

GRESBAS

Gamification Process to Increase Energy Efficiency

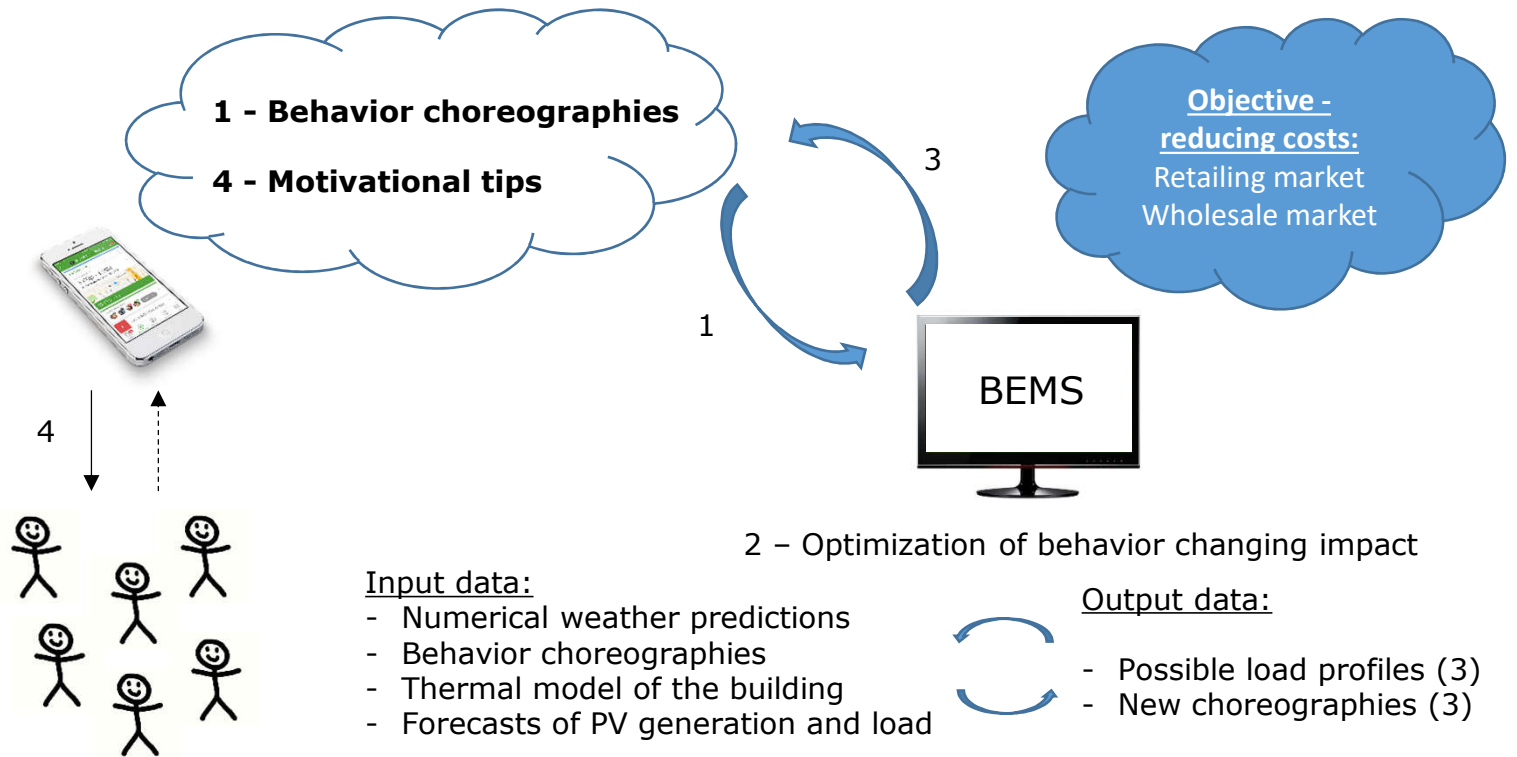
Integration Tools Workshop
Universidade Complutense - Madrid

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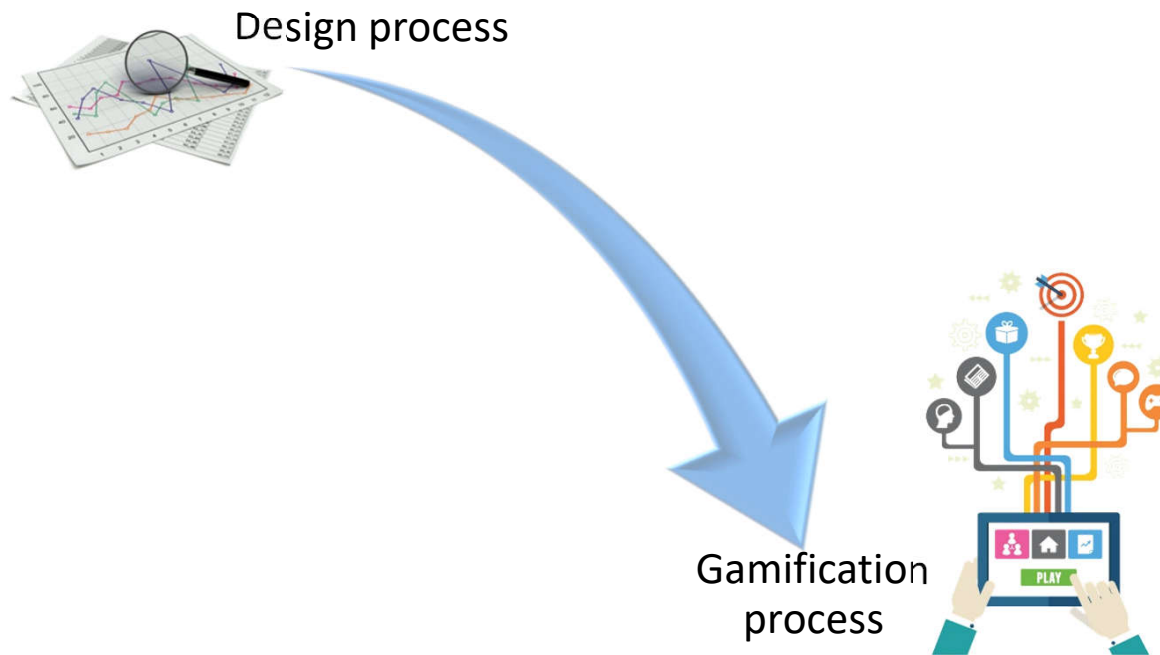
This project has received funding in the framework of the joint programming initiative ERA-Net Smart Grids Plus, with support from the European Union's Horizon 2020 research and innovation programme.



INESC TEC building



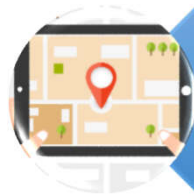
What we intend to do?



Identified challenges

- Few actions that can lead to energy costs savings
- Diversity of users with disparate behaviour's
- Difficulty to typify the behaviour of the building users
- Lack of knowledge of the INESC computer equipment
- Specificity of the building can generate high energy costs
- Obtain main energy costs of the building

3 steps development



Obtain common user behaviours & profile



Identify choreographies that can be changed to reduce energy costs



Promotes behaviours changes

1. How to obtain common user behaviours?

- Create an application (mobile, computer) to obtain common user behaviours [choreographies]
- What functions support:
 - Anonymously user tracking behaviours
 - Provide some tips to improve the health at work * (ex.: drink water, micro-breaks, etc.)
 - Show the information produced by the Communication service
 - Show basic information about staff company (office location, contacts, etc.)
 - Show tips to reduce energy consumption

* <http://www.health.com/health/gallery/0,,20975165,00.html>

How to Identify Choreographies that can be changed?

- Create an application (web) to identify choreographies that can be changed to reduce energy costs
- What functions allow:
 - Identify actors and roles
 - Show anonymously end-users behaviours [choreographies]
 - Create users groups with common choreographies
 - Associate choreographies with energy consumption / costs
 - Generate the obtained choreographies
 - Reproduce choreographies integrating energy costs
 - Simulate new choreographies integrating new inputs (weather, energy costs, etc.)

Example

Identified choreography



€uros spent

Proposed choreography

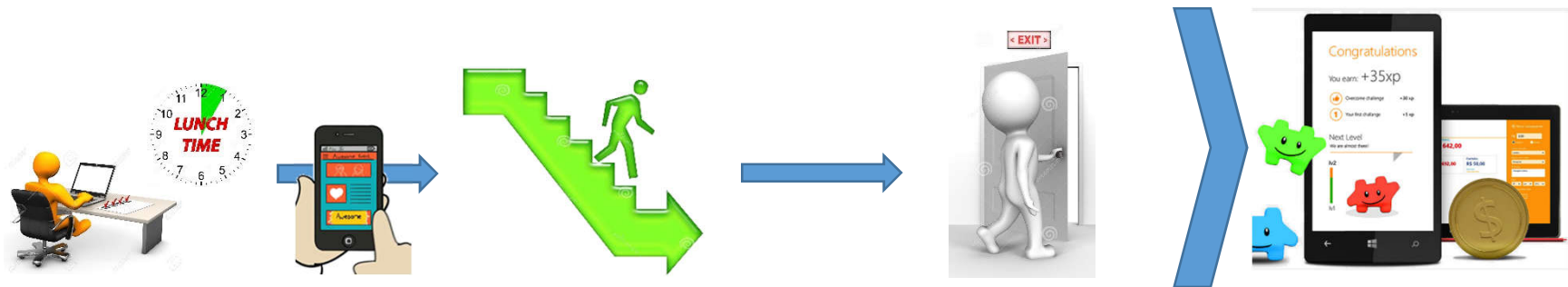


€uros saved

How to engage users to adopt the proposed choreography?



Use gamification to propose the best choreography



Gamification Process

6 steps gamification design framework *

- 1) Define business objectives
- 2) Delineate target behaviour
- 3) Describe your players
- 4) Devise activity loops
- 5) Don't forget the fun
- 6) Deploy appropriate tools

* Werbach, K., Hunter, D. (2012). *For the win: How game thinking can revolutionize your business*. Wharton Digital Press, Philadelphia, US.

1 – Define business objectives

- Reduce energy costs (example: reducing the consumption peaks)
- Change behaviour's and energy consumption awareness
- Involve the entire INESC community
- Have a reliable and large database to forecast certain aspects

2 – Delineate target behaviour *

- Control temperature (example: thermostat regulation, open windows)
- Control lighting (turn off light when leaving, use natural day light, check whether is convenient to turn off the lights for a certain period of time)
- Control energy consumption of personal computers. (unplug power supply when not needed, banish screen savers, turn off the screens and computers when leaving, do not use too much computer programs simultaneously)
- Use of the stairs instead the elevator.
- Think twice before printing a document.
- Control energy consumption of personal electrical appliances.

* New behaviour's may appear after previous work

3 – Describe your players

- Two types of actors *
 - Individual
 - Applicable to any collaborator of the INESC community.
 - Group
 - Teams according the location (example: open space 1.0 / small offices / etc.);
 - Teams according the internal expertise team (example: CPES / CSIG / HR / etc.);
 - Teams according the type of employees professional background (example: researchers / professors / etc.).

* New actors may appear after previous work

4 – Devise activity loops

- What kind of tasks should be implemented?
 - Onboarding loops:
 - INTRINSIC MOTIVATION:
 - Demonstrate to users how much euros/trees/CO2 they are spending
 - Engage them how much euros/trees/CO2 they can save, doing some actions
 - Show us what you did! What have you done to save so many euros/trees/CO2?
 - Charity: With the money saved, we can give some percentage to a charitable institution
 - EXTRINSIC MOTIVATION:
 - Free Coffee! It is necessary to raise a proper friendly competition within the users (example: the team who wins will have free coffee or lunch)
 - Motivate the users to decrease energy consumption within the team in order to compete with the other teams;
 - Proper feedback to the users whenever they achieve positive results (leader boards, popularity, special benefits, etc.);
 - Progressive loops:
 - Example: increase the level of difficulty of the weekly/monthly goals defined.

5 – Don't forget the fun

- Thematic days (example: no elevator day / ...);
- Top teams/individuals will be rewarded by the end of the week/month;
- Lower qualified players can achieve the first positions by achieving certain predefined goals;
- Ranking displayed in one screen where everybody can see;
- Exhibitions shown in the walls of the stairs (example: show monthly energy saving costs by team);
- Charity: suggest what's the charitable institution that will receive the saved money
- Vote: elect the charitable institution

6 – Deploy appropriate tools

- Create an INESC App (Mobile and Windows) dedicated to the community:
 - CHA - Comfort & Health Application
 - Evaluate whether the users are feeling comfortable: When someone is not feeling comfortable, the user can share this feeling in the App (example: feeling too cold / too much noise);
 - According with the meteorology settings the app can propose to turn off the air conditioning, the lights, etc.
 - Provide some tips to improve the health at work * (ex.: drink water, micro-breaks, etc.)
 - ONA - Online News Application
 - Show the information produced by the Communication service
 - Show basic information about staff company
 - Show the menu of all the FEUP and INESC restaurants and bars
 - Show tips to reduce energy consumption
 - Gamification
 - This App will develop some gamification process in order to engage the users to proceed the main project goals.

6 – Deploy appropriate tools

- Create a Website dedicated to the INESC community:
 - Provide information about energy consumption / costs
 - Past / Present
 - Interactive representation of users choreographies
 - Show Leaderboards of the challenges
 - By group
 - By actors
 - Etc.
 - Show tips to reduce energy consumption

Challenges / Next steps

- User tracking:
 - Privacy – we must guarantee that all the tracking system is anonymous
 - Mobile – the wifi triangulation system uses too much battery
- Link user/group tracking with user/group consumption
- Identify choreographies that will allow to reduce energy costs
- Apply the Octalsys framework to this gamification process



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