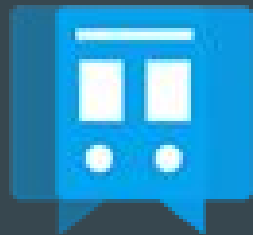


ACM SAC  
2017



TransReport

## Collaborative Supervision of the Public Transportation



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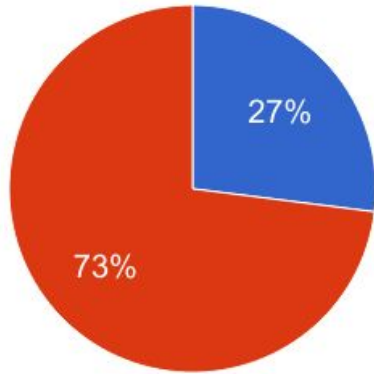
# Introduction

# Rio de Janeiro

8,266 buses

13 Million of people/day

67% by public transportation



● Satisfied ● Unsatisfied



# The disservice of the bus companies

Some complaints:

- “ ...driver is sleeping in front of the steering wheel...”
- “ ... driver told me to get out of the bus because he did not have any change ...”
- “ ... driver ignored me and did not stopped the car in the bus stop ...”
- “ ... until when we will feel like a chicken inside a oven? ...”
- “ ... I'm physically disabled and I could not be able to take the bus, the elevator did not work ...”

Source: <https://pt-br.facebook.com/faleonibus/>

## Some channels



Receives and sends complaints to bus companies (State of Rio de Janeiro)



Receives services complaints regarding Rio de Janeiro City

# What the problems of these channels?

FaleÔnibus does not monitor complaints, only forward messages. Is up to you to solve them

1746 does not provide more specific complaints about the buses conditions

Both channels are very slow to answer messages or forward the complaints, due to the high rate of user messages (~35,000 messages per/month)

Both channels does not shows summary of complaints. No stats are provided

There is not a public API to share data among people or researchers

# What the problems of current solutions?



Fiscal de Bolso: An app developed by Detro-RJ (public agency).

Was very limited in functionalities and no longer exists

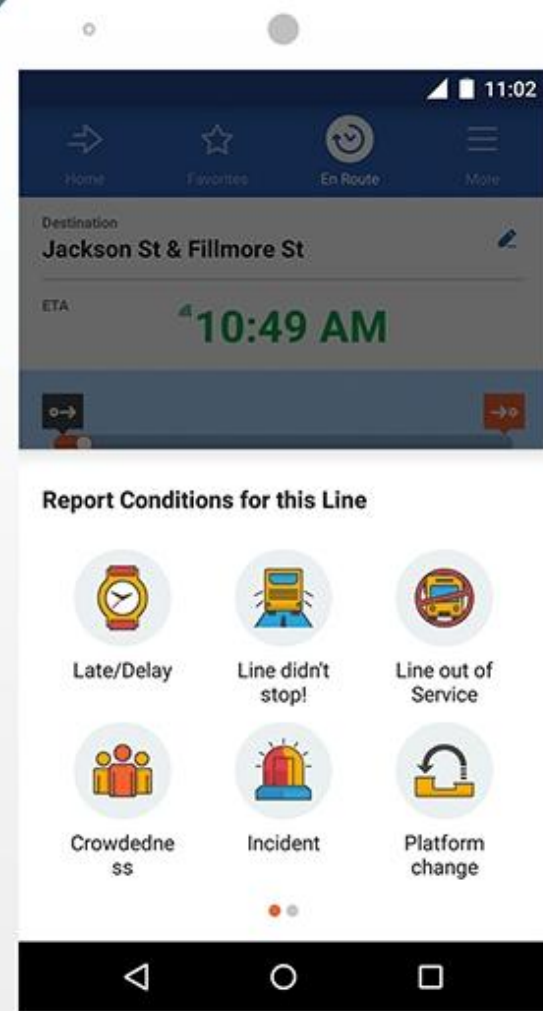
Fiscal de Bolso	
Veículo	
RJ Ex: 000.000	
Solicitação	
Comentário	
 Adicionar foto	
Enviar	

# What the problems of current solutions?



Moovit (Bus module). Moovit was not intended to deal with bus complaints.

There is no integration with government agencies.





# What the problems of current solutions?

**ReclameAQUI**

Reclame Aqui: A website that registers complaints about (almost) everything. Is the most popular website in Brazil about complaints.

Does not has specific attributes to deal with public transportation. Does not send messages to agencies.

# Some problems

Rio de Janeiro already had some corruption problems regarding bus companies. [2]  
Some of them were removed from investigations or gave up in the middle of the process. [1]

Court of accounts of the municipality (an important public agency) has found signs of cartel in at least 33 of the 41 bus companies of Rio de Janeiro [3]

When we talk about the supervising bus services in Rio de Janeiro, there is a common sense between the population about the existence of corruption and cartel.

People (generally) does not trust in tools and channels (aiming to solve issues) that comes from the same place where the problems exists

# Main questions

The quality of public transport is getting better or not?

How to send a complaint in real time using my cellphone ?

How can I track in real time my complaint ?

How can I make popular pressure to improve current buses conditions and services?

How can I see statistics about the complaints?

# Why those questions are important?

Gain of important strategic information about the quality of the public transportation

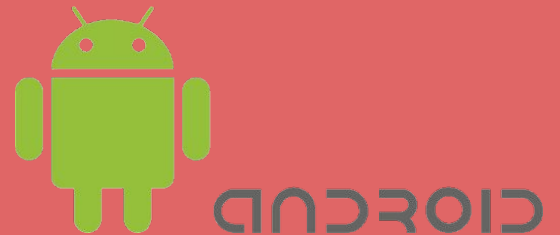
Generate more precise data and indicators for public agencies and population as well

Tool as popular pressure for transport quality

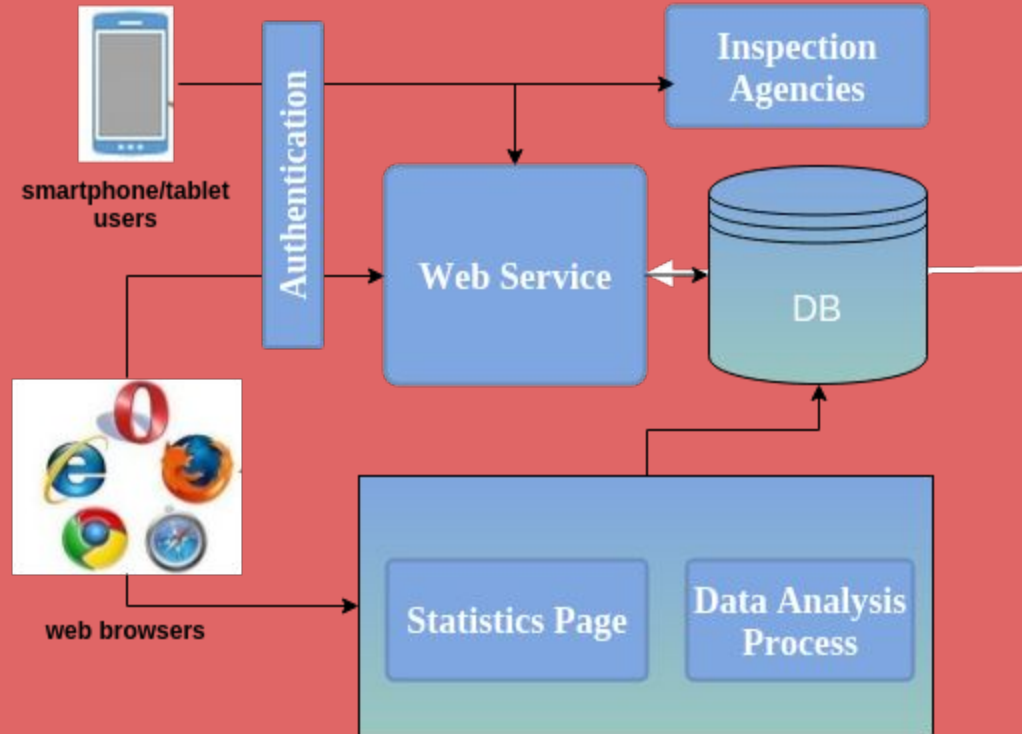
Database for future research and analytics

# Methodology

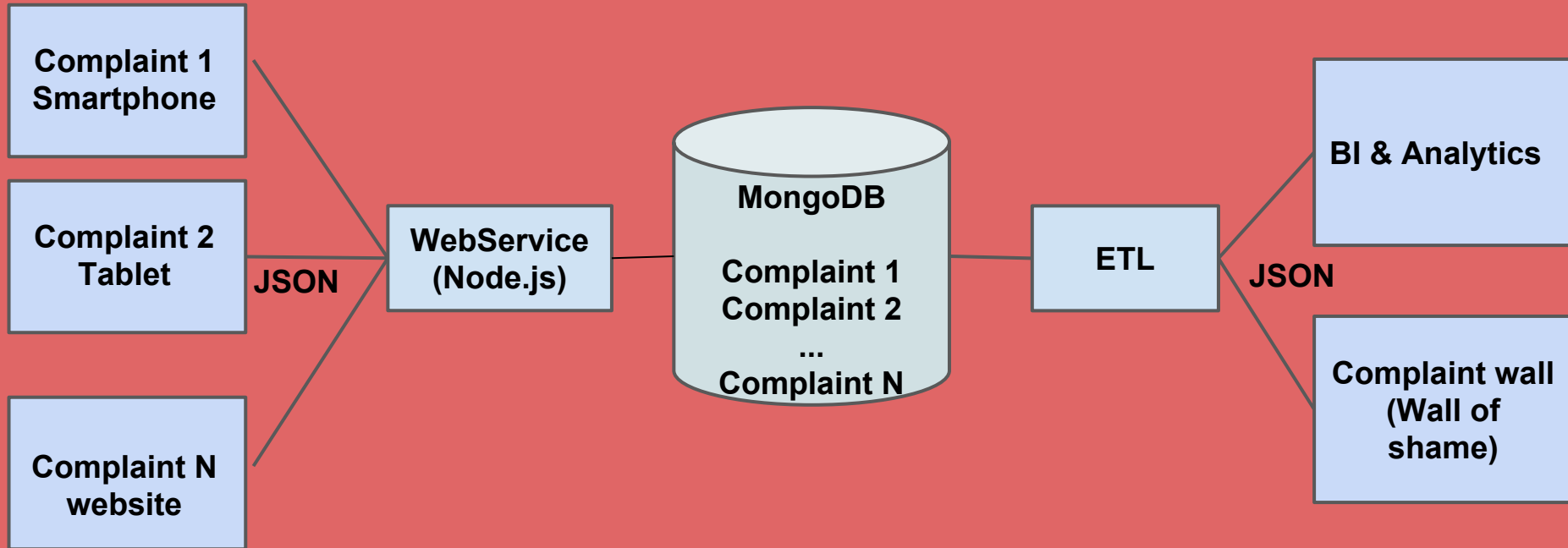
# Technologies



# Application flow



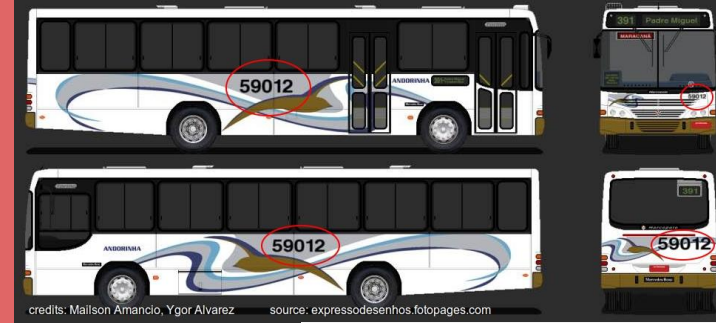
# Architecture





# How it works? (Complaints)

- Pick a line number from an autocomplete list [4][5]
- Fill the bus identification, retrieved by some parts of bus
- Choose the complaint in a list
- Set time when the problem approximately occurred
- Describe the complaint in more details (up to 100 characters)
- Optionally, choose a photo as an evidence of the complaint
- Send complaint pressing the submit button
- Sent complaint goes to TransReport database and FaleOnibus

A screenshot of the TransReport mobile application interface. At the top, there's a header with 'TransReport' and a menu icon. Below it, there are two main buttons: 'Complaint' (with a speech bubble icon) and 'Rating' (with a star icon). The main form area contains several input fields: 'Bus Route - 486 Fundão - General Osório' (with a 'required fields' label and a dropdown arrow), 'ID number (optional)', a time picker set to '4:30PM', a date picker set to '2/24/2015', 'Place (optional)', 'Complaint Type' (with a dropdown arrow), and 'Image (optional)' with a placeholder image icon. At the bottom right, there is a blue 'Send' button.

**TransReport** @TransreportApp · 13 de nov

@faleonibus O ônibus 512 - Urca - Leblon - A37665 está com o ar condicionado quebrado às 16:12 no dia 13/11/2015. #transreport



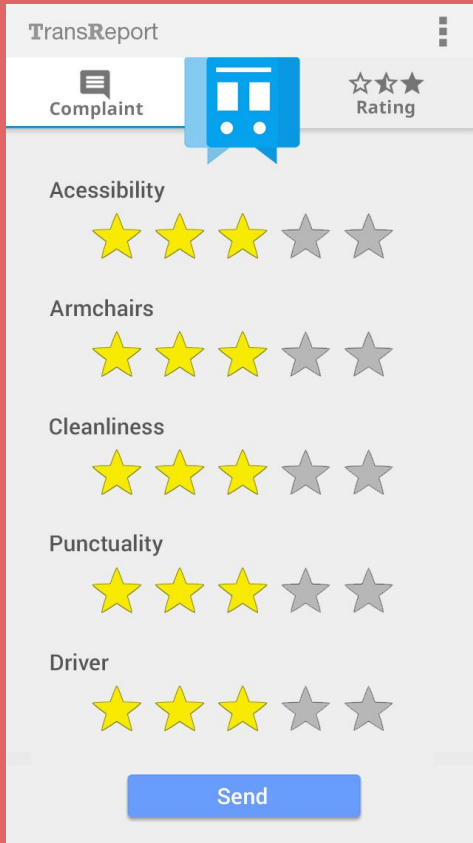
# How it works? (Rating and API)

Rating screen:

- Vote about the intern conditions
- The information is sent only to TransReport database

Public API:

- Allows requests (GET) to specific searches inside Transreport database. The response is in JSON.
- You just need to request a token to our team (it is free)



The screenshot shows the 'TransReport' app interface. At the top, there's a header with the app name 'TransReport' and a menu icon. Below the header, there are three main navigation options: 'Complaint' (with a speech bubble icon), a central blue icon of a train, and 'Rating' (with three star icons). The 'Rating' section is active, showing five categories for rating: 'Accessibility', 'Armchairs', 'Cleanliness', 'Punctuality', and 'Driver'. Each category has a row of five stars; the first three stars in each row are yellow, and the last two are grey. At the bottom of the screen, there is a blue button labeled 'Send'.

Category	Star 1	Star 2	Star 3	Star 4	Star 5
Accessibility	Yellow	Yellow	Yellow	Grey	Grey
Armchairs	Yellow	Yellow	Yellow	Grey	Grey
Cleanliness	Yellow	Yellow	Yellow	Grey	Grey
Punctuality	Yellow	Yellow	Yellow	Grey	Grey
Driver	Yellow	Yellow	Yellow	Grey	Grey

# Results

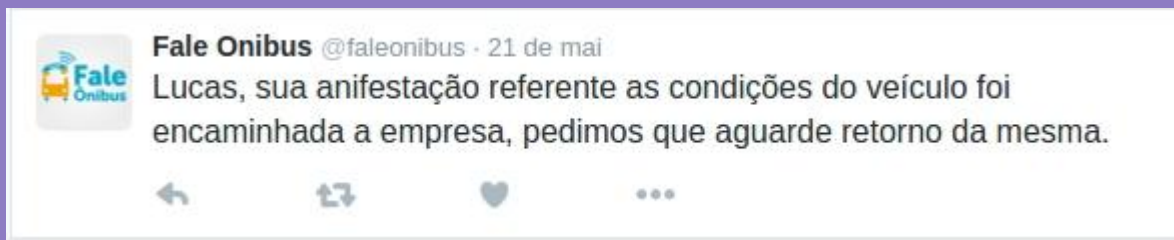
# Some comparative results

**Table 1: Comparative Table.**

Features	Fiscal de Bolso	Moovit	TransReport
Complaint Types	2	11	16
Send Complaint to Agencies	Yes	No	Yes
Quality Assessment	No	Yes	Yes
Statistics	No	No	Yes
Complaint Tracking	No	Yes	Yes
Social Media Sharing	No	Yes	Yes
Public API	No	No	Yes

# Complaints results

Fale Onibus answering a sent complaint by TransReport platform



Some users had their requests answered also via email. In these emails, the supervisory agency of the municipality of Rio de Janeiro asked for more information about the complaint, continuing the case.

# First numbers

- 30 days of testing
- 126 users
- 468 complaints

First system to show statistics provided in real time regarding to public transportation complaints in Rio de Janeiro!

Table 2: Complaints table.

Complaint type	Quantity	%
Has not stopped at the bus stop	119	25.43
Has no air conditioning	92	19.66
Overcrowded	79	16.88
Poor condition of conservation	53	11.32
It has its driver reckless / rude	39	8.33
Has a broken air conditioner	23	4.91
It is taking too long to pass	15	3.20
Stopped outside the bus stop	12	2.56
Ran over a pedestrian	8	1.70
Had changed its itinerary without justification	8	1.70
It is with technical faults	5	1.06
Stalled	4	0.85
Has his driver talking on the phone while driving	4	0.85
It was robbed	3	0.64
Closed a cross	2	0.42
It is circulating with its doors open	2	0.42

# Other results

We were able to point out:

- Top 20 worst bus in general
- Top 20 worst bus by complaint type
- Most common complaints by quantity
- Most common intern conditions problem

# App & Platform

One of the winners of the 1º Big Data Challenge at Big Data Reference Centre UFRJ / EMC²:

<https://sites.google.com/a/ppgi.ufrj.br/selecao/home/desafio-em-big-data-2014/resultados-desafio-2014>

Media notes (in Portuguese):

<http://www.techtudo.com.br/tudo-sobre/transreport.html>

Play Store (App):

[https://play.google.com/store/apps/details?id=com.transreport&hl=pt\\_BR](https://play.google.com/store/apps/details?id=com.transreport&hl=pt_BR)

Platform (Database): <https://github.com/raulsenaferrreira/TransReport>



# Conclusions & future work

# Why those results are interesting?

With the intense use of this system by population we can provide some solutions:

- Efficiency and familiarity of real quality of public transportation
- Trustful indicator of user feeling
- Powerful collaborative surveillance
- A cheaper and more reliable alternative to sensors
- Helping to promote better actions in public policies in this sector

# Current steps

- Reactivating the project (Closed since 2016)
- Allow users track their complaints through the app
- New interface and improved design
- Sharing the complaint through social media
- Users may see his/her complaints and the answers from bus companies
- 5 more cities: São Paulo, Brasília, Curitiba, Porto Alegre and Salvador



mail

password

[Sign up](#)

Login

or



Login with Facebook



Sign in with Google

# Next steps

- Will be expanded to trains and subways
- Integrate more agencies from other cities
- Spread the system adoption, through the insertion of new line numbers
- Create more graphs based on the information collected
- Allocate space inside the system for the companies answers about the complaints
- Integrate more agencies from other cities to respond their complaints through the TransReport system

# References

1 - <http://cpidosonibus.com.br/site/noticias/por-que-eliomar-deixou-a-cpi.html>

2 -

[https://pt.wikipedia.org/wiki/Licita%C3%A7%C3%A3o\\_de\\_linhas\\_de\\_%C3%B4nibus\\_no\\_Rio\\_de\\_Janeiro](https://pt.wikipedia.org/wiki/Licita%C3%A7%C3%A3o_de_linhas_de_%C3%B4nibus_no_Rio_de_Janeiro)

3 - <http://oglobo.globo.com/rio/tcm-questiona-licitacao-dos-onibus-do-rio-5463290>

4 - Data Rio API: <http://data.rio>

5 - Va de Onibus: [www.vadeonibus.com.br/](http://www.vadeonibus.com.br/)

\*More references to links and articles that helped to compose this work may be viewed at published Paper in the SAC proceedings

# Get in touch



Collaboration, suggestions, critics or compliments ...

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## Thank you!