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The role of open knowledge in regional development – case study

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Abstract - The paper describes the experience of CSP, a regional agency in the field of the Information Society. As catalyst for innovation in Piedmont region (north-west of Italy), CSP has been working in line with the regional strategy for the development of a knowledge-based economy.

The paper outlines the key elements of the current strategy for regional development and describes the model and results implemented by CSP.

Keywords – Regional Catalyst, open knowledge, service-oriented production, micro-firms.

I. INTRODUCTION

CSP - Innovazione nelle ICT is a local development agency in the field of Information Society. CSP, as catalyst for innovation in Piedmont region (north-west of Italy), has been working in line with the regional strategy for the development of a knowledge-based economy.

CSP is actually running a Structural Fund Project (called DIADI 2000) focusing on technology transfer towards SMEs. Through DIADI 2000 CSP, looking at state-of-art initiatives such as the R&D EU DBE project, aims at introducing the business ecosystem pattern in Piedmont. DIADI 2000 is a medium-term project aimed to locally complement the long-term research-based orientation towards open knowledge.

The paper firstly outlines the key elements of the current strategy for regional development, secondly it describes the model and results implemented by CSP.

CSP has been addressing 3 interconnected domains to reach its aim: culture, business models and technology. According to CSP regional experience, the open knowledge paradigm is a possible approach to increase local competitiveness, favouring the widespread of competences and tools, as well as the rise of new business opportunities.

The project so far has managed to disseminate some key concepts to SMEs — such as a focus on highly customised services (rather than on software), reassurance that the software elements needed are widely available (importance of OS components), and that there are merits in reinforcing the dynamics of networked businesses and ecosystems.

Furthermore, the project saw the implementation of a software component which has been released following the Open Source paradigm in order to promote its use in SMEs business networks. The project is now co-financing some

Pilot Projects addressed to stimulate local SMEs to implement new knowledge-intensive services.

According to CSP vision, the open knowledge paradigm - as to say a model of production based on knowledge openness and sharing - represents one of the main challenges for the local entrepreneurial system in the near future.

II. THE REGIONAL STRATEGY

A knowledge-based economy, defined as an economy based on knowledge production, distribution and use[1], is one objective to favour Piedmont growth and increase local competitiveness.

The diagram in Figure 1, inspired by the Digital Ecosystem research vision [2] shows the interconnections among growth, innovation policies and ICTs, and appears to represent the background of regional strategies. Policies are fed by the economic growth and can be addressed to support the development and accessibility of open knowledge.

Nowadays knowledge is more crucial than ever before and applications of ICTs are the drivers of the new economy[3]. ICTs play a key role in knowledge formalization and distribution, reducing the effort of gathering and disseminating knowledge and giving it an easy-to-find and easy-to-use structure. This peculiarity fits a growing number of industrial activities, in which the amount of knowledge to be managed is simply too large for any single actor.

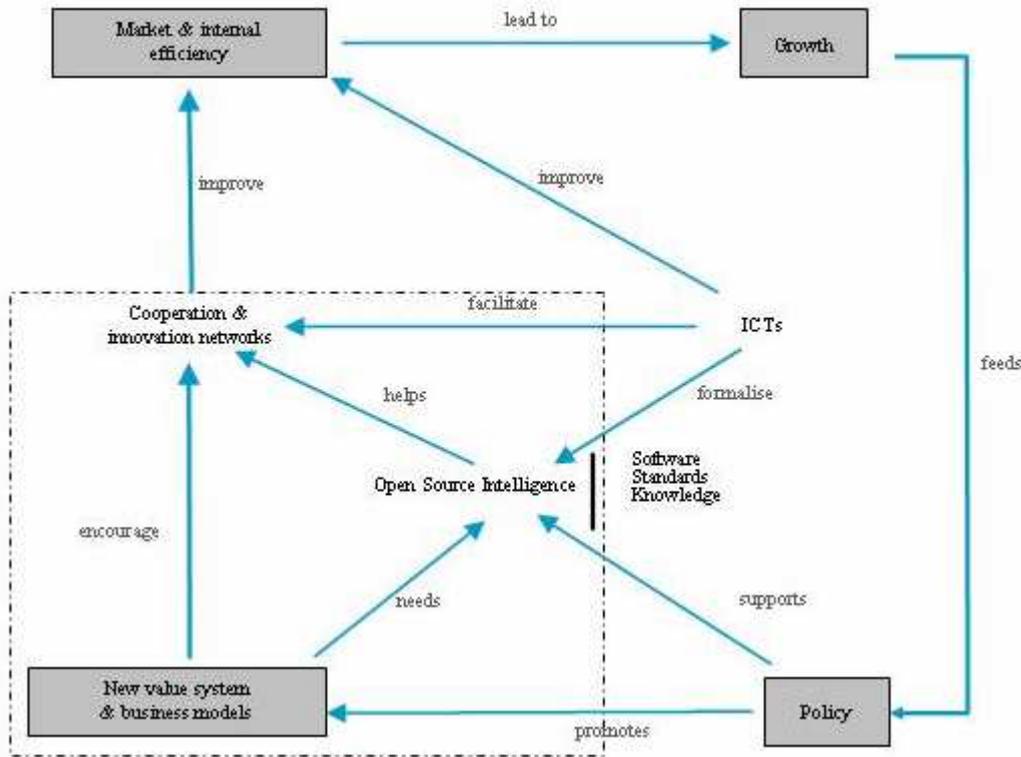
A new approach is emerging world-wide in the ICT sector, based on collaboration, knowledge mutualism and open innovation: open knowledge - made of open software, standards and information – can be the paradigm to build new value system & business models, where cooperation and innovation networks can contribute to the improvement of market and internal efficiency.

Policies can contribute to change the background of value added production, leading to new dynamics of cooperation and competition in the productive community and thus reinforcing the market efficiency from which growth is generated. Cooperation and innovation networks, also through ICTs, unify producers, suppliers, partners, competitors and other stakeholders in a shared base of knowledge. “This economic community produces goods

and services of value to customers, who are themselves members of the ecosystem”[4].

> over 95% of small/medium enterprises are micro-firms with less than 10 employees, traditionally reluctant to the

Figure 1: The Open knowledge paradigm – Diagram of ICTs and Policies for growth



Inspired by the “Flow diagram for growth catalysed by ICTs” in *The Digital Ecosystems Research Vision: 2010 and Beyond* [2]

Thus, innovation policies can promote the establishment of collaborative environments to share knowledge and services and to exchange information among complementary actors.

III. THE CSP MODEL

CSP is a regional development organisation in the field of Information Society. It aims at facilitating the innovation processes, at regional level, in order to compete in global markets.

CSP, within a Structural Funds Regional Project called DIADI 2000, has faced the question of favouring the spread of the model of open knowledge paradigm. DIADI 2000 is focused on technology transfer among SMEs as to increase their competitiveness.

With the aim to gain a deeper knowledge of SMEs and their local environment, CSP action in DIADI 2000 started from the analysis of the Piedmont entrepreneurial system, which showed today Piedmont local situation is characterized by two main trends:

introduction of technological innovation.

> the ICT sector is still strongly focused on software production and body rental, although business opportunities in such domains are heavily decreasing due to local and global changes in markets.

In DIADI 2000 CSP had to face those challenges in order to draw up a sound programme to implement the regional strategy.

A. Business ecosystem approach

CSP drew its attention on networking and collaboration dynamics as key lever for micro-enterprises business growth and survival in the market.

More than ever before, in the knowledge economy companies should collaborate and learn from shared experiences and best practice, in order to optimize the development, improvement and marketing of products and services.

Value networks are made of several actors providing specific tasks in a complex and wide networked system. In such “networked organizations” each actor makes its effort

with the aim to produce and offer goods and services to respond to the contingent requirements. The interdependency, connecting manufacturers with suppliers and customers and sometimes competitors, is based on stable collaboration, cooperation, negotiation, trust and reputation.

Technologies play a complex role in helping develop organizational structures, and the networked form in particular, allowing the delivery of the right knowledge to the right person, for the right purpose (knowledge logistic). At the inter-firm level of “networked organisations”, ICT can reduce inefficiencies resulting from lack of coordination between firms, reducing information asymmetries between buyers and suppliers and building closer relationships among trading partners. Nevertheless, CSP analysis showed that in Piedmont business relationship and interactions within entrepreneurial “networked organizations” are still based on face-to-face communication.

With the purpose of contributing to overcome this weakness, CSP focused its action on collaborative software platforms enabling the optimisation of resources and relationships management within “networked organisations”. In this context, CSP has been working with the aim to make the local entrepreneurial system progressively evolve into a business ecosystem, where members “work co-operatively and competitively to support new products, satisfy customer needs [...]”[5] and cooperate in order to be more competitive. A business ecosystem is “an economic community supported by a foundation of interacting organizations and individuals”[4]. It implies a high degree of interconnection among all actors involved and knowledge is widely exploited in different economic activities [6].

B. From the software to the service

According to CSP vision, a model of production based on knowledge openness and sharing represents one of the main challenges for the local entrepreneurial system in the near future. Open Source Software is the base for an alternative business model of growing importance: “while improvements in the open source software are not appropriable, commercial companies can benefit if they also offer expertise in some proprietary segment of the market which is complementary to the open source program”[7]. Companies which have understood that, are already participating to cooperative development of Open Source Software and have introduced a new approach to intellectual property within their business strategies.

In a paradigm based on open knowledge, the outcome of a knowledge collective production is not the product to be commercialized but it rather represents the base on which a marketable activity can be built (support services, training, customization ...). Contributing to the development of a public knowledge or good generates rewards for

contributors in terms of skills improvement, learning, enhanced development of specific software components (as in the case of OSS), and competitive advantage [8].

Two main business strategies can be identified for companies approaching Open Source Software:

- The distribution of open software products can facilitate firms in reaching a wide base of customers for the provisioning of support services (training, customization, maintenance, updating, ...).

- The participation in open development, sharing parts of one’s own software product within the free software community, can draw some benefits for the company in terms of potential product improvements made by external developers. Furthermore, it can help a key-product to gain a wide diffusion, thus ensuring opportunities for the commercialisation of proprietary complementary products.

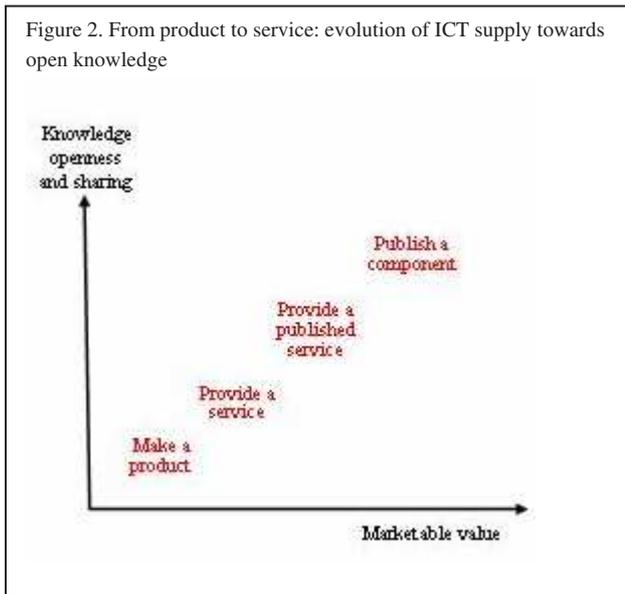
In Piedmont regional policies, the Open Source model is a key lever for the spread of innovation, standards and knowledge and for the increase of local competitiveness.

Due to local and global changes in markets, ICT companies are suffering for a decrease in business opportunities linked to software production and body rental, which still represent their core activities. The ICT sector is now requiring advices from research organizations and support from the government in order to re-gain competitiveness and to preserve the marketable value of their production.

According to CSP vision, the *marketable value* of ICT production can be interrelated with an approach based on *Knowledge openness and sharing* (intended as open knowledge made of standards, software and knowledge) as shown in figure 2. As Regional Catalyst, CSP promotes a progressive evolution of local companies core business from a product-oriented approach into a service-oriented model based on shared components. Doing that, CSP means to favour the development of a local ecosystem based on “cooperation for competition” which could contribute to increase the market efficiency and the local socio-economic growth and competitiveness.

The change from a software-oriented production into a service-oriented one (based on shared components) can not be expected to happen immediately and directly but rather to be a progressive evolution, since it firstly requires a change in culture: companies need to go over cognitive barriers and well-established behaviour. Changes in behaviours can be also influenced by business aspects: companies (mainly small ones) have a need for mid-term results and the marketable value is one of the key levers to influence their attitudes.

In these terms, companies should not necessarily consider production based on an open knowledge approach as limited to a non-profitable sphere. In addition, “open-source software is by some measure less expensive than proprietary software”[9]: using it lowers the cost for applications and services.



Moving from the existing conditions of production and competition in a regional industrial background, local innovation policies, government initiatives and regional catalysts can promote the spread of the open knowledge paradigm by offering financial support to open source products and projects, setting up stable legislations in the field of intellectual property protection able to promote correct exchanges of knowledge, facilitating access to research output produced by universities and promoting the availability of open resources and components to be used in the productive field.

More specifically, Regional Catalysts, as mediators between research/academy and the industrial world, could concretely act to favour the availability of Open Source Software components to be shared within the productive community, in order to stimulate the implementation and commercialisation of knowledge-based services.

IV. CSP EXPERIENCE AS REGIONAL CATALYST

As for large enterprises, where production and distribution are effectively managed through specific software platforms, also “networked organizations” require software tools enabling the smart management of their business.

Many types of software can make the management of a firm’s resources more efficient. Nevertheless, most of applications and solutions today available on the market have been created for the needs of large corporations and value net partners and are very often sectorial.

Based on its skills and vision, with the ambition of favouring the spread of ICT in “Networked organisations”, CSP developed and published Talea, an experimental software component to be shared within the local community of SMEs. Aimed at supporting the customer-supplier interaction in an Enterprise Application Integration perspective, Talea is a multi-device software platform for

the customization of knowledge-based services supporting B2B.

Talea was released following the Open Source principles and is now available at <http://talea.csp.it>. Releasing Talea, CSP has meant to make a first concrete step to increase the availability of open components to be used in the productive field, favouring the diffusion of a service-oriented approach (see “2.1.From the software to the service”). Talea can be viewed as a generic matchmaker for e-business, supporting a flexible matching between services provision and request: its architecture has been designed in order to facilitate easy customization to specific domains, thus enabling even smaller companies to customize services targeting customer-supplier interaction. The result of the customization is an application that can be exploited by the final user to provide and consume *resources* (products or services). Talea users can be both “providers” and “consumers” of *resources*; “providers” are small/medium enterprises, while “consumers” can be individuals, agencies or enterprises.

The transition from a software-oriented production into a service-oriented one - based on shared components - must start from a cultural change. Therefore, CSP action did not only concentrate on technological aspects related to the model implementation, but has also focused on dissemination activities for a shift towards a new cultural attitude. Moreover, considering that companies have a need for mid-term results, CSP has analyzed the sustainability of the model, concentrating on legal and business issues from the market perspective.

Moving from the existing conditions of local “networked organizations” CSP offered financial support to open source projects using Talea open software for the implementation of innovative services. To favour the customization and experimentation of Talea-based services in the real market, DIADI 2000 is 50% financing some Pilot Projects. Developed by Piedmont small/medium enterprises, Pilot Projects are aimed at customizing some new knowledge-intensive services dedicated to support collaborative business in the most several domains, such as social and medical, pharmaceuticals, tourism, agronomy, small local trade, goods delivery and sustainable transfer.

For instance, one of the Pilot Project is aimed at increasing the competitiveness of the small local trade in comparison with the large-scale retail trade, through the creation of a strong network of small local trade within a specific neighbourhood. It applies Talea brokerage system for the integration of the 3 key components of the small local trade: the local shops’ supply, the delivery of goods, the need for sustainable transfer. The implemented system will in fact also be able to optimize the transport routes, in line with sustainable and environmental development plans.

All Pilot Projects will close on July 2006; they include an experimentation phase with real users, as to test and consolidate the new services to be transferred to the real market.

V. CONCLUSIONS AND FUTURE WORK

In this paper we have introduced the vision of CSP about interconnections among local development, innovation policies and ICT, as well as its experience as a Regional Catalyst promoting the spread of a development model based on Open Source and open knowledge.

The key issue lies in moving the scene from a software-oriented production into a service-oriented one, using Open Source as a key lever to move further steps towards a knowledge-based economy. This would lead to renewed dynamics of cooperation and competition among the actors of the local business ecosystem, in order to gain a higher market efficiency than in a monopolistic approach based on a strong intellectual property protection.

With the aim to develop a regional knowledge economy based on “an efficient system of distribution and access to knowledge as a *sine qua non* condition for increasing the amount of innovative opportunities”[10], CSP future actions will be aimed at further trialling initiatives able to exploit Knowledge as a way to create innovation and economic growth.

Moving from Talea experience and from the Pilot Projects that will be implemented, CSP intend to further involve Piedmont SMEs in the development and customization of Open Source Software components, the access to which will be widely promoted as opportunity for the increase of local competitiveness.

Moreover, for the further dissemination of the open knowledge paradigm, CSP is establishing a network addressed to SMEs and involving all regional centres of excellence leading Open Source research and development activities. The network will be aimed at facilitating access to research output and promoting the availability of open resources and components, in order to help SMEs improve their expertise, to ease their participation to collaborative knowledge production and to foster their competitiveness.

As resulting from CSP experience, the role of Regional Catalysts [11] is crucial in local development processes to achieve local consensus among stakeholders and opinion leaders from the productive community and to spread innovation and facilitate the share of knowledge in networks of local players, thus helping the development of a local business ecosystem.

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