SNAP4CITY

KM4CITY

100% OPEN SOURCE

EU GDPR COMPLIANT

PEN Test Passed

SNAP4CITY on EUROPEAN OPEN SCIENCE CLOUD MARKETPLACE

SNAP4 Appliances and Dockers Installations

Be smart in a SNAP!

LIVING LAB

HERIT-DATA Meeting
15-07-2020 on line
https://herit-data.interreg-med.eu/

Interreg Mediterranean HERIT-DATA

SCALABLE SMART ANALYTIC APPLICATION BUILDER FOR SENTIENT CITIES

UNIVERSITÀ DEGLI STUDI FIRENZE | DINFO | DISIT

agenda

- 14:00-15:00
  - overview DISIT activity (herit data organization on snap4city)
  - demo of Twitter Vigilance
  - comparison with former tool of Almaviva
  - Integration of Twitter Vigilance with Dashboard and IOT App in Node-red
- 15:00-16:00
  - Acquired data from the cities
- 16:00-16:30
  - exploitation of data from IOT App and Dashboard
  - data analytic on accessible data vs COVID lockdown

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Work Done

- **Organizations on Snap4City have been created**
  - Knowledge base and maps areas are active
  - According to your login on left side you see KB and Twitter Vigilance, etc.
- **Twitter Vigilance** Channels have been set up,
  - accounts are available (please ask), only 1 or 2 have been provided
  - Keywords have been setup and Tweets collected
  - NLP, SA has been activated so far in Italian and English
- **Example IOT Application** collecting data from Twitter Vigilance for processing them for Dashboard has been created
- **Data Collection**
  - Template for collecting data have been distributed
  - Only few data have been provided
  - Some of them have been started processing, collecting: Florence, Dubrovnik??

Paolo

Snap4City

User: paolo.pont, Org: PontDuGard-Occitanie
Role: AreaManager, Level: 0
LOGOUT

- My Snap4City.org
- My Dashboards in My Organization
- Extra Dashboard Widgets
- Data, my Data, OpenData
- Knowledge and Maps
- IOT Applications
- IOT Directory and Devices
- Resource Manager
- Development Tools
- Management
- Decision Support Systems
  - Smart City Control Room
  - Workflow Management Ticketing
  - Workflow Management, Ticketing
  - DORAM Public Transport Analyzer
  - Doc: DORAM Pub Transp. Analyzer
  - Twitter Vigilance Pont Du Gard
  - Twitter Vigilance Notes
  - What-If Analysis
  - Doc: What-If Analysis
  - Origing Destination Matrices
  - Traffic Flow Reconstruction
  - High Res. Pollutant Predictions
  - Resilience Decision Support Sys
  - Smart Decision Support Sys
  - Doc: Smart & Resilience DSS
- Help and Contacts
- Documentation and Articles

Snap4City

Home | How and Why To Use it | Tools | Tutorials and Videos

Home / Tutorials and Videos / Welcome: how to start using Snap4City for beginners

Welcome: how to start using Snap4City for beginners

We suggest you:

You have already created a **Dashboard**. Now, you may decide to make it public (visible and accessible) to all on WEB, or to provide access in view to other specific users that you know by nickname.
In addition, you can pass the Ownership of a **Dashboard** to some other user of the system, and you can clone the **Dashboard** as well. So that you can create **Dashboard** for other users as well.
We sugget to test these functionaltiies, since you can:

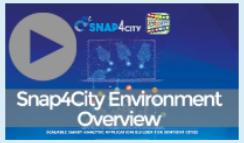
- access to Data Set **Manager** to upload/download, share data sets as files in CSV: https://datagate.snap4city.org/ssologin_handler
- upload data for the **knowledge base** and **dashboards** via Data Set **Manager**,
- access and share of resources as: **dashboards**, **IOT Applications**, blocks, etc.; https://processloader.snap4city.org/processloader/ssoLogin.php?redirect=page.php%3FshowFrame=false
- access to help and contacts, **FAQ**, documentation and articles
- manage personal data: profile, IOT Sensors, **Annotations**, Personal Data, **Dashboards**..; https://www.snap4city.org/drupal/myprofiledata
- Auditing Access to My Data according to **GDPR**.

See this test case to experiment some of the above possibilities:

TC1.10. Dashboard delegation to access, and passage of ownership, and/or cloning

We suggest you to play a bit with the **interactive presentation of the platform**

New vedeos have been published on **dashboards** and overview:



Username: paolo.pont

Search

Search
-Any-

Powered by www.km4city.org

FI-WARE Node-RED

Organization Groups

PontDuGard-Occitanie
- Developers
- Users

Updates on Tools

News from Snap4City & slides, Where to Meet Snap4City experts new
roottooladmin1

SCENARIO: MOBIMART Interreg: MOBilità Intelligente MARe Terra new
roottooladmin1

Paolo

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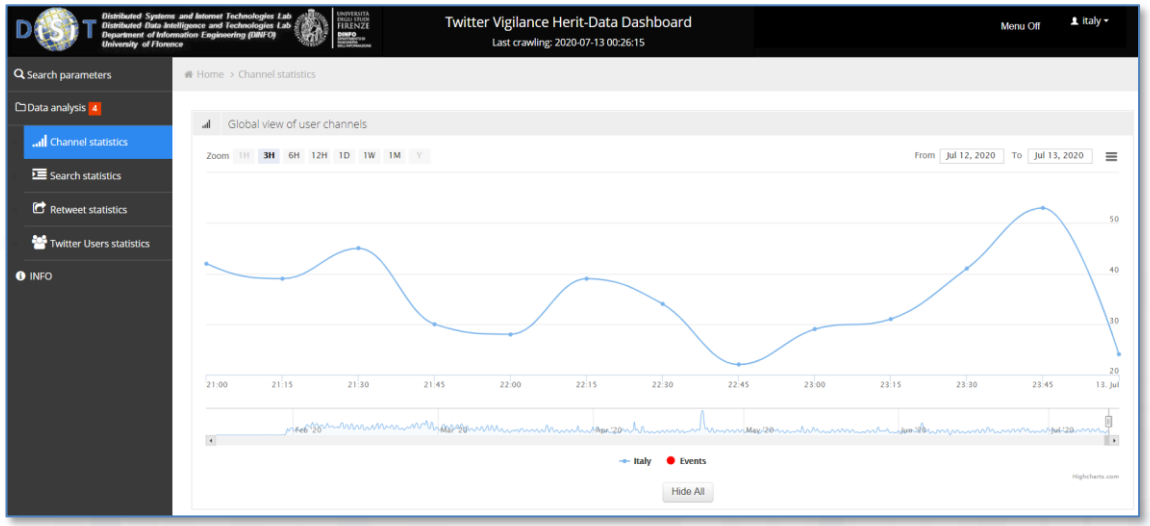
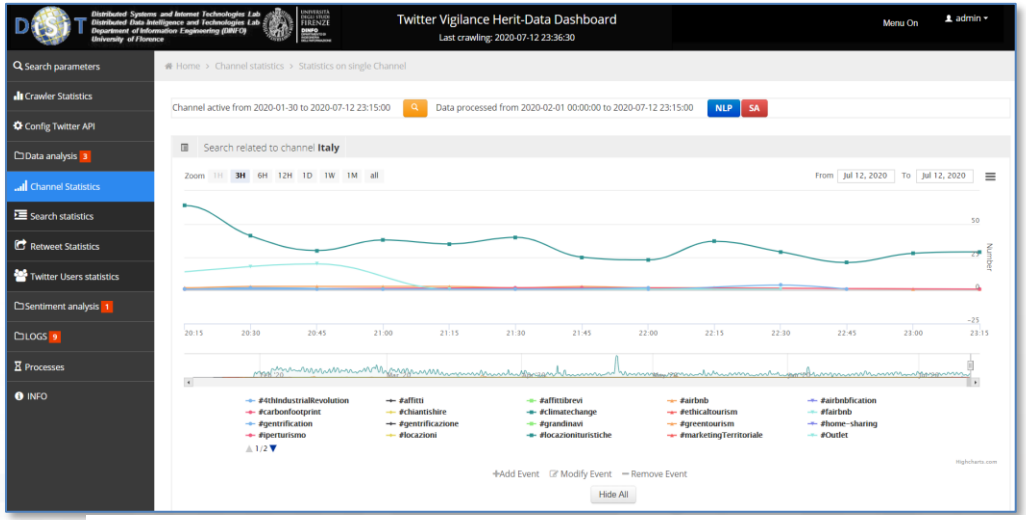
Twitter Vigilance Herit-Data: *Channel & Key-Search*

- Twitter Vigilance for Herit-Data: https://rttvhd.snap4city.org/
- Data Acquisition is based on the concept of ***Channel***



Italy

- A *Channel* is a thematic set of simple and complex ***Key-Searches***



#4thIndustrialRevolution #affitti #affittibrevi #airbnb
#airbnbfication #carbonfootprint #chiantishire #climatechange
#ethicaltourism #fairbnb #gentrification #gentrificazione [...]

- *Channel := { Key-Search1, Key-Search2, … , Key-SearchN }.*
- *For a specific channel, the Twitter Vigilance platform collects* Twitter posts (tweets and retweets) containing:

Key-Search1 OR Key-Search2 OR … OR Key-SearchN

Gianni

Twitter Vigilance Herit-Data: *Key-Search*

- ***Key-Searches*** can be single or groups of terms used to monitor and extract tweets and retweets information through Twitter APIs.
- Each term can be:
  - *keyword*
  - *#<hashtag>*
  - *@<username> citation*
  - *from:@<username>*

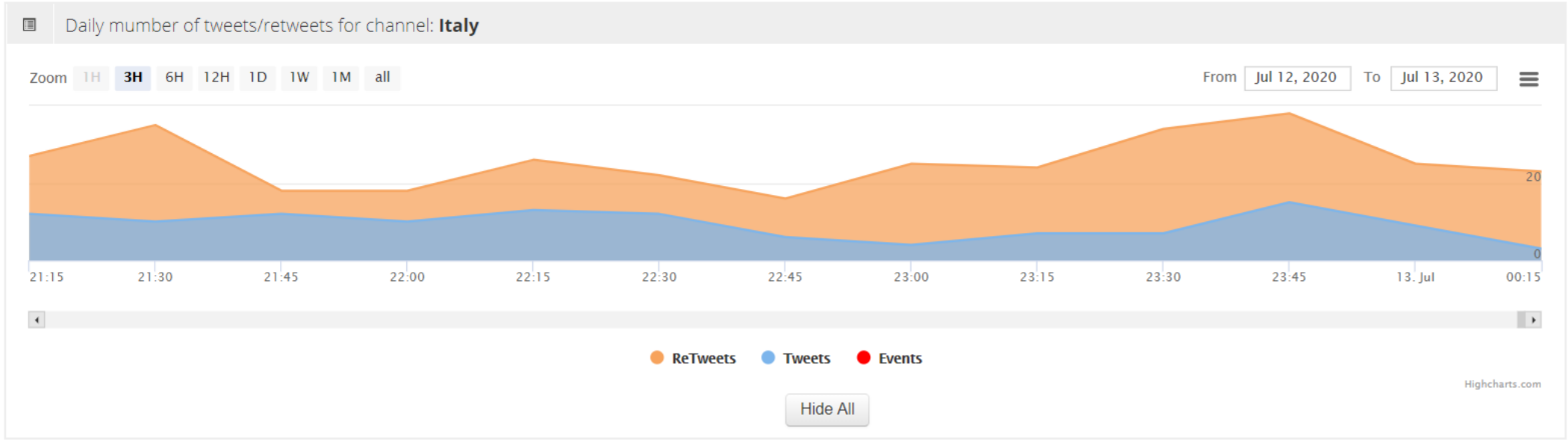
- A complex ***Key-Search*** can combine several terms: string keywords, hashtags, username citations etc.

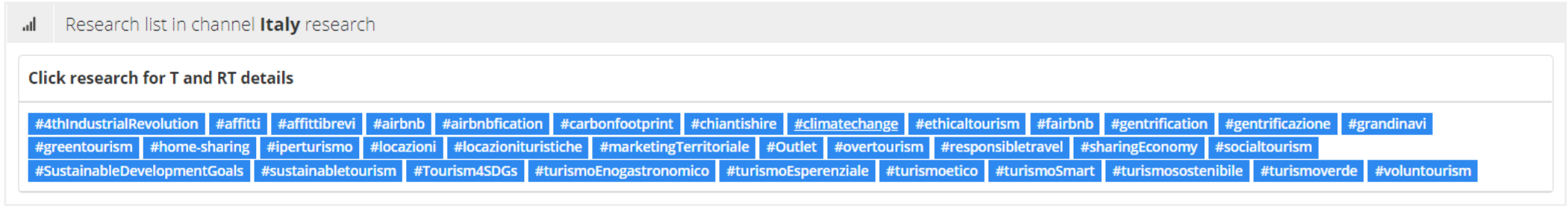
- Terms in a complex Key-Search are logically combined in AND relation:

  crowded beach Dubrovnik search for: crowded AND beach AND Dubrovnik in the same Tweet message.

Gianni

- Channel / Key-Search Statistics: Total Number of Posts (Tweets + Retweets)
  - Graphical details: charts, temporal trends of tweets and retweets for Channel / Key-Search

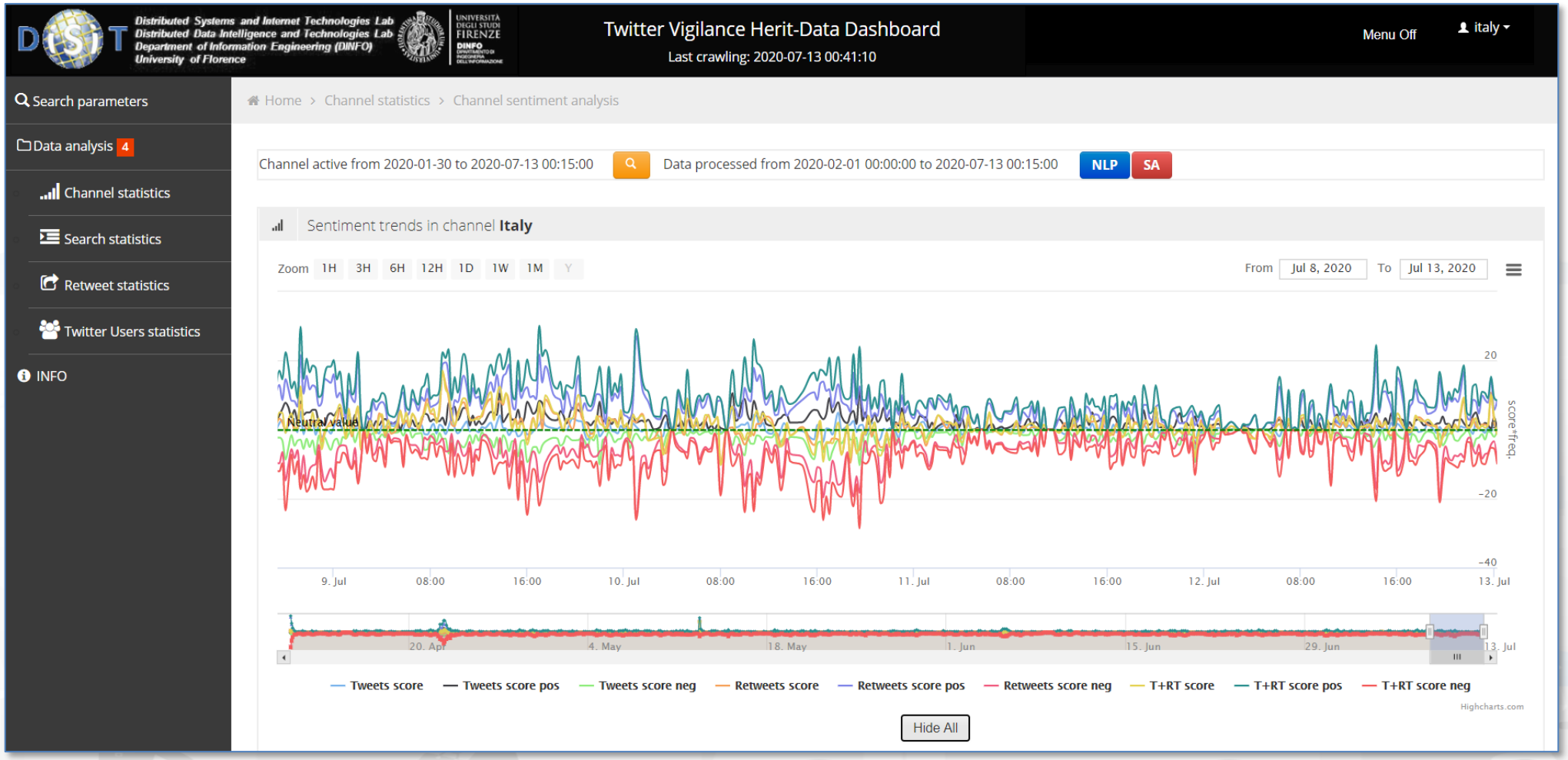




Gianni

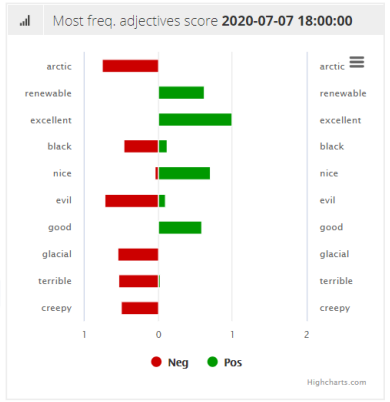
NLP SA

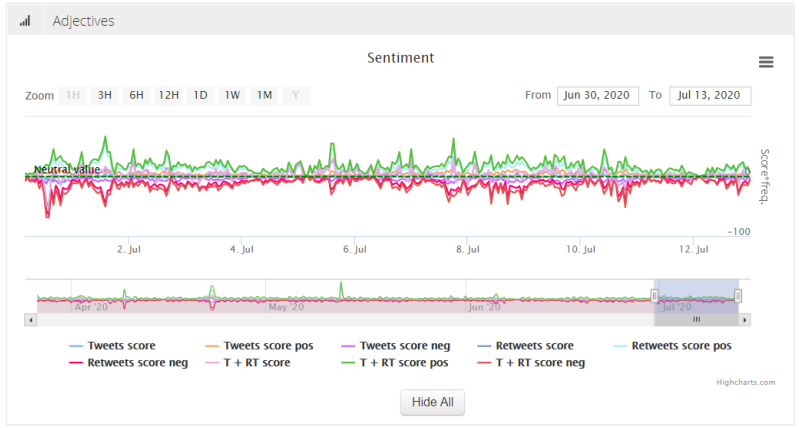
- Natural Language Processing (NLP) and Sentiment Analysis (SA) of collected tweets and retweets for Channel / Key-Search

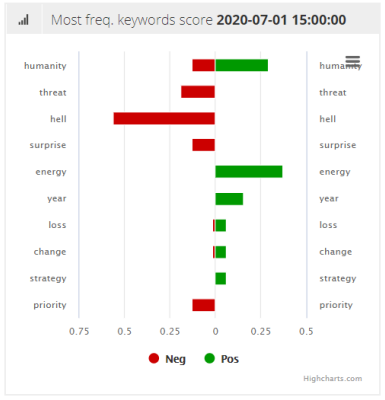


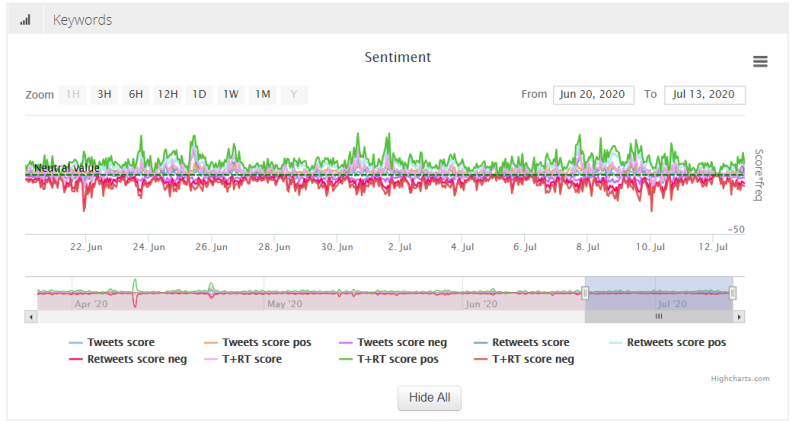
Gianni

- Sentiment Analysis for different Part-Of-Speech: Adjectives, Nouns, Verbs.

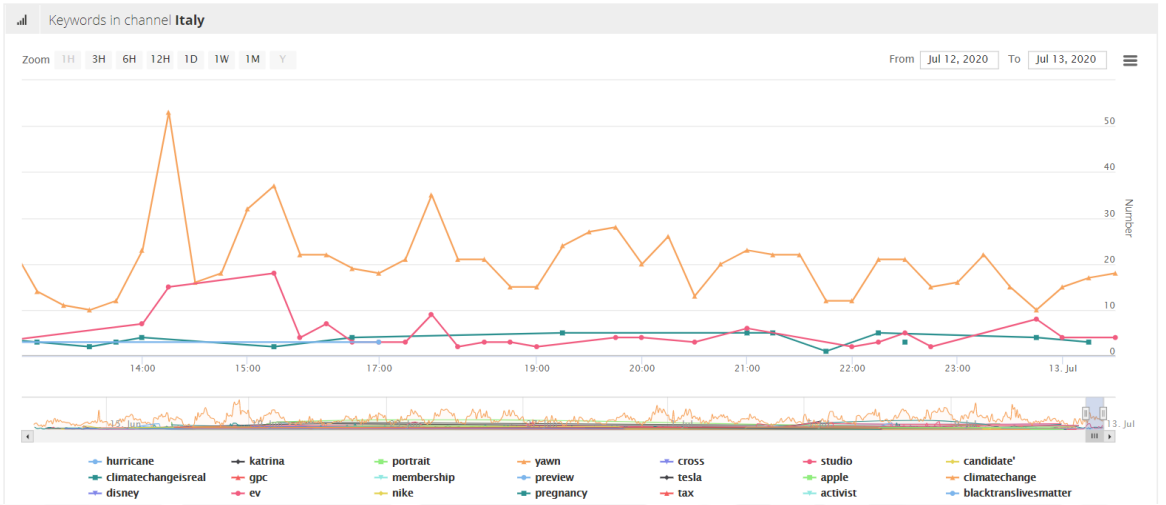








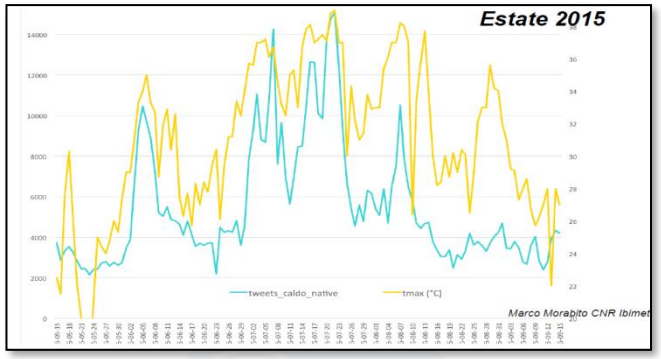
- NLP Extraction of different Part-Of-Speech: Adjectives, Nouns, Verbs, Hashtags, Usernames.



Gianni

Prediction/Assessment

- Football game results as related to the volume of Tweets
- Number of votes on political elections, via sentiment analysis, SA
- Size and inception of contagious diseases
- marketability of consumer goods
- public health seasonal flu
- box-office revenues for movies
- places to be visited, most visited
- number of people in locations like airports
- audience of TV programmes, political TV shows
- weather forecast information
- Appreciation of services



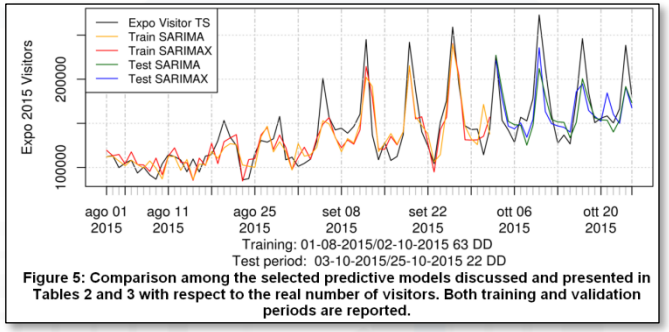
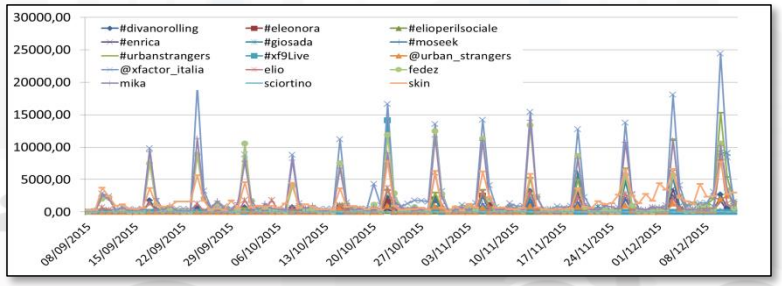


Figure 5: Comparison among the selected predictive models discussed and presented in Tables 2 and 3 with respect to the real number of visitors. Both training and validation periods are reported.



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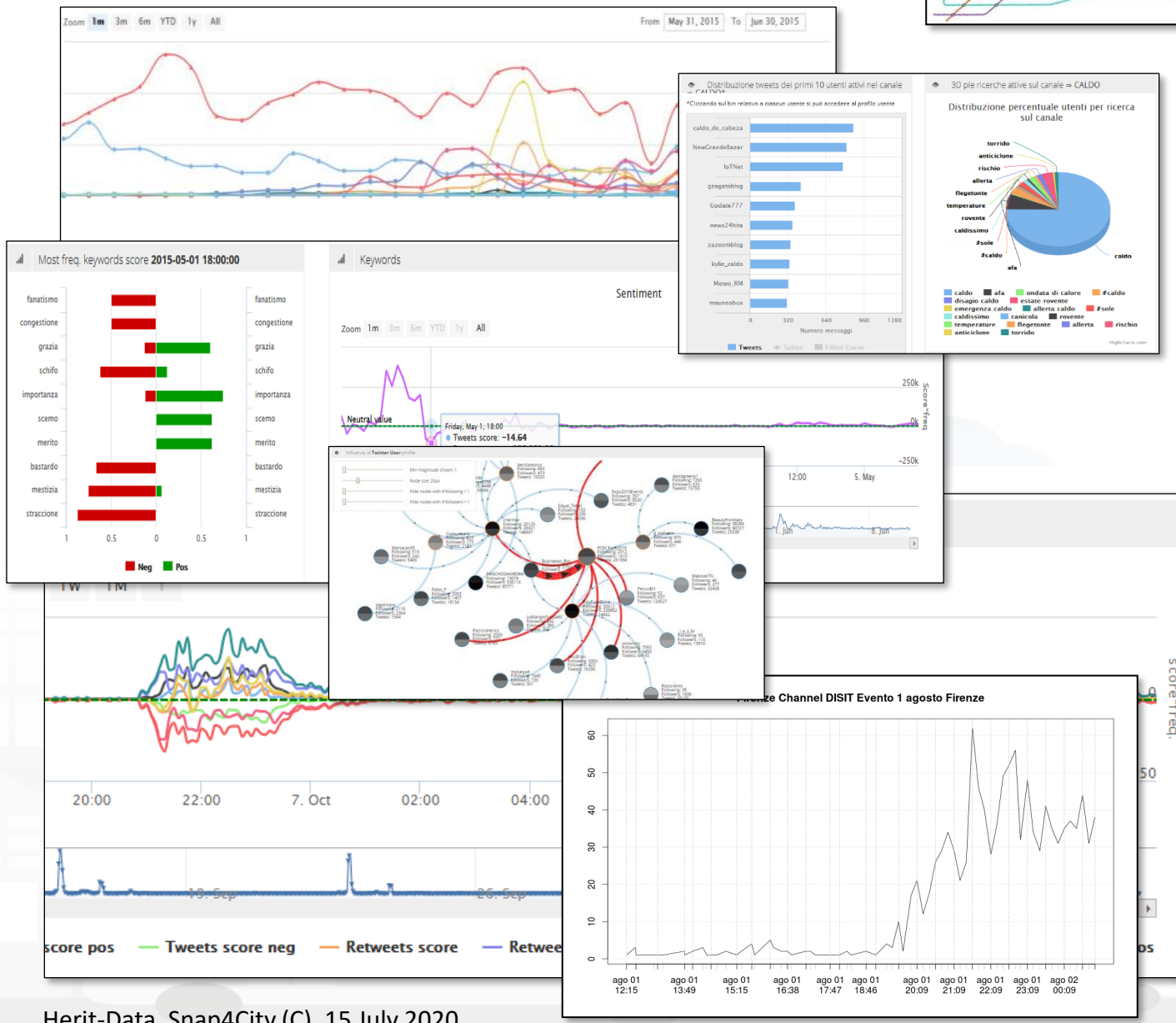
Twitter Vigilance

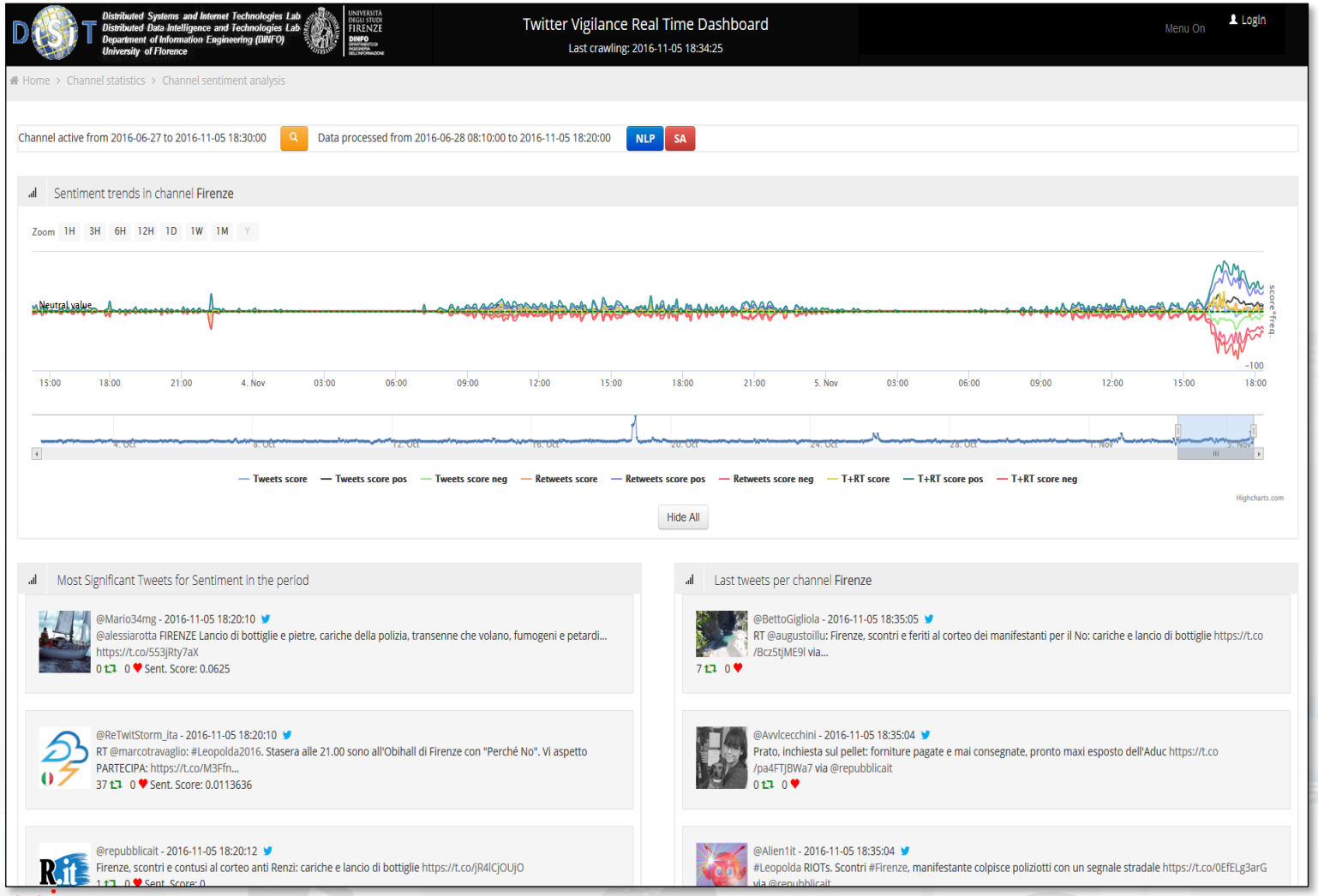
- http://www.disit.org/tv
- http://www.disit.org/rttv
- Citizens as sensors to
  - Assess sentiment on services, events, …
  - Response of consumers wrt, …
  - Early detection of critical conditions
  - Information channel
  - Opinion leaders
  - Communities
  - Formation
  - Predicting volume of visitors for tuning the services



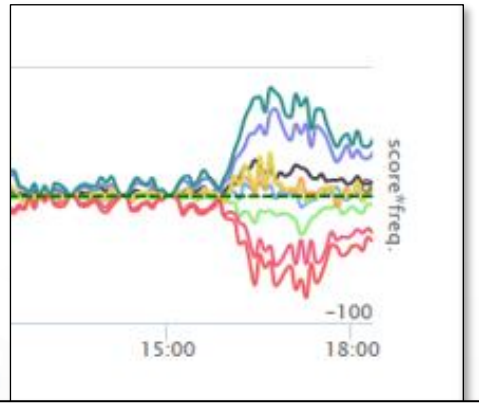
Gianni

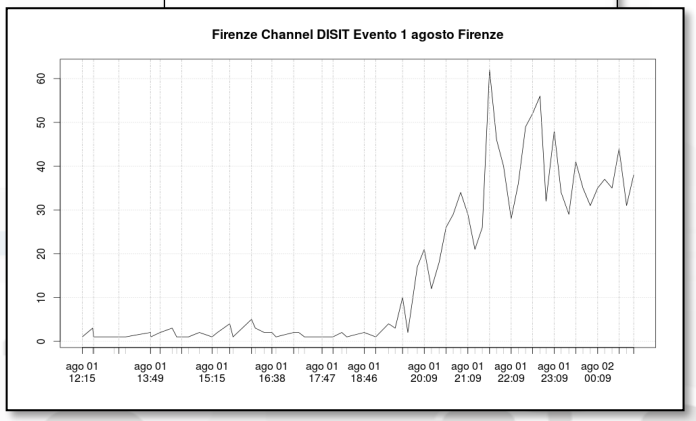
Twitter Vigilance

Twitter Vigilance RT: sentiment analysis



Real time
Early Warning

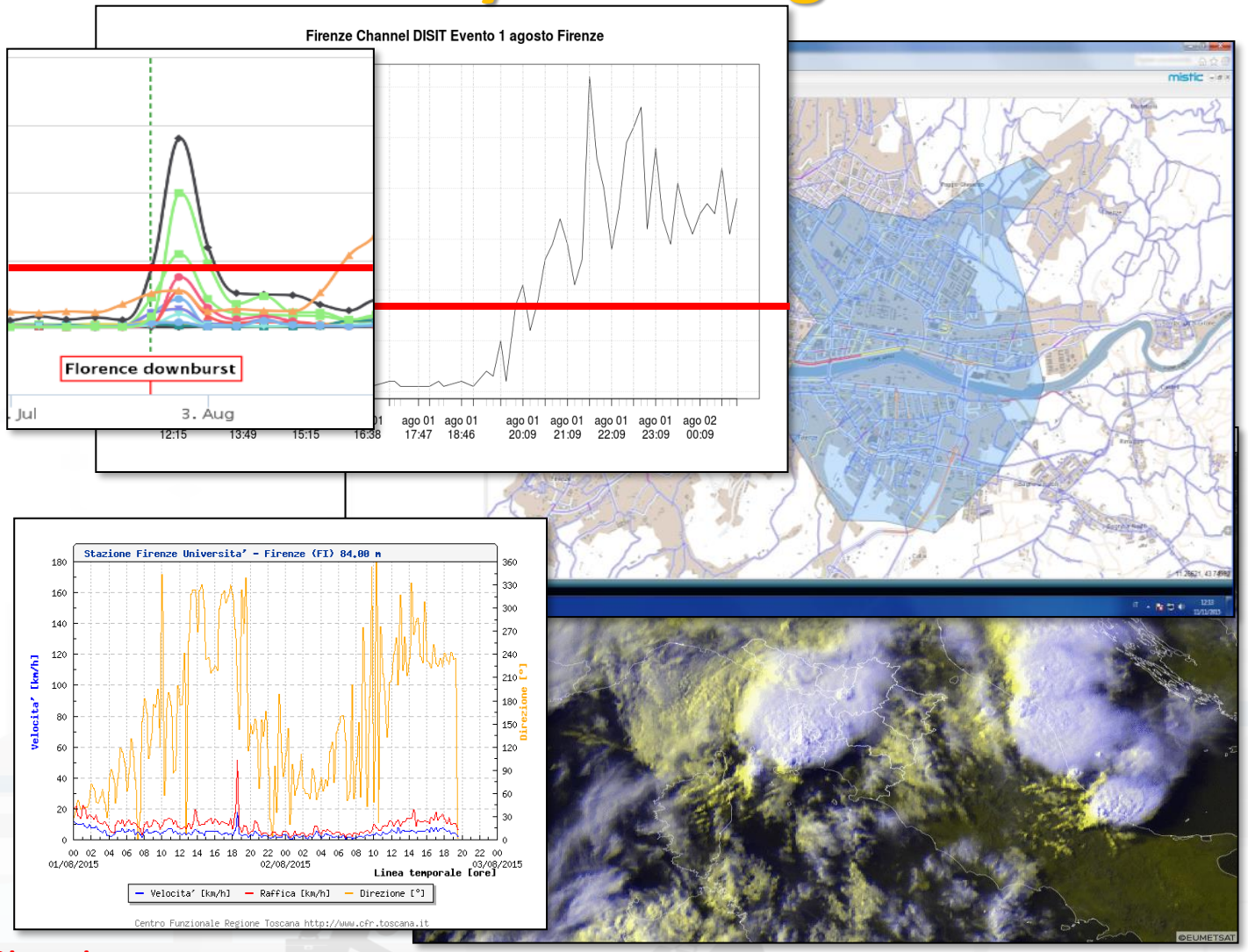




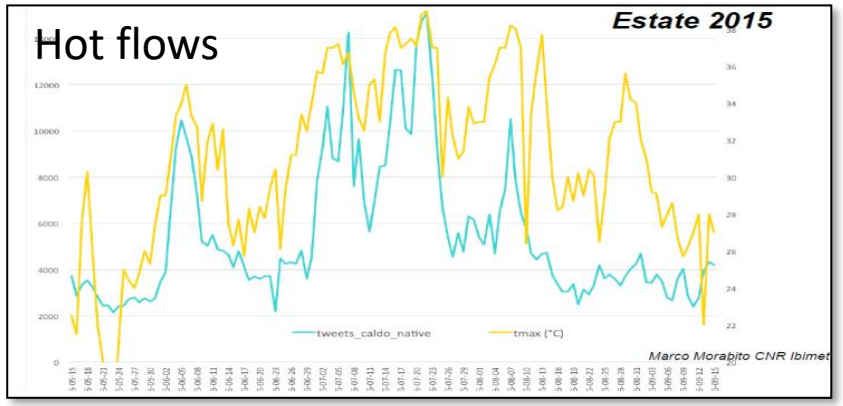
Gianni

Twitter Vigilance

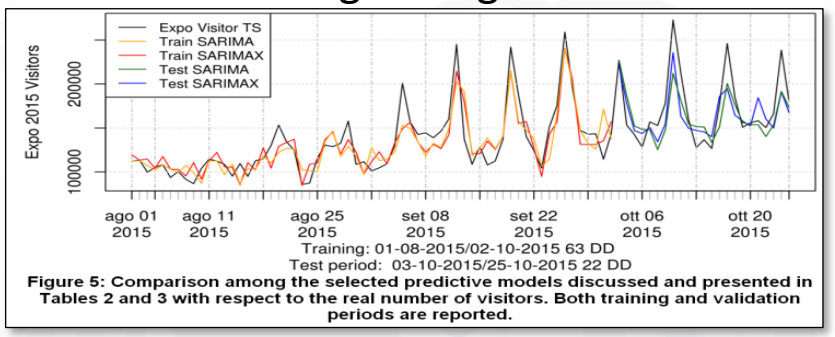
Early Warning



Predictive models



Attendance at long lasting events: EXPO2015



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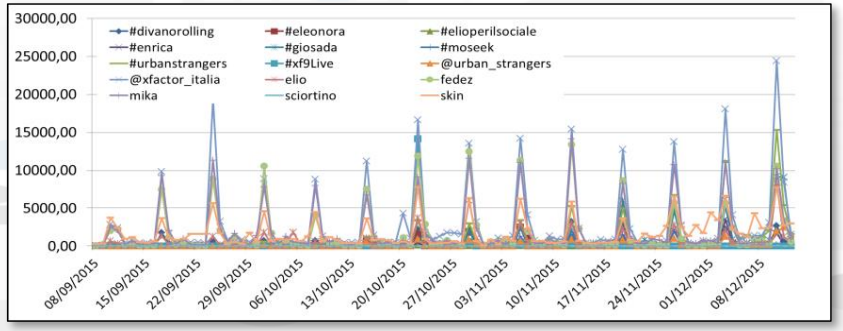
Attendance at recurrent events: TV, footbal



Gianni

Twitter Vigilance Herit-Data: *Some Numbers*

Channel Name	Total Number of Collected TW+RTW	Number of Collected Tweets	Number of Collected Retweets	Twitter Volume Processing Time Range	NLP & Sentiment Analysis Processing Time Range	NLP & Sentiment Analysis Languages
Spain	94.7 Millions	34.5 Millions	60.2 Millions	From 30-01-2020 to current datetime	From 01-02-2020 to 17-05-2020 and from 05-07-2020 to current datetime	English
France	15.8 Millions	3.7 Millions	12.1 Millions	From 30-01-2020 to current datetime	From 01-02-2020 to 8-04-2020 and from 05-07-2020 to current datetime	Italian, English
Greece	9.6 Millions	3 Millions	6.6 Millions	From 30-01-2020 to current datetime	From 01-02-2020 to current datetime	English
Italy	762 Thousands	264 Thousands	498 Thousands	From 30-01-2020 to current datetime	From 01-02-2020 to current datetime	Italian, English
Croatia	14 Thousands	5.3 Thousands	8.7 Thousands	From 30-01-2020 to current datetime	From 01-02-2020 to current datetime	English

- For Spain: 87 million of TW taken for too generic keys
- For France: 8.2 Million of TW taken for too generic keys

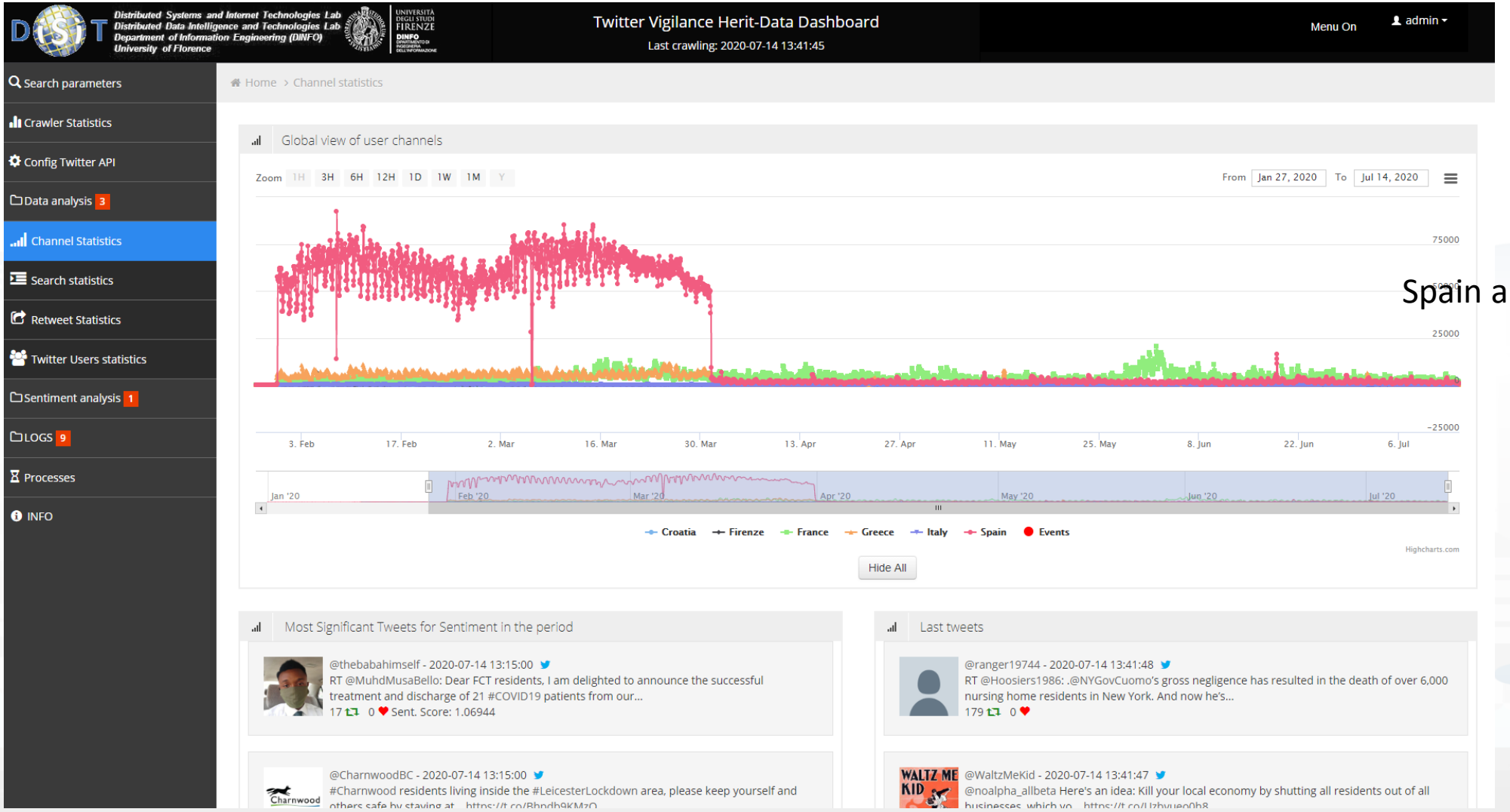
Gianni

Demo Twitter Vigilance

- Show Twitter Vigilance channel (Italia)
  - Trends for the Channel
  - Trends for the Keys
  - Trends for the NLP
  - Trends for the SA

Gianni

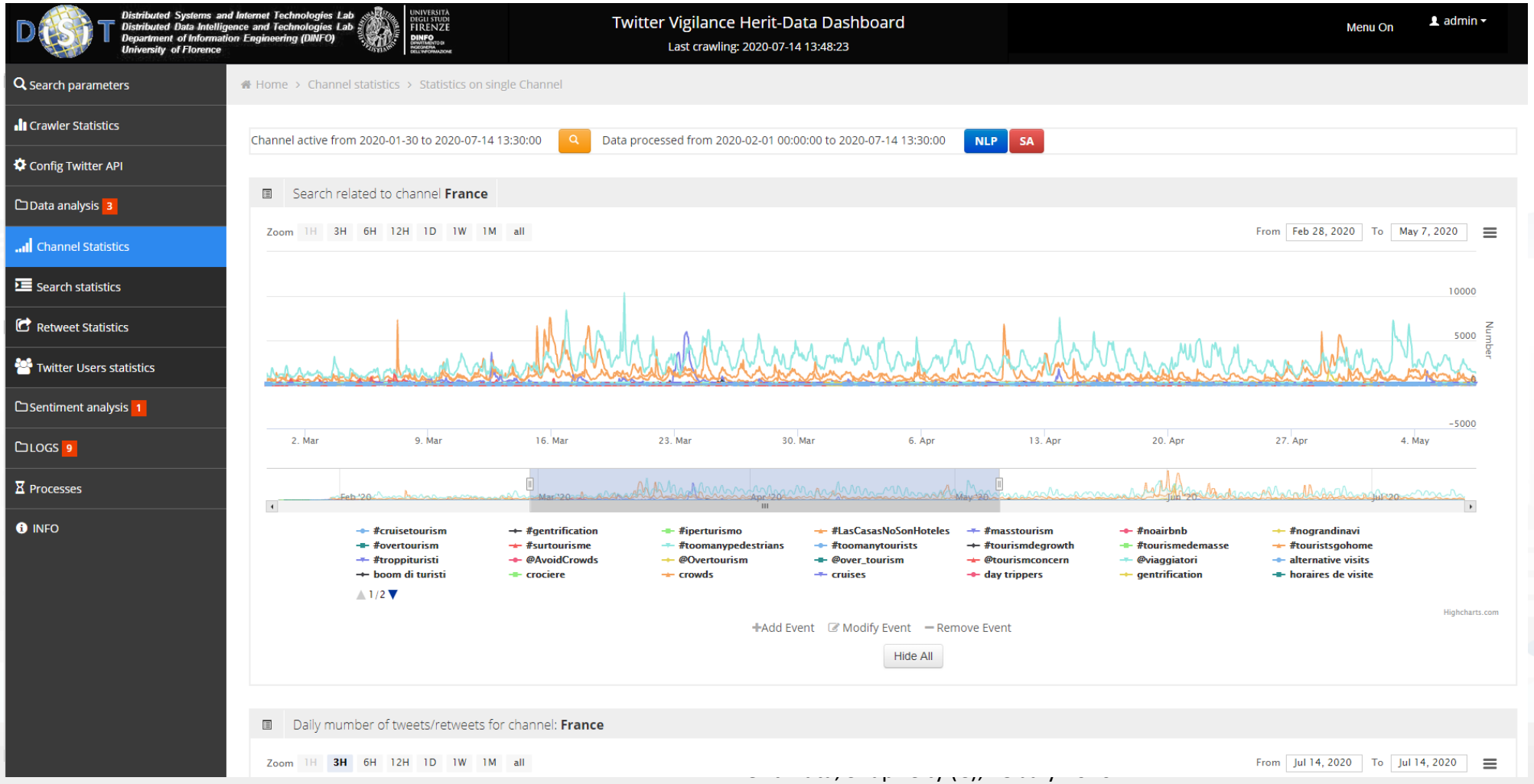
Too Generic Keywords at the beginning



Spain and France

Paolo

Some Keywords increased in Lockdown



Paolo

Detected issues

- Increment of some Keywords in Lockdown
- Decrement of some keywords in Lockdown
- Detection of spikes in Lockdown:
  - start, end,
  - in the middle probably for some events that we do not know
- Thus we performed a Data Analytic study as presented later on

Paolo

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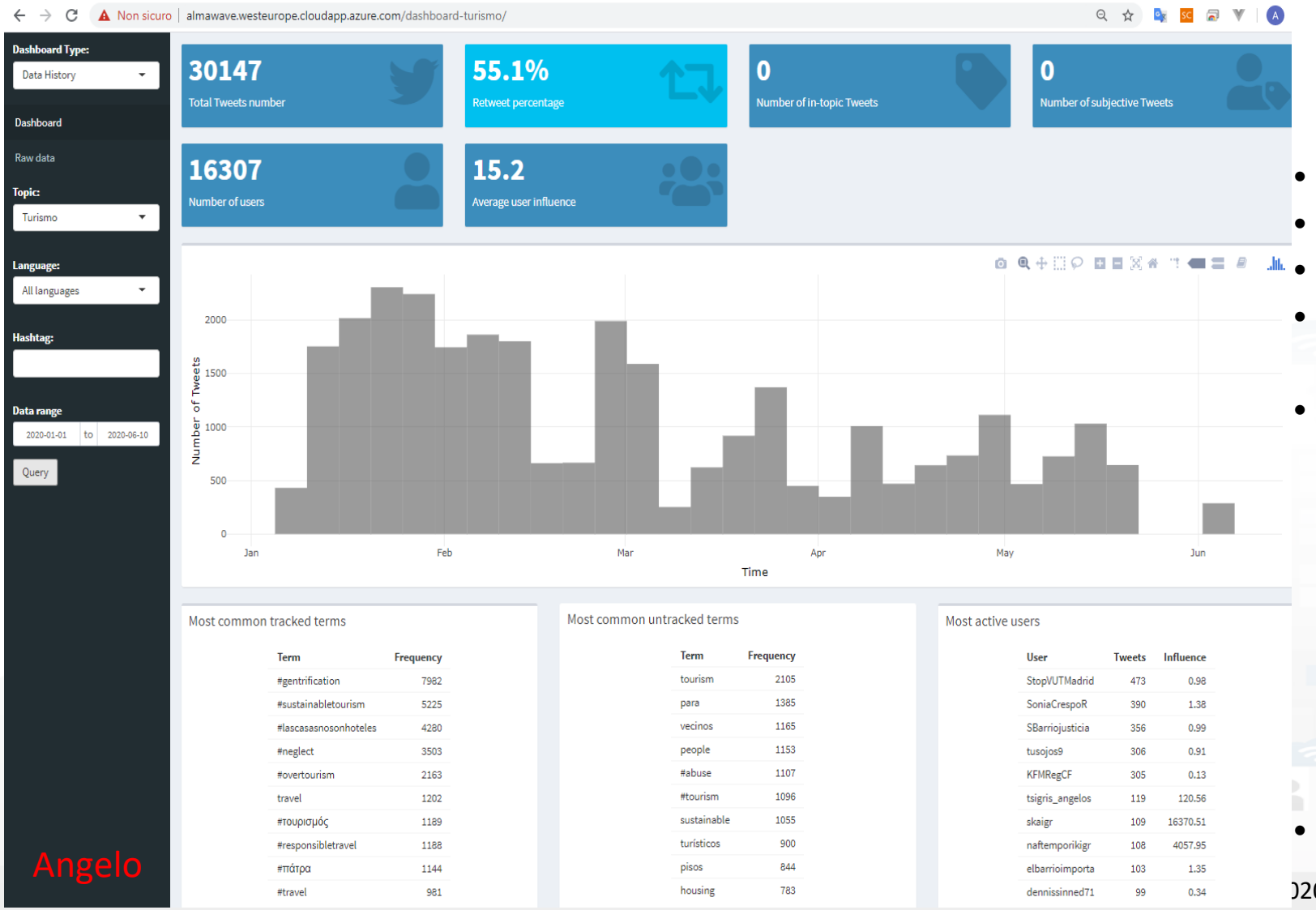
Angelo

Almaviva Tool and comparison (1)

- http://almawave.westeurope.cloudapp.azure.com/poc
  - final user, no admin privileges (?)
  - Doc 15/01/2019 «Descrizione architettura e addestramento modello sentiment»
- Functionalities: collect tweets of interest in specific topics, visualize in an aggregate way, enable manual SA tagging, create model to generate prediction for the sentiment
  - dashboard-turismo/
  - tagging-turismo/
  - trainingapp/ (not available for turismo?)

Angelo

Almaviva Tool and comparison (2)



Term	Frequency
#gentrification	7982
#sustainabletourism	5225
#lascasasnosonhoteles	4280
#neglect	3503
#overtourism	2163
travel	1202
#τουρισμός	1189
#responsibletravel	1188
#πάτρα	1144
#travel	981

Term	Frequency
tourism	2105
para	1385
vecinos	1165
people	1153
#abuse	1107
#tourism	1096
sustainable	1055
turísticos	900
pisos	844
housing	783

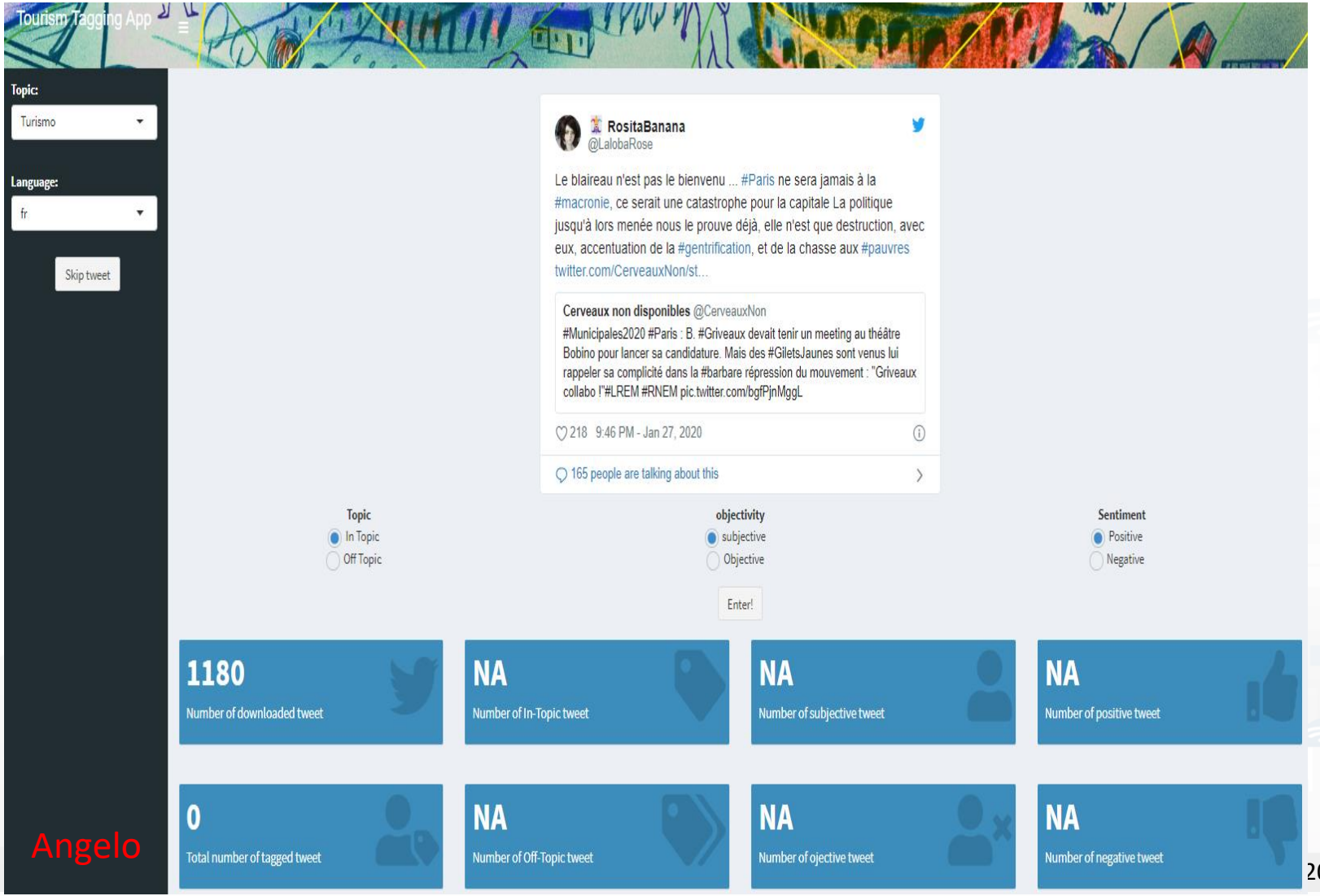
User	Tweets	Influence
StopVUTMadrid	473	0.98
SoniaCrespoR	390	1.38
SBarriojusticia	356	0.99
tusojos9	306	0.91
KFMRegCF	305	0.13
tsigris_angelos	119	120.56
skaigr	109	16370.51
naftemporikigr	108	4057.95
elbarrioimporta	103	1.35
dennissinned71	99	0.34

Dashboard

- data-history (from-to) / real-time (30-360min)
- topics managements
- several languages
- hashtags, users, keywords?
  - (dynamically?)
- tweet: 30147
  - en:18470
  - es:4542
  - el:2475 (Greek, Modern)
  - fr:1180
  - it:766
  - de:436,
  - nl:206,
  - hr?
- most commons

Angelo

Almaviva Tool and comparision (3)



Angelo

Tagging

- topic/off-topic
- objective/subjective
- sentiment positive/negative

Dashboard Type:

Data History

Dashboard

Raw data

Topic:

Turismo

Language:

All languages

Hashtag:

#gentrification

Data range

2020-02-01 to 2020-06-01

Query

4972
Total Tweets number

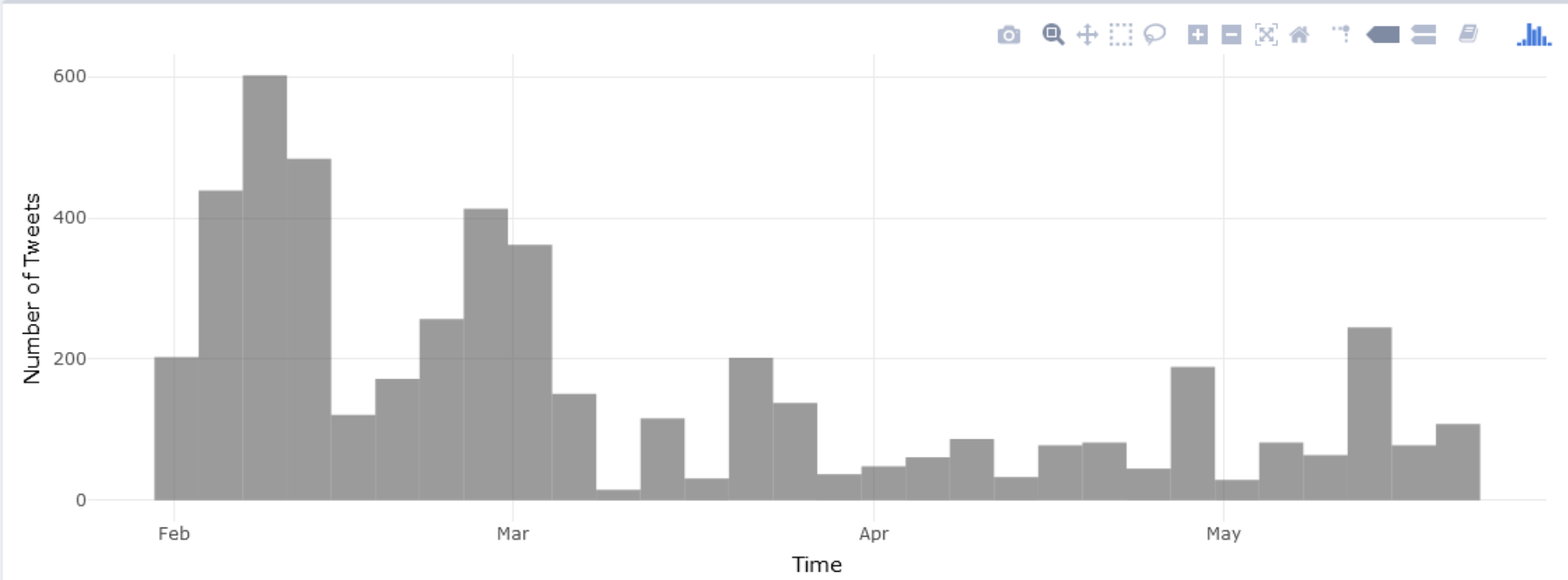
46.7%
Retweet percentage

0
Number of in-topic Tweets

0
Number of subjective Tweets

3411
Number of users

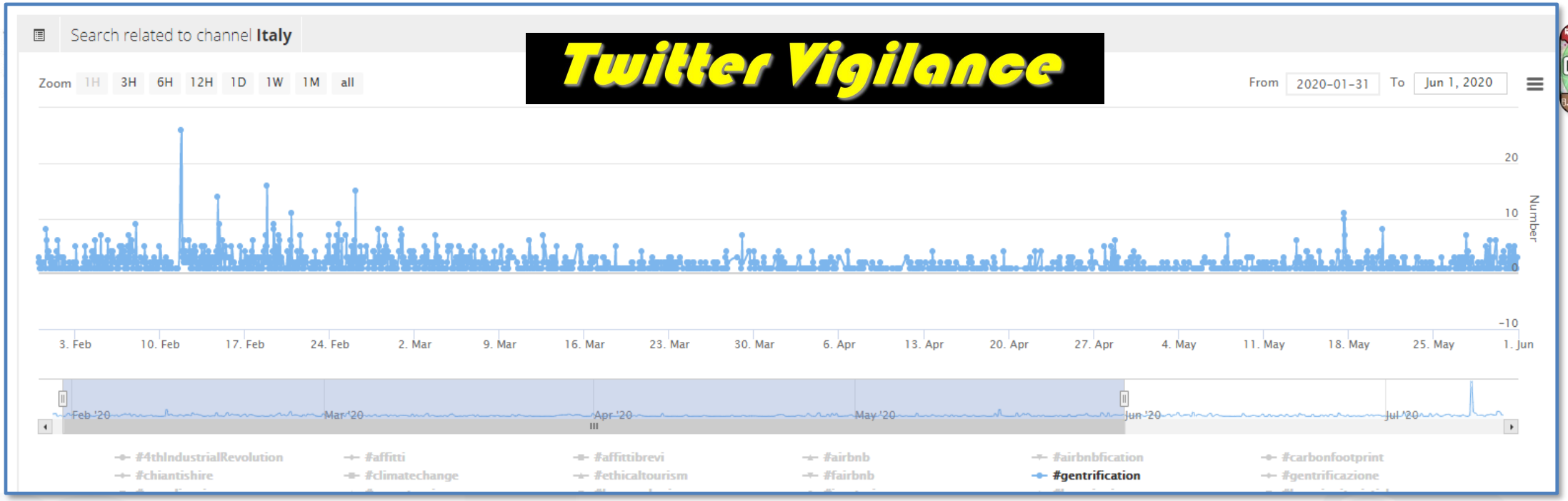
4.67
Average user influence

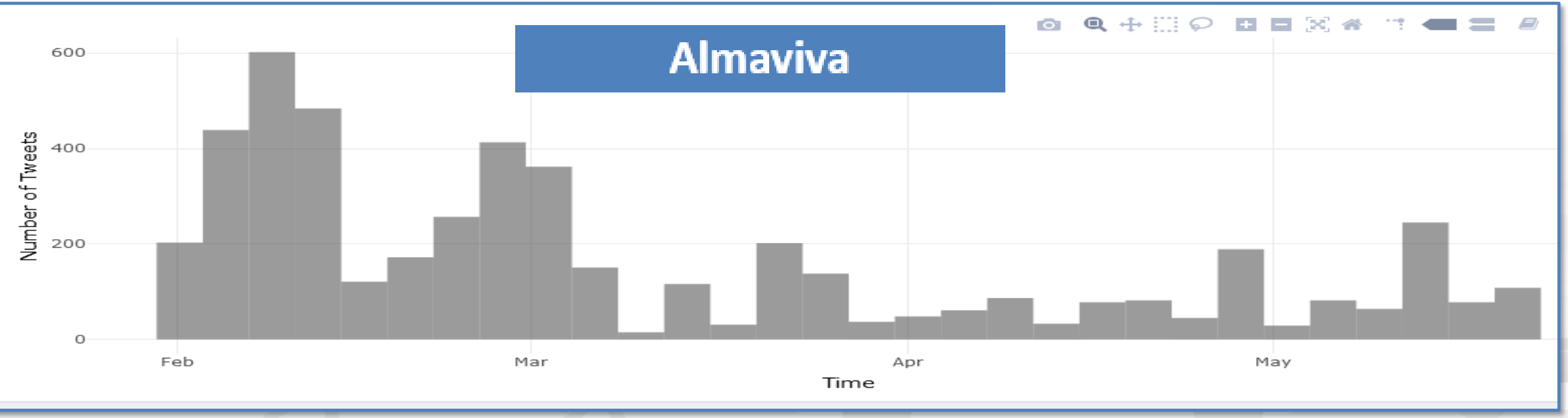


Almaviva Tool and comparision (4)

	Almaviva	Twitter Vigilance
Supported languages	all (HR is missing?)	all (SentimentAnalysis currently for EN + IT)
Data collections	hashtags, users, keywords	hashtags, users, keywords
Data organization	topics (turism) (one for all pilots)	channels (Greece, Italy, …)
Dashboard types	Data history (from-to) / real-time (2sec)	Data history (from–to) / real-time (15min)
Data presentation granularity	5 days (fixed resolution)	15 minutes up to 1 days
Data graph type	Tweets (Tw + ReTW), hashtags	tweets, retweets, hashtags, keywords, SA, citations,…
Type of data	tweet, retweet, quote tweet (?)	tweet, retweet
Export data	png	png, csv, xls, pdf, …
User management	no	yes, with roles and sharing
NLP	no	adjectives, hashtag, keyword, mentions, verbs
Ratio TW/RTW	yes	yes
Sentiment Analysis	yes, manual	yes, sentiwordnet
Learning/Prediction on SA	yes	Not needed
User influence	yes	yes
Volume	30147	120 million
Connection with Dashboards	**no**	**Yes**
API and MicroServices	**no**	**Yes and IOT App integration**

Angelo





#gentrification

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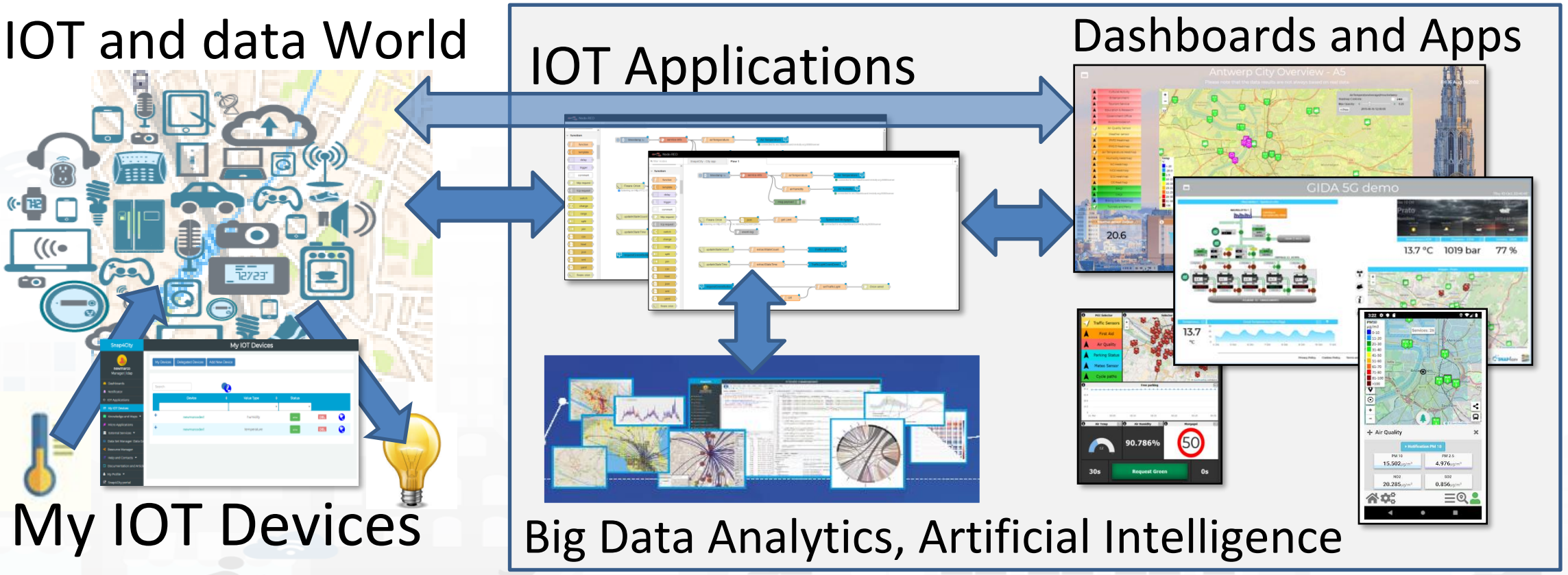
  - data analytic on accessible data vs COVID lockdown

Snap4City: Builder of Sentient Cities Solutions

Dashboards with data driven IOT Applications enforcing intelligence

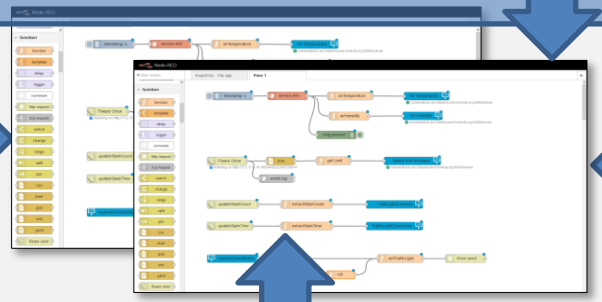


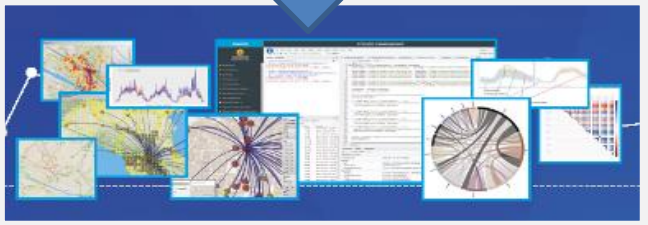
Paolo

Twitter Vigilance

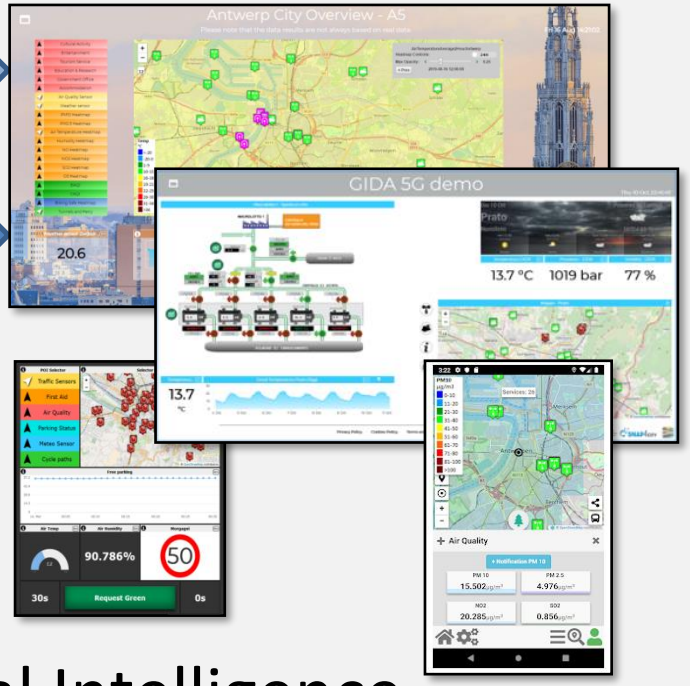
IOT and data World

IOT Applications





Dashboards and Apps



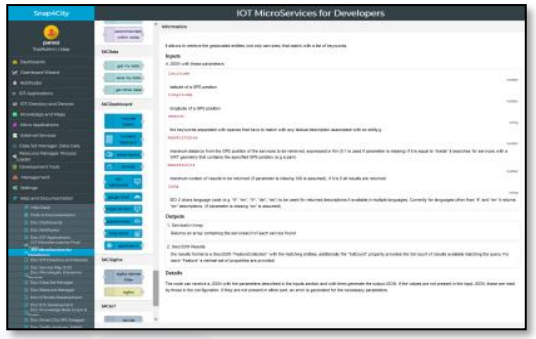
Big Data Analytics, Artificial Intelligence

Paolo

IOT Applications Development

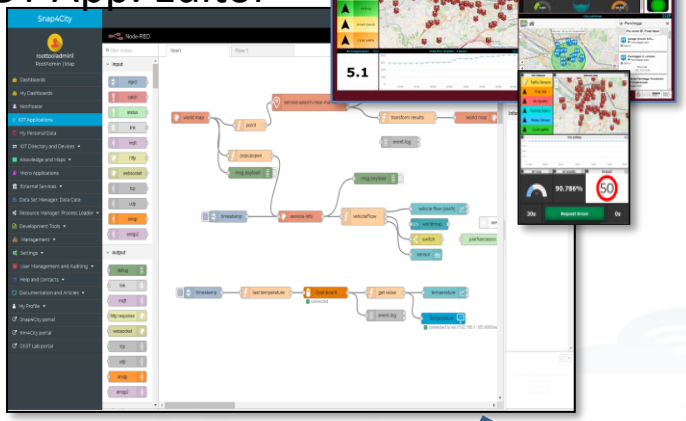
IOT Discovering

MicroServices collections

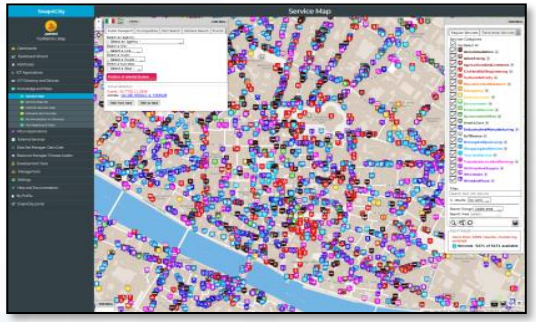


My IOT Applications

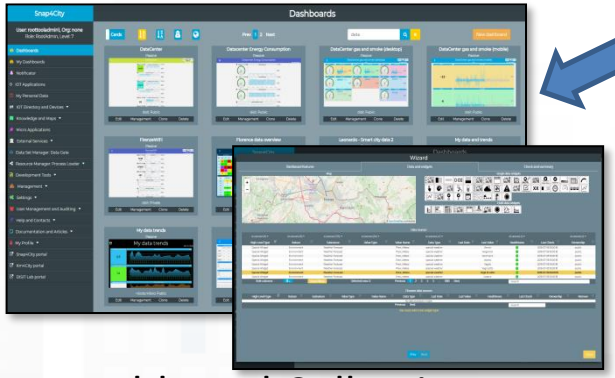
IOT App. Editor



Generating IOT App
With Dashboard



ServiceMap Discovery



Dashboard Collection,
Editor and Wizard

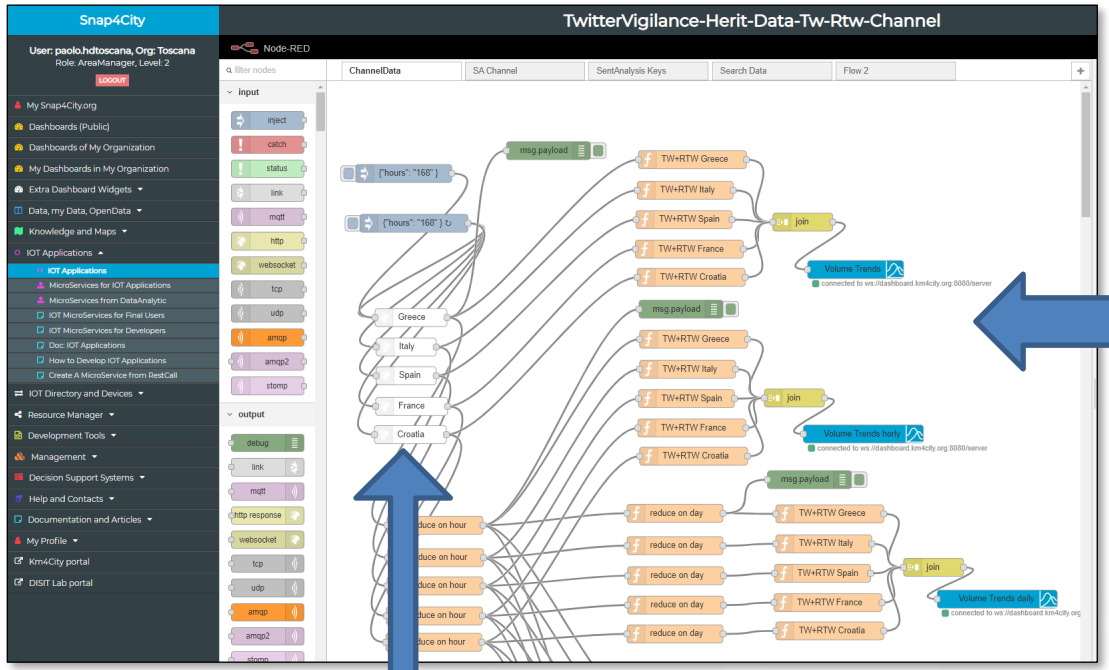
Sharing/saving
reusing IOT App

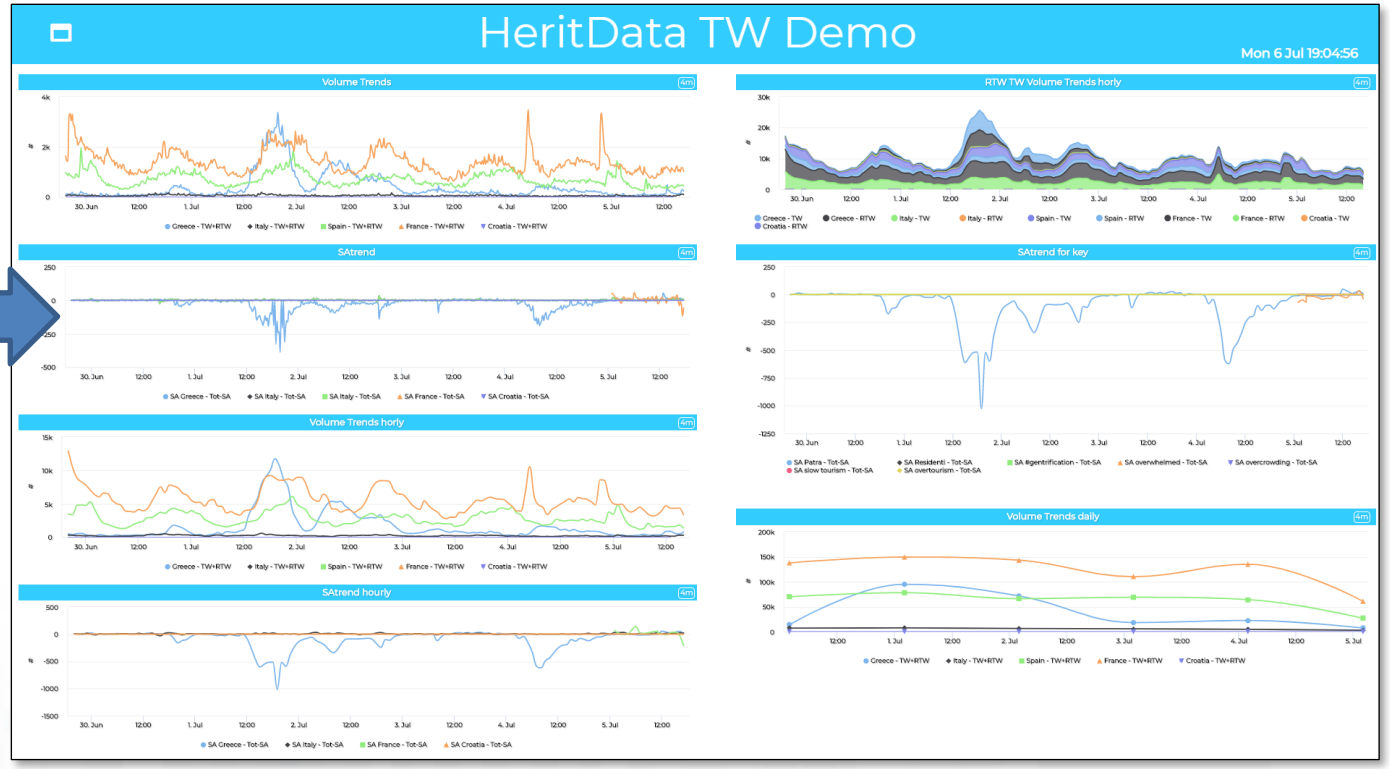
Resource Manager

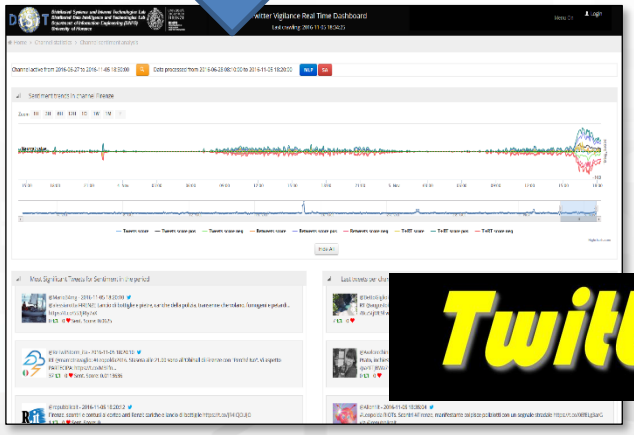
Knowledge Base, Km4City

Paolo

Overview (paolo)







Twitter Vigilance

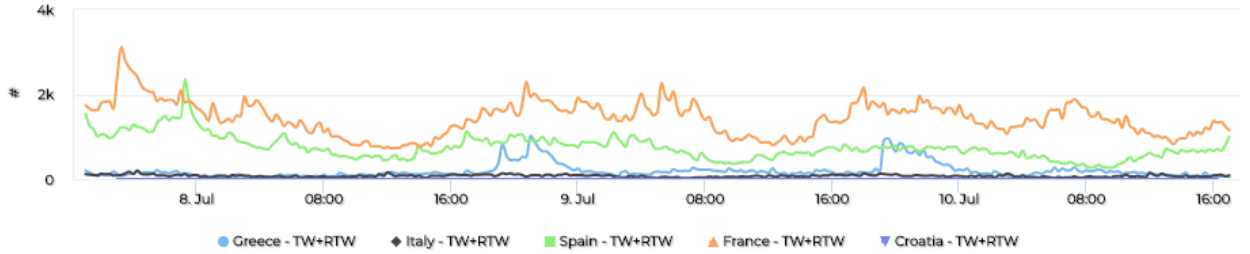
https://www.snap4city.org/dashboardSmartCity/view/index.php?iddasboard=Mjc3NQ==

Paolo

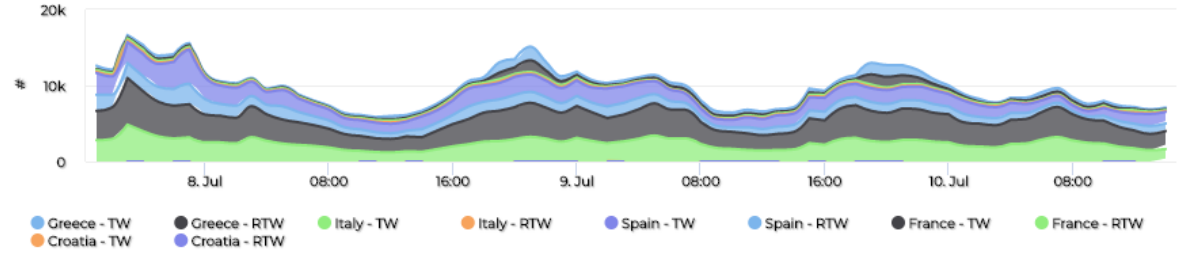
HeritData TW Demo

Tue 14 Jul 16:54:43

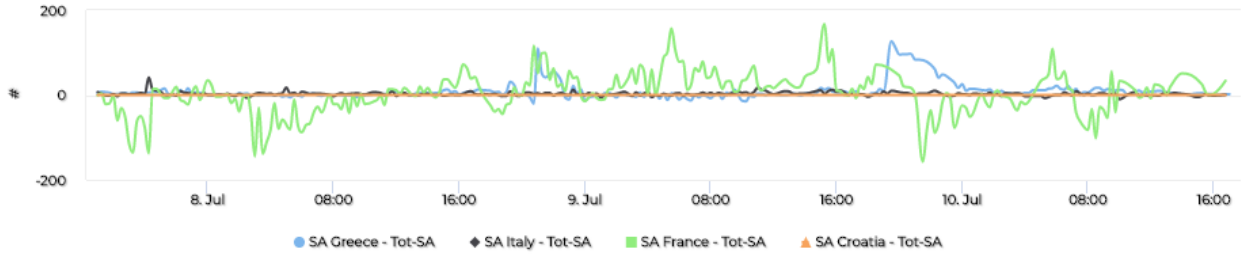
Volume Trends



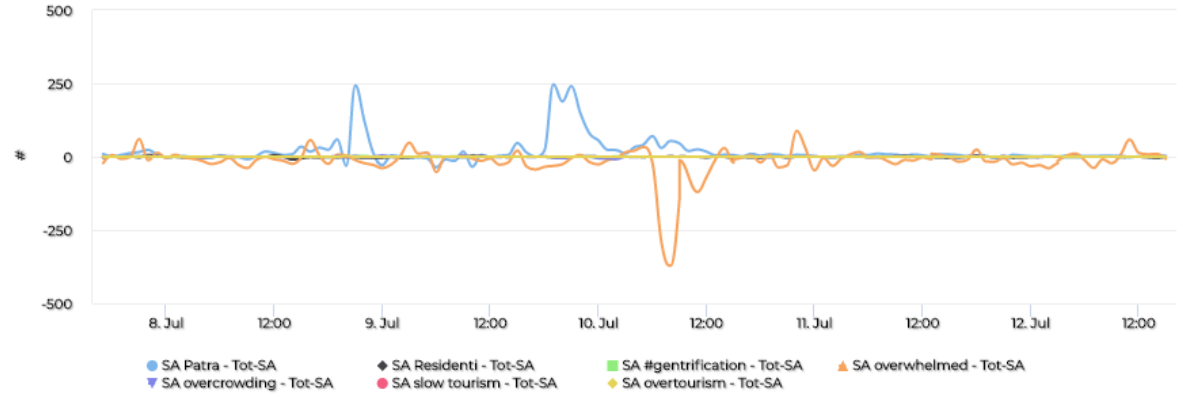
RTW TW Volume Trends horly



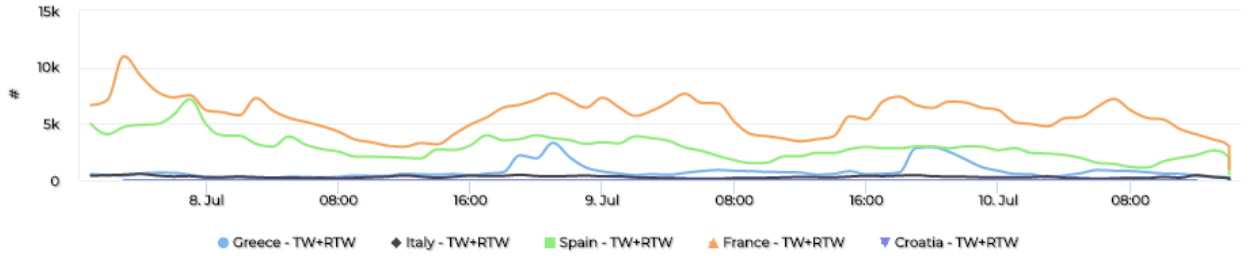
SAtrend



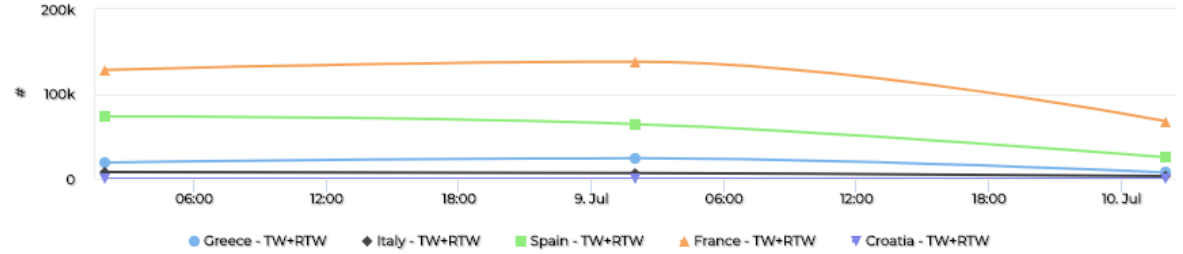
SAtrend for key



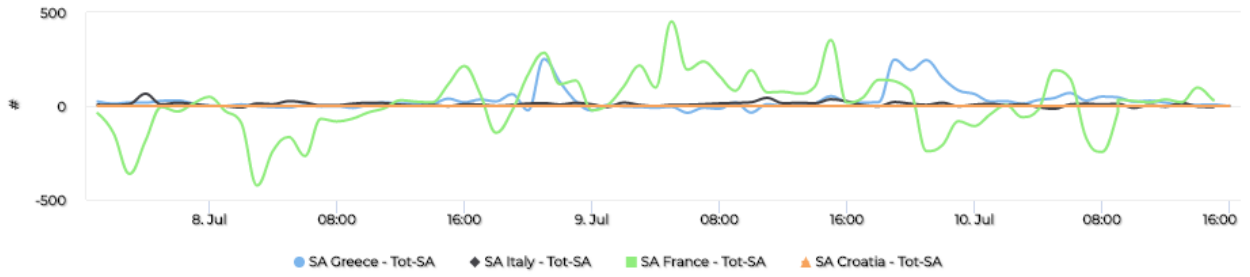
Volume Trends horly



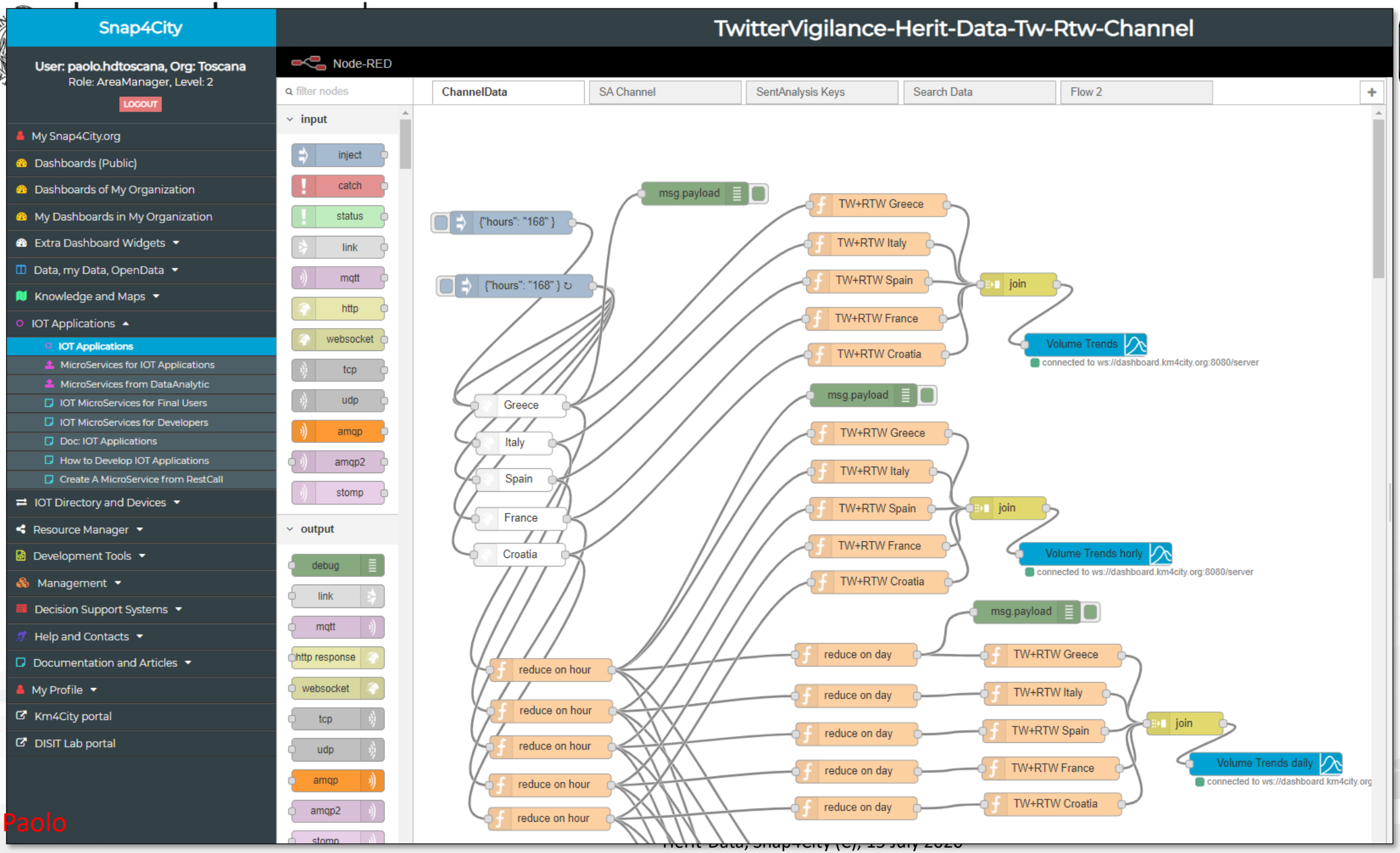
Volume Trends daily



SAtrend hourly



TwitterVigilance-Herit-Data-Tw-Rtw-Channel



Paolo

agenda

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Michela

- 16:00-16:30
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Dataset Analysis

	Data Table	Data Availability	Data Description (source)	Data ingestion in Snap4City
Dubrovnik	✓	✓	• Camera position • #people every minute Licence: **Attribution-NonCommercial-NoDerivatives 4.0 International**	**Work in Progress:** • Camera Position • Average #people every 15 minutes
Florence	✓ (partial)	✓	• Camera position, #people every minute • Many other data in place NOW !!! **Licence: Open data**	**Work Finalised:** ✓ • Wifi position • Average #people every 15 minutes
Pont Du Gard	✗	✗	Monitoring the Pont ?? ✗	✗
Mostar	✗	✗	✗	✗
Valencia	✓	Not yet ✗	• Pax counters position • Number of persons in transit between two points • Average time spent in sensor location **Licence: private data**	✗
WestGreece	✓	Not yet ✗	Building/Site Capacity - Static + dynamic Data **Licence: Public as CC: to be decided the specific ones**	✗

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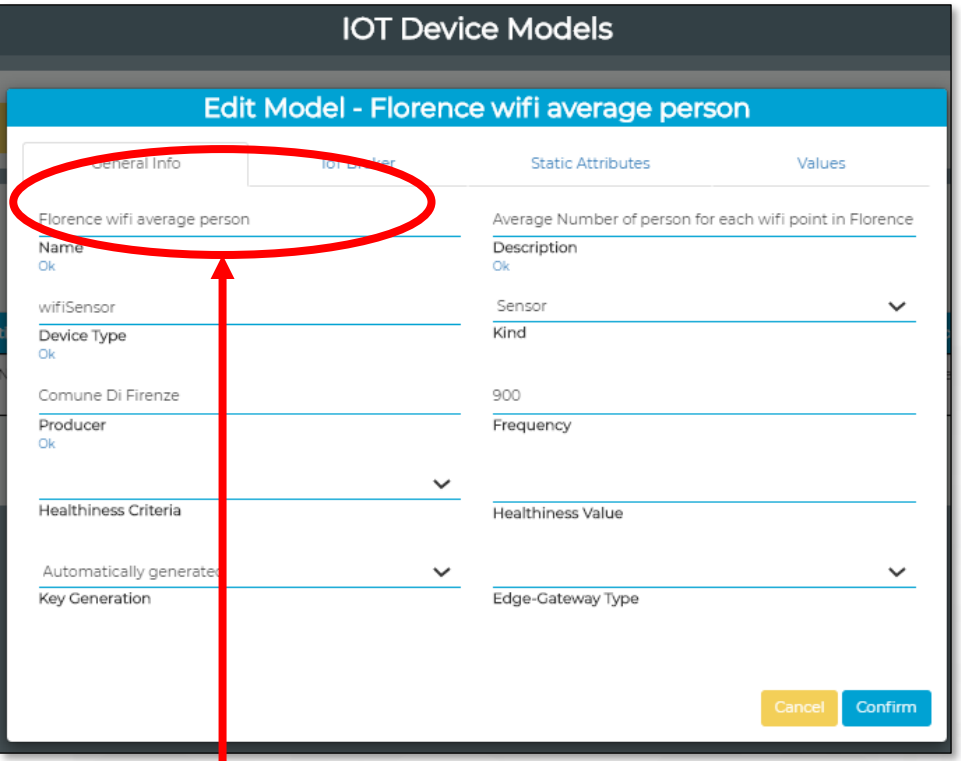
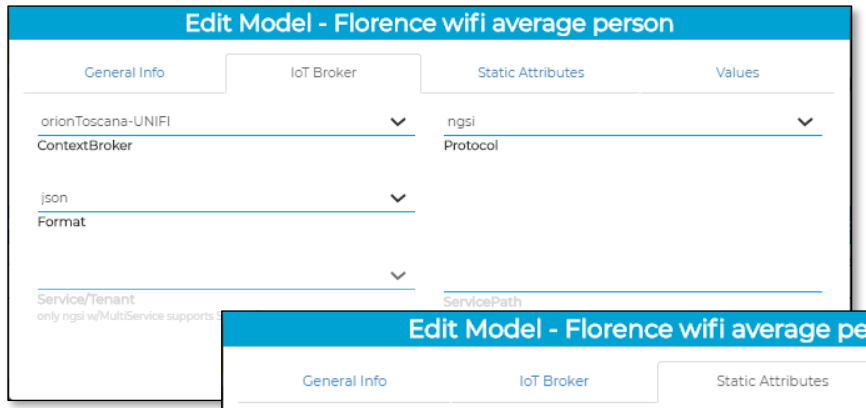
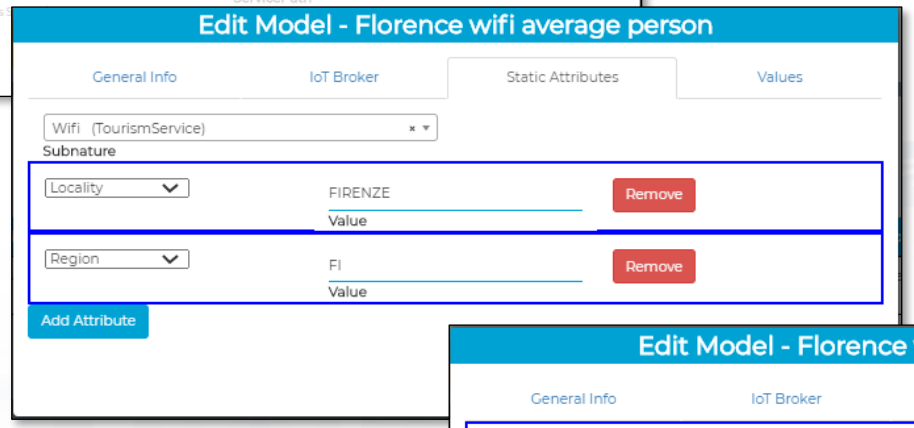
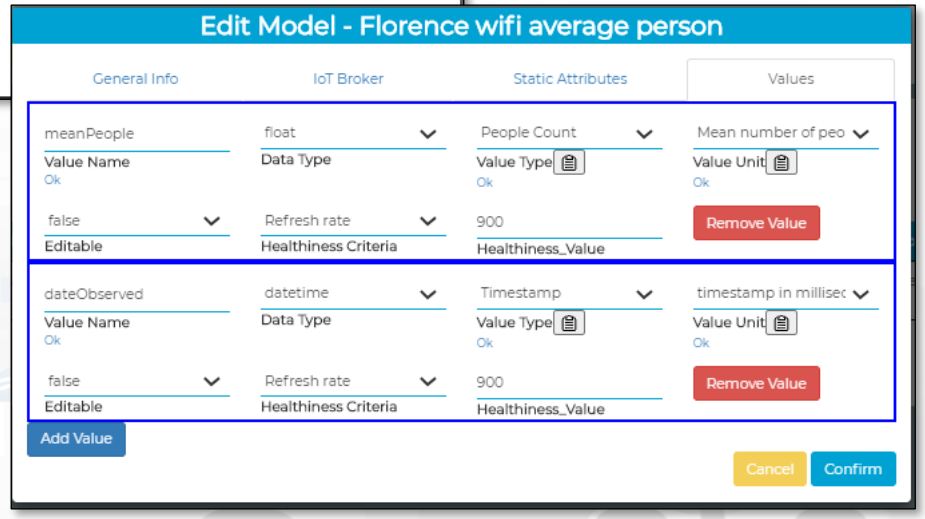
Dataset Creation

1) Model creation









Florence Wifi

Model name: Florence wifi average person

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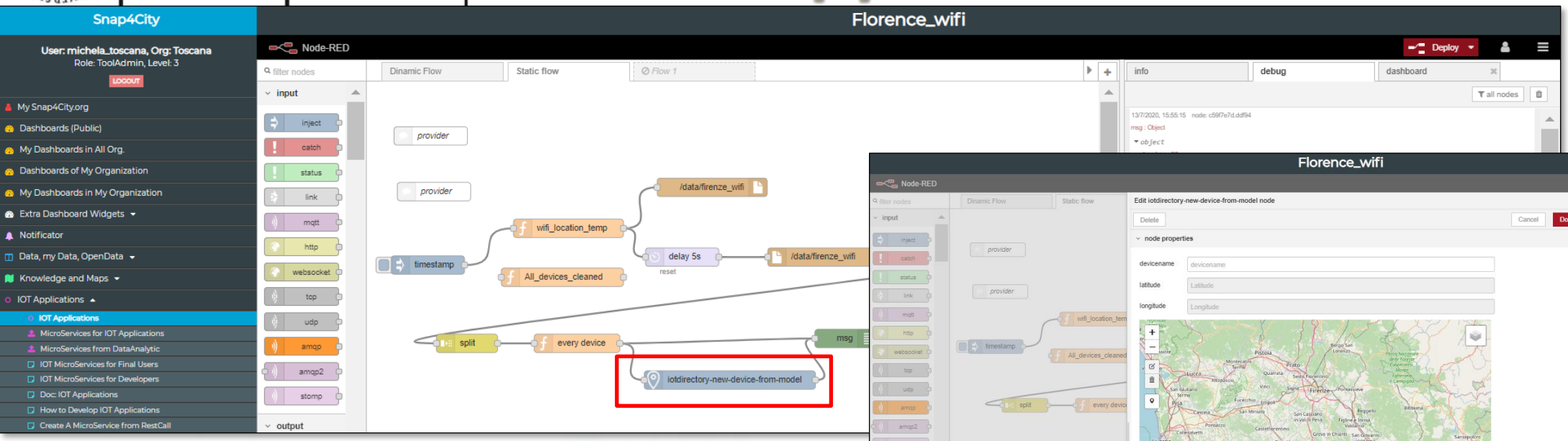
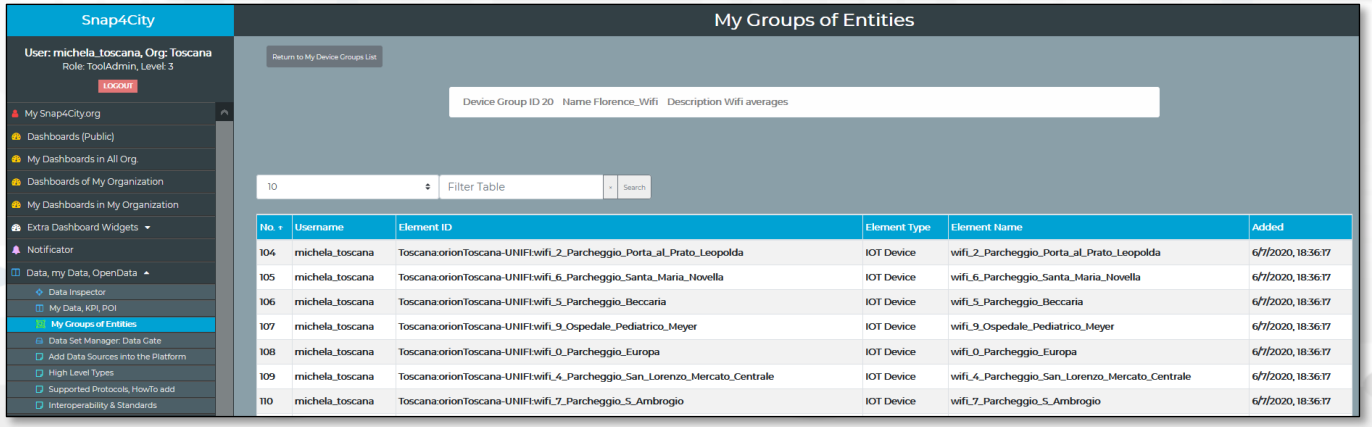
IoTApp static flow



Florence Wifi

2) IoT Devices Creation

BLOCK: 'IoTDirectory-new-device-from-model'
Model name: Florence wifi average person

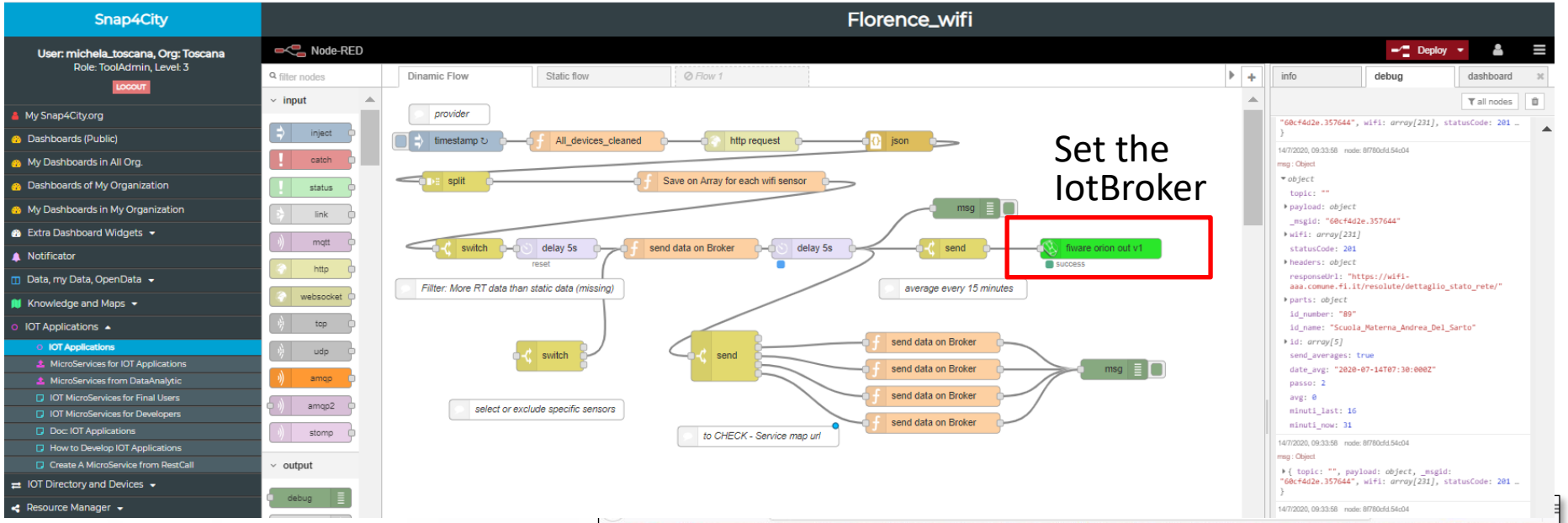


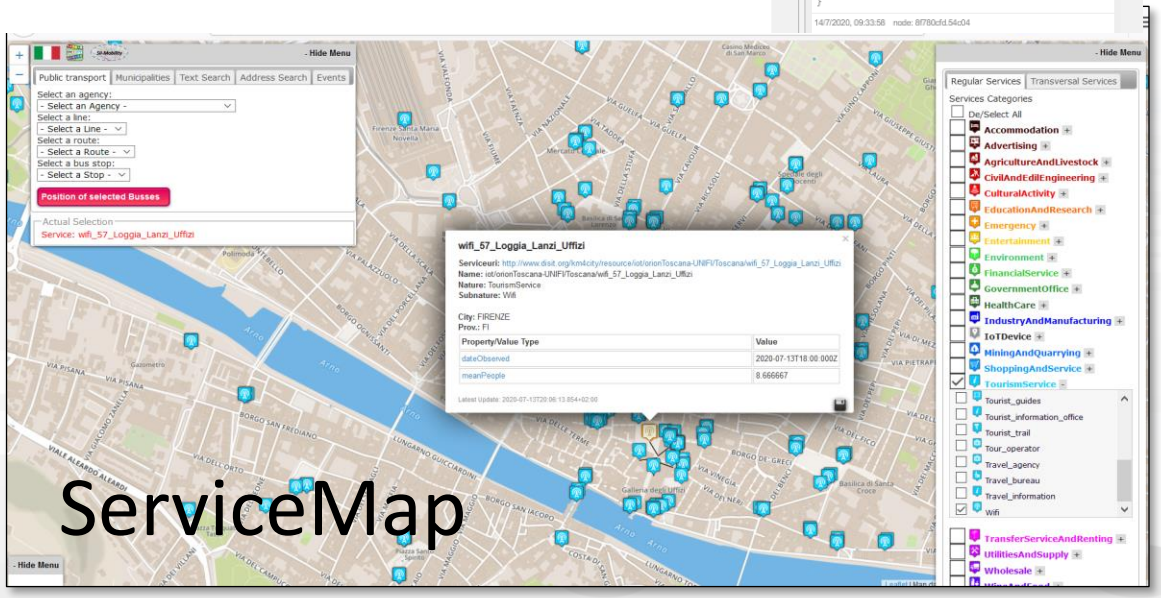
3) Group Creation (more than 200 devices) -> put all the devices in the group and put them as 'public' (or they remain private)

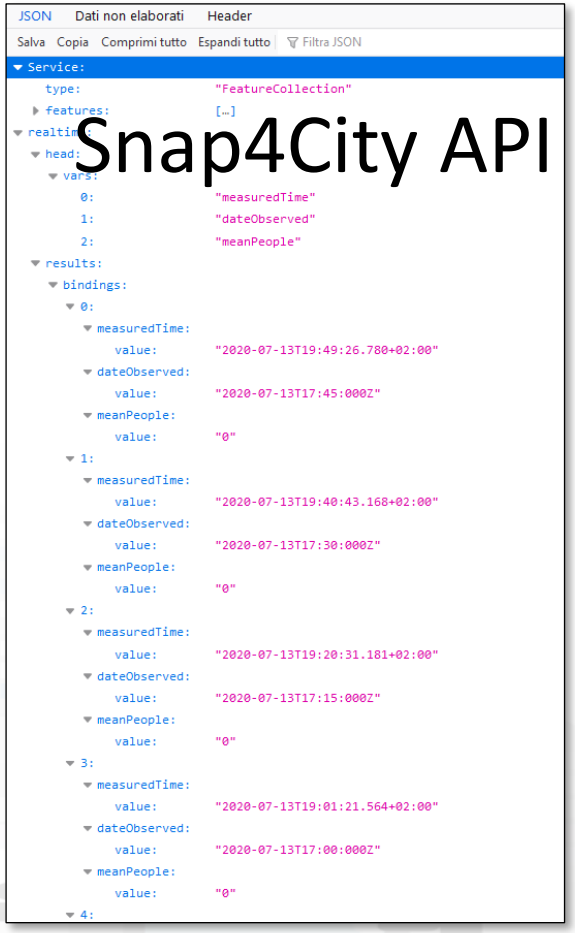
Michela

IoTApp Dynamic Flow

Florence Wifi







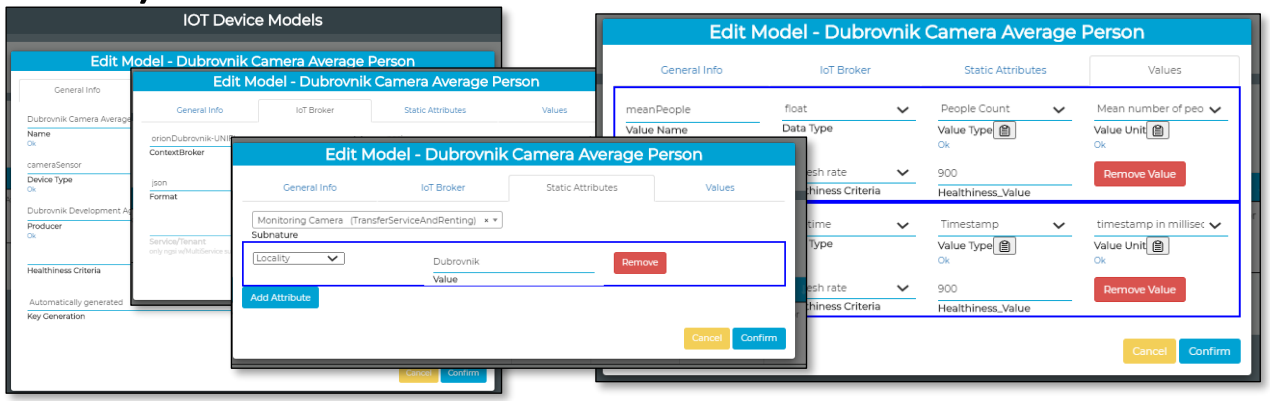
4) Send RT data to the IoTDevices

5) Verify RT Data via Snap4City API or via ServiceMap

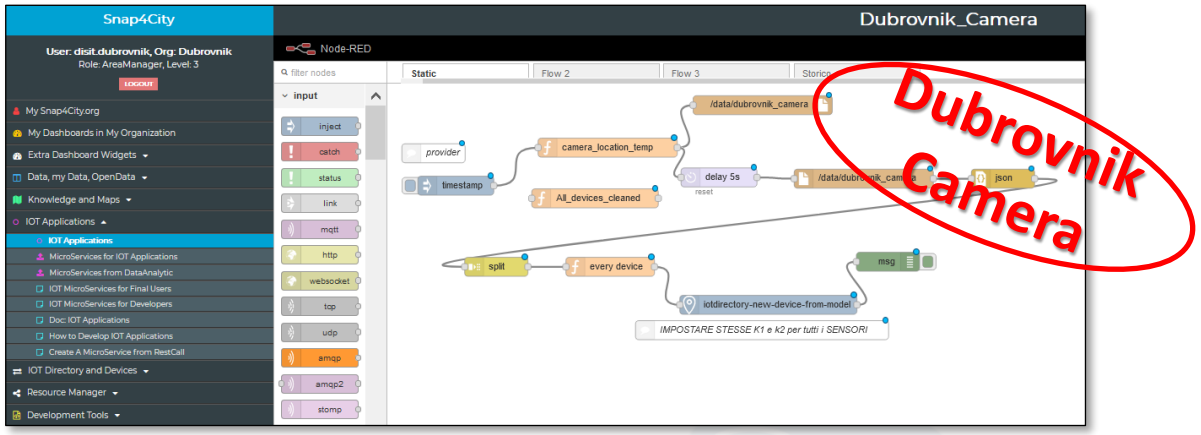
Michela

Work in Progress...

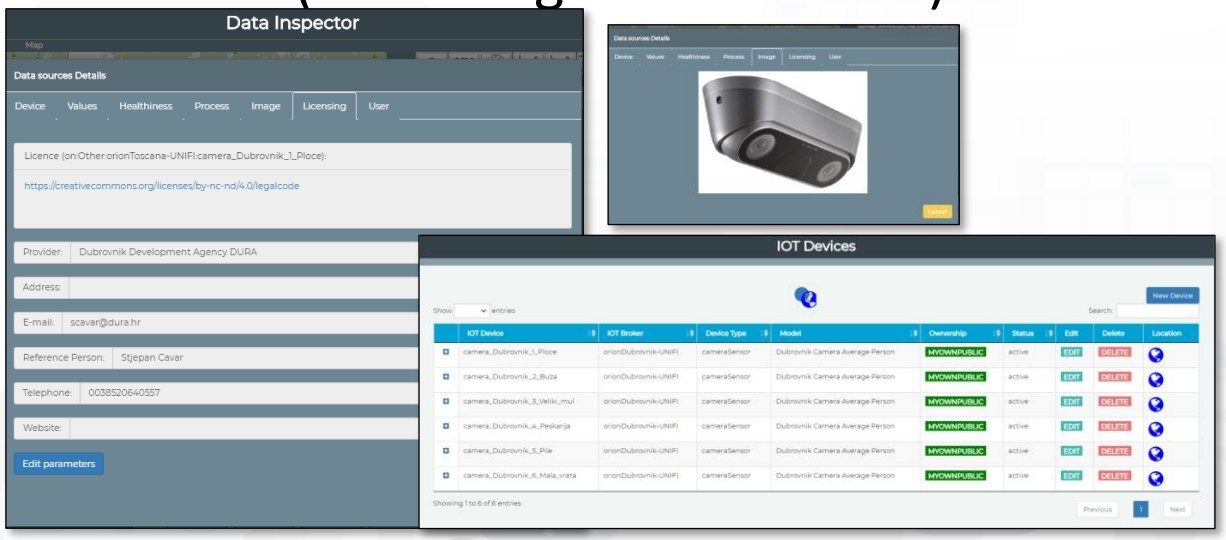
1) IoTModel



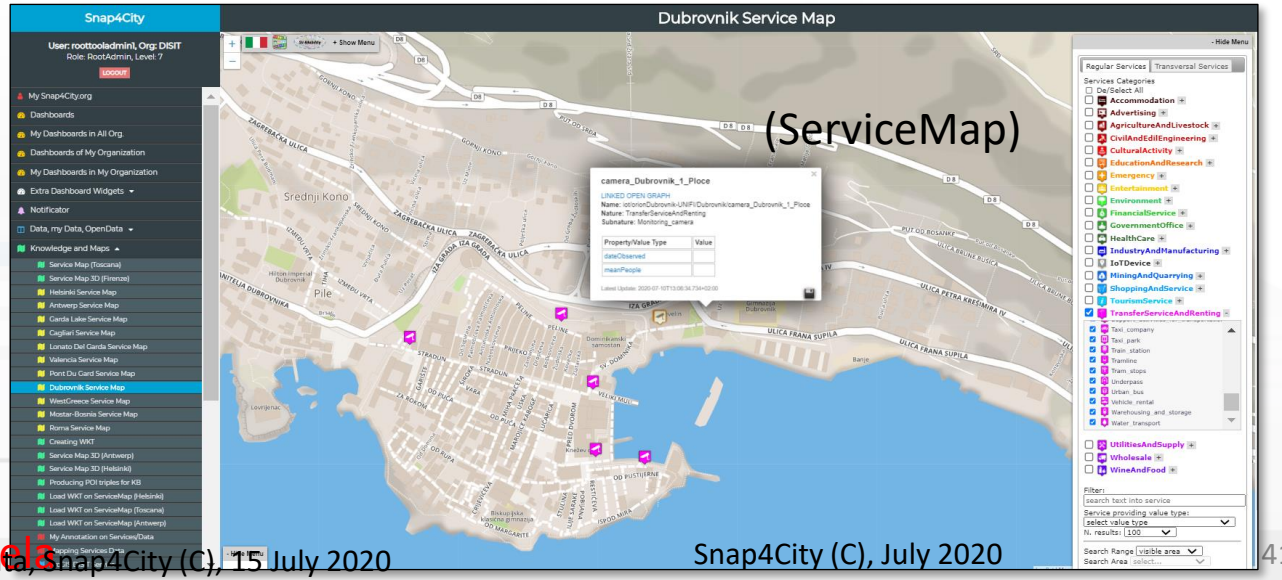
2) Static Flow to create IoTDevices



3) Add the license and Make Public the IoTDevices (according to the license)



3) Search for the Cameras on Map



(ServiceMap)

5) **Working on** Dynamic Flow to save Average #people every 15 minutes for each IoTDevice

Michela

agenda

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General status

	KB ready	Streets	Civic Numbers	IOT App ready	Big data store	MyKPI	Dashboards ready	Active loaded data
Dubrovnik	✓	✗	✗	possible	✓	✓	1 on TV	Twitter Vigilance, TV Cameras
Florence	✓	✓	✓	possible	✓	✓	1 on TV	Twitter Vigilance, WiFi people, traffic, POI, some Apps, parking, etc.
Pont Du Gard	✓	✓	✗	possible	✓	✓	1 on TV	Twitter Vigilance
Mostar	✓	✗	✗	possible	✓	✓	1 on TV	Twitter Vigilance
Valencia	✓	✓	✗	possible	✓	✓	1 on TV	Twitter Vigilance
WestGreece	✓	✗	✗	possible	✓	✓	1 on TV	Twitter Vigilance

Paolo

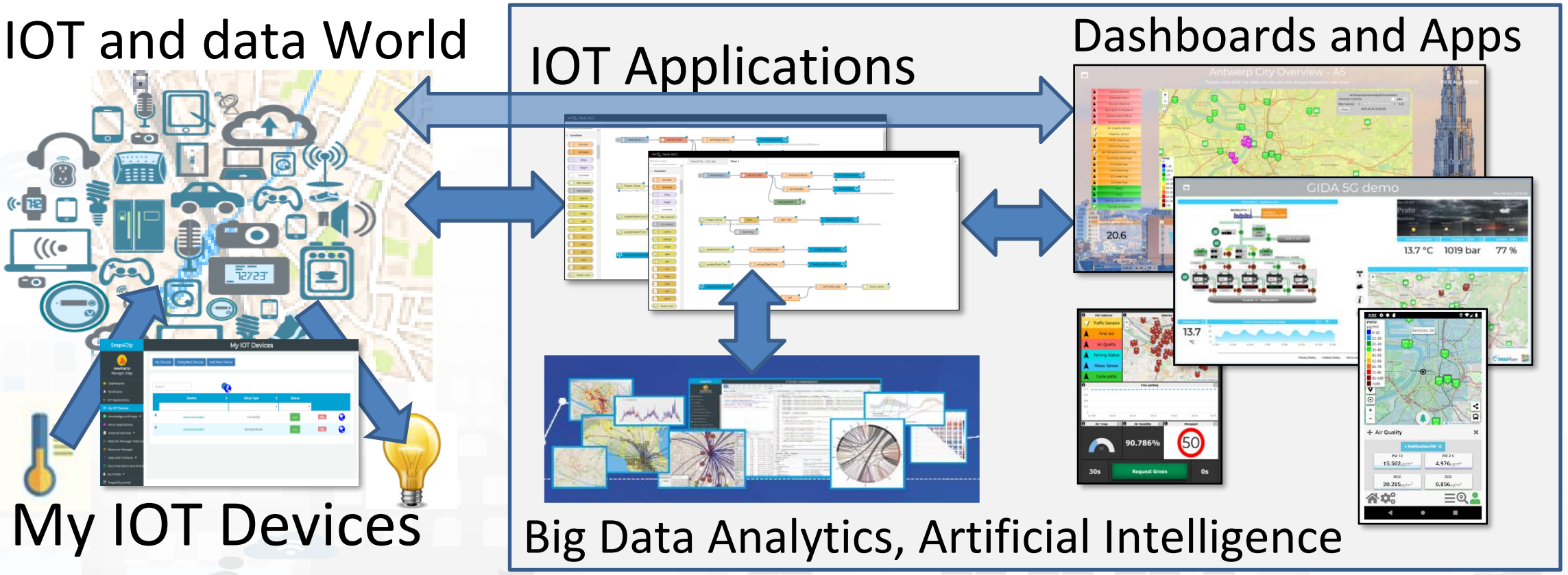
Presently

- Each Organization can access to its own data:
  - Firenze / Tuscany has a large set of data almost all accessible
    - KB, smart city API and MicroServices and thus IOT Apps
- Do multiple users and emails for accessing to multiple Organizations
- Ask for the UserName and Password for accessing to Twitter Vigilance Herit-Data Real Time

Paolo

Snap4City: Builder of Sentient Cities Solutions

Dashboards with data driven IOT Applications enforcing intelligence



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Irene & Paolo

Data Analytics

- Daily data related to 85 research keys (features) associated to Covid lockdown periods in Italy, Spain, France, Greece and Croatia.
- Period from February 1st to May 30th, 2020.
  - marginally different Lockdown periods

Goal

Study of the lockdown impact:

investigate about significant search keys related to the lockdown period.

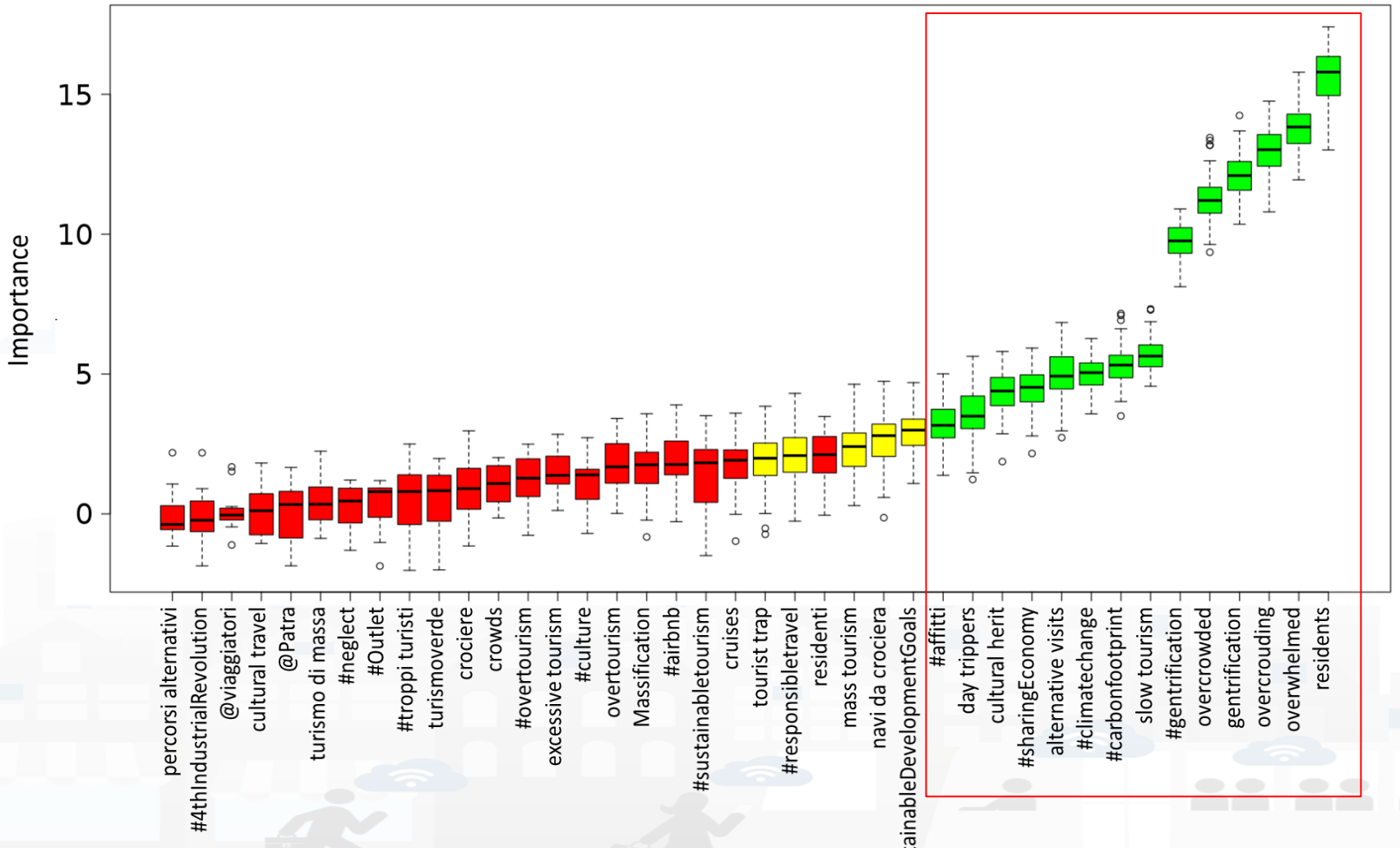
Irene

Research keys

- #4thIndustrialRevolution
- #affitti
- #airbnb
- #carbonfootprint
- #climatechange
- #gentrification
- #Outlet
- #overtourism
- #responsibletravel
- #sharingEconomy
- #SustainableDevelopmentGoals
- #sustainabletourism
- #turismoverde
- #culture
- #neglect
- #Πάτρα
- #τουρισμός
- cultural herit
- cultural_travel
- excessive tourism
- overtourism
- patra
- west greece
- αρχαία ολυμπία
- δυτική ελλάδα
- κατάκολο
- μνημεία
- παραμέληση
- πάτρα
- πολιτιστική κληρονομιά
- προστασία
- συνωστισμός
- φθορά
- #Amunt
- #enfamilia
- #planesconniños
- #turismofamiliar
- #Valencia
- #VisitSpain
- congestión
- contaminación
- inseguridad
- masificación
- masificado
- massification
- overcrowded
- papeleras
- petada
- suciedad
- valencia
- Dubrovnik City Walls
- Dubrovnik great
- Dubrovnik holiday
- Dubrovnik Old City
- Dubrovnik summer
- Old City crowds
- Old Town crowds
- Stari grad
- #gentrification
- #LasCasasNoSonHoteles
- #overtourism
- @viaggiatori
- alternative visits
- crociere
- crowds
- cruises
- day trippers
- gentrification
- mass tourism
- navi da crociera
- overcrowding
- overtourism
- overwhelmed
- paquebots
- percorsi alternativi
- residenti
- residents
- slow tourism
- tourisme de masse
- tourist trap
- trop de touristes
- troppi turisti
- turismo de masa
- turismo di massa
- turistificación

Irene

Relevant Feature Selection - Italy



Random Forest Model Results expoiting the *confirmed* keys:

- Accuracy = 0.90
- Kappa index = 0.81

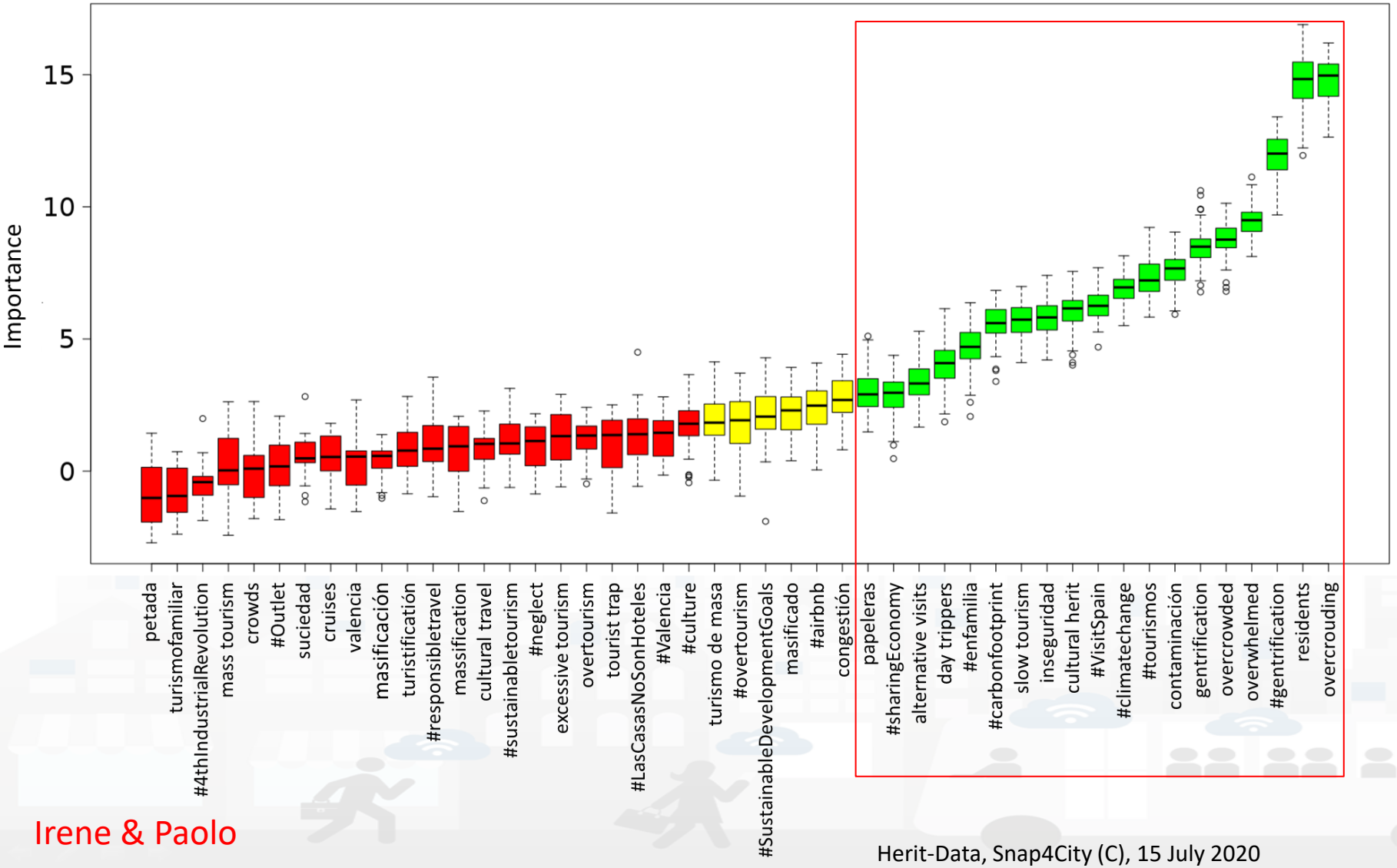
Irene

Logistic Model Results - Italy

- The statistically significant research keys (with a 95% confidence level) are:
  - *Residents (+)*
  - *#gentrification (-)*
  - *Overwhelmed (+)*
  - *Overcrowded (+)*
  - *day trippers* (-)
- With the lockdown in Italy the **number of research keys**
  - *residents*, *overwhelmed* and *overcrowded* **increased**
  - *day trippers* and *#gentrification* **decreased**.
- The Pseudo R-squared of the model is **0.79**

Irene & Paolo

Relevant Feature Selection - Spain



Random Forest Model Results expoiting the *confirmed* keys:

- Accuracy = 0.937
- Kappa index = 0.876

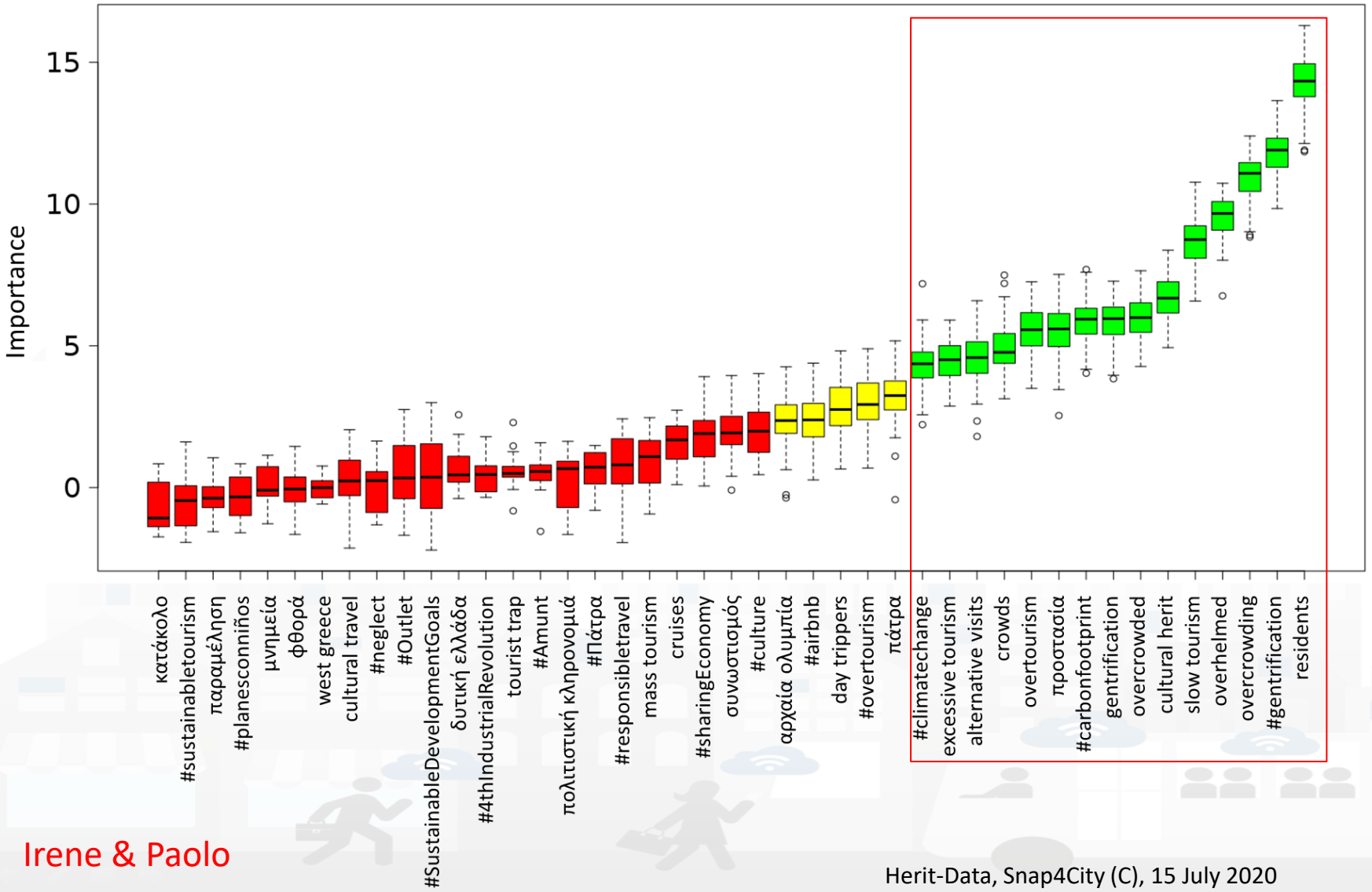
Irene & Paolo

Logistic Model Results - Spain

- The statistically significant research keys (with a 95% confidence level) are:
  - *#tourismos*
  - *#gentrification*
  - *#VisitSpain*
  - *#enfamilia*
  - *residents*
  - *day trippers*
  - *inseguridad*
  - *overcrowding*
  - *congestion*
- With the lockdown in Spain the **number of research keys**
  - *#enfamilia*, *residents* and *overcrowding* **increased**
  - *#tourismos*, *#VisitSpain*, *#gentrification*, *day trippers*, *inseguridad*, *congestion* **decreased**.
- The Pseudo R-squared of the model is **0.79**

Irene & Paolo

Relevant Feature Selection - Greece



Random Forest Model Results expoiting the *confirmed* keys:

- Accuracy = 0.898
- Kappa index = 0.773

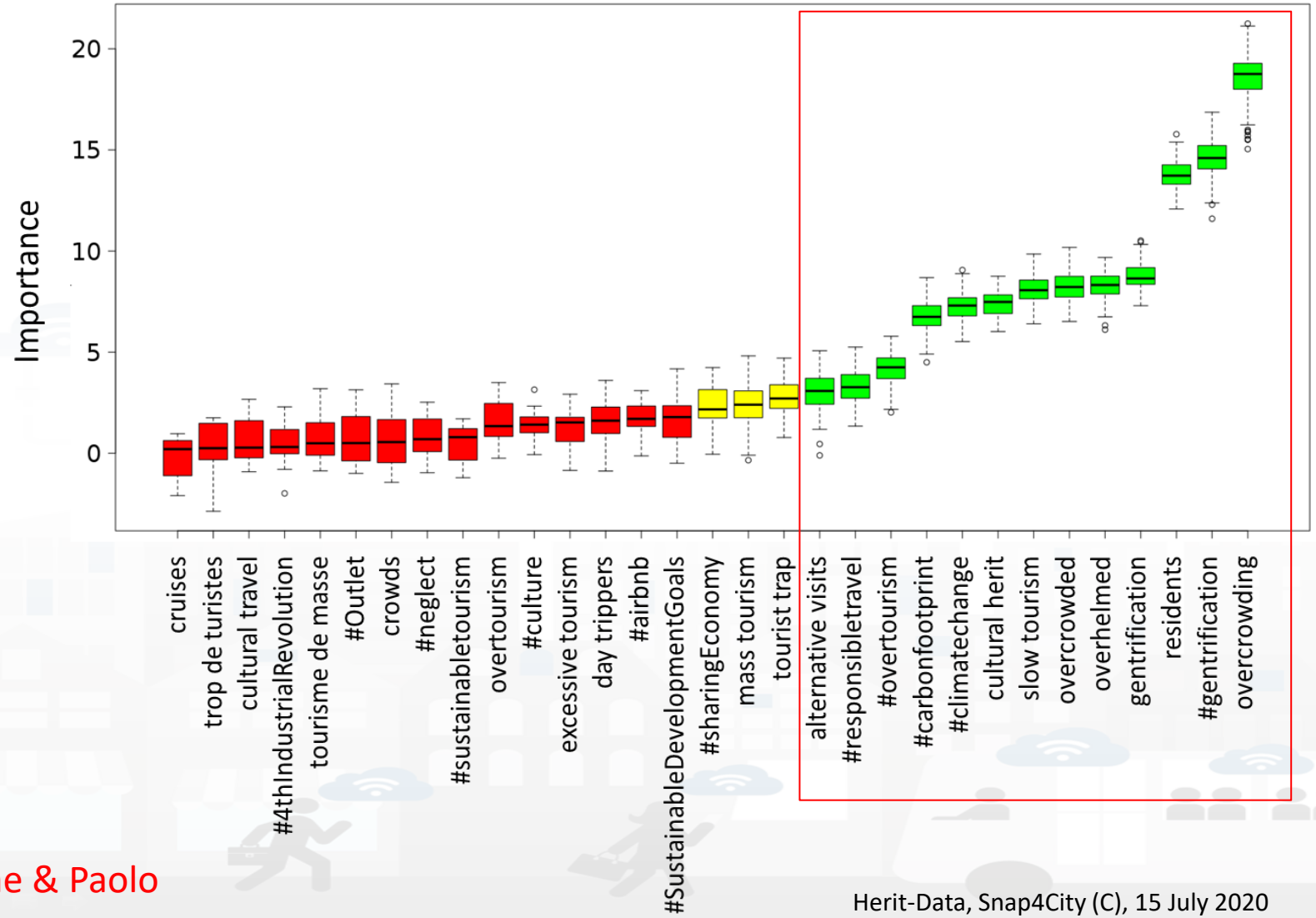
Irene & Paolo

Logistic Model Results - Greece

- The statistically significant research keys (with a 95% confidence level) are:
  - *residents*
  - *#gentrification*
  - *overwhelmed*
- With the lockdown in Greece the **number of research keys**
  - *residents* and *overwhelmed* **increased**
  - *#gentrification* **decreased**.
- The Pseudo R-squared of the model is **0.52**

Irene & Paolo

Relevant Feature Selection - France



Random Forest Model Results expoiting the *confirmed* keys:

- Accuracy = 0.928
- Kappa index = 0.856

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Logistic Model Results - France

- The statistically significant research keys (with a 95% confidence level) are:
  - *#gentrification*
  - *#responsibletravel*
  - *overcrowding*
- With the lockdown in France the **number of research**
  - *overcrowding* **increased**
  - *#responsibletravel* and *#gentrification* **decreased**.
- The Pseudo R-squared of the model is **0.78**

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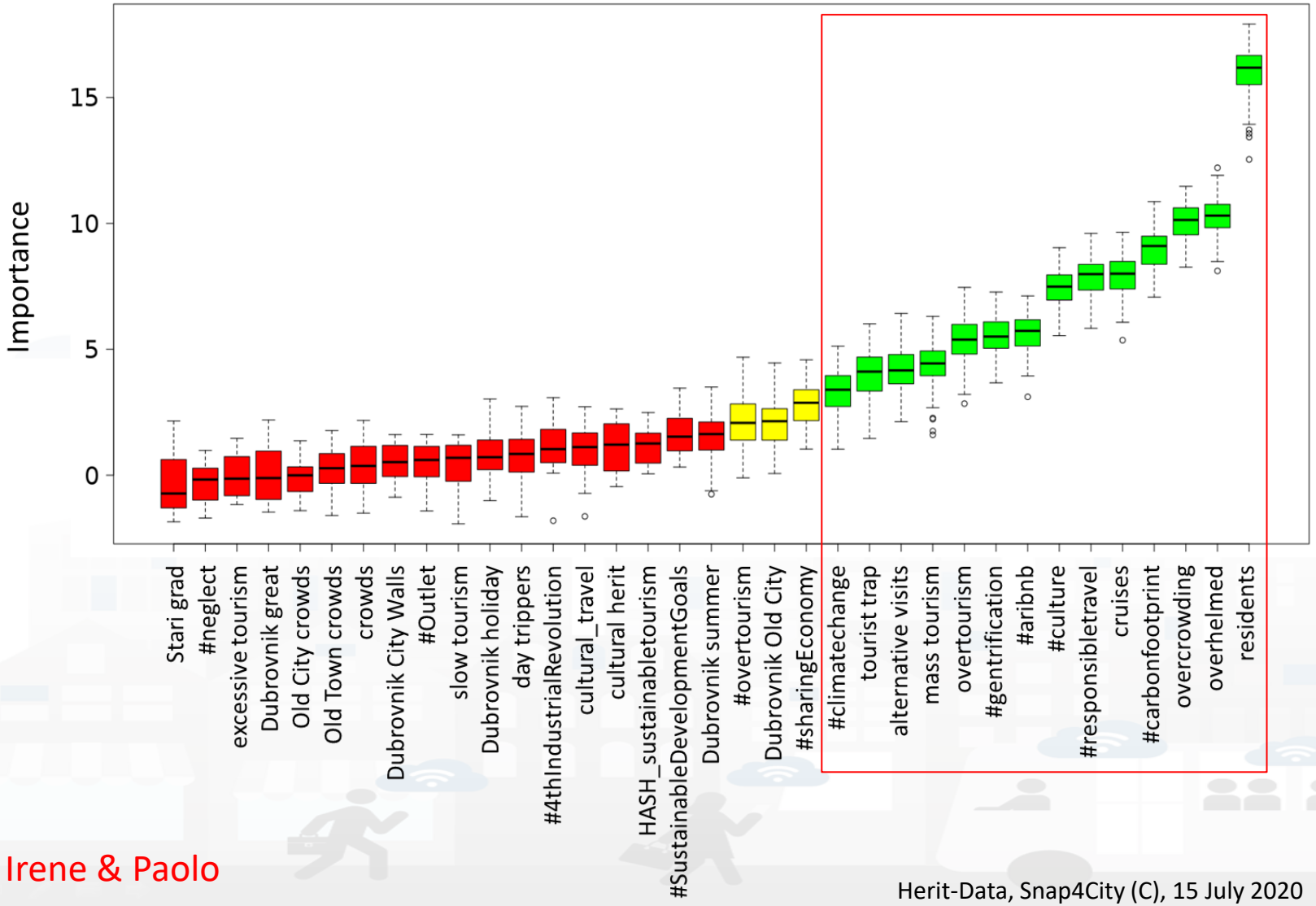
Relevant Feature Selection - Croatia



Random Forest Model Results expoiting the *confirmed* keys:

- Accuracy = 0.945
- Kappa index = 0.847

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Logistic Model Results - Croatia

- The statistically significant research keys (with a 95% confidence level) are:

  - *#responsibletravel*
  - *#gentrification*
  - *#aribnb*
  - *residents*
  - *overtourism*
  - *overcrowding*

1. With the lockdown in Croatia the **number of research keys**
   1. *#aribnb*, *residents* and *overcrowding* **increased**
   2. *overtourism, #responsibletravel,* and *#gentrification* **decreased**.
2. The Pseudo R-squared of the model is **0.55**

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