SmartTrash

Accelerating to the green future

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Reality


Vision

Sustainability is innovation's next frontier.

~Nicola Acutt, VP of Sustainability Strategy (VMware)

Tackling Sustainability

- **Meeting the needs** of the present **without compromising** the ability of future generations to meet their needs.
- Disposing garbage carelessly or ineffectively leads to soil/air/water pollution.
- Lack of knowledge in properly throwing items away.

Differences Between Recyclables, Compost, and Landfill

Recyclables

Recyclables are waste materials that are able to be reused later on. It is wise to wash or rinse whatever you are recycling because the recycling plant will most likely toss it out.

Examples

- Plastic
- Paper
- Glass
- Metal

Compost

Compostables are organic materials that are can decay and be used as fertilizer for crops on farms. Almost every food item that we eat can be composted.

Examples

- Food Scraps
- Soiled Paper
- Compostable Plastic
- Yard Trimmings

Landfill

There aren't many items that can go into the landfill bin. Whatever goes in here can't be put in either of the other 2 bins, they can't be recycled nor composted.

Examples

- Broken Glass
- Ceramics
- Cat litter
- Your cousin ;)

Have you ever been confused on where to dispose your waste?

Well, we made an app that can do just that. Introducing SmartTrash.

Building the App

Software Tools

Swift

A programming language developed by Apple Inc. for devices running iOS. We applied it to create the the front-end of our app to make the UX and UI.

Xcode

An integrated IDE used to program a language called Swift and Objective - C With Swift, it's easy to deploy beta apps on mobile devices. It automatically converts XML data.

Firebase

A backend storing all data as JSON data. Easy-to-use dependency to query all JSON data. Due to its simplicity, data can be queried in seconds.

Python

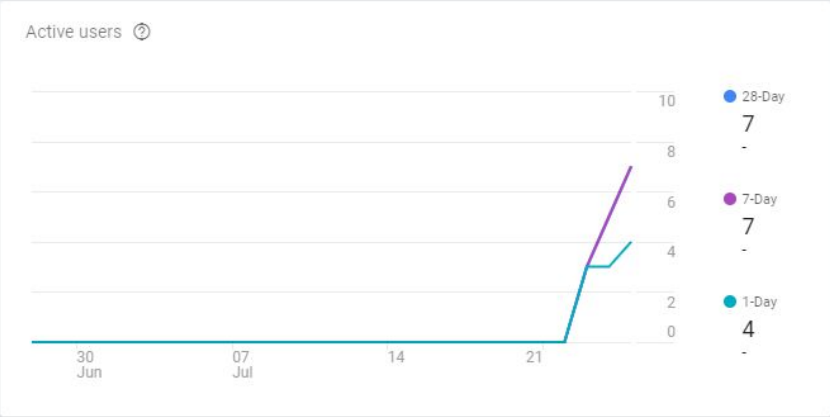
A powerful language useful for processing and backend development. We used it for training the model using an API called keras and Tensorflow.

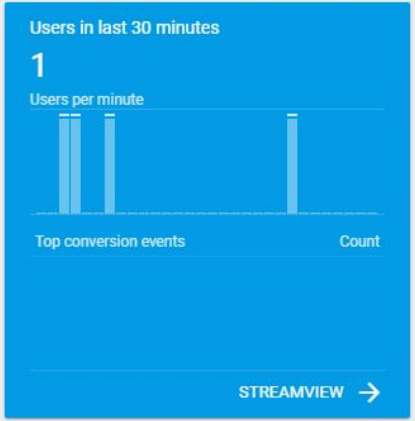
Kaggle

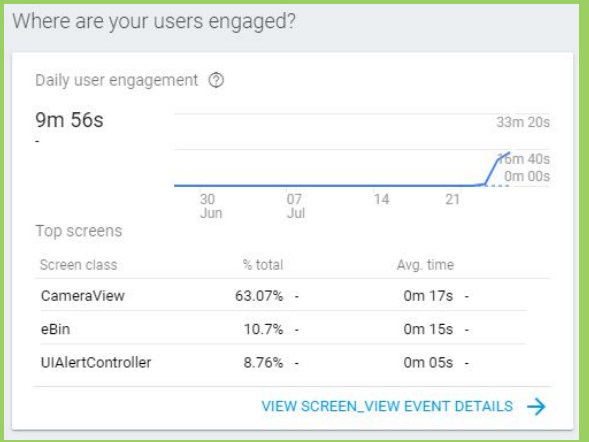
We used Kaggle in order to find and form a detailed data set with our required images in order to form a good machine learning model and algorithm.

G Analytics

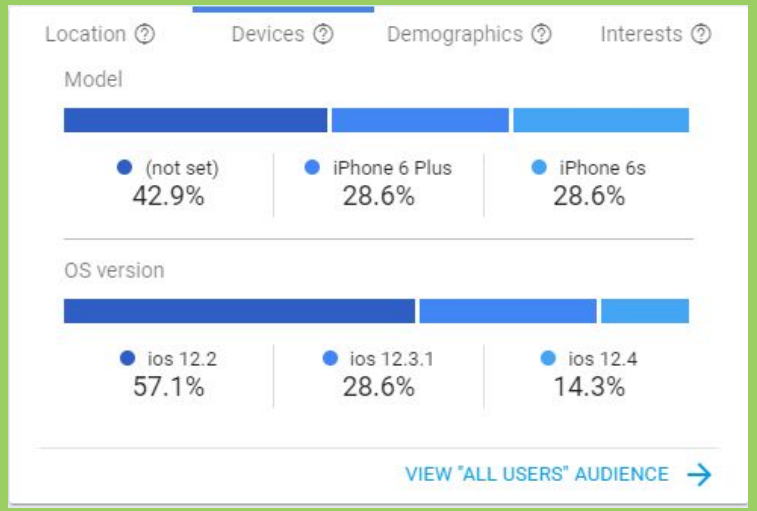
Deployed to analyze user data through key funnels such as user actions, trends, and retention.


Active users
10
8
6
4
2
0
30
Jun
07
Jul
14
21
28-Day
7
-
7-Day
7
-
1-Day
4
-


Users in last 30 minutes
1
Users per minute
Top conversion events
Count
STREAMVIEW

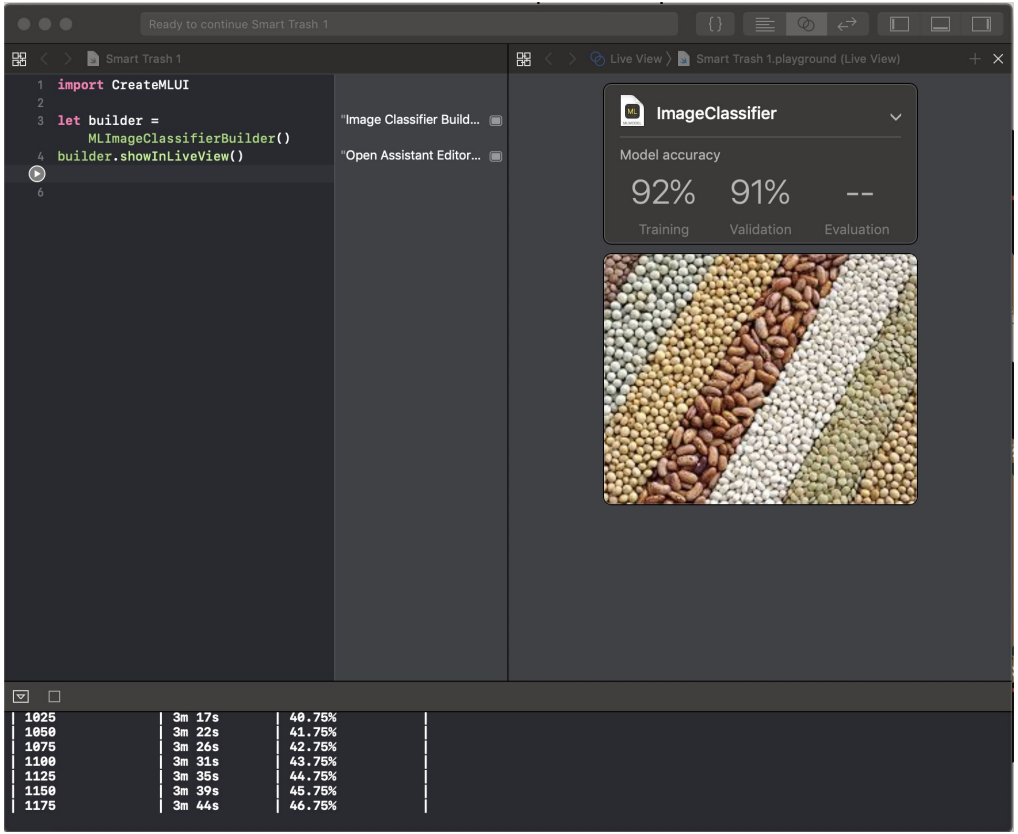

Where are your users engaged?
Daily user engagement
9m 56s
-
33m 20s
16m 40s
0m 00s
30
Jun
07
Jul
14
21
Top screens
Screen class
% total
Avg. time
CameraView
63.07%
0m 17s
eBin
10.7%
0m 15s
UIAlertController
8.76%
0m 05s
VIEW SCREEN_VIEW EVENT DETAILS


What is your audience like?
Location
Devices
Demographics
Interests
Country/Region
Sessions
% Total
United States
21
100.0%
VIEW "ALL USERS" AUDIENCE


Location
Devices
Demographics
Interests
Model
(not set)
42.9%
iPhone 6 Plus
28.6%
iPhone 6s
28.6%
OS version
ios 12.2
57.1%
ios 12.3.1
28.6%
ios 12.4
14.3%
VIEW "ALL USERS" AUDIENCE

	first_open	screen_view	session_start
Users	7	6	7
Event count	7	632	21
Event value	0	0	0

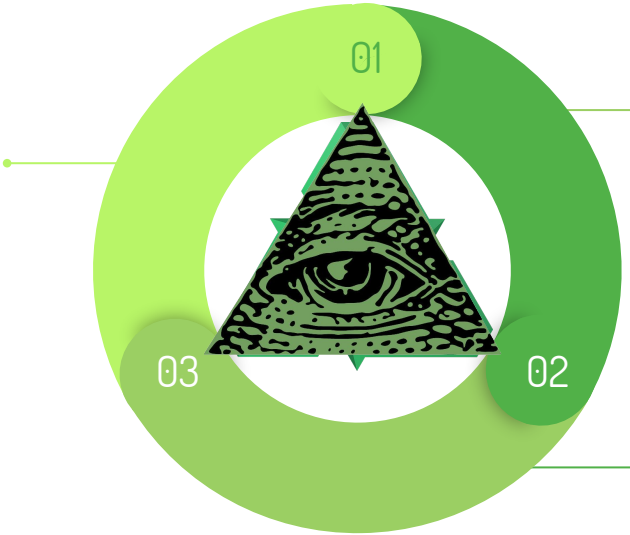
Training the Model with Kaggle Dataset



Using the App

Three Simple Steps:

Open the SmartTrash app.



Scan the object with a simple phone camera.

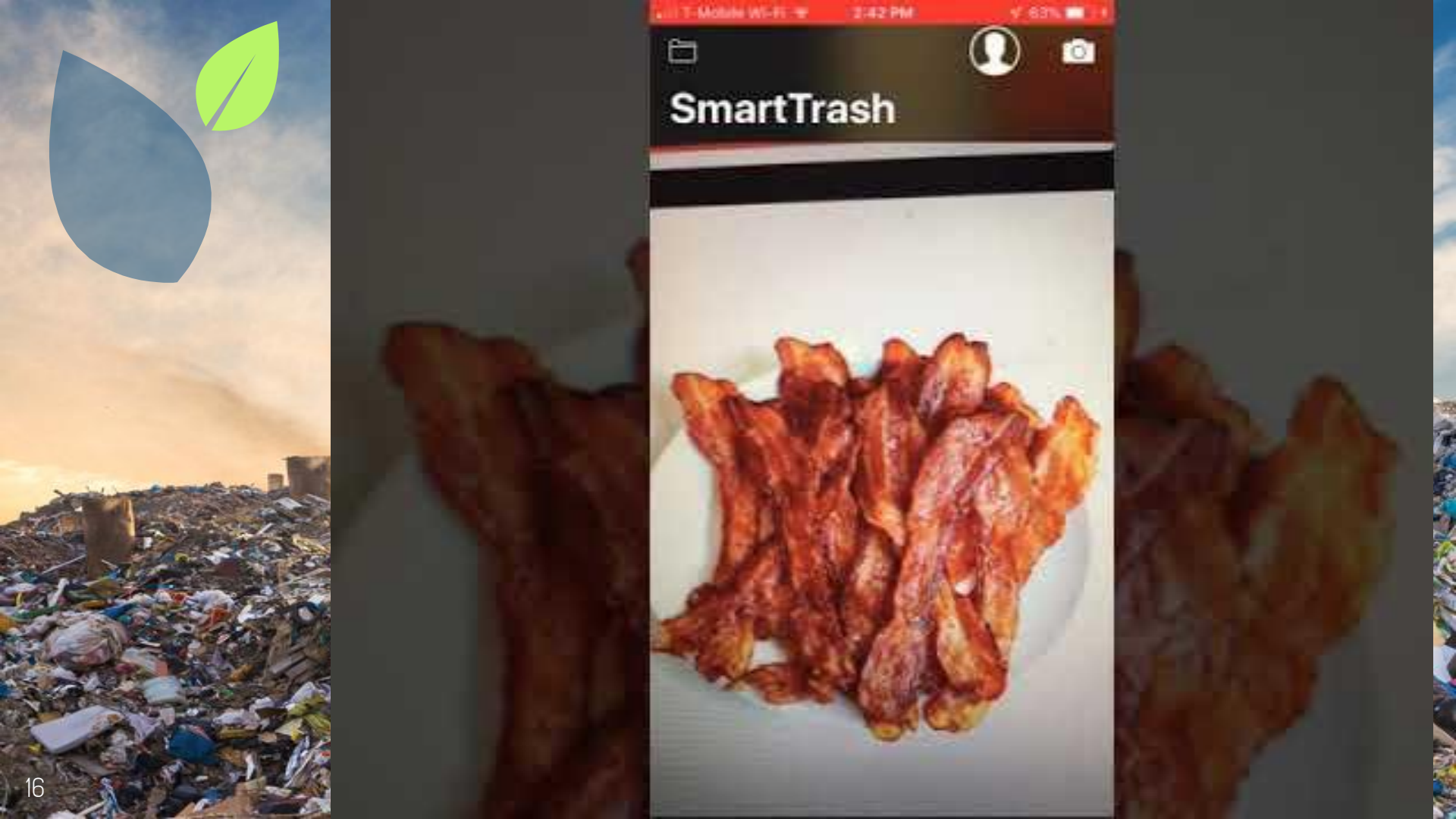
Dispose object based on output from the app.

Illuminati Confirmed

iOS App Demo

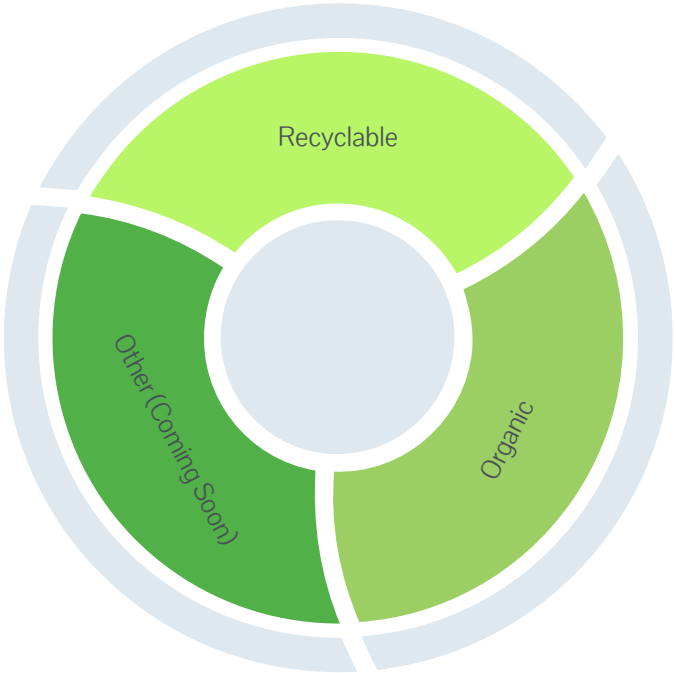
Here comes the fun part!

Presented by Ishan and Yash


SmartTrash

Data Analysis

Classification Analysis



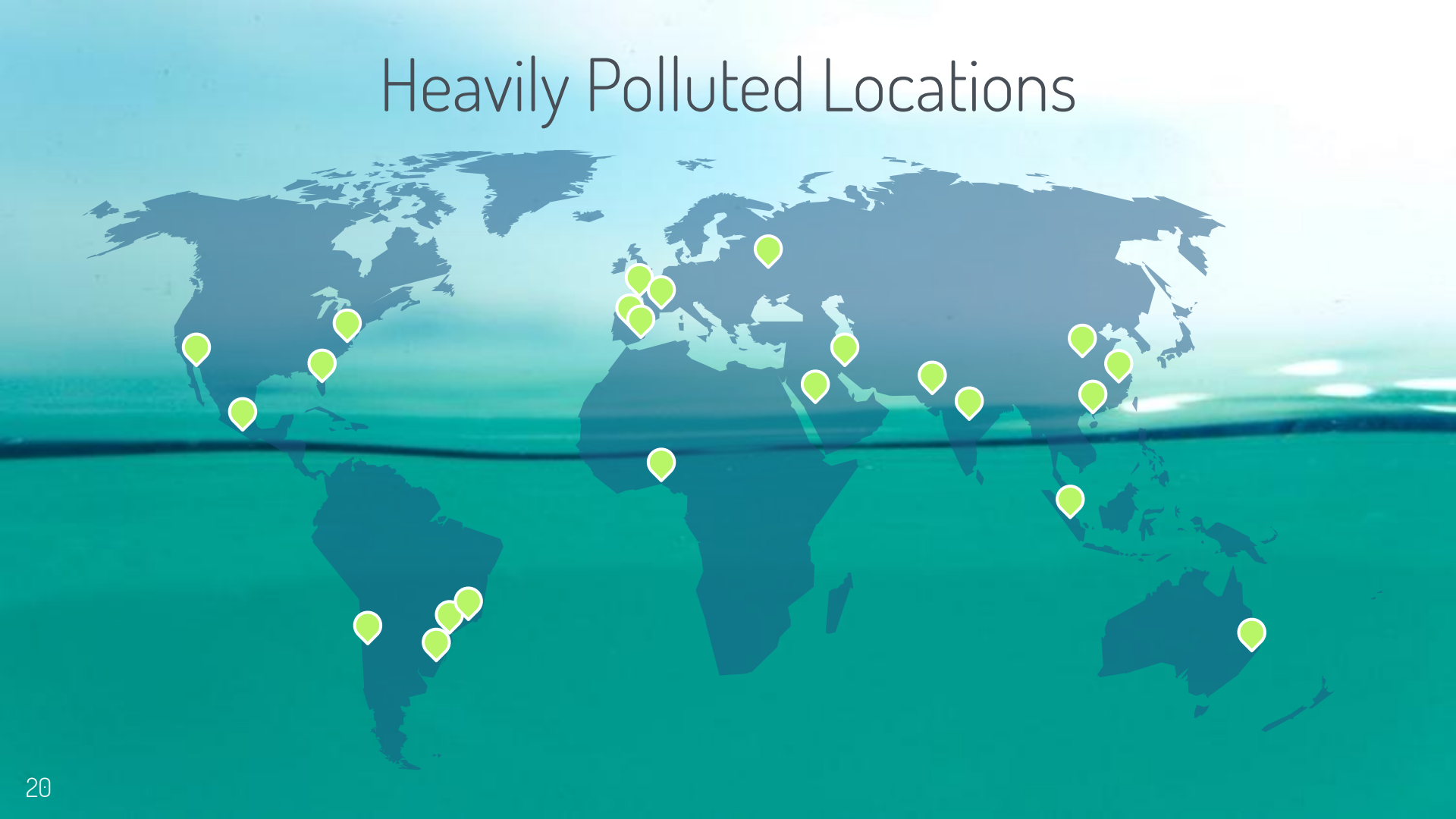
Target Audience

Major economic hubs across the globe

United States: SF, LA, NY, Chicago, Washington

Other: Toronto, London, Paris, Shanghai, Seoul

Heavily Polluted Locations



3,600,000

Predicted yearly scans executed

300,000 scans

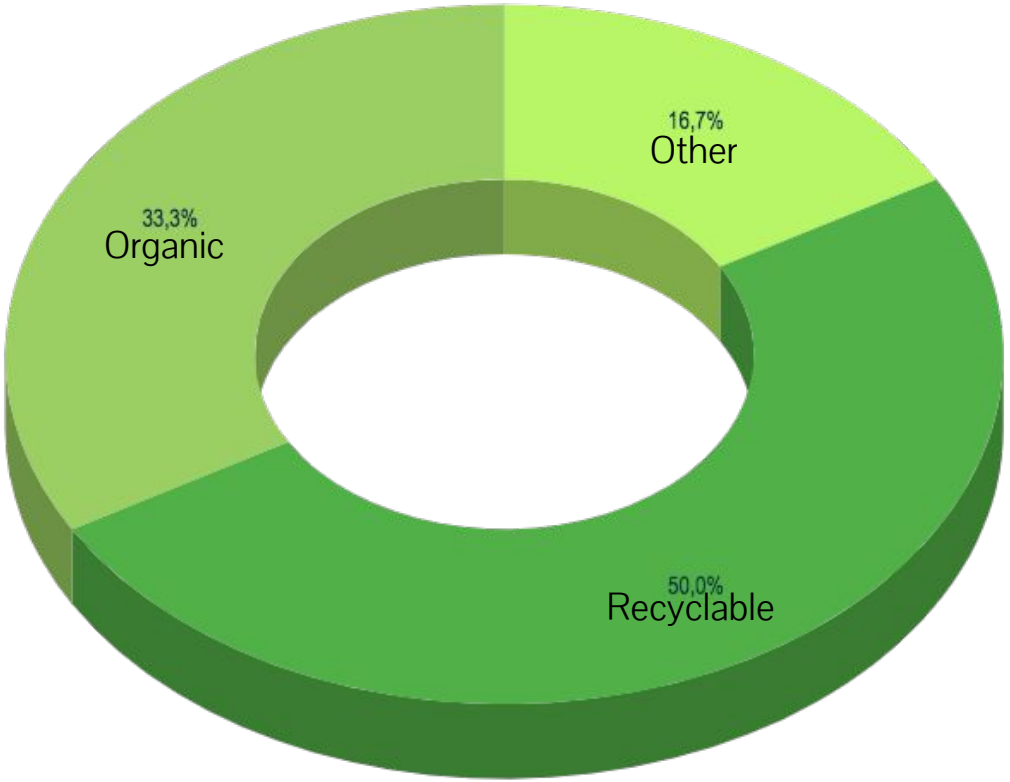
Weekly (Average of 3 scan/user)

100,000 users

Active Monthly

93% -> 100%

Scan Accuracy



Visual Trash Breakdown

Challenges

A few problems we encountered

Collaboration

Our dynamic team had diverse skill sets that we needed to strategically streamline for each role.

User Testing

The app did not have sufficient testing from users to allow the team to fix issues, implement features, and perform various analysis.

Bugs

We ran into numerous bugs when developing the back-end as well as the front-end of the app.

Future Potential

Future Modifications

1. Expand the app to android
2. Add a graph to visually represent how much trash you are sorting
3. Add a calculator to calculate how much you are benefiting the environment through a carbon footprint

Ultimate Impact

Save trash services effort, money, and time in sorting out materials.

Prevent the mix of improper waste disposal.

Protect animals and their habitats.

Healthy Environment!

Credits

Special thanks to VMware for giving us this special opportunity to present our final product:

- Katherine/Courtney
- Interns
- Guest Speakers

Thanks!

Q&A Session :)