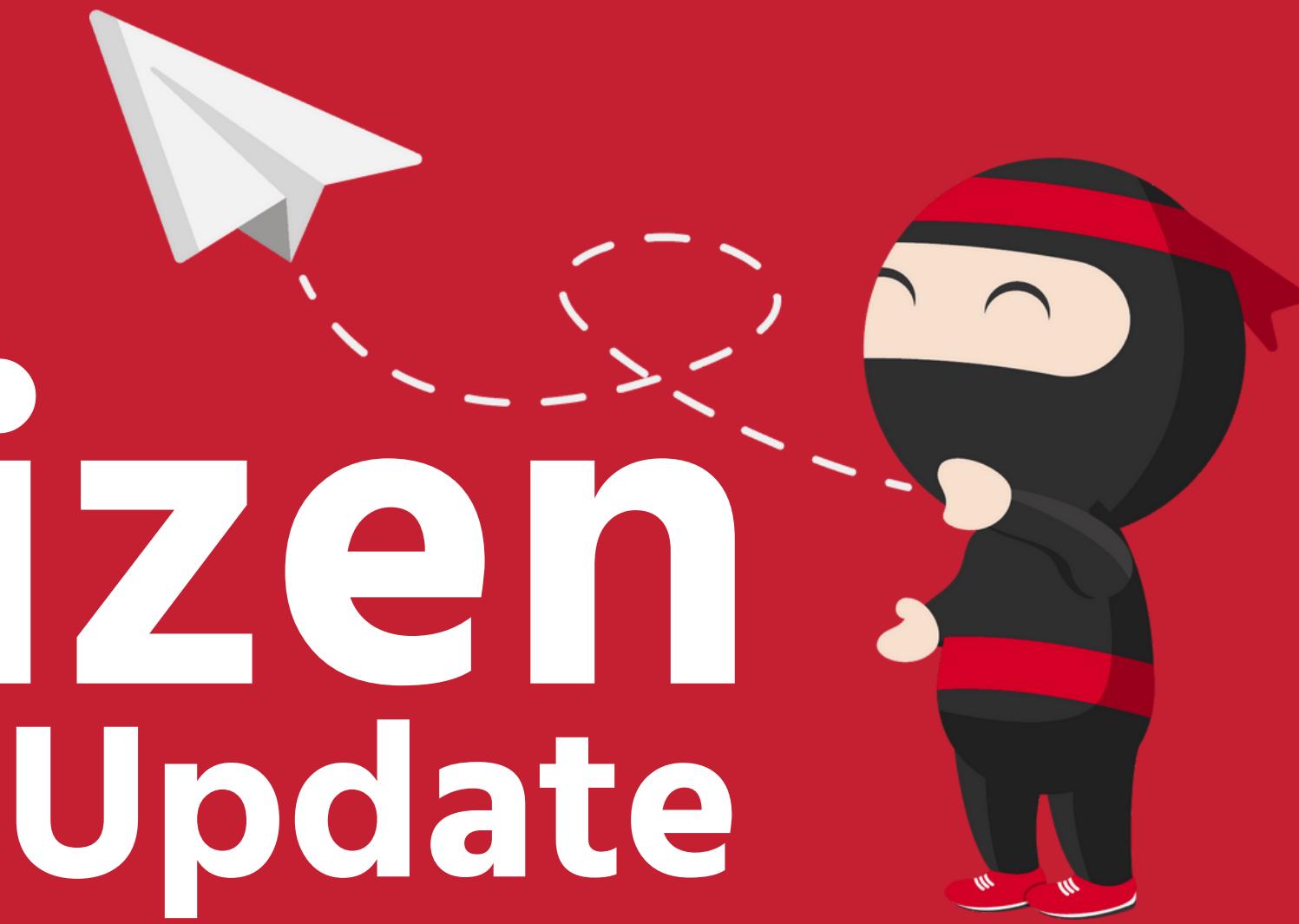
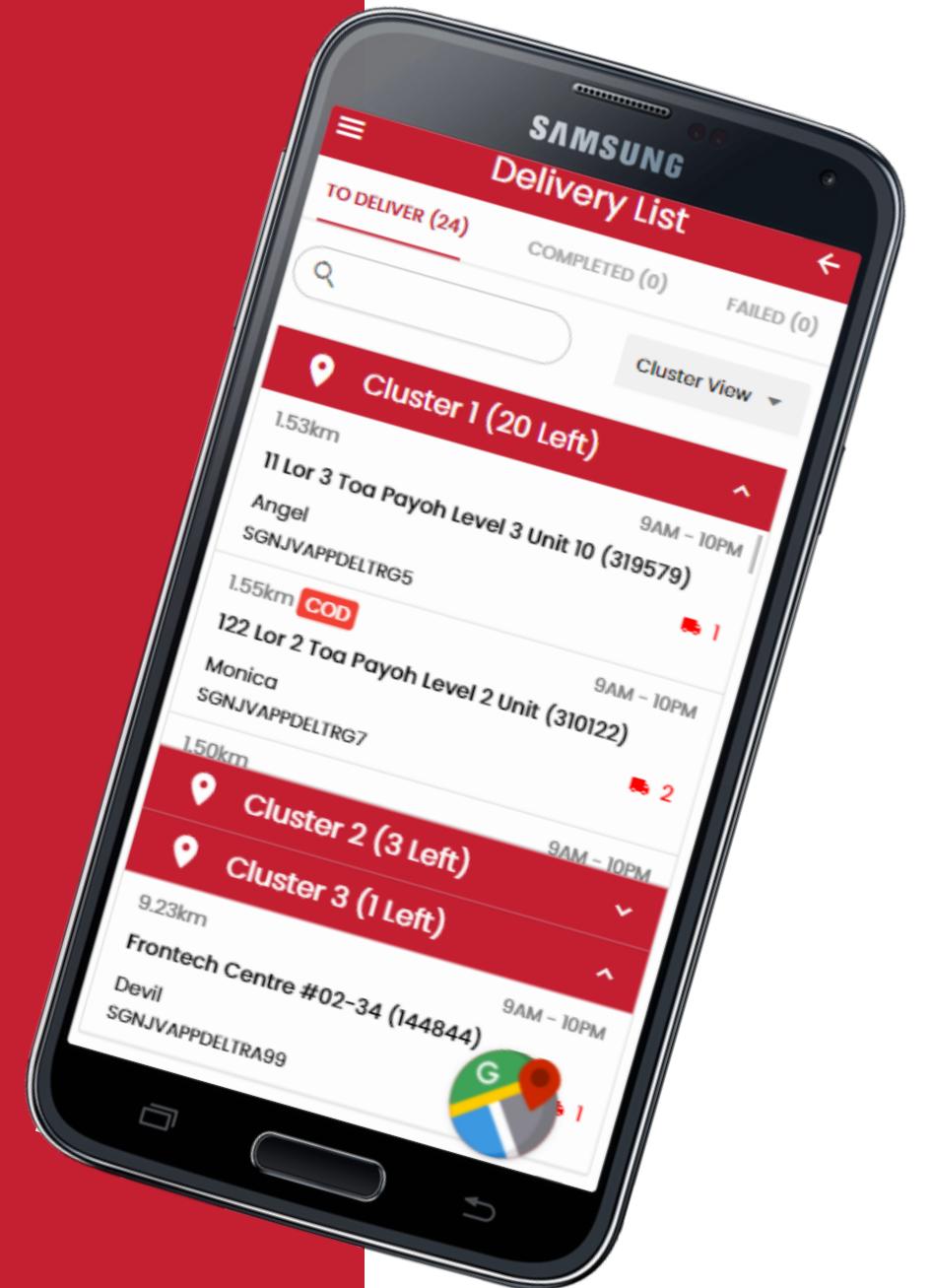


The Kaizen Update



Date of the
25 Feb 2022

Presented by
Team Kaizen



In the past 6 months,
newly registered
drivers account for

30-32%

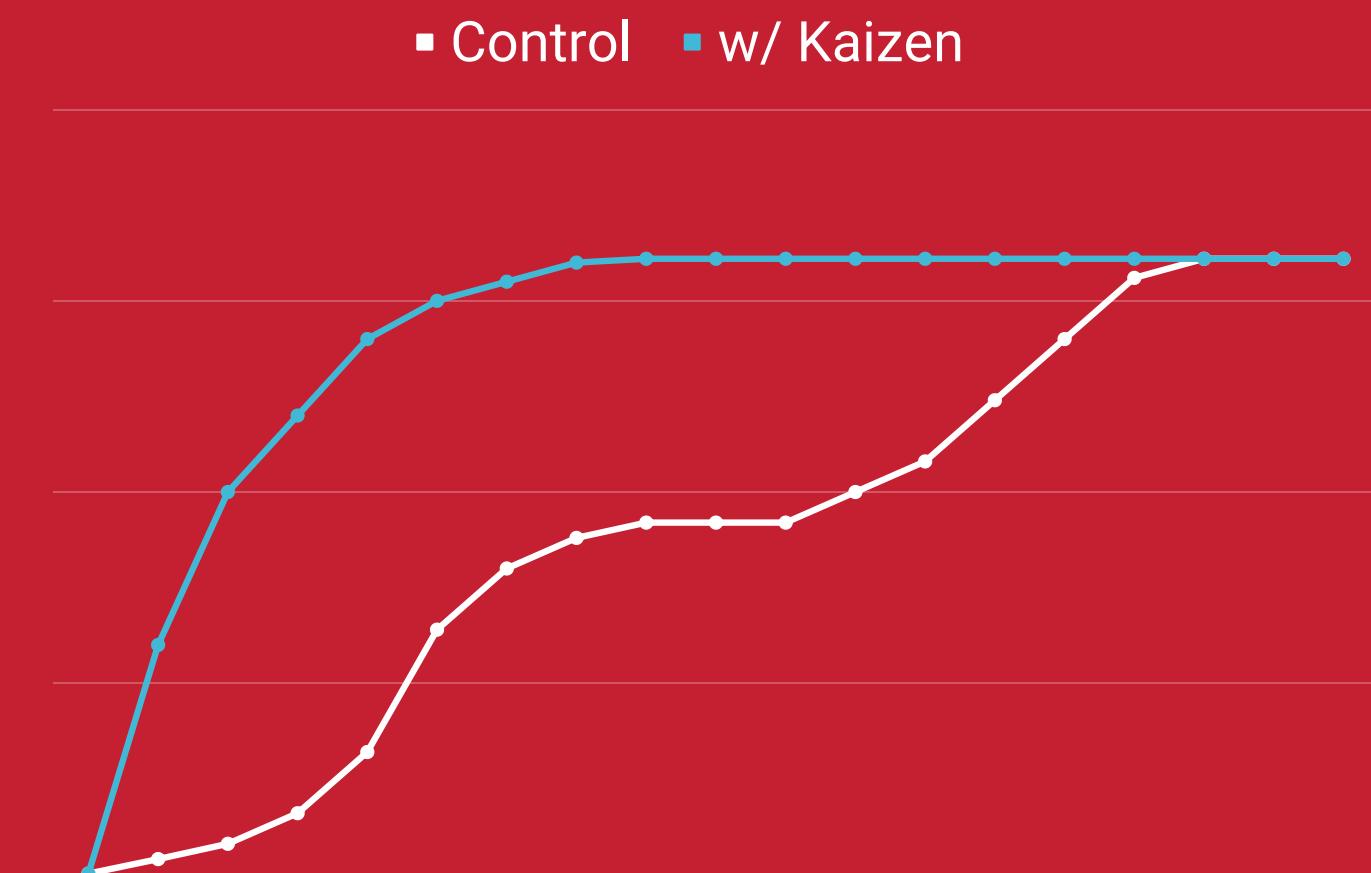


of all drivers in the
Ninja Van fleet.

Problem

Human intuition is as powerful as it is dangerous. While experienced drivers are able to determine and optimize delivery routes, it is often not the case for novices.

For these new drivers, unfamiliarity and poor intuition can often lead to costly mistakes in routing; reducing their productivity and that of the company.



Learning Curve for New Drivers in Route Optimisation

In last mile delivery, time is an important factor that affects the delight of both driver and consignee.

With Kaizen, new drivers are equipped with powerful tools to minimise mistakes and maximise productivity, ensuring a smooth delivery for consignees.

Solutions



Driver Turn Management

We digitalised the driver turn management process — drivers can now seamlessly and reliably collect their parcels for delivery.



Route Optimisation

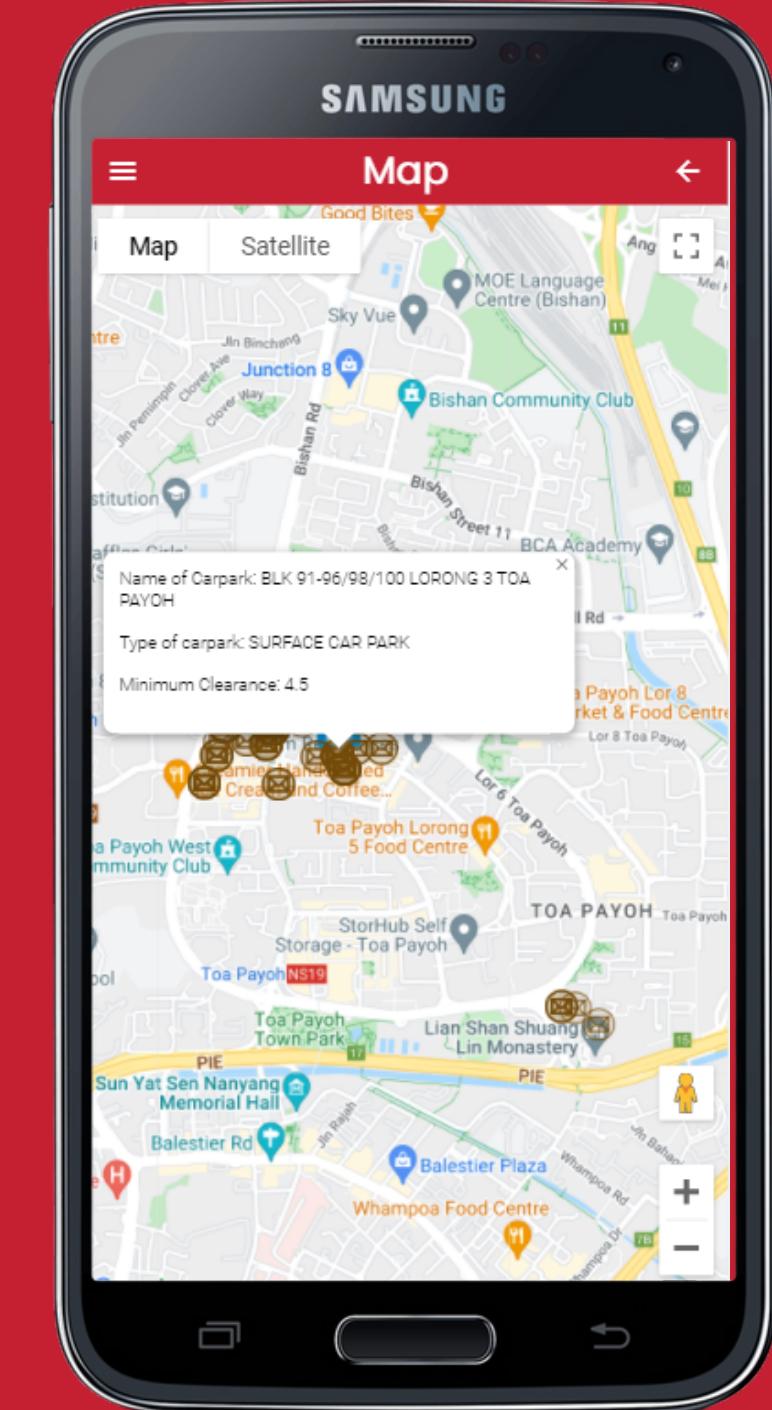
We leverage clustering algorithms and deep learning to transfer useful insights from existing drivers to newcomers.



UI/UX Revitalisation

We revitalise the UI/UX of the driver's app, bringing delight not just to newcomers, but to all drivers.

Introducing



Learning & Productivity Redefined.

Bridging the Gap Between Old & New

About

The
Kaizen
Update



We are combining human intuition from experienced drivers with deep learning, providing newcomers with an accelerated learning journey.



We all know change is the only constant and as a leading innovative logistics provider, passing on valuable insights from older drivers to newcomers is paramount for continuous improvement.



Update Roadmap



End-Feb 2022 (MVP)

Phase I: Theoretically Optimal Solution

- Advanced Clustering Algorithm (HDBSCAN)
- Centroid in Geographical Cluster
- Identify Theoretically Optimal Unloading Zone based on Public Carpark API

End-Apr 2022 (Alpha)

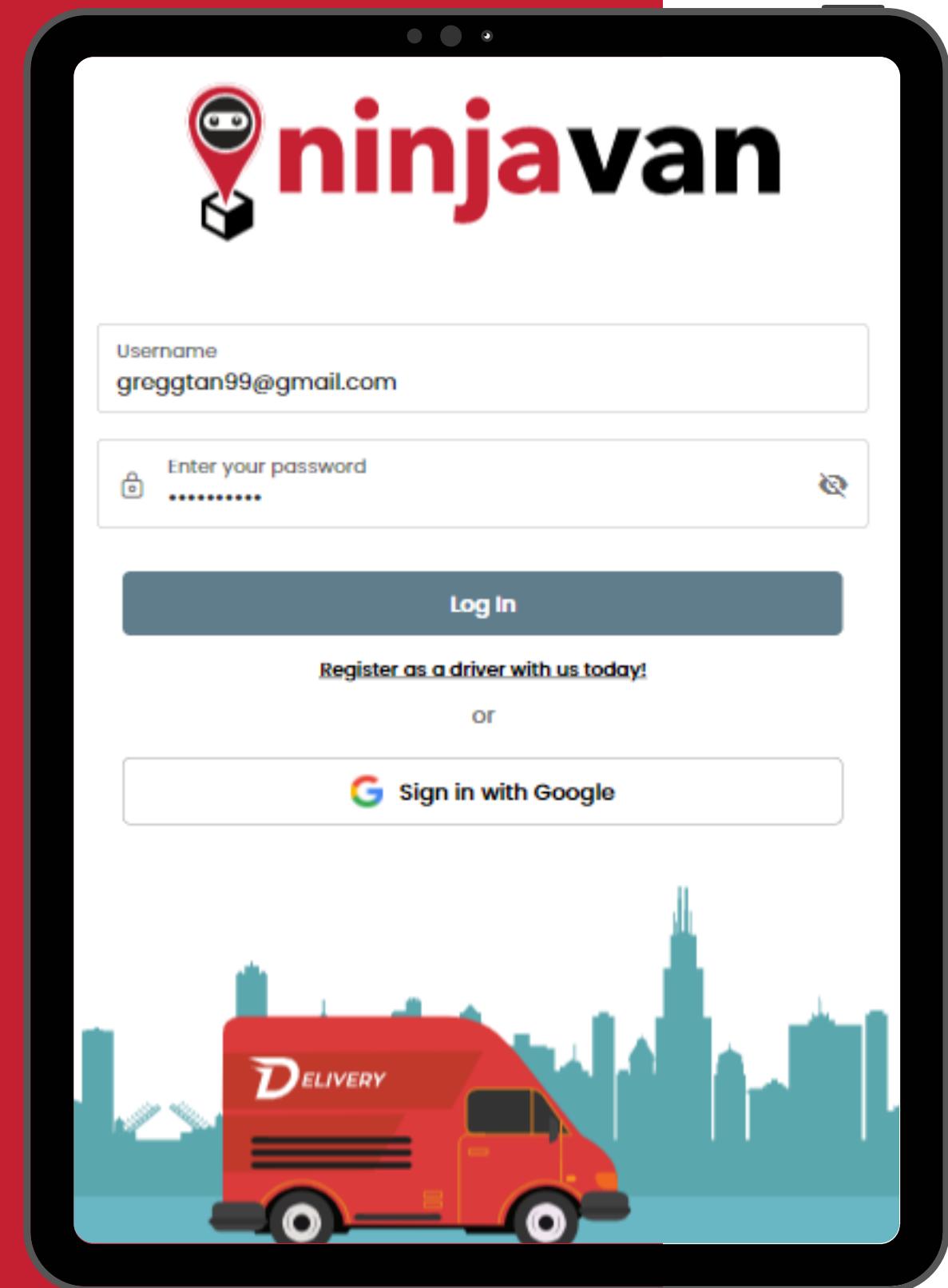
Phase II: Empirically Optimal Solution

- Data Collection from Experienced Drivers
- Model Delivery Behaviour with Deep Learning
- Identify Empirically Optimal Unloading Zones based on Cluster Similarity

End-Aug 2022 (Beta)

Phase III: Scale & Refine Parameters

- Additional Data Collection from Experienced Drivers
- Model Routing Behaviour for Similar Clusters
- Exponential Weighted Moving Average for ML

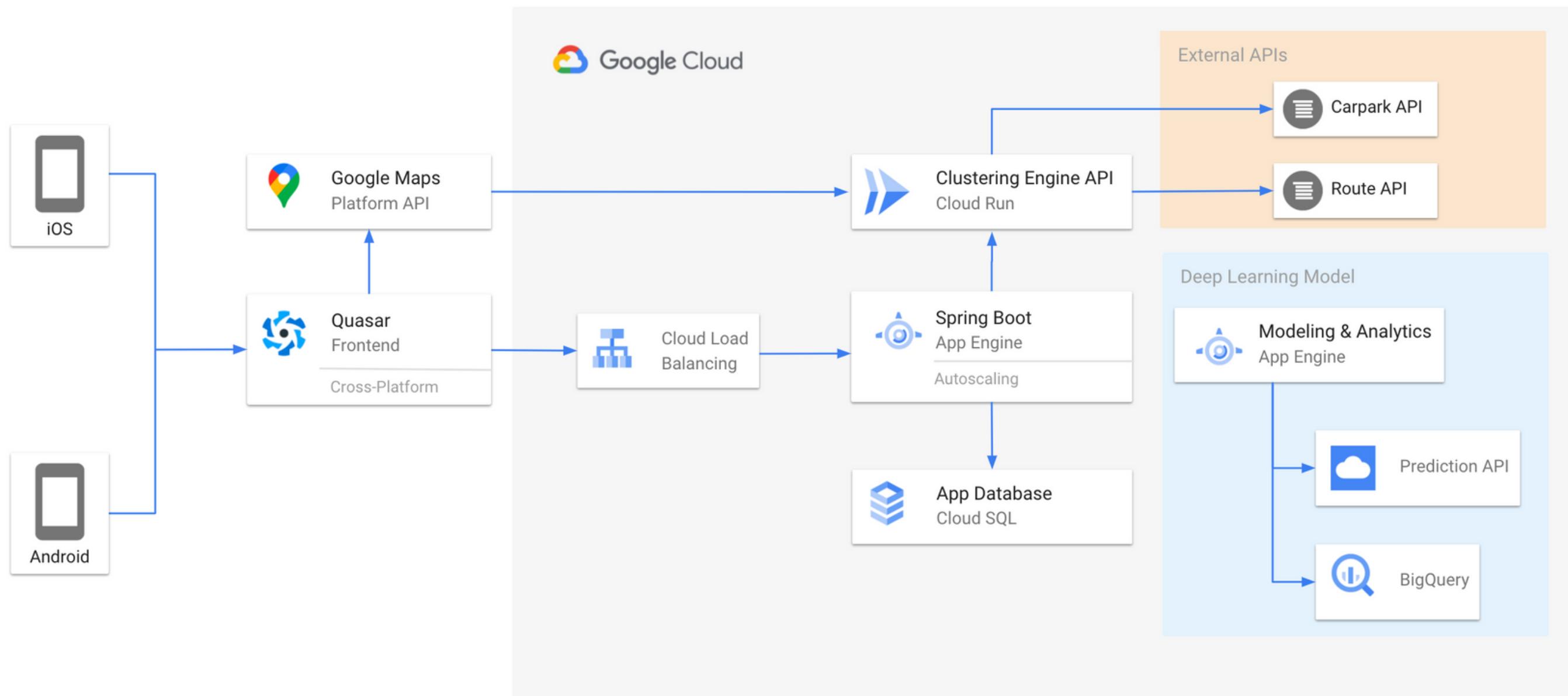


Phase I

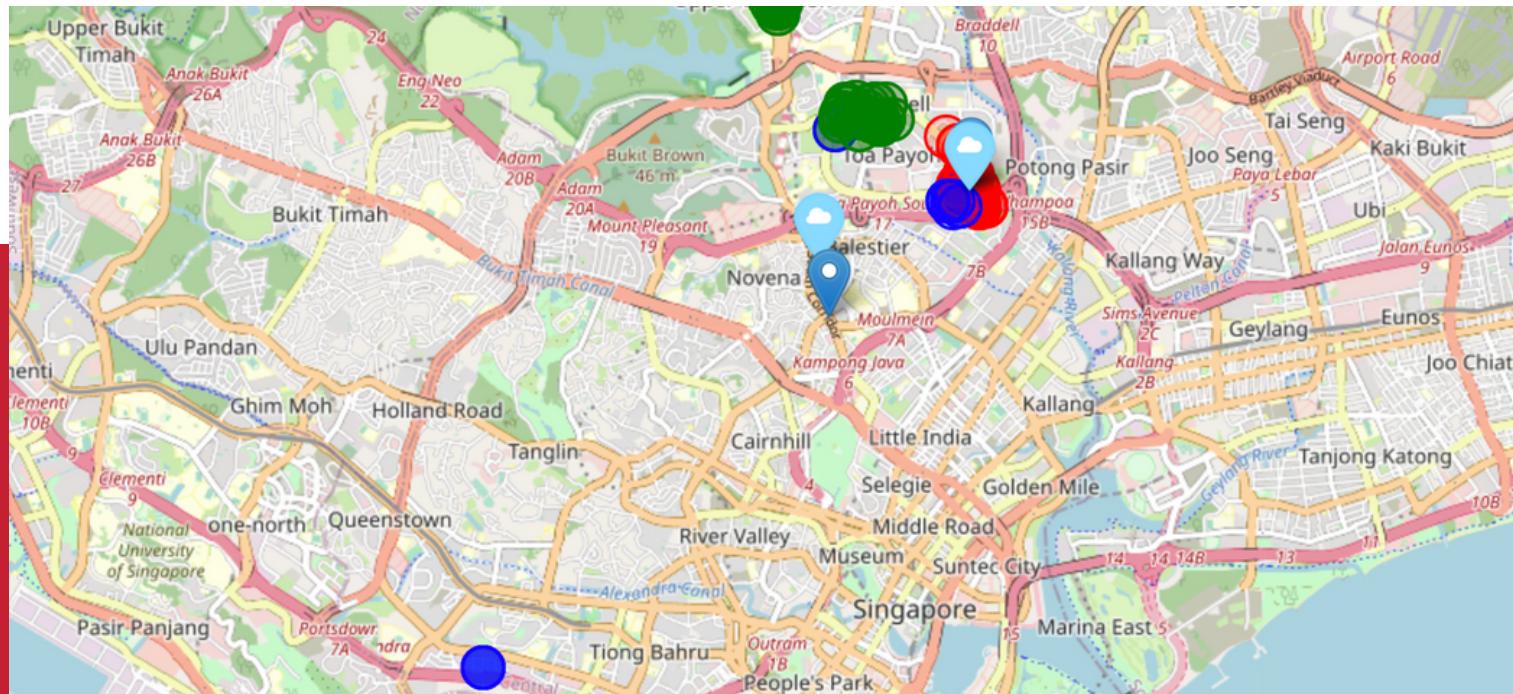
Features &

Methodology

Solution Architecture

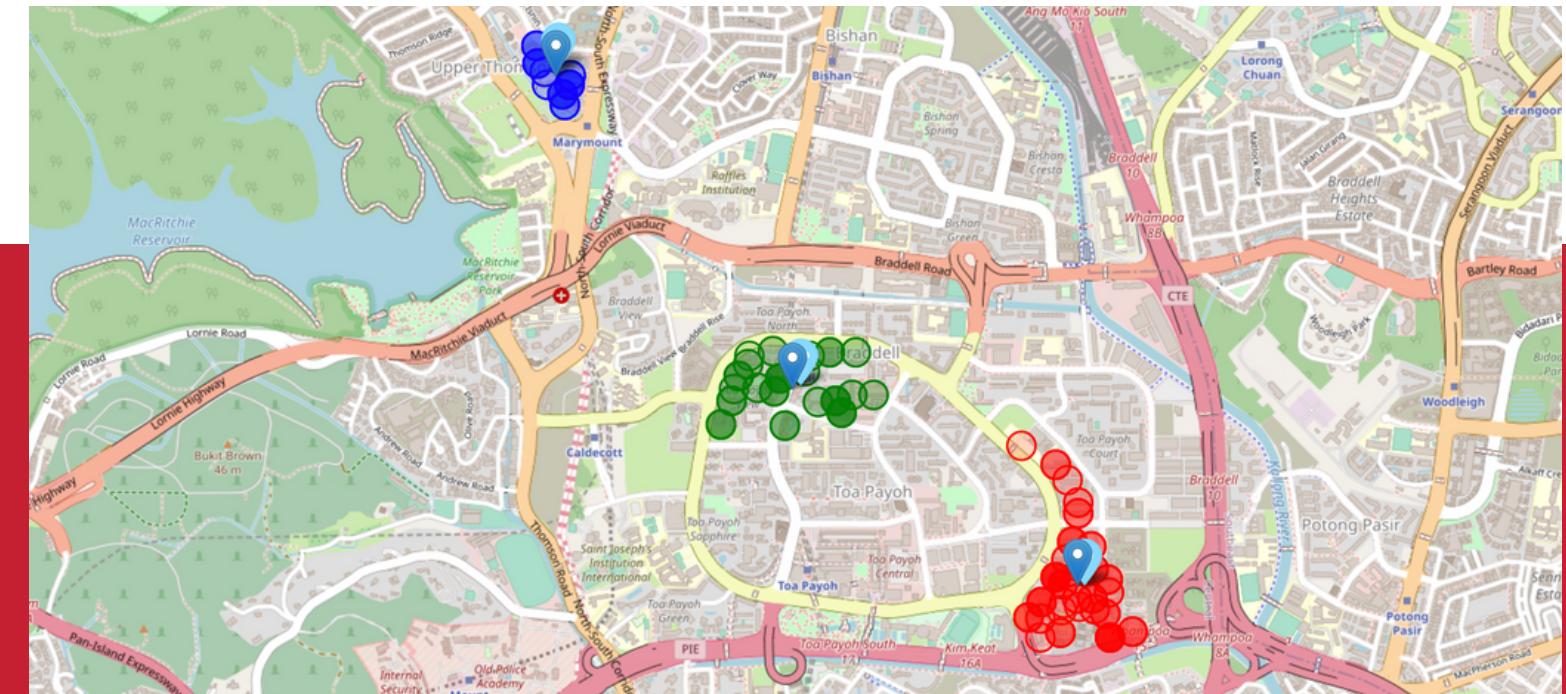


K-Nearest-Carparks



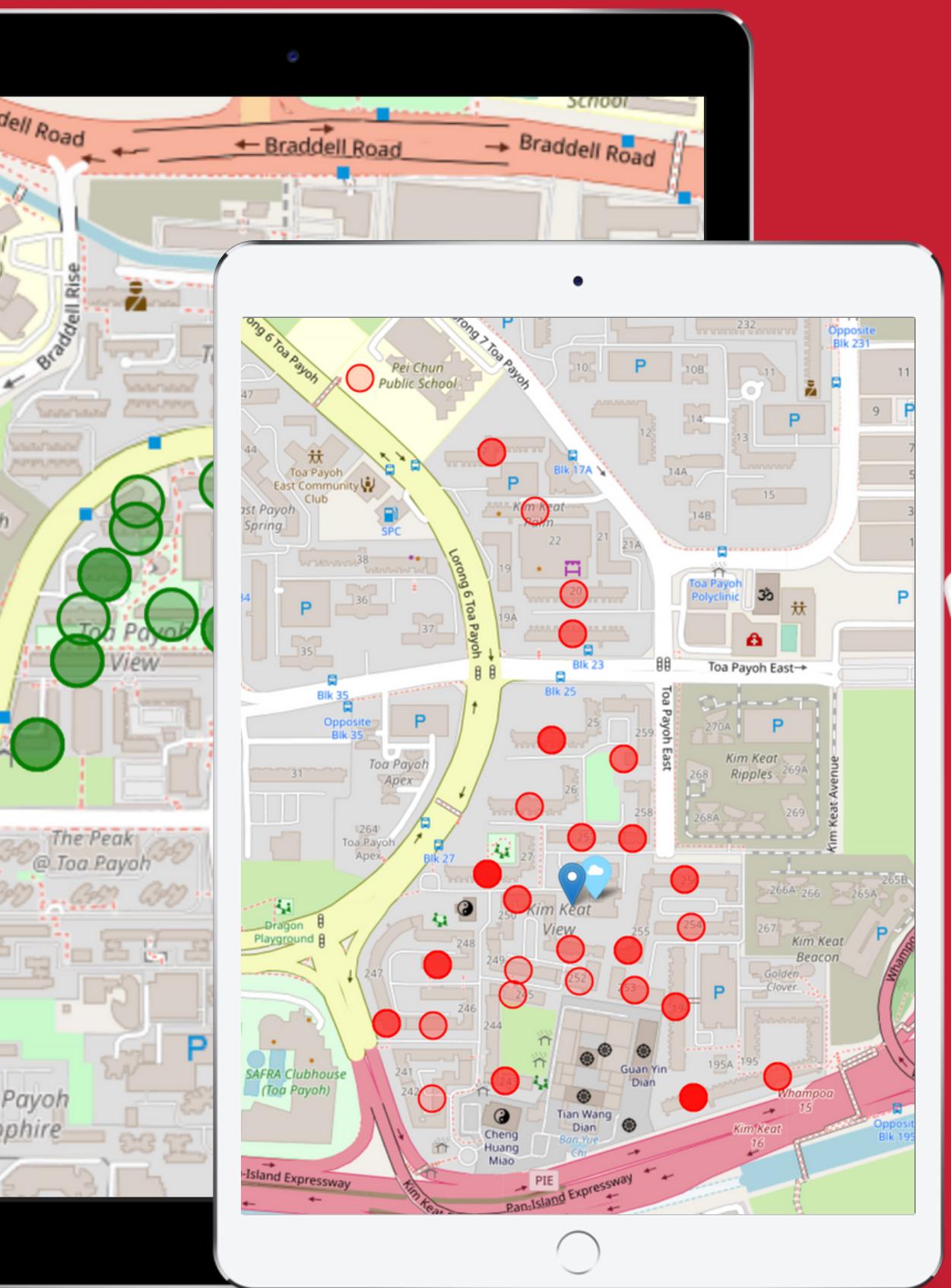
Centroid-Based Clustering (K-Means)

- Must Specify No. of Clusters
- Only Supports Spherical & Convex Clusters
- Bad with Outliers & Noise



Density-Based Clustering (HDBSCAN)

- No Need to Specify No. of Clusters
- Size & Shape Agnostic
- Efficiently Handles Outliers & Noise



1

**Identify clusters in a route
using HDBSCAN**

2

**Find the centroid of a cluster
using average of cluster
coordinates**

3

**Calculate the shortest distance
between centroid and public
car parks**

4

**Return the coordinates of the
theoretically optimal car park.**

UI/UX Revitalisation



**"We want not only
to bring delight to
new drivers, but to
all drivers."**

- Team Kaizen

