

SMART INDIA
HACKATHON
2020**Vel Tech**Rangarajan Dr. Sagunthala
R&D Institute of Science and Technology
(Deemed to be University Estd. u/s 3 of UGC Act, 1956)

WhatsInAName

PS ID: DRI35**(Virtual Tourist Guide)**

Govt. of Goa

Main goals

From our problem statement, we basically find the following required things:

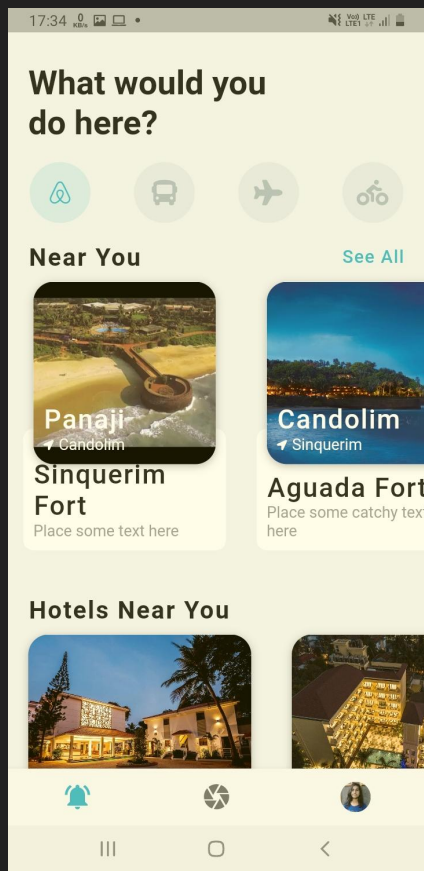
- Clicking pictures to get information about the place
- Suggestions for similar places in the vicinity
- Collection of user reviews
- Statistics tracking for the monument/landmark with user details

Landmark classification

- **EfficientNet** is used for transfer learning
- EfficientNet is the current state-of-the-art model for image classification
- Our classifier is trained on **15000+** images, spread across **15** distinct classes*
- Lightning fast classification due to less no. of parameters (< 1s)
- Low resource usage, even on the deployment

*Classes included: Our Lady of the Immaculate Conception Church, Se Cathedral, Aguada Fort, Basilica of Bom Jesus, Chapora Fort, Church and Convent of St. Francis of Assisi, Corjuem Fort, Mae De Deus Church, Shantadurga Temple, Ponda Fort, Ramnathi Temple, Reis Magos Fort, Safa Masjid, St Augustine Tower Ruins, Yashwantgad Fort

Home Menu

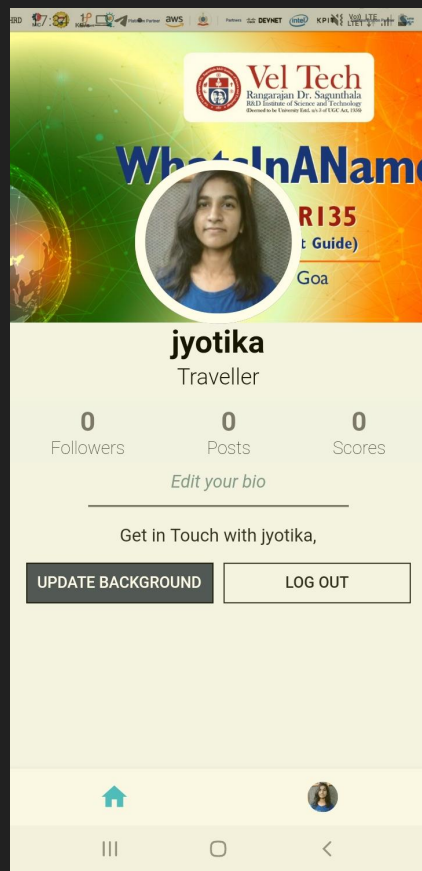


SOS
button

Camera

Profile

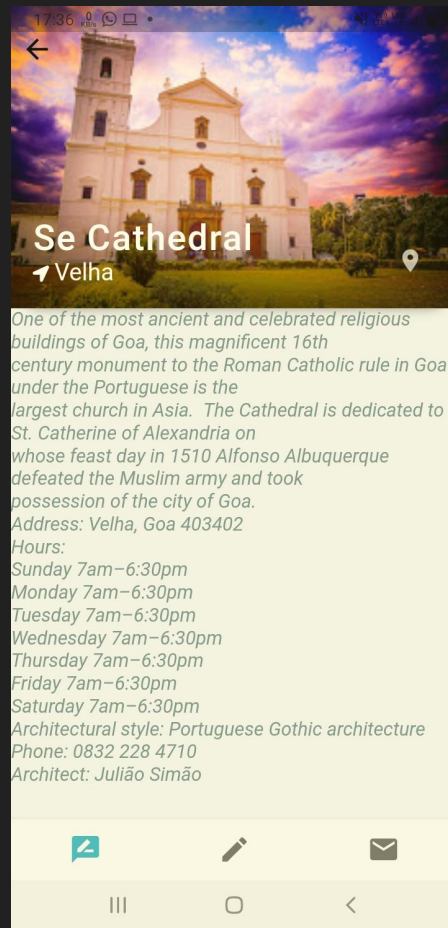
User Profile



Camera



Result



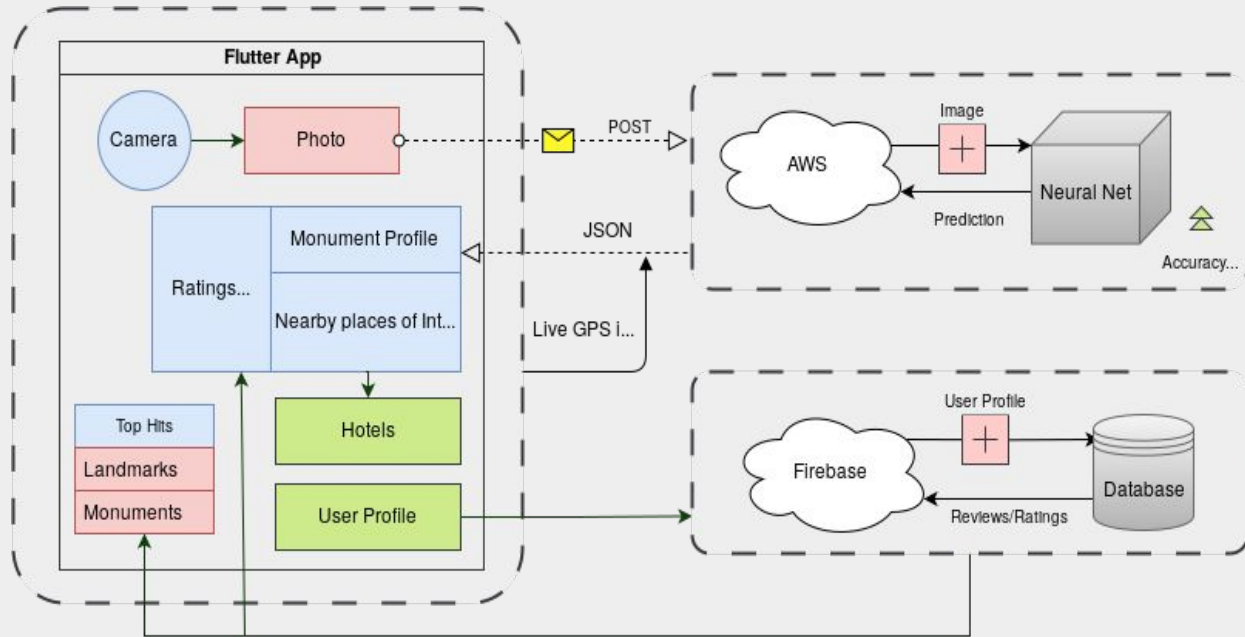
Improvements over a general system

- Client Side : Flutter
- Deployment : **Kubernetes**
- **TensorFlow Lite** classifier bundled within the app for getting results even **without the internet!**

All these improve the overall performance of the system. Let's dive into the details.

Deployment architecture

- The model is fully containerizable with a cutting edge API built using **FastAPI**
- Deployed on kubernetes cluster instead of traditional servers
- **Rolling, zero-downtime** deployments with one command
- **Self healing** infrastructure (eg: automatically replaces failing AWS systems)
- Service Discovery via DNS (eg: redis is located at "redis.production.mycluster")
- An infrastructure that allows easy log aggregation and audits
- Cost saving using real time load balancing pods
- Highly scalable - We can easily **scale up without any loss in uptime or latency**



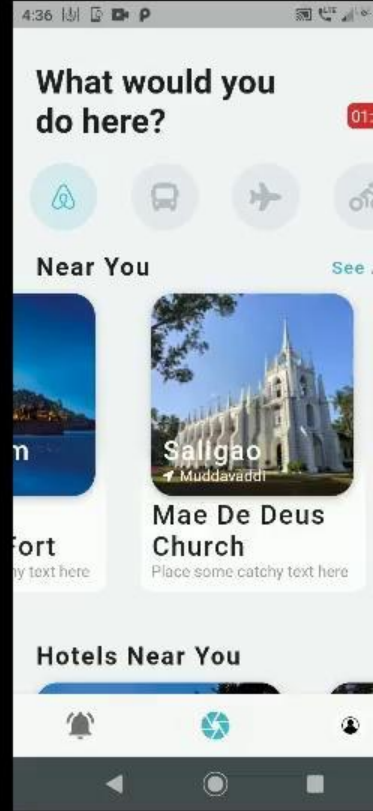
Client application

- The client side app is implemented in Flutter using Dart
- Truly cross platform, with same codebase for both Android and iOS
- Even ready to run on the web
- Secure user profiles using Google Firebase
- Predictions that happen in less than 1 sec after taking a photo

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Extra features that we have

Here are some extra features which go beyond the scope of the problem statement that our app has -

- Restaurants and hotels in the vicinity of the user's current location.
- A list of the monuments that are the most popular along with directions on how to visit them
- An SOS button that can be used in case of emergencies