End-user profile: behavioral foundations of an energy control platform

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End-user profile: 
behavioral foundations of an energy control platform

✓ ICT platforms allow users to control energy consumption, as well as optimizing its energy efficiency.

✓ In this day and age, this is a powerful tool for any user considering its remote real-time data access feature, thus permitting an energy consumption optimization, contributing to reducing “smart cities” energy related problems.
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✓ Generically, the energy-saving behavior is influenced by a large diversity of both behavioral and situational factors.

✓ Thus, the end user profile assessment is an essential tool to provide the foundations of the energy related platforms requirements and system.
# Pre-test Survey

1. **Demographics**

2. **Attitudes toward energy saving**
   - Environmental domestic routine behaviour

3. **Attitude toward nature**

4. **Attitudes toward energy saving**
   - Behavioural changes perception

5. **Behavioural Changes**
   - Incentives judgement

6. **Electric Vehicles**
   - Users characterization
1- Demographics

\[ N = 206 \]

\[ Mean \text{ Age} = 46.96 \]

94.12 % never participate in any related pilot before
1- Demographics

Education Level

- Primary school
- Secondary school (6 years)
- Secondary school (10 years)
- University studies
- Doctoral studies
- Other

Count
1- Demographics

- Income

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2- Attitudes toward energy saving
Environmental domestic routine behaviour

Please indicate how often you generally carry out the following activities:
(1- Never to 5 Always)
(Overall score could be calculated and compared with 4).

1- Use the standby mode for often used appliances;
2- Start the washing machine with only a half full load;
3 - Leave warm water running while brushing teeth;
4 - Close the door between heated and not heated rooms;
5 - Shower for more than 10 minutes;
6 - Leave the window tilted at night during winter;
7 - Switch off lights when leaving the room for half an hour;
8 - Put on warmer clothes before turning up the heating if it gets cold in a room;
9 - Wash clothes at times of lower price (i.e. at night);
10 - Switch off computer when it is no longer used;
11 - Switch off the light when leaving the room;
12 - Use a switchable power socket and switch it off when not using any appliances;
13 - Turn air conditioning (A/C) down during sleep hours;
14 - Use pots with lids for heating water and food;
3 - Attitude toward nature

Please select one level of agreement for each statement to indicate how you feel:
(1 - I completely agree to 5 - I don’t agree with this at all)

1- We as human beings have to live in harmony with nature if we want to survive;
2- We have to conserve natural resources for future generations;
3 - Climate change will never stop if we carry on as before;
4 - If we carry on as before, energy will become increasingly scarce;
5 - For every kind of problem-solving, we always have to consider the consequences for the environment first;
6 - We should be careful not to disturb the balance of nature;
7 - Society should promote environmental protection;
8 - Environmental issues should have precedence in all government decisions;

Participants consider themselves green (environmentally friendly).
4 - Attitudes towards energy saving – Behavioral Changes Perception & Behavioral Changes – Incentives judgment
4 - Attitudes towards energy saving – Behavioral Changes Perception & Behavioral Changes – Incentives judgment

Please indicate how easily you would adopt the following behaviors:
(1 - Very hardly to 5 - Very easily)

1- Programming all my electronic appliances to work or charge it’s battery on lower overload network schedules;
2- Performing washing cycles with maximum load;
3 - Turning off all lights when leaving a room;
4 - Taking short hot water showers;
5 - Brushing your teeth without warm water running;
6 - Using electrical extension cable or power socket with switch and turning them all off when electronic appliances are no longer in use;
7 - Turning off electronic appliances when no longer in use, not using the stand by mode;
8 - Closing of any door between heated and not heated rooms;
9 - Closing all windows in cold seasons;
10 - Dressing in multiple layers to keep your core temperature comfortably warm if it gets cold in a room;
11 - Turning off the computer when is not in use;
12 - Turning off all lights when leaving a room for a short period (e.g. half and hour);
13 - Turning off AC two hours before go to bed;
14 - Using pots with lids;
**4 - Attitudes towards energy saving – Behavioral Changes Perception & Behavioral Changes – Incentives judgment**

*Please indicate how much effective do you think could be each incentive*

(1- Extremely effective to 5 - Not effective at all)

1. Information about your neighbors energy consumption efficiency
2. Energy consumption qualitative ratings. (e.g. low; moderate; high)
3. Information about money savings.
4. Track the consumption and cost of each device.
5. Bill prediction indications based on actual consumption.
6. Information about cost per hour/day.
7. Participate in competitions or challenges that test your energy efficiency.
8. Usage prediction indications based on actual consumption.
9. Receive an email or sms always that is some unusual usage.
10. Compare your consumption between past similar periods (e.g. seasons)
11. Information about current usage rate (kWh).
12. Information about unit cost of electricity (€ per kWh).
13. Information about the impact of your energy consumption on the environment.
14. Play an energy control online game.
4 - Attitudes towards energy saving – Behavioral Changes Perception & Behavioral Changes – Incentives judgment

Attitudes toward energy saving – Behavioral changes perception

Behavioral Changes
Incentives judgment
5 - Electric Vehicles
Users characterization

Which electric car you use:

- 35% Own electric car
- 45% Company / Institution electric car
- 20% Other

Please indicate, during a week, how many times you usually charge electric vehicles (EV) in each place.

- 1 - At home, on a public charging point; / 2 - At home, on a private charging point; / 3 - At work, on a public charging point; / 4 - At work, on a private charging point; / 5 - Other.

Please indicate, during a week, how many times you usually charge electric vehicles (EV) during each period.

- 1 - morning; / 2 - noon; / 3 - afternoon; / 4 - evening; / 5 - during sleeping period.
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Considering the results presented before, some main aspects that were considered are highlighted:
✓ Target population will be middle-aged, middle class/upper-middle class, with university degree or higher schooling level;
✓ Results gathered indicate a population segment clearly environmentally aware;
✓ It seems there is a current positive attitude towards energy efficiency that is not being translated into efficient behavior;
✓ EV drivers in particular seem to present behavioral patterns consistent with the peak hours, a behavior perfectly in line with this project’s main goal;

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