Team ID: B21-CAP0467

Active Member ID and Name:

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Inactive Member ID and Name:

- NONE

Selected Theme: Mobility & Smart City

Title of the Project: Optimization of public complaint reporting system

Executive Summary:

There are many applications developed by the government with public complaint reporting as one of its features (or maybe the only feature). Some of these applications are Jakarta Smart City, Jalan Cantik, and SIKOJA. In these applications, the public can make complaints, reporting things such as damaged roads, damaged bridges, trees covering the highway, and many other cases concerning public facilities' conditions.

To make a complaint report, the public (a user) is required to upload some photos of evidence, scene information, a short description of what happened; and then chooses the case of the report being made. After that, the report is simply sent to the system for then gets checked by related officers. This process might sound totally fine, but we find a problem there.

The problem we found is that these applications act as "a place for collecting reports", literally. What we mean by it is that the system has no filtering procedure for incoming reports. All the reports being made are received by the system and need to be validated by officers one by one, including fake reports and the invalids. A user can pretend to make a road damage report while the photos of evidence are totally unrelated to the case being reported, and this fake report will still get received by the system and not considered spam. The absence of a filtering procedure in these applications makes the work of officers become inefficient and more time-consuming. Therefore we propose an idea to implement Machine Learning in the public complaint reporting system.

The first step that can be taken for that implementation is to make a filtering procedure for fake or invalid reports. This implementation will increase the efficiency of officers' work, making them able to focus on handling only valid reports, therefore making the public services become more effective. There are many more possible steps that can be taken, but given the limited time we have, we will focus on this filtering procedure only.

Project Scope & Deliverables:

Project Scope: The public complaint reporting system will be narrowed to handle only 4 different image cases of traffic disturbances: damaged roads, traffic jams, floods, and wildfires.		
Week	**Activity**	**Deliverable**
1	Requirement and Flow Planning	Application requirements and flow
	Design Mock Up	Application UI/UX mock-up
2	Cloud Back-end Service	Cloud architecture
	Machine Learning Modelling for Traffic Disturbance	ML model

	Application Design Code	XML, ViewModel, API Service
3	Application Integration	Make Livedata & Retrofit
	Evaluation	Evaluation report
4	Project Testing	Fix Bug / Unit Test & Instrument Testing
	Application Pitch Presentation	Presentation

Project Schedule:

Activity	Week 1		Week 2		Week 3		Week 4	
Requirement and Flow Planning								
Design Mock Up								
Cloud Back-end Service								
Machine Learning Modelling								
Application Design Code								
Application Integration								
Evaluation								
Project Testing								
Application Pitch Presentation								

Project Resources:

- Paper and articles:
  Artificial Intelligence for Smart Governance; towards Jambi Smart City by Maratun Saadah (2020)
  Document of Strategi Ketahanan Kota Jakarta by Oswar M. Mungkasa
  Smart City Governance in Developing Countries: A Systematic Literature Review(2020)

- Dataset:

Road with Pothole	https://www.kaggle.com/virenbr11/pothole-and-plain-rode-images

	https://www.kaggle.com/sachinpatel21/pothole-image-dataset
	https://www.kaggle.com/sovitrath/road-pothole-images-for-pothole-detection
Damaged Road	https://www.kaggle.com/alvarobasily/road-damage
	https://www.kaggle.com/prudhvignv/road-damage-classification-and-assessment
Surface Crack	https://www.kaggle.com/arunrk7/surface-crack-detection
Traffic Jam	https://www.kaggle.com/mashrukhzaman/banglanet
	https://www.kaggle.com/tunhunhminh/demodata
Flood	https://github.com/cvjena/eu-flood-dataset
	http://data.kalbarprov.go.id/dataset/foto-bencana-banjir-di-kabupaten-kapuas-hulu
Wildfires	http://www.kaggle.com/phylake1337/fire-dataset
	https://github.com/aiformankind/wildfire-dataset

- GCP services:

GCP Services Name	Usage
AutoML Vision API	To use google Vision API in android app
AutoML Vision/Edge	For machine learning model and training model in cloud
Google Storage Bucket	Storing dataset for training model
Cloud SQL	Storing app and data in database
Cloud Monitoring	Monitoring cloud infrastructure

Risk and Issue Management Plan:

Possible Risk and Issue	**Prepared Management Solution**
Low ML model accuracy	• Enhance preprocessing • Re-model the architecture • Reduce categories • Find dataset manually

	• Change topic
Highly complex of application Integration	• Use library • Re-model flow application • Find android documentation • Search similar apps for references
Lack of experience in using GCP services with android	• Find community and peer support • Find a mentor
Hardship in combining Android, Machine Learning, and Cloud Services	• Find problem solving in Stackoverflow