European Commission

ICT for Societal Challenges

Digital Agenda for Europe

Publications Office of the European Union - Luxembourg, 2012

ISBN: 978-92-79-27933-1
doi:10.2759/9441

Introduction

In a fast moving, globalised society citizens' needs change rapidly. New questions arise while the old ones may require new answers. This is especially true in a context of crisis, where scarce resources have to be complemented with smart thinking to tackle great challenges and turn them into opportunities for growth.

The Digital Agenda for Europe (DAE) is one amongst the flagship initiatives under the **Europe 2020 Strategy** for smart, sustainable and inclusive growth, under the responsibility of the European Commission Vice President Neelie Kroes. It focuses on citizens' and businesses' needs, addressing them with latest technology and online services to boost job creation, promote economic prosperity and improve the daily lives of all Europeans.

Priority areas for action include *digital single market*, greater *interoperability*, boosting *internet trust and security*, much *faster internet access* and *better investment in research and development*. Some are particularly close to concrete issues faced by citizens and society as a whole, such as ageing, health, security and climate change. We refer to them as societal challenges.

This brochure illustrates how Information and Communication Technologies (ICT) can currently help addressing and solving some of these societal challenges. It focuses on five topics close to the citizen where it is presenting the latest developments as a result of the EU budget investment in ICT research and innovation.

Thanks to ICT solutions it is possible to provide everyone, regardless of their location, with **better and personalised healthcare**, whilst at the same time cut down the cost for health care systems. Citizens and business **interactions with public authorities can be faster and more effective**, including across borders. For our ageing population, a greater number of people will be able to **live healthier and more independently**. ICT can also help tackling environmental issues such as **energy efficiency** and **greener transport** notably in **the context of smart cities**. Last but not least, continuous research and innovation can help to build a **secure**

and trustworthy digital environment, enabling citizens to manage and protect their identities and personal data when they interact in the networked digital society.

Our stakeholders include public authorities, universities, research centres, industry, civil society and other organisations. Only with their engagement and mobilisation we can satisfy societal needs using ICT solutions.

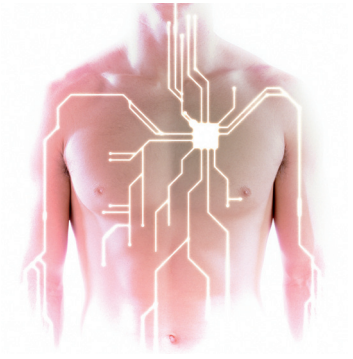
Enjoy the reading!

Paul Timmers
Director ICT for Sustainable & Secure Society
DG Communications Networks, Content and Technology
European Commission

Editorial team

Mirjam Borštnik Gergely
Gemma Carolillo
Agnieszka Chłąd
José Vicente Garcia

Better and personalised healthcare, anywhere and at a lower cost



Better quality of care and controlled medical costs enable people to enjoy longer and more independent lives. Information and Communication Technologies (ICT) have already made a strong contribution to these goals, but much more remains to be done. eHealth technologies enable the delivery of higher quality and more efficient services to European citizens, irrespective of where they are. This is made possible by granting online access to personal health information, by supporting prevention and early diagnosis for diseases, by supporting personalised therapies and by implementing innovative telemedicine services.

The smart use of technologies and innovation can help to address the challenges healthcare systems are facing today, including an ageing population, a shortage of healthcare professionals and a lack of financial resources. Digital solutions to improve people's quality of life can respond to the demand for sustainable healthcare systems.

The development and widespread adoption of eHealth technologies can also contribute to job creation, including in new emerging professions, as well as supporting smart growth.

Ultimately, ICT should enable users to better manage their health and lifestyle, with improved quality of services and reduced healthcare costs.

But how can we achieve this?

The **Digital Agenda for Europe** has defined a number of objectives, including the implementation of interoperable electronic patient records – which can be safely accessed and exchanged across the EU. By 2020, telemedicine services should be widely deployed. To reach these objectives, the **eHealth Network**, which is composed of Member States' representatives, will cooperate to ensure wider use of eHealth including EU wide interoperability of electronic patient summaries. The Network is supported by the **eHealth Governance Initiative**, a group of eHealth stakeholders

which develops strategies, priorities, recommendations and guidelines designed to deliver eHealth across Europe. Building on these initiatives and their results, the eHealth Action Plan 2012 – 2020 will support Member States in bringing forward Interoperable eHealth services within and between national healthcare systems. It includes a series of measures, ranging from personal health management to research investments into personalised medicine, all designed to put patients at the centre of healthcare.

On a practical level, eHealth services, just as other electronic public services, rely on digital infrastructure: effective and fast **broadband connections** are key to the spread of telemedicine services. In 2011, 95% EU citizens had "basic broadband" access, meaning that the Digital Agenda for Europe's target of 100% broadband coverage for all Europeans by 2013 is well on track. The next step will be to see all EU households enjoying access to fast broadband (>30Mbps) and at least half of them subscribing to ultra-fast connections (>100Mbps) by 2020.

Managing health data

Up to 50% of European adults search online for health information. The need for widespread online access to accurate, relevant information on diseases and therapies, as well as to personal health data, is essential. The same is true on the research side, where access to wide sets of health data for scientific purposes is vital for making progress in areas such as clinical trials and drugs safety.

EU-ADR

The Adverse Drug Response (ADR) system collects information on the use of a medicine in several European countries, as well as associated drug use and background rates of adverse drug events in the population. It then applies text mining, epidemiological and other computational techniques to assess and detect 'signals'.

http://www.eu-adr-project.com

Funded by the Seventh Framework Programme (FP7)
Duration: 2008-2012

Access to healthcare data helps researchers to produce more accurate, faster tests on medicines to be launched on the market. New drugs undergo extensive trials prior to authorisation. Once they are on the market, clinicians are responsible for recognising and reporting suspected side effects. However, a number of recent drug safety issues have shown that adverse side-effects may be detected too late, when millions of patients have already been exposed. The EU-ADR project exploited advanced ICT to develop new ways of using existing clinical and biomedical data sources to detect

Adverse Drug Reactions (ADRs) as early as possible. The project used the anonymous electronic healthcare records of more than 30 million European citizens. The **EU-ADR** integrated platform has already been successfully used in other projects to assess the relationships between specific drugs classes and specific adverse events. It is at the heart of the EU-ADR Alliance, a European collaboration framework for running drug safety studies.

In the same area, the **Linked2Safety** project seeks to give researchers, healthcare professionals and pharmaceutical companies homogenous and effective access to the enormous amount of medical information contained in the Electronic Health Records (EHRs) developed and maintained across Europe. Increasing the knowledge-base for researchers and practitioners will help to advance clinical practice and medical research on adverse events in clinical trials, while patients will enjoy greater safety thanks to earlier detection of side effects.

Linked2SafetY

The project will develop an integrated system, including a scalable technical infrastructure and a patient data protection framework, to facilitate the semantic interlinking, sharing and reusing of different EHR repositories.

http://www.linked2safety-project.eu

Funded by the Seventh Framework Programme (FP7)
Duration: 2011-2014

Benefiting from personalised care

More effective care starts with a more precise diagnosis, based on the patient's health history and current situation. ICT helps health professionals to improve diagnosis and to adapt treatments to the patient's specific needs and profile.

The **euHeart** project is building computer models of the diseased heart to personalise and optimise the selection of the most indicated treatment in several *cardiovascular diseases* such as heart failure and heart rhythm disorders, and also coronary artery, valvular and aortic diseases. The simulation tools can be used by doctors to predict the outcome of different types of therapy. The project, which will be concluded by the end of 2012, is expected to be not only beneficial to patients, who get personalised and safe care, but also to society, thanks to lower medical costs.

EuHeart

EuHeart uses clinical data from various sources, such as medical imaging, measurements of blood flow, blood pressure and electrocardiography. Computer models integrate heart behaviour and the aorta at molecular, cellular, tissue and organ level. These models also incorporate knowledge about how the cardiovascular disease disturbs the correct functioning of the heart at these levels.

http://www.euHeart.eu

Funded by the Seventh Framework Programme (FP7)
Duration: 2008-2012

Epilepsy is the most common brain disorder, affecting 1-2% of the population, especially children and adolescents. What can ICT do for such a common, serious and still incurable disease?

The **ARMOR** project will use the modern monitoring and communication technologies to provide healthcare specialists with a framework for the monitoring and analysis of epilepsy-relevant multi-parametric data. The specificity of each patient and the need for constant adjustment of the treatments will be addressed through a Personal Health System (PHS) to achieve a flexible monitoring and efficient diagnosis management.

ARMOR

The project combines clinical and basic neuroscience research with advanced data analysis, medical management tools and telecommunication to develop novel applications for the management of epilepsy.

It will deliver non-intrusive personal health system (PHS) for monitoring and early diagnosis of people with epilepsy and will support healthcare professionals by providing accurate analysis.

http://www.armor-project.eu

Funded by the Seventh Framework Programme (FP7)
Duration: 2011-2014

Assessing how degenerative disorders affect individuals leads to a more accurate management of each case but also to progress on future treatments for currently incurable diseases. According to a multi-perspective approach, the **SENSE-PARK** project addresses the *Parkinson* disease by combining expertise from technology with the experiences of patients and the scientific know-how of health professionals. It will develop a novel sensor information and data capture system to provide the patients with daily valuable

information on their health status and help doctors and researchers progressing in diagnoses, treatments and therapeutic trials.

SENSE – PARK

Thanks to a multimodal sensor information system, designed to be modular and minimally obtrusive, disease-relevant parameters of Parkinson's' patients will be captured. Routine and leisure activities will be monitored in the users' home environment. The information will increase patients' self-awareness and activity and assist medical and scientific professional in the management and therapy development for the disease.

http://www.sense-park.eu/

Funded by the Seventh Framework Programme (FP7)
Duration: 2011-2014

Quality care to everyone, everywhere

Providing patients with needed treatment, wherever they are, is one of biggest challenges of eHealth. On the one hand this implies sharing good practices in diagnosis and treatment of diseases. On the other hand, it means giving people the opportunity to travel freely throughout Europe – knowing that they or their carers can access their health information from anywhere. The number of potential beneficiaries is enormous: 12,3 million EU citizens are resident in a Member state different from their origin and every year millions more make trips to other EU countries. The resulting impact on health safety and quality of life is massive: the availability of vital information, especially for patients suffering from chronic diseases, enables them to move across borders without anxiety and to receive the most appropriate treatment whenever needed.

Pioneer in this field, the **epSOS** pilot project validates and improves *patient summaries* and *ePrescriptions*. Patient summaries include general and medical information about the patient and his current medications. ePrescriptions enable the patient to obtain medication in any EU foreign pharmacy participating in the epSOS pilot phase. The project is currently testing how to make the patient summaries securely accessible to the European emergency services (112 emergency number) and the potentialities of the *European Health Insurance card*, a document shared by all persons insured in the EU, Iceland, Liechtenstein, Norway or Switzerland, as one of the tools for the electronic identification of patients.

epSOS

epSOS has the aim of at improving medical treatment of citizens while abroad by providing healthcare professionals with the necessary electronic patient data. The result is a service infrastructure enabling the exchange of patient data – Patient Summaries and ePrescriptions – across borders. 23 different European countries participate in this Large Scale Pilot.

http://www.epsos.eu

Funded by the ICT Policy Support Programme (ICT PSP) – Competitiveness & Innovation Programme (CIP)
Duration: 2008-2013

The widespread usage of *telemedicine* services – based on interaction between doctors and patients or among health professionals through electronic media – is an opportunity for citizens and a driver of great economic impact. The European telecare market is expected to be worth more than 5 billion€/year by 2015. However, despite a general level of maturity in telemedicine applications and Personal Health Systems (PHS) – devices which enable the provision of personalised health services regardless the patient's location – the market is not yet developed on a large scale. Moreover, although there are some good examples, the transfer of solutions across healthcare centres and borders remains an exception rather than a rule.

The **Renewing Health** project seeks to deliver telemedicine and PHS services to the large segment of the population suffering from *Chronic Obstructive Pulmonary Diseases* (COPD), *diabetes* and *cardiovascular diseases*. The project is implementing large-scale real-life pilots for the validation and evaluation of innovative and patient-centred PHS and telemedicine services using a common rigorous assessment method (MAST). The ultimate goal is to demonstrate that PHS and telemedicine services are sustainable and improve the quality of life. Moreover, they enable patients' involvement and empowerment while optimising the use of resources in healthcare provision.

RENEWING HEALTH

Applying the Model for Assessment of Telemedicine (MAST) on a total sample of 7900 patients suffering from COPD, the project provides the foundation for evidence of the effects of telemedicine services and PHS. Nine European Regions and partners collaborate to manage issues such as integration, patients' involvement and user perceptions, as well as transferability of knowledge and results pooled by the project to other regions in Europe.

http://www.renewinghealth.eu

Funded by the ICT Policy Support Programme (ICT PSP) - Competitiveness & Innovation Programme (CIP)
Duration: 2010-2012

The attitude of the end user is key to allow the diffusion of telehealth services. The Chain of Trust project, funded by the Public Health Programme, focuses on the perspectives of patients, doctors, nurses and, pharmacist to understand their needs and the evolution of their approaches to telehealth over the time. Its outcomes will feed the policy process and help build confidence in the users and overcome the barriers to their full acceptance of the new systems.

Adequacy in care also means innovation in the way that care and social support are delivered, especially to the increasing number of patients suffering from *chronic disorders*. Worldwide, health systems are moving towards "*integrated care*" models, seeking to integrate and coordinate the management, organisation and delivery of health and care services related to diagnosis, treatment, care, rehabilitation and health promotion. Changes in lifestyle, empowerment of patients and relatives and better collaboration among the actors at different levels of the care chain are key parts of this process. What is the role of ICT?

The **Nexes** project moved the focus of care from hospital to primary and home care using ICT support. To this end, the project assessed deployment of four innovative Integrated Care Services (ICS) for *chronic patients* (respiratory, cardiac and type II diabetes mellitus) including well standardized patient-centred interventions: home-based wellness and exercise-training; enhanced care for frail patients; home hospitalization and early discharge and remote support to primary care for diagnosis and therapy.

The pilot was carried out in three different sites – Spain, Greece and Norway – where it developed insights into local structural and operational barriers to overcome for further development of Integrated Care Services.

NEXES

Specific achievements of the project have been:

- Development of Integrated Care Services for chronic patients with enhanced effectiveness and reduced costs;
- Consolidation of an open source modular Health Information Sharing Platform supporting organizational interoperability among actors and clinical decision support systems
- An innovative business case
- Strategies for scalability of the ICT services at regional level

http://www.nexeshealth.eu

Funded by the ICT Policy Support Programme (ICT PSP) - Competitiveness & Innovation Programme (CIP)
Duration: 2008-2012

Independent, active and safe living for older people

Europe's population is ageing. The projections for the future show a slight increase in the total population but a substantial change in the average age: in 2060, 30% of likely 517 million Europeans (502 million in 2010) will be 65 or more (currently 17%). The impact on the workforce will be massive: for every retired person there will be only 2 people working (the present ratio is 1:4).

While this trend poses extraordinary challenges in terms of adequate assistance to the elderly, and health and social care public spending, it will also bring new opportunities. Older people are a key resource for society. The search for adequate answers to their needs, to enable them not only to live longer but also better, can foster smart thinking and innovative solutions for the sustainability of social and health care systems. In terms of economic growth, this means also high potential for the expansion of current markets and the creation of new ones.

Enabling elderly people to live independently and safely at home rather than in hospital or in care centres; people with disabilities easily interacting with their environment: these are just some examples of the benefits Information and Communication Technologies (ICT) can bring to people. Ultimately, ICT can support a behavioural change, providing tools that empower older people to keep control of and responsibility for their lives.

The European Commission is working together with Member States, Regions, professionals and users to deploy ICT more widely in areas that will allow people to age well.

The **Digital Agenda for Europe** reinforces **the** Ambient Assisted Living (AAL) Joint Programme as a major element of the wider policy action on ICT for Ageing Well. The AAL JP focuses on improving the quality of life of elderly people and strengthening the competitiveness of European industry in the AAL field through the use of ICT. Launched in 2008, the Programme involves 23 European countries and has a total budget of €700M over six years – 50% from the AAL partner countries and the EU's 7th Research Framework Programme and 50% from participating private organisations.

Solutions for the ageing population are also at the heart of **European Innovation Partnership on Active and Healthy Ageing (EIP on AHA)**, a pilot partnership proposed in the EU 2020 flagship **Innovation Union**. Partners from the whole Europe (end users, public authorities, industry, healthcare professionals and others) cooperate on concrete actions to improve older people's quality of life, support the long-term sustainability of Europe's health and social systems, foster EU growth and EU industry expansion in the field of active and healthy ageing. The final aim of the Partnership is to increase the healthy lifespan of EU citizens by 2 years.

Several EU funding instruments, including the **Competitiveness and Innovation Framework Programme**, the **Public Health Programme**, the **Structural Funds** and the **Seventh Framework Programme**, now allocate funds to meet the priorities the EIP on AHA identifies (e.g. prevention, integrated care, age-friendly environments, adherence to prescription).

Helping elderly people to live independently and safely at home

Active involvement in society of elderly, disabled and people with physical impairments starts by improving their living conditions in their own environment, and facilitating their social life and contacts. This has also a positive impact on their families and caregivers, enabling them to rebalance the time devoted to care in favour of quality aspects, nurturing the relationship with the older persons. "Smart houses" – i.e. houses with automatic systems for lighting, temperature control, multi-media and many other functions – are designed for this purpose, but their functioning has to be simplified.

The pilot project **Dreaming** developed a solution that integrates different services, (such as tele-care, tele-medicine and elderly-friendly videoconference), which help to prolong independent living and reduce the number of hospitalizations. The platform is also designed to keep users socially engaged via video, sensors, and mobile communications.

The services were tested in six pilot sites across Europe over the last 24 months of the project. The final results showed that the services were well accepted by the trial participants, whose majority experienced an increased sense of security.

DREAMING

DREAMING integrated familiar devices - such as blood pressure cuffs, mobile phones and TV - in a single platform. The system is based on a "box" installed at the user's home and connected to the network. Key information on the environment where the person lives and on his/her clinical parameters are sent to a Contact Centre which can take action and, when necessary, dispatches the appropriate resources (e.g. fire brigade or ambulance).

http://www.dreaming-project.org

Funded by: ICT Policy Support Programme (ICT PSP) - Competitiveness & Innovation Programme (CIP)
Duration: 2008-2012

In the same field, the recently ended Living Lab on Wellbeing Services and Technology project, funded by the European Structural Funds, investigated users' experience of the latest welfare technology installed in real homes in three regions in Finland. A mobile emergency response system, a cooker safety solution, and a nurse alarm system were among the tested solutions. The feedback enabled the suppliers to develop or re-develop their products, resulting in new user-driven innovations. The project succeeded in creating an innovative Living Lab structure to produce better solutions for elderly people that could be transferred to other contexts.

Independent living is also at the core of the **Rosetta** project, which specifically addressed people with *progressive chronic disabilities*, helping them to keep their independence and quality of life as long as possible, and supporting their carers. The project's targets were in particular people suffering from *dementia* (in the different stages of the illness) and Parkinson's disease.

Rosetta

The system is based on:

- An advanced awareness and prevention service, e.g. smart cameras to monitor users' activities;
- An early detection system to monitor behaviours and detect changes in chronic long-term conditions;
- An elderly day navigator, e.g. reminders of daily activities, a visual phonebook, digital communication facilities.

http://www.aal-rosetta.eu

Funded by the Ambient Assisted Living Joint Programme (AAL JP)
Duration: 2009-2012

The developed system was tested in field trials with users in Belgium, The Netherlands and Germany in the period 2011 – 2012 to evaluate the user friendliness of the system, as well as the impact of the system on the quality of life of the elderly people with chronic disabilities and their caregivers.

After the project's completion in May 2012 the different parts of the ROSETTA system are being progressively brought to the market.

Elderly people often live alone at home, even if they have relatives and/or external care-givers assisting them. As they get older the need for some form of home care tends to become stronger and it is not always possible for families to meet these needs. What if the children could have "shadow" assistants for their old parents? The **SRS** project is developing the prototype of a remotely controlled robot that will act as a home carer for the elderly, shadowing the role of the care-givers. The robot, which will be able to perform unpredictable tasks and work semi-autonomously, will reduce the physical commitment needed from human carers. At the same time, it will prolong the independent living for the assisted people. The final solution is expected to be further developed by industrial partners for the worldwide market.

SRS

The project will deliver the prototype solution thanks to the following innovation:

- HRI (Human-Robot Interaction) design principles and interaction patterns for semi-autonomous multi-role shadow robots in home environments.
- A safety-oriented framework derived through extensive usability and user acceptance.
- Mechanisms to enable the robot to be tele-operated, to perform effectively its tasks and learn from its experience.

http://www.srs-project.eu

Funded by the Seventh Framework Programme (FP7)
Duration: 2010-2013

Robotic technologies can also support older people's social interaction.

The **Excite** project has evaluated user requirements for robotic solutions employing the Giraff platform, a mobile telepresence device that connects the person in the house with the external world. Thanks to the videoconference facility, the elderly can request help or receive "virtual visits" by caregivers, family and friends.

EXCITE

The project's methodology is to involve the end users – the elderly and their caregivers – in the development phase of the prototype robot. The feedback on the prototype has been so far generated by cyclic on site user validations on a pan-European scale. The longitudinal analysis of the end users' needs has enabled a better understanding of parameters such as acceptance, integration in a domestic environment and suitability for social interaction. The results have been taken into account in the deployment of the marketable product.

http://www.excite-project.eu

Funded by the Ambient Assisted Living Joint Programme (AAL JP)
Duration: 2010-2012

The project has deployed currently 25 Giraff robots in 6 countries (Sweden, Denmark, Norway, Germany, Italy, and Spain) and will soon deploy 15 more. By 2015, the robot producer estimates to reach a total of 5,123 units sold.Ambient Assisted Living (AAL) solutions can offer great support to the elderly and their carers. As the demographic trend of an increasingly ageing population persists, the potential market for this solution also expands. To facilitate the development and the adoption of AAL solutions, the **universAAL** project produced the first prototype of an open platform with standardized specifications on which developers and service providers can build their applications in a cost-effective and quick way. The platform also offers a series of tools, such as the store, which is a sort of online "marketplace" for providers, developers and users.

UniversAAL

The platform consists of three main parts:

- Runtime support, a software environment providing services for the execution of AAL applications.
- Development support, which includes documentation, tools and an online developer depot of various development resources
- Community support, in particular: training and the online store.

Up to 10 applications are expected to be developed during the project's lifetime.

http://www.universaal.org

Funded by the Seventh Framework Programme (FP7)
Duration: 2010- 2014

Some of the solutions presented above give an idea of the extent to which robotics or other related technologies can help older people, especially those suffering from disabilities, to carry on an independent life at home. New innovative initiatives are and will be increasingly needed. Especially when it comes to radical innovation, traditional schemes are not always enough.

Europe boasts an innovative ICT industry with a great number of large companies and SMEs with the research base to develop products and services for innovation in healthcare. But, as the offer is still consolidating, buyers have difficulty in properly assessing how those new products can meet their needs. Meanwhile industry is reluctant to invest in products for which level of demand is uncertain. As a response to this market failure, public authorities should make greater use of their purchasing power.

To stimulate more "out of the box" thinking, the **SILVER** project adopts a cross-border Pre-commercial Procurement (PCP) to obtain prototype solutions supporting independent living. The project will run an open competition on potential innovative solutions using robotics technology. The competition will focus only on the challenges to address, without specification of the final expected output. The aim is also to demonstrate the effectiveness of such processes to meet societal needs and lead to wider adoption by governments.

SILVER

The project will launch a call for innovative solutions. The call will foresee four phases:

- Solution Design
- Prototype Development
- Pre-commercial/small scale development
- Commercialization/diffusion of product/service.

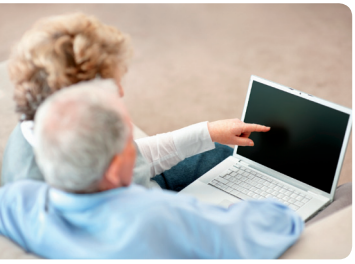
http://www.silverpcp.eu

Funded by the Seventh Framework Programme (FP7)
Duration: 2012-2015

The procurement of innovative and sustainable solutions for the improvement of the quality of elderly care is also the object of the **HAPPI** project (Healthy Ageing Public Procurement). The project, which recently started and will run until 2015, aims to link up European health public procurers in order to detect and purchase the innovative and sustainable solutions for ageing well.

Technology to communicate and socialise better

Only 20% of the elderly are active internet users. They can communicate more and better using devices they are more familiar with, such as TV screens and remote controls. The **T-Seniority** pilot project developed a solution based on digital TV specifically tailored for elderly people. Using a TV set, people can obtain information, contact public services and receive care via tele-monitoring. The TV-conferencing facilities enable them to stay in touch with their carers, family members and their local community. Since the end of the pilot phase in 2010, the T-Seniority solution has been implemented and currently used in sites in Spain, UK and France, reaching more than 1750 users as well as successfully serviced outside of the project's framework in two locations in Spain.



T-Seniority

This project enables the elderly to obtain local and general interest information, to can contact public services and to receive care via tele-monitoring.

T-Seniority helps to strengthen social relationships and to fight the isolation often experienced by the elderly and bridges physical, psychological and generational gaps.

http://tseniority.idieikon.com

Funded by the ICT Policy Support Programme (ICT PSP) – Competitiveness & Innovation Programme (CIP)
Duration: 2008-2010

Moreover, the solution is also targeted on the US market which presented business opportunities for its commercialisation.

Moving about

It is estimated that one in three people aged over 65 is at risk of falling – going up to one in two for those over 80. Falls often have very serious psychological and physical consequences, including a real risk of fatality. Technology permits the development of solutions which enable the elderly and the disabled with severe injuries to walk and move safely.

A solution for fall prevention is provided by the research project **Smiling**, which designed a 'smart shoe' that retrains the elderly's motor skills and restores their postural balance, reducing the probabilities of falling. The smart shoe underwent

several user trials in different sites throughout Europe.
The project also resulted in a comprehensive rehabilitation programme that can be followed in health care and fitness centres and, in the future, at home.

SMILING

The solution developed feeds the information about the patients' gait via sensors hidden in their shoes. After the walking pattern is analysed, the shoe performs small variations in height and slope on the patient's feet and legs. These variations loosen stiff walking patterns and bring back flexibility and stability. The solution comes with a comprehensive rehabilitation programme that can be followed in health care and fitness centres and, in the future, at home.

http://www.smilingproject.eu

Funded by the Seventh Framework Programme (FP7)
Duration: 2008-2010

In the same area, the project **Confidence** widened the focus, addressing both fall detection and unexpected behaviours that could indicate health problems. The principal output of the project was a prototype of an innovative alarm system for fall detection and prevention, targeting elderly users living independently at home. The usability, accessibility and acceptability of the final prototype have been tested with real end-users.

CONFIDENCE

The system developed works indoors, with small and low cost changes needed in the user's environment.

The portable device has a customised alarm protocol that enables the elderly to carry on the usual daily activities in a safer and more comfortable fashion.

http://www.confidence-eu.org

Funded by the Seventh Framework Programme (FP7)
Duration: 2008-2011

The main innovation consists in the development of a care system, based on a portable device, which can detect a set of abnormal events signalling potential problems for the elderly. The system is designed to raise alarms for the caregivers and issue warnings for the users, reducing the burden of the assistance for the former and enhancing the independence and the participation in society for the latter.

The recently launched project **I-DONT-FALL** seeks to increase the still low take up of innovative ICT solutions for fall prevention. The project will deploy, pilot and evaluate a range of innovative ICT solutions for fall detection and prevention management. The effectiveness of the solutions will be tested over three years by over 500 elderly users/ patients across different countries, cultures, age groups and fall risk factors.

I-DONT-FALL

The I-DONT-FALL platform offers integrated fall management solutions that allow tailoring to the specific needs, root causes, risk factors and cultural factors associated with fall incidents.

http://www.idontfall.eu

Funded by: ICT Policy Support Programme (ICT PSP) - Competitiveness & Innovation Programme (CIP)
Duration: 2012- 2015

Going beyond the pilot schemes, a group of 30 consortia, members of the European Innovation Partnership on Active and Healthy Ageing, has now defined the implementation details of an action plan on **fall prevention**. The consortia are composed of over 150 partners from almost all EU Member States, representing public regional authorities, sub-national administrations, delivery organisations, health/ care provider organisations, academic institutions, industry and other organisations. The objective is to deliver by 2015 across the EU evidence based validated and operational programmes for prevention, early identification and minimisation of risk, and management of falls.

Making technologies accessible to the ageing population

The solutions mentioned above show how ICTs can offer better chances for people with disabilities. Yet, technologies, in their pervasiveness, can also represent a barrier.

The **GUIDE** ("Gentle user interfaces for elderly people") project is creating a software framework and design tools which allow developers to efficiently integrate accessibility and personalisation features into their applications. GUIDE-enabled applications and services can automatically adapt their user interface to the specific impairments and preferences of elderly users. The project is now (Autumn 2012) entering its validation phase and the software framework is being showcased at events around Europe such as IFA 2012, a leading trade show for Consumer Electronics and Home Appliances.

GUIDE

The system provides automatic integration and adaptation of various consolidated and next-generation user interface technologies, such as gesture interaction, voice control, avatars, second screen multi-touch devices and gyroscopic remote controls.

GUIDE puts a dedicated focus on the emerging Web & TV platforms and services (Connected TVs, Set-Top Boxes, etc.). These platforms have the potential to become the main media terminals in the users' homes, due to their convenience and wide acceptance.

http://www.guide-project.eu/

Funded by the Seventh Framework Programme (FP7)
Duration: 2010-2013

Effective online public services for citizens and businesses

Effective interaction between public administrations, citizens and businesses is essential to build the digital society. Online delivery of basic services to citizens (e.g. personal documents and certificates, income taxes and job search tools) and businesses (e.g. company registration, social contributions, corporate tax, VAT) help public authorities to meet people's needs. In times of crisis, governments need to operate more efficiently and ensure a smooth connection with citizens. Today, 41% of EU citizens and 84% of businesses use online public services and more than 82% of public services are on average fully available online in Europe. While the "passive" use (e.g. reading information) of public authorities' websites has remained pretty stable over the past years, there has been a steady increase in the "interactive" use of these services, such as the downloading of official forms and returning completed forms. However, we need to ensure that administrations and people can fully interact digitally. Also, most public services do not work across borders, and specific needs, such as services for online registration of new companies or getting the unemployment rights, are not yet fully met.

The European Commission is working towards **effective online public services** via the **e-Government Action Plan**. The objective is to empower users to actively contribute to the production of eGovernment services or even policy-making. This will influence public administrations to become more open, transparent and accountable. The Action Plan also proposes measures so that citizens and businesses can benefit from on-line services in other EU Member States as easily as they do at home, and increase the overall usage. Concrete goals include the registration of data with governments only once, the EU-wide use of national electronic identities (eID), the personalisation of services to better respond to users' needs and the promotion of more open, proactive and transparent administrations.

The eGovernment Action Plan is in line with the **Digital Agenda for Europe** (DAE), which addresses these challenges by ensuring that public sector websites are fully accessible by 2015. The Plan is requesting Member States to formally agree on a common list of key cross-border public services and implement seamless cross-border e-Government services in the EU single market. The ultimate goal is to make it easier for companies to set up and run a business, and for citizens to study, work, reside and retire anywhere in the EU. Key to this strategy is the development of **large**

scale pilot projects (LSP). These bring together public authorities, service providers and research centres across the EU in the implementation of common solutions to deliver online public services and make them accessible throughout Europe. So far, five LSP have been selected for funding, four of which are in the area of public Services – STORK, PEPPOL, SPOCS and e-CODEX.

Cross-border public services for an easier life

In many European countries, citizens have identity cards and use them when interacting with public authorities. Electronic identification (eID) schemes can make these interactions much simpler for citizens and more cost-effective for administrations.

However, most online public services do not work across borders, or else involve heavy procedures. A citizen from one EU country cannot easily apply for public services in another, using the national electronic identification. This reduces the mobility of citizens and businesses, and hampers the development of the Digital Single Market

Interoperability refers to the possibility of different systems and organisations to cooperate and exchange information electronically. It is central in the DAE strategy for public services, which highlights the importance of ICT-based solutions to, for example, enrol in higher education, register a car and participate in a public tender throughout Europe.

Building on existing national electronic public services, the **STORK** (2008-2011) and **STORK 2.0** projects aim to have them accessible across borders through users' electronic identities. STORK has developed a European Electronic Identity (eID) Interoperability Platform allowing citizens to use their national electronic identities to access public eGovernment services in other Member States, in full respect of data protection and privacy rules.

STORK

The projects implement:

- Cross-border authentication for online public services via eIDs;
- Cross-border safer Chat application ;
- Student Mobility;
- Cross-border eDelivery;
- Change of Address;
- Citizens identification and authentication to access EC applications via national eIDs.

STORK 2.0

- Cross-border eID services in real life settings (pilots in eLearning and Academic Qualifications, eBanking, Public Services for Businesses and eHealth)

http://www.eid-stork2.eu

Funded by the ICT Policy Support Programme (ICT PSP) – Competitiveness & Innovation Programme (CIP)
Duration: 2012-2015

Member States are working together, along with partners from the private sector, to implement architecture for the connection of different countries' eID systems in an interoperable way. The solution has been tested in these countries on more than 20 applications. The project STORK 2.0 now aims to expand the identification services to legal entities, representatives and mandates, as well as to explore the uptake of STORK solutions in private sector applications. It thus builds a basis for a future widespread use of eID solutions across borders contributing to Europe's leadership in eID market.

eProcurement is one of the high impact services with the potential to represent an important portion of Europe's economy – the overall market for purchases of goods, services and works by the EU public sector is estimated to be almost 20% of EU GDP (2010 figures). An increase in trans-EU eProcurement serves the goal of a digital single market, it can make Europe more competitive especially for SMEs, and it offers substantial efficiency gains.

Companies, especially small firms, often find it difficult to access public procurement. Moreover, while many EU countries are using electronic procurement (eProcurement) to make bidding for public sector contracts, these solutions are often implemented as isolated islands within Member States.

The **PEPPOL** project focused on making cross-border e-procurement easier and more efficient by improving electronic communication between companies and government bodies. PEPPOL is an important step towards fully achieving the Single European Market. It helps connect existing eProcurement communities, which is essential to allow businesses to bid for public sector contracts and handle ordering and invoicing anywhere in Europe. Peppol also supports the 2012 European e-procurement strategy towards a legal framework for compulsory interoperable e-Procurement. For example, the project has developed an interoperability solution to support the exchange of evidence across borders. Also called 'Virtual Company Dossier', this

eAttestation tool developed a standardised structure to submit evidences both in the tendering process and under existing contracts. The project officially ended in August 2012 but the project partners regarded the results to be so valuable that they decided to transfer them into the OpenPEPPOL Association. It gathers public and private members of the PEPPOL community, taking over responsibilities for PEPPOL specifications, building blocks and services and promoting implementation across Europe.

PEPPOL and OpenPEPPOL

The PEPPOL project allows any company in the EU to communicate electronically with any EU governmental institution to fulfil procurement procedures. This can result in significant benefits for SMEs, as well as EU governments at every level which will enjoy reduced costs through automated and simplified processes and more competition in bids. Electronic processes also ensure transparency and better control of funding, as well as the possibility of facilitating sustainable procurement.

http://www.peppol.eu/about_peppol/openpeppol

Funded by the ICT Policy Support Programme (ICT PSP) – Competitiveness & Innovation Programme (CIP)
Duration: 2008-2012

The *European services sector* accounts for 75% of the EU's GDP and employment, and the 4.4 million firms in this sector generate 95% of all new jobs. Benefiting from the results of PEPPOL and the STORK Large Scale Pilot, **SPOCS** seeks to build the next generation of Points of Single Contact (PSCs) – intermediaries between services providers and national public administrations as foreseen in the Internal Market Services Directive. The Points of Single Contact are "one-stop shops" that fulfil two main functions: information dissemination and online completion of administrative procedures. However, there is still a limited availability of online procedures and the interoperability between national eGovernment services is poor. In this context, SPOCS has been aiming to take down barriers to cross-border business and to make life easier for entrepreneurs, especially those who want to expand their businesses abroad. It is doing so by providing seamless electronic procedures by enhancing cross-border interoperability. The project is expected to foster competitiveness, increase efficiency and reduce the administrative burden in a more transparent and user-friendly way.

SPOCS

SPOCS addresses:

- User identification and authentication;
- Provision of supporting electronic documents;
- Syndication of data and eDirectories;
- A Secure delivery and data tracking exchanges.

http://www.eu-spocs.eu

Funded by the ICT Policy Support Programme (ICT PSP) – Competitiveness & Innovation Programme (CIP)
Duration: 2009-end 2012

Improving interoperability between legal authorities and thus making justice faster is at the heart of the **e-CODEX** project. It seeks to improve access of citizens and businesses to the judicial system of other countries in Europe, linking the national judicial systems to the European e-Justice portal and building a One-Stop-Shop for e-justice. The project will pilot the technical solutions developed in four application areas: small claims procedures, the European Payment Order procedure, exchange of sensitive documents and the European Arrest Warrant. Claims for lost luggage, speeding fines, filling and submitting forms to courts in different countries: the opportunity to process this online, in their national language, is a concrete example of e-Justice for citizens.

e-CODEX

e-CODEX mainly builds on existing national solutions to develop a pan-European interoperability layer. Connecting existing systems will allow communication and data exchanges based on the development of common technical standards in the field of e-Identity, e-Signatures, e-Payment and e-Filing.

http://www.ecodex.eu/

Funded by the ICT Policy Support Programme (ICT PSP) – Competitiveness & Innovation Programme (CIP)
Duration: end 2010-end 2013

Europe could gain EUR 500 billion by fully developing the Digital Single Market by 2020, increasing its GDP by an extra 4%. To this end, the proposed ***Connecting Europe Facility (CEF)*** sets as one of its main goals the interconnection of national digital services infrastructures to unlock the potential of European public services. The CEF is foreseen to be a new funding instrument that the Commission is proposing to support projects intended to fill the gaps in Europe's energy, transport, telecommunication and ICT networks for the 2014-2020 period. The proposal foresees to support investment in the provision of cross-border digital services in key areas including eProcurement,

eID, eJustice and eHealth. The funding from CEF would link up Member States' infrastructures by ensuring interoperability and meeting the costs of running the infrastructure at European level. The CEF proposal is at the time of writing negotiated between the European Parliament and the Member States, so the final budget and the scope of the CEF will only be known once negotiations conclude[1].

Citizens on the move

More than 12.3 million Europeans have moved to live and work in a different country. Effective transmission of individual data between national authorities must therefore be a priority. The **European Civil Registry Network** project **(ECRN)** allowed EU Member States' local administrations to exchange civil status acts (birth, death, marriage, divorce etc.) in electronic form via internet in a fast, secure and certified way. It was very important to collaborate closely with the STORK project on the recognition of electronic identity for anyone accessing the services network.

ECRN

The project's main objectives were:

- Increasing the efficiency of local administrations by strengthening their ability to use new technologies;
- Shortening time for public bodies to manage procedures and for citizens to reply to certification requests;
- Enabling public authorities to gain immediate knowledge in case of changes in a citizen's civil status.

http://www.ecrn.eu

Funded by the ICT Policy Support Programme (ICT PSP) – Competitiveness & Innovation Programme (CIP)
Duration: 2008-2011

[1] http://ec.europa.eu/budget/reform/documents/com2011_0665_en.pdf

Active participation in political life and decision-making

Is participation in politics and decision making still something which is limited to a few groups? Thanks to ICT - particularly social media - more and more citizens are able to take direct part in political debate. However, the information and resources that governments and public administrations make available to citizens can be difficult to understand. This leads to a sense of detachment and disillusionment towards public bodies and the democratic process itself.

The better we understand our rights as EU citizens, the more informed the decisions we can take and the more we can contribute to the democratic life with our engaged contributions. With this aim in mind, the European Commission decided that 2013 should be the **European Year of Citizens**. Also, the **Europe for Citizens Programme** (2007-2013) promotes initiatives that facilitate the active participation in the civic and democratic life of the EU.

The projects presented here also aim to make the formulation of policies as participatory and inclusive as possible

The **Puzzled by Policy** project provides citizens with a unique online platform to learn about the EU and find out which specific policies are relevant to them at national level. The project addresses the specific topic of immigration, giving users the opportunity to contribute to policy drafting and impact assessment. At the same time, citizens' feedback helps decision makers at national and European level to better understand the impact of their policies by feeding citizen reactions back to them. In order to ensure wide accessibility, the platform widget is made available also on social media channels and mobile devices.

Puzzled by Policy

Users can compare graphically their views on immigration with national and EU immigration policies, as well as with the opinions of relevant stakeholders. The platform is customised for Greece, Hungary, Italy and Spain, where the users can refer to their national language as well as engage in debates in English.

http://www.puzzledbypolicy.eu

Funded by the ICT Policy Support Programme (ICT PSP) - Competitiveness & Innovation Programme (CIP)
Duration: 2010-2013

In a similar vein, the **ImmigrationPolicy 2.0** project uses state-of-the-art ICT technologies (including Web 2.0 and social networking) to pilot a range of citizen-centred services (e.g. searchable inventories on national migration policies and related legislation). The key objective is to facilitate citizens' involvement in immigration policy development, granting access to policy information and enabling them to express their views. At the same time, the project supports the harmonisation of immigration policies and actions across the EU, providing public administrators, politicians and decision makers with input for the preparation of immigration policy texts, the development and testing of policy models and the evaluation of possible scenarios.

ImmigrationPolicy 2.0

The projects proposes a single entry point to a range of services, including:

- Data repositories
- Search Services
- Knowledge Harvesting and Content Extraction Services
- A Governmental Management and Modelling Service (GMMS)
- Migration Policy synchronization and homogenization services
- Open Debate Suport Services (ODSS)

http://www.immigrationpolicy2.eu

Funded by the ICT Policy Support Programme (ICT PSP) – Competitiveness & Innovation Programme (CIP)
Duration: 2010-2013

As a response to very low turnout of young people in elections, including the European elections, **OurSpace** (2010-2013) seeks to promote the active involvement of young people in the process of decision-making through the use of ICT. It provides a Social Networking space " Ourspace" where young Europeans can express their thoughts on politics, society, economy and debate them with politicians and peers across Europe. The results of the trials will be communicated to the relevant public administration bodies, National committees and eventually relevant EU institutions responsible for Youth affairs aiming to influence the decision-making and policy process.

Moving public services to the Cloud

Public administration are often organised in silos: monolithic architecture models make it difficult to re-use services for the development of new applications. What if these services were connected and the access to information opened up? The European Commission is currently testing the potential of a Cloud of public services for the development and the delivery of more flexible public services by combining building blocks and allowing service sharing between public and private providers. Ultimately the citizens should benefit from more personalized public services, provided also by third-party actors using public information. In turn, public administrations experience savings and increased flexibility in services design and provision.

Four projects were launched early 2012.

The **InGeoCLOUDS** project (2012-2014) focuses on providing seamless access to geospatial information, integrating and connecting existing datasets and moving them to the Cloud. In addition, the project plans to demonstrate the ability to build more intelligent services by using and combining data integrated seamlessly through the Cloud.

The **Open-DAI** project (2012-2014) will test the efficiency and added value of Service Oriented Architecture (SOA) and Cloud-based architecture on several public administrations. It will assess the business benefits for both public and private organizations of developing new collaborative services in areas such as transport and mobility, localization and geographic information, and environment and pollution.
http://www.open-dai.eu/

Similarly, the **eEnviPer** project (2012-2014) will integrate relevant processes and data collected by public authorities and agencies. It will allow them to model and deploy services, as part of a Cloud of e-Government services that supports the granting of environmental licensing procedures to citizens and businesses. At the same time it supports public participation, consultation and transparency in policy making.
http://www.eenviper.eu/

In many regions of Europe, citizens and businesses are faced with the difficulty or impossibility of finding information and services provided by local public authorities on the internet. Information currently available is often segmented and isolated in a non-user friendly manner. The **OASIS project** (2012-2015) will facilitate this search by grouping online services in a unified portal, using cloud architecture and following a user-centric approach. It will also help public administrations to make better use of customer and businesses information and better adapt public e-services to the needs of people and businesses. The project is thus seeking to make services more accessible, user-friendly, efficient and less expensive for the taxpayer.

Living in a secure and trustworthy society

The concern for security is as old as humankind. What is "new" is its extension to our digital environment. Indeed, our economy and society are now highly dependent on Information and Communication Technology (ICT). We have grown accustomed to the benefits brought by the Internet, smartphones, and the visible and invisible computing power around us. ICT services and devices have become an integral part of our way of life, and even of our culture.

The **Digital Agenda for Europe** (DAE) recognises that the Internet has proved to be remarkably secure, resilient and stable. However, the extensive usage of ICT brings not only benefits but also carries risks. Only 12% of European web users feel completely safe making online transactions. 38% of users had concerns with the safety of online payments and have changed their behaviour because of concerns with security issues: 18% are less likely to buy goods online and 15% are less likely to use online banking. IT networks and end users' terminals still remain vulnerable to a wide range of evolving threats (lack of privacy, loss of data, malfunctioning of the network due to a cyber-attack). Therefore, the DAE has defined a number of objectives in the field of trust and security:

- ***security of networks*** – the internet has become a critical information infrastructure, encompassing IT systems and networks across the globe. It must be resilient and secure against all sorts of threats. Strong cooperation between EU governments, public bodies and private companies is necessary to improve information exchange and to ensure that security problems are addressed quickly and effectively. The European Network Information and Security Agency (ENISA) serves as a focal point for this exchange and cooperation. To react to threats in real-time conditions, the European Commission will establish a network of Computer Emergency Response Teams (CERTs), also for European institutions.

- ***fight against cybercrime and cyber-attacks*** – attacks against information systems are a growing threat, and there is an increasing concern about the potential for terrorist or politically motivated attacks against information systems which form part of the critical infrastructures of Member States and the Union. The forthcoming European Strategy on Cyber-Security will

set out ways to strengthen network and information security across the EU. It will protect the public and private sectors from intrusion and fraud, by strengthening cross-border cooperation and information exchange.

- ***trust in technology*** – 74% of EU Internet users in 2012 think that the risk of becoming a victim of cybercrime has increased in the past year. Building citizens' confidence in the digital world needs an EU-wide solution – also because cyber attackers do not respect national borders.
- ***safety of children online*** – whereas the Digital Agenda for Europe aims to have every European digital, children, who start using Internet from the age of 7, need quality content online to stimulate their imagination and help them learn. But they also need the skills and tools for using the Internet safely and responsibly. A combination of policies is required to deliver a **Better Internet for Children**. The "**Strategy for a Better Internet for Children**" proposes a series of actions to be undertaken by the Commission, Member States and the whole industry value chain.

To meet those objectives and to keep our society secure and provide citizens with the trust in ICT services and devices, a twofold approach is needed:

1. The definition of *legal frameworks* to protect us from any disruption of, or attack on, our services and devices. To meet this requirement, the European Commission will propose the **EU's Strategy for Cyber Security**. It has also created a **Task Force Legislation Team (eIDAS)** to deliver a predictable regulatory environment for electronic identification and trust services for electronic transaction in the internal market to boost the user convenience, trust and confidence in the digital world.

2. **The investment in research and development** of *secure, trustworthy and privacy- protecting ICT*.

Defending ICT infrastructures

The Internet has evolved significantly over time, and people have come to depend on it for a number of activities such as voice and video communications, social networking, online banking, e-government and shopping. Trust is the core of social and economic activity in the Internet, and is the basis of economic transactions, social connections, and communication between people and organisations. As we increasingly rely on broadband networks, it is extremely important to make them more secure and trustworthy and protect them against any kind of accidental or deliberate failure.

Over the past decade we have witnessed an ever-increasing amount of *cyber attacks* on the Internet. Ranging in style from large-scale worms to phishing attempts, cyber attacks have evolved to unprecedented levels of sophistication. To counter these phenomena, defenders are (mostly) developing safeguards after the attacks are made. In the meantime, while defenders are busy with mending the fences, attackers have already developed and planned their next strike. We are facing an asymmetrical threat; unless addressed, this asymmetrical threat will have the defenders locked into a vicious cycle: chasing after attackers without ever being able to catch up.

The Project **SysSec**'s objective is to be proactive instead of being reactive to cyber attacks. Instead of cleaning up after existing (or past) attacks, they will work on predicting threats and vulnerabilities, and build the defence before threats materialise. SysSec will create a Network of Excellence in the field of Systems Security for Europe to play a leading role in changing the rules of the game.

SYSSEC

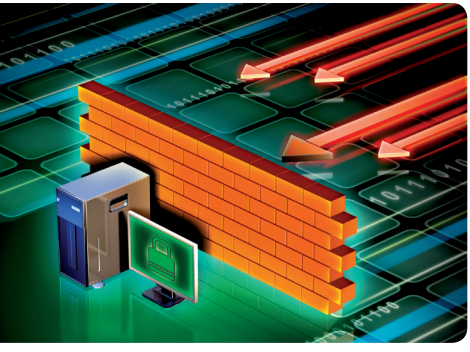
The project's aims are to:

- create a virtual centre of excellence consolidating the Systems Security research community in Europe;
- promote cyber security education and to engage a think-tank in discovering the threats and vulnerabilities of the Current and Future Internet;
- create an active research roadmap in the area, and
- develop a joint working plan to conduct State-of-the-Art collaborative research.

http://www.syssec-project.eu/

Funded by the Seventh Framework Programme (FP7)
Duration: 2010-2014

Current trends in Internet applications such as Web 2.0, cloud computing, and the *Internet of Things* are bound to bring more pervasive data collection, longer persistence of collected data, higher and more heterogeneous traffic volume. All these factors make *network management* an evolving environment that becomes more challenging every day.



The **DEMONS** project seeks to build a novel cooperative network monitoring and mitigation system based on a completely decentralised, application-aware, privacy-preserving, multi-jurisdictional monitoring infrastructure. Such an infrastructure will provide the detection, reporting and mitigation mechanisms needed to combat

not only today's threats, but also those of tomorrow. DEMONS's objective is to realise this infrastructure by applying novel distributed systems technologies and leveraging their native scalability and fault tolerance characteristics. In doing this, the project will put special emphasis on privacy, trust, and legal issues arising from collecting and exporting data across operator domains and multiple jurisdictions. These issues have previously prevented other security solutions from being widely deployed and have therefore rendered them ineffective.

DEMONS

(DEcentralized, cooperative, and privacy-preserving MONitoring for trustworthiness)

The project will demonstrate the results in a production-like environment through inter and intra-domain trials. Moreover, there are plans to exploit DEMONS technologies after the conclusion of the project in actual operational networks.

http://fp7-demons.eu/

Funded by the Seventh Framework Programme (FP7)
Duration: 2010-2013

Trust, privacy and identity in the digital economy

The information society has deeply and irreversibly transformed our society. In digital interactions such as social networks and forums, individuals are leaving a life-long trail of *personal* data.

The number of transactions performed electronically is rising fast. Every day people use the Internet for purposes ranging from accessing information to electronic commerce and e-banking, to interactions with government bodies. As securing these transactions requires strong authentication, electronic authentication tokens and mechanisms have become common.

The key challenge is to protect *privacy* in emerging applications, like collaborative processes, participation in virtual communities or the use of personalised services, maintaining life-long privacy control.

To date, credentials such as digitally signed pieces of personal information or other information used to authenticate or identify a user have not been designed to respect the users' privacy. They reveal the identity of the holder even though the application at hand often needs much less information, for instance only confirmation that the holder is a teenager or is eligible for social benefits. Thanks to **Attribute-based Credentials (ABC)** a holder reveals just the minimal information required

by the application, without giving away full identity information. These credentials thus facilitate the implementation of a trustworthy and, at the same time, privacy-protecting digital society.

The aim of the **ABC4TRUST** project is to deepen the understanding of ABC technologies and enable their efficient and effective deployment in practice. These results will allow stakeholders to better understand privacy-preserving ABC technologies, and compare the relative merits of different technologies in different scenarios.

ABC4TRUST

(Attribute-based Credentials for Trust)

ABC4Trust s objective is to:

- define a common, unified architecture for ABC systems to allow comparing their respective features and combining them on common platforms, and
- deliver open reference implementations of selected ABC systems and deploy them in actual production pilots. This will enable provably accredited members of restricted communities to provide anonymous feedback on their community or its members.

https://abc4trust.eu/

Funded by the Seventh Framework Programme (FP7)
Duration: 2010-2014

The **TABULA RASA** project will address some of the issues of direct attacks to trusted *biometric systems*. This is a problem that needs to be tackled urgently, because conventional biometric techniques, such as fingerprints and facial recognition, are rather vulnerable to direct attacks.

Attacks are performed by falsifying the biometric trait and then presenting this fake information to the biometric system. One such example is to fool a fingerprint system by copying the fingerprint of another person and creating an artificial or gummy finger which can then be presented to the biometric system to gain access. This issue affects not only companies in the high security field but also emerging small and medium sized enterprises (SMEs) that wish to sell biometric technologies.

Tabula Rasa

(Trusted Biometrics under Spoofing Attacks)

The project will:

- address the need for a draft set of standards to examine the problem of spoofing attacks;
- propose countermeasures such as combining biometric information from multiple sources;
- examine novel biometrics that may be inherently robust to direct attacks.

http://www.tabularasa-euproject.org/

Funded by the Seventh Framework Programme (FP7)
Duration: 2010-2014

Secure and trustworthy service infrastructures

Today, tens of millions of users rely on the internet to do business and access a wide variety of applications and services. Examples include *banking transactions*, *voice over IP*, *e-government services*, *e-commerce* and *business-to-business interactions*. Trustworthy applications and services, and their underlying software-based service platforms, are a prerequisite for the use and uptake of innovative business models and services that benefit the further development and growth of the European economy.

The Future Internet will provide an environment in which a diverse range of services are offered by a diverse range of suppliers. Users are likely to unknowingly invoke underlying services in a dynamic and *ad hoc* manner. Moving from today's static services, we will see service consumers that mix and match service components depending on attributes such as availability, quality, price and security.

Thus, the applications that end users see may be composed of multiple services from many different providers. The consequence is that the end user may have little guarantee that a particular service or service supplier will actually offer the security claimed.

The **ANIKETOS** project will help to establish and maintain trustworthiness and secure behaviour in a constantly changing service environment. The project is aligning existing and developing new technology, methods, tools and security services.

ANIKETOS will provide methods for analysing, solving, and sharing information on mitigation of new threats and vulnerabilities. A platform will be constructed for creating and maintaining secure and trusted composite services.

ANIKETOS

The project is addressed to all service users, developers and suppliers. It will:

- provide solutions for security engineering and trust management on the Future Internet;
- develop an integral framework to support secure interoperation and manage trustworthiness.

http://www.aniketos.eu/

Funded by the Seventh Framework Programme (FP7)
Duration: 2010-2014

Energy saving, greener transport and care for the environment to support future growth

How to foster economic growth while respecting the environment and coping with a growing shortage in resources? Sustainable growth – i.e. a long-term development pattern in line with the planet's ecological capacity - is one of the European Union's top priorities. The EU is committed to building a low carbon society by setting ambitious energy and emissions objectives for 2020: to reduce greenhouse gas emissions by 20%, to increase the share of renewable energy to 20% and to make a 20% improvement in energy efficiency[2]. Great attention is given to the contribution policies, business strategies and individual behaviour can make to achieve a sustainable society. Information and Communication Technologies play an important role in this respect, supporting less resource-intensive production and allowing energy savings in, for example, buildings, transport and electricity networks. Furthermore, ICT can provide useful information about environmental parameters and personal behaviour, which in return will raise awareness and trigger a more responsible attitude about energy use.

In order for ICT to play the aforementioned role, the **Digital Agenda for Europe** (DAE) emphasises the importance of quantifying the ICT industry's own energy performance and carbon footprint as well as its potential to render sectors such as buildings, transport and energy generation and distribution more energy efficient. This is why the DAE highlights the importance of cross-sectoral industrial cooperation to accelerate the development and deployment of ICT-based solutions for smart

[2] http://ec.europa.eu/clima/policies/package/index_en.htm

grids (i.e. electricity networks smartened up with digital technology) and meters (i.e. electrical counters that record consumption, generate data, give advice and work bi-directionally), near-zero energy buildings and more energy-efficient transport systems. In these regards, the DAE has set specific targets and tasks:

- the establishment of a commonly agreed methodology to quantify the energy and carbon footprint of ICT goods, services and companies;
- the support of partnerships between the ICT sector and major emitting sectors (e.g. buildings and construction, transport and logistics, energy distribution) to improve energy efficiency and substantially reduce greenhouse gas emissions. Smart Cities will be the framework within which the European Commission will support partnerships between the ICT, buildings, energy and transport sectors;
- the assessment of the potential contribution of smart grids to the decarbonisation of the economy and promoting their interoperability;
- an agreement between Member States on common functionalities for smart meters.

One of the greatest challenges facing the EU is how best to design and adapt cities into smart intelligent and sustainable environments. Almost three quarters of Europeans live in cities, consuming 70% of the EU's energy. Congestion costs Europe about 1% of its GDP every year; most of it is located in urban areas. Smart urban technologies can make a major contribution to tackling many urban challenges. This is why in July 2012, a new **European Innovation Partnership on Smart Cities and Communities (SCC)** was launched to achieve a meaningful large-scale deployment of smart city solutions in Europe, focusing on the intersections of ICT, energy and transport. The partnership proposes to pool resources to support the demonstration of these solutions in urban areas. This will enable innovative, integrated and efficient technologies to roll out and enter the market more easily, while placing cities at the centre of innovation.

Besides these actions, the European Commission is also funding a whole series of research and innovation projects to improve the energy efficiency of data centres and investigate how ICT could reduce energy and water consumption in sectors other than buildings and grids.

Another set of funding instruments aims to identify and promote the potential benefits that ICT and ITS (intelligent transport systems) applications and services can bring to safer, cleaner and more energy-efficient mobility of people and goods. Green ITS can have a significant positive impact on road transport, energy efficiency and emissions of CO_2.

Changing behaviour at home as well as at work

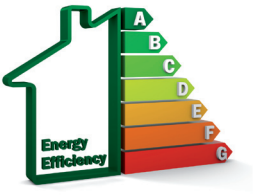
Everyone can contribute to lowering our energy consumption. Awareness is the first step towards the improvement of energy use. This is the base-line of the **BeAware** project, which has developed new information tools and services to help turn citizens into active energy-saving players. The project has developed Energy Life, a web-based solution for mobile phones which makes users become aware of the power consumption of their home appliances in real time, with the overall target of reducing power consumption in households by 15%.

BeAware

Energy Life is equipped with ambient interfaces allowing measurement of energy consumption of home appliances, helping users to monitor their consumption via mobile phones and adopt energy-saving behaviours. The solution uses gaming and learning tools, and provides real-time feedback and advice for energy savings.

http://www.energyawareness.eu/beaware

Funded by the Seventh Framework Programme (FP7)
Duration: 2008 - 2011



The **SAVE ENERGY** project uses a serious game (virtual computer game used for professional training purposes) with an engaging virtual environment for users to gain awareness, understanding and experience associated with energy saving attitudes. The main objective of SAVE ENERGY is to make use of ICT to transform the behaviour of users.

SAVE ENERGY

The project is being developed and tested in five pilot buildings in five European cities. The buildings are equipped with sensors, meters and control devices to monitor overall energy use. The real time data gathered is then centralised and used to generate an action plan for reducing energy use via the 'serious game' interface and real time information.

http://www.ict4saveenergy.eu

Funded by the ICT Policy Support Programme (ICT PSP) - Competitiveness & Innovation Programme (CIP)
Duration: 2009 - 2011

Saving energy in public buildings and spaces

Until recently, the focus of energy reduction in public buildings/spaces has been primarily in schools and offices. Hospitals, however, also use a large amount of energy. The **HosPilot** project provides an ICT-based service to drastically reduce the energy consumption of newly built hospitals and of existing ones needing renovation, while increasing well-being and comfort of end-users, i.e. patients, medical staff and visitors. HosPilot works in two main areas: lighting and HVAC (Heating, Ventilation and Air Conditioning), which account for nearly 80% of all energy use in hospitals.

HoSPILOT

The HosPilot system aims at:

- Assessing the hospital's energy-saving potential;
- Providing hospitals with an ICT-based scheme to reduce energy consumption;
- Implementing the scheme;
- Fine-tuning the scheme for maximum energy saving through regular monitoring.

http://www.hospilot.eu/

Funded by the ICT Policy Support Programme (ICT PSP) – Competitiveness & Innovation Programme (CIP)
Duration: 2009 - 2012

Energy saving is also very important in social housing. Project eSESH for instance addresses both tenants and social housing providers, regional and national governments. By providing usable ICT solutions to tenants, project eSESH enables them to compare their energy consumption with other consumers, to review their own consumption history allowing them to take appropriate action to reduce it. eSESH will also provide social housing providers, regional and national governments with the data they need to optimise their energy-related policy and investment decisions at national, regional and organisational level.

eSESH

The project aims to design, develop and pilot new solutions to enable sustained reductions in energy consumption across European social housing. ESESH is providing ICT-based services directly to tenants, allowing them to quickly and easily obtain information on their energy consumption through a web-based platform.

http://esesh.eu/project/

Funded by the ICT Policy Support Programme (ICT PSP) – Competitiveness & Innovation Programme (CIP)
Duration: 2010 - 2013

Connecting smart buildings to smart grids

Connecting ICT devices to smart grids is another source of energy savings which is considered as one of the sustainable solutions to invest in now and for the future.

The **SmartHouse/SmartGrid** project tests in particular how ICT-enabled groups of smart houses – i.e. houses with advanced automatic systems for lighting, heating and other functions - can achieve higher levels of energy efficiency by connecting them into a network. The project builds on existing industry standards from the ICT and the energy sectors and communication and computing capabilities which are widespread in normal houses and working environments.

SmartHouse/SmartGrid

The technology is being field-tested in three countries, each focusing on a specific aspect:

- The Netherlands: how to handle large scale communication, negotiation and information exchange between thousands of smart energy devices simultaneously;
- Germany: how to interact intelligently with customers and deliver optimal home energy management;
- Greece: how to control smart energy devices in a fully decentralized and bottom-up way to achieve optimal energy efficiency and higher supply security for end-users.

http://www.smarthouse-smartgrid.eu

Funded by the Seventh Framework Programme (FP7)
Duration: 2008 - 2011

It has a three-fold goal: improving energy efficiency, increasing the penetration of renewable energies, and diversifying and decentralizing Europe's energy mix.

Reducing the energy consumption of Data Centres

In the era of information and data deluge, data centres play an increasingly critical role in every aspect of our socio-economic activity. While there is an insatiable need for more computation and storage power, the energy consumption in data centres poses an "energy wall" that must be addressed to be able to advance to more powerful data centres. Moreover experience has shown that up to now only a holistic approach leads to the most efficient and sustainable solutions. This starts from the decision on the data centres location all the way up to the technologies used in the various systems, and the reuse of the heat that is produced by them.

The **Games** and **FIT4GREEN** projects are two ongoing initiatives on energy efficiency for data centres exploring two different approaches.

GAMES aims at developing innovative methodologies for individual Green, Real-Time and Energy-aware IT Service Centres. A Green IT Service Centre is an infrastructure for executing business services and a repository for the storage, management, and dissemination of data in which the mechanical, lighting, electrical and computer systems are designed for maximum energy efficiency and minimum environmental impact. Thanks to its holistic approach, GAMES is expected to increase energy efficiency in data centres by up to 25%.

GAMES

The project will adopt an innovative approach, taking into account the interrelations between different layers (business/applications, infrastructure, facility) and their effect on energy consumption.

It will deliver a methodology and toolset for the holistic design and operations monitoring of green IT service centres, trading-off Quality of Service, performance, virtual and physical resource allocation and overall energy efficiency.

http://www.green-datacenters.eu/

Funded by the Seventh Framework Programme (FP7)
Duration: 2010 - 2012

The **FIT4GREEN** project applies power optimization by spreading load across multiple data centres. It enhances existing deployment strategies by moving computation and services around a federation of data centres sites. The project expects to provide at least 20% saving in the energy consumption of servers and network devices in comparison with a traditionally managed data centre and an additional 30% saving due to reduced cooling needs.

FIT4GREEN

The project aims to save energy in data centres, and works with existing logistics. It has been designed to work for any data centre, Computing style, Monitoring and Automation frameworks, and also federated data centres.

The project dynamically tunes the amount of computing resources to the workload, unused servers are turned off and automatically restarted when load increases.

http://www.fit4green.eu

Funded by the Seventh Framework Programme (FP7)
Duration: 2010 - 2012

Smart mobility solutions

Human error is involved in 95% of all traffic accidents on Europe's roads, in which more than 30 000 people are killed and 1.5 million injured every year. Road transport also burns one quarter of the European Union's overall energy consumption, with one fifth of the EU's CO_2 emissions caused by road vehicles. eSafety "smart" technologies, based on the powers of computers and telecoms, can make a major difference to these figures.

For example, the European Commission's eCall system saves lives by having the car automatically dial 112 – Europe's single emergency number – in case of a serious accident, thus dramatically accelerating the arrival of emergency rescue teams. The call informs the emergency call centre about the crash, even if all occupants are unconscious and transmits a set of data, including the exact location of the crash site. eCall is to be introduced in all new models of passenger cars and light-duty vehicles, and will be supported across the EU as well as Iceland, Norway and Switzerland by 2015.

Thanks to stand-alone and cooperative systems, living in a city with improved traffic safety for all road users, reduced congestion and shorter and more predictable journey times, is possible. These are systems by which vehicles sense their environment and assist the driver or wirelessly "talk" to each other or the road infrastructure. Stand-alone and cooperative systems can help improve road safety, traffic efficiency, traffic management and public transport. Covering stand-alone and cooperative systems, euroFOT and DRIVE C2X are complementary projects.

euroFOT's ambition was to test eight close-to-the-market stand-alone driver assistance systems. Thanks to the project, anybody involved in decisions on motorised road transport, including the car buyer, can now make better informed decisions on driver assistance systems. In contrast to euroFOT, **DRIVE C2X** is working on cooperative systems. The project is preparing comprehensive test programmes

euroFOT

euroFOT coordinated the testing under real traffic conditions of eight mature systems assisting the driver in his/her driving task. euroFOT tested systems embedded in the vehicle, such as Forward Collision Warning or Adaptive Cruise Control, are stand-alone systems which need not communicate with e.g. other cars. The project aimed to measure the impact of these systems on road safety, mobility, driver behaviour and the environment. The impact was assessed through a comprehensive technical and socio-economic evaluation programme that involved both passenger cars and trucks.

http://www.eurofot-ip.eu

Funded by the Seventh Framework Programme (FP7)
Duration: 2008 - 2012

for such systems in that it develops a common reference scheme for all such tests. This will ensure comparable test results and thus enable better informed decisions, as well.

DRIVE C2X

DRIVE C2X develops a reference framework for the testing of cooperative systems. The term 'cooperative' refers to systems by which cars 'talk' to each other or to road-side installations such as traffic lights. DRIVE C2X' framework ensures that the results of tests carried out in different places and at different times will be comparable. In the end, DRIVE C2X will thus contribute to the safety, efficiency and environmental acceptability of road traffic.

http://www.drive-c2x.eu

Funded by the Seventh Framework Programme (FP7)
Duration: 2011 - 2013

Moreover, the European Commission cooperates with the USA and Japan in the field of Intelligent Transport Systems (ITS). A particular focus is put on cooperative systems. The aim is to develop global standards to harmonise the way cars communicate with each other and the infrastructure.

Greener transport

Cooperative systems can also help transport to have less impact on the environment. Project **eCoMove** is based on the idea that, for a given trip by a particular driver in a particular vehicle, there is a minimum energy consumption that could be achieved by the perfect eco-driver using a perfectly eco-managed road network. eCoMove will come up with an integrated solution for road transport's energy efficiency. It develops systems and tools that help drivers sustainably eliminate unnecessary fuel consumption (and thus CO_2 emissions), and road operators to manage traffic in the most efficient way.

eCoMOVE

(Cooperative mobility systems and services for energy efficiency)

The project will tackle three main causes of avoidable energy use by road vehicles:

- Inefficient road planning and route choice
- Inefficient driving performance
- Inefficient traffic management and control

eCoMove intends to achieve this reduction through exchange of information between vehicles and between vehicles and the traffic infrastructure.

http://www.ecomove-project.eu

Funded by the Seventh Framework Programme (FP7)
Duration: 2010 - 2013

Taking into account that to date 73% of all petrol consumed in Europe is burnt by transport, the introduction of electric vehicles is of high urgency. However, in order to buy and use electric cars, customers need to be free from "range anxiety", i.e. the fear to get stranded because the car runs out of battery power. The rationale of the **ELVIRE** project is therefore to contribute significantly to neutralizing drivers' range anxiety and encourage customers to take up electric road vehicles.

ELVIRE

ELVIRE will address a system that will anticipate and be aware of both users' charging needs and the state of the grid. Thus, it would be a smart system providing new functionalities and new business opportunities at the interface between the car and the energy supplier.

http://www.elvire.eu

Funded by the Seventh Framework Programme (FP7)

Links to useful sources

Digital Agenda for Europe
http://ec.europa.eu/digital-agenda
https://www.facebook.com/?ref=tn_tnmn#!/DigitalAgenda
@DigitalAgendaEU
@NeelieKroesEU

Europe 2020: A strategy for smart, sustainable and inclusive growth
http://ec.europa.eu/europe2020/

Competitiveness and Innovation Programme (CIP)
http://ec.europa.eu/cip/

Seventh Framework Programme for R&D (FP7)
http://cordis.europa.eu/fp7

Sixth Framework Programme for R&D (FP6)
http://ec.europa.eu/research/fp6

European Innovation Partnership on Active and Healthy Ageing
http://ec.europa.eu/active-healthy-ageing
@ActiveHealthyAgeing

Health and Well being
http://ec.europa.eu/information_society/activities/health
http://ec.europa.eu/information_society/tl/qualif/health
https://www.facebook.com/?ref=tn_tnmn#!/ehealthinfso
http://www.ehgi.eu
http://blogs.ec.europa.eu/neelie-kroes/innovating-healthcare/
@EU_eHealth
@EU_eHealthweek

Public Services

https://ec.europa.eu/digital-agenda/en/digital-life/government
https://www.facebook.com/?ref=tn_tnmn#!/pages/EGov-Infso/138369062922852
@EU-eGov

Digital Social Platforms

https://ec.europa.eu/digital-agenda/node/1106
http://www.aal-europe.eu/
@eInclusion_EC

Trust and Security

http://cordis.europa.eu/fp7/ict/security/home_en.html
https://ec.europa.eu/digital-agenda/en/telecoms-internet/cyber-security
http://www.enisa.europa.eu/
@EU_TrustSec

Smart Cities and Sustainability

https://ec.europa.eu/digital-agenda/node/1100

For further information:

connect-h@ec.europa.eu

European Commission

ICT for Societal Challenges

ISBN: 978-92-79-27933-1
doi:10.2759/9441

Luxembourg: Publications Office of the European Union

KK-31-12-380-EN-N

European Commission
Directorate-General Communications Networks, Content & Technology
Directorate H

B-1049 Brussels

ISBN 978-92-79-27933-1

doi:10.2759/9441