Review of SPIDER'S funding of ICT Collaboration

Projects with Swedish Partner Universities

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Executive summary

The task of this evaluation is to review the results and effects of the ICT Collaboration Projects with Swedish Partner Universities programme, in particular the project results and the experience of the first two rounds of project funding, and to give SPIDER input to help it decide whether it should fund a third round of applications for the period 2007–2009.

The increasing use of ICT in developing countries, including the poorest, will increase the need for help in establishing a sound infrastructure and appropriate ICT services. However, there are still few people available in the countries with the necessary competence to build, run and maintain the networks and to develop and run the services.

The ongoing restructuring of the Swedish development aid, with a shift towards an increased presence in the field and increased responsibilities for the Swedish embassies, will probably lead to increased need for supporting services like SPIDER.

There is also a market for SPIDER's work outside Sweden. As SPIDER has unique competence in Europe it might be possible to expand its services to other agencies, including other Nordic countries and the EU development aid services.

This review was carried at an early stage of the development of SPIDER and is based on a fairly small number of projects, none of which have yet been finalised. However, the following observations can be made.

- The projects are all on track and are promising.

- The linking to groups and researchers in selected developing countries has been excellent and both knowledge and training have been achieved.

- The departments supported have become involved in the work of SPIDER and are now well aware of and informed about SPIDER.

- A number of young Swedish researchers at different levels have been trained and they have been exposed to development problems.

- Partners in developing countries have put in considerable work for the projects. At least one project (Garrett) has mobilised additional international funding and resources 'in kind'.

- Networking between the Swedish research groups has only been marginally enhanced by the funding programme.

In conclusion I recommend that

- SPIDER continue to fund Swedish research projects at similar or increased levels of funding;

- SPIDER continue to experiment with the forms of funding and keep flexibility in the funding of Swedish research;

- project proposals be invited from one more Nordic country;

- links and contacts be established, and if possible shared work be undertaken, with other funding organisations in the ICT field.

Background

The *Swedish Program for ICT in Developing Regions* (SPIDER) is a national centre created to strengthen Sweden's support to developing the use of ICT in poor countries. By creating a network of ICT experts from academia and the private and public sectors, SPIDER can serve Sida and other donor agencies in the field of ICT for development.

SPIDER is a new organisation which was created by Sida and KTH two years ago. Since then some thirty ICT project collaborations have been funded and organised. The work of SPIDER builds on a network of universities and other organisations and individuals, now comprising thirteen Swedish partner universities, national and international organizations, and several hundred individuals committed to ICT for development.

The core activities of SPIDER are the ICT collaboration projects, which are initiated either by organizations from developing countries or by the Swedish partner universities. Of the latter kind there are now 15 projects in all, nine of which were funded in 2004 and six, still ongoing, were funded in 2005–2006.

Tasks for the review

The objectives of the evaluation are given in the attached terms of reference (Attachment 1). In brief, the purpose was to review the results and effects of the ICT Collaboration Projects with Swedish Partner Universities programme and to give SPIDER input to help it decide whether it is justified to fund a third round of applications for the period 2007–2009.

The review was to discuss the fulfilment of the programme objectives, relate the SPIDER project funding to other research funding, and discuss the results in terms of scientific or technical reports, knowledge gains, software or products and other academic results of the programme, as well as their contribution to capacity building in developing countries. The review could also comment on any additional benefits of the programme for the Swedish researchers.

Finally the effect of the programme on the SPIDER organization should be discussed and recommendations made about future administration of the programme.

Opinions could also be given about the assessment, monitoring and evaluation of the programme. However, these aspects were optional as they are covered by a separate study.

The execution of the review

The review of SPIDER's funding of Swedish research was carried out in the winter of 2006–2007. The reviewer participated in the conference at Jönköping University in December 2006, where presentations of SPIDER's work were given, some of them by researchers in the programme. A couple of interviews with project leaders were carried out during the conference. The remaining project leaders were visited and interviewed later, most of them in connection with visits to their institutions. Some additional material was collected from the research projects in addition to the documents provided by SPIDER (applications, progress reports, assessments and forms). Interviews and discussions were also held with representatives from Sida and SPIDER Board members and with the SPIDER staff.

The need for SPIDER

SPIDER works in a very specialised and technically demanding sector. The need for its services has so far been high and can be expected to increase. The recent increased funding from Sida for the coming three-year period gives a clear indication of Sida's need for SPIDER's services and work.

The ongoing restructuring of the Swedish development aid with a shift towards increased responsibilities and presence in the field (at the expense of 'in-house' competence in Stockholm) and increased responsibilities for the Swedish embassies will probably increase the need for SPIDER. In some respects it may also create new difficulties. It can be expected that as the number of bodies (embassies etc.) asking for advice for ICT work increases there will be an increased need for support and contacts. SPIDER will also have to continue to demonstrate why and how new and better electronic communications will be important for the poor in developing countries and what prospects ICT for development can offer.

There is also a market for SPIDER's work outside Sweden. ICT is rapidly growing to an important means of communication in developing countries, including the very poorest, while there are still few people around with the competence needed to build, run and maintain the networks and to develop and run the services. The present changes in the Swedish system are only a part of a European rethinking of development aid, and similar changes will occur in other places. As SPIDER has unique competence in Europe it might be possible to expand its services to other agencies, including other Nordic countries and the EU development aid services. To do so would help SPIDER to reach a fully efficient size. ICT for development might become an area of strength for Swedish development aid.

The review was carried out against this background and with this changing context in mind.

Results of the programme

ICT Collaboration Projects with Swedish Partner Universities

The main objectives with the funding of projects initiated in Sweden are:

- Support pilot project that could be of interest for Sida (and other funding agencies) to develop into full-scale projects.
- Engage research groups and the partner universities in the SPIDER network.
- Raise awareness of the importance of and develop knowledge about ICT for development among the network members.
- Create synergies between the network partners.

The initial round of projects funded in 2004 were intended to start up new, or to boost ongoing, activities and were fairly small (SEK 300 000–450 000). Nine projects were supported.

First round of funding

Proj. leader	Title	Sw. inst.	2004
Birgitta Rydhagen	Digital delivery: what is the potential of participatory e-learning in rural Tanzania?	BTH	350 000
Björn Pehrson	Vientiane gigabit network	KTH	400 000
Bo Göransson	Harnessing information and communication technologies for development in Laos	LU	300 000
Karl Sandberg	ICT4ICT	MU	450 000
Kurt Sandkuhl	ICT – Support for formation of business relationships with Developing countries Based on Immigrant Competences	HJ	300 000
Paul Johannesson	MiCOpA – Micro credit operation automation	SU	450 000
Sverker Holmgren	Efficient use of computer capacity – Grid computing in a developing country	UU	300 000
Åke Grönlund	Next generation eGovernment	ÖrU	400 000
Åke Sivertun	Spider-link	LiU	300 000

Five of the projects (Pehrson, Göransson, Sandkuhl, Holmgren and Grönlund) became forerunners to bigger projects in the second round. The objectives of initiating work and stimulating participation in development efforts have clearly been achieved.

One of the projects was considerably changed and expanded in the next phase: the Gigabit network in Laos was changed into an African project with a focus on Tanzania (Pehrson). When it turned out to be impossible to carry out the intended work in Laos the researchers shifted the project to Africa and a different setting. The project was also expanded. Göransson at Lund University joined the project and a research group from Kalmar University was also involved.

The second round of project applications funded in 2005–2006 were bigger and mostly planned for two years of work with a total funding of SEK 5 million. The review concentrated on this latter category.

Six projects were funded in the second round of funding for 2005 and 2006. One of them (Sandkuhl) was a direct continuation of the first round of funding in 2004. None of the projects have yet been completed.

Second round of funding

Proj. leader	Title	Sw. inst	2005	2006
Kurt Sandkuhl	ICT – Support for formation of business relationships with Developing countries Based on Immigrant Competences	HJ	180 250	519 750
Åke Grönlund	Bangladesh Virtual Classroom	ÖrU	214 500	685 500
Lars Asker	Language processing resources for under-resourced languages	SU	160 000	640 000
Martha Garrett	INFORM/Tanzania/Health	UU	100 000	400 000
Richard Wait	To build a compute-intensive network infrastructure	UU	575 000	325 000
Björn Pehrson	Towards Sustainable Broadband Communication Markets in Rural Areas	KTH	0	1 200 000

Most of the projects focus on social problems of different kinds where ICT can be of use (linguistics, interactive learning, health services, support to markets). One of the projects is mainly technical (Wait, the Sri Lanka grid) with the purpose of establishing a high-performance computing node in Sri Lanka, connected to Uppsala University.

All the projects are being carried out in collaboration with researchers or research groups in developing countries and there are substantial elements of technology transfer and capacity building in developing countries. In some projects this is clearly the dominant theme (Garrett, Grönlund) and the Swedish involvement can be seen as a supporting element to work carried out in the respective countries (Tanzania, Bangladesh).

Two projects stand out as particularly promising and interesting, even if it is too early to judge their ultimate success. One, run by Lars Asker, is laying the basis for computer services in Amharic (the language spoken in Ethiopia). Amharic is a complicated language with word forms that are changed with both prefixes and suffixes, sometimes even changing the root of the word. It is therefore interesting that it seems to be possible to develop systems that can identify the words in a text and their grammatical role. The work is of evident importance for Ethiopia and Amharic-speaking people. Very little or no computer linguistics has so far been done for that language.

The project of Martha Garrett is still under development but it is impressive to observe how the Tanzanian partners and international partners have been involved on a broad basis. The purpose is to build up an indigenous capacity for teaching medical staff to use internet resources, not only as a potential resource but also as one which they master and *really use*. It is co-funded and supported in kind by a number of other international bodies.

The SPIDER funding of the Swedish projects has been carried out well. SPIDER is following up the projects carefully and has good contacts with the research groups involved.

The projects of the first round of funding in 2004 have been satisfactorily reported and over half of them have been continued.

The projects funded in 2005–2006 have progressed well and are promising, as noted above. The Sri Lanka project is hampered by the political instability of the country; it has been delayed and some national outcomes may be threatened. However, the system for advanced computing, mainly to be used for academic purposes and the connection to the Uppsala computing resources, is in place.

In some cases some adaptations have been made to the projects, as can be expected when partners are really involved and begin work seriously with them.

The project on broadband communications in rural areas (Pehrson) had three participating research teams from KTH, Lund University and Kalmar University. The funding was considerably less than what was requested, and my impression is that the project became too thinly funded to achieve its objectives in all respects. The coordination and collaboration between the different teams were not fully realised. The project should probably have been redesigned in the light of the funding limitations.

Substantial and effective networking among Swedish research groups, particularly if it is across different discipline areas, is difficult to achieve and normally requires substantial funding over extended periods of time. There are few academic rewards for a researcher collaborating and working outside his or her own discipline. It also adds to organisational

difficulties and costs, particularly if the research groups are in different universities. The level of funding which is possible for SPIDER will probably not be sufficient for creating true and real collaboration across disciplines and university boundaries. However, if the ambition level is lower and is limited to awareness of and information about what is going on in other research groups, then the programme has achieved this, not least through annual SPIDER meetings where different groups present and discuss their results.

The project leaders are generally satisfied with the application procedures and the funding arrangements.

The projects supported are small in relation to the total research volume of the departments concerned but they have given added benefits to the departments, particularly by training young researchers.

Conclusions

This review was carried out at an early stage of the development of SPIDER and is based on a fairly small number of projects, none of which have yet been finalised. However, the following observations are made.

- The projects are all on track and are promising.

- The linking to groups and researchers in selected developing countries has been excellent and both knowledge and training, and in a few cases also equipment, have been transferred.

- The departments supported have become involved in the work of SPIDER and are now well aware of and informed about SPIDER. The project funding by SPIDER is greatly appreciated.

- A number of young Swedish researchers at different levels have been trained and they have been exposed to development problems.

- Partners in developing countries have put in considerable amounts of work for the projects. At least one project (Garrett) has mobilised additional international funding and resources in kind.

However, the objective of increasing contacts and collaboration between the Swedish researcher groups has only been achieved marginally by the funding programme. Other SPIDER activities (annual meetings etc.) have probably been more effective in this.

Recommendations

Continue project funding

SPIDER is a small organisation still in its early stages of development and is still learning to run its business in an area where the technical opportunities are rapidly changing and where little is known about how best to introduce and use the technology in developing countries. In this work it must have a good understanding of and knowledge about what it is possible to do in different developing countries, as well as good grasp of technical issues. SPIDER cannot build that competence entirely in-house but must have access to good competence in its network of partner universities. The way to build this competence is to fund some research groups for relevant work and – of course – to involve them in development projects in developing countries. The funding of Swedish academic work on social and technical issues of importance in ICT is therefore of great importance for SPIDER.

The system has only been running for two (three) years and the projects in the second round, from 2005–2006, have not even been completed. Their full results are not yet realised and the results cannot be safely summarised yet. However, my preliminary conclusion from the review is that the projects for 2005–2006 have run well so far, some of them very well indeed.

There are strong reasons to continue funding projects of this kind as they will create a broader competence base for SPIDER, as well as contributing to the creation of new knowledge. Continued project work will certainly strengthen the involvement of Swedish research groups for building competence in developing countries.

The administration of the application process could well be handled by external consultants but the work should be done in close contact with SPIDER and the projects should report to SPIDER so that the organisation benefits fully from the network of contacts and the knowledge available in the network.

I recommend that SPIDER continue to fund Swedish research projects at similar or increased levels of funding.

Greater flexibility

SPIDER is a development agency and its main purpose is to help the developing countries in the best possible way. The ICT area is technical in nature and the problems are mainly practical. Most of the projects so far have been concerned with the applications of ICT, training and organisational problems. The quality of research and technical development must be secured in the funding process, but there is little need for SPIDER to behave like a research council working in the basic sciences.

Some of the funding might be set aside for 'minor research tasks' for young researchers and even for advanced students for carrying out work in connection with a PhD thesis, or even for C or D level essays and studies or for small pre-studies and investigations. Such funding, within a certain financial bracket, could be decided on by the administration and reported to the Board afterwards. It could also be provided whenever the need arises and should not need to be included in the process of funding of bigger projects. In a 'young' area like ICT young people can be very competent technically and can be of good help in

some respects. Care should of course be taken not to put them to tasks which exceed their competence and experience.

Other projects might be geared towards increasing collaboration with other organisations and research groups abroad. Co-funding of projects with Sida (adding a specific 'SPIDER component' to Sida projects) might be considered. Flexibility will be required here as well as there may be constraints in time and mode of work imposed by Sida and other partners.

A third type of project may be of the present type: medium-sized research grants responding to open calls for project proposals and spanning a couple of years for a research group or a computer department, perhaps with a particular emphasis on building bridges between technical research and social and economic research. One possibility is for SPIDER to further limit the area or type of research in the call for projects, based on what it sees as particularly relevant or urgent at present. These larger grants should be applied for in open competition and reviewed in a proper referee system, as is indeed done now, in order to get the best possible quality of work.

I recommend that SPIDER continue to experiment with the forms of funding and keep flexibility in the funding of Swedish research.

Broaden the competence base for SPIDER

The network of competent Swedish research groups and their respective departments and universities is critically important for SPIDER in carrying out its work and keeping itself technically abreast. There is probably scope to further expand this base in Sweden with new participating research groups and young researchers.

However, Sweden is a small country and the number of researchers who are willing and able to involve themselves in this type of development work is fairly small. SPIDER should therefore consider a broadening of its base. Using experts from developing countries is one possibility: there are competent people in India and South-East Asia, and expertise may sometimes be found in some African countries.

I see great promise in extending the network to other Nordic countries if this can be accepted by the main donor, Sida. It seems to me that the competition for funds has not been particularly sharp up to now. One could therefore try to extend the call for applications to at least one more country or open the way for project applications in the same way as was done in 2004 for Swedish research groups. Such an extended Nordic network of researchers and research groups can improve and broaden the base for SPIDER's bilateral work and be a base for recruiting experts for bilateral projects.

By involving researchers in our neighbouring countries it might also be possible that they will wish to use the services offered by SPIDER. As SPIDER is a unique organisation in the Nordic countries (and indeed in Europe) there should be a potential for expanding its work and letting other agencies use its competence. Such an expansion will of course increase the work of the SPIDER secretariat, and care must be taken so that Sida and Swedish embassies get the continued full service and attention for their projects.

I recommend that project proposals be invited from at least one more Nordic country.

Link up with other funding organisations

It may also be necessary to expand and deepen the research, particularly about the use of ICT and its social and economic aspects. This is a big task and it may be necessary to enlist

financial support from other sources in order to carry it out; SPIDER's present means may not be enough for the task. Perhaps Sida or other Nordic donors could become partners in that bigger second task, and perhaps sometimes also other agencies, VINNOVA or the Swedish Research Council. A first step may be to fund projects jointly when opportunities are offered. Shared work within the EU framework programme may be a possibility.

Work in this field is also done by IDRC in Canada and it may be useful to investigate the possibilities for exchange and joint enterprises with them.

I recommend that links and contacts be established, and if possible shared work be undertaken, with other funding organisations in the ICT field, such as the EU, the Swedish Research Council, VINNOVA, IDRC etc.

Tidigare arbetsrapporter/working papers

2007:66 Peter Schilling: SSF:s satsning på strategiska forskningscentra – En analys av bedömningsprocessen

2007:65 Enrico Deiaco & Göran Melin: Riskanalys av KTH:s engagemang i Pakistan Sweden University

2007:64 Göran Melin & Fredrik Scheffer: Gräddfil eller B-lag? Undersökning av anställningsformen biträdande lektor

2007:63 Anders Broström: Collaboration for competitiveness – Towards a new basis for regional innovation policy

2007:62 Anders Broström, Karla Anaya-Carlsson, Enrico Deiaco & Fredrik Scheffer: Vad kan Staten lära av en effektanalys av såddfinansieringsprogrammet? – En förstudie

2007:61 Enrico Deiaco, Anders Broström & Lars Geschwind: Högskola och region – ett trevande förhållande. Reflektioner över exemplet Västra Götalandsregionen

2007:60 Karla Anaya-Carlsson & Göran Melin: Den postdoktorala perioden för doktorsexaminerade läsåret 1998/99

2007:59 Fredrik Scheffer, Åsa Smedberg, Göran Melin: Fallstudie av en neurovetenskaplig forskarskola. Utvärdering av SSF:s satsning på National Network in Neuroscience

2007:58 Fredrik Scheffer & Göran Melin: Fallstudie av en biomedicinsk forskarskola. Utvärdering av SSF:s satsning på programmet Glykokonjugater i biologiska system

2006:57 Enrico Deiaco: Utbildningsbranschen – drivkrafter, storlek och nya affärsmodeller

2006:56 Göran Melin & Andreas Högberg: "Alla blir professor". En framåtblickande utvärdering av befordringsreformen vid KTH

2006:55 Enrico Deiaco & Göran Melin: Considerations on university alliances. Motives, risks and characteristics

2006:54 Göran Melin & Rickard Danell: Effects of funding young, promising scientists

2006:53 Andreas Högberg, Peder Karlsson & Peter Schilling: "Det gäller inte bara pengar, vi behöver även idéer" En studie av samverkanspraktik vid fyra lärosäten

2006:52 Olle Edqvist: Internationalisering av svensk forskning. Reflektioner från ett antal fallstudier

2006:51 Linda Blomkvist & Göran Melin: Forskarstuderande under och efter utbildningen. Jämförande offentlig statistik från Sverige och Danmark

2006:50 Enrico Deiaco & Göran Melin: Hur mår klinisk forskning? – en studie av FoU-verksamheten i Landstinget i Östergötland.

2006:49 Enrico Deiaco, Peter Schilling & Åsa Smedberg: Att möta kompetensbehov hos små och medelstora företag. En studie av KK-stiftelsens satsningar på Expertkompetensprogrammet

2006:48 Andreas Högberg & Göran Melin: Utvärdering av SSF:s satsning på Junior Individual Grants

2006:47 Åsa Smedberg & Göran Melin: Utvärdering av SSF:s satsning på Senior Individual Grants

2006:46 Ulf Sandström: Forskningsdebattens vad, vem, hur och varför

2006:45 Lillemor Kim: Kvalitet kontra kvantitet: Högskoledebatten 2005 – 2006

2006:44 Peder Karlsson & Peter Schilling: Nya teorier – Ny kunskapsproduktion? Några teoretiska perspektiv på IVA:s universitetsframsyn 2005/2006

2006:43 Karin Caldwell, Ulf J Johansson, Anders Liljas (ordf) & Göran Melin (sek): Utvärdering av INGVAR (Individual Grant for the Advancement of Research Leaders) - med avseende på utformning, urvalsprocess och ledarskapsprogram

2006:42 Peter Schilling & Maria Johansson: Finansiering och strategi - En fallstudie över KK-stiftelsens profil- och plattformssatsning vid Blekinge Tekniska Högskola

2005:41 Enrico Deiaco & Fredrik Lagergren med medverkan av Åsa Smedberg: Energisystemforskning – till vad och hur mycket? Utvärdering av programmet för Allmänna energisystemstudier

2005:40 Enrico Deiaco, Maria Johansson & Hans Westlund: Ju mer vi är tillsammans… – Utvärdering av Delegationen för regional samverkan om högre utbildning

2005:39 Maria Johansson, Lillemor Kim, John Storan & Sverker Sörlin: Bridging the Gap – Comparing Actions for Widening Participation in Higher Education in Sweden and England

2005:38 Anders Broström, Enrico Deiaco & Göran Melin: Vägval för Örebro universitet och Mälardalens högskola : Utredning av förutsättningar för fusion, allians eller annan samverkan

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2005:35 Göran Melin: De nya kulturutbildningarna - en undersökning av nya typer av högskoleutbildningar på kulturområdet

2005:34 Enrico Deiaco & Anders Broström: Kunskapsregion Stockholm på världsmarknaden - möjligheter och utmaningar för det regionala tillväxtprogrammet

2005:33   Lillemor Kim & Ewa Olstedt : Utbildningsvetenskapliga kommittén - en ny aktör i forskningslandskapet

2004:32   Anders Broström, Enrico Deiaco & Sverker Sörlin: Tekniska universitet på världsmarknaden? -motiv och förutsättningar för en strategisk allians mellan KTH och Chalmers

2004:31   Sverker Sörlin, Institutssektorn, högskolan och det svenska innovationslandskapet

2004:30   Sverker Sörlin (ordf.), Mårten Carlsson, Britt-Marie Drottz-Sjöberg och Göran Melin: Utvärdering av det svenska medlemsskapet i IIASA

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2003:27   Anders Broström, Hans Lööf & Carolina Sigfridsson: Kartläggning av högre utbildning och universitetsforskning i Mälardalen

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2001:04   Ulf Sandström : Om den svenska arkitektur-, bostads- och stadsbyggnadsforskningens karaktär

2001:03   Jenny Beckman, Mats Brenner, Olle Persson & Ulf Sandström : Nya arbetsformer inom diabetesforskning – studier kring en nätverkssatsning

2001:02   Lillemor Kim, Robert Ohlsson & Ulf Sandström : Kan samverkan mätas? Om indikatorer för bedömning av KK-stiftelsens satsningar

2001:01   Alexander Kanaev & Albert Tuijnman : Prospects for Selecting and Using Indicators for Benchmarking Swedish Higher Education