Assistência Técnica ao Projecto de Apoio ao Diálogos Sectoriais UE-Brasil

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Para: Ministério do Planejamento
Delegação da CE

MISSÃO
Consultoria de Curto-Prazo como Independent Consultant for the Mission Technical Assistance within the workshop on the APLs Innovation Project (IT Services and Software)

Relatório Final

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1   Introduction

This document deals with the description of technical assistance consisting of the preparation and speech delivery at the Workshop on APLs and Innovation with focus on IT Service and Software Clusters held on Brasilia on 30/06 – 01/07 2010, the subsequent technical study visits of the Brazilian ICT clusters (APLs) on IT Services and Software located respectively in Recife and Florianopolis carried on 2 July – 9 July 2010 and their related analysis.

As such, it first includes the presentation of the "Mission Objectives" (Section 2), "Duration of Assignment" (Section 3) and "Start, Completion and Location of the Assignment" (Section 4).

Section 5 reports on the Activities carried out during the mission, including the Brasilia Workshop and the technical visits carried out in the APLs based in Recife and Florianopolis (section 5.1, 5.2 and 5.3).

Then, the study analysis is presented in section 6 "Findings", whereas the "Conclusions" of the study are included in section 7.

Finally, section 8 presents the recommendations for future actions. In the light of pointing out opportunities and challenges for cooperation with European Union, recommendations have been articulated in the following subsections:
- Areas of Improvements
- Opportunities
- Potential Risks
- Strengths
- Weaknesses

2   Mission Objectives

The overall objective was to promote the dialogue and exchange of experiences between the European and Brazilian public and private actors involved in the development of the business clusters (APLs) within the Brazilian economy, strengthening the innovation process of the Brazilian companies with a high potential of technological level.

Specific objectives were the participation to the "International Seminar on Innovation on Cluster Economy" which took place in Brasilia on 30 June and 1 July 2010. The consultant delivered a lecture and participated to the debate of one of the 8 Panels addressing the key role of innovation for the development of APLs focusing on the topic Information Technology (Software and IT services).

Following the Seminar, the Consultant has been deployed in one of the selected clusters among the regions of Brazil in order to perform a technical visit of 6 days of the companies belonging to the APLs in Recife and Florianopolis

In particular, during this assignment the Consultant has been requested to:

- Prepare a ppp, deliver a lecture and participate in the debate on the topic of IT Services and Software Clusters during the Seminar in Brasilia;
- Perform a visit to the companies of the IT Services and Software APLs;
- Prepare a document on IT Services and Software of minimum 10 pages to be delivered after the field mission in Brazil.

3   Duration of the Assignment

The assignment has been implemented within the period 28 June - 9 July 2010, for a total of 8 working days.

The mission took place in Brasilia, Brazil, for 2 working days according to the schedule between 30th June and 1st July, and in Recife and Florianopolis, Brazil, for 6 working days, for an overall input of 8 working days.

4   Start, completion and location of the Assignment

The mission has implemented in the following locations and periods:
- Brasilia, on 28 June – 2 July 2010
- Recife, on 2 July – 6 July 2010
- Florianopolis, on 6 July – 9 July 2010

5   Activities carried out during the mission

The following main activities have been carried during this mission:
- Participation to the Brasilia Workshop
- Visit of IT Services and Software APLs in Recife
- Visit of IT Services and Software APLs in Florianopolis

Sub activities and tasks have been depicted in the related subsections in the following.

5.1   Participation to the Brasilia Workshop

Prior to the beginning of the Brasilia Workshop, the document "*Innovation: the main driver of ICT Cluster Development and Renewal*"*,* an electronic version of the speech for the workshop has been delivered.

On 29 June, still prior the beginning of the Workshop a meeting has been held in the Ministry of Development, Industry and Foreign Trade, with the purpose to harmonise the interventions of the different speakers and finding the way to share the expected results. Information was given in order to organise the study visits to the relevant APLs.

On 30 June the speech, focused on the importance of Innovations in ICT Clusters, has been delivered to an audience of more than 100 people. Active participation to the "IT Services and Software" panel has been ensured and replies to a number of questions has been guaranteed.

Finally, during this very day and in the following Workshop day, the Consultant has been contacted by a number of persons, including university professors, researchers and entrepreneurs and further explanations as well as contacts and linkages have been delivered.
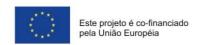
5.2   Visit of IT Services and Software APLs in Recife

Located in ancient Recife*, **Porto Digital*** is the ICT Cluster with a focus on software development. Porto Digital was born in July 2000, bringing together public investment, private business companies and universities in order to build a local innovation system that currently includes 130 institutions, among which ICT companies, special services and fostering agencies.

The ICT Cluster Governance is ensured by the Porto Digital Management Unit (NGPD), a not-for-profit civil association. The mission of the Management Unit is to organize the ICT Local Production Cluster, in addition to enable access and knowledge management as a way of supporting the other production sectors in the State.
The neighbourhood's current infrastructure is suited to host ICT companies thanks to its excellent road network and banking services, as well as the fact of being only 7 kilometres away from the largest airport in the north-eastern region. As a further feature, 8 kilometres of optic fibre cable and 26 kilometres of duct have been installed, making it one of the country's most modern urban areas in terms of communication.

In addition to the redevelopment of urban and technology infrastructure, there are appropriate sectoral policies in place and a full set of tools to complement Porto Digital's structuring projects. Among them are the Investment and Promotion Fund, the Human Capital Fund with a focus on vocational training, and the Guaranty Fund offering guarantees of up to 70% for loans by public banks to software companies. The Municipal Act 16.731/01 also benefits companies through financial incentives allowing for a reduction of up to 60% of the local sales tax on services (ISS).

The Porto Digital cluster is composed by small and medium companies, but multinationals like Motorola, Samsung, Dell and Sun Microsystems are also installed in Porto Digital. IBM and Microsoft transferred to Recife their regional headquarters. Major competencies developed by the local cluster include web-based solutions, as well as solutions in outsourcing, biometry, information security, IT infrastructure, mobility/wi-fi, distance education, and games.

The visit consisted of an exhaustive presentation run by the NGPD, followed by interviews to the Incubator managers and some enterprises, including Jinx (gaming), Serttel (mobility), Informa (physical asset management).

Half a day was spent in CESAR, the ICT research centre visiting all departments including chip design, embedded systems, mobile systems, digital tv, etc.

5.3   Visit of IT Services and Software APLs in Florianopolis

With support from businesses and government, the Federal University of Santa Catarina started **CERTI** Foundation in1984.
Nowadays, CERTI is a no-profit organisation with a core competence focused on technological research and development; operating 4 facilities in Florianopolis, with others in Manaus and its spin-off Sapientia Institute in Brasilia. CERTI is a world-renowned institution for innovation and development in the fields of ICT, mechatronics, quality assurance, industrial processes and innovation environment.

CERTI is articulated in several high-tech areas, including Digital Convergence, Edutainment, Metrology, Mechatronics, and Automation, mecaoptoelectronics and Quality Assurance. Along with applied research they provide consultancy and incubators to develop innovative companies with specific project to support company internalisation. They have been successful also in supplying technical and scientific services to multinationals and South America companies.

The visit was performed on 7 July 2010 and consisted of a general presentation of CERTI activities, followed by a visit of the several centres of competence including ICT (digital TV, edutainment). On the afternoon, Consultants were invited to tell their European experiences to a limited but very interested audience consisting of Cluster practitioners, entrepreneurs, etc.

On the following day, the visit of the CELTA incubator was carried out along with the presentation of the activities of ENI (company internalisation). Then, the IT services and Software APL was presented along with the ACATE technology company association and CETIC (ICT organisations forum), sort of informal management unit of the IT services and Software Cluster.
Finally the visit of the Alpha and Sapiens Science Park was carried out.

6   Findings

The Brasilia Workshop resulted in a number of informal talks with Brazilians with different backgrounds. They expressed genuine interest in the EU research and innovation activities and looking for collaboration chances in the IT Services and Software domain.

Issues arisen concerned with the relationship between ICT clusters and innovation in Europe, the role of public government (at any level) in Cluster initiatives, the awareness of the need of long-term policies as well as the need of creating, while taking advantage of the global job shifting in ICT, differentiators in order to efficiently compete globally.

Concerning the technical visits of ICT APLs, we believe indeed we were presented with very successful initiatives and IT Services and Software Clusters in Brazil. We wonder if these represent the excellence in Brazil or it is rather the average situation of Brazilian ICT Clusters.

However, since we did not want to rely on impressions, we assessed the different IT Services and Software APLs against the following indicators[1]:
- Presence of Universities – Research Centres;
- Presence of Financial Mechanisms;
- Government Support;
- Technical & Managerial Capabilities;
- Start-ups creation.

Porto Digital scored high in all indicators except the last one. The most serious problem appears to be the small number of start-ups plus the maturity level of most ICT companies, revealing a potential low level of innovation in the Cluster. However, the interview of the Porto Digital Incubator Manager made clear that they incubate projects rather then companies and that company agglomeration is a strategy strongly pursued for innovative companies, trying to achieve economy scale. This explains the limited number of incubated companies.

Porto Digital resulted into a too broadly defined Clusters and it contains indeed several sub-clusters composed each of them by several companies. In particular, we were impressed by the visit and activity presentation of the Gaming Cluster and the potentiality of its human capital consisting of very young, well-educated, English-proficient professionals.
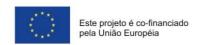Entrepreneur interviews especially enlighten the difficulties in the internalisation and globally competing process which is:
- firstly very rarely pursued for, due to a number of reasons including the fact that Brazil is a very large and profitable market and there is no need for other "more difficult" streams of revenues;
- secondly, in most cases, competition is referred to companies and Clusters belonging to other Brazilian States rather than other countries or continents;
- thirdly, once there are entrepreneurs trying to go abroad (for example, opening an office or trying to establish a partnership) they feel left alone and not enough supported.

On the research side, CESAR represents the research anchor of the Porto Digital Cluster feeding the Cluster with their know-how and human capital. It has a number of very interesting, good-quality, applied research projects as well as a record of successful exploitation of research results. Financial mechanisms appear to be very efficient to fund and support research.
Internalisation of research, in particular the participation to European Research Framework which is open to Brazil, is rarely pursued for and when it is implemented it seems to rely on passive

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[1] W. Ghodbane, "*ICT job shifts and ICT cluster assessment : An exploratory study*", Proceedings of SIG GlobDev's First Annual Workshop, Paris, France December 13th 2008

participation (being included in a proposal by other partners) rather then driven by the awareness
of potential benefits deriving from it. Moreover, starting a company does not appear very attracting
from the point of view of a researcher or University professor.

Finally, it is worth mentioning the fact that the Cluster Management Unit of Porto Digital, NGPD is
well separated from the provision of research and consultancy activities which are mainly carried
out by CESAR.

Generally speaking, Porto Digital appears to be very well positioned as an off-shore software
development platform able to attract investments from multinationals, more and more companies
and able to compete globally against ICT clusters from other countries and continents. This is
probably a potential short term strategy for Porto Digital, whereas on the longer term, it could be
worth focusing on the most innovative clusters such as the emerging e-content and media
(gaming, education) companies and their young and well-prepared human capital. Moreover, this
emerging e-content cluster could be boosted by the Old Recife neighbourhood renovation
resulting into a very attracting location for creative people.

In **Florianopolis**, CERTI has created an incredible, world-class environment to feed research and
innovation into APLs.
No surprise then that Florianopolis scored very high in all indicators we used for ICT Cluster
assessment. In particular, we were impressed by the level of research and services offered by
CERTI, the facilities offered by the different prize-winning incubators such as CELTA and, above
all, the strong support received by the local and State government which is heavily betting on
high-tech developments.
The ICT research and innovative projects available at CERTI showed a certain similarity with
those going on in Recife even sometimes covering different aspects, particularly in the areas of
Digital TV and gaming. Managers and researchers seem to be unaware of overlaps and possible
synergies with activities carried out in other Brazilian States.
Moreover, it worth enlightening experience such as ENI, the international (self-sustained) support
to innovative companies, which appear to be a singularity in the Brazilian high-tech environment.

Concerning the IT Service and Software Cluster, the Management Unit is still at an informal level
and it consists of a meta-organisation (organisation of organisations) called CETIC. Again, we
were facing a too much broad definition of Cluster, being the most important sub cluster identified
in the enterprise software. Moreover, it is not clear the relationship between universities, research
centres and the IT companies within the Cluster given the fact that the R&D engines are not
represented inside CETIC.
Common problems with Recife were the lack of internationalisation and even the perception of the
need to compete globally within the General ICT Cluster where the action of CELTI and related
incubators and Science Parks seem not having reached the largest mass of ICT companies.
A better focus on innovative ICT sub clusters is definitely worthwhile as well as removal of barriers
to the CERTI action in order to reach the bulk of ICT companies (for example, we were told that
CERTI is sometimes perceived as a competitor by ICT entrepreneurs given the fact it performs
ICT research and consultancy).

7   Conclusions:

Both IT Services and Software Clusters are well positioned as software development off-shore platforms able to attract foreign investments, multinationals and more and more ICT companies, highly profiting of the international ICT job shifting, if this is the strategy to pursue for.

However, they should be aware not only of the current international competition (available benchmarking at Cluster level seems to focus only on other Brazilian ICT Clusters seen as potential competitors) but also of the number of ICT Cluster Development efforts going on in Asia and Africa promoted by global development actors such as the World Bank, United Nations and European Union.

Innovation within such global ICT Cluster competition scenario appears to be the crucial element to guarantee the ICT Cluster Development and possible Renewal.

Indeed, innovation maintains the cluster at the forefront of the market whilst a strong R&D base can provide the ideas and products for future development. As research must have no barriers and its internationalisation is a *must*, we consider very useful a stronger, more active participation of Brazilian ICT R&D entities and innovative companies to the European Research Framework. This is likely to require the Federal Government to make an effort to render the participation to EU programmes more attracting than national research programmes, providing matching funds and even prizes on top of them (for example, this is the strategy currently followed in Norway). The creation of specific actions or even agencies to advertise the collaboration chances, including cooperation with European ICT Clusters, should be considered.

As a matter of fact, both ICT Clusters had high scores as far as the assessment against the following indicators is considered:
- Presence of Universities – Research Centres;
- Presence of Financial Mechanisms;
- Government Support;
- Technical & Managerial Capabilities;
- Start-ups creation.

However, the technical study visits pointed out the similarities of research and activities carried out in different ICT APLs. Developing synergies and avoiding overlaps can deliver obvious benefits as well as providing the basis for potential ICT Cluster integration in order to build world-class champions able to compete globally. Moreover, since *skills shortage* has been identified as a serious problem to be faced quite soon, exploiting complementarities can help alleviate this problem (other initiatives can be the delivery of intensive "crash" training courses, establishing IT certification recognised state or nation-wide, etc.).

Additionally, there is a need of focusing on the definition of ICT cluster, which is currently too broad and lack specialisation. Clear identification of most innovative sub clusters should be performed in order to support them.

Finally, support to company internationalisation and awareness campaign if such mechanisms are available, must be implemented along with the dissemination of entrepreneurial culture removing barriers between universities and companies (e.g., researchers should leave the university to start up new companies maintaining their university salary for a determined period).

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8   Recommendations

General recommendations are as follows:

- Make EU collaborative R&D activities in ICT more attracting to Brazilian universities and companies so as to contribute to their internationalisation
- Provide financial mechanisms for Brazilian entities taking part to EU programmes
- Clearly define ICT Cluster on the basis of their specialisation and their activities
- Clearly identify innovative clusters or sub clusters and strongly support them
- Develop synergies among different Brazilian ICT Cluster carrying out similar activities in order to build stronger ICT Clusters able to compete globally
- Support ICT company internationalisation
- Remove barriers between universities and companies
- Organise Cluster Management Units and/or incubators on the basis of "zero potential conflict of interest"

Areas of improvement:

- Internationalise ICT R&D with improved participation to EU R&D programmes
- Better define ICT Clusters, identify Cluster activities, identify Innovative Clusters
- Enhance company collaboration within a cluster

Opportunities:

- Support & develop existing innovative ICT sub clusters
- Exploit synergies among Brazilian ICT Clusters as well as among Brazilian and European ones
- Develop stronger linkages between Brazil and EU R&D in the ICT sector

Potential risks:

- Fierce Competition (ICT clusters are everywhere!)

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- Innovation perceived as neither necessary nor desired
- Lack of internationalisation with total focus on domestic market
- Different Cluster activity overlaps

Strengths:

- Strong government support
- Availability of financial supports
- Strong universities and R&D actors
- Strong Managerial skills (most managers have a US Master or PhD)
- Presence of a young, well-educated, English-proficient work force

Weaknesses:

- Isolation in research and focus on local market
- Competition with other State-based ICT Clusters
- Weak entrepreneurial culture