



MOBISTYLE

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MOTivating end-users Behavioral change by combined ICT based modular Information on energy use, indoor environment, health and lifeSTYLE

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Publishable executive summary

MOBISTYLE Things Connector aims to reach the following practical goals: adapt and customize, together with Whirlpool product development team, the Holonix i-LiKe platform solution (originally applied to industrial production environments) to manage the data-flows from smart home appliances, following their lifecycle and providing data to the MOBISTYLE Modular Information Services.

The expected result is an easy and quick access to smart home appliances data flows and lifecycle information while the appliance is installed into his final position. The Holonix i-LiKe solution is made able to acquire 3 data flows from 3 different home appliances types. The solution is complete and available, targeted at TRL 7 of development and testing. Further development and implementation will be done during the project duration according to the final position that will be given to the Whirlpool appliances for the demo cases.

Key words:

Appliances, connection, IOT, data flow, data visualization, dashboard, real time, indoor environment, energy consumption.



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2 Introduction

The overall aim of MOBISTYLE is to raise consumer awareness and motivate behavioral change by providing attractive personalized combined knowledge services on energy use, indoor environment, health and lifestyle, by ICT-based solutions. Providing more understandable information on energy, health and lifestyle will motivate end-users to change their behavior towards optimized energy use and provide confidence in choosing the right thing. It will offer consumers more and lasting incentives than only information on energy use.

In WP5 Practical ICT based tools will be developed, including:

- MOBISTYLE things connector that will allow users to visualize real time data about the appliances available in their indoor space (home, resident, office, etc.)
- MOBISTYLE modular information for Trust and Privacy that will allow a safe and private system compliant with European targets
- MOBISTYLE Open Users Platform that will allow users to have an ad hoc platform able to get data defined in WP3 and WP4.

The Things connector to be developed for MOBISTYLE has to:

- read data from the MOBISTYLE infrastructure
- show to the user the data available into the infrastructure
- manage different type of users
- allow the user to configure and personalize his own dashboards
- allow a user to have more than one single dashboard, to show different groups of data coming from different *sensorized entities*.

The described features will support one of the main aims of MOBISTYLE, which is to create consciousness in the end-user and to help people becoming curious about energy and lifestyle. To do so, the HOLONIX i-LiKe solution had been adapted and further developed to support home appliances monitoring and, when the data will be made available, to monitor indoor environments and physiological data acquired from wearable devices.

The MOBISTYLE Things connector, in its first version due in month 12, focuses on allowing the user in monitoring the information coming from the appliances (energy consumption, status, temperature, status of the doors, etc.). The objective is to prove the ability of the HOLONIX i-LiKe solution to monitor and to visualize actual data coming from the MOBISTYLE infrastructure. As soon as the chosen sensors will be installed into the buildings, wearable devices will be provided to users and their data will start flowing through the MOBISTYLE infrastructure, other dashboards will be created and other “things” will be connected. At the end, the connected “things”, will be appliances, sensors data coming from the buildings, and data coming from wearables, all flowing through the MOBISTYLE infrastructure.

Deliverable 5.1 will mention the preliminary analysis done on the information collected through the workshops and the focus groups. Then it will show the outcomes of Task 5.1 and the actual working version of the MOBISTYLE Things connector software.



3 Preliminary activities done

The complete and technical description of the Architecture of the final expected MOBISTYLE platform is included into D4.2 due at 30/09/2017, too. Through D4.2 it is possible to understand how the Things connector is correlated to the overall MOBISTYLE platform. References are done to avoid repetitions of basic content.

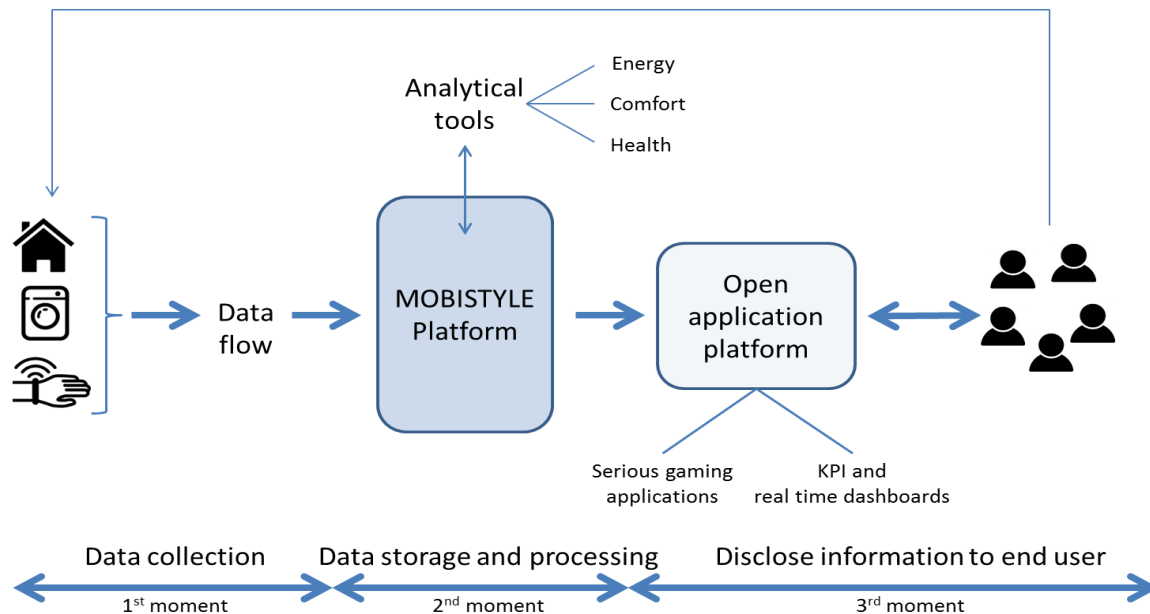


Figure 1. MOBISTYLE general architecture

More detailed information about the final requirements of the platform are going to be deployed and described in the incoming months and in other deliverables. Those material will be used to improve the Things connector and to focus the incoming expected developments of the MOBISTYLE platform.

3.1 Baseline of expected MOBISTYLE functionalities

To answer to the question “which will be the main function of the MOBISTYLE platform?”, a series of Workshops had been held in Amsterdam during 14th and 15th of February, where IT partners HOLONIX, HIGHSKILLZ and DEMO actively participated. Other workshops with potential end users, in the form of focus groups, had been guided by Academic partners and the outcomes had been shared in the consortium. Both are described in D2.2, which has to be considered as the baseline of the developments chosen for the MOBISTYLE Things connector.

For each DEMO CASE, the expected baseline functionalities had been grouped into 4 different kinds of IT requirements. Three of the groups had been considered at a preliminary reasoning as MOBISTYLE CORE FEATURES, and they are:

- **Things Connector**, grouping features that can be related to a Dashboard in which the data can be shown in real time. Which data have to be shown can change by demo case and by purpose.

- **Suggestions to the users**, that could be activated according to the values received by the sensors and will be defined with the objective to let the user being aware of his energy consumption and of his lifestyle.
- **Collaborative and Social features**, to be developed as gamification or serious gaming applications.

Other functionalities identified are, for now, considered as out of scope of the MOBISTYLE CORE.

For example the integration with a personal calendar, weather forecast, tourist information about the city, suggestions for dinner, managing cleaning services, inventory of the food available in the fridge, diet suggestions.

They will not be immediately excluded, but analyzed deeper inside the consortium and in correlation with the information that will come from incoming co-creation workshops.

3.2 Internal validation of the approach

The developments of Things connector had been shared with IRI-UL as a preliminary validation, according to the outcomes of D2.3, including the “10 commandments” list.

On top of this, the Things connector real time data visualization is confirmed coherent with the outcomes of the Focus Groups and the needs expected from the potential users.

According to the development roadmap, under discussion in cooperation with WP4, the front end visualization will be modified and improved according to the indications and the requirements that will be defined during the growing up of the project.

One additional suggestions for the future is the possibility to create real time dashboard for expert users and a simplified one for normal users, in order to approach the expectation of a “customized” dashboard.

4 HOLONIX i-LiKe solution for MOBISTYLE Things connector

4.1 Introduction and general features

As described into D4.2 (chapters 3.2, 4, 4.4), the MOBISTYLE Things connector platform is a dedicated extension and customization of the existing HOLONIX i-LiKe solution.

This allows many general features to be native, as for example:

1. Possibility to manage different “types” of entities.
2. Possibility to manage as many single entities as required, called “*sensorized entities*”.
3. Possibility to manage different level of users:
 - a. *Administrator* who can have complete access to the platform and create new types of entities;



- b. *Managers* who can create new single entities and manages accesses allowing users to visualize data from the single entities;
 - c. *Common users* can visualize the entities and real time data correlated.
4. Possibility to personalize the way in which the information is visualized (which data, which labels, in which order, etc).
5. Possibility to get the data from the MOBISTYLE platform and eventually even from external data sources.
6. Etc.

According to the description of the Deliverable in the MOBISTYLE official Description of Action, the examples are related to Whirlpool appliances actually connected.

4.2 MOBISTYLE Things Connector screenshots

In the following pages, the images taken from the actual version of the Things connector will explain the main features available and how the user can use it.

Available appliances examples are:

- A fridge
- A washing machine
- A dryer

Actually three Whirlpool fridges are connected, and a specific sensorized entity had been created to monitor them remotely. The fridge with serial number WPR333388JFB6 is used in the following images.

The flow which is described through the following images follows the process for the creation, configuration and usage of the dashboard with information about the fridge:

CONFIGURATION PHASE (used by Administrator)

1. User profile configuration
2. Creation of the WHR Fridge sensorized entity type
3. Configuration of the WHR Fridge dashboard
4. Creation of the “status” field in the WHR fridge dashboard
5. Configuration of the “status” field in the WHR fridge dashboard
6. Configuration of the “temperature” field in the WHR fridge dashboard

VISUALISATION PHASE (used by Appliance User)

7. Fridge dashboard complete, in simple version
8. Fridge dashboard complete, in “for expert” version, with additional fields
9. Fridge sensorized entity created for appliance with serial number WPR333388JFB6
10. Connected fridge available and monitored through the dashboard

Afterward, the following screenshots will show the example of the dashboard created for a washing machine and a dryer machine.



CONFIGURATION PHASE

Creation of a user profile, in this example creation of the personal profile for Mr. Giorgio Whirlpool.

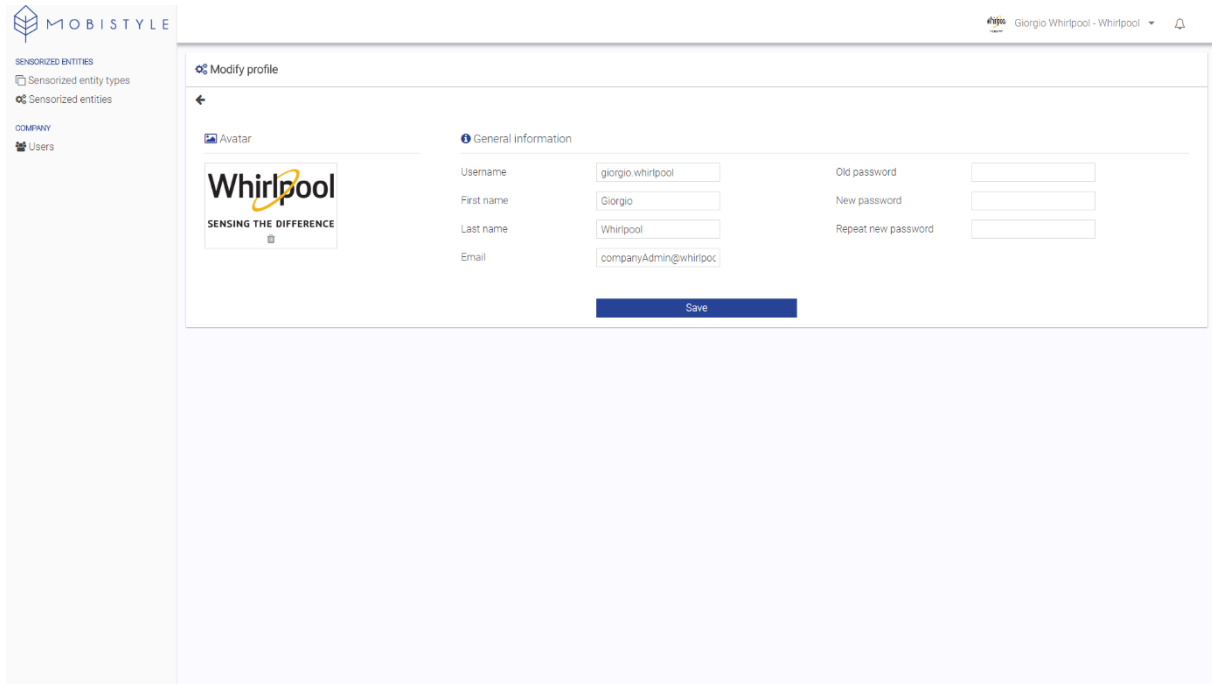


Figure 2. Things connector User profile configuration

Creation of a typology of entity with specific characteristics: in this case an example of a model of connected Whirlpool fridge.

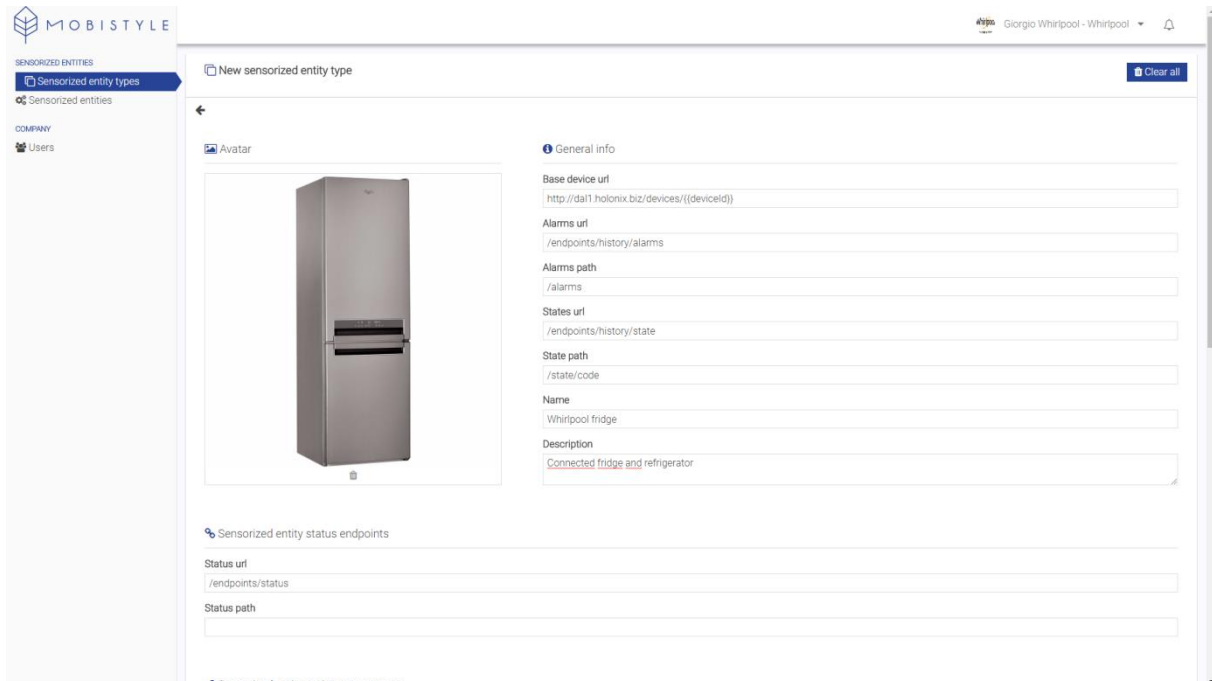


Figure 3. Fridge entity type creation

The administrator can configure a dashboard for the specific model of connected Whirlpool fridge.

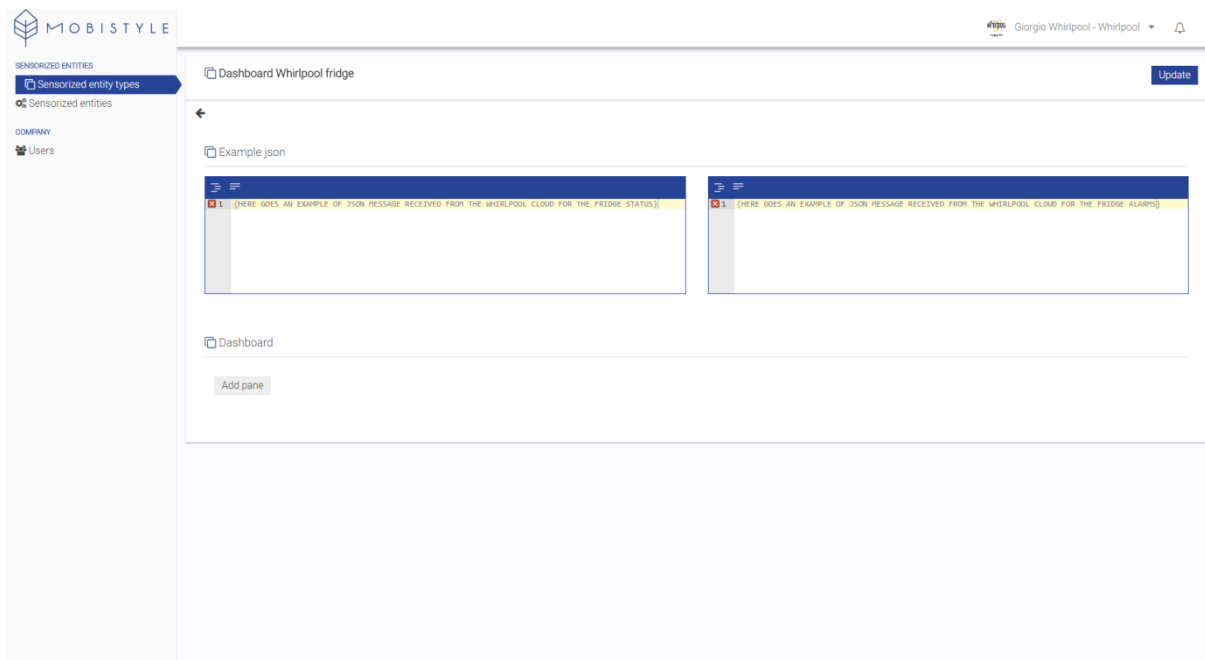


Figure 4. Fridge dashboard configuration

All parameters that need to be visualized into the dashboard of all that model of connected fridges can be configured, as for example status on/off and temperature.

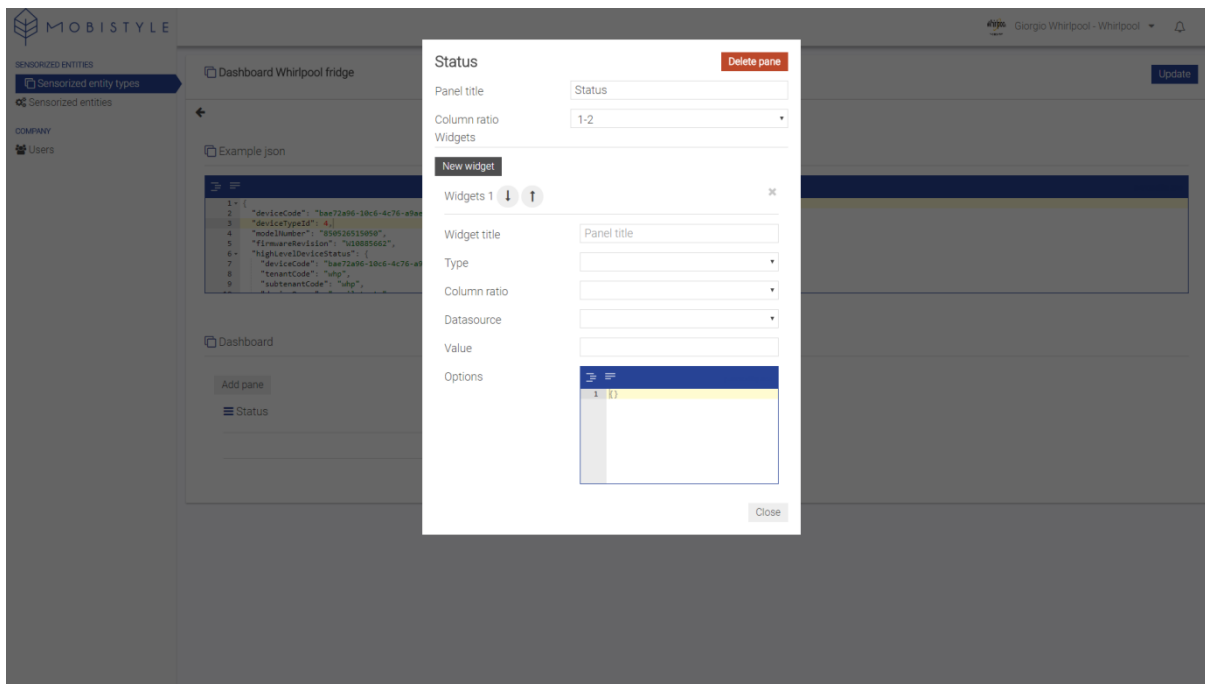


Figure 5. Fridge dashboard configuration: status field creation

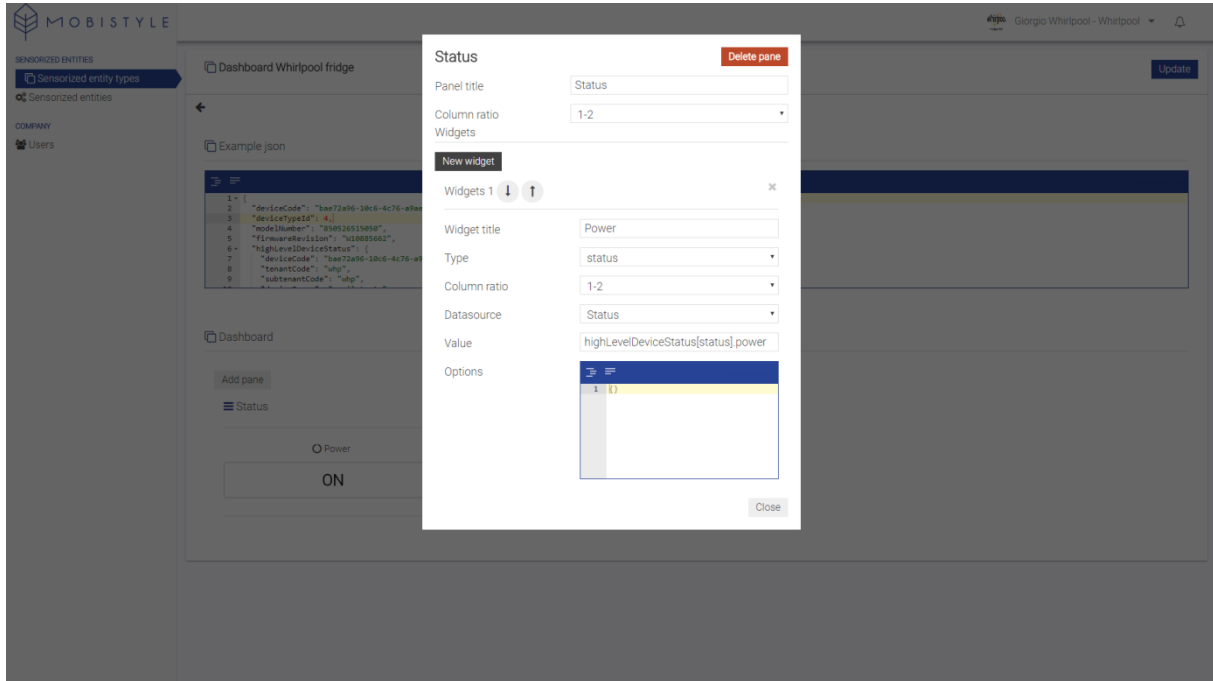


Figure 6. Fridge dashboard configuration: status field configuration

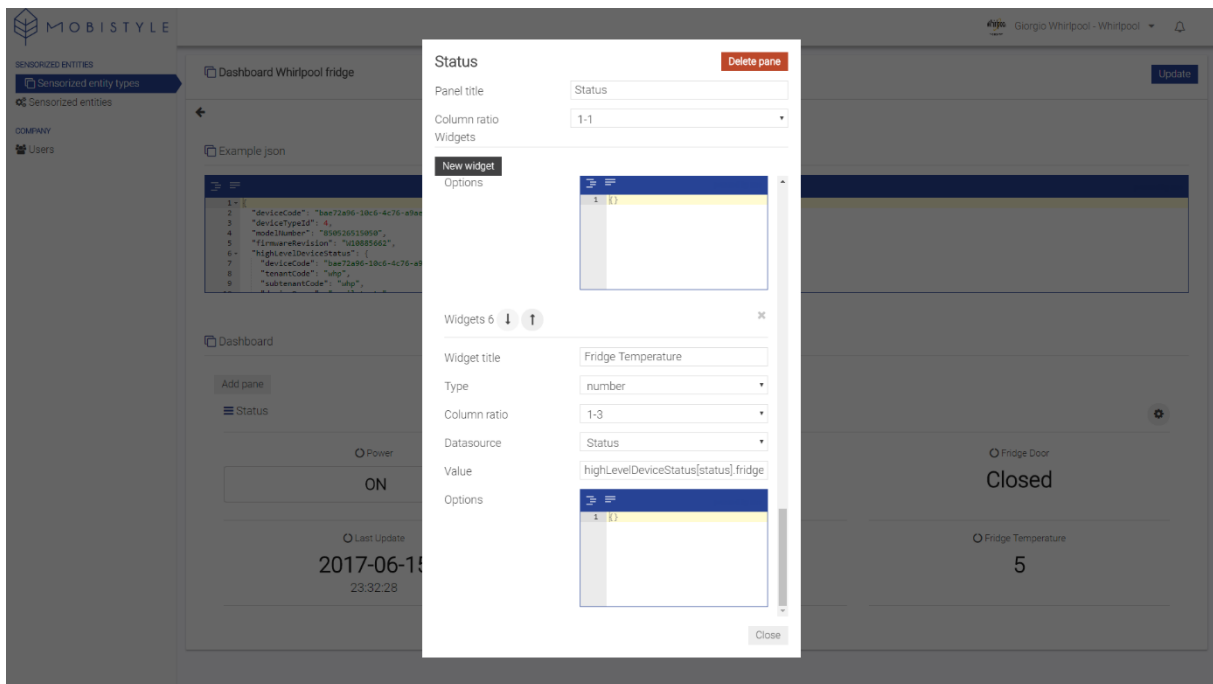


Figure 7. Fridge dashboard configuration: temperature field configuration

VISUALIZATION PHASE

Here follows the preview of the dashboard configured for the model of fridge proposed. Two possible versions are proposed, according to a selection of data available coming from Whirlpool: a simple version for not expert users, and a more complete version for expert users.

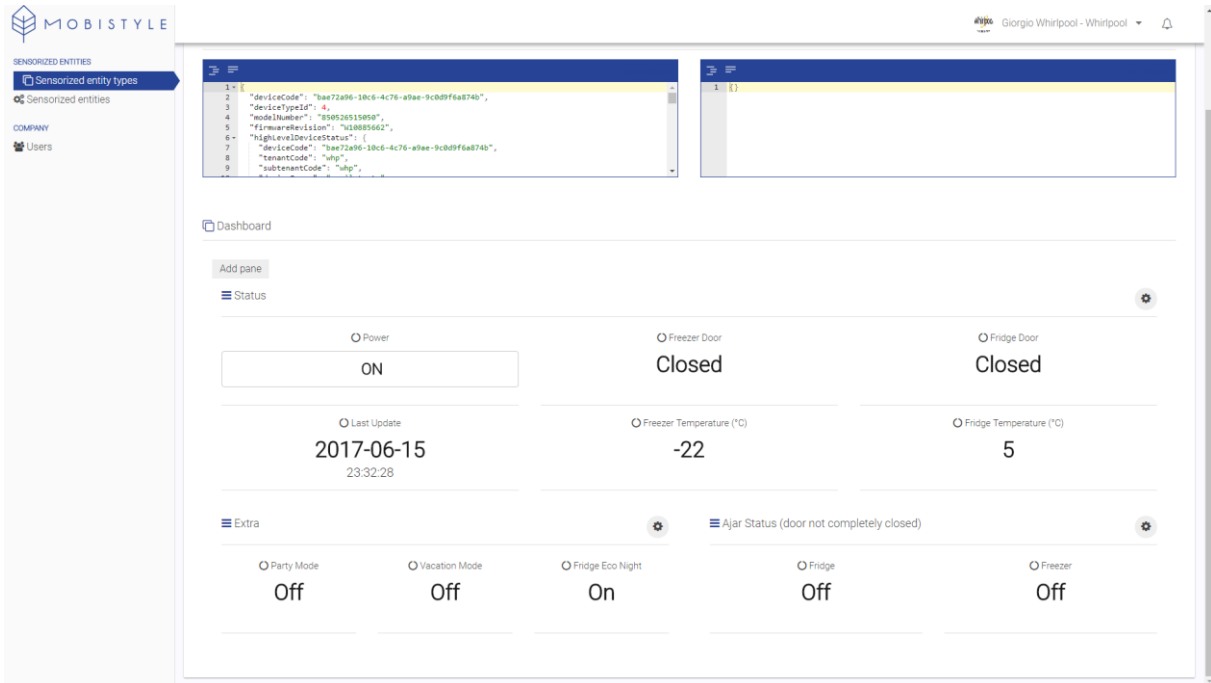


Figure 8. Fridge dashboard complete - simple version

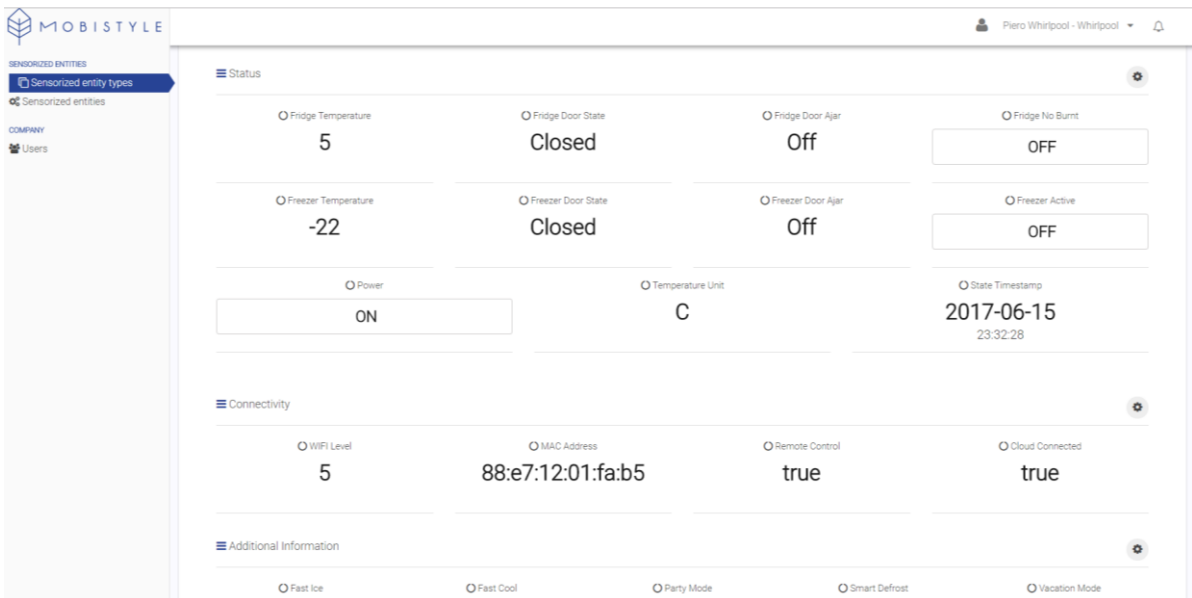


Figure 9. Fridge dashboard - other available data that can be used in the “for experts” version



The entity type of the model of connected fridge can be declined into specific “sensorized entities” which are related to a specific object with its own serial number. The configuration of the dashboard had been defined through the previous steps, and here are made available the specific data coming in real time from the real object.

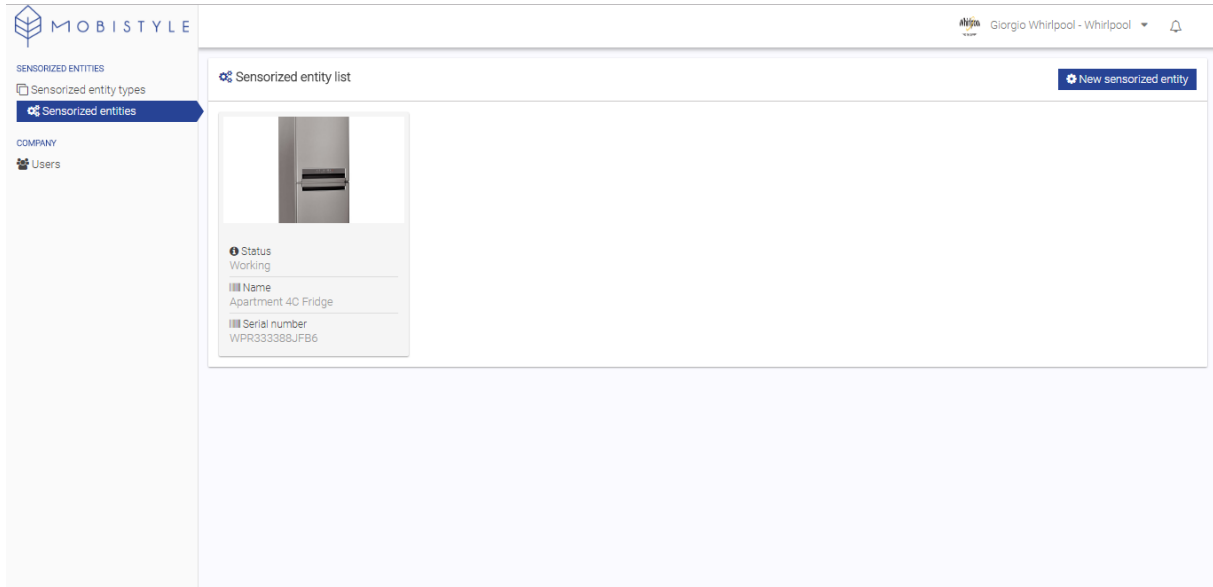


Figure 10. Fridge - sensorized entity for serial number WPR33388JFB6

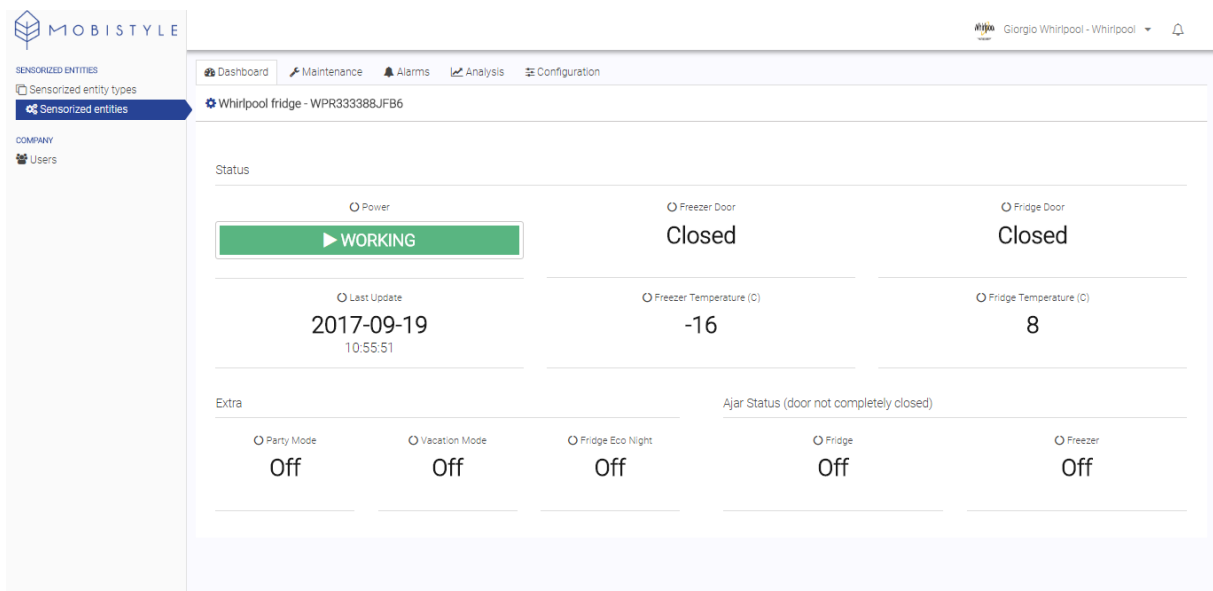


Figure 11. Fridge - dashboard for serial number WPR33388JFB6



In the following images are caught the screenshots about the sensorized entity type and about the dashboard of two other kind of objects: the washing machine and the dryer.

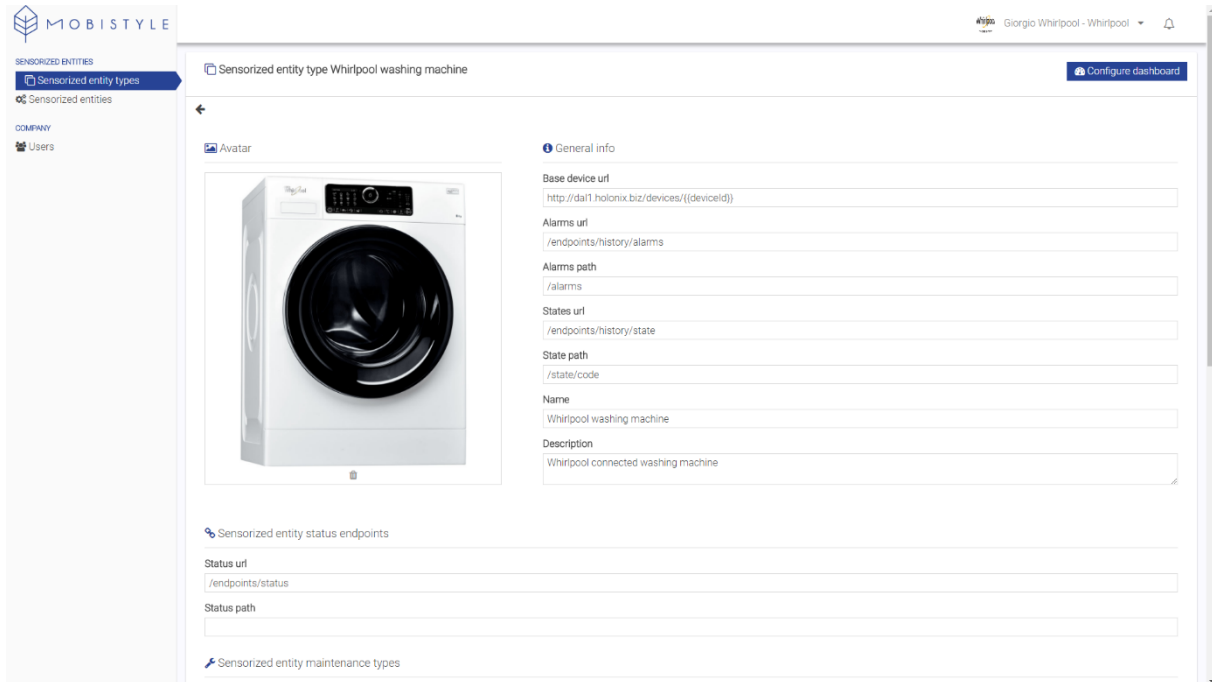


Figure 12. Washing machine entity type

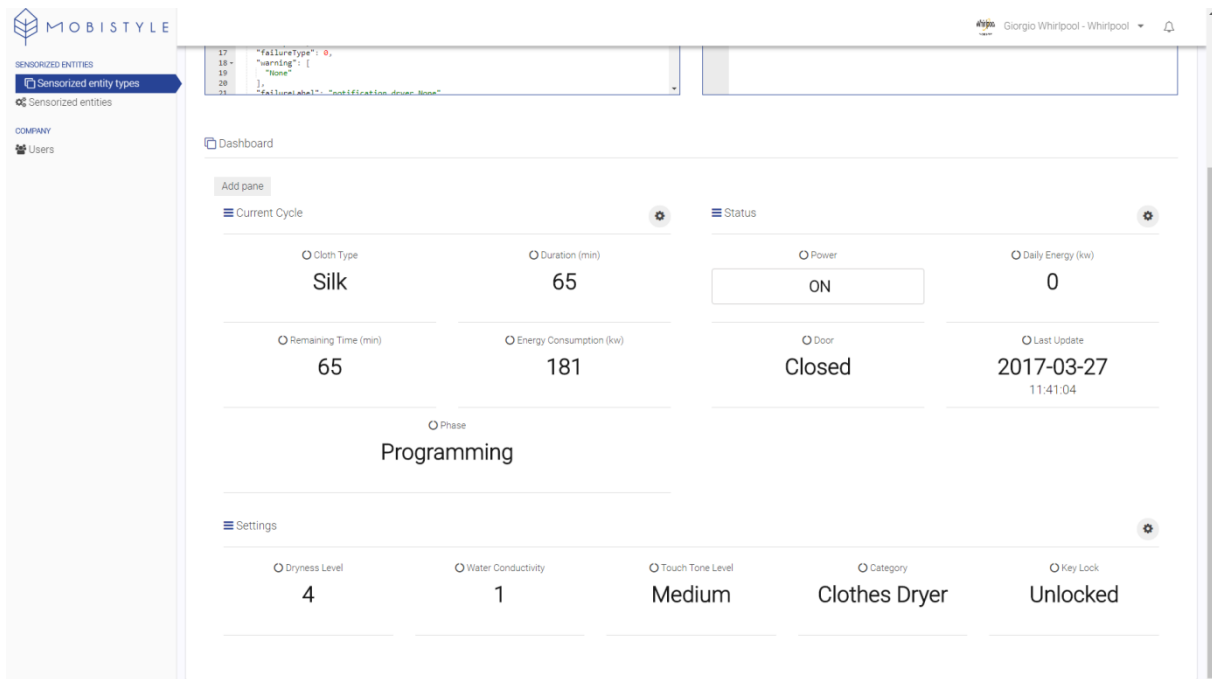


Figure 13. Washing machine dashboard



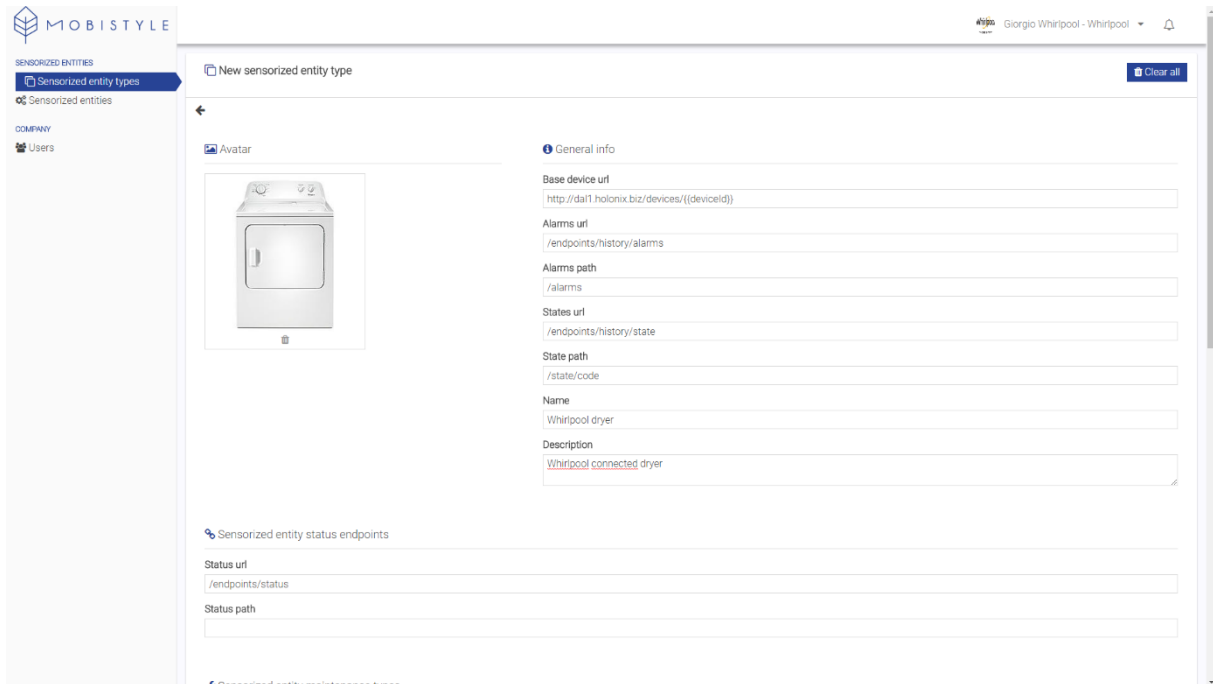


Figure 14. Dryer entity type

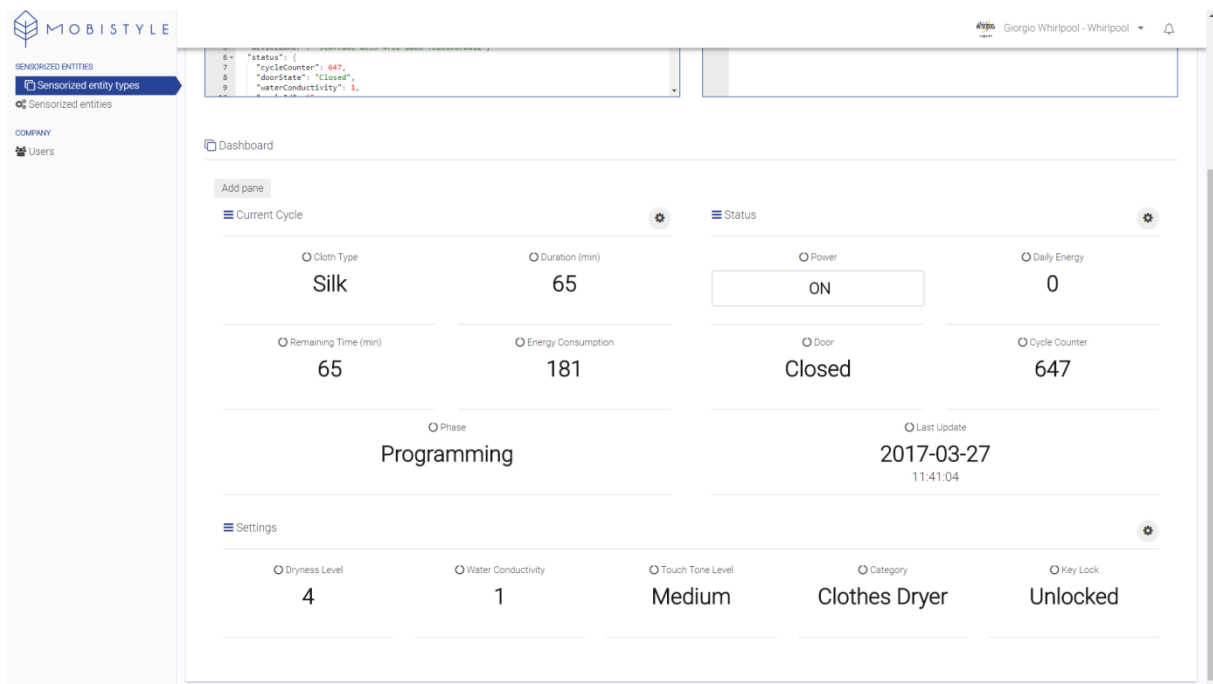


Figure 15. Dryer dashboard



4.3 How to access a public demo of the MOBISTYLE Things connector

The official public URL to access the Things connector demo is the following:

demo.holonix.biz/MOBISTYLE/

The system can be accessed through different common users and different administrators, whose credentials are available easily asking via email at the following address: research@holonix.it.

5 Conclusions

The activities carried out till now have reached the objective to create a MOBISTYLE dashboard to be used as example and starting point to explain to the potential users and to the demo cases participants how the system could work for them.

It should be enough complete to ensure that the information that can be monitored by a common user are a lot and very flexible.

From now on, the existing system will be improved in strong cooperation with the MOBISTYLE partners both on the back end side, with IT partners, and on the front end side, receiving requirements and suggestions from Demo Case holders and Academic Experts.

