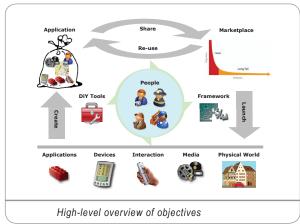## Project Results

# Accelerating access to the Internet of Things
## Technical platform removes barriers to user-generated IoT applications

*The Internet of Things (IoT) marks the next major revolution in worldwide connectivity. The ITEA 2 DiYSE project has developed a technical platform to overcome barriers to user-generated IoT applications for ordinary people, developers and other ecosystem actors alike. Key outcomes are a live public experimental Internet site and a series of underlying technical assets, many already being exploited.*

IoT offers a new world of interconnected smart objects but poses major problems in terms of device heterogeneity, many application domains and diversity of custom installations and applications. DiYSE set out to develop a platform for cost-effective exploitation and management of IoT systems by combining two trends: the IoT itself and do it yourself – the advent of cheap, accessible, programmable and easy-to-use hardware with sensors enabling ordinary people to build their own applications.

The goal was an open platform enabling the masses to share and control their creations in a 'smart things' environment. DiYSE focused on the smartness of the data produced by these objects, offering a technical platform for further reasoning and reusable abstraction. It also demonstrated how this technology could act as an enabler for an ecosystem of players working in an IoT.

### CONSTRUCTING CREATION STEPS
DiYSE identified four creation stages in an ecosystem to launch IoT applications:

1. **Install and connect** – involving sensors and other items to connect objects to the Internet. Partners developed hardware for sensors, middleware for tiny footprint sensor boards, and enhanced driver sensor gateway technology enabling semantic enrichment of the sensor data.
2. **Sense** – extracting and abstracting data meaningfully and aggregating it. Another important innovation in the 'sense' phase was feature extraction from video and speech. The result is a rich, meaningful stream of data flowing into the DiYSE system.
3. **Create** – building applications and reusable paradigms based on this meaningful data for generic and dedicated environments. Hardware designers can offer enriched devices, developers can build transformations of the resulting data and end users can build their own applications which can be shared with friends or used as templates for new applications in an ecosystem at end-user level.
4. **Execute** – defining the necessary technology to run the multitude of applications on a scalable, distributed real-time architecture in the cloud. The underlying distributed architecture efficiently executes component graphs as a lower technical layer translation of the applications that the ecosystem partners co-create, processing all the data in real time, from sensor to visualisation.

### FAST EXPLOITATION OF RESULTS
Telecommunications partner Alcatel-Lucent developed SenseTale, a live public experimental DiYSE system. The underlying technology assets will be exploited in machine-to-machine (M2M) solutions. Alcatel-Lucent also plans enhancements for telecommunications operators and other M2M service providers, making it possible



*High-level overview of objectives*

## Project Results



for them to offer third parties a cost-effective and scalable solution for bringing new applications to market. The company is also transferring their DiY Video Suite from the project to business.

Mobile phone operator Turkcell is looking at DiYSE components in the M2M market. And Thales is planning to use this technology in the surveillance and emergency management market for easy deployment of reliable ad hoc systems for emergency situations.

Philips has developed jointSPACE, an open source middleware architecture on its latest range of TVs that follows the DiYSE principle.

It offers an open platform where people can install their own IoT applications.

Other exploitation includes:
- Archos – with remote control Android and wireless accessories for home automation, surveillance and video communications;
- Finwe – extending its Key2phone for assisted living and a parking pilot;
- Neotiq – as the basis for its next-generation voice and video platform; and
- There – with novel home automation user interface concepts.

### CRITICAL FOR EUROPE
With DiYSE and other European IoT projects before it, Europe has addressed some key IoT technology areas beyond what is available in the rest of the world. The adoption of IoT will change lives but acceptance by people is essential. DiYSE addresses this by offering an ecosystem which gives control to end users, developers and other ecosystem actors alike. Designers get a single horizontal platform allowing reuse of elements. The underlying technology will be used in many more applications in future.

## Major project outcomes

**DISSEMINATION**
- 90+ publications
- 90+ presentations at conferences/fairs
- 8+ organised public events, among which a final workshop with 7 related EU projects

**EXPLOITATION**
- 8 new products and solutions, among which the SenseTale platform, hooking up many device technologies from partners
- Several new services
- 10+ new system artefacts, potentially leading to further products and solutions

**STANDARDISATION**
- 20+ contributions to standardisation bodies

**PATENTS**
- 10 patent applications filed
- 12+ patent application in preparation

**SPIN-OFFS**
- Internet of Things related spin-off being founded in France

EUREKA

**DiYSE**
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