

PROJECT PROFILE

CAT209

Driving use of smart wearable objects will boost Europe's important Internet of Things and smart-city markets
[H2O]

H2O (Human 2 Object), a follow-up project to eGo, takes 'wearable computing' to the next level. It does so by stimulating and promoting human-computer interaction and smart wearable-devices through developing and testing key elements needed to drive and support the resulting emerging businesses based on Internet of Things and e-Mobility, e-Health and e-Commerce applications.

It has been said that 'wearable computing' facilitates a new form of human-computer interaction, comprising a small body-worn computer (such as a user-programmable device), which is always on and always ready and accessible. While still in their infancy, wearable devices are on the verge of moving mainstream, as we are witnessing with current flagship products from major suppliers. Importantly, there is now the will to seriously invest in smart wearable-devices, thanks to strong product strategies and active developer communities able to develop an app-ecosystem around the hardware.

What is now needed to give wearable computing and the resulting businesses – Internet of Things (IoT) and smart-city key application areas, notably e-Mobility, e-Health and e-Commerce – a real boost is to design and develop missing key elements required to support and drive these businesses, while also helping to provide users with an enhanced digital lifestyle.

Building on tried-and-tested technology

The H2O project is a follow-up to eGo, a CATRENE project that successfully defined, designed, developed and tested a technology that establishes secure, bidirectional wireless channels between objects or individuals, based on a bootstrapping scheme using the electrical conductivity of human skin.

In line with wearable computing's technical and market demands, H2O has two major objectives:

1. To provide a robust and open technology-platform (hardware, embedded software and management tools) for the development and customisable integration of a large variety of secure wearable objects for trusted, privacy-maintaining and easy user-interaction in future IoT or smart-city environments. The project deals with a double challenge:

maintaining high-level security in an open, non-secure environment; and supporting multi-tenant business models. The mass-market objective also includes cost-effective and fast-operations solutions;

2. To validate the capabilities of the platform in representative IoT or smart-city use cases such as e-Health, e-Mobility or e-Commerce. The validation process will include several facets, such as user panelization, fast-track prototyping, living labs and pre-deployment schemes in real working-conditions.

Major assets delivered by H2O will be:

- A high-performance, reliable, ultra-low-power BCC (body communication coupling) technology with a standardised physical layer which should be usable as communication enabler in any body-area network;
- A representative set of non-intrusive, secure, low-cost, always-working, wearable devices, suitable for several application domains pertaining to IoT or the smart-city domain. The eGo project prototyped some form factors (aspects of hardware design which defines and prescribes the size, shape, and other physical specifications of components) acceptable to a large category of users. H2O will implement robust and easy-to-use form factors (such as watch, bracelet, clips) suitable for target applications;
- A fully trusted and privacy-preserving transaction environment, enabling the object(s) that users wear or can touch to seamlessly initiate applications or communicate with or between objects;

PROJECT CONTRIBUTES TO

-  Communication
-  Health and aging society
-  Safety and security
-  Digital lifestyle
-  More than Moore

PARTNERS

Gemalto
 CEA LETI
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 Worldline
 IDEMIA
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 IDATE
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COUNTRIES INVOLVED

-  France
-  Ireland
-  Portugal
-  Czech Republic

PROJECT LEADER

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KEY PROJECT DATES

01 January 2015 - 30 June 2018

- An open software-development kit (SDK) and application-certification tool-chains which facilitate third-party development of wearable-computing apps, and ensure such apps can be automatically verified before being remotely loaded on user-owned wearable devices;
- A complete reference and trusted-security architecture enabling seamless, secure synchronisation of wearable devices. This synchronisation includes loading credentials onto a blank wearable device;
- A pilot implementation of wearable-computing scenarios in IoT or smart-city application domains, together with initial quality-of-service (QoS) or quality-of-experience (QoE) feedback.

Growing wearable technology markets

The primary business goal of H2O is to provide the European industry with the required enablers to master the smart wearable-objects domain and address successfully key segments of the emerging and rapidly increasing IoT and smart-city markets. Encouragingly, these are already primed to go mainstream now that major players have wearable devices on the market and strong product and investment strategies in place, and an app ecosystem around the hardware is under development.

The wearable markets look promising. This is confirmed by Gartner, a consultancy, which is expecting growth of 16.7% year-over-year across the global wearable market in 2017. This covers a range of device types and form factors – from smartwatches and body-worn cameras, to head-mounted displays. Its forecast projects sales of 310.4m wearable devices worldwide in 2017, generating a total of US\$30.5 billion in revenue, of which it expects US\$9.3 billion to come from smartwatches.

Project and commercial know-how

The right industry mix – namely, technology suppliers, technology integrators, silicon manufacturers and embedded-application developers, together with software houses, digital security companies, designers and market analysts – means that the H2O project consortium can provide competencies needed to support the value chain more than adequately. The consortium also includes large and small companies strongly committed to promoting industry standards.

Looking to the future, the consortium has the expertise, scale and spread needed to promote wearable computing and smart objects, and also deal with foreseen security and user requirements of the application domains being addressed. Where possible, H2O will reuse outcomes from several funded-projects, to extend the architecture initiated by eGo – the eGo Smart Watch – and help establish the H2O eco-system.

