Project Plan
Product-based Capstone Project

Team ID : C241-PS527

Team Member :

1. (ML) M268D4KX1749 – Stella Juventia Grace – Universitas Muhammadiyah Surakarta - [Active]
2. (ML) M268D4KX1752 – Shindy Maheswari – Universitas Muhammadiyah Surakarta - [Active]
3. (ML) M228D4KX2629 – Alfun Roehatul Jannah – Universitas Jenderal Achmad Yani Yogyakarta - [Active]
4. (CC) C012D4KY0872 – Andre Christian Napitupulu – Universitas Telkom - [Active]
5. (CC) C012D4KY0963– Anton Pratama Yuwono Putra – Universitas Telkom [Active]
6. (MD) A008D4KY3556 – Muhammad Zhafran – Universitas Gadjah Mada - [Active]
7. (MD) A008D4KY3787 – Arif Rahmat Maulana – Universitas Gadjah Mada - [Active]

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Final Selected Themes:

Empowering Minds: A holistic approach to education and personal development

Title of the Project:

Historia

Executive Summary/Abstract:

The objective of this project is to teach and improve the knowledge of childrens and people by creating a history learning program in everyday life, leveraging machine learning, mobile development, and cloud computing technologies. Specifically, the project aims to evaluate the effectiveness of the program in teaching historic knowledge.

Problem Statement:

Knowing and understanding history is important for us to remember the hardship and our culture so that we will not forget it, the lack of reading with misinformation and also lack of personalized guidance, often hinders individuals from knowing and understanding our history.

Research Questions:

- How can a history app be developed to peak an interest in learning history?
- What are the most effective strategies for promoting reading literacy?
- How can technological innovations such as AI and wearable devices be leveraged to teach people about history?

Background Information:

Indonesia's history is a tapestry of diverse cultures and influences. The archipelago has been inhabited for tens of thousands of years, with early hunter-gatherer societies evolving into complex civilizations engaged in trade and agriculture. From the 1st century CE, Indian traders brought Hinduism and Buddhism, leading to the rise of powerful kingdoms like Srivijaya and Majapahit. Islam spread gradually from the 13th century, resulting in the emergence of Islamic Sultanates. European colonialism began in the 16th century, with the Portuguese followed by the Dutch, who ruled Indonesia for over three centuries. Dutch colonization profoundly impacted Indonesian society, economy, and culture. After World War II, Indonesia fought for independence, finally achieving it in 1949 after a struggle against Dutch colonial rule. Post-independence, Indonesia faced political and economic challenges. Suharto's authoritarian rule from 1965 to 1998 brought stability but also repression and corruption. Since Suharto's resignation, Indonesia has transitioned to democracy, making significant strides in economic development despite ongoing challenges such as corruption and religious extremism.

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How did your team come up with this project?
We came up with this idea because we want to teach everyone about the history of our beautiful country. As we see it now, not many people are interested in learning history and our culture. Because of the lack of knowledge and because of our low literacy skill, not many people want to search, look or read about our history. With this app we hope to improve the knowledge of our people through an application that is simple and informative so everyone can easily learn and understand about the history and cultures.

Project Scope & Deliverables:

<table>
<tr><th>Team</th><th>Mobile Development</th><th>Machine Learning</th><th>Cloud Computing</th><th>Delivery per week</th></tr>
<tr><td></td><td rowspan="3">Setup the mobile development environment</td><td rowspan="3">Search for related journals</td><td rowspan="3">Search for other Project Infrastructure</td><td rowspan="3">Week 1
(May 1 - May 13):
Team:
- Project Plan
- Task Assignments and responsibilities N</td></tr>
<tr><td>Define project boundaries and requirements</td></tr>
<tr><td>Assign task and responsibilities to team members</td></tr>
<tr><td>Waiting for announcement result review on project plan</td><td></td><td></td><td></td><td>Week 2
(May 14 - May 20</td></tr>
<tr><td rowspan="2">Revise project plan revision if there is any</td><td>Develop app UI/UX design (2 days)</td><td>Explore dataset libraries, may perform some EDA</td><td>Requirement Identification</td><td rowspan="2">Week 3
(May 21 - May 26):
Android:
- Resource gathering and requirement identification
Cloud Computing:
- Requirement Identification
- Infrastructure Identification
Machine Learning:
- A Much better understanding about data and the cleaned version of it</td></tr>
<tr><td>Develop the app UI and basic features (5 days)</td><td>Pre-processing dataset: cleaning data.</td><td>Infrastructure Identification</td></tr>
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	Develop features 5-6 (5 days)	Building machine learning models	Set Up Compute Services	**Week 4 (May 27 - June 2):** Android: - Designing UI/UX and user workflow Cloud Computing: - Set Up Compute and Storage Services Machine Learning: - Building machine learning models
	Prepare the app for integration with cloud. (2 days)		Set Up Storage Services (Database)	
	Develop features 1 - 4 (6 days)	Developing and refine model algorithm	Manage Operations (Logging, Monitoring, Tracing, etc)	**Week 5 (June 3 - June 8):** Android: - Mobile app Main Page and Container for main feature (use dummy feature) Cloud Computing: - Manage Operations Machine Learning: - Test and validate ML algorithms
	Fix bugs in the app (1 days)			
Team review and testing on the application	Fix the remaining bugs for Mid Checkpoints (2 days)	Optimizing model algorithms	Deploy Application and Services	**Week 6 (June 9 - June 15):** Android: - Fixing the main page and start log in page Cloud Computing: - Deploy Application and Services Machine Learning: - ML model optimization
	Improve the app features based on feedback			

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Team review and testing on the finalized application	Test and debug app Fix bugs	Testing model and accuracy	Maintain Application and Services	**Week 7** **(June 16 - June 19):** Android: - Fixing login page with additional feature if feasible Cloud Computing: - Maintain Application and Services Machine Learning: - ML Model improvement based on user feedback
	Fix the bugs in the application.	Deploying model	Product Finalization	**Week 8** **(June 20 - June 21):** Android: - Final app version - Use case diagram - Data Flow diagram Cloud Computing: - Product Finalization - Prepare MVP and Presentation Machine Learning: - Finalize ML model and integration

Project Schedule:

Dates	Android	Cloud Computing	Machine Learning
May 13, 2024	Team Meeting for Project Plan Submission		
May 20, 2024	Project Plan Review Announcement		

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May 21, 2024	Develop UI/UX and basic function of mobile app	Setting up cloud infrastructure	explore dataset
May 26, 2024	Team Meeting		
May 27, 2024	Develop feature 5-6	Managing cloud infrastructure	Train model
Jun 1, 2024	Prepare the integration with cloud	Manage backend infrastructure to cloud and ML models	Refine model algorithms
Jun 2, 2024	Team Meeting		
Jun 3, 2024	Develop features 1 - 4	Testing backend	Develop model for another feature
Jun 9, 2024	Team Meeting		
Jun 10, 2024	Team testing the app to ensure all features are easy to use and there is no bug (Mid CheckPoint)		
Jun 15, 2024	Improve UI and features based on feedback	Optimizing backend infrastructure	Optimizing model algorithms
Jun 16, 2024	Team Meeting		
Jun 17, 2024	Test and Debug app	Ensure scalability, performance quality, and security	testing accuracy
Jun 18, 2024	Team Meeting		
Jun 19, 2024	Team testing the finalized app to ensure all features are easy to use and there is no bug, and prepare all the required documentations		
Jun 21, 2024	Final Checking (Final Deliverables Submission)		

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

There are several Tools/IDE/Libraries and resources that will be used in this project, including but not limited to:

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- Version Control:
  - **Github** (collaborative development. It allows our team to track changes, manage code versions, and resolve conflicts efficiently)
- **Cloud Computing**

  IDE :
  - **Visual Studio Code (**A versatile code editor with extensive support for cloud development workflows and integrations with cloud providers**)**

  Library :
  - **Express** (A lightweight Node.js web framework ideal for building the API that will be hosted in the cloud and interact with mobile app)
  - **bcrypt** (Ensures the security of user passwords by hashing and storing them in our cloud database)
  - **body-parser** (Simplifies the handling of data sent in requests to our cloud-hosted API)

  Resources :
  - **GCP Compute Engine** (Provides the virtual machines that will host our Express API in the cloud)
  - **GCP Cloud SQL** (its a fully managed cloud database service for storing structured data like user information and historical site details)

- **Machine Learning**

  IDE :
  - **Google Colaboratory / Jupyter Notebook** (Browser-based environments for experimenting with and developing our machine learning models, with easy access to GPUs for faster training).

  Resources :
  - **Kaggle** (A vast repository of datasets, potentially offering pre-existing datasets of historical sites or images that we can use to train or supplement our model)
  - **RoboFlow** (A platform for annotating images, essential for creating the training data our model needs)

  Libraries :

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- **TensorFlow** (An open-source deep learning framework developed by Google for numerical computation using data flow graphs)
- **Pandas** (A powerful Python library for data analysis and manipulation)
- **Numpy** (A fundamental Python library for numerical computing)
- **Keras** (A high-level deep learning API built on top of TensorFlow that simplifies the process of building and training neural networks)
- **Scikit Learn** (A popular Python library for machine learning that offers a wide range of algorithms for classification, regression, clustering, dimensional reduction, and more)

- **Mobile Development**

  IDE :

  - **Android Studio** (The official IDE for Android development, providing tools for designing layouts, debugging, and building our app)

  Library :
  - **Retrofit** (Simplifies communication between our Android app and the backend API hosted in the cloud)
  - **SharedPreference** (Enables storage of simple data on the device, such as user preferences)
  - **Room** (A powerful database library for storing data locally within the app)

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

- Need free and legal historic place datasets
- Need a mentor who can support our project with knowledge and experience in Android, Machine learning, and Cloud.
- Need an expert mentor with an e-commerce business background to help enhance our business and improve our idea.

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

For the Machine Learning part of our project, we plan to train custom models using TensorFlow. We'll explore various architectures and techniques, such as transfer learning, to optimize performance. Deployment will be done using TensorFlow.js/TFLite, ensuring compatibility with our mobile app without relying on Google Colab or local files.

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

Mobile development part of our capstone will be developing and integrating the application with the cloud services and machine learning models. This part will also design the UI/UX of the application.

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

The cloud part of this capstone is to use GCP to create and configure VM, storage, and database to store and manage the app's data, also making API for authentication and authorization. The backend would have a RESTful API that enables the front end to access and manipulate data.

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

1. Require an internet connection
2. Cost Management
3. Data Accuracy and Completeness

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