IMAGINE IOT
PROTOTYPE CHALLENGE

THE CROWDED BUS

Category: Transportation and Fleet Management

Prototype Prepared by: J S Donald Justin

Prototype Description
A prototype to describe an IOT solution for Overcrowding in City Public Transport
Summary

The passengers using the Bangalore city Metro bus Transport Corporation (BMTC) desperately require a solution to their daily issue of boarding a crowded bus. The transport authority also require an efficient system to identify the crowded hours and areas of high demand so that new buses can be deployed.

Story Line

The commuters in Bangalore face a high amount of challenge due to the traffic congestion in city. One of the key solution is to use public transport. Though there is a high amount of interest to use the public transport; due to issues like crowded and less frequency of buses at certain hours; people opt to take their own vehicles to roads. One of the solution which can be implemented is to notify the commuters and transport authorities with details of crowd in the bus like available seats, standing crowd, status of next bus in the same route etc. This will help the passengers to decide which bus to board or to book a cab and this data when analyzed by an analysis software like SAP can help BMTC to decide on increasing frequency of buses for appropriate routes.
Roopa BH

“...I’d imagine a day when I can travel in a public transport with comfort, reach workplace on time and keep up the promise to my little child to meet her early in evening after work”

About
- Aged 27, married has a little girl child
- Works as a Software engineer in a reputed IT firm
- Experience of 4 years in industry
- Use public transport to commute between workplace and home

Responsibilities
- Handles important customer coordination roles in workplace
- Takes care of family & little child

Needs
- Need for a comfortable travel between workplace and home
- Forecast on seats available on the upcoming bus
- Less wait time for a less crowded bus
- ...

Main Goals
- Reach workplace on time
- Reach back home early before late evening
- ...

Pain Points
- Un comfortable journey in a Crowded Bus
- Unaware of seat availability in buses
- Less frequency of buses
- ...

© SAP SE or an SAP affiliate company. All rights reserved.
User Stories on Bangalore Public Transport

“I was getting worn out daily on reaching back home after my office hours in a public transport. As a result, I purchased my own vehicle and preferred to drive in the congested traffic.”

Donald Justin

“I lost my favourite new phone in a crowded bus. It was stolen by someone. I hate to board a crowded bus but at that time I had no other choice…”

Steffy Donald Justin

BMTC Bus:
Point of View (PoV)

User + need + insight/why

Point of View

As a passenger of public transport each one need to have a comfortable journey with high availability so that all are encouraged and motivated to use public transports regularly, this will also make the pollution levels and traffic congestion issues to come down.

As an administrator of Bangalore city transport management there is a need to find a way to manage the growing issues of crowded bus in the city and also to effectively find which areas in the city are affected by this issue, where exactly deployment of buses is required and at what intervals they are required; so that the public transports can be deployed efficiently with high profits.
## UX Journey

Describe Actions, Mindset, Feelings and Touchpoints

<table>
<thead>
<tr>
<th>ACTIONS</th>
<th>MINDSET</th>
<th>FEELING</th>
<th>TOUCH POINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walk Towards nearby bus stop</td>
<td>Would a bus have already arrived?</td>
<td>😊</td>
<td>Bus Stop waiting queue bar</td>
</tr>
<tr>
<td>Arrive at bus stop</td>
<td>Is there a long queue waiting for the same route?</td>
<td>😈</td>
<td>Bus foot board</td>
</tr>
<tr>
<td>Wait for bus to workplace</td>
<td>Oh... Why the bus is getting so late?</td>
<td></td>
<td>Bus Seats Handle bar</td>
</tr>
<tr>
<td>Checks if bus is overcrowded</td>
<td>Will I get a place to Stand at least?</td>
<td></td>
<td>Bus Seats Handle bar</td>
</tr>
<tr>
<td>Boards a bus</td>
<td>Should I book a cab?</td>
<td></td>
<td>Hangings</td>
</tr>
<tr>
<td>Tries to find a comfortable seat</td>
<td>Will I reach office on time?</td>
<td></td>
<td>Bus foot board</td>
</tr>
<tr>
<td>Checks for location to de-board the bus</td>
<td>Aah this is so crowded I couldn’t even stand till the end</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Should I wait for next bus?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aah this is so crowded I couldn’t even stand till the end</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No seats again will I have to stand till the end</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oh.. these sudden breaks are hurting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Am I nearing my location..</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is all my things safe...</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Prototype (Screens for an IoT application to solve your PoV)

**BUS CROWD TRACKER**

**BOARDING POINT**

Select Source

**DESTINATION POINT**

Select Destination

SEARCH BUSES

*Note: Buses which are currently operational on road are tracked*

**BUS CROWD TRACKER**

- Select Source
- Select Destination

**SEARCH BUSES**

*Click bus num to show on map*

**Note: Buses displayed are currently operational on road**

Too Crowded?? Try booking a Cab

Book a CAB

**BUS CROWD TRACKER**

- Seats
- Standing
- Crowded

BusNo | Arr. Time | Crowd
--- | --- | ---
335 E | 10:15pm | Red
500 C | 10:25pm | Yellow
335 E | 10:40pm | Green
500 A | 11:00pm | Green

Too Crowded?? Try booking a Cab

Book a CAB

**BUS CROWD TRACKER**

- Seats
- Standing
- Crowded

BusNo | Arr. Time | Crowd
--- | --- | ---
335 E | 11:15pm | Green
500 E | 11:15pm | Yellow

Too Crowded?? Try booking a Cab

Book a CAB
Prototype Link:  
https://standard.build.me/api/projects/3e74cduc55daff770cd301a3/protoytype/snapshot/latest/index.html#/14774625653075180_S0

How it works

- IOT Sensors (Infra-Red Sensors) placed above the seats, handle bars and foot boards of bus will determine the presence of passengers
- The details are collected by a device installed at the bus next to the driver.
- The device will contain Bus number, route number and will also track the location of the BUS using GPS
- The details from the device gets transferred to the primary server at cloud.
- From this server the data is provided to the mobile apps of passengers to know the crowd status (The designs given above)
- The server also sends these data from various buses to an analytical software located at the office of bus administrator.
- This can be extended to other public transports like metro trains, mono rails etc.