



Strategies for Embedded Systems Research

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1. Introduction

COSINE2 aims at aligning RTD strategies between different countries and with EU activities and at opening more national ES research programmes for international (EU) participation by supporting this opening through information and best-practice examples. COSINE2 will offer support to all countries willing to co-operate regardless of their participation in the Support Action.

2. Acknowledgement

Work reported here was funded by the Information and Communication Technologies Programme of the European Commission under the COSINE2 Grant agreement No. FP7-ICT-215594. COSINE2 stands for “Co-ordinating Strategies for Embedded Systems Research”.

The COSINE partners are:

- eutema Technology Management GmbH (Co-ordinator, AT)
- Finnish Funding Agency for Technology and Innovation (FI)
- Deutsches Zentrum für Luft- und Raumfahrt (DE)
- The Israel Directorate for EU FP6 (IL)
- Institute of Information Theory and Automation, Academy of Sciences (CZ)
- Swedish Governmental Agency for Innovation Systems (SE)
- Bundesministerium für Verkehr, Innovation und Technologie (AT)
- Nemzeti Kutatási és Technológiai Hivatal (HU)
- Flanders Institute for the Promotion of Innovation (BE)
- Ministry of Universities and Research (IT)
- Atomic Energy Commissariat (FR)

3. Description of Work

Task 1.3 Co-operation between national programmes

The task will start with collecting information on best-practices and experiences from already cooperating national initiatives. It will publish this information on the COSINE2 portal. Policy makers in EU countries will be contacted to advertise trans-national co-operation in ES RTD and to inform about co-operation models, contacts, actors, etc. COSINE2 will offer its support and assistance to all RTD policy actors in the EU and associated countries. An intermediary report will summarize best-practice examples and success stories. In order to improve exchange of views, co-operation, and to get a better overview of national policies and programmes for ES research, an international conference will be organised.

4. Scope of Activities: Best Practice examples and success stories of Joint Programming

4.1. Sweden-Norway-Finland NORDITE funding initiative, call for proposals 2007

4.1.1. Background

VINNOVA, The Research Council of Norway (RCN) and The National Technology Agency of Finland (Tekes) will, based on a Memorandum of Understanding (MoU), facilitate co-operation in the fields of technology development for SW radio, wireless sensors, short range wireless networks and RFID or MEMS utilizing RF technology and to consolidate technological and economic development opportunities between Sweden, Norway and Finland. The main goal of this initiative is to support Swedish, Norwegian and Finnish research institutes and universities in their effort to develop state-of-the art research in the above-mentioned fields. The research topics defined in this CFP are continued from the NORDITE CFP in 2005.

4.1.2. Objective

The purpose of this Call for Proposals (CFP) is to solicit project proposals from teams composed of Swedish-Norwegian-Finnish universities and research institutes in beneficial areas for Sweden, Norway and Finland. The projects should provide results in form of technology development that can be utilized by Swedish, Norwegian and Finnish companies.

4.1.3. Scope

VINNOVA, RCN and Tekes consider that participants from all countries will find it profitable to work together on issues of common interest and that meaningful collaboration and business opportunities may result from this joint venture. Based on identified fields of common interest in the participating countries, from the response on the joint NORDITE invitation for Expressions of Interest (EOI), VINNOVA, RCN and Tekes have defined the areas below for cooperation in projects and activities. The goal is to develop technology for the following areas:

- SW radio
- Wireless sensors
- Short range wireless networks (a few hundred meter)
- RFID or MEMS utilizing RF technology

While the list itself is general, proposals shall be specific in terms of objectives, methodology and deliverables as well as market potential. A proposal may address more than one technology area, if there is an obvious linkage in terms of data, location, or user needs. The research should be motivated and guided by companies, which participate actively in the project steering group.

4.1.4. Summary

This CFP is being issued on behalf of VINNOVA, the Research Council of Norway and Tekes. This CFP is designed to promote increased co-operative research in the fields of technology development for SW radio, wireless sensors, short range wireless networks and RFID or MEMS utilizing RF technology and to assist Swedish, Norwegian and Finnish research institutes and companies to further develop and demonstrate their technical expertise in that area.

The NORDITE programme is planned to run from 2005 to 2010. The first call for proposals was announced the spring of 2005; this is the second call, announced and closing during the spring of 2007. Those projects that are already being funded through NORDITE should present the results of the first years research and specify new project content in order to apply for a second period of funding. The second call will also be open to new projects that were not funded from the first call. Each funding agency will fund the national part of the overall project, including costs from research exchange.

The total funds allocated for NORDITE projects in call 1 are:

Tekes: 2.2 million EUROS RCN: 2.1 million EUROS VINNOVA: 2.2 million EUROS

The expected total funds allocated for NORDITE projects in future call 2 are:

Tekes: 3 million EUROS RCN: 2 million EUROS VINNOVA: 3 million EUROS

Swedish, Norwegian and Finnish teams (research institutes and universities) with expertise in the area of the program are invited to specify research and technology development projects for which they foresee a significant market. This market potential should be confirmed by at least two companies by signing an agreement of participation, cf. appendix A. At least two representatives from two different companies must participate in a steering group of the project.

4.2 German-Russian Funding Initiative for R&D intensive Hightech SMEs

Together with a Russian funding partner (FASIE: Foundation for the Assistance of Small Innovative Enterprises) the German Ministry of Education and Research (BMBF) started a funding initiative to support bilateral cooperation projects in the high-tech area. This funding initiative focuses on R&D intensive SMEs and will be therefore an appropriate example for the overall orientation of recommendations coming from COSINE2.

4.2.1. Background

Germany and Russia initiated a partnership in the fields of education, research and innovation" in the year 2005 (www.deutsch-russische-partnerschaft.de), where the cooperation in the field of applied, innovative and industry-related research and development is of particular importance. In this context, the International Bureau (IB) on behalf of the BMBF and the Russian Fund for support of small innovative enterprises (FASIE) came to an agreement in December 2007 to fund future joint German-Russian cooperative projects.

4.2.2. Objectives

After a successful first joint call in summer 2008 both research promoters want to make their co-operation now persistent and published a second joint call for proposals in February 2009.

This call is aimed primarily at research-active German and Russian small and medium-sized innovative companies. On the German side application-oriented research institutions, may also apply for a funding grant.

Objectives of the call for proposals are German-Russian cooperative projects, which thematically from the perspective of German and Russian priorities are attributable to future technologies. The projects are as a rule with an eligibility period of not exceeding 24 months encouraged.

4.2.3. Scope

The funding initiative focuses on German-Russian research co-operations covering the following topics:

- Biotechnology, Health Research and Medical Technologies
- Nanotechnology
- Information- and Communication Technology
- New Materials and Industrial Production Technologies
- Technologies for Energy Efficiency and sustainable Environment resources
- Optical Technologies

Furthermore applicants from other thematic areas may be funded, if both project management agencies agree to these projects and classify them as relevant for the targets of the funding initiative.

The projects will usually be funded with a maximum amount of 50.000 Euro from both sides over a maximum project duration of 24 months.

4.3 Programme Inter Carnot & Fraunhofer PICF

4.3.1. Background

France and Germany share a common vision and instruments for the development of technological research. Carnot institutes (IC) and Fraunhofer institutes (Fhl), as research and technology institutes, are specialized knowledge organizations dedicated to the development and transfer of science and technology to the benefit of the economy and society.

Following the French-German Forum for Research 2008, the French Agence Nationale de la Recherche (ANR) and the German Ministry of Education and Research (BMBF) agreed, in a Memorandum of Understanding on a 3 years programme for joint funding of German-French collaborative research and innovation projects between the Fhl and the IC. The first call for proposals was jointly published and carried out by the ANR and the BMBF.

4.3.2 Objective, goals and scope

The objective of this call is to establish German-French collaborative research and innovation projects between Fhl and IC with the goals to:

- Enhance leadership on national and international industrial markets
- Prepare the transfer of technology and knowledge to industry
- Promote networking between excellent research organizations
- Construct sustainable strategic alliances

The first call for proposals has been opened in November 2008 (deadline 30. January 2009) on the following thematic fields:

- Civil security
- Energy
- Environment
- Health
- Information and Communication Technologies (ICT)
- Transport

4.4. ADMIRE-P – EU-Russian Cooperation in the FP6

4.4.1. Background

Russia has long been famous for its R&D including information and communication technologies (ICT). Under the European Union's Sixth Framework Programme, 285 million Euros were available for third country co-operation and which were spent in areas such as IST in a range of countries including Russia.

ADMIRE-P was an EU-funded project whose aim was to promote co-operation between EU and Russian research teams in IST. It was focused on a specific region in Russia, the Privolzhsky Federal District.

4.4.2. Objective

The ADMIRE-P project has helped EU and Russian researchers to develop joint proposals to the FP6 IST Priority by:

- Helping EU researchers find potential collaborators by profiling Russian research teams and classifying them according to their research interests.
- Organising brokerage events where researchers from both sides can meet to discuss common interests.
- Providing a help desk to assist EU researchers develop contacts, prepare research proposals, and overcome cultural, business and even travel problems.
- Training support organisations in Russia to help researchers understand the Commission's rules and procedures.

The ADMIRE-P consortium consisted of:

- The University of Nizhny Novgorod
- Bureau for International Research and Technology Cooperation (Coordinator), Vienna Austria
- Singleimage Limited, Cambridge UK

4.4.3. Regional Focus

Privolzhsky Federal District includes most of Russia's aircraft, aerospace, automotive, shipbuilding and engineering industries. Major companies such as General Motors, Intel and DaimlerChrysler have already made substantial investments in the region. In terms of research, the district has over 12% of all Russian research personnel and accounts for around 20% of Russian patents. In Information Society Technologies, it has widespread research in broadband transmission, e-learning, and technologies for trust and confidence. Not surprisingly for such a large region, there are many other areas of significant research capability.

5. Discussion of the Results and Conclusions

With these examples it is obvious that EU member states have to strengthen cooperation within topics of vital strategic interest and a global impact. It is the most fruitful way to face forthcoming global challenges and to gain sustainability of economy and ecology. Europe has to foster the development of global technological standards in order to reach a worldwide leading position.

The example of the German-Russian cooperation indicates that the take-up of technology cooperation can be initiated with a relatively small funding amount.

Discussions at the 4th COSINE2 project meeting:

COSINE2 members see the difficulties and the differences in opportunities to open national programmes throughout the EU-member states, e.g. in Germany and the Czech Republic. Due to formal Budget law restrictions the German government has no possibility to fund applicants from other countries. In contrast to that, such restrictions do not exist in the Czech Republic.

Embedded Systems technology is crosscutting through a widespread field of application areas and thus should be in the focus of a vital European interest. One very important problem is, for example, the quality assurance in complex product- and development chains (car manufacturers, aircraft industries etc.). This problem can only be faced by standardisation. COSINE2 has to stimulate cross-border cooperation as an initial step to overcome quality problems and to trigger the development of quality standards.

6. Recommendations for national ICT policy authorities

The first aim for national ICT policy makers should be to figure out the possibilities of opening national programmes for collaboration with other countries on the basis of the existing national budgetary and legal requirements. After this step, a further step could result in a first alignment, where two countries with embedded systems programmes launch a common call for funding on this topic.

The above mentioned examples show up, that countries with a small public R&D budget must not be automatically excluded from participating in bilateral or trilateral funding activities. The take-up of international co-operations can start on the basis of very low budgetary amounts, as we can see in the example in chapter 4.3.

Due to this we recommend a step-by-step approach: start simple, go global. After a successful take-up phase with small or medium-sized bilateral projects, these participants will be well prepared to make the next step by applying for funding in FP 7 or ARTEMIS.

One decisive conclusion can be drawn from the presented examples: The initial step of take-up can only be triggered and accompanied by the national governments. These examples also imply that if one single country has no sufficient R&D background (companies, research institutions etc.) of its own to start an embedded systems programme, such bilateral and/or trilateral initiatives can be a practicable cross-border substitution and solution.