Capstone Project Proposal

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Business Goals

Project Overview and Goal What is the industry problem you are trying to solve? Why use ML/AI in solving this task? Be as specific as you can when describing how ML/AI can provide value. For example, if you're labeling images, how will this help the business?	Vehicle identification: The aim is to build model to identify vehicle. This model can be used by: • Police to regulate roads. • Police to identify stolen vehicle or theft's Vehicle at smart city. • Smart city. • Some big organizations or big companies which have large closed places to regulate road traffic. • Some users who want to identify specific type of vehicle. … I will use ML/AI to build a model with that helps the user to identify the vehicles he\she would like to identify through the cameras and use this model through Google Cloud API's.
Business Case Why is this an important problem to solve? Make a case for building this product in terms of its impact on recurring revenue, market share, customer happiness and/or other drivers of business success.	This is an important problem because: • Helps regulate roads by fining drivers who violate traffic regulations. • It saves time of people and less stress. • Helps improve economies and productivity. • Keep up with the development of technology. • Help some customer to detect specific type of vehicle. … So, we need this application to <regulate roads, makes people more stressless, improve economies and much more!>

	This application can be sold by recurring payment or per model access times.
Application of ML/AI What precise task will you use ML/AI to accomplish? What business outcome or objective will you achieve?	• Collect my data set from through sites that provide free images for use, which leads to saving money, if we need sites that provide them with an amount of money or vehicles companies. As well as editing them to have all possible colors for each vehicle.> • Using Google AutoML, I will achieve good accuracy and gain Online model access with Cloud API's. • Increase economies and productivity. • Regulating roads. • Make people's lives more organized and smoother.

Success Metrics

Success Metrics What business metrics will you apply to determine the success of your product? Good metrics are clearly defined and easily measurable. Specify how you will establish a baseline value to provide a point of comparison.	In my view Success metrics are: • The increase of economies and productivity. • Number of user and active users. • Number of use cases usage. • The less stress of people, happier and more satisfied. • Positive reviews and feedback of users. • The high rank of our model. • Keep up with the development of technology. • More popular.

Data

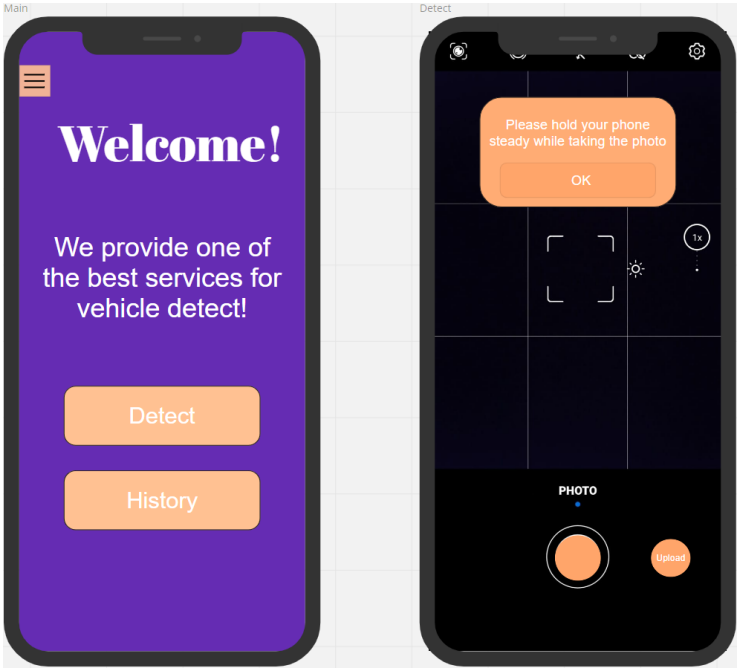
Data Acquisition Where will you source your data from? What is the cost to acquire these data? Are there any personally identifying information (PII) or data sensitivity issues you will need to overcome? Will data become available on an ongoing basis, or will you acquire a large batch of data that will need to be refreshed?	• Data source is images of vehicle from any browser, and training is done using Appen or others to create the model. • Our data collection it depends on our images, first we check for free images that have good quality. If we do not find, we will look for paid images to reduce the bias and cost. • Model is deployed to be used online with Google API or other API that give us good deal. So, the cost might be 10000$ approximately to deploy the model on Google cloud or other cloud that give us good deal. • There are some sensitive data in our model like the plate number of peoples' vehicle and faces of people. • We can add more data to the model to increase accuracy. But re-train the model costs 1500$ approximately. So, we can do this process each period.
Data Source Consider the size and source of your data; what biases are built into the data and how might the data be improved?	There might be biases on our data if we do not consider these problems: • Quality of the images. • Images' background. • Low numbers of images. • Unbalanced in number of images for each vehicle. • Not updating the data. • Some vehicles may be modified or damaged by accident, leading to a change in their appearance. • Colors of vehicle. • Resolution of camera. • And more… To solve these problems, we can do this list: • Picking high quality images. • Picking images with sample background or editing them. • Increasing number of images time to time. • Balancing in number of images. • Updating the data from time to time. • Making software that changes the color and appearance of vehicles. • High resolution camera.

	• And more…
Choice of Data Labels What labels did you decide to add to your data? And why did you decide on these labels versus any other option?	Labels are: • Type of vehicle (Road vehicle, pilot vehicle and marine vehicle). • Size of vehicle (Small, big, large…). • Brand/model of vehicle (…). • Serial number of vehicles. • Color of vehicle (White, black…). … I choose these labels as Is the target of the application to recognize vehicle by Input image. To have high accuracy for identify vehicle and provide the customer more information about the vehicle.

Model

Model Building How will you resource building the model that you need? Will you outsource model training and/or hosting to an external platform, or will you build the model using an in-house team, and why?	Use Appen platform or other platforms that give us good deal. to build the application model. Then deploy the model on Google API or other platforms that give us good deal and access the model online. Also, we will consider the sensitivity data like the plate number of vehicles. To make it inaccessible for unauthorized people.
Evaluating Results Which model performance metrics are appropriate to measure the success of your model? What level of performance is required?	Using the following tools will help us to have more accuracy and less bias for our model: • Precision. • Recall. • F1 score. • confusion matrix. … Because our model is a huge project we need more tools that help us to analyst our model, then detect where is the right problem to solve.

Minimum Viable Product (MVP)

Design What does your minimum viable product look like? Include sketches of your product.	Minimum viable product has at least detector for small vehicle (cars). It has a simple interface to enable customer to use it online with less features. Mobile version: 
Use Cases What persona are you designing for? Can you describe the major epic-level use cases your product addresses? How will users access this product?	Designing this application for people who <want to detect or identify vehicle in general. The major Customer use case: • Uploading images of vehicle. • Filtering the search to makes our model faster to detecting or identifying. • Sharing the result of detecting or identifying. • Communicating with customer support. The Administrator use case includes: • Retaining model from AutoML. • Adding more images to dataset. • Request model performance metrics. • Redesign the user interface. • Adding more features.
Roll-out How will this be adopted? What	• Application will be distributed on intermittently of time adding more features every time and fixing bugs If there are.

does the go-to-market plan look like?	• The pricing plan will be on different memberships, each with its own features, with limit of time.

Post-MVP-Deployment

Designing for Longevity How might you improve your product in the long-term? How might real-world data be different from the training data? How will your product learn from new data? How might you employ A/B testing to improve your product?	Improving the application by: • Adding more data with the time. • Checking the matrices successes. • Analyzing the model to improve it. • Adding more features. • Fixing bugs if there. • Improving user interface. • Listing for some feedback and review of customers. Real-world data might have new types and different quality than training data. Some vehicles may be modified or damaged in an accident. Even more vehicles are producing. Our model can learn from new data via training it then add it to the model. My product can add new data to the model being trained to ……. We can use A/B testing that provide our model with nice interface.
Monitor Bias How do you plan to monitor or mitigate unwanted bias in your model?	There are some bias we might face: • Some vehicles may be modified or damaged in an accident. • Less data for some vehicles. • Some vehicles have multiple colors. • New vehicles. … Charring these biases, we can review model statistics to detect the bias and solve it as well as we can do these ideas: • Make simulation software for vehicle damaged, modified vehicle as well as adding more color for the vehicle. To help our model to have more

	data for these sides. • Adding more data for our model with the time. • Taking data for new vehicles. … Always developing and improving our model to keep pace with development, reduce biases and get the best results.