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

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Workshop on Energy Efficient Solutions based on IoT

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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.
Energy Management Semantic Model
Behavioural Semantic Model

Group
  rdfs:subClassOf
  foaf:Member

Person
  rdfs:subClassOf

Agent
  iot-energy:isLocatedIn
  iot-energy:hasActivitiesAt

BuildingSpace
  wi:hasPreference

WeightedInterest
  rdfs:subClassOf
  rdfs:subClassOf

LifestylePreference
  GamePreference

hasWorkEngagement
  WorkEngagement

hasPersonality
  Personality

givesFeedback
targetUser
  Recommendation

rdfs:subClassOf
  QuizChallenge

Question
  Message
  Action

isValidatedBy
  ActionValidation

EBIO  FOAF  GO  SAREF  WI
Personalised Recommendation Mechanisms

Production Memory
- Semantic Rules
- Business Rules

Inference Engine
- Pattern Matching
- Agenda

PUB/SUB Framework
- Personalized recommendations

Working Memory
- Set of targeted users
- Engagement metrics
- Profiling characteristics

Big Data Repository

Sensor Data Streams

Apps
- ...
- Serious Game
- Personalized App

Recommendation Engine
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

- **Statistics**
  - **Areas**: 18
  - **Sensors**: 1079
  - **Streams**: 29
  - **Users**: 15
  - **Messages (Read/Unread)**: 567/762
  - **Feedback (Useful/Not Useful)**: 223/22

- **Weather**
  - **Location**: Murcia, Spain
  - **Conditions**: Mostly cloudy throughout the day
  - **Temperature**: 18 °C
  - **Humidity**: 42%
  - **Precipitation**: 2%
  - **Wind Speed**: 2km/h

- **Energy Consumption**
  - **Active People**: 12
  - **Consumption**: 5.0%
  - **Recommendations**: 22%

- **Monthly Statistics**
  - Graph showing consumption and temperature trends

- **Connected Applications**
  - **My Green Avatar**: 1022 pts, 200 written from User2
  - **The Energy Patrol**: Level 44

- **Applications**
  - Download official apps
  - **My Green Avatar**
  - **The Energy Patrol**

- **Degree Days**
  - Heating and Cooling Degree

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**ENTROPY**

**UBITECH**
ubiquitous solutions
Analysis and Visualisations Views
Personalised Applications Views
Serious Games Views

Available Prizes

Free Gift for your special eco effort

AR Clues

Hints

Multiple Q&As

Single Q&A

Data Visualisation

Badges

Recommendations

Leaderboard

Game Over

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: 255

No. Player Time
1. Marcelo 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. Player 1 1:08:42
10. Player 1 1:08:42
11. Player 1 1:08:42
12. Player 1 1:08:42
13. Player 1 1:08:42
14. Player 1 1:08:42
15. Player 1 1:08:42

Scoreboard

Share on Facebook
Thank you!

Questions?

Find more at:

http://entropy-project.eu/
https://twitter.com/EntropyEu