



PISCES

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Project Websites

www.celticplus.eu/project-pisces

<http://www.pisces-project.eu>

Promoting future Internet Solutions in health Environments

The PISCES project proves the concept of the Future Internet Paradigm in the Health domain. PISCES has demonstrated how the Future Internet and Semantics can help to provide personalised high-quality health services.

Main focus

PISCES copes with the idea of covering some of the most important issues in current conception of healthcare (prevention, information related patient management and patient empowerment).

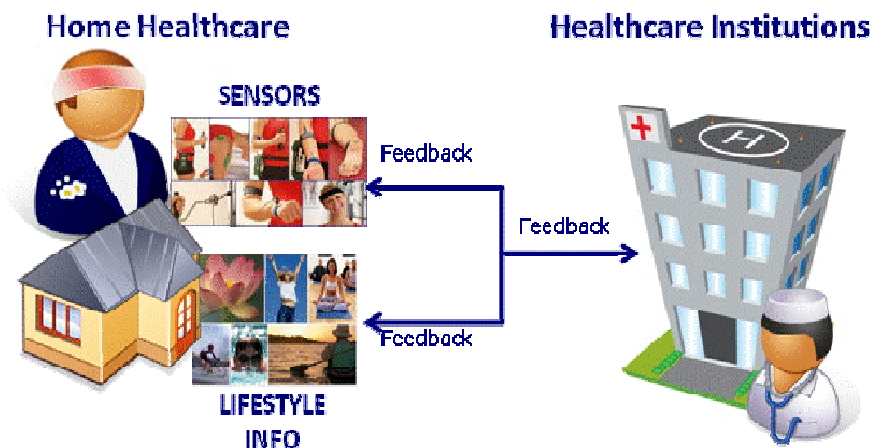
The new services developed will improve the quality of offered services to final users (patients, caregivers and medical professionals). If well-implemented and managed, this new wave of services will also mean more accurate overview of patients' status in time and space, and thus avoidance of unnecessary prolonged therapies, reduced patient hospitalisation, improving treatment by using lifestyle information, improving adherence to the treatment and early detection of problems.

The project goals combine different dimensions of **Future Internet Paradigm**. PISCES is aligned with the technical strategy defined by the FI PPP (Future Internet Public Private Partnership) through the FIWARE project (<http://www.fi-ware.eu>), and in close collaboration with the FI-STAR (<http://www.fi-star.eu>) project.

PISCES combines different dimensions of

Future Internet:

- ◆ **Internet of Services;** A future service-oriented Internet would allow the access to complex physical computer resources and offer contextualized and seamless access to services. Data gathered by sensors are processed and evaluated real-time on the mobile device and immediate feedback is provided both to the patient and the healthcare professional. The definition of the alert conditions is customized; values are set by the healthcare professional previously. Two level alert system is implemented: in case of a yellow alert the patient while in case of red alert the medical staff is notified and trigger the appropriate action.
- ◆ **Internet of Things;** enabling objects' exchange information, verify identities and process information. This allows, for instance, the development of a smart environment to provide better and less invasive monitoring.
- ◆ **Internet of Contents and Knowledge;** customized alert system is established based on individual physiological parameters, life-style behavior and personal data. Based on the data gathered a specific pattern is developed and the evaluation rules reflecting the complexity of medical treatment are fired against the pattern. Both the rule-base and the pattern contain high level medical knowledge.



REHEALTH SCENARIO

◆ Internet by and for the people: providing a multilingual environment and more interactive solutions for interconnect growing population over time

- ◆ Offering preventive, proactive and reactive services, e.g.: detecting arrhythmia
- ◆ Facilitating personalized treatment in case of arrhythmia and heart failure patients
- ◆ Giving patients an active part in managing their healthcare by advising changes in physical activity, promoting drug-compliance consciousness, providing additional physiological data (blood pressure, temperature, and weight) and subjective remarks.

Approach

ReHealth (Responsive eHealth)

ReHealth system and app was developed as a test case scenario that exploited the flexibility of the Future Internet technologies to promote patient empowerment for chronic disease management by providing real-time monitoring of patient's health condition and environment, and a comprehensive alerting system based on this monitoring, including proactive notifications that some health related problems might appear (prevention). ReHealth provides both the patient and the healthcare professionals with continuous feedback and support (proaction) and triggers additional services when needed (reaction).

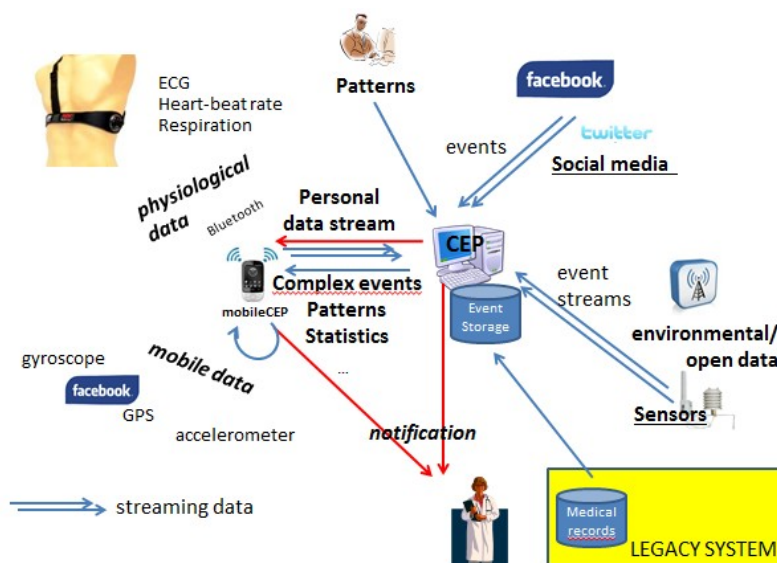
About Celtic-Plus

Celtic-Plus is an industry-driven European research initiative to define, perform and finance through public and private funding common research projects in the area of telecommunications, new media, future Internet, and applications & services focusing on a new „Smart Connected World“ paradigm. Celtic-Plus is a EUREKA ICT cluster and belongs to the inter-governmental EUREKA network. Celtic-Plus is open to any type of company covering the Celtic-Plus research areas, large industry as well as small companies

Main results

The main result of PISCES is a **Future Internet based architecture that improves the efficiency and reliability of an eHealth system** (especially home healthcare), leading to a new generation of

Processing, Semantic support, Context Management, Identity, Privacy, Confidentiality, Internet of Things - Advanced sensor networks. Enablers can be seen as generic or specific components - exportable to other domains apart from Health - based on Future



systems that proactively sense a problem situation and react correspondingly, based on a very large set of observed data. The specific objectives for PISCES project were the definition and analysis of a wide range of *functional and non-functional specifications and requirements* covering **prevention and disease/patient management**; development of architectural requirements to deliver Future Internet applications to Health domain in terms of Enablers for *Event and Data Management and*

Internet technologies that facilitate the early adoption and a wide use application of technologies to different areas.

Development of FI-oriented conceptual prototypes incorporating the FI technologies demonstrated critical solutions and their overall applicability and feasibility, and integration of this platform with other solutions.

Impact

PISCES' new services have improved the quality of offered services to final users (patients, caregivers and medical professionals) and also mean:

- ◆ more accurate diagnosis
- ◆ avoidance of unnecessary prolonged therapies
- ◆ reduced patient hospitalization
- ◆ improved treatments by using lifestyle information
- ◆ improved adherence to the treatment
- ◆ early detection of unexpected problems.

These new ICT based solutions also improve comfort and final perception of the services themselves. Apart from meaning a real improvement in citizens' quality of life these services provide a new subjective perception beneficial for the well-functioning of medical services.

or universities and research organizations. Even companies outside the EUREKA countries may get some possibilities to join a Celtic-Plus project under certain conditions.

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