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WHAT IS AN EUROPEAN DIGITAL ECOSYSTEM?

Policy Priorities and Goals

The **Digital Ecosystem** aims at contributing the Lisbon objectives, providing to small and micro enterprises [SMMEs] ICT applications and services which improve their efficiency, business integration and synergies within EU territories, but also enabling their integration of local value chains within the global market.

These applications and services are tailored on SMMEs local needs and are formed by the dynamic integration of several components, which are provided by different organisations scattered around Europe¹. In this way Europe industries will, maintain and enlarge its knowledge and capacity to develop² and to deploy ICT applications and services.

The digital ecosystem initiative has two target groups³:

- SMMEs (of any business sector) which need customised ICT applications and services for improving their efficiency through process and organisation integration and for extending their business beyond local barriers;
- ICT-related organisations: system integrators, service providers, software component developers (with emphasis on open source communities and open systems developers)

This goal is reached through the implementation of new paradigms⁴ which exploit the advantages of the EU economical structure (based on SMEs and on diversity and local identity), through the implementation of a network of digital ecosystems [1]; which activate a virtuous circle [fig.1].

The digital ecosystem initiative aims at fostering a cultural change in enterprise networking and in business practices. It innovates and impacts on three aspects: technology, business practices and knowledge. The initiative also requires the development of an ICT “digital system infrastructure”.

The **digital ecosystems infrastructure** is a pervasive “digital environment” which is populated by “digital components” which evolve and adapt to local conditions thanks to the re-combination and evolution of its “digital components”. “**Digital components**” could be: software components, applications, services, knowledge, business processes and models, training modules, contractual frameworks, law. A digital component is any useful idea, expressed by a language (formal or natural), digitalised and transported within the ecosystem, and which can be processed by humans or by computers. The digital ecosystem infrastructure supports the description, compositions, evolution, integration, sharing and distribution of the digital components and of knowledge.

¹ actually, it is expected that the components which are more customised, and have more value added, are produced by smaller organisations closer to the final user, whilst more generic components – a digital commodity – will be provided by larger organisations even de-localised

² or partly develop and integrate

³ it is focused on territorial development, integrating the policy objectives of GRID initiative (mainly focused on ICT services and users) and Software Initiative (mainly focused on software industry).

⁴ Paradigms, which mimic by the mechanisms of the natural ecosystems, which change the way to produce and to distribute software and services

Technology research actions are needed to develop the ICT enabling technologies for such environment: R&D on network architectures; R&D on an intelligent model-driven component-based distributed and pervasive open-source middleware infrastructure; R&D on protocols and formal languages which describe interfaces, ontologies, business, interactions, revenue; etc.... Such research activities⁵ will be complemented by national and local initiatives.

History

The initial conception of digital ecosystem dated 2002, when Unit D5 organised a series of workshop and produced a discussion paper [1] including first findings and ICT architectures [fig2]. The concept was endorsed by the scientific community and by the local administrators of regions which have a structure of strongly networked SMMEs and which have developed a ICT policy.

- In the FP6 1st IST call, three proposals of IP on digital ecosystems were presented (and passed the threshold), one was funded (DBE). DBE project started in 2003 and has already produced the first free and open-source working environment⁵. New formalisms are under development and are in the process to become OMG standards⁶.
- Regional pilots are flourishing: In only one year, addition to the initial 3 regional digital ecosystem pilots (Tampere, West-Midland, Aragon), two already joined the initiative (Extremadura and Piedmont), other four (including one in India) are in the process of joining.

The concept of digital ecosystem is recently emerging in USA as well.

Due to the different institutional and socio-economical structure of USA, the American digital ecosystems has different characteristics: it is not SMMEs oriented; the basic infrastructure is non open but it is ancillary to a proprietary systems whose owner is in a dominant positions; the evolutionary and dynamic composition mechanisms are absent; it poorly supports the diversity of license and revenue models; and usually there are elements of centralisation and central control. The European digital ecosystem is focused on the Lisbon Objectives, it is based on the subsidiarity principle, leveraging the potentiality and synergies of “infopoles” or “local clusters”, creating the conditions for the governance and for the improvement of the competitiveness of the European knowledge-based territories, fostering the market efficiency and the networking of the European SMEs.

Stakeholders

Main stakeholders are:

- *National and local decision-makers and administrators*: since it is a tangible strategy for improving productivity and economic development preserving local identity and values;
- *SMMEs producer of software and knowledge-based services*: since it offers them the possibility to produce and distribute just a component of complex solutions;
- *Large software and telecom companies*: since it offers a possibility to build a rich “ecosystem” of applications and services complementing their basic components (a “commodity”), boosting the mobile telecommunications.
- *SMMEs which need affordable and customised ICT technology & services for their integrating within the local ecosystem and a complex value chains*;
- *Focused Communities of Knowledge-based producers* (e.g. Scientific and Research Community; Open Source Developers, Jurists, Teachers) since it stimulates research and development.

Additional References

Additional information could be found at: <http://www.digital-ecosystems.org>

⁵ The evolutionary mechanisms allow immediate tangible results within a long-term research vision.

⁶ Like the *Semantics of Business Vocabulary and Business Rules* (SBVR) for the *Business Semantics of Business Rules* (BSBR) language.

Figure 1 – The Digital Ecosystem Vision: the virtuous circle

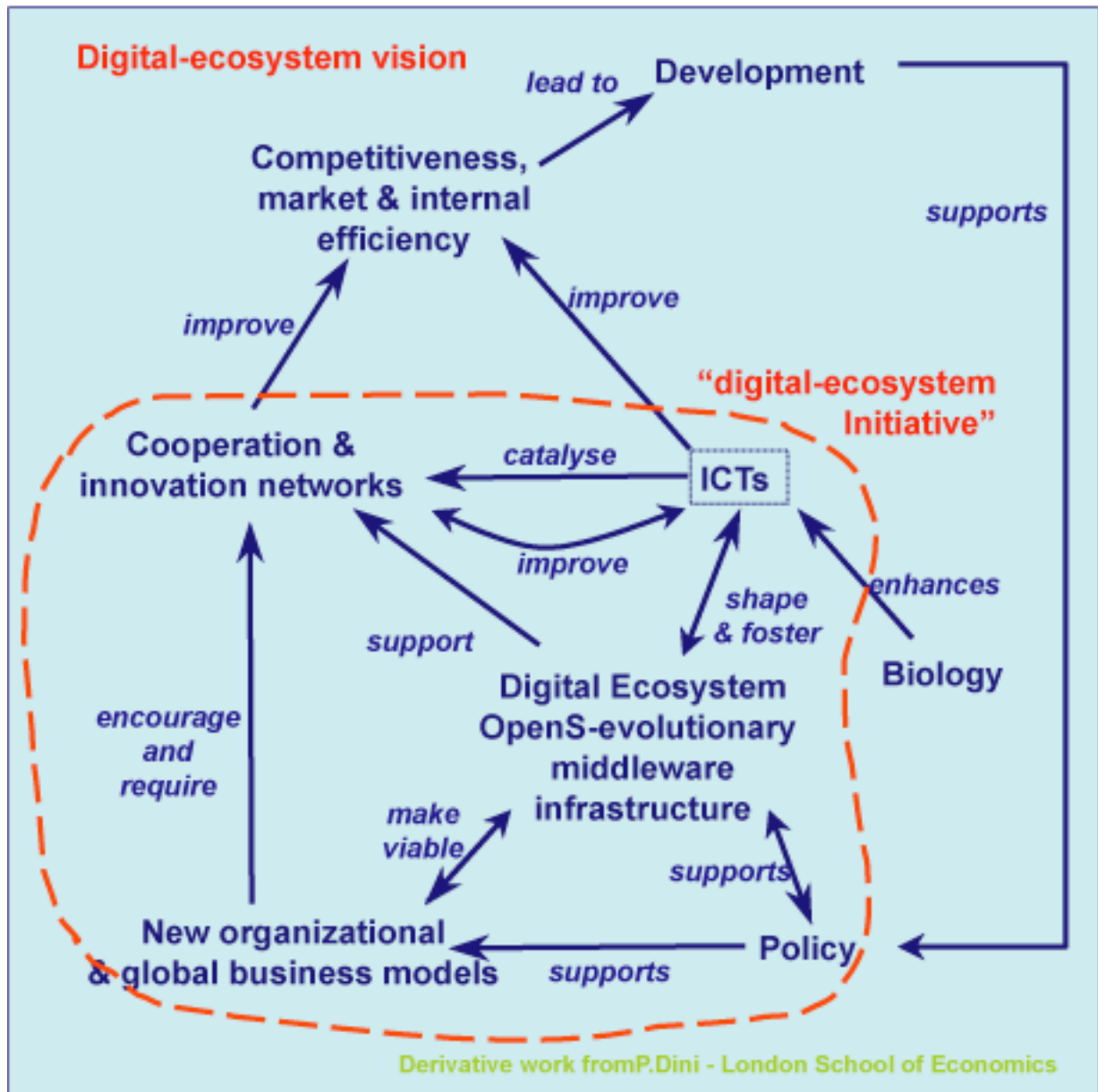


Figure 2 – The Digital Ecosystem Infrastructure [2002]

