

FP7 – General Orientations

Applications Research – “ICT supporting businesses and industry”

Title

“Innovation ecosystems”

Definition of this field of research

Multi-disciplinary research activities aiming at creating an environment favourable to the innovation and the development of clusters of SMEs and of the knowledge- and capacity building of the territories. SMEs-based ecosystems of innovation are fuelled through the co-evolution of the structurally coupled socio-economics eco-systems and their digital representations (the digital eco-systems). The innovation ecosystems, based on constructivist perspectives and an ecology-inspired paradigm shift, enable new forms of business and computable representations of both the micro-economic and the macro-economic aspects.

The innovation ecosystem is the result of the continuous interaction between the business ecosystem and the digital ecosystem.

The business ecosystem is the network of a multitude of buyers, suppliers and makers of related products or services (without the specific need for central keystone players) plus the socio-economic environment, including the institutional and regulatory framework.

The digital ecosystem is a pervasive ICT infrastructure with a particular architecture and framework, which is collectively defined and built following the specific requirements defined through a multi-stakeholder participative process, and which exhibit some characteristics of the natural ecosystems. It is considered a step forward of internet, which instead of dealing with packets, carry knowledge and services.

Objectives for medium-term 2013 and longer term 2020

- The prime long-term objective of this research area is Capacity Building for European SMEs and territories, based on an eco-systemic paradigm shift. This will help abolishing digital barriers and boost the competitiveness and dynamism of SMEs in the EU. The ICT market will be enlarged by reaching out much better to micro- and small enterprises, thanks to the boosting of ICT provisioning/services based on intelligent cooperative solutions linking multitudes of actors, building blocks and components of an affordable, trustworthy, adaptive and evolutionary nature.
- To these ends, the medium term objectives of this research area are to build, gather and trial the technologies, philosophies and general knowledge needed for the development and the continuous evolution of the digital ecosystems, and to facilitate the self-organised deployment of a digital ecosystem infrastructure in the EU.

State of the Art

First results from FP6 (open source communications infrastructure from Integrated Project, multidisciplinary research founded by Network of Excellence); First rudimental ecosystem (involving pilot regions); Latest findings in socio-economics and human sciences (philosophy, epistemology, sociology, economics, law, politics) and natural sciences (evolution, sustainable development)

Web 2.0 -> Digital Ecosystems;
Business Modelling Languages -> Economics and Socioeconomic Languages
Formalisation of Micro-economics -> Macroeconomics
Natural Habitats -> Digital Habitats
Anthropologists -> Digital Anthropologists

Key issues to be solved

How to build consensual models and knowledge representations of aspects of the world (economics, legal issues, power relations, conflicts and interests) which are computable and fuels autopoietic ICT systems which exhibits selected characteristics of natural ecosystems. How to select those characteristics? How to implement such characteristics in a digital ecosystem? How to have a multiplicity of such innovation ecosystems (business and digital ecosystems) which evolves and adapt to the environment?

Since the digital ecosystem is built by the representation of models of micro- and macro-economic aspects (but also of social representations and regulations) and on a social constructivist perspective, it requires scientific and technological advances in a wide variety of aspect needed to the construction of knowledge representations such as Formal Languages, Linguistics Anthropology, Epistemology, Social Science, Philosophy, Economics, Cybernetics, System Theory.

It also requires new ICT and model-driven architectures that support the effective automatic transposition of the represented knowledge in implemented software systems; business services and economic activities.

It requires as well software and system architectures which supports the self-organisation of the constituents and the worldwide self-deployment of a pervasive transport P2P free digital ecosystem infrastructure which has no points of centralisation and control, and inherits the basic principle of internet* and of the natural eco-systems

Topics to be addressed

The topics are multidisciplinary: the philosophy/knowledge representation is strictly coupled with ICT technologies (but are the new perspectives and approach makes the difference).

Specific ICT aspects to be addressed: Formal languages representing knowledge, Network Architectures and Topologies, SOA and MDA, choreography, logic of second order

Socio-economic aspects: Economic Models, Development Models, Governance Models

Philosophical aspects opening the new perspectives and paradigms: Formal Languages, Linguistics (from formal languages to speech acts), Knowledge Representation, Education and Training, Anthropology, Epistemology, Social Science, Philosophy, Economics, Cybernetics, System Theory, Socio-Economics.

Goal

Develop ICT technologies which make possible European alternative approaches to innovation and business models, based on a network of distributed clusters of small organizations which cooperate worldwide exchanging dynamically resources, applications, services and knowledge.

Develop the knowledge and the governance model for building an integrated, distributed pervasive free network of local digital ecosystems for small business organisations and for local e-governance, which allows them to share and compose services and knowledge.

Milestones

The ecosystem paradigm does not fit with a mechanistic plan. The evolutionary paradigms allow to deliver intermediate tangible results (including both technological development and trials, business case demonstrations, and the implementation and uptake of new modes of practise, social constructs and communities), which keep evolving, towards a long term vision.

2002 first rudimentary concept

2004 first project

2005 EU concept differentiates from US one

2006 first pilot ecosystems

2007 20 regional ecosystems which includes business services

2008 worldwide pilots; integration of multimedia aspects

2009 a new multidisciplinary science has born

2010 first models and services generated from descriptions in natural language (e.g. made by SMEs or individuals)

2011 ecosystems exhibit introspection and ability to self-generate economic knowledge

2012 innovation ecosystems widely adopted as instruments of industrial policy and capacity building

2015 digital life in ecosystems

Potential links

- with other ICT areas
 - some areas does not exist yet as ICT (social science, epistemology, social constructivism, ...)
 - Network architectures and topologies
 - Knowledge representations and languages
 - Business modelling
 - Software
- with CIP and Regional funds
 - The deployment, in regions and for vertical sectors, of innovative services which populate the ecosystems
- with other EU programmes
 - International cooperation (for deployment and cooperation in strategic areas with economic structures SME-based and without keystone players: Latin America, Indian Peninsula, Africa)
- with ERA (map regional developments with cross-regional, national and international)
- With UNDP and World Bank
 - Innovation ecosystems is a powerful instrument for implementing development strategies and for fostering capacity building.

International co-operation dimension

Why: for creating strategic alliances based on an EU model, for networking the economies (networking the SMEs), for allowing SMEs to reach international markets, for creating new complex multicultural services, for exhibiting a cooperation policy.

What: Establishment of interconnected digital ecosystems which allows to network business ecosystems in specific sectors.

With whom: the actions are always activated at territorial or national level, activated by a catalyst as instrument of industrial policy or development policy.

* No one owns it. Everyone can use it. Anyone can improve it. The intelligence is at the end