Towards a Common Strategic Framework for EU research & Innovation Funding

Views on the European Commission's Green Paper

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Briefing

➢ ***The need to support research and innovation in Geographic Information***

Geographic Information underpins much economic activity, social development and many public policies – security and defence, land planning, environmental monitoring and sustainable development and in location based services. This is exemplified for example by its role in the GMES & GALILEO undertakings.

➢ ***Further harmonisation is needed in geographic information infrastructure***

Policy and services development needs research and innovation to achieve harmonized accessibility and cross-border integration of information. This will reduce costs in businesses and public administration and stimulate innovative commercial applications.

➢ ***Market and policy developments require research and innovation which supports the iterative cycle from concept to delivery***

A more strategic approach to funding is required to support this iterative cycle in a more joined-up manner. In particular, the rules for matched funding should be based on such a strategic approach, more than on a clear cut division between research and innovation.

Currently, separate programmes exist for research and innovation. These need to be more integrated.

A perennial funding mechanism for long term research infrastructure activities is required to support the inter-leaving of the research and user requirements. The funding mechanism should be use a feasibility study approach with cost benefit analysis, testing and validation elements for innovation projects.

➢ ***The role of science organisations in the evaluation of project proposals***

European scientific organisations provide access to networks of experts in Europe and beyond and can assist the Commission in evaluating proposals to ensure funding of scientifically sound activity.

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Geographic information and European Policies

Geographic information has long underpinned important policies at all levels of government including, and increasingly, at the European level. An early benchmark of this underpinning was described in a European Commission document on the spatial impact of EU policies[1]. Since then, geographic information, and in particular public sector geographic information made available by the national mapping and cadastral agencies (NMCAs) has figured more prominently in EU polices and initiatives, for example; in the Communication on the European eGovernment Action Plan 2011-2015 and subsequent Council Conclusions, the Digital Agenda for Europe, and in the GMES regulation and the INSPIRE directive. It is also an essential component, both in terms of infrastructure and the development of innovative new services of the GALILEO infrastructure.

About geographic information

Geographic information, taken in its widest sense, is location information about land, sea and air. Geographic Information (GI) relates to the earth's landscapes, people, places and environment. GI, for example, records official names and the location of features, from points of interest, e.g. a post box, to linear features running through many countries such as the River Danube. GI provides the essential framework which allows attributes about features to be related or connected to them. This includes information about ownership, construction, environmental conditions, and the existence of essential services.

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[1] The Spatial Impact of European Union Policies. JRC. 2001

Geographic Information is fundamental content for Spatial Data Infrastructures. The INSPIRE directive provides the legislative framework for national and a European spatial data infrastructure.

Comments on issues addressed in the European Commission Green Paper: *From Challenges to Opportunities: Towards a Common Strategic Framework for EU Research and Innovation funding*

How should EU funding best cover the full innovation cycle from research to market uptake?

Geographic Information, as with many fields within ICT, is characterized by long term developments resulting from iterative fast and short term innovation cycles. These require careful consideration of supplier capabilities and end user requirements facilitated very often by innovation providers, typically an SME, and the research community.

In this respect EuroGeographics, EuroSDR and AGILE working together harnesses expertise in the full innovation cycle. AGILE is committed to innovative solution development, while EuroGeographics represents the delivery of location information and services, and EuroSDR acts as a bridge both by way of applied, proof-of-concept test activities as well as transferring research outcomes into GI service delivery workflows.

What we can see is that the split in research, typically FPRD, and innovation, typically CIP ICT, which is also a split not only in funding mechanism, but in funding schemes (research partners are to get less support in CIP ICT), hinders in some instances the needed team based approach which spans from user requirements to research and innovation. We witness that many universities were objecting to their teams taking part in Commission funded projects because of inadequate levels of funding. Further, some activities though deeply needed, such as test beds infrastructure which play a crucial role in assessing the effectiveness of any solution or innovation, do not fit well with the existing EU frameworks, in the first place because persistent, to some extent perennial services are needed in this respect, beyond the standard time extent of an EU funded project.

We believe that a more strategic approach would be more appropriate that supports the three parts of the cycle in a more joined-up manner. In particular, the rules for matched funding should be based on such a strategic approach, more than on a clear cut division between research and innovation, not speaking of validation mechanisms.

We would welcome a perennial funding mechanism for long term research infrastructure activities that support the inter-leaving of the interests of the research community and the user community. Currently, separate programmes exist for research and for innovation and we believe that these need to be more integrated.

We would also welcome a funding mechanism that supports research based on a feasibility study approach with cost benefit analysis testing and validation elements for innovation projects.

How should EU research and innovation funding best support policy-making and forward-looking activities?

We consider that this question delineates a clear case for research in Geographic Information Science, and in developing European-wide Geographic Information Infrastructures. Indeed, as already pointed out in INSPIRE and GMES documentation, and briefly explained above, geographic information is an indispensable part of the information infrastructure needed for decision making, be it at the level of a corporate company, or at the level of local, regional, national and European policy-making.

Hence explicit mention of Geographic Information Science and Geographic Information Infrastructures in European R&D programmes is part of the answer to this question.

How should open, light and fast implementation schemes be designed to allow flexible exploration and commercialisation of novel ideas, in particular by SMEs?

We perceive disadvantages in the large integrated project mechanism for funding applications. It is very expensive for research groups to build consortia and much time is expended in putting the consortia together, establishing a common level of knowledge and agreeing a basis for initial communication. As a result, the lead-in time is very significant. In addition, throughout the lifetime of the project, research groups can spend a significant amount of their time administering work packages.

Further, the SMEs which take part in EuroSDR activities are very clear in stating that the integrated projects are not an option for them, which implies that the advent of this new framework has dramatically impacted their participation in the EU FPRD.

We would like to see provision for fast-tracked funding for lighter-weight, fast turnaround projects to encourage innovation and engagement with SMEs. Anecdotal evidence suggests that SMEs are reluctant to commit to large integrated projects.

How should research infrastructures, including EU-wide e-Infrastructures, be supported at EU level?

We mentioned above the need for test beds to be available to researchers and innovators, so that their solutions can be assessed in a systematic and verifiable way. Such a test infrastructure would help in certifying, or at least assessing new innovative services.

Further, to develop such innovative services, even at the development and innovation stage, one needs a coherent geographic information infrastructure, which goes beyond INSPIRE harmonization, by offering harmonized access to integrated data for R&D activities (as a first step towards harmonised conditions for commercial activities).

That would mean an information infrastructure, of at least geographic information, with access conditions suitable for R&D projects, and which would be a backbone infrastructure (in addition to GALILEO, INSPIRE or GMES infrastructures), for R&D projects to be able to develop innovative projects based on real service conditions.

The best instrument to set up this infrastructure is to be worked upon, but a clear starting point would be to build starting from national infrastructures.

It is worth noting that such developments entail a standardisation component, which in turn implies that they would give Europe a strong position in related international standardisation, which would help European companies.

Non-technological research issues

Rapidly developing Web services will entail radically new business models, hence new licensing models. Google made this clear over the past years, while the music industry is still suffering from the lack of appropriate models for Web services to provide the expected revenue. Web services based on location, hence on geographic information, give rise to the very same issue: How to define and run appropriate ways of collecting a return on invest, needed to feed the value chain, from the service provider to the information providers.

Research needs to explore appropriate licensing models, not just for data but also for web services. This is necessary to support the addition of value-added-services with the potential of revenue generation for government organisations.

As stated above, research on privacy protection in an era of highly interconnected information pools, with non-explicit connections deductible through geographic reasoning, is clearly an issue to deal with.

Evaluation of project proposals

Scientific organisation such as AGILE and EuroSDR, and others for other scientific fields, have the feeling that, one the one hand, experts requested to evaluate proposals or projects are not always deeply versed in the addressed topics, and on the other hand, science societies are well equipped to at least pick experts in the field, if not provide a scientific evaluation. In addition AGILE and EuroSDR have working ties with many international organisations (such as the OGC, ISPRS, ICA, and many others), hence provide a bridge towards the international science community.

We propose and are ready to assist in evaluating scientifically sound proposals by way of peer review by those active in the related scientific areas.

Further, the new collaborative 3-organisation approach to scoping studies and research topic explorations such as with the crowd-sourcing, Persistent Test Bed and 3-Dimensional data collection projects can help to elucidate research needs and opportunities. Very modest funding by the Commission, channelled through such European organisations could be a sound and economic approach to research topic selection, specification and research network development.

R&D and innovation related to Geographic Information

There are four tracks in terms of activities related to geographic information:
- Providers of 'reference data' - involved in collecting, maintaining and making available authoritative GI;
- Suppliers of 'associated data' – involved in collecting, and supplying information which is 'connected' to the reference data;
- Developers and suppliers of services based upon geographic information;
- Users in governments, businesses and civil society.

The NMCAs fall in the first group but their work is complemented by:
- SMEs typically providing 'quick to market' value added services;
- A range of medium size companies many of which collect reference information which may duplicate the work of the NMCAs but more often compliments it;
- Internet giants and telecommunication providers who came to understand that most information has a geographical association and so can be searched by, or presenting in its location;
- aerospace companies,
- public service authorities involved in making available information for which location is an important component, including, but not limited to, emergency response, civil security services, fire departments, local authorities, land management and land planning authorities.

Several issues are at stake in this area:
- The ability to timely collect and integrate in a coherent information system geographically localised information, which induces many research directions spanning from real time acquisition and dissemination matters, to integration of information based on ontology matching and conflation processes;
- Interoperability of services needed for dissemination from many pools to allow for the development of applications and services for governments, businesses and the citizen

In terms of new services, the field of actively developing location based services was studied in depth within the context of GALILEO studies and more recently. This is unanimously considered as a fast expanding market, which already accounts for at least €2billions within the EU. In addition, on the non market side, such services include services for civil security, or information services for the citizen.

It has been said that 'Location is a powerful key for relating disparate databanks and unearthing information about possessions, spending habits and an assortment of behaviors and preferences, real or imagined'[2]. Many information related applications and processes are directly or indirectly related with geographic information characteristics and tools. This may range from geography/location based marketing to services delivered for ageing citizens, among many others. Research in the field of geographic information science, including research on how to protect privacy of the citizen within this scope, is a critical part of research on ICT.

We would like to stress the human capacity issue. AGILE and other organisations are engaged in a Body of Knowledge project which aims to define a shared curricula for European Geographic Information education thus both focussing education and training in the priority areas and enabling joint courses to be operated across laboratories and countries. Such matters do not always fit well with targeted research projects but we would like to stress the importance of such European harmonisation.

The international dimension

Historically the initial developments in Geographic Information Science took place in Europe, hence many techniques were developed in Europe, and many international science organizations had a strong European background. However, helped by a sustained flow of Dept. of Defense orders and R&D contracts, American companies quickly took the lead, starting in the nineties. Europeans still have a foot in some niche markets, including hardware, but more often than not as part of American companies even though other companies show that Europeans can succeed. Most Japanese of Korean companies are still to develop an international presence in this area, but Chinese and Indian companies are clearly aggressively building up, and already address European markets.

On the other hand many SMEs and startups are developing well in Europe, which offer products in the field of data dissemination, management and location based services. We think that there are opportunities now

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[2] Mark Monmonier in his book '*Spying with maps: surveillance technologies and the future of privacy*'

for the development of European competitors in the branch of ITC which deals with geographic information, and is rapidly expanding.

About EuroSDR

EuroSDR is the European research platform for National Mapping and Cadastre Agencies (NMCA's), embracing Academic Institutes, the Private Sector (essentially SMEs), Industry and User Groups, on issues related to the implementation of technology developments with respect to optimising the provision (collection, processing, storage, maintenance, visualisation, dissemination and use) of reference information (data serving as a spatial framework for organisations involved in monitoring, management and development) in a Geo-information Infrastructure (GI) context. EuroSDR history traces back to 1953.

About AGILE

The Association of Geographic Information Laboratories for Europe (AGILE**)** was established in 1998 to promote academic teaching and research on GIS at the European level and to ensure the continuation of the networking activities that have emerged as a result of the EGIS Conferences and the European Science Foundation GISDATA Scientific Programmes.

AGILE seeks to ensure that the views of the geographic information teaching and research community are fully represented in the discussions that take place on future European research agendas. AGILE also provides a permanent scientific forum where geographic information researchers can meet and exchange ideas and experiences at the European level**.**

About EuroGeographics and national mapping & cadastral agencies (NMCAs)

EuroGeographics is the non-profit representative body of the European national mapping, land registry and cadastral agencies, based in Brussels. They currently bring together 56 definitive information authorities from 44 countries across Europe, providing a strong, unified and well-respected voice. They provide a single point of contact for communication with their members, and a platform for the exchange of information and best practice. Their geo-spatial products and services make a significant contribution to the operational delivery of a wide range of national and EU polices.

The national mapping, land registration and cadastral agencies (NMCAs), as a public task, produce, update and distribute reference and other geographic information (including topographic, cadastre and land information). Countries need geographic information that is reliable, sustainable, coherent and continuous at national level to deliver public services and underpin economic activity. Public sector geographic information has been the subject of particular attention under the PSI Directive. Therefore NMCAs, as holders of public sector geographic information tend to have a high profile among PSI stakeholders, including those in their respective member states. NMCAs have paid close attention to the requirements of the Digital Agenda, the PSI Directive, INSPIRE, GMES and policy thinking in these areas.

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