delays in treatment.

Data Quality: The accuracy and completeness of the data used to train the machine learning model will be critical to the application's success. There is a risk that the data may be of poor quality or contain errors that could affect the model's performance.

Technical Issues: The application may experience technical issues, such as bugs or crashes, which could affect the application's reliability and user experience.

From cloud there are a few risk potential:

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It is possible that the API will not be able to establish a connection with the Android device, which could potentially cause issues with data transfer and other functions that rely on this connection. Therefore we should always do testing the API so that the API always connects or can receive request methods. We might not be able to find a third party API the list of indonesia's hospitals, another plan we should list it by ourself.

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

Notes/remarks that should be considered when developing a SCANTION:

Collaboration with medical professionals is crucial for the development of an accurate and effective SCANTION. User interface design should be intuitive and easy to use, which is especially important for medical applications. The development of a SCANTION should be an iterative process that continually evaluates and improves the application based on user feedback and new data. Ethical and legal considerations, such as patient consent, privacy, and regulatory compliance, must be taken into account throughout the development and use of the application. Consulting with legal and ethical experts can ensure that the application is designed and used responsibly.