PARENT: PARticipatory platform for sustainable ENergy managemenT

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Background

The PARENT project aims to provide communities with technology and support to help reduce energy consumption in their homes and to investigate ways in which communities can work towards more sustainable lifestyles. It is an ongoing three years project with pilot studies in Brussels, Amsterdam and Bergen.

In the Amsterdam pilot, the East Harbour Prosumers Community (EHPC), energy monitors were installed to collect prosumers' electricity consumption and PV generation data. To help those prosumers reduce their electricity consumption and increase their PV self-sufficiency, an ICT-based platform was developed and enhanced by a combination of gamification elements. This platform analyzes and visualizes collected data to help residents become more aware and engaged with their energy use. The platform can be used for different energy applications, such as energy efficiency, PV self-consumption and demand response (DR), as seen in Fig. 1.
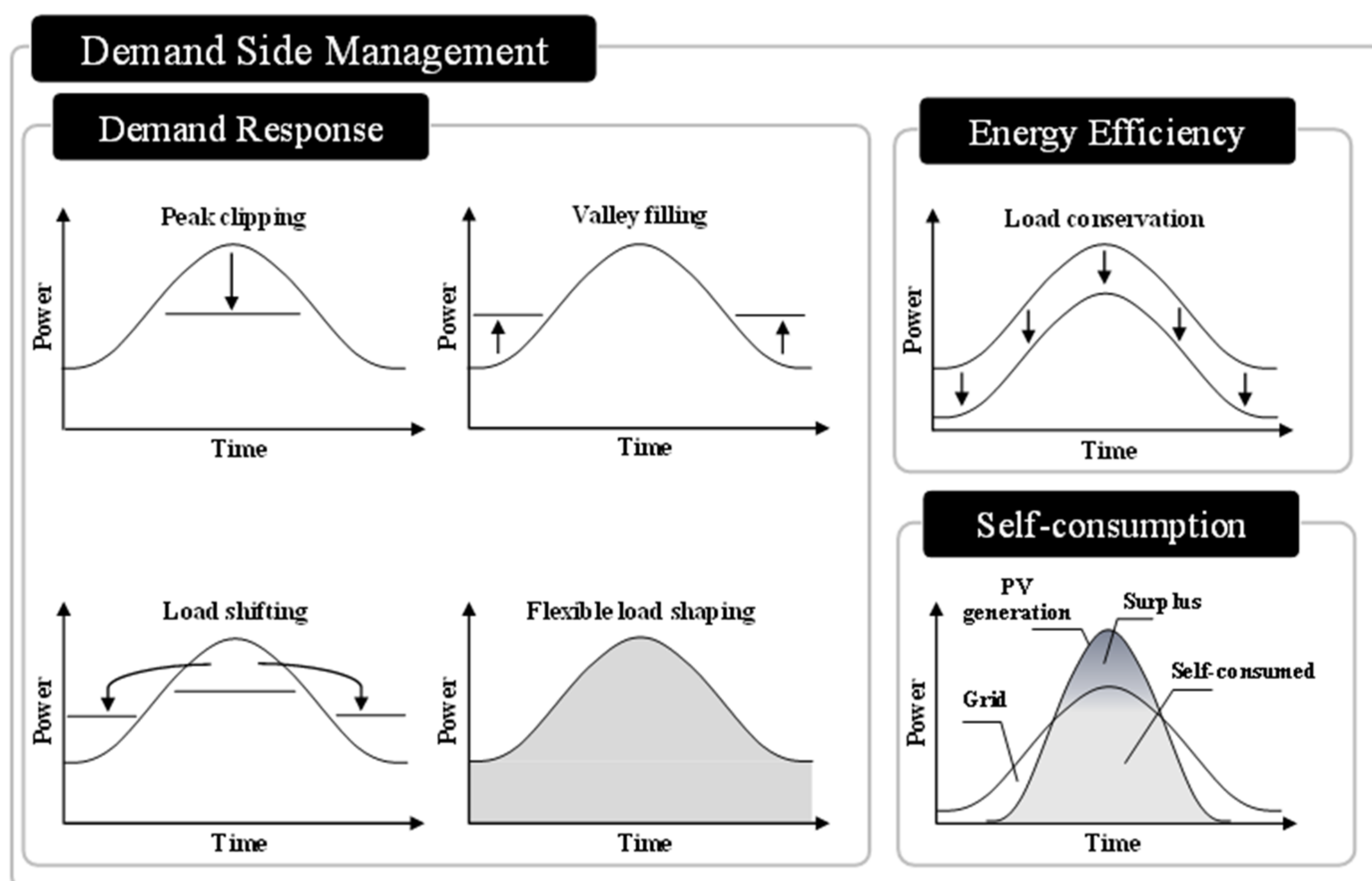

Fig. 1. Energy applications for residential customers.

System design

The first step is to identify the energy-related behavior change requirements that are needed to engage residential customers in energy applications.
The second step is to define the components needed to fulfill these requirements, which are summarized as follows:

1. **Technical system (Fig. 2):**
   - Smart metering systems
   - Energy Management System (EMS) that receives the meter readings, measures the local PV production, and possibly controls households' flexible appliances
   - Networks, software and database
   - Web/mobile application
2. **Game design elements:**
   A combination of game design elements is required to engage households in the considered applications. A compilation of the most commonly used game design elements based on the various literature and projects in this area is classified into five categories and presented in Fig. 3. The elements can be incorporated in the EMS and displayed in the mobile/web app interface.
3. **Value propositions:**
   - Value for a residential customer
   - Value for energy system actors
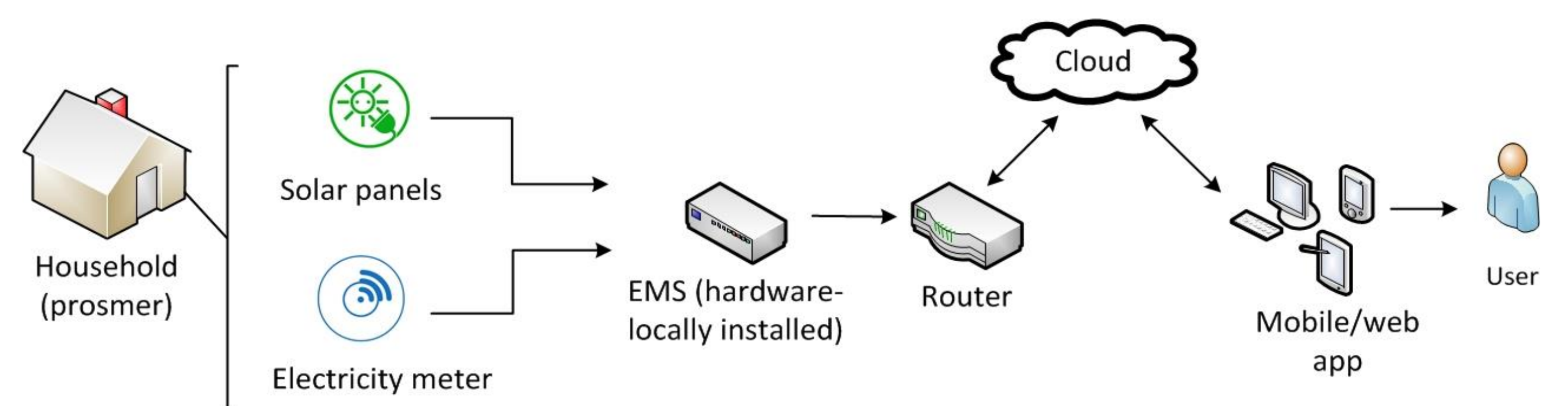   - Value for society
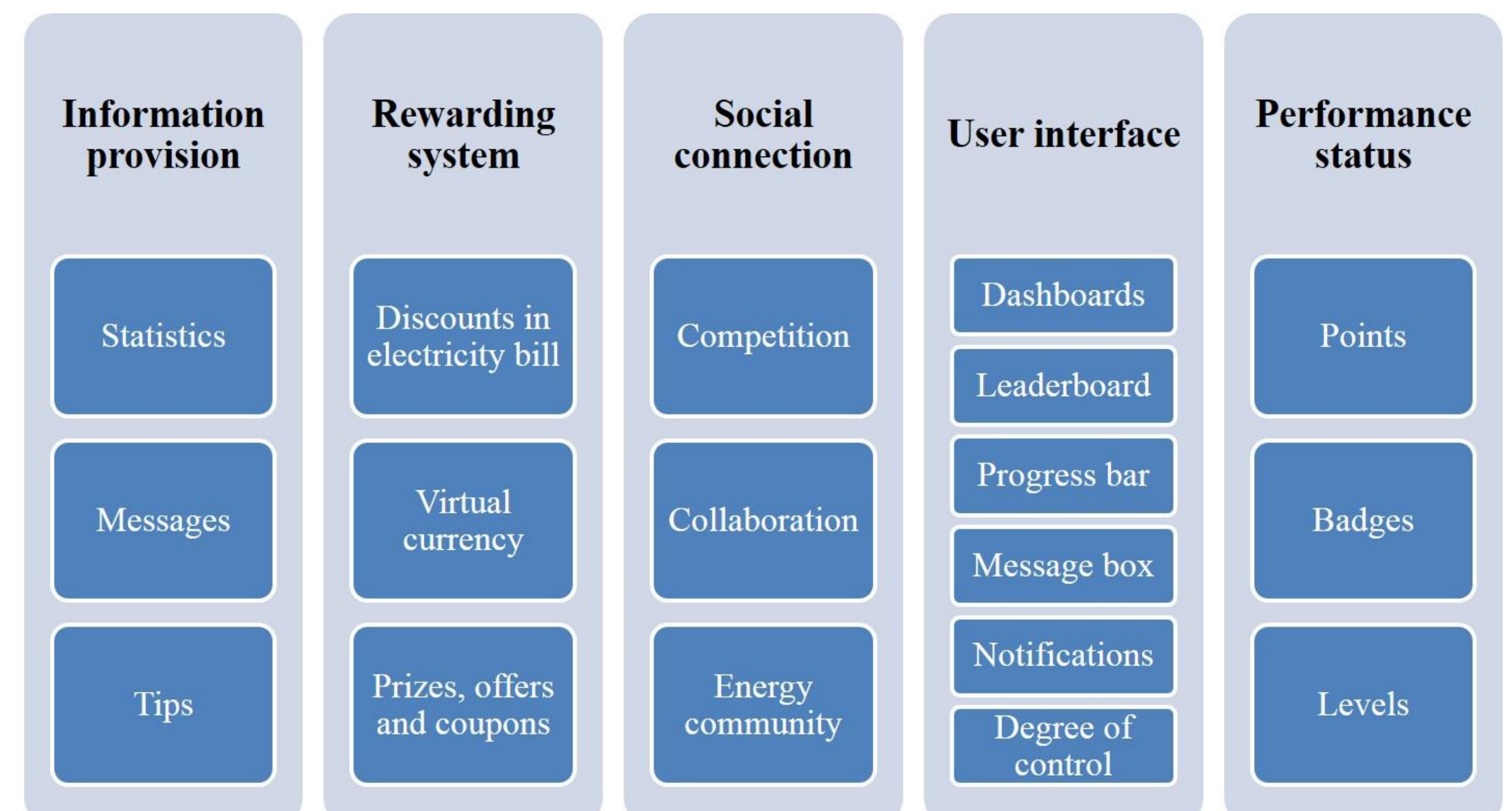

Fig. 2. System architecture of the technical component.

Fig. 3. Game design elements categories for residential energy applications.

PARticipatory platform for sustainable ENergy management (PARENT)

A European project that operates across three European cities: Amsterdam (Netherlands), Bergen (Norway) and Brussels (Belgium).
Aim: *"Reduce electricity consumption in households through community participation and ICT solutions"*.
- provides an innovative participatory energy management platform for reducing electricity consumption in households.
- increases the engagement of individuals in the responsible management of their own electricity usage

Amsterdam pilot: East Harbour Prosumers Community (Fig. 4):
- Energy management system (EMS) installed in 27 households (boats, houses and apartments)
- Using a combination of gamification elements:
  - Real time information provision with hourly, daily, weekly and monthly statistics using an interactive and easy to use mobile/web apps with dashboards.
  - Periodic newsletters with feedback and personalized tips.
  - Challenges for energy saving.
  - Social connection: living labs, performance comparison with other users (similar size, type, average)
  - Performance status: leaderboards

Fig. 4. PARENT project: East Harbour Prosumers Community.

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