NEO

IDEAS AND INNOVATION

SMART EUROPE

A PROPOSAL FOR AN INVESTMENT PLAN IN THE EUROPEAN UNION (2015-2018)

March 2015

indra

INDEX

AN INNOVATIVE EUROPE: INVESTING TO UNLEASH THE POWER OF SMART INFRASTRUCTURES

Decisive action is needed for a new deal in Europe. We cannot wait and lag behind other leading economies worldwide, so a **productive investment is required for solid competitiveness, sustainable growth and new employment**. This action should be taken jointly and in a coordinated manner by the public and the private sectors.

Europe is well placed **to take advantage of the digital revolution**. Achieving the goal of an innovative Europe requires a new paradigm of mobility, flexibility, adaptability and an **innovative demand of a full range of new technologies** that are reshaping our way of life. There is a large gap between the rhetoric of preaching the knowledge society and the reality of little shift in preparing to engage with it.

The formidable European network of infrastructures can rapidly benefit from smart technologies. The increased connectivity between the digital world and real life provides an unparalleled opportunity to reshape our industry and modernize fundamental services. ICT solutions are key components of modern infrastructure.

Given the increasing investment gap, boosting investment in innovation should be a key priority. **The Investment offensive lead by the European Commission is a positive step forward at EU level**, although estimated investment needs amount to 1,000 Billion EUR for the achievement of Trans-European networks in the field of transport and energy and for the deployment of broadband alone.

Within this context, **Indra aims at contributing with constructive and concrete proposals** through a Smart Europe package with a double purpose:

- To strengthen the **sense of ownership of the European citizenship** with regards its common infrastructures and assets.
- To **foster efficiency and productivity by means of digital technologies**, boost competitiveness in key industrial sectors and create sustainable and equitable growth.

SMART INFRASTRUCTURES FOR THE ENERGY UNION

A key objective of the European Union in relation to Energy is **to promote secure, affordable and climate-friendly energy for European citizens and businesses**. Achieving this goal requires allowing a free flow of energy across national borders within the Union, as well as bringing into the system new technologies and renewed infrastructures to promote energy efficiency and ensure security of supply.

In this context, there are **several types of valuable investments that Europe** should pursue:

- The **implementation of smart technologies to ensure a resilient power system**. The new system will have to support and integrate (1) the growing distributed renewable generation, (2) energy storage as a critical game-changing piece of future power systems, (3) electric mobility infrastructure and (4) the end-customer as a key element in the operation of the energy system (customers will become "prosumers" – producer + consumer). Managing all this will require investing in the concept of edge computing applied to the management of smart grids and in advanced analytic platforms.
- Fostering **energy efficiency, through investing in client engagement platforms** that support (1) the interaction with the new "prosumer" of energy and (2) the development of new concepts like demand management or multi-utility business models based on a new generation of bi-directional smart metering infrastructure. These platforms should also consider the interaction with the new "connected" elements that smart cities will bring (contributing to the evolution of the "Internet of Things" technologies).
- Deploying **new solutions for the optimal operation and maintenance of energy infrastructures**. These solutions should consider a predictive approach to the management of assets and an intensive use of advanced analytic techniques and IT-OT integration. From a technological perspective, they must ensure the application of strict cyber-security standards and should interact fluently with new technologies like augmented reality or drones.

With a vision of an integrated continent-wide energy system where energy flows freely across borders in mind, **Indra is among top European ICT companies that shall contribute to develop the new technologies needed to deliver smart energy for Europe**.

SMART EUROPEAN TRANSPORT, CITIES & PORTS

Good transport connections are vital for Europe's growth and competiveness. Innovative **Intelligent Transport Systems** will play a significant role in determining our transport compositions for the future as long as they increase efficiency. Sustained investments are therefore needed to transform the current European transport model and facilitate a better use of the existing infrastructure.

Shifting **from capacity to connectivity** – achieving a cooperative, better interconnected transport system – is a priority and it has to be done by means of the deployment of the modernised air traffic management infrastructure in Europe and equivalent land and waterborne transport management systems. Furthermore, air, land or rail traffic management systems developed in Europe, such as SESAR technologies and ERTMS, can be exported outside Europe, reinforcing the competitiveness of their European users and manufacturers.

A EUROPEAN AIR TRAFFIC MANAGEMENT ADVANCED MODEL

The Single European Sky Air Traffic Management Research Programme (SESAR) is contributing to the Single European Sky (SES) implementation by developing technologies and procedures for a new-generation system capable of ensuring a high level performance over the next 30 years.

Further and fast progress on SESAR deployment –**industrialization and implementation**- as well as on the global interoperability between SESAR and developments outside Europe are of essential importance for the Single European Sky, its operators and final users as well as for the competitiveness of manufacturing industry. The European Investment Plan should contribute **to ensure a timely, synchronised and successful SESAR deployment**, helping Airlines, ANSPs and Airports to tackle the needed investments and bear its related risks.

It has been estimated that **SESAR deployment would require 3 Billion EUR in EU funds over the period 2014-2024** to mitigate risks related to unsynchronised deployment, negative business cases and to leverage private and other investments. EU financial intervention should focus on performance sensitive projects in line with the priorities identified in the Master plan.

SMART PORTS

Smart Ports are key hubs in global supply chains. 90 % of Europe's international cargo trade and 40% of the intra-Community trade in goods passes through EU ports.

Smart Ports can strengthen local economies and EU trade by addressing the core business needs of port managers and operators, (advanced landlord) port or maritime authorities and the stakeholders of their logistical communities, Investments on solutions that facilitate the integration of all processes and operators in the multi-modal logistical chain of the hinterland.

A high level of investment on smart technologies should lead to growth, competitiveness and the attraction of knowledge-intensive companies to the port and city.

STATE-OF-THE-ART EUROPEAN RAIL TRAFFIC MANAGEMENT SYSTEMS

Currently there are more than 20 train control systems across the European Union. Each system is stand-alone and non-interoperable, and therefore requires extensive integration, engineering effort, raising total delivery costs for cross-border traffic. This hampers the competitiveness of the European rail sector by creating technical barriers to international journeys.

As a unique European train control system, ERTMS is designed to gradually replace the existing incompatible systems throughout Europe. The full deployment of European Train Control Systems (ETCS) level 2 and the progressive use of satellite-based solutions shall consolidate more productive performance of rail infrastructures.

Such systems will bring considerable benefits to the railway sector in terms of higher speed, maintenance costs savings, safety, reliability, punctuality and traffic capacity in addition to interoperability. They will boost international freight and passenger transport:

Modern intelligent rail traffic systems could also consider to invest in:

- The deployment of broadband WIFI Networks for the monitoring of rail assets and safe gauge train monitoring for enhanced safety in transnational train services.
- The deployment of Integrated Intermodal Traffic Management and Intermodal Passenger Information systems.

The Shift2Rail Joint Undertaking, a new public-private partnership in the rail sector established under Horizon 2020, can be a relevant step forward to help the European rail industry to retain and consolidate its leadership on the global market. Ensuring that R&I activities and results can provide a competitive advantage to EU industries is a first step to stimulate and accelerate the market uptake of innovative technologies through a coordinated investment action which can be reinforced through deployment at national and EU level.

SMART CITIES

Efficient information and communication technologies -Cooperative ITS, Multimodality, Big Data- can help people move around more easily, safely and economically, in a more environmentally friendly manner. At the same time, they can provide smarter mobility, transport options as well as other benefits to Smart Cities.

One of the most interesting trends of urbanization is **the rise of the mid-size city**. About 400 of these, which on average count less than 2 million inhabitants, are poised to generate **nearly 40 per cent of global growth over the next 15 years**. In a world that is ever more interconnected through technology and cheaper travel and in which state borders are rapidly fading, the city is the entity that will shape the future.

Smart cities will soon become a new paradigm for new ways of driving where the smart car and safer mobility shall prevail. Europe has an outstanding position as the leading player to provide with **smart platforms and value added real-time information services**.

Key drivers for new investment would be:

- The implementation of automated real-time information systems geared towards accident prevention, managing adaptive speed and volatile traffic flows. Cooperative ITS solutions will foster automation for intermodal transport: trams, metros and road vehicles.
- Digital services to fleet managers and consumers within "pay as you drive" schemes to optimize risk assessment insurance schemes, more effective maintenance programs and increase safety.
- Citizens will demand real time personalized transport ticketing solutions and contactless payment technologies based on Near Field Communications (NFC) for both public and private services turning any smartphone into a payment terminal promoting interoperability and intermodality.
- Optimizing social media tools can help a better delivery of post-sales services and strengthen the second hand market.

SMART INDUSTRY

Europe needs to adopt a **comprehensive vision and take coherent action on the fourth industrial revolution**. The aim would be to connect classic manufacturing competences with innovative software based tools for setting up Industry 4.0.

Smart industry or Industry 4.0 refers to the technological evolution from embedded systems to cyber-physical systems. It represents the coming revolution on the way to an **Internet of Things, Data and Services**. Decentralized intelligence helps create intelligent object networking and independent process management, with the interaction of the real and virtual worlds representing a crucial new aspect of the manufacturing and production process.

Industry 4.0 connects embedded system production technologies and smart production processes to pave the way to a new technological age which will radically transform industry and production value chains and business models (e.g. "Smart Factory").

Indra is aware of the challenges ahead and is willing to invest on cross smart platforms to provide seamless mult-device semantic interoperability between multiple systems with the purpose to allow the exchange of information from the real world between smart applications, in every sector of activity and through the Cloud.

SILVER ECONOMY & SMART HEALTH

Citizens over 55 already represent 25% of Europe's population. **People in Europe aged 65+ will almost double, from 85 million today to 151 million in 2060**. Germany and Italy already have the 2nd and 3rd highest median ages in the world.

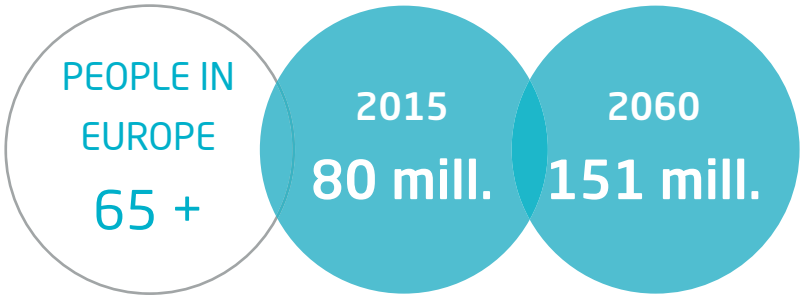
While this demographic shift brings challenges, it also brings significant opportunities. Older people can be major assets for communities and ageing populations can be drivers of economic growth. Large new public and consumer markets of ICT products and services for ageing well are developing - the so- called Silver Economy.

On the other hand, the combination of public-sector budget constraints and the fragmentation of the healthcare systems have resulted in a backlog of investments that is difficult to quantify.

PPP models could be more broadly used solutions if they can provide Value for Money. At the same time, investments aimed at improving the efficiency and performance of the entire healthcare system are needed.

The EU has already launched a number of measures to stimulate the Silver Economy and help European industry take the driving seat. They include the Active and Assisted Living Joint Programme, the eHealth Action Plan, the European Innovation Partnership on Active and Healthy Ageing as well as dedicated parts of Horizon 2020 Societal Challenge 1 on Health, Wellbeing and Active Ageing. Despite the increasing appreciation of the potential opportunities in this area, a number of challenges remain.

OVER 55 ALREADY REPRESENT 25% OF EUROPE'S POPULATION



Indra aims at focusing on transforming these challenges into opportunities. The following specific actions could help optimize the use of innovative technology based solutions to promote smart health:

- Digital Hospital at home and Multi-specialty telecare products
- Smart home accessible to healthcare services
- Smart multilevel alert system
- Advanced medical simulation centre
- Computer-aided and genetically driven personalized diagnosis systems
- Integrated information and management system for clinical end epidemiological data for research
- Integrated system for digitalization, indexation and management of clinical information
- Smart management system in emergency services
- Integrated traceability system for patients and resources
- Hospital robotics
- Integrated patient management system
- Smart room
- Secure digital hospital and preservation of clinical information
- Pattern mining systems for detection of adverse drug reactions from social networks
- Open data systems to determinate the most efficient usage of the healthcare resources

SMART SECURITY FOR CITIZENS

We are at a significant decision point for the European Security Model. The nature and intensity of emerging and evolving threats can differ from country to country, yet, no single one will be able to respond effectively in isolation anymore. An effective response requires public-private cooperation for a swift, flexible and operational approach, taking into account risks of any kind to the freedom and security of European citizens.

Raising levels of **security for citizens and businesses in cyberspace,** and **modernizing the EU external border management by means of an integrated approach** are among the strategic objectives to be achieved at a EU scale.

For that purpose, the EU needs to identify which technologies would be critical, which are the investment gaps to be filled in and set up a roadmap for their development and deployment in the near, medium, and long term. The creation of a **single security market** would indeed be key to foster in parallel high skilled jobs and new niches for growth, thus contributing to the Re-industrialisation of Europe.

A more rationale use of EU funds dedicated to Security (H2020 and Internal Security Fund) won't be enough. Additional investment should be adequately channelled. Furthermore, a successful security industrial policy cannot hinge only on either a Security Research Program or on national driven deployments. **Europe needs a strategy for a fast track deployment of innovative solutions at an European Union scale**.

Within this context, Indra advocates that efforts to respond to current and future threats in the short, medium and long term should concentrate on **2 Flagship comprehensive investment programmes on Cyber security and Integrated Border Management** which should aim at filling the investment gap and provide technology autonomy to Europe.

Pilot projects could focus on:

- **Integrated Border Management**: development of a EU smart border capability based on data fusion platforms and evidence-based investigative tools for a common external border situation awareness and response infrastructure.
- **Cyber security**: set up of a in cloud cyber security as-a-service EU platform oriented to provide added value security tools to improve information sharing and mutual trust among national authorities.

SMART SPACE INFRASTRUCTURES & APPLICATIONS

Galileo and Copernicus, the two European satellite programmes, are advancing Europe's march into the 21st century helping a multitude of sectors take off, from agriculture to transport. Both will act as a catalyst for a variety of economic activities and, as a result, underpin sectors throughout the European economy: power grid synchronisation; air and sea traffic management; mobile phone networks, or a broad range of environmental and security applications.

The 'spill-over' effects are expected to be immense. Accordingly, their potential for jobs and growth creation go far beyond the physical infrastructure itself:

- **Satellite communications systems** will be soon an enabler to better integrate infrastructures and create knock-on benefits in seemingly unrelated parts of the economy. For instance, all transport modes will benefit from the deployment of dedicated satellite networks for Traffic Management Systems both land and air. Indra is ready to seize the opportunity offered to exploit the vast potential of a downstream market of applications and services based on cutting-edge technologies with regards all transport modes.

  As regards Air Traffic Systems, the integration of RPAS in a non-segregated airspace within the Single European Sky is both a challenge and a opportunity if an ambitious level of investment is achieved.

- The EU space Industry has an outstanding position to **export its know-how and products** to regions (i.e. Latin America) aiming at strengthening their strategic partnership with the EU. The European Investment Plan could envisage **innovative funding instruments** to foster not only the global competitiveness of this new industry but also the optimisation of the return on current investment in European space infrastructures

- **Space Surveillance & Tracking (SST)**: Space debris has become the most serious threat to the sustainability of our space activities. Building up an integrated European SST infrastructure mostly based on ground-based sensors such as radars would be key to provide **strategic technological autonomy** to Europe, unleash the potential of a new array of critical services and foster the **competitiveness** of the European Industry throughout the world.

CONCLUSION

Between now and the end of 2017, the ambition of the European Commission is to mobilise at least EUR 315 billion public and private investment into the real economy.

Indra welcomes this level of ambition and advocates for smart funding and sustained investment to unleash the power of smart infrastructures.

- An appropriate **combination of private and public sources**, duly coordinated, would assure an optimized financial support adapted to the nature of the challenge.
- Massive adoption of digital technologies will have a transformative effect on all industrial sectors, changing internal processes, design concepts, ways and means of collaboration between companies, definition of supply chains and business propositions. **Europe should be at the forefront of the design and implementation of Industry 4.0**. Smart Energy, Smart Transport, Smart cities, Smart Health or Smart Security are all relying on digital infrastructure.
- To this end, investment plans should address the need to build a strong foundation ensuring that the appropriate skills are developed and disseminated across Europe.**The aim is to reap the benefits of game changing paradigms such as big data, cloud technologies, cyber physical systems, robotics or internet of things** to foster total factor productivity and help achieve a leading Smart Europe.

indra

Avda. de Bruselas 35
28108 Alcobendas
Madrid (Spain)
T +34 91 480 50 00
F +34 91 480 50 80
indracompany.com