



Seatizen

Save a seat. *Save a life.*

Team 13 & 14 (Good Seatizens) Proposal

Good Seatizens (Team 13 & 14)

Name	Email	Role in the Hackathon
Jean	t14m02@msazurehol.onmicrosoft.com	Back-end, Front-End
Judah	t14m01@msazurehol.onmicrosoft.com	Machine learning, Front-End
Yunting (Heather)	t14m06@msazurehol.onmicrosoft.com	Machine learning
Maggie	t13m04@msazurehol.onmicrosoft.com	UI/UX, Front-end
Samihah	t13m05@msazurehol.onmicrosoft.com	UI/UX, Presentation
Kangjie (Zé)	t13m06@msazurehol.onmicrosoft.com	UI/UX, Presentation
Ruqsana	ruqsana.jabbar@microsoft.com	Mentor
Michael	Michael.Dannenbring@mtahq.org	Mentor

Business Goals of Seatizen

Challenges, Innovation, and Implementation

What problems will **Seatizen** solve?

1. Ridership decline due to the pandemic

- MTA needs a data-driven solution that can boost rider confidence and safety to bring them back on track.

2. No existing interface showing passenger occupancy levels

- MTA Operations staff can benefit from utilizing a dashboard for alerting any overcrowding on Metro North trains.
- Passengers can make informed decisions with real time information in the palms of their hands.

Technical Innovations of Seatizen

1. Real time passenger count using camera feeds and object identification using cognitive services and machine learning
2. Predictions of occupancy patterns using historical data
 - Passengers with flexibility in travel time can make informed decisions for improved social distancing.
3. Smart recommendation of low-occupancy cars to passengers
 - Passengers about to travel will receive a personalized car suggestion to board and to travel to their destination.

Business Implementation of Seatizen

1. Seatizen app will be distributed through iOS App Store and Google Play.
2. Enhanced camera feeds in conjunction with load bearing measurements will be used to estimate the most accurate passenger count.
 - Imperfect count accuracy is acceptable for providing estimates used to indicate occupancy levels.
 - Edge computing and performance optimized machine learning algorithms will be used to reduce response and processing time for predicting crowd count.

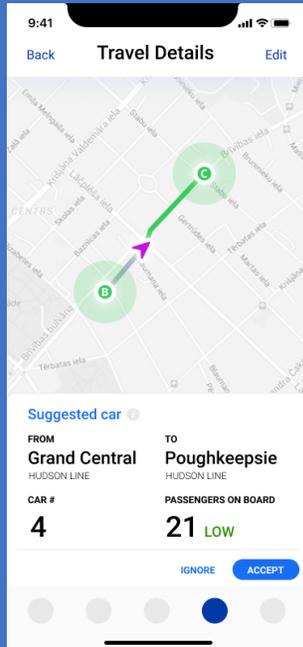
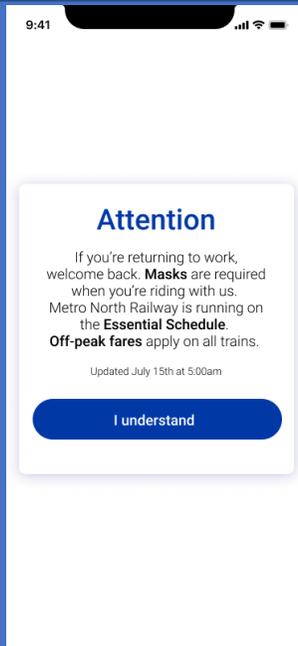
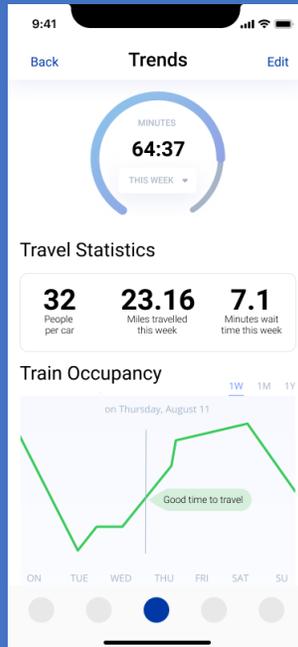
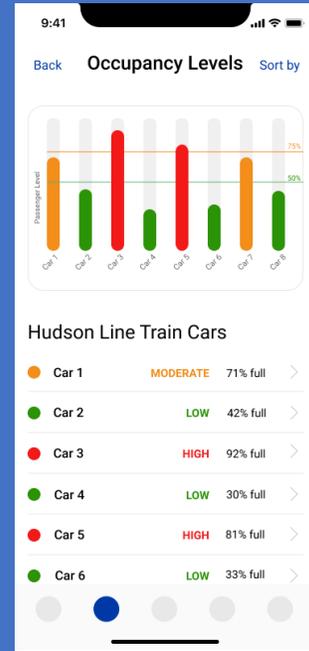
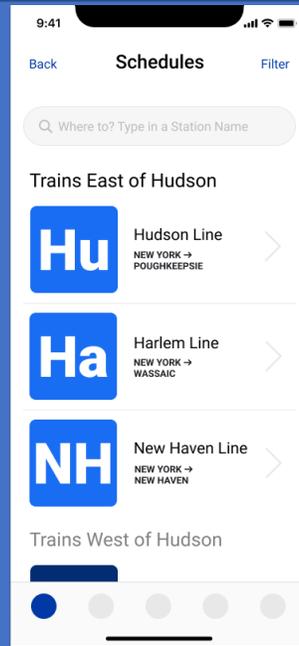
Introducing Seatizen

Application Snippet and Walkthrough

[\[https://www.youtube.com/watch?v=gICINB8XP0s\]](https://www.youtube.com/watch?v=gICINB8XP0s)

Seatizen

Interface Mock-up

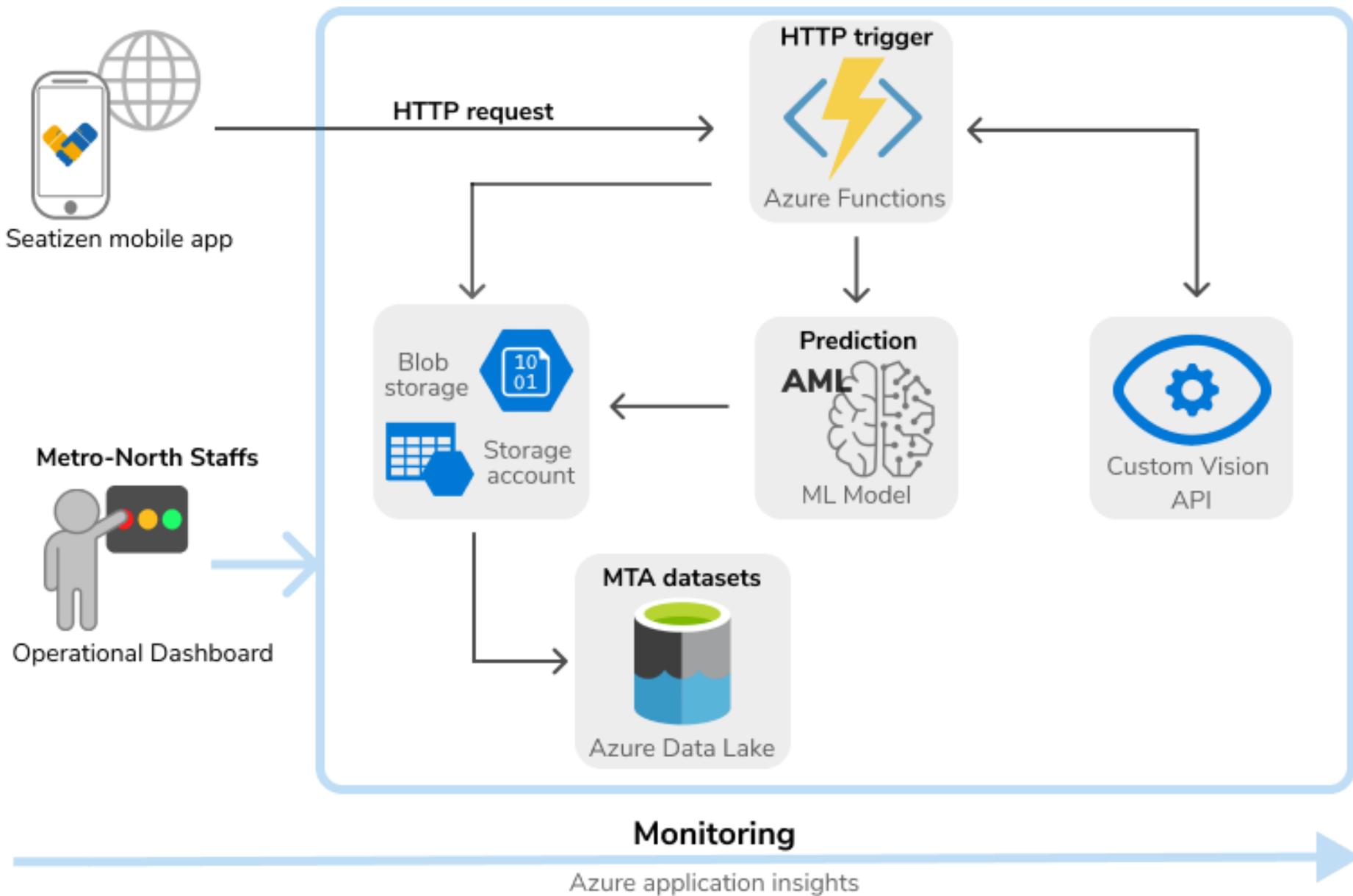


The Architecture of Seatizen

Data and solution architectures, [link](#) to application code

Seatizen

Solution Architecture





Train Occupancy	COVID guidelines	Occupany Level	Distribution
Train Performance	On Schedule	Disruptions	Maintenance
Emergency Management	Incidents	SOPs	COVID Incident
Customer Satisfaction	Social Media	Surveys	Ridership

1. User clicks

Metro-North Staffs



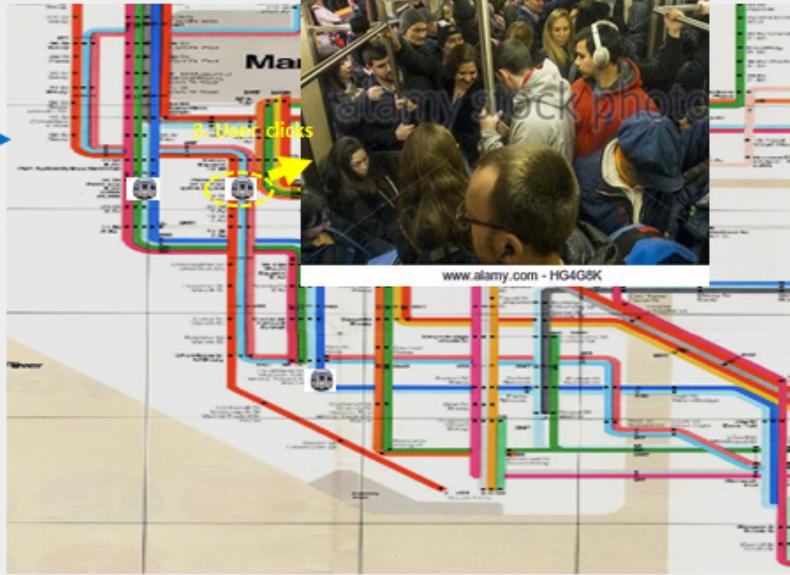
Operational Dashboard

2. User clicks

Trigger Standard Operating Procedure



3. User clicks



Extra Consideration: Operations Dashboard

Mock-up Data

Train Time API

MYmnr Data

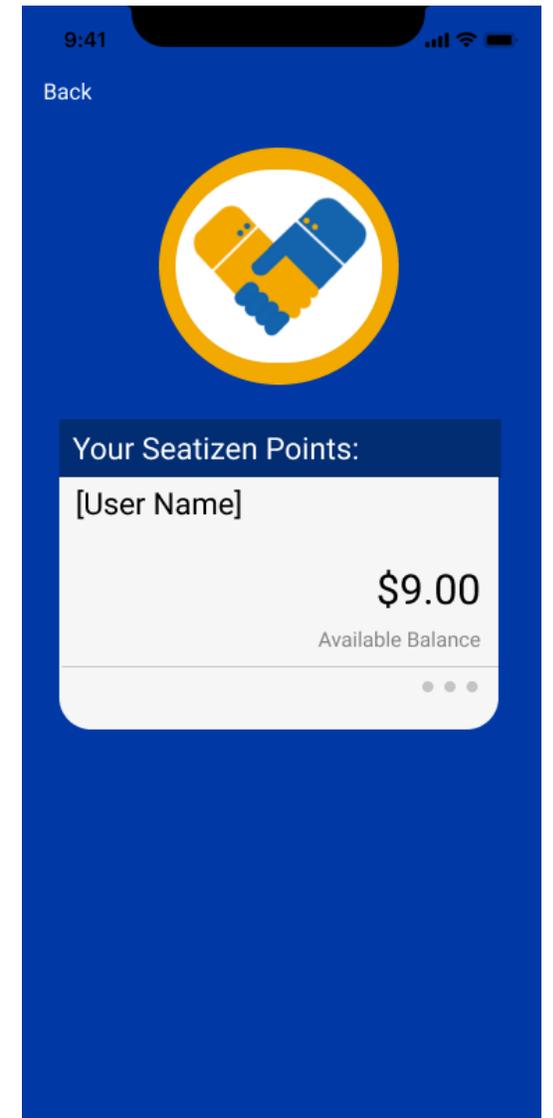
BranchID	TrainID	StationID	StationName	CarID	Month	Day	Hour	Passenger_Count	
0	3	6549	116	GREENWICH	6	9	2	7	41
1	1	8841	40	MANITOU	3	6	4	22	20
2	2	9650	57	BOTANICAL GARDEN	7	5	6	14	10
3	1	8750	14	SPUYTEN DUYVIL	6	5	1	7	4
4	3	6349	128	DARIEN	1	11	2	8	27
5	3	6549	127	NOROTON HEIGHTS	7	6	1	21	19
6	2	9650	61	WAKEFIELD	6	6	5	16	31
7	3	6547	131	SOUTH NORWALK	4	4	2	6	20
8	2	9546	68	CRESTWOOD	7	6	5	1	38
9	3	6349	140	BRIDGEPORT	7	1	3	15	36

A Future with Seatizen

Future considerations, complementary implementations

Seatizen: Going Forward

- Additional prediction sources for our app's machine learning framework
 - Derived from incoming, new rolling stock, M7's weight sensor data.
- Passengers that follow the car suggestion will be included in a points and reward system and can be provided with discounts on future tickets.
 - Create incentives for individuals who would otherwise not socially distance



Seatizen: Going Forward

- Build a reservation system that assigns car numbers to tickets and set thresholds for each train and car to prevent overcrowding.
- Improve passenger flow at stations platforms for assigned cars.
- Individual car sales will be automated and regulated by TIMs.
- Conductors will have access to an interface to keep track of passenger boarding and exiting train cars.
- Visual indicators on each car to flag occupancy levels



Thank you from the team of
the Good Seatizens