



Data Aggregation, Fusion and Recommendations for Strengthening Citizens Energy-aware Behavioural Profiles

Global IoT Summit 2017

Workshop on Energy Efficient Solutions based on IoT

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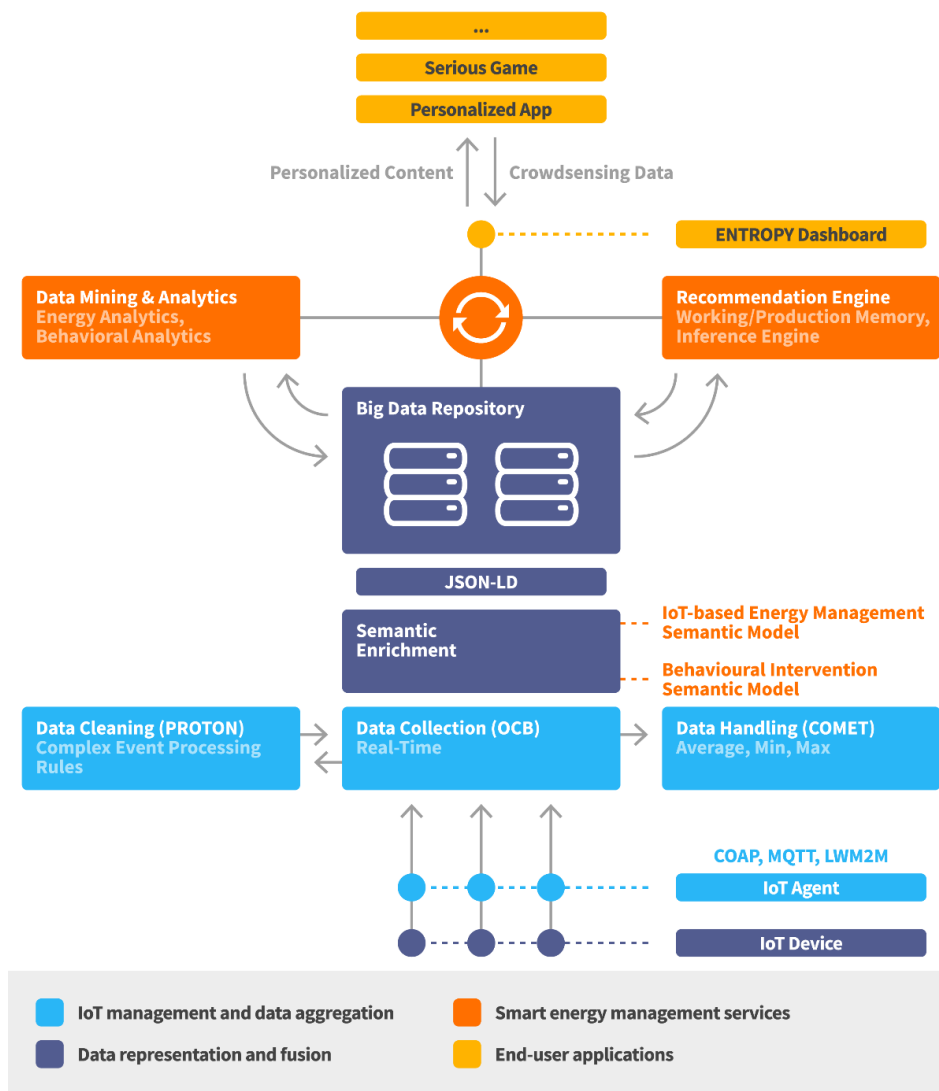
U. Simsek, A. Fensel, Semantic Technology Institute, Innsbruck

08 June 2017, Geneva, Switzerland

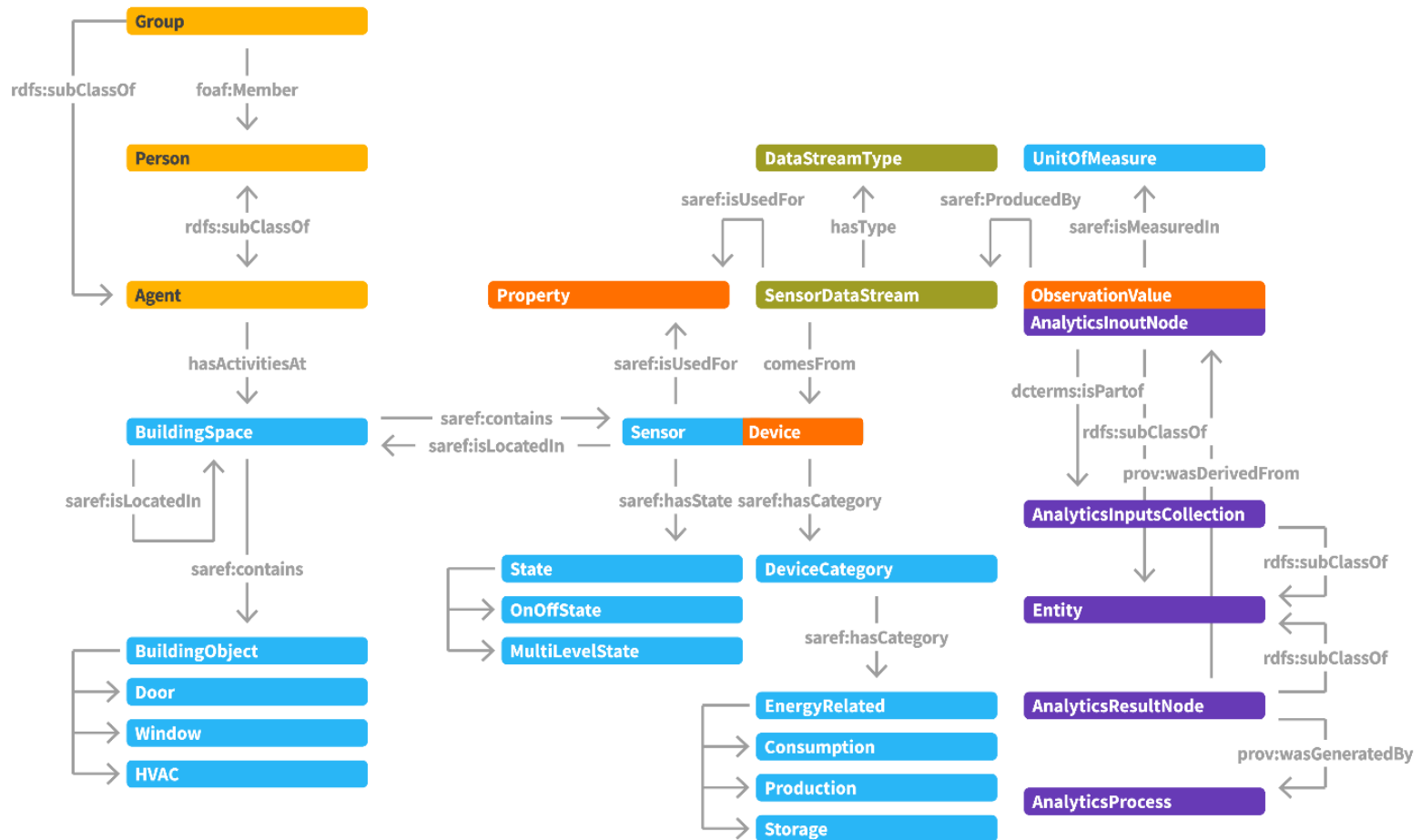
Overview

- Energy consumption in buildings is estimated to account for 40% of total energy consumption.
- The design and adoption of novel ICT technologies towards achieving higher levels of energy efficiency in the buildings sector is considered promising.
 - Potential for 20 percent reduction of global CO2 equivalent emissions by 2030.
- The application of novel ICT technologies has also to rely on people adjusting their energy consumption behavior.
 - Up to 20 percent of energy savings can be achieved through different measures targeting consumer behavior.

ENTROPY Platform

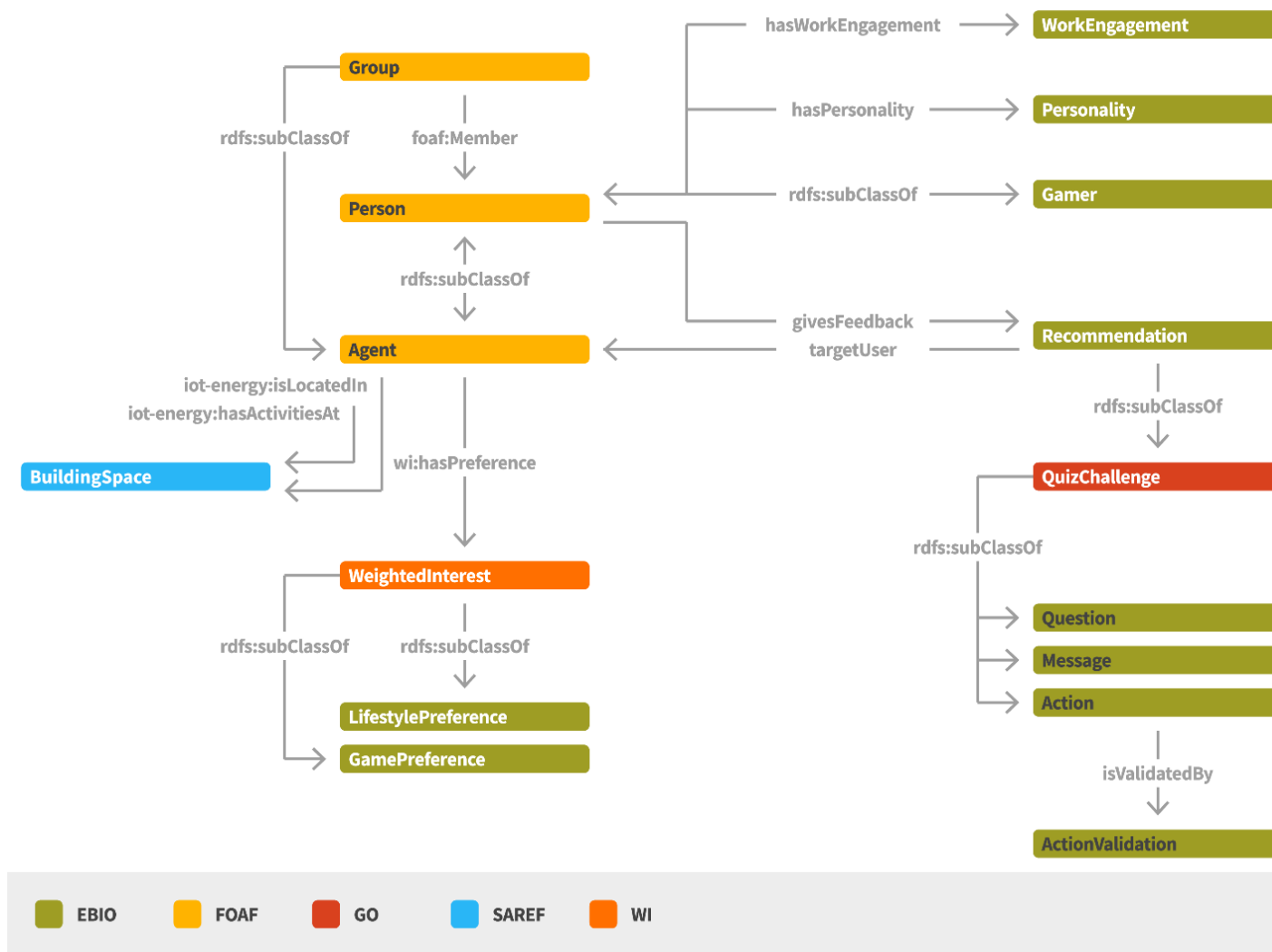


Energy Management Semantic Model

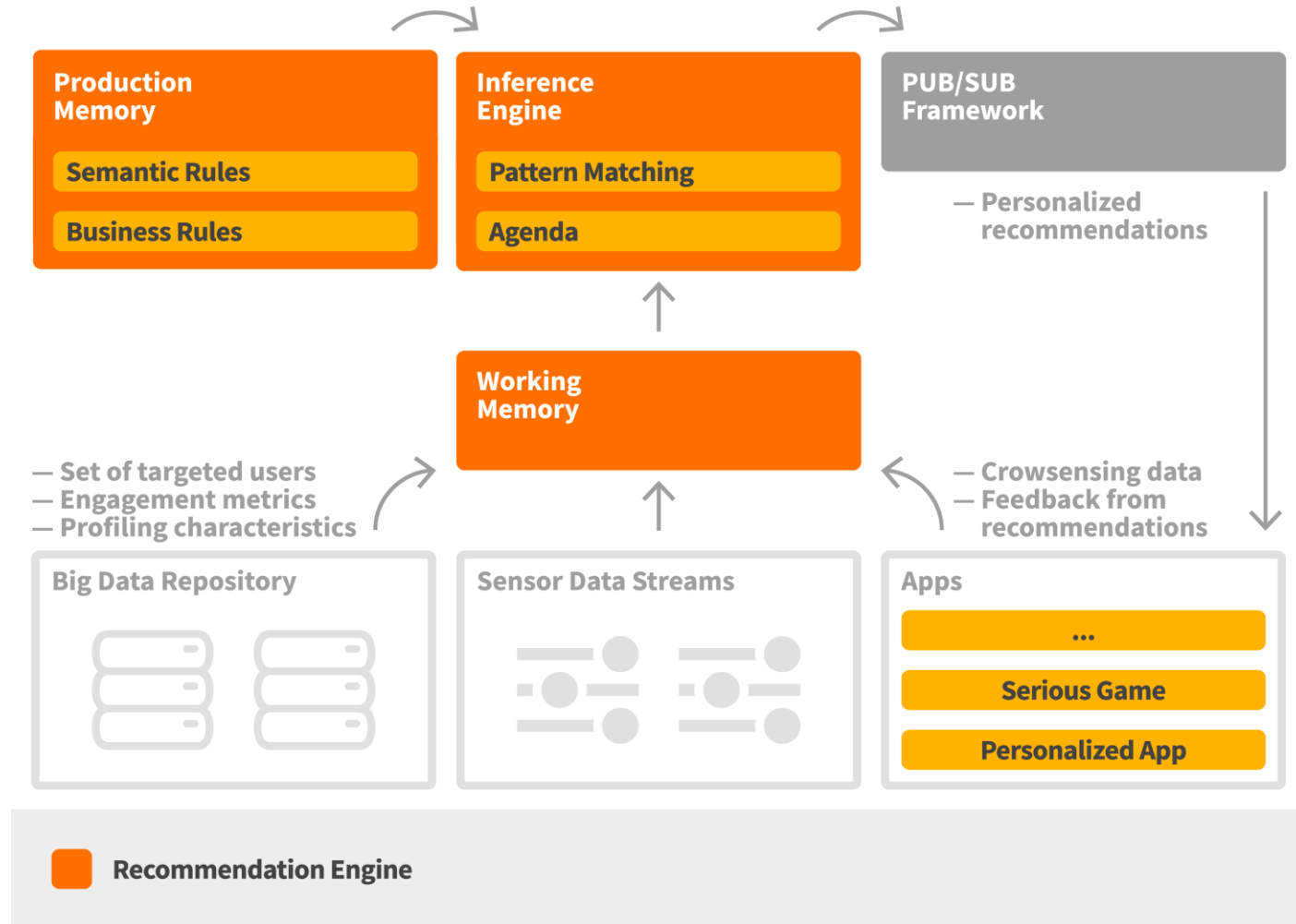


IoT-Energy FOAF LDAO SAREF SSN

Behavioural Semantic Model



Personalised Recommendation Mechanisms



Indicative Recommendations

ACTION

TITLE

Energy waste in HVAC.

DESCRIPTION

Energy consumption is considered high with regards to the today's weather conditions! Could you reduce the HVAC operation?

VALIDATION

Check value of set temperature in HVAC for the next 15 minutes.

QUESTION

TITLE

Perception of comfort level.

DESCRIPTION

Do you feel comfortably in your current location?

VALIDATION

Response in the question (rating from 1-5).

QUIZ

TITLE

Energy Awareness Level.

DESCRIPTION

Set of multiple choice questions.

VALIDATION

Completion of quiz and saving of result.

MESSAGE

TITLE

Sunny day, no need for lighting.

DESCRIPTION

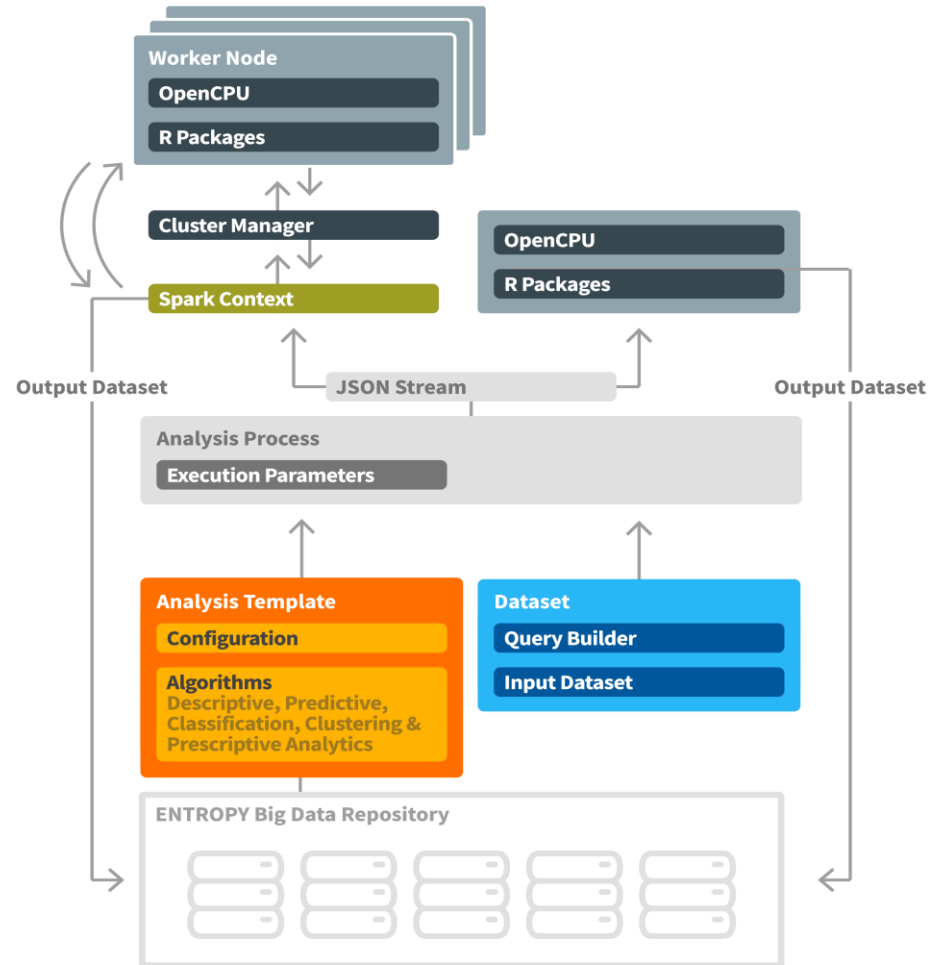
It is a sunny day. We hope you switched off the lights!

VALIDATION

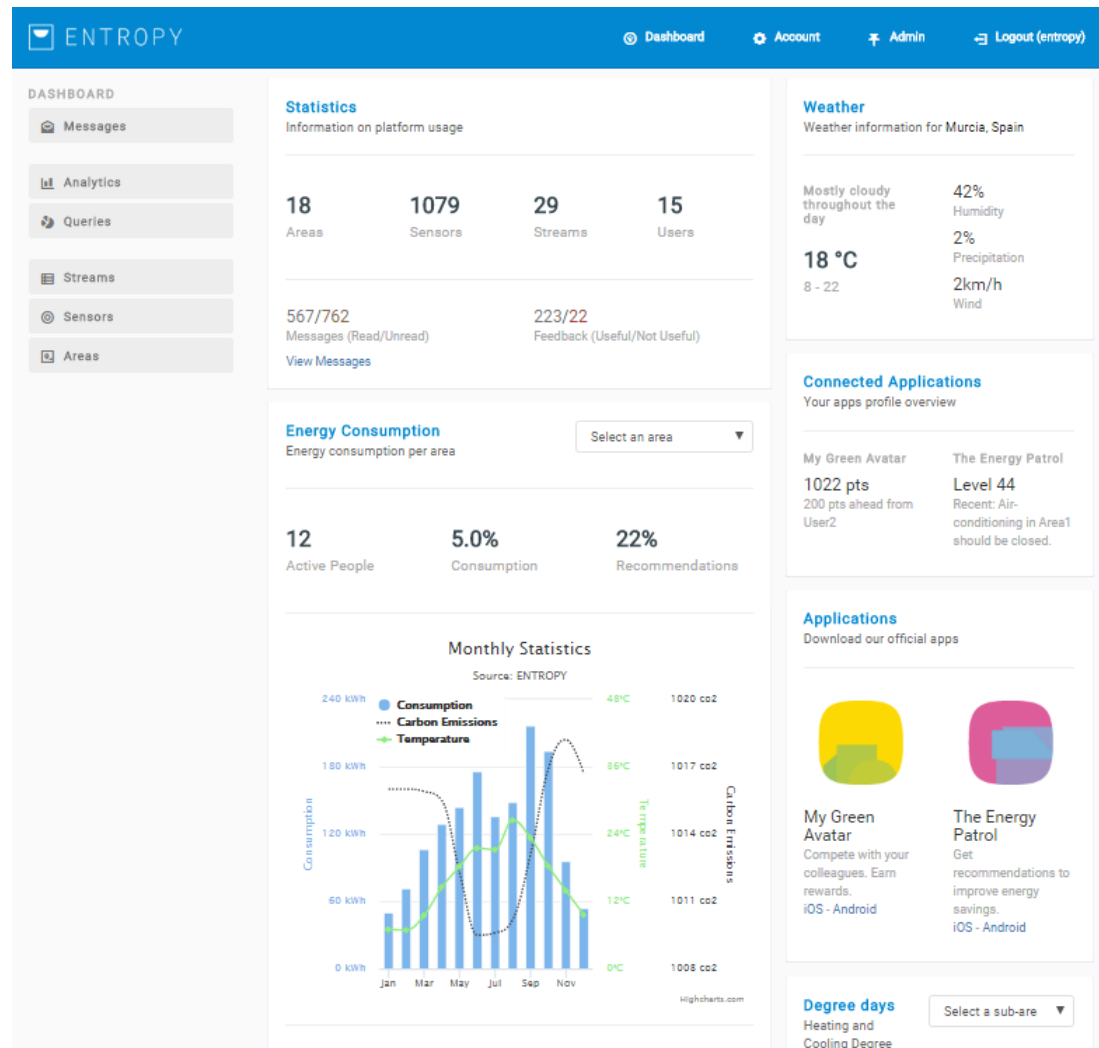
Reading of the message in the browser.

Analytics Toolkit

- Big data analytics toolkit.
- Definition of analysis templates.
- Support of R and Spark analysis tools.
- Management of input and output data streams.



ENTROPY Dashboard



Analysis and Visualisations Views

/ QUERIES / EDIT

← Queries
Data Query Edit

Name
AvgCO2perHourPolaris And TotalEnergyInPolarisPerHour

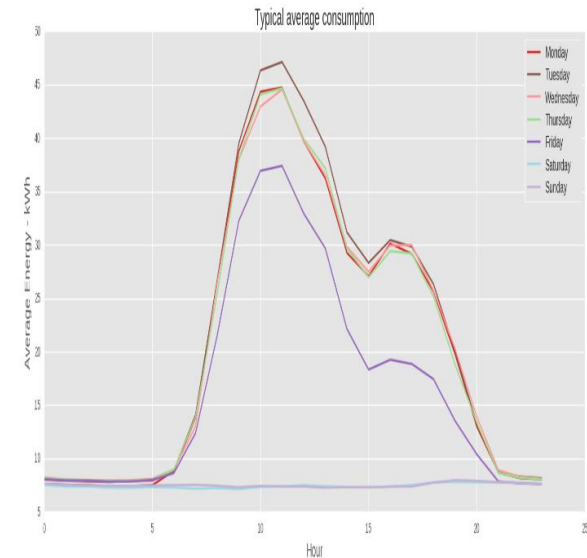
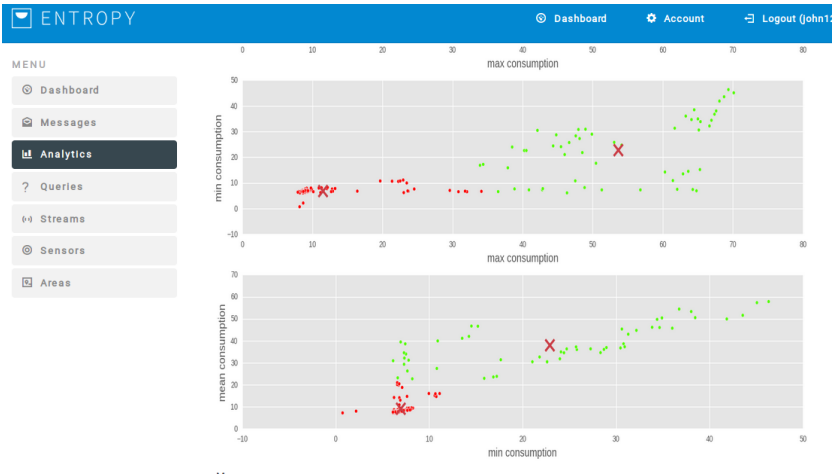
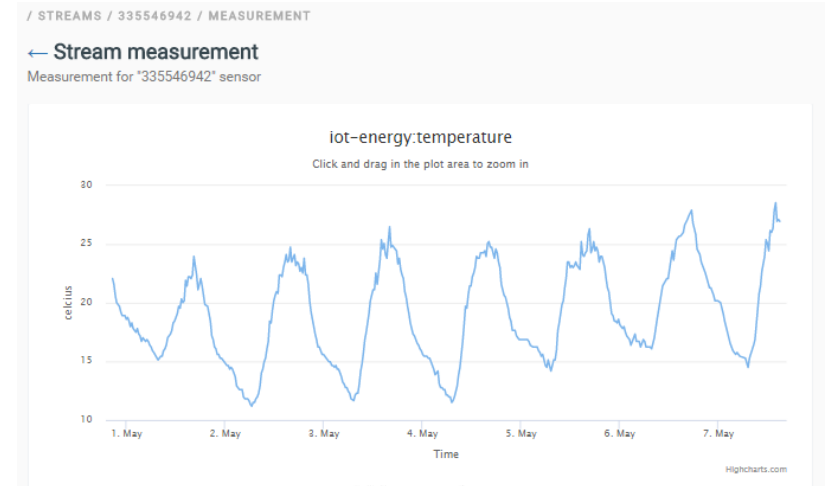
Selected Collection: SENSORSTREAM_AGGREGATION

☐ NOT **AND** OR + Add rule + Add group

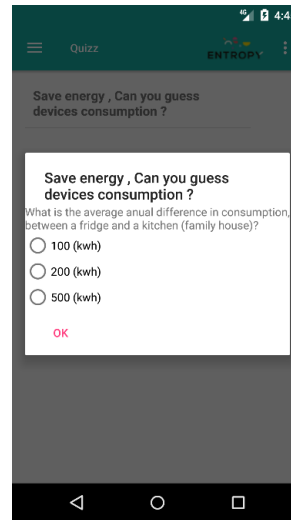
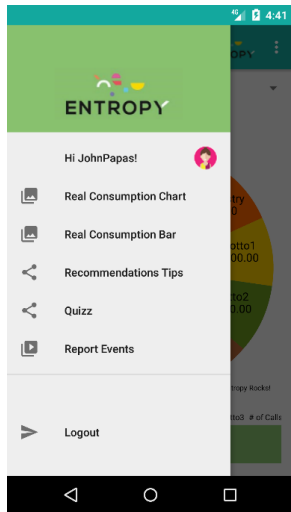
isProducedBy equal http://entropy.euprojects.ne ✕ Delete

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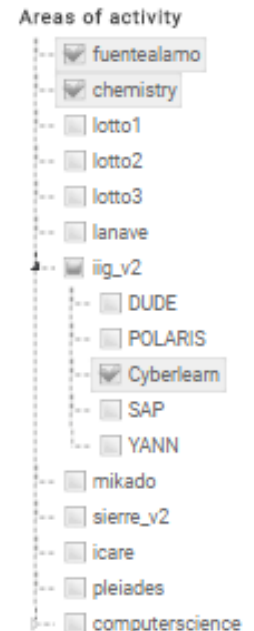
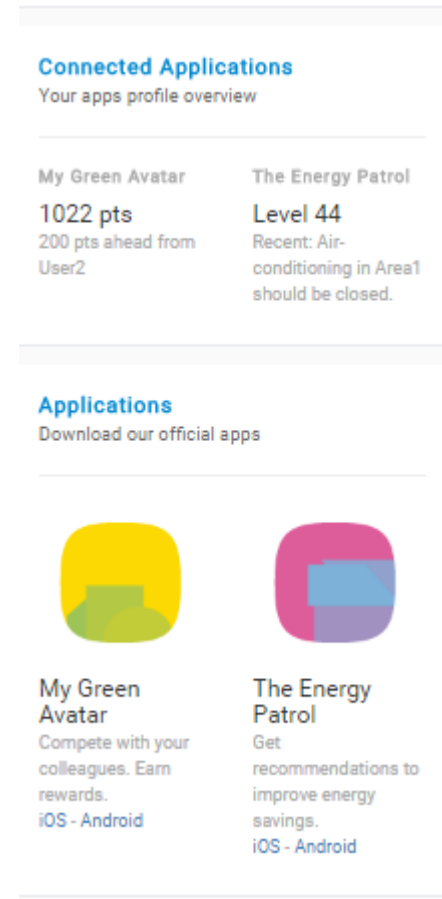
Update Query Run Query Reset



Personalised Applications Views



Ranking	
1. Usuario 7	Puntuación: 19 (Total: 85)
2. Usuario 6	Puntuación: 18 (Total: 17)
3. Usuario 2	Puntuación: 12 (Total: 13)
4. Usuario 8	Puntuación: 12 (Total: 86)
5. Usuario 1	Puntuación: 11 (Total: 56)
6. Usuario 15	Puntuación: 11 (Total: 159)
7. Usuario 5	Puntuación: 8 (Total: 26)
8. Usuario 10	Puntuación: 8 (Total: 14)
Volver	



Serious Games Views

← Current game

AVAILABLE PRIZES

FREE GIFT
for your special eco effort

Your next clue is the image of the light bulb that according to experts should be replaced by other more energy efficient bulbs.

Find and Scan the Image of this Project Logo

CAMERA OFF

HINTS

TH 60

STEP 2/6

How is light bulb brightness measured?

WATTS
LUMENS
JOULES
FOOTCANDLES

32

The Room Sensor says it's: 29.0

HINTS

TH 138

STEP 5/6

Please guess the temperature (in Celsius) in the Chemistry room at Murcia University?

More energy consumption
Inexpensive to buy
Invented by Thomas Edison

Not sure? ASK YOUR FRIENDS
SKIP No points for you

TH 198

STEP 6/6

Scoreboard

No.	Player	Time
1.	Team 1	1:08:42
2.	Team 1	1:08:42
3.	Team 1	1:08:42
4.	Team 1	1:08:42
5.	Team 1	1:08:42
6.	Team 1	1:08:42
7.	Team 1	1:08:42
8.	Team 1	1:08:42
9.	Team 1	1:08:42
10.	Team 1	1:08:42
11.	Team 1	1:08:42
12.	Team 1	1:08:42
13.	Team 1	1:08:42
14.	Team 1	1:08:42
15.	Team 1	1:08:42
16.	Team 1	1:08:42

TH 80

STEP 3/6

CONGRATULATIONS

MARCELO!

You are currently in **1st position**. Please check scoreboard at the end of TH to discover if you won some prizes.

SCORE: 258

No. Player Time

1	Marcelo	355
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SCORBOARD Share on Facebook

GAME OVER
PLAY AGAIN

← **VOUCHERS**

UMU: Room1

5 lux

31 %

29 C

ENTROPY

Recommended temperature at winter 20 - 24 C/n
Recommended temperature at summer is 23-26 C

DATA VISUALISATION

← **AR CLUES**

Actions

ACTIVE DONE ACHIEVEMENT

REFRESHER BADGE
To get this badge you need to watch out on air pollution in your environment.
For this badge you need to collect 5 symbols.

TEMPERATURE BADGE
To get this badge you need to watch out on temperature change in your environment.
For this badge you need to collect 5 symbols.

ILLUMINATOR BADGE
To get this badge you need to watch out on temperature change in your environment.
For this badge you need to collect 5 symbols.

BADGES

← **MULTIPLE Q&As**

Actions

ACTIVE DONE ACHIEVEMENT

CO₂ Level pollution

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

ACCEPT CANCEL

RECOMMENDATIONS

← **SINGLE Q&A**

Scoreboard

TEAMS SOLO PLAYERS

No.	Player	Time
1.	Team 1	1:08:42
2.	Team 1	1:08:42
3.	Team 1	1:08:42
4.	Team 1	1:08:42
5.	Team 1	1:08:42
6.	Team 1	1:08:42
7.	Team 1	1:08:42
8.	Team 1	1:08:42
9.	Team 1	1:08:42
10.	Team 1	1:08:42
11.	Team 1	1:08:42
12.	Team 1	1:08:42
13.	Team 1	1:08:42
14.	Team 1	1:08:42
15.	Team 1	1:08:42
16.	Team 1	1:08:42

LEADERBOARD

← **HINTS**

Congratulations

TREASURE HUNT STILL IN PROGRESS

00.05.03 TO END

CONGRATULATIONS MARCELO!

You are currently in **1st position**. Please check scoreboard at the end of TH to discover if you won some prizes.

SCORE: 258

No. Player Time

1	Marcelo	355
---	---------	-----

SCORBOARD Share on Facebook

GAME OVER
PLAY AGAIN



Thank you!
Questions?

Find more at:

<http://entropy-project.eu/>

<https://twitter.com/EntropyEu>