European industry call for a focused ICT Initiative on "Network and Information Systems" in Horizon 2020: A Bright Future for Europe

The European Telecom, IT, Media and vertical industries welcome the Horizon2020 framework programme and its approach to combine basic, technology-driven and applications-driven research in one coherent programme to maximise the achievements and impact as to facilitate the exploitation of results on a greater scale than previous programmes.

During the last 10 years, Europe has initiated and integrated most of the significant achievements in ICT such as the mobile expansion and the democratisation of access to Internet, but Europe has not always got the benefits in proportion to our contributions.

The clear statements of H2020 looking for European leadership as a direct result of this programme is very much appreciated by the ICT industry in this context. We agree that there is an opportunity now for the EU ICT industry to achieve a competitive advantage in the global marketplace by acting coherently to prepare the next generation of ecologically sensitive technologies and to lead the development of new innovative services.

We propose to assemble competences at a European level into a focused ICT initiative within Horizon2020 to develop the next generation of Network and Information Systems that will lead European business, government and society in to a bright future by 2020.

To get the maximum benefits for Europe, we propose that the ICT research should be focused on a limited number of "ICT Grand Challenges" where Europe has both strength and opportunities and to which the EU ICT industry is committed:

1. **To provide capabilities for Big Data and Innovative Services**
2. **To provide Fast, Reliable and Green Networks and Infrastructures**
3. **To provide an Inclusive, Trustworthy and Secure Digital World**

Addressing these challenges as part of a coherent research and investment strategy, that also promotes the usage and uptake of the results, is a recipe for success. The ICT industry shares the vision with the EC and is willing to be a proactive partner in developing and performing this programme and achieving the goals for Europe.

European leadership in Network and Information Systems will not only enhance the ICT industry but will also allow productivity gains in all other sectors, and thereby multiplying the GDP improvements from this investment.

Our Vision: 1. To provide capabilities for Big Data and Innovative Services

Big data value is based on advanced technology trends that will facilitate a new approach to understanding the world and making decisions. We now have lots of information; more than two zettabytes[1] of data worldwide[2], from people, social networks, mobiles, companies, authorities (Open-Data) which people want to share. When we merge this with the dramatically increasing information from "things" and sensors we are swamped with information. Lots of this data is unstructured. Europe needs intelligent systems that can process this data in real time and provide instant decisions. It needs new techniques to understand this data and identify the value in it; it needs entrepreneurs who will see the value to be found in processing big data. Much of this data will reside in the cloud and EU can expect more than 2 million new jobs linked to Cloud Computing by 2015.[3]

In the Horizon2020 timeframe, we foresee that a complete new value sector will emerge where many organisations, including lots of innovative SMEs and start-ups, will generate new knowledge and correlate this information in clever ways and will enable many business and societies to benefit. This will create many new jobs and add to European GDP. This development will be enabled by the holistic approach of developing and providing the necessary infrastructure in cooperation with the services and content industry.

Our Vision: 2. To provide Fast, Reliable and Green Networks and Infrastructures

The demands and needs for advanced networking will increase drastically in coming few years in line with the dramatic increases in the number of connected objects, the ever-increasing data rates, and the demands for pervasive and continuous access to information from users. Already many service models are based on immediate access to, and reliable streaming of, content to the point where personal copies are no longer needed, like in cloud computing. This makes users' behaviours strongly network-dependent.

The future networks will have to support very demanding connectivity characteristics (immediate, ubiquitous, reliable, secure…) and to support connectivity with smart mediation. New roles will emerge such as: infrastructure service provider, integrating network storage and execution services. In ten years from now, the network infrastructures will be massively based on undedicated and programmable hardware that will offer

[1] Zetta = 10^{21} bytes
[2] IDC Digital Universe Study, sponsored by EMC, June 2011
[3] IDC white paper « Cloud computing's role in job creation »

resources for transport, routing, storage and execution on demand. Network provision will be based on innovative virtualization technologies.

Communication networks are increasingly becoming a critical infrastructure for society and the economy and investment must be prioritised on this basis. All of these new infrastructure aspects need to be designed, developed and implemented under an optimized architecture allowing the flexible provision of powerful network functions that meet the future social, industrial and market needs. This architecture and its components will have to be sustainable from both energy and cost perspectives, considering predicted and unpredicted network and traffic growths. A significant improvement in the overall network energy efficiency and reduced cost will have to be achieved.

Our Vision: 3. To ensure an Inclusive, Trustworthy and Secure Digital World

To be inclusive the digital world must have access points that even the most unfamiliar with new technologies can access and use the information on line, this requires new generations of user friendly intuitive interfaces and economical devices. In the same vein, these users must be protected and able to trust the services they access even if they have no concept of information protection. Universal management of identities and privacy rights must be ingrained in the systems at all levels.

Given these models of pervasive networks and ever more complex automated services gathering and processing data, there is a clear need for specific attention to security, privacy and trust so that all players in the new era are secure and their property is safe. The goal to enhance preparedness, strengthen the resilience of critical infrastructures, as well as to foster a cyber-security culture in the EU has been highlighted[4] for attention, but the range and quality of security measures needs to be dramatically scaled up to address the revolutions expected in data and networks and to protect the use of ICT for many critical infrastructures in our society and economy.

ICT – a most important sector….

ICT is pervasive throughout all sectors of the economy, and is itself now one of the largest and fastest growing sectors of the European economy

The ICT sector represents 12 million jobs in Europe and generates between 5 and 6% of the EU GDP[5]. Even more important is that applied ICT is estimated to be providing 50% of all European productivity growth. In particular many new jobs can be created in secondary sectors of the service industry through the deployment and use of advanced ICT services and networks. Therefore, the general availability of connectivity is not only an essential requirement for further economic growth, but it is probably the unique investment that can be made today that has the potential to improve the productivity of all other sectors and restore growth to the European economy.

Setting the European ICT focus in the right way so that the needs of European key industries, like smart grid, smart cities, factory automation, environmental technologies, automotive industry, and aerospace industry, are addressed will ensure the sustainability of these European industries' businesses.

Considering the magnitude of this economic sector Europe should act to remain among the top players in the network and information systems domain.

The need to act….

The pace of development in the ICT sector is very fast and still accelerating. The race for the next generation of networks and information systems has started worldwide and Europe should act now to maintain its pole position and for both economic and security reason to stay in control of such a strategic sector. The impact must be maximised through strategic focusing of the ambitions, if we are to achieve the progress in the facilities and capabilities necessary for the future generations of Europeans to be connected, digital and successful.

We must plan for giving citizens reliable superfast ubiquitous access to intelligent and adaptable ICT services that will enhance their personal and professional lives. This plan should also address how the innovations in ICT can be integrated into the processes of just about every other sector while achieving economies of scale and efficiencies in the use of resources and infrastructure. We must enable M2M interaction at large by further developing the required fundamental technologies in the ICT arena.

Clearly this is a very significant challenge and it needs to be tackled from a holistic perspective by taking into account all building blocks from people, services and applications down to the infrastructures (networks and information systems). This needs a multidisciplinary approach led by strong European industrial stakeholders, supported by academia and innovative SMEs, to develop the devices, networks and services required to support the digital society and economy. We need an extensive exchange between the stakeholders from all the different domains – ICT, energy, automation, logistics, healthcare, … – achieving a clear mutual understanding on each other's needs and setting up joint projects targeting exactly these needs.

This will significantly boost not only the European ICT industry but also all other European industries relying on ICT infrastructures. This has been started in the context of the FP7 FI-PPP already by working towards extensive trialling and needs to be continued and significantly extended by working on new networking paradigms and technologies.

[4] Press Release "Commission consults on a future EU Network and Information Security legislative initiative"
[5] EU press release Reference: IP/09/397 Date: 13/03/2009

Expected impact of the initiative …

An initiative of this type can have impacts on many different levels. The industry recommendation here is to link our ambitions with measurable performance indicators so for both the participants and the EC the success of the initiative can be documented. Our expectations are that it will reinforce and boost the competitiveness of enterprises and administrations, create new economic opportunities, while empowering innovators and citizens to benefit from European ICT developments.

These ambitions have yet to be prioritized and quantified, but typical targets could be:

- To reinforce the European leadership in Network and Information Systems
- To attain European leadership in uptake and use of ICT technologies
- To advance the communications infrastructure in Europe
- To strengthen the software and service development industries in Europe
- To be the global leader in the "Big Data" economy and services
- To grow the European GDP

Ms. Kroes, EC commissioner for the Digital Agenda reflected this potential impact on GDP when she said in Rome in April 2012 that: *"Investing in Information and Communications Technology pays off: ICT offers a bigger return than most other capital investment. No wonder it already represents half Europe's productivity growth."*

In terms of key performance indicators that could be used to measure progress we can monitor the European GDP share coming from ICT, the employment levels in the ICT industry and related sectors, the capabilities of network infrastructure on offer in Europe, the uptake and use of such advanced capabilities, and then some social/societal parameters could be measured including quality of life, optimization of work/private life balance, average health levels, environment and ecological impact just to name a few.

In some of the areas we can get more specific for example in network infrastructure the goal could be **5G**^{2} where this means **5**th **G**eneration mobile and **5 G**igabit home connectivity being specific targets of the work on networks and infrastructures.

European Industry calls for:
a specific initiative on Network and Information Systems within Horizon2020

This call from the Telecom, IT, Media and vertical industry in Europe is to establish a pan-European partnership between the public and the private sector to align the research activities on Network and Information Systems within Horizon2020 with a clear strategy, based on measurable goals, . Our recommended approach is to combine the interests of the European Public authorities with the Industry objectives in a coherent use of available resources. The ambition is to guide research and innovation energies to achieve the maximum impact and the highest possible return in terms of the competitiveness of European industry and the benefits to European society.

The scale of the challenge requires **an advanced model of a Public Private Partnership**. The industrial commitment and investment will be such that it must be allowed to share the responsibility for the continuous assessment and refocusing of the programme between the public and the private sector that will be necessary in any programme that takes a short to medium term perspective in such a fast moving industrial sector.

We must use and leverage in a consistent way all the instruments at our disposal: shorter term R&D PPPs, medium-term cooperative IPs and STREPs, CIPs Pilots A & B, and the rest in a managed way to define the full innovation trajectory for the three ICT Grand Challenges, and consequently to attain the best results. This means having clear goals for each activity and an awareness of how they contribute to the holistic view of creating the digital Networked Society.

This partnership will stimulate the acquisition and motivation of competences and capabilities within Europe to address the three ICT Grand Challenges and the related societal challenges, while integrating the related issues of accessibility, availability, interoperability and ecological impact. The partnership will accelerate the development of industrial technological expertise while shortening the time to market of innovative services and solutions. In effect, this initiative will enable whole new application sectors and increase European competitiveness through increased employment and GDP growth.

Not Just ICT…

Our vision of a new partnership also envisages that we bring the applications sectors and the ICT sector together to work out common solutions from an end-to-end perspective. Addressing these challenges will also require open cross-functional and cross-sector projects which must grow way beyond the limits of current sector driven structures. The complexity of the challenge largely exceeds the individual operational boundaries of today's European stakeholders (operators, vendors, IT providers, vertical and application markets, Public Authorities…) and it is only possible by innovative and open collaboration that the holistic vision can be achieved. In addition, it is only the holistic approach that will provide the economies of scale that allow for exploitation at a pan-European and global level. It is a win-win scenario.

European industry commitment to an initiative on Network and Information System in Horizon2020

With this call we are declaring the willingness of the undersigned industrial players to face the challenges of the connected /digital society and we call on the European Community to consider the strategic development as a top priority for Horizon2020 and European success.

With the ambition to develop the next generation of Network and Information Systems, the European industry is ready to join their R&D&I forces to establish a new Public Private Partnership with European Commission in the context of Horizon 2020

The ICT industry is willing to engage the Commission immediately in a constructive discussion to determine the optimal working structure for such a viable partnership model for the governance of this initiative. To achieve this we propose a number of specific activities:

- A significant part of ICT work in Horizon2020 must be conceived and operated as a large scale co-ordinated ICT initiative in partnership with the ICT and the sectors' industries.
- All Horizon2020 instruments (like IPs, STREPs and PPPs) must be employed in a coherent and complementary way to maximise the return on the joint investment of industry and the public authorities.
- The work programmes must be based on clear tangible objectives to ensure that the major challenges get sufficient investment to obtain significant sustainable results.
- The targets for the ICT work to achieve industrial, economic and societal improvements in Europe should be measurable though improvement in the inclusiveness of the digital networked society.
- The budget for ICT within Industrial Leadership should be reinforced in direct proportion to the Impact of ICT on GDP growth.
- The dynamic flexible management of this ambitious programme must be designed to integrate and respond to the changing needs of the ICT sector. (It is unlikely that goals determined in 2012 will still be optimal in 2020).

Our goal is to have an attractive, relevant and effective research programme with clear goals, values and timescales that can be measured in terms of both progress and impact.

This partnership model must reflect the actual needs of society and industry and appropriately accommodate the vital contributions that the academic community, the research institutions and the innovative SMEs will make to achieve the focused goals of the initiative in Europe.

Signatures of ICT Initiative Core Group Members:

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