Developing ICT Policies to Foster Cooperation Between Europe and the Mediterranean Countries

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Abstract: There is a common agreement on the importance of Information and Communication Technologies (ICTs) as an essential tool for growth and advancement of development. The Mediterranean Partner Countries (MPC) region realized the potentials of ICT and therefore has been witnessing a booming ICT sector in recent years. To sustain such conditions, ICT research is absolutely essential to focus on innovative ICT solutions to respond to real national and regional needs. The paper addresses the development of policies and strategies to support research and development in ICT in the MPC. Extensive consultations with stakeholders in the region have resulted in identifying a set of priorities in terms of Framework Program 7 (FP7) challenges and objectives. This will help MPC to focus their own research agendas towards a closer co-operation with Europe in the field of ICT. It will also allow for focused efforts to establish networks between Europe and MPC based on the identified priorities. The paper describe in details two EU funded projects for realising these objectives.

1. Introduction

Information and Communication Technologies (ICTs) are now widely considered by developing countries as the motor of growth, the driver of efficiency and effectiveness and the tool to enhance human development. Recognizing the potential of ICTs, infrastructure initiatives and development of various ICT strategies are being increasingly promoted and encouraged. If we look specifically at the south Mediterranean region (or what is widely known as Mediterranean Partner Countries or MPC), the region has been witnessing a booming ICT sector in recent years. ICT contribution to GDP in most countries in the region has increased significantly over the past few years and is expected to continue to increase. For example the contribution of the ICT sector in Tunisia amounted to 10% of the national GDP in 2009 and is estimated to contribute around 13% in 2011 [1]. We can find a similar pattern in the case of Jordan where the total revenues from ICT products and services has tripled since 2003 [2].

In order to strengthen the ICT sector and exploit its potentials, ICT research is absolutely essential to focus on innovative ICT solutions to respond to real national and regional needs. There have been several efforts in MPC to strengthen the role played by ICT through research and development. But as of today, there are no long-term research policies in the full sense – only plans or agendas such as the MCIT activities in Egypt [3], the Lebanese STIP [4], the Jordanian R&D Strategy for ICT [5], or the Syrian national ICT Strategy [6]. Looking at these examples, one can see that, generally, they are not

comprehensive and not formulated in a systematic way to ensure wide participation from all concerned stakeholders. Moreover, they do not exploit the cooperation initiatives between the region and the European Union (EU). There is pressing need for the MPC to focus their own research agendas towards a closer co-operation with Europe and to learn more about the concrete Framework opportunities and procedures, in particular in the field of ICT.

In this paper we look at efforts to address this issue in the form of two EU funded project, MED-IST: the Mediterranean Information Society project, running from 2007 to 2009 (FP6); and JOIN-MED: Establishing the EU-Mediterranean ICT Research Network that started early 2009 and will run until mid 2011 (FP7).

2. Objectives

The identification of the MPC research priorities related to the Information Society field is one of the main objectives since it will help the MPC countries formulate a long term Research Agenda and Policy oriented towards future collaboration in the European Framework Programme for Research and Development (FP7). The rationale for this priority-setting exercise is rooted in the well-identified need for the further building of the Information Society in the MPC, so that these countries master the ICT technologies and adapt them to local needs. ICT research collaboration with the EU represents an important avenue for all MPC to pursue, as it can: first, yield important benefits to individual MPC researchers and research organisations; and second, improve the overall countries' capacity to innovate, address critical socio-economic challenges, and ultimately strengthen their own position. The other broad objectives are:

1. Set up a list of ICT research priorities reflecting the actual needs of MPC countries
2. Map the identified MPC ICT research priorities to the FP7's ICT challenges
3. Develop an ICT Strategic Research Agenda (SRA) per country
4. Harmonize the results from each country and develop a Policy Paper providing "Recommendations for shaping EU scientific co-operation with the MPC: 2007-2013"
5. Create a sustainable network of ICT research organisations in the MPC and Europe

3. Methodology

The methodology we opted for is to first identify current capacities in MPC in ICT and attempt to identify priorities. The knowledge obtained will then be used to create a sustainable network to reinforce research cooperation between the two regions. Figure 3.1 summarises the major elements of the methodology used.

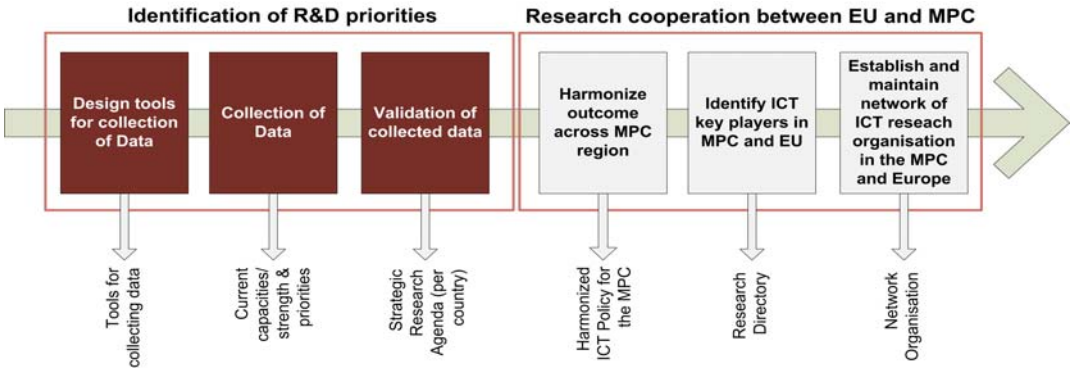

Figure 3.1: Methodology Used and Outcome From Each Process

3.1 Identification of R&D Priorities

One major source for the development of our consultation methodology has been the available literature on research priority setting, SRA development and allied national or thematic forecasting and foresight exercises and case studies [7-11]. The general way research prioritisation has been approached in the studied examples tends to vary with the scope of the related exercises and/or the size and status of the countries involved, with larger countries and European Technology Platforms primarily focussing on the identification of emerging technologies of strategic relevance for the related country or research field. In contrast, smaller and developing countries tend to perform research priority exercises aiming at the development or re-focussing of technological specialization strategies, and the matching of their national potentials with economic opportunities and societal needs. The corresponding methods and tools employed vary accordingly, and usually comprise a combination of tools such as Delphi and issues surveys, critical key technologies, SWOT analysis, foresight exercises, technology road-mapping, and scenario development exercises. We opted for a two-phase consultation process that was designed around the deployment of a scoping survey followed by the organisation of a consultation workshop. The specific analytical tools used within this context have been selected following an analysis of other SRA and research prioritisation exercises, and was grounded on a blend of trend and SWOT analyses and the CSIRO importance-feasibility prioritisation framework [12]. Key reasons for this choice include: (1) the simplicity and ease of use; (2) flexibility to accommodate any differences in the level of analysis performed in each country as a result of prior ICT research priority-setting work; (3) compatibility with time constraints and overall two-staged consultation concept; and (4) their provision of a systematic, consistent and transparent basis for the formation, analysis and evaluation of research priorities and research themes. The entire process was split into three phases as shown in Figure 3.1

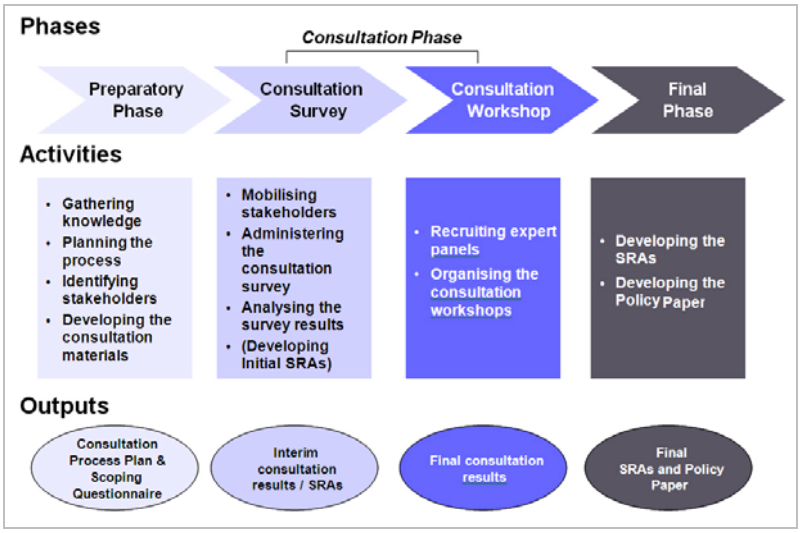

Figure 3.2: Overview of the Consultation Process

3.2 Research Cooperation Between MPC and Europe

The identification of research priorities and direct stakeholders will facilitate the development of networks at different levels: (i) the cross-regional networking events; (ii) the focused distribution of the "EU-MPC Research Directory" in the EU (via EU members states' National Contact Points (NCPs), CORDIS, and directly to key EU research organisations) and dissemination of information on the MPC organisations through

participation in major EU dissemination events; (iii) providing targeted EU contacts (Commission, key EU research organisations, and personal contacts from the extensive networks of the MPC EU partners). Networking events are the most important element to achieve this objective by bringing researchers from EU and different MPC together to discuss and develop concrete research activities and projects. They will also be the platform for the policy exchange, where current policy developments will be presented and discussed among the participants and the relevant stakeholders of the countries addressed.

4. Results

We implemented an open consultation process involving more than 250 ICT stakeholders in the participating MPC including ICT experts, research actors, policy makers, ICT company representatives, NGO and civil society representatives. Through a scoping questionnaire and extensive discussions, we established an overview of the ICT capacities in each country and identified the ICT priorities for the future in terms of the seven challenges of FP7 (see http://cordis.europa.eu/fp7/ict/programme).

4.1 Nominated Research and Development Priorities: Summary

The nomination of priorities for future R&D in the MPC were based on two criteria:

1. The R&D capabilities of the countries as the most important one, since these existing capabilities will qualify organisations as promising partners in collaborative EU projects.
2. The expected needs of the countries play a role when defining priorities for the future, but should do this to a much lesser extent than their capabilities. It is not the role or task of FP7 to support building up entirely new Research and Development directions in the country, this falls under the responsibility of the countries themselves or under specific aid programmes.

In most countries this principle was well respected, in many cases the priorities reflect a needed strengthening of certain areas, which is within the scope of an FP7 R&D project. Figure 4.1 shows the summary of nominated Research and Development priorities for all countries. There is a clear preference for Challenge 1, followed by Challenges 4, 5 and 6. Challenges 2, 3 and 7 do not play a major role when looking at the entire region.

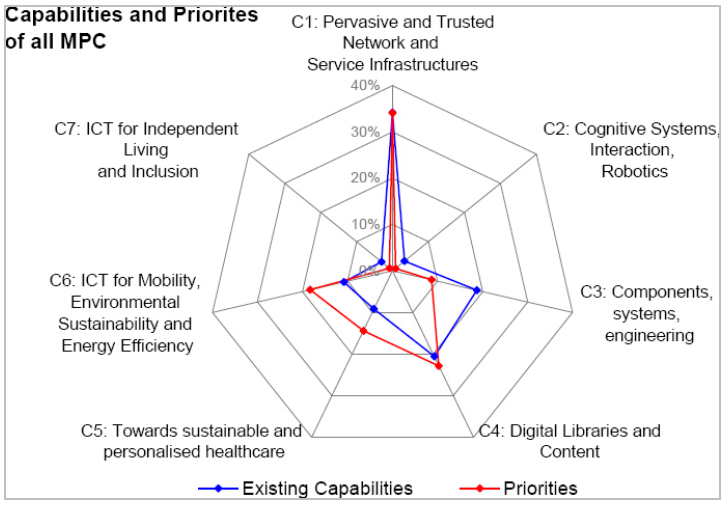

Figure 4.1: Nominated Research and Development Priorities for All MPC Countries in Terms of FP7 Challenges

4.2 Nominated Research and Development Priorities: Individual Countries

If we looked at each MPC individually (see Figure 4.2) we notice there are quite distinct local differences concerning the future priorities: In Egypt and Jordan the network issues are not seen as an important priority for future Research and Development but instead Challenge 6 (with a strong focus on Environment/Energy and Mobility) and Challenge 4, where both countries have already developed a good Research and Development infrastructure. All other countries see pervasive and trusted networks as an important Research and Development topic for their communities. Tunisia has put a strong focus on Challenge 3, Components, systems, and engineering, while Challenge 4 this is rated fairly low in most of the region.

We also observe some discrepancies concerning the above mentioned relationship between Priorities and Capabilities: For example in Egypt, where the existing capabilities relating to Challenge 6 are rated very low, but at the same time this Challenge has the highest priority for the future. Similar cases can be observed in Morocco (Challenge 6) and Lebanon (Challenge 5). For more details see [13].

4.3 Priorities Suitable for EU-MPC Research and Development Collaboration

Following examination and analysis of collected information the following priorities (Table 4.1) could be proposed as reflecting the overall capacity and importance for the MPC.

Table 4.1 Potential for EU-MPC Research and Development collaboration in the Period 2008-2013

Potentials	FP7 Challenges and Objectives
HIGH	**C1:** Pervasive and Trusted Network and Service Infrastructures *Objective 1.1* The Network of the Future *Objective 1.2* Service and Software architectures, Infrastructures and Engineering *Objective 1.4* Secure, dependable and trusted infrastructures
	C3: Components, Systems, Engineering *Objective 3.3* Embedded systems design
	C4: Digital Libraries and Content *Objective* 4.1 Digital libraries and technology-enhanced learning
	C5: Towards sustainable and personalised Healthcare *Objective 5.1* Personal health systems for monitoring and point-of-care diagnostics
	C6: ICT for Mobility, Environmental Sustainability and Energy Efficiency *Objective 6.3*: ICT for Environmental Management and Energy Efficiency
MEDIUM	**C3:** Components, Systems, Engineering *Objective 3.1 Next generation nano-electronics components and electronics integration*
	C6: ICT for Mobility, Environmental Sustainability and Energy Efficiency *Objective 6.1* ICT for the intelligent vehicles and mobility services
LOW	**C2:** Cognitive Systems, Interaction, Robotics **C7:** ICT for Independent Living and Inclusion

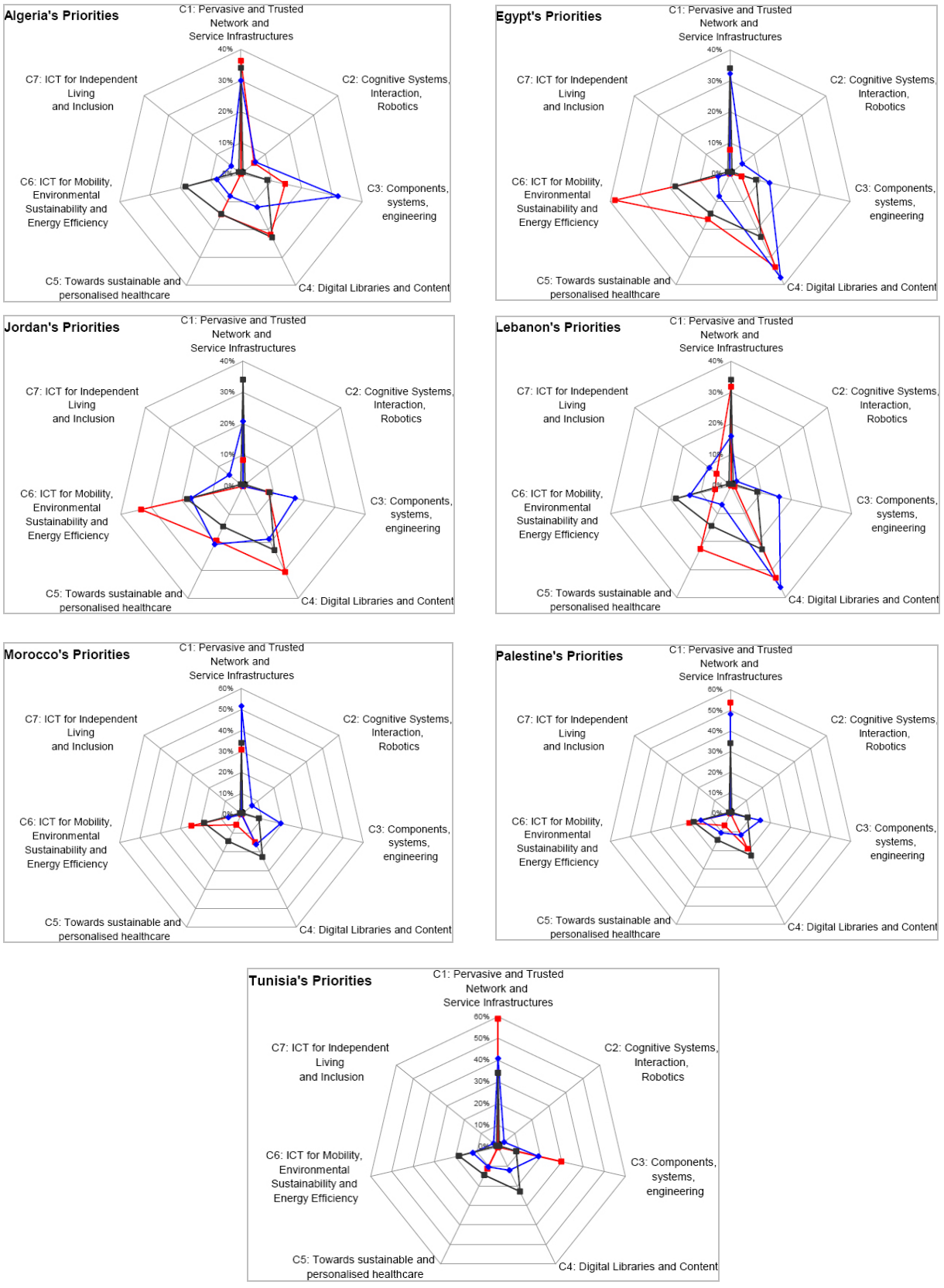

Figure 4.2: nominated Research and Development priorities for each MPC countries in terms of FP7 challenges

5. Future Activities

As a necessary and natural follow-up to the MED-IST project that had its focus more on the individual MPCs, JOIN-MED is pursuing a cross-regional focus on the one hand and the research networking with Europe on the other. It will continue supporting the ICT policy dialogue, in particular the coordination of national policies on international S&T co-operation across the MPC. JOIN-MED is formulating a harmonised ICT policy specific to MPC region through an open dialogue, among the MPC as well as with Europe.

To help unfold the potential of the research capacity across the MPC, where R&D is still driven by national initiatives with very little cross-regional co-operation, JOIN-MED will promote closer research cooperation across the region, by moving from country-focused networking events to cross-regional ones. On the practical side, JOIN-MED will create a sustainable network of ICT research organisations in the MPC and Europe, reinforcing the Research Cooperation between these two regions on a wider scale.

6. Conclusions

In this paper we described efforts in the form of two EU funded projects to bring the MPC closer to FP7 ICT and one of its specific objectives is to obtain a clearer picture of the ICT R&D landscape in the MPC, which has made significant advances over the recent years, but often unnoticed by the European research and IT community. This paper summarises the findings in the MPC region (with the exception of Syria and Libya), highlighting the existing ICT capacities and the future priorities for each country. During the discussions at the consultation sessions, three FP7 ICT Challenges were identified as the most relevant ones across the region:

- Challenge 1: Pervasive and Trusted Network and Service Infrastructures
- Challenge 4: Digital Libraries and Content
- Challenge 5: Towards sustainable and personalised healthcare

The many consultation sessions across the region highlighted a number of problems in understanding FP7 aims and objectives, defining priorities or in distinguishing between research and applications. A number of these were of a general nature and identifiable across the region and since some lessons can be learnt from them.

In view of the fact that already three MPCs have signed a 'Science and Technology Agreement' with the EC - a fourth country will sign this year - giving these countries a more prominent position in EU cooperation, the stakeholders at the consultation meetings expressed their views on what needs to be done to bring the two regions closer together. In terms of collaboration with Europe, the answers are quite clear:

1. Continue support activities in the MPC to create awareness about the FP7 opportunities and provide specific information about the procedures, open calls, etc.
2. Help creating Euro-Med Networks to bring the research communities from the two regions closer together.
3. Put more focus on mobility and exchange opportunities offered by the People Programme of FP7, possibly by integrating awareness activities for those into the specific ICT activities. A closer coordination between these programmes within the EC could also help.
4. Consider the launch of a specific Euro-Mediterranean Programme, possibly along the lines of EUMEDIS but with a stronger focus on sustainability.
5. Simplifying the procedures of the Framework Programme (a recommendation probably shared with all Europeans)

It is clear that the ICT theme in FP7 cannot support the development or improvement of the ICT Research and Development infrastructure in the MPC; however a successful and mutually beneficial participation of MPC organisations in the ICT Programme does indeed

require an up-to-date infrastructure. In other words, if Europe is really interested in closer links with the MPC in terms of ICT Research and Development, it must also support the development of the necessary infrastructure.

Even more difficult but possibly also more important is the improvement of the education and academic Research and Development environment with appropriate Research and Development funds. In the long run it is of course the responsibility of the countries to invest the proper share of their GDP in education, R&D and technological development, but until the countries are in a position to do that, external support is necessary. Hence, the recommendation for an EU policy towards the region is to put more emphasis (and money) into higher education and Research and Development, possibly by adapting the 'European Neighbourhood and Partnership Instrument' accordingly.

References

[1] Tunisia online news: "*Tunisia: ICT's contribution to GDP to reach 13% in 2011*", February 2009. Article available online (www.tunisiaonlinenews.com/2009/02/02/). Visited on 18 May 2009

[2] Information Technology Association – int@j: "*IT Industry Statistics 2007*", August 2007. Article available online (intaj.net/). Visited on 18 May 2009

[3] Ministry of Communications and Information Technologies in Egypt: "Egypt's ICT Strategy: 2007-2010". May 2007. Article available online (http://www.mcit.gov.eg/ICT_Strategy.aspx). Visited on 18 May 2009

[4] United Nations Educational, Scientific and Cultural Organization, Lebanon Office: "*Science, Technology and Innovation Policy (STIP)*". Article available online (www.cnrs.edu.lb/stip/). Visited on 18 May 2009

[5] Suhair Khatib, Jawad Afifi, Ahmad Khawaldeh, Omar Al Jarrah, Salem Aqatesh, Edward Jaser, Omar Hamarneh, Saed Younis, Batoul Ajlouni and Alaa Qattan: "*Research & Development strategy for Information and Communication Technology*". April 2007. Article available online (www.moict.gov.jo/).

[6] Ministry of Communications and Technology in Syria: "*National ICT Strategy for Socio-Economic Development in Syria*". 2004. Article available online (www.undp.org.sy/publications/national/E-trategy/ICT_Strategy_en.pdf). Visited on 18 May 2009

[7] Aichholzer, G. Searching for leadership in innovation niches: "*Technology Foresight in Austria*". Article available online (www.nistep.go.jp/achiev/ftx/eng/mat077e/html/mat077be.html).

[8] Cassingena Harper and Pace: "*Creative Processes in Policy Making: A Case for Context in Foresight*". Article available online (www.cs.um.edu.mt/~gpac1/Teaching/Foresight/Papers/context.pdf).

[9] Gassler, Polt, Schindler, Weber, Mahroum, Kubeczko and Keenan: "*Priorities in science & technology policy – an international comparison*". 2004. Article available online (www.rat-fte.at/files/Studie_Priorities_in_STpolicy.pdf). Visited on 18 May 2009

[10] Rongping Mu, and Zhongbao Ren: "*Technology Foresight towards 2020 in China: the Practice and its Impacts*". Article available online (forera.jrc.es/documents/papers/Technology%20Foresight-murongping.pdf).

[11] Salo A. and Liesiö J.: "*A case study in participatory priority-setting for a Scandinavian re-search programme*". 2004. Article available online (www.woodwisdom.fi/content/Pdf/AhtiSaloArticlePrioritysetting.pdf?from=1698829078490013). Visited on 18 May 2009

[12] CSIRO – The Australian Commonwealth Scientific and Industrial Research Organisation

[13] MED-IST Report "*Co-operation with the Mediterranean Partner Countries - Priorities, Experiences, Recommendations*". Article available online (www.med-ist.eu/Reports/MED-IST_Report_1_TheMPCPriorities_V2.0.pdf