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SYNC – Science beYond National Cooperation

Communiqué from the FEAST/UQ Symposium: *Enhancing interoperability in the emerging global research order*

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Global experts on international science cooperation met in Brisbane on March 24-25 to identify ways in which national research can more efficiently and effectively link to international efforts.

Over the past 20 years the increase in global research output has been driven largely by an increase in internationally conducted research (particularly in regards to solving major global problems such as in medicine and the environment).[1] Such international efforts are generally of a larger scale, and exhibit increased quality and impact, than purely domestic research. Matters of national significance are increasingly relying on globally conducted research to provide solutions, since international cooperation enables the pooling of resources, reduces risks, allows for knowledge sourcing, aids in globalization efforts, and many other tangible and intangible benefits.[2]

In an ideal[3] research ecosystem researchers would be able to submit a proposal for funding anywhere in the world, regardless of location or nationality (such as with many of the National Institutes of Health (NIH) grants in the USA)[4], and they would have their proposals and research findings assessed against internationally agreed benchmarks. Innovators would be able to apply for a single unified patent covering all jurisdictions, as well as absorb knowledge from the global marketplace.

Challenges

Whilst there are a small number of significant programs that are endeavoring to achieve this ideal, for example the European Union's Framework Programme[5], for the most part the political and economic realities of current publicly funded research systems means that this ideal is unlikely to be achieved in the foreseeable future. In the meantime there are individual national and international initiatives in place that both aid and hinder the pursuit of interoperable research systems. Some of the issues faced by international research endeavors in the current patchwork of national and international systems include: multiple evaluations of the same research proposal due to separate individual national requirements; different intellectual property and other legal rules across different jurisdictions; lack of portability of worker entitlements, such as retirement schemes, for researchers; a lack of synchronicity of calls for proposals across different countries; different requirements for research proposals and CVs across nations and programs, and; science policy being subsumed within innovation policy in many countries leading to pressure to demonstrate direct economic benefits from scientific research.[6]

With the increasing costs of research and research infrastructure, and the decreasing national revenues of many developed countries, now is the right time for all nations to examine their strategies for international engagement in research, and to work with international agencies (such as the United Nations and the OECD) and scientific bodies (such as the many scientific unions)[7] to enhance the process of conducting international research. This will lead to an increase in the amount of research being conducted whilst at the same time decrease transaction costs and duplication of work. In

[1] FEAST Discussion Paper 1/10, *http://www.feast.org/index/document/1*
[2] Greater detail about these issues can be found in the Royal Society
[2] Greater detail about these issues can be found in the Royal Society policy document *Knowledge, Networks and Nations: Global scientific collaboration in the 21st century*, March 2011, *http://royalsociety.org/knowledge-networks-nations*
[3] "Ideal" from the perspective of researchers being internationally connected and engaged.
[4] *http://grants.nih.gov/grants/foreign/determining_eligibility.htm*
[5] *http://cordis.europa.eu/fp7*
[6] Despite the fact that science also plays important roles in wider social issues, including fundamental creation of knowledge.
[7] *http://www.icsu.org*

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particular, the established science powers in Europe, North America, leading Asian countries, and other advanced nations such as Australia and New Zealand, stand to gain enormously from making their own systems more interoperable with each other, given their common political systems and cultures, in order to remain competitive in a world where new scientific powers are emerging (China, India, Brazil, etc.) and increasingly dominating discussions around research and innovation.

Conducting joint (bilateral or multilateral) funding programs can introduce large administrative costs (in both time and money). However, developing rules and mechanisms via which researchers can use existing domestic funds to engage internationally introduces only marginal costs and allows domestic researchers to tap into far larger international pools of knowledge. Examples of such mechanisms include COST (European Cooperation in Science and Technology, funded by the European Commission)[8] and ISL (International Science Linkages, funded by the Australian Government)[9].

It has been noted that whilst many national programs are restricting the length of funded projects – due in part by relatively short political cycles, in part by the uncertainty of future public revenue, and in part by an increase in desire for public accountability for monies spent on research – most successful international research efforts have resulted from long standing collaborations, sometimes over decades. Indeed, it is precisely the longevity that has resulted from researchers developing trusted professional networks that allows them to pursue fully integrated and interoperable research activities that exhibit little or no risk to the funded activities.

Opportunities

Some simple, and cost-effective, solutions to better enable different research systems to become more interoperable with each other include:

- Learning from other major issues of international significance, such as telecommunications, air traffic control, nuclear safety, financial management systems, etc., which have been made explicitly interoperable out of necessity and offer exemplars of the scale of international agreement and coordination possible when nations agree on priority issues;
- Highlighting deficiencies in national funding programs when they hamper international collaborations. This includes better definitions of success and impact, reducing red tape (despite increasing compliance requirements), and increasing the availability of funds for international collaborations;
- Involving major research bodies with the development of international standards and agreements relating to research and research systems (such as the Consortia Advancing Standards in Research Administration Information (CASRAI) initiative being led by Canada)[10];
- Encouraging and supporting the international exposure and connectedness of research managers, science policy bureaucrats, and other actors at the interface of research and government, in order to gain better understanding of the best practice initiatives in this area, as well as the genuine challenges that can be addressed through practice and policy changes;
- Identifying mechanisms that will support local innovation gain access to the global knowledge marketplace, hence supporting governments in making decisions regarding the distinction between the types of research that will be supported domestically and regionally, and the types that will be sourced from, or shared with, international partners.
- Encouraging and supporting researchers to become involved with major international initiatives and programs, and provide feedback and input to those schemes to enable greater international interoperability (for example, the European Commission has recently released a green paper seeking comment on matters that will influence the future of its enormous Framework Programme)[11];
- Encouraging and supporting civil society, including scientific unions, to coordinate and advance research efforts whilst opening science and innovation policy to other sectors, including science diplomacy, and;
- Continuing to provide support for early career researchers to develop lasting international professional networks, in order to build relationship capital with international participants.

Attendees and presenters at the FEAST/UQ Symposium comprised some of Australia's senior research scientists, government officials, university executives, research managers, interest group representatives, diplomats and independent consultants. There were also world-leading experts in science and innovation policy from Europe, North America, and Australasia.

Further information about the Symposium, including the list of speakers and their presentations, can be found on the FEAST website at *http://www.feast.org/symposium2011*.

[8] *http://www.cost.eu*
[9] *https://grants.innovation.gov.au/ISL*, due to conclude in June 2011
[10] *http://casrai.org*
[11] *http://ec.europa.eu/research/csfri*, note that FEAST will be coordinating an Australian response to this paper