H2020 MOBISTYLE Project

Motivating end-users behavioral change by combined ICT based tools and modular information services on energy use, indoor environment, health and lifestyle

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“We know less about the buildings in which we spend most of our time, than we know about the cornflakes we had for breakfast or coat we wore this morning.”
Actual and theoretical energy consumption per m² of detached housing per energy label

Performance gap in different building types

Performance gap

Cause for performance gap:
- Prediction modelling
- Technical issues
- Poor metering
- Poor maintenance & commissioning
- Occupant behavior

[UserTEC – User Practices, Technologies and Residential Energy Consumption]
Let’s change perception from ‘Buildings consume energy’…

…to the fact that ‘People use energy.’
MOBISTYLE: Motivating end-users behavioral change by combined ICT based tools and modular information services on energy use, indoor environment, health and lifestyle

Duration: October 2016 – March 2020
MOBISTYLE Objectives

MOBISTYLE has the following specific measurable qualitative objectives:

- To transform measured data into **understandable information** for identified user profiles raising awareness on energy use, health and indoor environment.
- To motivate **long lasting behavioral change** of end users by combined **modular information on energy use, health and lifestyle**.
- To develop **easy to use ICT-based tools** which will make energy monitoring a **well-accepted and attractive ‘daily activity’** (routine).
- To deploy and validate the developed solutions for 5 demonstration cases featuring **different building types and end user types**: employees in an office environment, residents in a social housing, students and staff in university buildings, residents living in a smart city, guests staying in a hotel.
- To foster **new business models** and applications.

The main quantitative objective of MOBISTYLE is reduction of buildings energy use for 16 %.
Change is gradual...

- Old habit: “I don’t know that I don’t know.”
- New habit: “I don’t know that I know.”
- “I know that I don’t know.”
- MOBISTYLE active engagement
- Continuation

Energy-conscious behaviour

Time
MOBSTYLE 4-step people-centric ICT design approach

IDENTIFICATION
Who are we solving for?

RESEARCH
What do people want?

INTERPRETATION
What and how will we create to serve the user needs?

USABILITY TESTING
What and how will we create to serve the user needs?

Design and development of services

improvements
MOBISTYLE recommendations for the ICT developers

based on the focus groups findings (organized at the 5 demonstration locations)
Method to provide feedback to users about their energy use and indoor environment and guiding them to change their practices.

Green boxes indicate inputs/action required from the user, while gray boxes indicates activities performed by the app.
Methodologies (Algorithms, models)

- Energy
- IEQ
- Health

Wearables

- Energy, IEQ sensors

White goods

- Energy, IEQ sensors

Data cloud

- Wifi

Database

- Digital authentication

MOBSTYLE Users Platform

- MOBSTYLE Expert Tool

GAME

- Missions
- Goals
- Suggestions
- Achievements

DASHBOARD

- Sensorized entities

OFFICE APP
MOBISTYLE Game

Mobile application:
- Used in homes.
- Uses “nudges”, complemented by “tips”.
- Using data from energy-IEQ sensors.
- Triggers missions & detects their completion.

⇒ Game developer:
MOBISTYLE Dashboard

Desktop and Mobile application:

- Used in universities & hotel demonstration cases.
- Aimed to both consumers & company managers.

→ Dashboard developer:
MOBISTYLE Expert tool

**Desktop application:**
- Primarily for building managers and experts.
- Allowing:
  - Data management;
  - KPI calculation;
  - Interoperability.

→ Expert tool developer:
Desktop application:

- Aimed for employees & company managers.
- Used primarily to encourage dynamic indoor conditions.

→ Office App responsible:
MOBISTYLE Office App

Desktop application:

- Aimed for employees & company managers.
- Used primarily to encourage dynamic indoor conditions.

Office App responsible:
Are comfortable stable temperatures actually healthy?

Experimental studies at MU showed that regular exposure to mild cold can increase:

- Energy expenditure, energy metabolism (*)
- Resilience to thermal discomfort due to acclimation (*, ***)
- Resilience to cardiovascular disease and insulin sensitivity (**)
Gradually cooler environment in winter and warmer in summer can lead to energy saving, improved comfort and higher acceptance.

Dynamic indoor conditions within MOBISTYLE

Physiological response → Psychological response →

Schellen et al., Indoor Air 2010

Temperature training

Temperature [°C]

0 17 25

240 480

Time [min]
Health is today’s wealth.
DO YOU KNOW THAT THE ONLY STAND-BY YOUR LAPTOP IN ONE YEAR CAN CONSUME AS MUCH AS TWO TIMES A YEAR'S WORKING ENERGY?

STOPNICE
ZRAK
HLAJENJE

MOBSTYLE

UDINE, 29. APRIL 2007

SVOJ INVESTORSK RASPOSATELJ MI PRAVIMO Ystävällisemmin

HUYPGEN
INGENIEURS & ADVISEURS

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“MOBISTYLE is the way of life…
Let me tell you why!”

Health is today’s wealth.

Promote solutions and services where goals on energy efficiency, good IEQ and health overlap.

Energy conscious and healthy behaviour becomes a way of life and not only a one-time service, noticed as energy saving at the end of the month.

| Reduced energy bills | 16 % |
| Improved indoor climate | 21 % |
| Improved health | 5 % |
Thank you for your attention.

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www.mobistyle-project.eu

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