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Societal Challenges: compilation of all inputs for ICT

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SOCIETAL CHALLENGE 1 – HEALTH.....	2
SOCIETAL CHALLENGE 2 – FOOD.....	22
SOCIETAL CHALLENGE 3 – ENERGY.....	23
SOCIETAL CHALLENGE 4 – TRANSPORT	29
SOCIETAL CHALLENGE 5 – CLIMATE	42
SOCIETAL CHALLENGE 6 – IIS.....	44
SOCIETAL CHALLENGE 7 – SECURITY	75

Societal Challenge 1 – Health

3. Advancing active and healthy ageing will support activities which extend active and independent living, allow for early detection of risk-factors (for example based on analysis of behavioural data, functional capacity, frailty) and propose new types of interventions.

3a Deployment of ICT solutions for older people with cognitive impairments

Specific challenge:

The rapid ageing of the population increases the prevalence of people suffering from cognitive impairments which has major negative consequences for quality of life of citizens and their carers as well as on the sustainability of care systems. This is evidenced by the work of the European Innovation Partnership on Active and Healthy Ageing (EIP-AHA) which has identified innovation in support of cognitive impairments as a priority area to be addressed.

Research and innovation in ICT solutions for cognitive impairments have demonstrated the potential to help address this challenge, but further efforts are required to help translate these results into scalable practice across Europe.

Scope:

The challenge is to deploy innovative and user led pilot projects deploying ICT based solutions and services for prolonging independent and active living of older people with cognitive impairments and including relevant support to their formal and informal carers. The scale of the pilots in terms of number of users involved should be defined to ensure statistical significance in the impact analysis, but a minimum of 4 pilot sites in 4 countries involving together at least 5000 users are expected to be involved.

The pilots should build on common flexible and open ICT solutions which can be adapted to the specific users' needs. They should also provide credible socio-economic evidence about the return of investment, identify viable business and financing models as well as developing associated best practices based on pilot deployment across Europe. Innovation in organisational models and business models for service delivery will also be supported as well as standardisation and interoperability work on required ICT platforms, services and data sources.

Expected impact:

Based on quantitative and qualitative output indicators and impact data, each pilot is expected to demonstrate relevant contributions to the following expected impacts: Clear evidence on return of investment from ICT based solutions for cognitive impairments of older people, best practices concerning viable business and financing models which are scalable across Europe; Clear evidence of improvements to quality of life and active ageing for involved users and carers; Contribution to the competitiveness of the European ICT industry in the domain, through enhanced interoperability and scalable markets.

Collaborative Project (70%) – Single stage

3b Service and social robotics in support of active and independent living

Specific challenge:

The rapid ageing of the population require new solutions to support people with increasing risk of frailty to stay active, socially included and independent for as long as possible. There is need to provide older citizens and their carers with new solutions which can provide significant support in improving physical and cognitive functioning. This should help to prolong active participation in society, avoid unnecessary hospitalization and delay institutionalization for as long as possible.

Scope:

Develop and demonstrate radically new ICT based solutions and services which can solve important needs of an ageing population for remaining active and independent for longer. The work should build on advances in service robotics and assisted living environments combined with multi-disciplinary research involving behavioural, sociological, health and other relevant disciplines. Focus should be on solutions which are driven by relevant user needs, in particular modular, cost-effective and reliable solutions which can flexibly meet a range of needs, can be deployed in a realistic setting and can achieve adequate safety and end-user acceptance.

Validation should aim for proof-of-concept with involvement of mix of relevant stakeholders required to provide measurable evidence on the benefits and expected impact

Expected impact:

Reduction of admissions and days spent in care institutions and prolongation of time spent living in own home when ageing with emerging functional impairments. Improvement of active ageing and functioning of older persons and quality of life of their carers. Global leadership in advanced solutions supporting active and healthy ageing knowledge

Form of funding:

Collaborative Project (100%) – Single stage

3c Early risk detection and intervention for an ageing population

Specific challenge:

Early detection and intervention on major risk factors related to active and healthy ageing could help to substantially reduce the large negative impact on quality of life and functioning older people and theirs carers as well as improving the future sustainability of health and social care systems. On the other hand the rapidly increasing availability of behavioral data combined with ample processing power for data analysis in the environment of older citizens offer unprecedented and currently unexploited opportunities to help address this challenge

Scope:

ICT based solutions revolutionising early detection and prevention of risk factors related to active and healthy ageing such as (but not limited to) cognitive impairments, frailty, depression, falls. The challenge is to demonstrate that through unobtrusive sensing and large scale collection of data readily available in the daily living environment of older individuals, it will be possible to link consistent changes in behaviour to reliable early detection of important risks and conditions associated with ageing. In addition to design interventions to counter the identified risks and innovate in treatments and therapy based on early detection.

The work should build on multi-disciplinary research involving behavioural, sociological, health and other disciplines, driven by relevant user needs and ensuring their acceptance of proposed solutions.

Validation should aim for proof-of-concept with involvement of mix of relevant stakeholders required to provide measurable evidence on the benefits and expected impact.

Expected impact:

Significant potential demonstrated for radical improvements in reliable early detection of risk factors related to active and healthy ageing. Clear improvements of outcomes from new therapies and interventions based on early risk detection in comparison with current practices. Global leadership in ICT based innovation for active and healthy ageing.

Form of funding:

Collaborative Project (100%) – Single stage

Co-ordination/Support Action

4. Integrated, sustainable, citizen-centred care will support the development of new health system architectures based on integrated care models that are more closely oriented to the needs of patients, specific patient groups (e.g. stratified and co-morbidity) and European citizens:

4d Advanced ICT systems and services for Integrated Care

Specific challenge:

Health and social care systems are under stress because of an ageing population, globalisation as well as the economic and financial crisis. Furthermore, the specificity of chronic conditions and the complexity of co-morbidities require changes in the organisation and management of health and social care. There is a need to adapt and develop new, cost efficient care models and systems that respond to new needs, using innovative approaches and tools. The challenge in this re-design of care systems is to develop integrated care models that are more closely oriented to the needs of the patients and older persons: multidisciplinary, well-coordinated, anchored in community and home care settings, and shifting from a reactive approach to proactive and patient centred care

Scope:

To go clearly beyond the current state of art in telehealth and telecare systems by developing new ICT-based approaches for integrated care. Proposals need to address gaps and hurdles both from technological and organisational points of view:

- Development of robust, accurate and cost-effective systems that facilitate monitoring of patient status, patient activity and compliance to therapy.
- Fusion, analysis and interpretation of data coming from patients and from care providers, to improve decision making among formal and informal care givers and patients.
- Multi-channel and multi-actor interaction and exchange of knowledge in integrated care settings, across digital collaborative platforms.
- Development of patient-oriented services to support patient empowerment, self-care, adherence to care plans and treatment at the point of need.

- Development of new patient pathways, new training programmes for the care workforce and new organisational models to improve the coordination of care services as well as the skills and collaboration of health professionals, social carers and informal care givers.
- Personalisation of care management programmes to specific characteristics of patients' profiles, through analysis of multimodal data, risk stratification algorithms for chronic diseases and multi-morbidity conditions, predictive algorithms of patient's status, and personalisation tools for patients.
- Creation of new knowledge for the management of co-morbidities and for addressing poly-pharmacy.

Validation should aim for proof-of-concept with concrete and measurable evidence

Expected impact:

Each proposal will present quantitative indicators or measures of success to quantify the potential impact along the points listed below.

- Reduced admissions and days spent in care institutions, and actual improvements in the daily activities of older persons through effective use of ICT and better coordination of care processes.
- Strengthened evidence base on health outcomes, quality of life and care efficiency gains from the use of ICT in integrated care.
- Improved cooperation and secure information exchange among the actors involved in health, social and informal care services.
- Improved interaction between patients and their carers, and more active participation of patients and their relatives in care processes.
- Reinforced medical knowledge with respect to management of co-morbidities.
- Strengthened European industrial position in ICT products and services by measurable indicators such as new business areas, start-ups and protected intellectual property

Collaborative Project (100%) – Single stage

4e Deployment of ICT solutions for integrated care

Specific challenge:

There is growing interest for integrated care services that aim to develop a more holistic and personalised approach to the multi-dimensional care needs of patients and older persons. This is evidenced by the work of the European Innovation Partnership on Active and Healthy Ageing (EIP-AHA): integrated care is one of the priority areas in the Partnership, with a large group of stakeholders involved in it.

To deliver integrated care at scale, a major challenge is to take proven research concepts and recognised good practices to successful implementation on the ground. This requires involvement of the necessary value-chain of stakeholders, combination and convergence of technology options towards interoperable ICT tools, implementation of organisational changes, and innovative business models.

This objective will aim at addressing the above hurdles and, in doing so, magnify the efforts towards deployment of operational integrated care services across the EU, to the levels envisaged by the targets of the European Innovation Partnership on Active and Healthy Ageing.

Scope:

Large scale pilot projects will support deployment of ICT-based services for integrated care in EU regions. In this context, integrated care refers to integration of healthcare, social care, long-term and self-care. The actions will target primarily national and/or regional authorities deploying integrated care programmes for the first time.

The pilots will address the challenges of developing consensus approaches in the design of transferable integrated care programmes across regions and countries, producing large-scale evidence and economies of scale in the market. They will validate approaches for process optimisation through care pathway redesign and identification of standardised procedures and activity work-flows, with the aim of speeding up adoption within regions and care delivery organisations. Innovation in organisational models and business models for integrated care will also be supported as well as standardisation and interoperability work on platforms, devices and data sources.

Expected impact:

Each pilot will present quantitative or qualitative indicators to quantify the potential impact along the points listed below.

- Contribution towards first-time introduction of integrated care programmes in Member States or Associated Countries and regions.
- Provision of practical solutions to address organisational and business models for integrated care.
- Contribution to improved cooperation and secure information exchange among the health, social and informal care sectors.
- Improved interaction between patients/older persons and their carers, and more active participation of patients/older persons and their relatives in care processes.
- Enhanced body of evidence on quality of life and health outcome benefits, as well as care effectiveness and efficiency from the use of ICT in integrated care solutions.
- Contribution to the competitiveness of the European ICT industry in the domain, through enhanced capability for ICT products and services and new business models.
- Availability of common ICT-based components/building blocks necessary for the deployment of integrated care services.

Collaborative Project (70%) – Single stage

4f Citizen engagement in health, wellbeing and prevention of diseases**Specific challenge:**

Empowering a healthy individual to maintain and self-manage their health throughout life would improve health outcome and wellbeing and save resources of the healthcare system. This requires research into socio-economic factors and cultural values, behavioural and social models, attitudes

and aspirations in relation to personalised health technologies, mobile and/or portable and other new tools, new diagnostics, sensors and devices (including software) for monitoring and personalised services and interventions which promote a healthy lifestyle, wellbeing, mental health, self-care, as well as support for knowledge infrastructures. Solutions will be developed and tested with the use of open innovation platforms such as large scale demonstrators for health and service innovation.

Scope:

- The projects shall enable individuals to become co-managers of their health and wellbeing (including physical and mental wellbeing) with the help of ICT, tools and personalised services. The focus is on the creation of a supportive environment for healthy behaviour, (including support to behavioural change i.e., mathematical, dynamic modelling of behaviour with quantitative, testable models especially in real world settings and application of the sciences in designing interventions), health promotion, health literacy and disease prevention. Activities will envisage developing a multi-stakeholder ecosystem (of health and care professionals, patients, nutrition - and pharmaceutical industries, public healthcare authorities, health IT, mHealth actors, health insurers and regulators, etc...) to develop a 'co-production of health' business model – an evidence based, general, alternative way of creating and augmenting personalised health, supported by information exchange and utilisation. A migration path towards comprehensive solutions that could be incorporated into health care processes would be an advantage.

Expected impact:

- Strengthened evidence of the impact of healthy behaviors on health and wellbeing.
- Strengthened evidence on the impact of disease prevention on health and expenditure.
- Validated programs for health promotion and disease prevention.
- Ecosystem and new business models for promotion and co-production of health.

Form of funding: Collaborative Project (70%-100%) – Single stage - CSA

4g mHealth for disease management

Specific challenge:

Mobile eHealth (mHealth) could be considered as a subset of eHealth and roughly divided into medical apps for medical service provision and health & well-being apps for consumer or non-medical use. Mobile devices such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices have further potential to deepen the perception of patient empowerment and create new or better medical/health/well-being interventions. The challenge is how the individual/patient could be empowered and how the interventions could be developed to enable the individual to manage his/her health condition in a way that utilises the achievements and current development paths of the IT industry (i.e. mobile devices, middleware and respective infrastructures originally developed for consumer use) while respecting the safety and privacy of the patient/citizen and the needs of the professional.

Scope:

The projects will focus their research on i) knowledge management systems to analyse and compile the data collected by apps on individual's health and activities in order for such information to be utilised by the persons themselves, health professionals and public health monitoring authorities, ii)

chronic disease management supported by mHealth, iii) economic aspects of encouraging (secondary) prevention and addressing avoidable negative health and wellbeing outcomes, iv) public health or health promotion interventions addressed to large sectors of population through mHealth apps.

Expected impact:

- Measurable progress towards improved public health and health promotion outcome
- Improved service offering and respective business concepts and models (beyond the sole app development)
- Improved knowledge about individuals' behaviour related to health and wellbeing facilitating the creation of new personalised behavioural health interventions
- Impact in several of the following facets of mHealth e.g., patient safety, contribution to or revision of (guidelines of) relevant legal frameworks, medical guidelines, harmonisation (across borders), standards, co-ordination of therapies, recognition of mHealth as a reimbursable act, improved accessibility, liability, interoperability, more reliable connectivity, patient empowerment, improved patient-health professional interaction, maturing personalised health systems, sustainability, usability, and user acceptance

Form of funding: Collaborative Project (70%-100%) – Single/double stage - SME Instrument

4h Patient empowerment

Specific challenge:

Empowering chronically ill individuals to improve and self-manage their health throughout life will result in more cost-effective healthcare systems by enabling the management of chronic diseases outside institutions and improve health outcomes. This requires research into socio-economic factors and cultural values, behavioural and social models, attitudes and aspirations in relation to personalised health technologies, mobile and/or portable and other new tools, new diagnostics, sensors and devices (including software) for monitoring and personalised services and interventions which promote a healthy lifestyle, wellbeing, mental health, self-care, improved citizen/healthcare professional interaction, personalised programmes for disease management, as well as support for knowledge infrastructures. Solutions will be developed and tested with the use of open innovation platforms such as large scale demonstrators for health and service innovation.

Scope:

The projects shall lead to empowerment of patients, with already diagnosed illness, to manage their health conditions. Health management will be addressed in a holistic approach, from healthy lifestyle interlinked with disease management, placing the patient in the centre and putting increased emphasis on health education, secondary prevention and self-management of individual conditions, including co-morbidities.

The projects will address i) personalised guidance to patients based on their profiles and the use of wearable/portable devices (mHealth) and improved individual/healthcare-professional interaction, ii) engagement of patients as active members in managing their diseases, in particular addressing chronic diseases, co-morbidities, treatment adherence, rehabilitation, self-diagnostics and self-care. iii) decision support systems interoperable with electronic health records

Expected impact:

- Improved interaction between patients, their relatives and care givers, facilitating more active participation of patients and relatives in care processes.
- Improved cooperation between the providers of health -, social - and informal care.
- Strengthened evidence base on health outcomes, quality of life, care efficiency gains and economic benefits from the use of ICT in new care models.
- Reinforced medical knowledge with respect to efficient management of comorbidities.
- Increased confidence in decision support systems for disease/patient management.
- Involvement of care authorities in development of personalised care solutions, with increased commitment in the deployment of innovative services after the R&D phase.
- Increased level of education and acceptance by patients and care givers of ICT solutions for personalised care.

Form of funding: Collaborative Project (70%-100%) – Single stage PCP

2014

4i Public procurement of innovative eHealth services

Specific challenge:

The sustainability of developed solutions and services in pilots and demonstrations has been broadly perceived as one of the biggest challenges in trying to streamline the healthcare delivery processes and improve the cost efficiency while maintaining or improving patient safety. The pace of development has been slow and penetration of ICT still has high growth potential in healthcare compared to other public or private sectors.

This activity facilitates public purchasing of innovative solutions in healthcare which have not yet been deployed on a large scale.

Scope:

The projects shall improve sustainable deployment of new or improved services by healthcare service procurers in line with the eHealth Action Plan. Examples of target outcomes for healthcare delivery could be addressing early hospital discharge, delivery of healthcare in remote, sparsely populated and difficult to access regions, eHealth services for mobile and agile EU patients, and pre/post operation care outside the hospital environment,

The intended scope of the PPI pilot(s) is to specify, purchase and deploy ICT based solutions which can deliver sustainable, new or improved healthcare services and improve the ecosystem in which procurement approaches for innovative healthcare solutions are successfully applied.

Proposals should be driven by clearly identified procurement needs of healthcare organisations.

- Solutions should be based on a complete set of common specifications for technology and end to end services.
- The implementation phase should have the ambition to reach a large scale across multiple regions of Europe

- Proposals must engage public and/or private procurers from each country participating (at national, regional or local level) that have responsibilities and budget control in the relevant area of care or supply of services.
- Wherever possible the work should build on and contribute to relevant standards to ensure interoperability and take into account best practices and relevant standardisation efforts as well as provide appropriate safeguards against relevant ethical and privacy issues.
- The work will include a non-confidential, comprehensive socio-economic evidence base for ICT investments in the field (including e.g. cost-benefit analysis, assessment of impacts, return of investments, medical evidence, patient safety gain and user satisfaction) to facilitate the development of sustainable business models.
- Good practices will be made available for replication in other regions, for example detailed plans for larger-scale sustainable uptake as well as reference material including guidelines, manuals and educational materials.

Expected impact:

- Contribution to regulatory and legal process development addressing possible barriers to procurement of innovative solutions in healthcare.
- Growing awareness and successful use of public procurement by the procurers to boost broadly the innovation in the application of ICT in the sector concerned.
- Support to interoperability and defragmentation of the market.
- Sustainable implementation of services and creation of economic conditions that support long-term development.
- More forward-looking, concerted, public sector approach to eHealth.
- Reduced fragmentation of public sector demand across a number of EU Member - or Associated States by enabling public purchasers to collectively implement PPI strategies, which due to their nature are better addressed jointly, or which they would not have been able to tackle independently.
- Increased opportunities for wide market uptake and economies of scale for the supply side for ICT based solutions and services by forming critical mass on the public demand side.

Form of funding: PPI

2015

4j: eHealth Sectoral Prize – Development of an interactive health and well-being scoreboard

This prize will reward the development of an interactive health and well-being. The rules of the contest will be established and published¹ by the European Commission, which will launch and manage the contest and award the prizes based on the judgement of independent experts.

eHealth and well-being are areas with high growth potential and possibilities for innovation, notably by unlocking effective health data exchange. However, the challenges of the economic crisis, market fragmentation and other barriers limit the benefits of eHealth for healthcare, the health systems, the economy and the individual citizen.

The objective of this inducement prize is to unlock the eHealth market with apps that would support citizens in being more active in treating their conditions, and physicians in communicating with their patients.

¹ On its 'participant portal' (<http://ec.europa.eu/research/participants/portal/page/home>) but also actively publicised elsewhere to maximise participation.

Launch of competition: 02 June 2014

Deadline for mandatory registration for all participants: 02 June 2015 at 17:00:00 (Brussels local time).

Deadline for submission of proposals: 01 December 2015 at 17:00:00 (Brussels local time).

Eligibility and specific evaluation criteria

Eligibility criteria: Participants in the competition must be legally established in one or several EU Member States.

Award criteria:

The prize for the "Interactive health and well-being scoreboard" will be awarded, after closure of the competition, to the contestant who in the opinion of the jury provides a solution that best addresses the following cumulative criteria².

1. The solution ensures that citizens can securely store and access their health and well-being data. These data can be transmitted seamlessly to healthcare professionals.
2. The application shall provide a health and well-being scoreboard to the user in order to help her improve her health and well-being
3. The solution should be available in at least 3 EU official languages
4. The solution should be able to retrieve information from other existing health and well-being apps.

Note also that applications that concern only one operating system will not be considered. Similarly, the solution should be developed by the contestant.

Funding Scheme: Prizes³

Indicative budget: €1 000 000

The award structure will provide for:

20 Nominees for this eHealth sectoral Prize

10 Winners, with Prizes of 12 500 each (rank from 4th to 13th position).

3rd rank: €125 000

2nd rank: €250 000

1st rank: €500 000

Prize outline:

PRIZE NAME: App for the better health & well-being of the EU citizen	PURSE: €1M
Goals of the prize: <ul style="list-style-type: none">• Engage the European Citizens in their health and well-being• Develop effective approach to continuously collect / monitor health and well-being data• Develop ICT solutions for better interactions between citizens & healthcare professionals	
Guidelines (The winning application will...)	

² Subject to further clarification in the competition rules which will be released at competition launch.

³ Under which regulation, article, WP? to be added

- Propose a user-friendly app storing personal health and well-being information
- Capture relevant health data information (e.g. blood test, vaccination, weight, surgical records, patient history, drugs, accident, health events, sleep, stress, etc...) over X years
- Provide a scoreboard from health and well-being related data for monitoring, self-diagnosis and self-management
- include Artificial Intelligence mechanism to provide feedback to the user on his lifestyle and possible improvement
- Allow seamless transmission of data to health and well-being professionals
- Store health and well-being data in a standardized EHR
- Allow generation of pseudonymised data (statistics) for general public authorities and researchers and knowledge co-creation networks
- Develop user engagement through social networking, crowdsourcing, and gamification

Metrics:

- Number of people who created an account
- Number of visits in a 12 months period (minimum)
- Number of visits per account (average)

Future Headline: Your health scoreboard

5. The data challenge: improving health information, data exploitation and providing an evidence base for health policies and regulation

Many of the activities described above rely on the **development of tools, methods and approaches as well as on the storage and sharing of information sources**, and thus on the integration, standardisation and sustainability of data. The evidence base for public health policies is strengthened by the effective collection, storage and exploitation of data.

5) The data challenge: improving health information, data exploitation and providing an evidence base for health policies and regulation

5a Digital representation of health data to improve diseases' diagnosis and treatment

Specific challenge:

In order that all the health data available for an individual, (that can be sizeable our days and is growing with age, so becoming a challenge), can be globally and coherently used for preventing, diagnosing and treating him in a personalised way, they have to be included into an integrative digital representation (Digital Patient) that allows a global investigation, a meaningful knowledge extraction and a decisional support. There is a need to provide new ways to combine the patient information in a useful highly visual representation and to generate new clinical information needed by the healthcare professional for the patients' management. An important aspect is the integration of multi-scale and multi-level physiological models with patient specific data and population specific data. Digital personalised models, tools and standards are today available with application for some specific clinical targets, but there is a need for a more complex integration, at a higher level, for example for a group of organs, systems and diseases that interact.

Scope:

The clinical situations are often complex and patient specific, so needing an integrated holistic approach to be the closest possible to the clinical reality. The projects should propose new decisional support systems based on a complex integration of data and models and highly visual representation, user-friendly in order to assure usability and acceptability. They will be used by healthcare professionals for personalised prediction and decision in prevention, diagnosis or treatment and should take into account the data protection and the ethical considerations. . The models should be multi-level and multi-scale and integrating, when relevant for the targeted clinical situation, the required molecular and cellular data, including genomics and epigenomics data, or data on exposure to therapeutics and environmental factors or coupling personalised physiology/functional disorders/diseases modelling. Data coming from other technologies and key-enabling technologies are encouraged.

Expected impact:

Better management of complex clinical situation.

Enabling use of the same information by the different medical services.

Better control and inter-service coordination in the management of the patient health.

Providing a consistent view of a patient care needs.

Form of funding: Collaborative Project (100%) – 2 stages

Year 2015**5b - Predictive systems based on computer modelling/other technologies to be used by the patient himself**

Specific Challenge: Several clinical situations would be prevent, or better monitored and managed with the participation of the patient himself. In order to promote the self-management, predictive personalised models can be combined with personal health systems and other sources of data (clinical, biological, therapeutical, behavioural, environmental or occupational exposure, lifestyle and diet etc.) and used by the patient himself, in order to raise the individual awareness and empower the patient to participate in the management of her health, with application in lifestyle and prevention, in monitoring of the disease, wellbeing etc. This will improve the quality of life of patients and the self-management of the disease and lifestyle.

- *Short and concise text, maximum 1500 characters with spaces*

- *See guidance*

Scope: The projects should develop decisional systems based on computer-models that will be used by the individual. The decisional systems should be based on the collection of various data (patient, environmental, social etc.). Connected predictive models will process these data in real-time to predict how the health of the patient will evolve in the near future and the prediction will be used by the patient himself. These decisional systems could help also for improving the interaction citizen/professionals and for co-decision in healthcare and wellbeing. Combination with monitoring

personal health systems and other technologies and sources of data, as for ex. tools for collection of data on external factors potentially linked to the disease are possible.

- *Short and concise text, maximum 1500 characters with spaces*

- *See guidance*

Expected impact:

- Improving the participation of the patient to the care process
- Improving the quality of life of the patient
- Boosting the development of personal devices used for self-management of health
- Improving the management of the disease by reducing the number of severe episodes and complications

- *Could be moved to the end of the call description if it applies to the call overall*

- *See guidance*

Form of funding: Collaborative Project (100%) – 2 stages

Year 2015

5g – Towards the development and adoption of a clinical and reference information model for eHealth

Specific Challenge:

There doesn't seem to be a wide consensus among the stakeholders on a common reference information model which should be used for eHealth services deployments in Europe, among the existing international standards. It is unclear whether the goal to reach wide international consensus on a common (clinical) reference information model is achievable in a reasonable timeframe and budget. The question to be answered is whether we can afford competing or overlapping standard to coexist in a common eHealth European Interoperability Framework or not. This will impact the EU-US collaboration in the framework of the Memorandum of Understanding on eHealth between the European Commission and the US department of Health and Human Services

Scope:

The proposal should at least build on existing CEN, ISO, and HL7 standards. The need for a formal standardization activity in the area should be demonstrated, as well as a realistic roadmap with concrete deliverables. Alternative scenarios should be envisaged. Proposals should build on existing initiatives and EU projects in the area. Large involvement of stakeholders (including at least Member States, Industry and international SDOs), consensus building and endorsement of the work carried on and the submitted deliverables will be considered as a key success factor. Contribution to the EU eHealth Interoperability Framework should be demonstrated. The successful proposal should support large scale deployments of eHealth services (including cross border) in Europe and contribute to the implementation of the EU-US MoU and roadmap.

Expected impact:

Convergence in the use of eHealth Standards in Europe and in the world. Contribution to the eHealth Interoperability Framework and to large scale deployment of eHealth Services (including cross border) in Europe. Contribution to the EU-US roadmap

Form of funding: CSA (100%)

5h Semantic interoperability of electronic prescriptions (eP) in the cross border setting

Specific Challenge:

The Directive on patients' rights in cross-border healthcare (Directive 2011/24/EU) pursues the objective to enhance safety and continuity of cross-border treatment through interoperable access to patients' summary data and interoperable ePrescriptions. The biggest challenge to address in regard to ePrescription, which the epSOS project had to face was to answer the question "How can medicine – in ePrescription – be communicated in the cross border setting?". The solution which has been proposed by the epSOS project works but has a number of drawbacks which were identified in a report of WP3D technical liaison. There doesn't seem to be neither a common data model nor a common vocabulary for medicinal products or pharmaceutical products throughout Europe.

Scope:

There is a need to investigate the possibility to combine existing or develop a new European or international standard which would need to address the following issues:

- unambiguous definition and description of medicinal and pharmaceutical products, including unique identification.
- handling of substitution

A proposal should be submitted by a consortium gathering relevant international standards development organisations, member states' public authorities and fora and consortia which have a demonstrated expertise to perform the work.

The successful proposal should build on existing standard vocabularies, terminologies and ontologies and demonstrate that it will contribute to the adoption of existing or the development of international standards

Expected impact:

The proposal should provide practical solutions to solve the specific challenge and enable large scale deployments of cross border ePrescription services in the EU. It is also expected to contribute to the EU-US roadmap and MoU.

Form of funding: CSA (100%)

5i – Business modelling of eHealth Interoperability

Specific Challenge:

The Connecting Europe Facility will provide the funding and the governance framework to deploy cross border eHealth Services, among other digital services, until 2020. It is the intention to progressively migrate the Connecting Europe facility from a publicly funded initiative to a self-financed operation. There is a need to identify the right business model and plan which would

identify sustainable sources of revenue and all the costs which the operations of such services would generate. Gathering evidence that interoperability contributes to lowering the cost of health systems is an important element for decision makers when they have to envisage eHealth investments.

Scope:

The proposal should build on existing work done by projects such as epSOS and SemanticHealthNet which will have developed key building blocks which will help addressing the challenge. Pilot project epSOS has been piloting two basic use cases (ePrescription and Patient Summary) and successful proposals are expected to identify and agree on a roadmap of use cases that should be deployed on large scale in the future after the epSOS use cases. The successful proposal will demonstrate the value proposition of healthcare providers with regard to interoperability and assess sustainable incitement schemes that would encourage healthcare providers to code health data and provide it in an interoperable way and to invest in interoperable eHealth systems.

It should gather a large multidisciplinary group of stakeholders from the Member States, Regions, Standards Development Organisations, sectoral fora and consortia, industry, health insurance companies, key interoperability experts, patients associations, health care providers associations, and any other stakeholders which will be deemed necessary. It should deliver a full business plan going beyond 2020 including all revenue streams and cost items.

Expected impact:

The proposal will contribute to the planning and road-mapping of the CEF for what concerns the deployment of cross border eHealth services. It will also contribute to help the member states and the eHealth Network to prioritise use cases to be deployed at national level and better plan their own national deployments.

Form of funding: CSA (100%)

5j eHealth Sectoral Prize – Development of dematerialised ePrescriptions and Patients summaries for CEF/eHealth deployment

This prize will reward the development of an application which will allow the transmission of patient summaries and ePrescriptions via smartphones. The rules of the contest will be established and published⁴ by the European Commission, which will launch and manage the contest and award the prizes based on the judgement of independent experts.

eHealth and well-being are areas with high growth potential and possibilities for innovation, notably by unlocking effective health data exchange. However, the challenges of the economic crisis, market fragmentation and other barriers limit the benefits of eHealth for healthcare, the health systems, the economy and the individual citizen.

The objective of this inducement prize is to facilitate take up of cross-border eHealth services through patient mediated exchanges of health data, instead of healthcare provider mediated exchange of data, as developed by the EPSOS project.

⁴ On its 'participant portal' (<http://ec.europa.eu/research/participants/portal/page/home>) but also actively publicised elsewhere to maximise participation.

Launch of competition: 02 June 2014

Deadline for mandatory registration for all participants: 02 June 2015 at 17:00:00 (Brussels local time).

Deadline for submission of proposals: 01 December 2015 at 17:00:00 (Brussels local time).

Eligibility and specific evaluation criteria

Eligibility criteria: Participants in the competition must be legally established in an EU Member State or in associated countries (ICPC?).

Award criteria:

The prize for the "dematerialised ePrescriptions and patients Summary for EPSOS" will be awarded, after closure of the competition, to the contestant who in the opinion of the jury provides a solution that best addresses the following cumulative criteria⁵.

1. The solution ensures that citizens can securely access their stored health well-being data, and that the data can be transmitted seamlessly to healthcare professionals.
2. The application must comply with the EPSOS interoperability framework
3. The solution should work in at least 2 European Member States
4. The application must use the EPSOS/CEF terminology service in order to deliver the health data in the local and foreign languages

Note also that applications that concern only one operating system will not be considered. Similarly, the solution should be developed by the contestant.

Funding Scheme: Prizes⁶

Indicative budget: €1 000 000

The award structure provides for:

20 Nominees for this eHealth sectoral Prize

10 Winners, with Prizes of €12 500 each (rank from 4th to 13th position).

3rd rank: €125 000

2nd rank: €250 000

1st rank: €500 000

Prize outline:

PRIZE NAME: App for integration of EPSOS in smartphones	PURSE: €1M
Goals of the prize: <ul style="list-style-type: none">• Leverage exiting Cross-border eHealth digital services to help realising the Digital Single Market.s• Develop effective and innovative approach to transmit ePrescriptions and patient	

⁵ Subject to further clarification in the competition rules which will be released at competition launch.

⁶ Under which regulation, article, WP? to be added

summaries via smartphones

Guidelines (The winning application will...)

- Propose a user-friendly application for retrieving and storing and updating ePrescriptions and patient summaries via smartphones (dematerialisation).
- Comply with the EPSOS terminology and interoperability framework.
- Develop integration towards professionals (pharmacists, hospitals, point of care...) with a seamless transmission of ePrescription data.
- Ensure a secure use of identification, authentication and authorisation mechanisms.
- Ensure citizen data privacy

Metrics:

- Number of transactions in a 12 months period (minimum)
- Number of integrated countries

Future Headline: Smart EPSOS

6. Other activities.

6b Support to the European Innovation Partnership on Active and Healthy Ageing

Specific Challenge:

The Strategic Implementation Plan (SIP) of the European Innovation Partnership on Active and Healthy Ageing (EIP-AHA) has identified a number of Priority Action Areas. In a subset of them, Action Groups of committed stakeholders have already been formed and developed Action Plans for implementing innovative services for the ageing population. Another subset of Priority Action Areas addresses domains whose readiness towards implementation is maturing and may soon give rise to additional Action Plans.

The Strategic Implementation Plan has invited, among others, the European Commission to establish favourable framework conditions to implement the actions outlined in the Plan. The European Commission, in its Communication "Taking forward the Strategic Implementation Plan of the European Innovation Partnership on Active and Healthy Ageing", committed to take account of relevant priorities of the Plan, together with input from other stakeholders, for future research and innovation work programmes and instruments.

Support is therefore required in facilitating: the execution of Action Plans, the establishment of favourable framework conditions for the deployment of the intended innovative services, and the future development of further Action Plans and priority areas.

Scope:

The aim is to provide coordinated support to the activities of the European Innovation Partnership on Active and Healthy Ageing concerning the following aspects:

- Support the existing Action Groups in implementing their Action Plans. The support may relate for example to coordination of Action Group activities, communication among partners and dissemination of results.
- Support the development of new Action Plans coming from more Priority Action Areas identified in the Strategic Implementation Plan of the EIP-AHA, and subsequently, support the newly formed Action Groups in the same way as in the point above.
- In collaboration with relevant stakeholders, identify any new areas that can be regarded as future Priority Action Areas, and develop a roadmap of research priorities, which are needed in the context of the existing and future Priority Action Areas.
- Work together with the European Commission, with relevant legislative and standardisation initiatives and with national, regional and local authorities in developing recommendations for more favourable regulatory and standardisation conditions, innovative procurement and incentive mechanisms.

Expected impact:

Each proposal will present quantitative or qualitative indicators to quantify the potential impact along the points listed below.

- Enhanced communication among EIP-AHA stakeholders, enhanced coordination of activities in the Action Groups of EIP-AHA and enhanced communication of their results.
- Identification of priority areas for research and innovation actions in the domain of Active and Healthy Ageing.
- Accelerated progress in the establishment of favourable framework conditions to implement the actions outlined in the Action Plans of the EIP-AHA.

Form of funding: Coordination and Support Action (100%) – Single stage

Summary: EU support to the Active and Assisted Living (AAL) Programme

What's the issue?

- Europe has a rapidly ageing population which creates particular challenges for families, national health and social care systems and public finances. Digital technologies have a vital role to play in meeting these challenges.
- The current Ambient Assisted Living Joint Programme (AAL JP) involves 19 EU countries, plus Israel, Norway and Switzerland. It aims to support in particular small and medium sized Enterprises (SME) in bringing to the market innovative products and services for ageing well based on digital technologies. The AAL JP is a Member State driven initiative which has been supported by the European Commission with €150 million from the current (7th) research framework programme (FP7).
- So far the AAL JP, which expires in 2013, has been very successful, with over 40% SME participation and a large exploitation potential. That's why the Commission proposes to continue the programme from 2014 till 2020 under the new Horizon 2020 research framework programme.

Who will benefit and how?

- Older adults will have access to more and better products and services for ageing well. These will help them to participate in economy and society, and to live independently in their own homes for more years.
- Industry and especially SMEs will have a larger market, more efficient and better coordinated research efforts and improved EU competitiveness in ICT based products and services for ageing well.
- Researchers will benefit from collaboration with experts in other participating countries at a European scale.
- Governments will gain through cost efficiencies and increased sustainability of health and social care, while tackling the societal challenge of demographic ageing.

Why does action have to be taken by the EU?

- EU action is needed because there is currently a lack of innovative products and services for ageing well to meet the user needs across Europe. This is caused by the fragmentation of the research efforts and the markets for ageing well, plus a lack of a shared European vision on these markets by stakeholders.
- By joining forces between Member States and the EU a critical mass of investment can be mobilised to help translate research investments into growth. The initiative brings users, researchers and industry from different countries together to help them develop products and services which meet genuine needs across Europe and can compete at promising global markets.

What exactly will change?

- Renewing the Active and Assisted Living Programme ensure that for seven more years projects for applied research and innovation of ICT enabled products and services for ageing well can be funded.
- The new AAL Programme will be closer to market and will ensure that the results respond to actual user needs. It will have SME partners and greater user-involvement in each project. The AAL Programme's scope will also better align with the 6 actions of the European Innovation Partnership on Active and Healthy Ageing: medication adherence, fall prevention, frailty and malnutrition, integrated care, independent living and age-friendly environments. .

When is the proposal likely to come into effect?

2014 (till 2020)

Budget Summary Societal Challenge 1

	2014	2015
SC1 – CNECT H2	€M	€M
3.b Service robotics (R&D 100% funding)	25	
3.c Risk detection	0	25
4.d Integrated care (=elements of Active & independent living) (R&D 100% funding)	25	
3.a Pilot - Independent living with cognitive impairments (70% funding, EIP)		12
6.b CSA - Support to EIP	2	
4.e Pilot - integrated care (70% funding, EIP)		11
Active and Assisted Living Joint Programme	25	25
	77	73

	2014	2015
SC1 – CNECT H1		
Standardisation, interoperability		
5g.....reference information model	1	
5h.....semantic operability of eP	1	
5lbusiness modeling	1	
5j.....sectoral prize....	1	
in-silico medicine		
5a.....digital patient		20
5b..... predictive systems		20
Self-management of health		
4f.....citizen engagement	25	20
4g.....mHealth for disease management	25	
4h.....patient empowerment	25	
4i.....public procurement for eHealth		10
4j.....sectoral prize...scoreboard	1	
	80	70

Societal Challenge 2 – Food

Food Chain Data Standardisation

Specific challenge: The EU's General Food Law makes traceability compulsory for food and feed operators and requires businesses to implement traceability systems, which record all movement of product and steps within the whole food chain by means of tracking media. An easy-to-apply and low-cost Europe-wide data system of standard identifiers for individual food items is needed for food recall by producers, food information and feedback by consumers, and other up- or downstream announcements. A standard, reliable and essentially context-free method to recognise identifiers as identifiers for food items is needed, together with standard and reliable methods for allowing food producers to work in complete independence from one another to generate unique logical identifiers. (761 of max. 1500 characters)

Scope:

The goals are to develop (i) standard sets of concepts (ontologies) and (ii) interoperable systems of internet-enabled standard identifiers for individual food items for the recording of information and the transmission and processing of messages at all stages of the food chain, from tagging at the point of production until the point of consumption – all based on already available systems for food identification, description and classification. The system should serve as an enabling platform for new service processes, creating value for all food chain actors. Note that the goal is neither to build a platform where all such data would be hosted – which is for individual industrial actors – nor to physically associate an identifier with a food item. The centre of gravity of the project should be R&D activities, also showing the technical feasibility of the approach in a simulated environment. (902 of max. 1000 characters)

Expected impact:

The food industry and the retail sector become able to issue food product recalls all the way to individual consumers and to allow for consumer feedback to move all the way in the opposite direction down the supply chain. In addition, the standardised data collected at various points along the food chain could be shared or sold so as to enable various forms of value-creating data analytics, such as data sharing in view of industrial reuse or general social value, e.g. customer relationship management. Both points are clear cases of social innovation. In addition, this topic leads to a knowledge-intensive service innovation, which will help increase consumer trust in foods and thereby enhance competitiveness and growth of the European food industry. Standard setting is another important impact of the topic. (817 of max. 1000 characters)

Form of funding: Collaborative project (100%) – Single stage

Proposed year: 2014 or 2015

For Focus Area “Sustainable Food Security”: No

For other focus area: No

For International Cooperation: No

Societal Challenge 3 – Energy

1) Focus area: Energy Efficiency

A – Advancing design and evaluation of energy efficient building via interoperability of ICT tools

Specific Challenge: Building energy performance simulation (BEPS) models, are proven to be very useful to compare buildings design alternatives. Designs are made by architects using CAD systems now enhanced with energy efficiency additional features. Building Energy Management systems (BEMS) are installed in the majority of complex buildings and maintenance is also supported by digital tools. However data doesn't flow seamlessly between these systems. Ideally, Energy Modelling data should be exported to the Building Energy Management Systems that optimize energy consumption at operational stage. In turn these systems need to obtain data from sensor clouds and energy meters, and be able to command intelligent appliances (e.g. white goods, micro and mini energy renewable sources, HVAC systems). To facilitate an incremental investment of consumers in energy management appliances a strong plug and play principle is needed. Finally, prosumers will trade with the Smart Grid their energy consumption in a free market with a language that needs to be independent of the utility.

Scope:

The research focus is on developing methodologies and providing the adequate interphases to link the different ICT tools that intervene in the process of designing and operating energy efficient buildings. There is also a need to help standardising the measurement and characterisation of building energy performance, exploiting the latest advances in predictive analysis and modelling of thermal transfer based on multi-variable techniques and image recognition.

The requirements of interoperability between all these ICT tools are therefore high and standardisation plays an important role. The first step is to agree on the high level data models, where standardization can be easier proposed and achieved. Work has to build on the results of the previous advances on Energy Efficiency Semantics, Vocabularies and Ontologies.

Proposals should cover (i) technical developments mainly interphases between at least 2 types of ICT systems, (ii) a substantial validation phase in real-life environments in at least two different types of buildings (iii) a precise evaluation phase where proposals shall record evidence of energy savings, total cost of operation, scalability of the solutions, user's acceptance, benefits that accrue, and extract lessons for those planning to deploy and finance such systems. Interphases with public administration systems for example for planning permission or energy audits would be an asset.

Proposals should be ready to participate in horizontal activities making progress on a standard methodology for measuring energy efficiency gains, and use these methodologies at the validation stage, so that we obtain comparable results.

Considerable resources are expected to be committed, however consortia must be compact with partners each making substantial contributions.

Expected impact: Reducing the gap between real and predicted energy performance in a building. Significant reduction on time to design and accuracy gains due to avoiding re-taping. A level playing field for new and small companies to enter the market (interoperability today is possible only if all systems are from the same vendor).

Funding scheme: Collaborative Projects and CSA

Funding: 20 M€ for collaborative projects. 1M€ for a CSA on preparing the ground for data-models standardisation. 1M€ for a CSA on preparing the grounds on the measurement and characterisation of building energy performance. TOTAL 22 M€

B- Market up-take of energy-efficiency products and services via ICT

Specific Challenge: Energy efficiency products and services are in many cases developed following the requirements of the industry and then imposed into consumers via regulation. This makes difficult for the consumers to accept these services as they do not see the benefits. ICT allows – mainly via social media and simulation - for the consumers to be involved since the begging into the design and deployment of new products and services for energy efficiency.

Scope: The focus is on the creation of innovation ecosystems that will develop services and applications making use of information generated by energy consumers (e.g. through social networks) or captured from sensors (e.g. smart meters, smart plugs). These applications range from Apps for smart phones and tablets to serious games to stimulate costumers' participation in the energy market.

Pilots should promote integrated approaches for achieving systemic energy efficiencies and emissions reduction (between 15% and 30%). The objective is to ensure that energy savings from ICT enabled new business models are greater than the cost for the provision of those services.

The target group should be publicly owned buildings (including administrative offices, social housing) and buildings in public use or of public interest.

The pilots are to use existing user-friendly ICT (off-the-shelf or mature/tested research results) –the innovation is on the application of these technologies to the energy market.

The consortia must include energy and ICT expertise and users are to be at the core of all work.

Validation must be carried out in real life conditions, for at least 1 year, and result in a consolidated set of best practices, including guidelines, business models, manuals, training material.

Validation should provide socio-economic evidence for ICT investments in the field, including user's acceptance and recovery of investment. Proposals should include detailed plans for sustainability and larger-scale uptake beyond the project's life time.

Information should be shared and synergies should be established with other relevant projects, notably those already funded through the ICT PSP, with a view, in particular, to define and adopt a common methodology for measuring energy gains via ICT.

Proposals should include specific and realistic quantitative indicators to monitor progress at different stages in the project's lifetime.

Expected Impact:

Better user engagement in energy efficiency policies and acceptance of new products and services. Maximising the potential for ICT to contribute to reduced GHG (greenhouse gas) emissions and energy savings, inter alia by engaging in measurement methodologies, and delivering innovative digital solutions to this end. Accelerate market acceptance and wide deployment of innovative ICT solutions creating smart digital products and services for energy efficiency.

Funding scheme: Pilot Projects

Funding: 15 M€

C- Networking public procurers for Green Data Centres

Specific Challenge: Procurement of Green Data Centres technologies involve risk associated to technology and scalability and require tailored (i.e. not off the shelf) solutions by suppliers. PPI (Public Procurement for Innovative solutions) and PCP (Pre-Commercial Procurement) represent a not yet sufficiently exploited opportunity for public administrations to drive innovation in this area.

Scope: harmonizing across different administrative domains and accelerating the adoption of relevant guidance and specifications to procure technologies and systems for higher energy and environmental efficiency of data centres. Special attention should be given to cross-border procurement.

Proposals should demonstrate, as appropriate, sufficient expertise on relevant guidance/standards for the measurement of the energy and environmental footprint of data centres as well as on virtualisation/cloud technology.

Consortia should be compact (no redundant roles for partners from the same country).

Expected Impact:

- Significant improvements in terms of energy consumption and environmental footprint of public data centres when the procurement is implemented; such a development would set new norms and practices on the sustainability performance of data centres in Europe.
- Significant promotion of cloud/virtualisation technology as an energy saving one in data centres in Europe.
- Promotion of standards/metrics in measuring the energy/environmental footprint of the ICT-sector (as data centres form a core part of almost every ICT infrastructure).

Funding scheme: CSA

Funding: 3 M€

II) Focus area: Competitive low-carbon energy

A – Smart Electricity Grids

Specific Challenge: The European Commission has defined Smart Meter functionalities, but these are general guidelines which can be interpreted by specific meter vendor and/or DSO (Distribution Systems Operators). The metrology aspects of the smart meter keeps a de facto bundle between the meter and the new Smart Grid functionalities however issues related to remote access, data security, confidentiality as well as how the "prosumers" are visible in the energy web and by whom have to be addressed in an open and competitive market. Additionally there is high potential on bringing together stakeholders from both the energy and the telecom sectors to develop common approaches for future digital networks and smart energy services infrastructure for energy distribution.

Scope: Activities should focus on either:

- (i) Deploying an open and flexible architecture of the Smart Metering Systems with the following overall main features:
 - Appropriate decoupling of metrology from the end user functionalities;
 - Extreme flexibility to allow for new Smart Grid functionalities to be added later, during system exploitation in a plug and play way.

- connection to local BMS (Building Management System), to local intelligent white appliances (Smart Grid ready appliances), to local generation and storage as well as to other local utilities meters (gas, water, heat) shall also be included in the architecture;

- The solution has to be such that the cost for a prosumer (mono-phased meter + end user functionalities + service provision) will not exceed 100€ for large quantities (such as 100.000 orders).

(ii) Bringing together stakeholders from both the energy and the telecom sectors to share backbone infrastructure and last mile connectivity, considering not only technologies (e.g. LTE, GPRS, PLC, and possibility for spectrum allocation) but also the appropriate business models to deliver significant cost and investment savings. Improving robustness and reliability of the existing telecommunication infrastructure in order to cope with mission critical services that require milliseconds response times. Explore the possibility of deploying dedicated services on shared telecoms infrastructure, rather than entirely new infrastructure.

Expected impact: Reducing the cost of smart metering deployment; accelerating the deployment of smart grids; creating an open market for services deployment.

Instruments: For (i) PCP and Prizes. Through PCP procurers will be given grants for developing the proposed innovative solution. The PCP grant is complemented with a prize which will ensure a kind of competition between the procurers for overcoming the challenges best and fastest. Collaborative Projects for (ii)

Funding: 30M€

III) Focus area: Smart cities and communities

Specific Challenge: To develop and deploy replicable solutions for Smart Cities and Communities at the intersection of energy, transport, and ICT. In addition to the solutions themselves the challenge includes to set up the appropriate external environment for these solutions to be exploited commercially. This includes: optimising policy and regulatory frameworks; open, consistent data and performance measurements; citizens' engagement and empowerment; dissemination and unlocking the market potentials worldwide.

Scope: Activities should focus on either:

(i) Deploying and deploying replicable solutions for Smart Cities and Communities at the intersection of energy, transport, and ICT. Proposals should target primarily the third phase of the innovation process, i.e. large-scale demonstration in city contexts, where existing or very near-to-market technologies will be integrated in innovative ways. Yet the fourth and final phase, i.e. commercial roll-out in city environments, is also within scope inasmuch as the proposals are to prepare the ground for it.

Consortia should include both industry and city/consumer organisations from at least 2 medium/large cities and communities. In addition proposals must include a list of "follower cities", i.e. cities willing to contribute to the process because they commit to replicate the solution at the end of the project.

All involved cities should have an approved smart cities and communities plan beyond the scope of the proposal. Additionally the cities in the consortium have to have secured an overwhelming majority of the required funding from other sources, preferably private ones, but also other EU funding sources (cohesion or regional funds for example), national or regional funding. The proposal budget would thus be limited to a contribution of around 15% of the overall funding needed.

But besides economic sustainability proposals must also commit to scientific and technical requirements in support to replicability. These are:

- Interoperability of solutions, i.e. adaptability of solutions to new user requirements and technological change as well as avoidance of entry barriers or vendor lock-in through promoting common meta-data structures and interoperable (open) interfaces instead of proprietary ones;
- Optimal use of physical infrastructure, i.e. re-using as much as possible existing infrastructure, active and passive, and turning it as much as possible to multiple uses; no new infrastructure unless fit for use by service providers from all the three sectors;
- Open and consistent data, i.e. making relevant data as widely available as possible – including to third parties for the purpose of applications development – whilst using common, transparent measurement and data collection standards to ensure meaningfulness and comparability of performance/outcome measurements
- Clear commitment from the consortium to the transferability of solutions to other cities, open standards and interoperability of systems.
- Clear commitment for the consortium to cooperate to the fullest extent with accompanying measures as well as their 'follower cities'
- Common data collection, measurement and disclosure methodology, in order to facilitate a common footprint calculation methodology and other metrics (especially for energy saving; CO2 reductions, financial savings, number of jobs created, environmental impact etc.)

ii) Developing a framework for common, transparent data collection and performance measurement to allow comparability between solutions and best-practice identification. Work has to build on results from CONCERTO as well as the ICT-PSP pilots and could embrace other initiatives as the Green Button of the DoE in the US and 'The Social Energy Collective' in the Netherlands. In addition these common data collection standards should allow for economies of scale (and scope) with 3rd-party applications developers.

Performance measurements should consider the solution's impact on GHG reductions, improved energy efficiency and increased integration of RES into a city's energy mix. Moreover quantification of economic, and possibly even social, performance of the solution at hand has to be included to evaluate the potential value for money and consumer engagement. In short, key performance indicators are to be developed at least along the environmental and economic dimensions of sustainability. This work has to build on existing initiatives, notably the ITU.

Expected impact:

Instruments: Collaborative Projects for (i) and CSA for (ii)

Funding: 50M€

BUDGET IN RELATION TO STRATEGIC PROGRAMME HEADINGS

	CONNECT Budget 2014-2015	CONNECT Budget 2014-2020	Comment
Focus area I: Energy Efficiency	40 M€	200 M€(split in 100 M€for EeB PPP, 50 M€ on Green ICT and 50 M€ for	This would cover the ICT part of the Energy-efficient buildings PPP, Green ICT with a special focus on Data Centres, market uptake

		market take-up)	measures based on ICT.
Focus area II: Competitive low-carbon energy	30 M€	100 M€	This would focus on the Smart Grid to ensure flexibility and capacity of a secure European energy system with an active role of all its users.
Focus area III: Smart cities and communities	50 M€	100 M€	In the context of the EIP on SCC, it has been discussed with ENER and MOVE that the focus will be at the intersection of energy, transport and ICT, each contributing equally.
Total	120 M€	400 M€	

Societal Challenge 4 – Transport

ROAD

Objective 1: Connectivity for sustainable mobility (Call 2015)

The objective focuses on the sustainability gains achievable by Information and Communication Technologies (ICT). In the past 20 years, enormous progress was achieved in applying ICT to vehicles. Initially, the focus was on safety, resulting in stand-alone Advanced Driver Assistance Systems (ADAS) and Cooperative Systems. More recently, the energy efficiency issue rose in importance, due to the threats of climate change and human health. Connectivity for sustainable mobility needs to address both stand-alone and cooperative systems.

Looking forward to the next 20 years, driver will remain in control of vehicles: thus the promised effects will greatly depend on how drivers use the systems provided. To address sustainability and the reduction of greenhouse gas emissions, research in the short term needs to address green driving support systems challenging the driver to adopt a green driving style. A green driving style can add up to another 15% of CO₂ reduction to already 'green' vehicles.

This approach must go hand in hand with research objectives on increased automation in road transport, another main contributor to sustainable mobility.

CONNECT's approach: Providing eco-driving support systems ICT delivers grass root technology to achieve the Transport programme's objectives regarding smart and resource-efficient transport. The full potential of cooperative systems will leverage energy-efficiency and safety of transport.

ICT-enablers for connectivity for sustainable mobility

The following ICT elements are fundamental for connectivity for sustainable mobility:

1. Cooperative systems enabling road users and other actors to exchange information in real time;
2. Sensors to monitor the status of vehicles and the traffic surroundings;
3. Appropriate human machine interaction systems suitable for use whilst travelling/driving.

Research challenges

To contribute to more resource efficient transport which respects the environment, ICT research and innovation shall build upon and will integrate advances in-vehicle sensors and cooperative data.

- a) The human factor in (cooperative) green driving needs to be addressed by optimizing **human machine interaction (HMI)** and **advice strategies** to change drivers' behavior including:
 - i. Developing / refining driver state classifications with respect to green driving
 - ii. Developing / refining driver type classifications with respect to green driving
 - iii. Using work load information when developing the HMI strategies
- b) **Social media** and serious gaming need to be integrated as new options for higher user acceptance;
- c) **Pilots** and **large scale demonstrations** for green driving will deliver proof of concept on the impact of green driving support on sustainability;
- d) Accompanying measures supporting connectivity for sustainable mobility will facilitate accelerated take-up and deployment of the eco-driving systems.

A budget share of 20 M€ in the road part of the work programme is proposed for this objective to fund 1 IPs, up to 3 STREPs (a-c) and 1 CSAs (e).

Objective 2: Smart connected automation in road transport (call 2015)

***Disclaimer:** By the term “smart connected automation in road transport” we are not considering a driverless vehicle such as the NASA Mars Rover or the Google car. These can be classified as autonomous robots: they are sensing the environment, and they can drive from A to B avoiding accidents by making their own decisions. The technology to achieve these objectives is clearly in place.*

Definition – Our approach: Automation in road transport should be approached as the final stage in the evolution of Cooperative ITS. In our approach the fully automated vehicles have all the sensing capabilities such as the Google car, but on top:

- Communicate with other vehicles and the roadside infrastructure and take cooperative actions such as:
 - forming and dismantling a vehicle platoon to move from A to B in a fuel efficient way,
 - fully cooperative driving so as to achieve seamless and safe automated intersections,
 - automated emergency stop-over
- Interact with traffic management centres thus allowing the regulation of traffic in a local (city) or global level (city – region – country – EU level).

- Through an appropriate HMI make clear for the driver the level of automation currently in use, facilitate the transitions between different levels of automation or instruct the driver to take over control of the vehicle
- Provide an in-vehicle ICT platform for the integration of automation capability in novel transport services and mobility concepts such as automated last mile delivery of goods and the automated-car-as-a-service

ICT-enablers for automation

To enable an increased level of automation and consequently fully automated driving the following ICT elements are fundamental:

1. V2X communications to enable exchange of information between vehicles and vehicles and roadside infrastructure (road operators and traffic management systems); mechanisms for interoperability and secure flow of information across the involved stakeholders
2. A set of ICT sensors (such as short range radars, cameras, laser scanners), sensor fusion algorithms, perception algorithms.
3. Fault-tolerance vehicle actuation algorithms and mechanisms
4. Novel HMI taking into account the role of the driver in highly automated vehicles
5. Traffic management systems based on transport clouds that will be able to process in real time the vast amount of data and regulate traffic in a local, regional, national and ultimately European level.
6. European Wide Service Platforms (EWSP) built on top of the notion of Future Internet, the Internet of Things (cars), facilitated by social media that will integrate automation into novel mobility concepts.

Societal impacts of introducing automation in road transport

Smart connected automation in road transport aims at achieving societal impacts such as environmental sustainability, road traffic efficiency and road safety. Congestion costs the EU economy more than 1% of GDP. To reduce it, the EU needs more efficient transport and logistics, better infrastructure and the ability to optimise road capacity use. Automated driving offers a vast range of benefits if combined with traffic management. Traffic management can “intervene” at different levels of the driving task; the intervention can range from provision of information to direct actuation of the vehicle motion. The majority of road transport accidents is caused by human errors; automated driving at different levels has the potential to reduce such accident by eliminating the human factor.

Research challenges for the call(s)

Research and innovation shall build on and integrate advances in fail safe actuation of automated vehicles, merging of in-vehicle sensors with cooperative data, timely reactivation of human attention and action, cloud computing technologies for transport, and M2M

communications (Internet of cars). Connected-automated vehicles should be perceived as a unique platform for the provision of novel transport services to the European citizen.

Key research challenges to be addressed:

- a) fault-tolerant and resilient automated driving technologies and applications for connected, safer and sustainable road transportation
- b) cooperative automated driving in mixed fleets
- c) automated, seamless and safe fully automated intersections
- d) novel transport services and logistics concepts enabled by automated driving and ICT-based new and disruptive mobility concepts, such as the automated-car-as-a-service.
- e) distributed traffic management systems and traffic management systems for mixed vehicle fleets

A budget share of 20 M€ in the road part of the work programme is proposed for this objective and encompassed as part of the Green Cars PPP to fund 1 Integrating Project, up to 3 STREPs and 1 CSA.

URBAN

Objective 3: Smart connected urban mobility services (Call 2014)

The focus will be on mobility services based on Cooperative Intelligent Transport Systems (C-ITS) in urban environments. Europe's transport networks suffer from congestion, inefficient use of energy and safety challenges. Communication between users, vehicles and with the infrastructure build the platform for transformative services addressing mobility needs which will ensure resource-efficiency, sustainability and safety of transport.

CONNECT's approach: The Transport programme objectives regarding smart and resource-efficient transport can only be achieved by using ICT as enabling technology, in particular by the use of mobile communication means and service provision.

Several technologies and applications have been developed to monitor the status of the actual traffic conditions of large urban areas. These data processing technologies have now reached a level of maturity and accuracy that makes them ready for a large scale operational deployment. In addition, predictive analytics and even processing methodologies and technologies have also reached reliability and accuracy levels that make them ready to be applied on large scale exercises. Integration of these different methodologies and technologies needs to be addressed now.

While many standalone data feeds have been made available by public administrations across Europe, now accessible by citizens through smartphone apps (e.g. cameras, traffic intensity on a given road section, real time bus schedule information, etc.) no intelligent system able to provide citizens not only with useful integrated mobility information by analysing all the available real time data feeds, and customizing this information taking into consideration each individual's mobility requirements exists today. Such an envisioned system should also operationally deliver predictive analytics capabilities for traffic developments, integrated with real time weather conditions and forecast.

The operational deployment of such intelligent systems would improve European citizens' quality of life by reducing commuting times, improve traffic conditions in cities, and reduce pollution levels. The envisaged transformative ICT-based services will offer new environmental-friendly mobility options for citizens.

ICT-enablers for connected urban mobility services

The following ICT elements are fundamental for connected mobility services:

1. Mobile communications for real-time information exchange among actors (users, service providers, operators, communities)

2. Services provision by European Wide Service Platforms (EWSP) built on top of the Future Internet and Internet of Things to ensure European wide cross-border interoperability
3. Integration of social media for crowd data sourcing and uplifting of user acceptance

The full value-chain will be addressed including the integration of available technologies and service provision.

Research challenges for the call

The development of smart connected urban mobility services is based on the understanding of a new reality, in which interaction and cooperation processes involve the entire transport system: the human, the environment, the vehicle and in-vehicle technologies, as well as traffic management systems, new data feeds and decision support tools.

To contribute to more resource efficient transport which delivers better mobility, less congestion, more safety and security, the main research challenges to be addressed are:

Easy access to information through **real-time management systems** has high potential for a clean and efficient multi-modal mobility that can cope with the trade-offs between mobility, environment and societal impacts, both at individuals and network level.

The research will explore how to turn reliable **real-time traffic information and strategic routing** towards a more sustainable transport context by inducing positive behavioural changes in citizens towards eco-mobility and **eco-driving**.

Pilots will provide proofs of concept of **energy efficient intersection control systems and services** and its potential to reduce energy use and vehicle emissions at signalised intersections.

Pilots on transformative sustainability systems and services will proof the concepts and assess the impact of connected mobility on climate and environment.

Accompanying measures supporting smart connected urban mobility services will facilitate accelerated take-up and deployment of the innovative services and proper reach-out.

- to continue supporting a **stakeholder platform** ensuring take-up of results and dissemination;
- to support coordination with the **Smart Cities and Communities EIP**.

A budget share of 30 M€ in the urban mobility part of the work programme is proposed for this objective to fund 1 – 2 IPs, up to 5 STREPs (a-d) and 2 CSAs (e).

Objective 4: Smart cities and Communities (Call 2014)

This objective addresses the smart cities and communities focus area. It copes with the specific challenge of developing and deploying replicable solutions at the intersection of transport, energy and ICT. Projects supported by this objective will be innovation oriented. Therefore, projects will adapt and integrate existing technologies and systems and the research will be mainly on new organisational and business models and user participation.

Focus will be on projects at the convergence of the value chains of transport, energy and ICT. This objective will be implemented by joint calls for proposals with DG MOVE, and DG ENER.

- a) "Lighthouse projects" that deploy technologies at the intersection of transport, energy and ICT. These projects will be designed for maximum impact in the sense of kick-starting commercial deployment of their results. For the reach-out to others stakeholders beyond the immediate lighthouse project participants appropriate instruments must be used, e.g. forums, following cities and communities.

Proposals should target primarily the third phase of the innovation process, i.e. large-scale demonstration in city contexts, where existing or very near-to-market technologies will be integrated in innovative ways. Yet the fourth and final phase, i.e. commercial roll-out in city environments, is also within scope inasmuch as the proposals are to prepare the ground for it.

Consortia should include both industry and city/consumer organisations from at least two medium/large cities and communities. In addition proposals must include a list of "follower cities", i.e. cities willing to contribute to the process because they commit to replicate the solution at the end of the project.

All involved cities should have an approved smart cities and communities plan beyond the scope of the proposal. In addition to the solutions themselves the challenge includes to set up the appropriate external environment for these solutions to be exploited commercially. This includes: optimising policy and regulatory frameworks; open, consistent data and performance measurements; citizens' engagement and empowerment; dissemination and unlocking the market potentials worldwide.

- b) The call will also include a set of accompanying measures to
 - foster standardisation, interoperability and scalability of the solutions;
 - identify KPIs for analysing the socio-economic and environmental impact of the projects;
 - promote dissemination of results;
 - define policy and regulatory recommendations .

A budget share of 50 M€ coming from the Urban part will enable to co-finance the lighthouse projects with ENER and MOVE

LOGISTICS

Objective 5: ICT for smart logistics (Call 2014)

The efficient utilization of logistic resources, both vehicles and infrastructure, is one of the main societal challenges that need to be addressed in the upcoming years in Europe. Several studies reveal a high degree of inefficiencies in this area: Since long every year approximately 20% of all truckloads are empty trips, while load capacity utilization on trucks in Europe varies between 30 to 50%. Further expectations concern better integration between different transport modes. Currently, only 5% of internal EU freight traffic flows through intermodal routes.

Solving these issues is essential for the logistics industry sustainability, as it can reduce the sector's negative impact in terms of non-renewable energy consumption and emissions. This can only be achieved through collaboration among all the different actors in the logistic chain, and across all transport modes.

CONNECT's approach: Cloud-based data and services infrastructure, underpinned by common information models, will offer logistic stakeholders (shippers, logistic services providers, authorities) opportunities to collaborate on both operational and strategic level to contribute to the Transport Programme's sustainable mobility for goods objective.

The infrastructure shall make accessible data on logistics services demand from shippers, on resources availability and infrastructure status, both statistical and in real-time, to support various kinds of collaborative freight management processes.

ICT-enablers for mobility of goods

The following ICT elements are fundamental for mobility of goods:

1. Mobile communications for secured information exchange among actors (users, service providers, operators, communities);
2. Secure, resilient and trusted communications and information storage and processing;
3. Provision of position and spatial information regarding goods on the move
4. Web-based collaboration platforms.

Key research challenges to be addressed are

- a) Providing an easy-to-access **web-based open platform** to enable information exchange across suppliers, manufacturers, logistics providers and retailers without building costly interfaces with
 - a. highly automated data capture, data exchange and local decision-making, with the support of connected intelligent cargo units and vehicles;
 - b. technologies and services to collect and share environmental performance data for decisions-support and carbon-footprinting purposes, based on common approaches such as the CEN/TC 320/WG 10 standard.

- b) Enabling **seamless flow of information** along supply chains synchronized with flows of goods, enabling to get real time information on inventory levels and inventory location across multiple logistics actors;
- c) Accompanying measures supporting smart connectivity to facilitate cross-systems/cross-border interoperability and global reach-out.
 - by fostering further **standardisation** in view of global interoperability
 - and **international cooperation** with other regions of the world.

These research activities will deliver major achievements for resource-efficient transport and better mobility for goods. They prepare for future research and innovation related to logistics in the coming years, which should include pilots providing proof of concept for the platform.

A budget share of 10 M€ in the logistics part of the work programme is proposed for this objective to fund up to 4 STREPs and one CSA.

ITS

Objective 6: Mobile Services for Intelligent Transport Systems (Call 2014)

Complementary to objective 1 the smart connectivity and cloud computing for mobile services objective will address the integration of transformative communication technologies and cloud information technologies to support implementation new mobile services for people and goods on the move.

Such ICT-based tools are key enablers for achieving the Transport Programme's objectives of resource efficient transport that respects the environment and better mobility, less congestion, more safety and security. There are the fundamentals for any kind of Intelligent Transport System and address cross-cutting needs and they can create significant economic growth like the rise in the past of navigation services.

CONNECT's approach: Integration of such technologies for European transport systems follow the recommendations of the ITS Advisory Group who regards research and innovation activities in information and communication technologies as essential for the accelerated deployment of ITS in Europe (as expressed e.g. during the ITS Advisory Group meeting on 04 June 2013 in Dublin).

Our approach is fully in line with the ITS Action Plan (addressing optimal use of road, traffic and travel data as well as road safety) and the Transport White Paper in relation to smart and resource efficient transport. Transformative ICT-based services will offer new environmental-friendly mobility options for people and goods in urban, regional and cross-border settings. Interoperability is the key issue for successful and widespread deployment.

ICT-enablers for smart connectivity

The following ICT elements are fundamental for smart connectivity:

1. Mobile communications for real-time information exchange among actors (users, service providers, operators, communities);
2. Secure and resilient communications and information storage and processing;
3. Provision of precise position and spatial information including digital map technologies.

Particular attention needs to be devoted to human machine interaction to ensure people's minimal distraction from primary tasks (e.g. driving a vehicle) whilst providing the most useful information in given surroundings.

Key research challenges to be addressed are:

- a) Convergence of ITS dedicated short range communication (ITS G5) and 4th generation mobile communication technologies (LTE 4G) to provide **seamless connectivity** as needed for Intelligent Transport Systems including roaming issues;
- b) Next generation, **dynamic local maps** for efficient transport systems, based on cloud computing technologies;
- c) **Safe interaction/communication** with onboard and external (nomadic) devices and applications maximizing drivers' attention and system acceptance;
- d) Field Operational Tests and pilots will provide proof of concept of **interoperability of cooperative systems** and their potential to reduce energy use and vehicle emissions.
- e) Accompanying measures supporting smart connectivity to facilitate cross-systems/cross-border interoperability and global reach-out.
 - by fostering further **ITS standardisation** in view of interoperability;
 - and continuing **international research cooperation**, e.g. with US and Japan;

These research activities will deliver major achievements for resource-efficient transport and better mobility and prepare for future research and innovation related to automation in road transport.

A budget share of 30 M€ in the ITS part of the work programme is proposed for this objective to fund 1 – 2 IPs, up to 5 STREPs (a-d) and 2 CSAs (e).

Infrastructures

Objective 7: Digital infrastructures for transport and mobility (Call 2014)

Information- and communication technologies (ICT) are key enabling technologies for smart, green and integrated transport: Interoperability and open data are keys to ensure proper information flow between different transport providers and users. Connected smart mobility and resource efficient transport depend on advanced communication infrastructures which enable delivery of advanced mobility services to users. Digital infrastructures used in transport need to be resilient in the sense of end-to-end cyber security. Deployment of Intelligent Transport Systems (ITS) depends on integrated ICT.

CONNECT's approach: Integration of the physical and digital infrastructures is needed to serve societal needs such as safety, security, and efficiency, and to boost mobility for growth, by enabling smart mobility services. The digital infrastructures can be embedded in the physical ones, or come with transport equipment, or with users or goods in transit. This leads to ever-increasing, heterogeneous, complex infrastructures with concepts developing such as 'Internet-of-things' in transport. The development and validation of physical and digital infrastructures has to go hand-in-hand to cope with complexity and interoperability and to ensure rich, secure and resilient data processing and storage from end-to-end.

ICT-enablers for digital infrastructure

The following ICT elements are fundamental for digital infrastructures for transport and mobility:

1. Mobile and landline communications for real-time information exchange among actors (users, service providers, operators, communities);
2. Secure and resilient communications and information storage and processing;
3. Conceptual frameworks for information exchange such as the Internet of Things.

Key research challenges to be addressed are:

- a) Convergence of physical and digital infrastructures using dedicated short range communication (ITS G5) and 4th generation mobile communication technologies (LTE 4G) to provide **seamless connectivity** including roaming issues;
- b) Next generation, **secure and resilient hard- and software** for information exchange;
- c) **High speed broadband** landline and mobile communication networks to cope with the big data volumes generated and processed;
- d) Accompanying measures supporting digital infrastructures to facilitate cross-systems/cross-border interoperability and global reach-out.
 - a. by fostering **standardisation** in view of interoperability;

- b. and supporting **stakeholder platforms** ensuring take-up of results and dissemination.

These research activities will deliver major achievements for smart equipment, infrastructures and services and prepare for future research and innovation related to better mobility, less congestion and more safety and security..

A budget share of 10 M€ in the infrastructure part of the work programme is proposed for this objective to fund up to four collaborative projects (a-c) and 1 CSAs (d).

	CONNECT WP 2014-2015	2020 (2014-2020)
Road	40 (incl. 20 for Green Vehicles)	240 (incl. 120 for Green Vehicles)
Urban	80 (incl. 50 for smart cities)	165
Logistics	10	35
ITS	30	130
Infrastructures	10	25
Total	170	595

Societal Challenge 5 – Climate

FOR WATER:

Objective 1 (2014-2015), call 2014: Laying foundations for a Water Information System, (INSPIRE compliant)

To harmonize existing water specific conceptual models, partially developed under directive INSPIRE, in Europe towards specifications (conceptualisation and design) of a technology independent and open reference model of the water resources information system. The first step (2014-2015) consists of finding of new solutions to achieve interoperability between existing systems and develop new connectivity standards. One step further, the developed ontologies and the new interoperable solutions should be linked to the applications used in the water sector.

Topics to be addressed: ontologies, semantic interoperability, GIS, business modelling, DSS, and management tools.

Expected impact: to create a common language in the water sector and to overcome its fragmentation

Proposed instrument: (big) Collaborative project

Objective 2 (2014-2015), call 2015: Advanced ICT solutions for water resources management

To support the development and deployment of advanced ICT-based solutions in the water sector notably to: (1) better assess water consumption profiles in real time for short term predictions; (2) support interoperability across various systems and information models in the water sector and across the water and other sectors (e.g. energy) in order to provide more efficient services for the citizens; (3) enable the scalable composition of services; (4) enhance security and intrusion detection across various systems (particularly relevant when several devices are Internet enabled); (5) increase awareness on the environmental footprint (energy consumption, GHG emissions) of the various systems and processes deployed in the field. To achieve the above objectives, broad partnerships notably across academic communities, businesses and water authorities will be supported.

Expected impact: to meet the resource efficiency policy objectives thanks to the key enabling role of the ICT;

Proposed instrument: Collaborative Projects

FOR WASTE:

Objective (2014): Roadmap for electronic waste

To develop a coordinated and far reaching approach in Europe (including any appropriate research and deployment actions) regarding the treatment of electronic waste from the ICT-sector (the fastest growing sector of the global economy today). The action will be two fold: firstly to minimise the environmental effect of ICT and secondly to increase the recycling of rare materials that Europe imports today and are critical for the construction of ICT-products and so the competitiveness of its ICT-industry. A variety of different stakeholders (notably representatives across the whole ICT-sector, standardisation organisations, waste disposal facilities) will be addressed through this action.

Expected impact: to gather a better knowledge and to build metrics of the situation in Europe of the ICT waste

Proposed instrument: Coordination Action

For the SMART CITIES focus area under SC5 :

Objective (2014): ICT-enabled citizen-empowerment and interoperability across different information systems at city level

To develop and deploy ICT-based technology and systems with the aim to harness the data deluge and foster interoperability across different information systems linked to different economy sectors (e.g. energy, transport, water) and stakeholders at city level. Focus will be to address sustainability challenges and improve the quality and cost efficiency of services provided to the citizens. In this context ICT will provide the conditions of opening up new markets and lowering barriers across different value chains in cities. To further bring the citizen in the centre of any relevant action notably through increasing citizen awareness on sustainability issues in cities and facilitating her/his involvement in relevant actions aiming at improving living conditions in cities as well as her/his benefit from any new business opportunities that may arise through the above transformative role of ICT.

Expected impact: the role of ICT in this action will contribute to achieve the 3 bottom line objectives (20-20-20). Interoperable solutions will help decreasing the GHG emissions in the urban context, citizens will benefit from an improved quality of life and the scale up of these solutions may create new business opportunities.

Proposed instruments: Collaborative projects, Coordination actions

Societal Challenge 6 – IIS

Call 2 - Reflective societies: cultural heritage

Today, studies contributing to the understanding of Europe's intellectual basis, cultural identity and history necessarily rely more and more on digital expressions of culture and identity. In parallel, digital technologies offer new tools and enable novel approaches, both for researchers and the interested public. This specific challenge is about tapping the potential of ICT for facilitating access to and preservation of European cultural heritage and allowing richer interpretations of the European culture and identity.

1 - Accessing and understanding Europe's cultural heritage

Specific challenge

Collections in archives, museums and at cultural heritage sites contain a wealth of digital texts, images, audio-visual content and 3D representations of objects or sceneries largely inaccessible to both computers and humans: Humans can easily extract meaning from individual digital artefacts but are quickly overwhelmed by the current sheer number of items. Computers can process large amounts of data but are not yet very good at extracting meaning from them. To close, or at least narrow, this "semantic gap" would present a major step forward in digital humanities and social sciences.

Scope

Research on the creation of web discovery interfaces for different types of audiences (Humanities and Social Sciences researchers, scholars and interested public), semantic information extraction, visualisation, new modes of inquiry and narratives, and tools to mine, analyse, re-use and re-purpose cultural digital resources.

Expected impact

Material which used to be inaccessible because it is buried among huge amounts of data and not tagged with metadata will become accessible, searchable and re-usable.

Instrument and funding level:

Collaborative Project (100%) – Single stage

2 – Preservation of digital art

Specific challenge

The digital era has brought about a new form of cultural heritage: computer-based or new media art (such as digital painting, photography, poetry, graphics, electronic music, video, animations, interactive art, installations, software art...). But the prevalence of digital media and content raises new challenges as regards access to and preservation of cultural heritage. The UNESCO Charter on the Preservation of Digital Heritage states "that this digital heritage is at risk of being lost and that its preservation for the benefit of present and future generations is an urgent issue of worldwide concern". A large variety of media and technologies used and special features such as interactivity or mixed digital-analogue installation environments make the curation of digital art a particularly

demanding task. Moreover, artworks are different from, for example, legal records which may be easily migrated from one technology environment to another without losing their essential function: They are often sensitive to the look and feel of the media in which they are embedded, thus highly dependent on technology that evolves and becomes obsolete at an ever faster pace. Creative processes and their outcomes are thus a timely focus for digital preservation efforts.

Scope

Strategies and technologies for restoration of damaged or obsolete digital cultural objects as well as for embedding digital preservation into emerging creative processes and their outcomes. Research should target inherently digital objects – i.e. digital artefacts whose perceptibility, meaning, or usability arise from and rely on them being encoded in digital form. They cannot be meaningfully represented as page images and doing so loses essential aspects of their contents and/or behaviour. They can be dynamic, active or interactive, artefacts. Solutions should support curators and restorers to keep or replicate the original vision of the creator and the user experience over time. While strategies and technologies may be developed for and tested upon selected exemplary artworks, projects should also demonstrate how the approach chosen could be generalised. Projects will need to combine interdisciplinary expertise of memory organisations, computer history, IT providers, artists and other relevant domains.

The preservation of analogue cultural artefacts and the development of storage technologies are not in scope of the Call.

Expected impact

The project portfolio should prepare the development of effective digital preservation services and technologies for memory organisations curating digital art. Proposals are expected to describe the maturity level of the technologies developed as well as reflect on potential barriers for the uptake of technologies and concepts resulting from the research work. At medium term, this research should lead to a decrease in the corruption or loss of digital art and to a reduction of efforts and costs for its preservation. Proposals should explain how these impacts will be brought about and give a realistic estimate of timescales and the expected reduction of costs and efforts.

Instrument and funding level:

Collaborative Project (100%) – Single stage

3 – Creating an innovation ecosystem of digital cultural assets

Specific challenge

This specific challenge responds to the growing urge for cultural institutions to share the wealth of knowledge in their collections and to show how cultural resources can inform scholarship, contribute to innovation, how they can drive research and new developments, and generate societal and economic benefits. The vast amount of cultural heritage material needs to be turned into assets, whose integration and reuse can create value for European cultural organisations and industries. The objective is to develop a European ecosystem of digital culture assets that will foster innovation and enhance the use and analysis of cultural resources to improve our understanding of how European identity can be traced, constructed or debated.

Scope

The development of new environments, applications and tools, and services for creative re-use of cultural resources from scientific collections, archives, museums, libraries and cultural heritage sites, thus leading to innovation in this sector. The developed technologies or services should meet real user needs and foster cross-border, cross-lingual and/or cross-sector exploitation. They should support researchers and citizens alike and bring cultural content to new audiences in novel ways, or enable new paths towards analysing and understanding of Europe's cultural and intellectual history. Projects should demonstrate appropriate methods of re-using and repurposing digital assets, paving the way for wider exploitation of Europe's cultural resources and boosting innovation and business development.

Expected impact

Value generation and new business models for cultural material; Viable and sustainable cross-border, cross-lingual and/or cross-sector exploitation of large European digital cultural heritage assets.

Instrument and funding level:

Collaborative Project (75%) – Single stage

Publication date: - One single publication date in year 2.

Deadline(s): - end 2014, early 2015

Indicative budget: EUR 45 million from the 2015 budget

Call 3 – Inclusive and sustainable Europe for the young generation

Stimulating the use of ICT tools and services for learning and teaching

Specific challenge

The aim of the challenge is to boost and support the use of the Internet, digital tools, solutions and services for learning and teaching in Europe. The development and deployment of robust and fit-for-purpose digital infrastructure for learning is crucial to boost the modernization of education and training in that it supports and solicits for new engaging and motivating ways to learn and teach, facilitating the transformation of the education and training sector to embrace and fit the challenges of 21st century.

The building blocks of the infrastructure underpinning the digital ecosystem for learning make use of, expand and create new nodes of excellence in Europe in e.g. adaptive learning, affective learning, game-based learning and virtual environments/virtual worlds. It makes use of educational cloud solutions, mobile technology, learning analytics and big data, and facilitates the use, re-use and creation of learning material and new ways to educate and learn online.

Scope

a) Development and integration of innovative digital educational tools, solutions and services for learning and teaching that embrace novel pedagogical approaches, curriculum development and assessment. They should aim at reducing the current restrictions of time and physical space in learning and teaching, and at facilitating seamless learning between home and education and training institutions. They should foster greater connection between formal, non-formal and informal learning and remove obstacles for ubiquitous learning. Activities shall be implemented through large scale pilot projects in real settings. The pilots should link stakeholders in educational technology (research, innovation and market applications) with educational practitioners, students and support organisations. Focus is initially on primary and secondary education and higher education, starting with upper secondary. However, the longer term perspective remains the empowerment of young people with the full set of critical 21st century skills. As part of piloting scenarios, a specific target group to address are children, adolescents and adults with mental or physical disabilities who undergo general education, lifelong learning or vocational training.

b) Procuring research and innovation to pilot innovative, technology mediated scenarios for learning and teaching in educational settings.

c) Open interoperability frameworks between education and training applications, content & services, leveraging particularly on mobile and cloud technologies. Activities should also address easy ways to provide information on rights.

Expected impact

- Creation of a solid and structured basis of growth-oriented and self-sustained digital learning ecosystem in Europe
- Speeding up the rate of adoption on technologies for the modernization of education and training
- Enhance the development of digital learning and teaching resources, including for children, adolescents and adults with mental or physical disabilities

Instrument and funding level:

For a) Collaborative Projects (70%)

For b) PCP/PPI

For c) Collaborative Projects (70%) or CSA (tbc) – single stage

Publication date: - One single publication date at the launch of H2020, in year 1 or year 2

Deadline(s): - in year 1, year 2 or several deadlines over the two years

Indicative budget: EUR 60 million from the 2014 budget (of which max EUR 45million for point a), max EUR 10 million for point b) and max EUR 5 million for point c).

Call 10 – New Forms of Innovation

There is great potential for Europe to improve productivity and foster competitiveness with knowledge, creativity and technologies. The development, deployment and exploitation of new forms of innovation will be crucial in capitalising on this potential.

This call addresses new forms of innovation, including public sector innovation, social innovation and new business models. In addition it supports innovation in the public administration and women innovators through European competitions.

The modernisation of public administrations is one of the priorities of the European policy to exit the crisis and create growth and jobs⁷. ICT-driven public sector innovation refers to the use of ICT for the creation and implementation of new processes, products, services and methods of delivery which result in significant improvements in the efficiency, effectiveness and quality of public services. Supporting ICT-driven public sector innovation through research and innovation activities under this call will contribute to increased public sector performance, foster open and citizen-centric public services (eGovernment) and facilitate the seamless cross-border delivery of electronic public services. Furthermore, awards to the most innovative and forward-looking public initiatives across Europe will leverage and induce further innovation and excellence in Public Administration.

The call will also create and make easily accessible new knowledge on business model innovation enabling a high number of companies to benefit through new or strengthened business models.

Women are another source of innovation with high untapped potential, as there are few women creating innovative enterprises in Europe. Awards to women innovators will make their contribution more visible and bring more women from research to entrepreneurship.

ICT-enabled social innovation can generate new services, processes and models engaging stakeholders to tackle specific societal needs. Actions under this call will help better understand how new forms of digital platforms can be exploited as intermediaries for social innovation.

Actions in this area will support the *Innovation Union flagship initiative*, the *Digital Agenda for Europe flagship Initiative* and the *eGovernment Action Plan 2011 – 2015*.

1 - Digital Social Platforms

Specific challenge

Tackling major societal challenges requires new forms of innovation through effective engagement of citizens, SMEs, public authorities and other stakeholders. Building on social innovation principles, creative answers to those challenges shall be found where other, more established practices struggle or fail to reach stakeholders on a sufficient scale for demand-driven, bottom up research and innovation activities incorporating social, legal and ethical considerations.

Digital Social Platforms (DSP) is a new concept which aims to tackle this challenge by providing new and alternative ways for large scale engagement of relevant stakeholders using digital solutions.

⁷ 2013 Annual Growth Survey

DSP build on established communities of practice and collaboration structures, such as European Innovation Partnerships and seek to seize the full potential of existing IT tools, integration of networks and online collaboration, crowdsourcing, information sharing and social networking in order to reach the objectives. The purpose is to scale up to larger, multi-stakeholder communities engaged in collaboration and co-creation of innovative services and solutions addressing specific societal challenges.

DSP are characterised by monitoring and feedback mechanisms, the involvement of a critical mass / minimum proportion of end-users and the generation of social innovation.

The DSP approach aims at

- ensuring large-scale involvement of previously excluded stakeholders in innovation through novel types of incentives and participatory design processes (i.e. end users, social entrepreneurs, interaction designers, social scientists, artists, creative industries etc.)
- providing proofs-of-concept of innovative approaches which build on stakeholder engagement, needs and acceptance for better solutions and ultimately wider access to markets
- helping to overcome existing barriers to collaboration in bottom-up driven innovation, where possible taking a multi-cultural, multi-lingual and cross-border approach
- increasing the quality, relevance, social acceptability and sustainability of innovation activities
- generating knowledge and best practices about critical factors for successful social innovation and how innovation in general evolves, succeeds or fails providing a critical mass of data

Scope

- Understanding how Digital Social Platforms bring about new social dynamics and change existing structures, practices and policies through a combination of technical, financial and social innovation targeting innovative solutions to a clearly defined societal challenge
- Effective stakeholder engagement in bottom-up research and innovation processes at sufficient scale, using specific incentives to ensure effective engagement of participants in their respective local and personal contexts
- Methodologies encompassing iterative research approaches such as action research, co-design techniques, participatory design, agile development, social media and data analysis etc.
- Improving the chances for scalability of innovation and ensuring the significance of findings by defining and reaching out to a critical mass of participants

Proposals should clearly define

- the relevance of the specific societal challenge they tackle,
- how it will be addressed,
- the specific outcomes they expect,
- the role foreseen for the DSP and its added value,
- engagement strategies that motivate stakeholders to actively participate,
- methodology to monitor and analyse how social innovation changes existing structures, practices and policies mediated by DSP.

Expected impact

- Deeper understanding of social innovation processes and new methods for large-scale engagement of stakeholders mediated by DSP
- Transferability and scalability of the DSP model, as well as of the services developed, to enlarged communities across borders

- Increased involvement of end-users and other relevant stakeholders in innovation processes (qualitative and quantitative indicators)
- Improved cooperation among researchers, public authorities, private companies and end users in the design and production of innovative services (qualitative and quantitative indicators)
- A vital role for DSP in generating growth through faster, broader, more sustainable and widely accepted innovative solutions driven by users' needs
- Societal benefits achieved in relation to the specific outcomes (qualitative and quantitative indicators to be defined in the proposal)

Instrument and funding level:

Collaborative project (100%), timing: 2014 or 2015 (one of the two)

EUR 10 Million

2 - Innovation in the public sector by using emerging ICT technologies

Specific challenge

The transformation of European public administrations requires public sector innovation in order to foster efficient, open and citizen-centric public services. This requires multidisciplinary research on emerging ICT technologies.

The public sector typically combines and builds on top of existing technology elements in order to create and implement new processes, products, services and methods of delivery which can result in significant improvements in the efficiency, effectiveness and quality of public services. Technology forms part of a "solution to a need".

Applying emerging technologies in the public sector starts from one or combined emerging technologies, analyses the potential applications and finally demonstrates the benefit. This can allow emerging technologies to take-off and to modernise the public sector. For example, how can Web 3.0 (semantic web technologies), semantic interoperability, Linked Open Data, Internet of things, social sensor networks, radio-frequency identification or wearable technologies, be used in the public sector?

Scope

a) Collaborative Projects:

Based on development and use of emerging technologies and research carried out so far, activities will support the preparation of next phases and possible validation in near to operational environment for the implementation of emerging ICT technologies in the public sector. The focus can be on any or several of the below:

- Infrastructures and processes to support open government;
- Increasing transparency of public administrations;
- Improving effectiveness and efficiency of public administrations;
- Changing relationships and increase trust between the citizens and the public administration, including empowerment of citizens;
- Developing open services through collaborative service design & delivery;
- Reducing the administrative burden of citizens and businesses.

b) Coordination and Support Actions:

The activities should aim at encouraging networking of relevant stakeholders and teams working in these areas and to support constituency building. The dynamic network will carry out a gap analysis and identify emerging technologies and potential applications for their implementation in the public sector. The activities will conclude with the outlining of a technical roadmap for emerging research directions, taking into consideration activities also undertaken in non-EU countries.

The intention is to select maximum one (1) Coordination and Support Action for funding.

Expected impact

- Preparing the public sector of the future
- Encourage new innovations
- Stimulating the creation and use of new services utilising emerging technologies, coupled with private and public data.
- Demonstrating the benefit of using the technology in the public sector.

Instrument and funding level:

Instruments: CP (R&D), Funding level: 100%, Budget: 15 million EUR, Timing: Call 2015

Instrument: CSA, Funding level: 100%, Budget 300 K EUR, Timing: 2015

3 - Empowering citizens to manage and monitor their personal data

Specific challenge:

Personal data has become an essential element, and an asset in the digital environment. Individuals' trust in the technologies deployed and the online environment as well as their effective empowerment on the use of their data are two crucial factors for the uptake of digital services in Europe. The protection of the privacy of individuals and of their personal data online is acute and necessary⁸.

Privacy by design will ensure that ICT, from the very early stage of a system's lifecycle, fully embeds data protection (such as data minimisation, mechanisms to facilitate data subjects' rights, mechanisms to limit access to data or data sharing, appropriate security measures, etc). Privacy by default will ensure that, by default, settings of an ICT device or software tool are activated to guarantee a high level of data protection; it will allow individuals to have more control over their data and whom they want to share it with.

While the cross-border digitisation of public administrations should facilitate data exchanges between individuals and the public sector across Member States, the interoperability of national

⁸ The European Data Protection Supervisor has recently emphasized the need to embed privacy by design and privacy by default in the design of new ICT, and has recommended that R&D instruments are used to increase Europe's capacity to apply these principles in all relevant disciplines and that work programmes and calls for proposals take this objective into account.

databases should only be practiced in full respect of data protection principles, in particular purpose limitation. There has to also be an appropriate legal basis for the use of interoperability as a means to facilitate data sharing, together with appropriate data protection safeguards, and methods must be found and put into use to ensure that new ICT will respect these principles.

Scope:

a) Collaborative projects:

- Research and development projects that investigate ways for citizens to manage, trace and monitor usage of their personal data and focus, inter alia, on open data and open services by public administrations;
- Research on self-controlled data and identity management for citizens and SMEs: ownership, identification, authentication and authorisation;
- Research and development of methods to embed issues of trust and security into all stages of digital projects, from the design of systems and technologies to the end of their lifecycle.

The activities need to take into account the requirement of citizens and businesses having access to their data in registers at different administrative levels, and the right to delegate access rights to their data to other entities, whether they are within the administration or outside.

b) Coordination and Support Actions:

The activities should aim at encouraging networking of relevant stakeholders and teams working on the privacy aspects of handling personal data in an open government and to encourage constituency building. The activities will focus on finding ways to enable researchers and developers to understand the privacy impacts of public sector data collection. The dynamic network will carry out a gap analysis and identify emerging technologies and potential applications for their implementation in the public sector with the aim of making public services trusted and moving towards the principle of 'once only' registration of data. The activities will conclude with the outlining of a technical roadmap for emerging research directions, taking into consideration development of relevant legislation as well as activities undertaken in non-EU countries.

The intention is to select maximum one (1) Coordination and Support Action for funding.

Expected impact:

- Enhanced trust in digital services via the development of common methods and tools for data protection and privacy in the open governance and public sector context.
- Possible recommendations for mandates for European standards in the relevant areas, or for further R&D initiatives.
- Raising citizens' awareness of the implications of personal data handling by public administrations.
- All activities will contribute to the paradigm shift in how security is implemented and applied in ICT, and to an increase in the user's trust in online transactions to augment their number.

Instrument and funding level:

Instrument: CP (R&D), Funding level: 100%, Budget: 10 million EUR, Timing: Call 2015

Instrument: CSA, Funding level: 100%, Budget 300 K EUR, Timing: 2015

4 - Automatic discovery and composition of public web-services

Specific challenge:

Innovative technical approaches, such as "clouds of public services" and service-oriented architecture (SOA) help to build open, flexible and collaborative public sector services⁹.

Opening up previously closed information, data and services can increase participative forms of service design, production and delivery. In order to facilitate the collaborative production of services, public administrations start to provide modular services that may be reused by different public administrations as well as other actors. The public sector can become more efficient and effective if traditional silos are dissolved and cooperation between administrations is increased through pooling and sharing resources, data, content and tools, also cross-border. Innovative ways have to be found to facilitate public administrations and users to easily find, mix and re-use different service components and create new public services that are suitable for their needs. As the components can also be contributed by different actors, collaboration with companies, non-profit organisations, communities and citizens will be enhanced.

This will allow for the combination of existing services to deliver the same type of service in an increasingly more efficient and personalised way or to develop new services, also in combination with third parties. The aim is a modular service offering with services that are interoperable and can be easily integrated and re-used.

Scope:

a) Collaborative Projects:

- The research will build on the "cloud of public services" concept¹⁰ and move further on to address the potential of open services, benefiting from - inter alia - the "Internet of Things" concept;
- The research requires interoperable, reusable modules for public service functionalities. They can be cross-institutional, can easily be used, re-used and combined dynamically to address specific needs. The research activities can be supported by investigation of public sector processes;

⁹ See eGovernment Action Plan 2011-2015 (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0743:FIN:EN:PDF>)

¹⁰ Tested in the CIP ICT PSP calls

- The research and development will include tailored service provision with a modular, open or "atomic"¹¹ way of providing public sector information and services;
- Research will focus on automatic web service discovery and composition of web-services, facilitating the process of finding a suitable web service for a given task, allowing to easily create large numbers of web services; moving towards "universal" SOA¹² ;
- The research will include several domains in order to demonstrate the potential provision of services; cross-border potential and re-usability will be addressed;
- The privacy aspects should be addressed.

b) Coordination and Support Actions:

The activities should aim at encouraging networking of relevant stakeholders and teams working in this area and to support constituency building. The dynamic network will carry out a gap analysis and identify emerging technologies and potential applications for their successful implementation in the public sector, taking into consideration activities also undertaken in non-EU countries.

The intention is to select maximum one (1) Coordination and Support Action for funding.

Expected impact:

- Increased effectiveness, due to enabling the combination and re-use of public service components;
- Increased innovation in and by the public sector;
- Offering new services, using public information and services;
- Demonstrating the reusability of open, interoperable and modular public web-services;
- Demonstrating that the automatic discovery and combination of web-services works also across institutions and borders

Instrument and funding level:

Instrument: CP (R&D), Funding level: 100%, Budget: 15 million EUR, Timing: Call 2014

Instrument: CSA, Funding level: 100%, Budget 300 K EUR, Timing: 2014

5 – Open government: eParticipation and transparency

Specific challenge:

¹¹ As described in Study on user expectations of a life events approach for designing e-government services <http://ec.europa.eu/digital-agenda/sites/digital-agenda/files/smart2009-0075.pdf>

¹² Study on cloud and service-oriented architectures for e-government http://ec.europa.eu/digital-agenda/sites/digital-agenda/files/smart2010-0074summaryreport_0.pdf

The take up of ICT tools, such as social media, the increased connectivity and spread of networks are changing the relationship between citizens and the public sector. ICT tools – through empowering citizens and businesses¹³ - can foster participatory and open societies. They facilitate the involvement of citizens in policy-making, but also in wider changes across all public sector activities, processes and structures.

Open participation and open engagement are important pillars of an open governance framework in which all legitimate actors are invited to engage in the activities of government. While e-participation has traditionally focused on the use of ICT for citizen involvement in political decisions and public policy making, open engagement introduces a broader dimension, involving citizens in all aspects of the interaction with the public sector.

Transparency is an important element of the open government approach. Open data and information leads to more transparency. Openness and technology tools can also enable monitoring of the public sector and its performance. Transparency helps reduce the risk of performance failure and increases accountability and trust in administrations.

Scope:

a) Collaborative Projects:

The actions should address at least one of the sub-objectives (i or ii) below:

i) Open participation and open engagement

- The actions will identify and create missing¹⁴ ICT e-participation building blocks for easy re-use;
- Service components and applications (building blocks) will allow public administrations themselves or third parties (citizens and businesses) to develop new, complex open engagement related services based on them;
- The services need to be open and should take into consideration political, organisational and cultural differences across the EU;
- Interoperability and reusability of applications and services need to be demonstrated;
- Cross-border as well as privacy and data security features are to be considered;
- Pilot on embedding open citizen engagement into a public administration activity or process with a significant number of test users.

ii) Transparency

¹³ See also eGovernment Action Plan 2011-2015 (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0743:FIN:EN:PDF>)

¹⁴ eParticipation Preparatory Action and CIP ICT PSP Pilot Bs

- Actions on transparency will aim to develop tools to increase the transparency impact of ICT-based technology platforms of the public sector;
- Transparency tools will benefit from open data and could help in monitoring, enhancing accountability and fight against corruption (e.g. through data mining and other tools);
- The specific policy issues are to cover any area that can generate a significant number of test users.

b) Coordination and Support Actions:

The activities should aim at encouraging networking of relevant stakeholders and teams working in these areas and support constituency building. The dynamic network will raise awareness of the available solutions in order to increase usage by public administrations and take-up by users.

The intention is to select maximum one (1) Coordination and Support Action for funding.

Expected impact:

- Transparent, participatory and accountable decision-making by public administrations;
- Facilitating the use of ICT tools for participative processes by public administrations
- Increased participation of citizens in political and policy decision-making;
- Increased citizen engagement in public administrations' activities and processes resulting in transparent, participatory and accountable decision-making;
- Increased transparency of and trust in public administrations

Instrument and funding level:

Instrument: CP (close-to-market), Funding level: 50%, Budget: 14 M EUR, Timing: Call: 2015

Instrument: CSA, Funding level: 100%, Budget 300 K EUR, Timing: 2015

6 – Personalised public services and M-government

Specific challenge:

Today's complex societal and economic challenges, coupled with rising expectations to reduce the burden on users, put pressure on public administrations to foster efficient, open and citizen-centric public services. Public services delivered or enabled by ICT need to increasingly focus on flexible and personalised interactions with public administrations¹⁵.

¹⁵ See also eGovernment Action Plan 2011-2015 (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0743:FIN:EN:PDF>)

Collaboration with users plays an important role in the transformation of public services¹⁶. The availability of sophisticated ICT tools, open data and open services, support the participative forms of service design and delivery. By enabling and empowering citizens and businesses to create and deliver some of the services, these will be ultimately more personalised and user-centric.

Given the availability of data, ICT can also enable governments to observe and analyse societal developments including individual behaviour, which may result in providing more pro-active, higher quality and valuable services for users.

In addition, using data in a local context can facilitate offering or creating location-driven services, depending on where users are.

For the services to be effective, they need to be adjusted to the way citizens are communicating and delivered to a variety of mobile devices in order to accommodate the on-going transition from stationary to mobile.

Scope:

a) Collaborative Projects

Pilots on personalised and mobile public services will aim to benefit from one or more of the following:

- Intelligent and innovative use of large volumes of publicly available data for new, smart and mobile public services;
- Empowering users to create innovation themselves or co-produce solutions;
- Using open services and enabling third parties to create new public services;
- Pro-active and personalised citizen-centric public service applications (this can be according to a user profile created and controlled by the user and structured around modular public services);
- Following changes in user behaviour in accessing and using such services and supporting the organisational and back-office implications, including privacy.

b) Coordination and Support Actions:

The activities should aim at encouraging networking of relevant stakeholders and teams working in these areas and to support constituency building. The dynamic network will carry out a gap analysis and identify potential applications for their successful implementation in the public sector. The activities will include the mobilisation of developers and civil servants (through events, hackatons, etc.) and awareness raising among end users in order to increase take-up of newly developed eGovernment applications.

The intention is to select maximum one (1) Coordination and Support Action for funding.

¹⁶ See also eGovernment Action Plan 2011-2015 (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0743:FIN:EN:PDF>)

Expected impact:

- Enabling people to engage in innovative service creation and delivery
- Stimulating the creation and use of new services utilising new web technologies, coupled with public data
- Offering new services using open public data and services on a variety of devices
- More personalised public services that better suit the needs of users

Instrument and funding level:

a) Instrument: CPs (close-to-market), Funding level: 50%, Budget: 13 million, Timing: Call 2014

b) Instrument: CSA, Funding level: 100%, Budget 300 K EUR, Timing: 2014

7 - Large Scale Pilot on cross-border Online Dispute Resolution services**Specific challenge:**

Enhancing the accessibility and effectiveness of alternative means of redress, in particular for disputes relating to cross-border and e-commerce transactions, is essential in order to strengthen consumers and businesses' confidence in the Single Market, thereby contributing to Europe's economic growth and competitiveness.

However, the diversity and lack of interoperability of alternative dispute resolution (ADR), and in particular online dispute resolution (ODR), systems in the Member States is preventing consumers and businesses from fully exploiting their potential. These barriers often result in ADR systems not being equipped to handle disputes between consumers and traders located in different Member States.

There is a need to support ICT-driven innovation which improves access to efficient and effective ODR services throughout Europe. This pilot will address the interoperability of national ODR systems and their interconnection with the European ODR Platform established under Regulation (EU) No .../2013 on online dispute resolution for consumer disputes.

The pilot is expected to contribute to the delivery of seamless cross-border ODR services, which allow citizens and businesses in all Member States to have access to simple, fast and inexpensive ways of solving their disputes, in line with the objectives of Regulation (EU) No .../2013 and of Directive 2013/.../EU on alternative dispute resolution for consumer disputes.

The intention is to select maximum one (1) project for funding.

Scope:

The pilot will:

- Build on existing national ODR solutions in order to develop a pan-European interoperability layer based on commonly agreed specifications, covering in particular authentication/identity management, document semantics and standards, privacy, accessibility, multilingual information access and delivery. The pilot will, as appropriate, reuse results of other large scale pilots supported with the CIP-ICT PSP programme, while adapting them to match the needs of ODR.
- Comprise a minimum number of six relevant national administrations (or legal entities designated to act on their behalf) in at least six different Member States where operational ODR services, or services in advanced phase of testing, exist. Involvement of other relevant stakeholders, as well as of EU/international standardisation bodies, is encouraged in view of gaining wide consensus on common specifications and standards.
- Develop and test the services in the participating Member States, including a minimum twelve-month piloting phase.
- The free access to the foreground must be guaranteed to enable access by any MS to the results specifications.

Specific eligibility condition for close-to-market, pilot A type of projects:

The consortia must be comprised by a minimum of six relevant national administrations or a legal entity designated to act on their behalf from six different EU Member States or Associated Countries. If a national administration is represented in the consortium by a designated legal entity, then the national administration will need to certify that the legal entity has been designated to act on its behalf for the purpose of the pilot.

Expected impact:

- Contribute to the implementation of Directive 2013/.../EU and of Regulation (EU) No .../2013, by facilitating the uptake and wide deployment across Europe of ODR services for the out-of-court resolution of disputes arising from economic transactions in the internal market;
- Contribute to the objectives of the Digital Agenda for Europe, by boosting consumers and businesses' confidence and removing barriers to cross-border electronic commerce;
- Develop innovative ICT solutions to achieve interoperability and enhance the efficiency, effectiveness and user-friendliness of ADR and ODR services in the participating Member States;
- Lay the foundation for a methodology to encompass other Member States not directly involved in the pilot, independently of the state of development of their ODR systems;

- Contribute to the development of standards on ODR, in liaison with appropriate standard organisations.

Instrument and funding level:

Instrument: CP (close-to-market, large-scale pilot, Pilot A), Funding level: 50%, Budget: 10 million, Timing: Call 2014

8. – Business model innovation

Specific challenge:

Technologies as such do not have a specific value. Their value is determined by the business models used to bring them to a market. The return on Europe's investments in technology and process development therefore depends not only on the overall framework conditions for innovation and entrepreneurship, but also on effective business models.

However, in particular small and medium sized companies lack awareness and tools to innovate their business models. Against this background, the challenge addressed by this topic is to facilitate innovation in business models and allow a maximum number of companies to innovate their business models.

Scope:

A business model describes how a company communicates, creates, delivers and captures value out of a value proposition. Current thinking summarises the functions of business models as: articulating the value created for users by the offering; identifying a market segment; defining the structure of the value chain required and the position of the firm in this value chain; formulating the competitive strategy.

Innovation in business models mainly comes from new activities (content), new linkages between activities (structure) and new partners (governance). Inspiration for business model innovation can come, for instance, from business models developed in other business sectors (transfer) or from analyses of patterns in business models (system). The successful implementation of business model innovation depends notably on new knowledge how it happens, access to this knowledge and the capacity of companies to adjust their existing business models.

The project should therefore focus on:

- advancing existing knowledge about business model innovation, e.g. by identifying patterns, analysing the potential of transfer across sectors and EU member states;
- making this knowledge easily accessible;
- developing mechanisms how to adjust the knowledge to individual companies, and
- reaching out, possibly via existing channels, to a maximum number of SMEs.

Due attention should be given to the gender dimension in developing business models. The project could be targeted to specific sectors as long as it includes the transfer of business models across sectors. The project should aim to turn into a self-sustainable platform after the end of the EU funding.

Expected impact:

As a result of the project, the understanding and awareness of business model innovation will increase. SMEs will examine and change their business models, adopting solutions that increase their competitiveness.

At least 10% of Europe's 20 million SME should be reached, including the micro-enterprises with up to 10 employees and achieving a broad geographical coverage across the European Union.

At EU level, the project will increase Europe's attractiveness for innovators and contribute to the overall objectives of Innovation Union.

At company level, it will help companies to develop new or strengthen existing business models and thus grow in terms of jobs and turnover.

Instrument and funding level:

Collaborative project, EUR 3.0 million, Timing of call 2014.

9 – European Women Innovator competition

Specific challenge:

Europe urgently needs more innovators to stay competitive in the coming decades and to provide for economic growth. In face of the demographic development of the European continent, Europe can no longer afford to leave unused the greatest untapped pool of innovative entrepreneurs, the European-based women researcher. The large number of well-educated women researchers who, for various reasons, including lack of awareness, do not consider entrepreneurship as an option, represents a tremendous untapped pool of innovation. The mobilization of these talents will be of utmost importance for the accomplishment of the Europe 2020 strategy goals of delivering smart, sustainable and inclusive growth. Awards have a strong potential to drive innovation through the recognition of achievements and the promotion of role models. Therefore, the European Commission has created 2011 a Prize for Women Innovators to increase public awareness of this issue and to encourage women to exploit the commercial and business opportunities offered by their research projects and become entrepreneurs. The Commission calls out for proposals to innovative approaches to continue the competitions while increasing outreach and impact.

Scope:

After the success of the forerunners of the competition in 2011 and 2013, the Commission continues its drive to spotlight women researchers who have brought about outstanding innovations to the market. The Commission intends to award up to three "Prize for Women Innovators 2015" following a European-wide contest. The prizes are addressed to women who have founded or co-founded a

company and who have at some point of their careers benefitted from the EU's research framework programmes or the Competitiveness and Innovation Framework Programme. The prizes will not reward research or innovation proposed for the future, but results that have been already obtained by the contestant.

Expected impact:

The prizes will both boost the public awareness of the contribution, potential and importance of women researchers to entrepreneurship and will encourage entrepreneurial women themselves to become innovators. Although women are more and more active in research, there are still too few women creating innovative enterprises. This represents an untapped potential for Europe which needs all its human resources to remain competitive and find solutions to the great challenges that we are facing. The prizes will therefore help to achieve the objectives of the Europe 2020 Strategy.

Instrument and funding level:

Grant for support action, Timing of call 2015

Indicative Budget: EUR 1 million

10 – European Prize for Innovation in the public administration

Specific challenge:

The public sector accounts for half of GDP in the EU. It is an essential part in the economy. Europe needs to mobilise innovation and modernisation in its public administrations to stay competitive and to provide for economic growth. European Public Administrations need to become an integral part of the innovation ecosystem. Awards have a strong potential to drive innovation through the public recognition of achievements and the provision of role models. The European Commission therefore will reward for the second time the most innovative and forward-looking public initiatives across Europe to leverage and induce further innovation and excellence in Public Administration. The positive experience with the first awards in 2013 proved the need for such a prize. The European Commission is calling for best proposals how to further run and implementing the European Prize for Innovation in Public Administration and leverage Innovation in the Public Sector across Europe.

Scope:

The awards are addressed to all level of local, regional and national administration. The initiatives have to be successfully running at the time of submission and be or have the potential to be 'game-changers'. The lifetime of the initiative must have been long enough to present a first impact assessment of the created value of the initiatives to the Commission. The winning initiatives must have a strong potential for scaling up or replicability in other European contexts and help to create an innovation ecosystem.

Expected impact:

The awards will showcase vision and innovation in the public administration by giving visibility to the most dynamic, forward- looking and innovative public administrations and their initiatives. Their

example should be used as role models for other public administrations in Europe. Since the winners' innovative initiatives will have a strong potential for replicability and scaling up, it will inspire other public administrations to try out new approaches of smart public spending. Furthermore, the awards aim to challenge persistent negative stereotypes. By awarding the European Prize for Innovation in Public Administration we will increase citizens' expectation for excellence in public administration in Europe.

Instrument and funding level:

Grant for support action, Timing of call 2015

Indicative Budget: EUR 4 million

Other actions – New Forms of Innovation

In addition to the topics addressed in the call for proposals "New Forms of Innovation", the actions under this part further encourage and support innovation, through studies and through prizes, including to innovative cities, social innovators, and for eGovernment applications.

1– ICITY – European Capital of Innovation

Specific challenge:

With their capacity to connect people, places, public and private actors, urban areas can substantially enhance innovation in Europe. This award will aim to provide European level recognition to those cities that make the most to promote innovation within their communities and thereby improve the quality of their citizens' lives.

The topic will address the challenge of fostering innovation through actions at city level, by acknowledging innovative solutions to build up an innovation ecosystem and ideas to further expand and scale up these initiatives, thereby leveraging and inducing further systemic innovation in cities.

For the purpose of this award, cities are considered as a whole system, including built environment, municipal authorities and citizens, organizations and public structures, as a platform capable of facilitating the growth and development of creativity and innovation in its different meanings.

Applicant cities will compete under categories (see eligibility criteria, [link to eligibility criteria](#)).

The actions will include innovation activities, scaling up past or on-going achievements, thus contributing to the city's innovation ecosystem, European policy implementation or innovation capacity building, as well as support activities, such as planned events and the setting up of a dedicated Coordination Unit to coordinate and communicate innovation activities.

The proposals should be focused on:

- Developing an effective innovation ecosystem that captures the five I's of an innovative, inclusive, inspiring, interactive and integrated city;
- Identifying a specific future oriented challenge relevant for the city and putting in place mechanisms to solve the challenge in the year of the award.

Expected impact:

At the European level, the award will illustrate the commitment to innovation at the city level and to establishing a network of iCities that can inspire and share best practice with other cities in Europe and act as innovation ambassadors further afield. At the city level, the first impact will be the recognition of successful innovation policies within a city which raises the profile of the team and the political leaders that have developed and implemented these policies. Secondly, the award will help the city open up connections with other cities that would wish to learn from the city and analyse which policies and activities could be transferable. This will allow the city to attract international

interest in its activities. Thirdly, the prize should encourage and contribute to enabling the city to develop new innovation activities made possible only by the access of funding from the prize and by attracting investors, industry, top class researchers as well as talented and entrepreneurial individuals and so strengthening the innovative potential of the city in general.

Instrument and funding level:

2 prizes of EUR 1.0 mil each will reward the two winners, one for each of the two categories identified above.

Date of publication of the contest: July 15th 2015

Date of opening of the contest: July 15th 2015 at 12:00:00 Brussels local time

Deadline to submit applications: October 30th 2015 at 12:00:00 Brussels local time

Indicative budget: EUR 2.0 million from the 2015 budget

Eligibility Criteria:

1. The candidate cities must be established in an EU Member or in Associated Country and are entitled to apply only to one of the two categories: a) cities with a population up to 100,000; b) cities with a population over 100,000.
2. The submission consists of a complete application.
3. The achievements must relate to completed or on-going initiatives started after 1st January 2013.
4. The achievements have not been previously awarded with a monetary prize by an EU institution.

Award Criteria:

The following criteria will be applied to judge the achievements and the intended scaling up activities:

- Innovative – in terms of concepts, processes and tools
- Inspiring – attracting talent, funding, investment and ensuring citizens' involvement and engagement
- Integrated – covering the entire innovation ecosystem and its links with Europe 2020
- Interactive and inclusive – facilitating the interactions in the innovation ecosystem

2 – European Social innovation Competition

Specific challenge:

Social innovation designates new or improved solutions which have a social means or a social outcome. While there is no shortage of good ideas in Europe, social innovations are not yet producing the impact that they should. This is a missed opportunity because social innovation could bring solutions to social needs or societal challenges. But it also represents a source of jobs, markets and business opportunities which is not yet exploited enough, despite the acute needs evidenced in Europe currently and in the long term. Approaches that have clear advantages over current practices need to be supported at the early stage, scaled up and disseminated.

A prize competition for social innovators meets various objectives in this regard:

- it stimulates entrepreneurship and rewards applicants upon concrete results;
- it lowers entry barriers and therefore encourage some applications from social innovators which would not participate in other H2020 calls;
- it may include a coaching component to improve the maturity and feasibility of projects along the competition process;
- the prize operates as seed money and, combined with the exposure the competition offers, it can attract public funders, private investors and incubators;
- it draws media attention and widely raise awareness about the benefits offered by social innovations.

The first European Social Innovation Competition in 2012-13 proved a success and it is proposed to continue for 4 more years along the principles listed above.

The competition should be as open as possible to stimulate social innovations from individuals and any type of organisations (for-profit and not-for-profit), with the only exception of public authorities.

The specific topic(s) of the competition should be decided on a yearly basis.

Requirements for applicants may be increased along the competition process to ensure ideas are turned into potentially impactful and sustainable projects. The competition may touch upon various challenges and comprise different categories (e.g. 'inducement' and 'recognition') to reward projects at various stage of implementation. The competition should be accompanied by a call for tender for logistical support, communication and a mentoring/coaching scheme. The communication around the competition should stimulate applications from all European countries and from all categories of stakeholders. It should also serve the purpose of encouraging public/private funders to support those ideas.

Expected impact:

The winning ideas are directly supported with prize money but more projects will benefit from coaching, mentoring, peer-to-peer review, networking, exposure and media attention. It is expected that not only the winning projects but also other participants will find the necessary support to

implement their social innovation ideas, thereby addressing unmet social needs and creating jobs locally.

At EU level, the media exposure and political recognition for social innovators should encourage other entrepreneurs and organisations to realize social innovations. By stimulating social innovators to realize their ideas, the topic contributes to the Innovation Union Initiative.

Instrument and funding level:

Prize. The competition will also require service contract(s) for the organisation of the competition, the coaching activities and related communication.

Eligibility Criteria: be established in eligible countries (EU Member States and countries eligible to Horizon 2020) – individuals and non-profit/profit organisation may apply

Award Criteria: (i) innovativeness, (ii) potential for systemic change (impact, scalability), (iii) potential for sustainability

Date of publication of the contest: October 2014

Date of opening of the contest: October 2014

Deadline to submit applications: December 2014

Indicative budget: 1.5 million euros

3 - Support measures for ICT-driven public sector innovation

a) Studies:

A series of support activities addressing economic and social analysis of different topics concerning ICT-driven public sector innovation will be launched. The themes to be addressed are:

- Analysing how take-up of the solutions by businesses and citizens can be improved and which new ways of communication and marketing would have to be used.
- Cost-benefit analyses of the new generation of eGovernment services and how public administrators can become agents of innovation through ICT
- International cooperation; e-government cooperation beyond the EU

b) Organisation of prizes for new, innovative mobile e-government applications (public procurement)

The activities linked to the organisation of running this prize competition include amongst others specifying the evaluation categories, the selection of a jury, the organisation of the submission of applications, the evaluation, award ceremony (possibly combined with an existing event) and awareness raising.

Funding scheme: Public procurement

Indicative budget:

EUR 0.4 million from the 2014 budget

EUR 0.1 million from the 2015 budget

4 - Prizes for new, innovative mobile e-government applications

This action complements the call for proposals under "New Forms of Innovation" in the area of "Personalised public services and M-government".

The actions foresee the following:

- Dynamic user interfaces, user-centric configuration and ubiquitous services provided on a variety of mobile devices (open eGov Apps for mobile devices);
- The aim is to stimulate the use of new services (on any platform) utilising new web technologies such web 2.0 and 3.0, preferably coupled with public data;
- Cross-border dimension, sustainability and multi-lingualism are to be considered;
- The rewards can be in one of the following categories:
 - Best transaction service (Service App)
 - Best information tool (Information App)
 - Prize awarded by the public
 - Best catalogue of eGovernment apps
 - Best demonstration of EU benefits.

Expected impact:

- Stimulating the creation and use of new services utilising new web technologies, coupled with public data
- Offering new services using open public data and services on a variety of devices
- Identification and exposure of the best e-government applications

Funding scheme: Recognition Prize.

Eligibility criteria: The candidates must be established in one of the eligible countries (EU Member States and countries eligible to Horizon 2020); individuals and non-profit/profit organisation may apply

Award criteria: (i) innovativeness; (ii) impact; (iii) sustainability

Date of publication of the contest: Q3 2014

Date of opening of the contest: Q4 2014

Deadline to submit applications: Q1 2015

Indicative budget: EUR 1 million from the 2014 budget

Call 11 – Digital empowerment of citizens

This call aims at promoting societal inclusion in all areas of life and all ages as well as participation in 21st century digital society - increasingly relying upon creativity and innovation - by supporting interdisciplinary research and technological advances and new forms of collaboration and co-creation. Research shall support the implementation of the Europe 2020 strategy, the Digital Agenda for Europe as well as other relevant Union policies.

1 - Stimulating the use of ICT to facilitate the social & economic integration of excluded citizens

Specific challenge:

The current achievements on the area of e-Inclusion and e-Accessibility are clearly lagging behind the target set out in the Riga Declaration (2006), presenting a risk of not reaching the target of the Digital Agenda. Currently 110 million European citizens – the elderly (aged 65 and above), unemployed and low educated, migrants, people in need of care, people living in remote or poorer areas, persons with disabilities, homeless – are at the risk of digital exclusion, consequently, socio-economic exclusion.

Scope:

Proposals should address one of the following issues:

- a) Novel interfaces/technologies/services that would make a real change in the life of a large number of targeted excluded groups, enhancing their better integration in society. Activities include the development of innovative solutions targeting the needs of disadvantaged groups and people with disabilities, testing & providing accessibility by design and assistive technologies through research on innovative interfaces and artefacts, including BNCI.
- b) Open, massive scale, digital solutions to provide citizens at risk of exclusion with the necessary support, including digital skills, to enhance their employability and facilitate their smooth integration into society. Activities include works on skills recognition (badges) through smart and business intelligence applications, especially targeting disadvantaged citizens.
- c) Digital games for empowerment and social inclusion, including the accumulation of scientific evidence of their effectiveness for specific target groups or problems. Activities include the development of indicators and benchmarks for impact measures as well as the identification and sharing of good practices.

Expected impact:

- Novel accessibility solutions for user groups at risk of exclusion and people with disabilities, enhancing their social inclusion.
- Enhanced mechanisms for skills acquisition and validation, particularly for employability of people at risk of exclusion.

- Increase the effectiveness of digital games for professionals and researchers, intermediaries and social actors dealing with people with disabilities.

Instrument and funding level:

For a) Collaborative Projects (100%) – single stage

For b) and c) Collaborative Projects (70%) – single stage

EUR 50 million; timing: 2015

2. Coordination Action for the Joint Programming Initiative (JPI) "More Years, Better Lives - the Challenges and Opportunities of Demographic Change"

Specific Challenge:

Following the implementation of the actions foreseen by the Commission's Communication on Joint Programming to tackle Europe's major societal challenges, the Competitiveness Council has welcomed the progress made by EU Member States in Joint Programming Initiatives (JPIs) launched so far. Several Council Conclusions on Joint Programming¹⁷ invite the Commission to support JPIs via Coordination and Support Actions.

The JPI "More Years, Better Lives - the Challenges and Opportunities of Demographic Change" enhances coordination and collaboration between national research programmes related to demographic change. It enables Member States to pursue common visions and a strategic research agenda on demographic change.

In this specific challenge, coordination and support is sought for the implementation of the joint programming pursued by national governments in research and innovation.

Scope:

- Coordination of exchange on national programmes on Demographic Change in relation to the JPI MYBL
- Facilitation and management of an effective governance of the JPI
- Mapping and on-going update of national research activities in the area
- Support for the coordination of research activities addressing demographic change
- Support for the implementation of a Strategic Research Agenda of the JPI MYBL, Coordination and organisation of potential joint calls
- Alignment of national research programmes and activities to the JPI's Strategic Research Agenda

¹⁷ Council Conclusions of 12 October 2010, of 26 November 2010 and of 8 December 2011

- Support in harmonization, integration, and enhanced accessibility of national data related to active and healthy ageing, demographics, and statistics, to enable evidence-based policy making and effective cross-policy actions
- Dissemination and awareness actions

Expected impact:

- Effective governance and support to the implementation of the JPI MYBL
- further strengthen the international dimension of the JPI to be addressed by ensuring coherence with other relevant international initiatives
- Better coordination of research programmes in demographic change
- Alignment of national research programmes and activities with the JPI's Strategic Research Agenda and coordination with Horizon 2020 objectives
- Avoiding unnecessary duplication of research and infrastructure investment at national level
- Fostering a transnational, multi-disciplinary approach in order to provide solutions for the upcoming challenges in demographic change and make use of the potential of societal change in Europe
- Facilitating implementation measures based on the Strategic Research Agenda of the JPI

Instrument:

Coordination and Support Action

EUR 2 million; timing: 2014

3 - ICT for a more creative and innovative society

Specific challenge:

The challenge is to integrate those societal and technology drifts and to better explore the complex and elusive phenomenon of creativity that organisations put significant effort and resources into fostering, rewarding, retaining, and reproducing on demand. Research should include ICT, cognitive and social sciences and be focused on integrative strategies and environments to improve creative processes, measuring and understanding human behaviour during these processes in order to assess and maximise their effectiveness.

Scope:

Proposals should address one of the following issues:

- a) research on understanding how social innovation and creativity may lead to change in existing structures, practices and policies and how they can be encouraged and scaled-up. Interaction design and new software should be developed to support people in their creative activities. They should be

user-centred and user-driven in terms of usability, functionality or interface design, facilitating experimentation and adoption, using approaches such as social data mining and machine learning, crowdsourcing and analytics, in order to channel interaction among creators and large user communities.

b) systems to involve end-users and costumers in the design, production and delivery of products and services. Research should address the entire production chain and the relation creator/user. The objective is to unlock social creativity and access the collective intelligence of large user communities via idea exchange and group interaction. The proposed technologies should contribute in a substantial way to reduce time to market and overcome the existing limitations of space, interaction modalities, versioning and asset management, involvement of end-users for feedback and bridging the gap among designer, producer and costumer.

Expected impact:

Breakthrough/novel concepts supported by innovative technologies and tools to allow professional and all users being more creative in a large variety of configurations.

Contribute directly to creativity in the professional context by enabling both new kinds of outputs, more effective collaboration and mechanisms to overcome barriers hindering innovation.

Instrument:

Collaborative Project (100%) – Single stage

EUR 20 million; timing: 2014

Societal Challenge 7 – Security

The European Strategy for Cybersecurity highlights a set of actions to be implemented by the European Commission to "...develop the industrial and technological resources for cybersecurity...", "... promoting a Single Market for cybersecurity products...", and "... fostering R&D investments...". This call will be one of the instrument to reach these aims.

Cyber-security is a multi-faceted issue (involving critical economic and civilian stakes; cybercrime; defence; human rights protection; norms of behaviour). The proposed activities in this domain address the economic and societal dimension of security in the digital ecosystem, for the purposes of ensuring the well-functioning of the internal market. This work contributes to the efforts being done in the other areas relevant to cyber-security.

Securing the digital society must be our central concern. It entails preventing cyber-attacks on any component of the digital society (networks, access devices, IT services, ...) no matter what their nature or origin; as well as protecting physical (e.g. critical infrastructures) or intangible assets (e.g. finances, intellectual property, privacy). As a consequence this call addresses the technology to secure the infrastructure (e.g. networks), hardware (e.g. access devices), services (e.g. cloud computing), components (e.g. RFID), software (e.g. operating systems, web-browsers), etc... against accidental or malevolent use. As cybersecurity is cross-domain the call will provide cybersecurity whatever the application or domain (mobile, eCommerce...), or societal challenge (e.g. health, energy, smart cities, ...).

This Objective will thus focus on demonstrating the viability and maturity of state-of-the-art security solutions with the intention that after this validation phase they will find a wide up take in the market. Proving that the security concepts, processes and solutions work in a real life environment, in large scale demonstrators and directly involving end users who would ultimately benefit the most from the outcome, should increase the prospects for an ICT security market and demonstrate the validity and effectiveness of security. This in turn will reduce the risks of a negative economic impact due to a cyber-incident.

1. Privacy

Specific challenge:

Privacy is a major concern for online users. An overwhelming majority of online users is reluctant to disclose personal information online because of privacy concerns. Personal data has become an economic asset, but it is not the owners, i.e. the users, that control or monetize it. This is in the hands of the service providers whose business case is often built on the exploitation of the personal data they collect (e.g. social networks, search engines, online retailers, cloud hosting services).

Therefore, despite the existence of a data protection and privacy framework in Europe service providers are reluctant to respect the rules or implement them in a user-friendly way as this would harm their business case. There is also a lack of enforcement of the rules. As a consequence, users have either no choice, or difficulties in exercising their rights. Either way, users are deprived of the economic benefit derived from - the exploitation of their personal data. As the economic value of their data is obscured, users are not able to evaluate the value of their data relative to the value they assign to a "free" service. That indicates a market failure. Moreover, the user has no control over what happens with his data, e.g. he cannot verify the data is not passed on to 3rd parties.

Scope:

The focus is on the development of solutions to protect individuals' privacy by default while empowering the users to themselves set the desired level of privacy, based on a simple to understand visualisation of the privacy level, giving him control over how his data will be used by service providers, and making it easier for them to verify both whether their online rights are respected and if they get a reasonable bargain. Systems will either have to automatically detect the privacy settings, or the data will have its privacy settings permanently associated to it by the user.

Activities can include the investigation of preventive measures to safeguard privacy in the context of mass data handling, for example for services exploiting big data, cloud services, data sharing by interconnected devices in the internet of things, and data handling in the highly sensitive context of criminal investigations.

Where relevant, actions can be proposed to apply privacy-by-design frameworks for a range of different applications to promote the usage of privacy enhanced technology.

Expected impact:

Support the practical implementation of the legal obligation for prior consent; the identification and implementation of privacy by design architectures. Increased user trust online. Generate positive business cases for online privacy.

Form of funding:

CP, Funding level: 70%

Specific call year:

This topic is part of the call for 2014

2. Access Control

Specific challenge:

Security includes granting access only to the people that are entitled to it. Currently the most widespread approach relies on passwords. Managing the passwords has its limits and poses a challenge to the user, which adds additional vulnerabilities. Common practice is to use the same or similar password, which increases significantly the risk should the password be broken.

Scope:

The focus is on the development and testing of usable, economic and privacy preserving access control platforms based on the use of biometrics, smart cards, or other devices. The solutions are to be installed and tested in a broad band network, giving access to smart services running over networks with state-of-the-art security, avoiding single points of failure. Proposed work should include the management of the access rights in particular for the service providers, ensure the security and privacy of the databases, facilitate a timely breach notification and remediation to the user, and reduce the insider threat.

The proposed solutions have to guarantee interoperability and portability between systems and services, sparing the user to have to install a platform, service or country specific technology.

Proposed work could assist the objective of implementing a secure information sharing network.

Expected impact:

User-friendly secure access to ICT systems, services and infrastructures. Increased protection of online services and critical infrastructures. Consumerisation of devices for access control. Creation of commercial services making use of electronic identification and authentication.

Form of funding:

CP, Funding level: 70%

Specific call year:

This topic is part of the call for 2014

3. Secure Information Sharing

Specific challenge:

A lot can be gained by exchanging information on vulnerabilities, incidents or attacks. For this reason, the proposed Directive on Network and Information Security (NIS) is imposing obligations to share and report information on major incidents and the NIS public-private platform will discuss, among the other things, best practices on information sharing and incident coordination thereby complementing and underpinning the implementation of the Directive. However, at the moment the private sector and the national relevant security authorities are reluctant to share information unless they have a system and counterparts they can fully trust.

A variety of sources of information for incidents or vulnerabilities exist. For example, some business sectors have set-up a sector specific information sharing; large service providers, network operators and antivirus companies monitor attacks and exploits on their infrastructure and on the user systems; CERTs are providing services, ... However, those sources are rarely integrated or are not interacting by exchanging information between them.

Scope:

This objective goes beyond preserving the confidentiality of a point-to-point communication. It rather encompasses the development and implementation of a network for secure sharing of sensitive information, like a network of NIS competent authorities, law enforcement agencies, business sectors and end users. Where appropriate it will link existing networks and incident sharing platforms, making to the largest extent possible use of existing infrastructures and determine the cooperation mechanisms between industry and public authorities such as EC3, CERT's, law enforcement agencies, etc....

The network should be a multi-layer security network, permitting different levels of access over the same network sharing the relevant information between the different stakeholders with different security requirements. The network should provide additional functionalities like traffic monitoring and analysis, intelligence and trend analysis, managing trust in architectures comprising untrusted components, trust management over the whole data lifecycle, technical support to compromised users (in particular SMEs), automated and secure responses to threats and incidents, decision support to select and engage appropriate counter measures, facilitate the communication of security warnings from public authorities to business (including SMEs) and end-users.

Several pilots will be supported, for different application areas. The selected pilots will have to engage with the NIS platform, contribute to its objectives and take due consideration of its recommendations.

Expected impact:

Operational information sharing between the public and private sector. Building trust between the public and private sectors. Reduced impact of incidents. Increase the level of preparedness of SMEs. Faster response to incidents and/or vulnerability through faster sharing of information and an enlarged source of information.

Form of funding:

CP, Funding level: 70%

Specific call year:

This topic is part of the call for 2015.

4. Trust eServices

Specific challenge:

The implementation of trust eServices in specific applications areas like health, public administration, eCommerce includes the provision of electronic signatures, e-seals, timestamps or certified electronic delivery. The deployment and widespread adoption of these eServices is hampered by the lack of globally interoperable solutions, mutually recognized or compatible trust models and the absence of solid business cases for the reliance on electronic signatures, e-seals, timestamps or certified electronic delivery. In addition, the impossibility of transparently assessing the security assurance and trustworthiness of such eServices, in particularly when coming from third countries makes it difficult for citizens and businesses to confidently rely on them.

Scope:

The objective is to devise demonstrators for the automated comparison and interoperability of electronic trust services covering aspects such as security assurance levels, operational security audits, state supervision systems, data protection regimes or liability of trust service providers. Solutions should rely on state-of-the-art technology, interoperability linking existing electronic identification and authentication systems, taking into account different jurisdictions. Key elements of the initiative will be the differential assessment of technical and organisational standards for trust services, as well as the development of a framework for 'global trust lists'.

Validation platforms able to handle the specificities of various jurisdictional or national systems could be created to provide easy to understand assessments of the trustworthiness of any given trust service.

Expected impact:

Demonstrate a positive business case and the economic value for the use of and reliance upon trust eServices. By paving the way for global interoperability of trust eServices, the initiative should contribute to empower and protect users in their digital experiences like e-contracting, e-bidding, e-invoicing or accessing social networks. The initiative should create the conditions for more commercial applications and services to integrate the use of e-signatures, timestamps, e-seals and certified electronic delivery. Enhancing the trustworthiness of electronic transactions will ease the dematerialisation of processes, reduce administrative overhead for citizens and businesses and, last but not least, facilitate higher availability of eGov services.

Form of funding:

CP, Funding level: 70%

Specific call year:

This topic is part of the call for 2015

5. Risk management and assurance models

Specific challenge:

The ability to assess, manage, reduce, mitigate and accept risk is paramount. The dependence of networks and information systems, that are essential for the functioning of our societies and economies (including Critical Infrastructures), on public communication networks and off-the-shelf components is an additional risk. However, in the area of cybersecurity, recent developments and trends render traditional (i.e. static and iterative) risk management methodologies ineffective and rapidly obsolete.

Moreover, the proposed Directive on Network and Information Security will impose risk management obligations for cybersecurity for several business sectors. There are however no generally accepted best practices guidelines for risk management, nor a consensus on the minimal requirements for the market actors concerned, neither at a sectorial, nor at cross-sector level. For this reason, the NIS public-private platform will seek to identify best practices on risk management, including information assurance, risks metrics and awareness raising.

Also, although the NIS Directive does not impose risk management obligations on software developers and hardware manufacturers, it is essential to ensure that a risk management culture is well-established in those components of the value chain.

Scope:

The proposals should implement a pilot to demonstrate the viability and scalability of state-of-the-art risk management frameworks. The risk management framework will have to encompass methods to assess and mitigate the risks in real time. Work should include a socio-economic assessment to evaluate the cost-benefit of implementing the framework. The framework should be dynamic, continuously adapted to new ways of managing risk to keep up with the ever evolving threat and vulnerability landscape. New ways of dealing with the security risk resulting from on-demand composition of services and massive interconnectivity should be developed.

The work on risk management frameworks can be complemented with the development of tools to evaluate the risks and its impact on business, tools for preventive assessment of risk and trustworthiness of customers and providers, tools providing a simple view and understanding of a complex system, and tools to detect social engineering attacks.

Current assurance models and the resulting control and audit frameworks should be revisited. The applicability of the methods to the calculation of insurance premiums should also be investigated.

The selected pilots will have to engage with the NIS platform, contribute to its objectives and take due consideration of its recommendations.

Expected impact:

A risk management framework has to be put in place addressing not only legal requirements (such as imposed by the NIS Directive), but allowing the comprehensive comparison between the sector specific or national approaches, and providing an assessment on the residual risk. Facilitate the implementation of legal obligations on risk management and identify gaps in existing legislation.

Form of funding:

CP, Funding level: 70%

Specific call year:

This topic is part of the call for 2015.

6. The role of ICT in Critical Infrastructure Protection

Specific challenge:

Communication and computing networks are not only critical infrastructures on their own, but underpin many other critical networks (e.g. energy, transport, finance, health ...). In addition they are critically dependent on ICT technology. Therefore, the malfunctioning or disruption of the communication channel or of an IT system will have a cascading effect, on several other infrastructures or services that depend on it, potentially across all Europe.

Many vulnerabilities of critical infrastructures, including the communication networks, stem from the fact that ICT systems are deployed in an environment or for an application that it was not designed with security in mind. The deployment of ICT in new critical systems, including new generation ICT system, is exacerbating the problem by constantly introducing new risks and vulnerabilities, in particular for an interconnected system.

Scope:

Proposals should investigate the dependencies on communication networks and ICT components of critical infrastructures, analyzing and mitigating the criticalities, developing tools and processes to monitor the propagation towards the critical infrastructures of an incident occurring in the ICT layer, and develop self-healing mechanisms. ICT should be protected or re-designed at the software level, but also at the physical level, leading to more robust, resilient and survivable ICT infrastructure.

Based on the outcome of the work described above, plans of how to retrofit state-of-the-art security into networks can also be addressed.

The investigated concepts have to be tested in a field trial. Trials will have to distinguish between generic solutions and solutions specific to the critical infrastructure (e.g. health, finance, energy, transport, ...) they are applied to.

Advantage will be taken from the fact that ICT operators (e.g. telecom operators) have experience in securing information networks and this competence can be applied to new types of networks such as smart grids linking communication, energy and transport networks.

Expected impact:

Resilient and robust communication networks offering a reduced attack surface to the supported critical infrastructures. Reduced criticality of ICT components installed in critical infrastructures. Increased preparedness, reduced response time and coordinated response in case of a cyber-incident affecting communication and information networks. Reduce the possibilities to misuse ICT as a vehicle to commit cybercrime or cyber-terrorism.

Form of funding:

CP, Funding level: 70%

Specific call year:

This topic is part of the call for 2014