



# PERSIST



**The vision of PERSIST is of a Personal Smart Space, which is associated with the portable devices carried by the user and which moves around with him/her, providing context-aware pervasiveness to the user at all times and places. The Personal Smart Space will cater for the needs of users, adapting to their preferences and learning new ones as these arise.**

## At a Glance

### Project:

ICT PERSIST – PERsonal Self-Improving SmarT Spaces

### Project coordinator:

Kevin Doolin (kdoolin@tssg.org)  
Telecommunications Software and Systems Group,  
Waterford Institute of Technology ([www.tssg.org](http://www.tssg.org))

### Partners from:

- Telecommunications Software and Systems Group, Waterford Institute of Technology (Ireland)
- German Aerospace Center – DLR (Germany)
- Heriot-Watt University (United Kingdom)
- Security Technology Competence Centre (Slovenia)
- Institute of Communication and Computer Systems (Greece)
- LAKE Communications (Ireland)
- Soluta.net (Italy)
- Portugal Telecom Inovação (Portugal)
- Telecom Italia (Italy)
- INTEL (Ireland)

**Duration:** 30 months

**Total cost:** €5.6m (€3.6m funded)

**Programme:** ICT-2007.1.2 - Service and Software Architectures, Infrastructures and Engineering

### Further information:

[WWW.ICT-PERSIST.EU](http://WWW.ICT-PERSIST.EU)

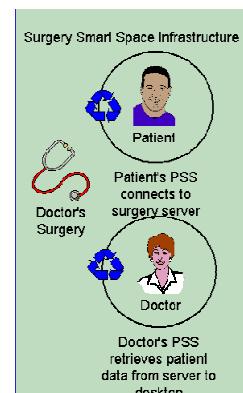
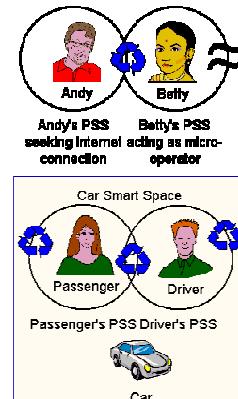
### PERSIST Objectives:

The primary objective of PERSIST is to implement a user-centric smart space, the Personal Smart Space, that provides a minimum set of functionalities which can be extended and enhanced as the user encounters other smart spaces.

### Personal Smart Spaces are:

Based on a personal area networks constructed from a variety of networked components which might range from mobile or wearable devices to smart dust. Personal Smart Spaces will be able to provide limited pervasiveness and context awareness at any time and anywhere. Their ability to inter-operate with other smart spaces will permit Personal Smart Spaces to automatically adapt environments to satisfy user preferences, to resolve conflicts and to facilitate a migration from smart places to smart regions.

### Personal Smart Spaces can...



Share information and services in an ad-hoc fashion - The possibilities range from simple business card exchanges to accessing the context sources of others, such as GPS information, to disaster management scenarios.

Personalise the configuration of fixed smart spaces - The PSS of the driver of a rental car can be used to personalise the ergonomics of the car, pro-actively adjusting the seat and steering wheel, for instance. Personal preferences for climate control can also be made available to the car's smart space.

Link into pervasive infrastructures - A patient might have a PSS which incorporates sensors which capture his vital signs and logs them. Upon entering the doctor's surgery this data can be uploaded to the surgery infrastructure and appended to his medical record which can be accessed by the doctor's personalised PSS graphical interface.

Generate new business models - Consider a not uncommon situation at a bus stop. Andy approaches the bus stop and would like to connect to the Internet to discover when the next bus is due but he has no connectivity. Meanwhile, Betty, another passenger waiting for the bus, is accessing the Internet via her UMTS connection. Betty's PSS automatically offers to act as a broker between Andy and her Internet service provider. She becomes a micro-operator for Internet service provision.

### Why PERSIST? - Key Innovations

Grouping and Sharing – When personal smart spaces overlap it will be necessary to reconcile the preferences of more than one user. Sharing of context information between users also becomes possible. Balancing the allocation of resources amongst multiple users is a further requirement, as well as adapting the behaviour of shared resources to maximise the overall utility perceived by the concurrent users.

User Intent – In order to properly personalise a pervasive environment it is necessary to know what a user is trying to achieve. User goals can be inferred from the past actions of themselves and those of other users.

Recommender Systems – When a user wishes to use a service of a particular type, recommender systems can suggest a particular service based on the previous choices of that user and other users.

Learning and Reasoning – Automatic learning of preferences by the system presents an opportunity to obtain accurate preference data without the user having to enter it manually. To

fully exploit the benefits of context awareness we use the concepts of soft context and location estimation to infer higher level context and continuously precise location from low level context sources and sensors.

Pro-active Behaviour – It should be possible to respond automatically to situations that arise affecting the user in various ways. Pro-activity involves the system taking action on behalf of the user in situations where the user has given prior consent.

### Why PERSIST? - Expected Impact

PERSIST will provide an open and extensible architecture to enable SMEs to use and augment smart spaces. PERSIST will explore the potential for new business models based on PSSs whose scale is likely to prove attractive to SMEs. With the decreasing number of borders inside Europe, Smart Spaces will be used throughout Europe and other regions of the world. Interoperability is the key for worldwide usefulness of this technology.

PERSIST will impact on dynamic service creation by promoting standards around the PERSIST software stack. Adoption of these standards will facilitate the evolution of services through open and agreed interfaces. The creation of these standards can only happen through collaborative research and the FP7 programme is central to this objective.

PERSIST will also allow for the creation of new networked services profitable for SW providers, service/content providers, manufacturers and operators. In particular SMEs will benefit from the PERSIST approach as it would require minimal effort market the PERSIST middleware as an innovative SW product in the PerCom area.

### PERSIST consortium

The PERSIST consortium has been selected for the diverse and complementary expertise and skills that the partners collectively bring into the project. The consortium has a strong balance between Research/Academic (5) and Industrial (5) partners, all of which have specific knowledge and experience relevant to the project's objectives. The consortium has significant experience in pervasive computing systems, machine learning and reasoning, and all areas specified in the Key Innovations section. The PERSIST industrial partners will exploit the project results to create new business opportunities in the area of pervasive computing, and will enrich their internal core skills in the area of smart spaces (offices, homes, etc).