

## **IMPLEMENTING OPENNESS: AN INTERNATIONAL INSTITUTIONAL PERSPECTIVE**

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### **Abstract**

The debate on “openness” has tended to focus on standard setting, software copyrights, patent policy and collaborative innovation models – large issues that evoke heated debates that take on a quasi-religious dimension. As these issues start to enter onto the mainstream public policy agenda of many countries, moving these ideas from punditry to policies is not obvious.

But openness also manifests itself in less visible, more tractable issues such as open access to infrastructure, scientific research and use of public data and information -- fundamental elements of “cyberinfrastructure.” While perhaps less visible in the public debate, these elements provide lessons on how to implement openness into public policy and outline an ecology for supporting openness. Our experience reveals that it is important to break down the issues into practical elements that bureaucracies can implement, where metrics can be devised that allow dispassionate economic analysis, where divisive issues can be isolated, and where the stakeholders are not so diverse.

### **Introduction**

1. The ‘openness’ debate as reflected in discussions about open source software, open protocols, open standards, digital rights management (DRM) and the appropriate role of patents has increasingly become a mainstream policy issue. Some of the debates have acquired a quasi-religious dimension where various sides of the issue feel that there is a battle to be fought and express their arguments with passion and historical analogies to conquests and domination<sup>1</sup>. While this tenor has been useful at bringing visibility to the debate, it can have a polarizing affect that can make it more difficult to turn laudable goals for openness into practice, i.e. from the drawing board into tangible and specific approaches and policies.

2. As the debate matures, it may be time to begin to implement openness in a more practical, perhaps less passionate way. The objective of this paper is to provide practitioners’ perspectives on how to implement “openness” and concretize the creation of value based on free complements or openness. It does so from the point of view of an intergovernmental, international organization

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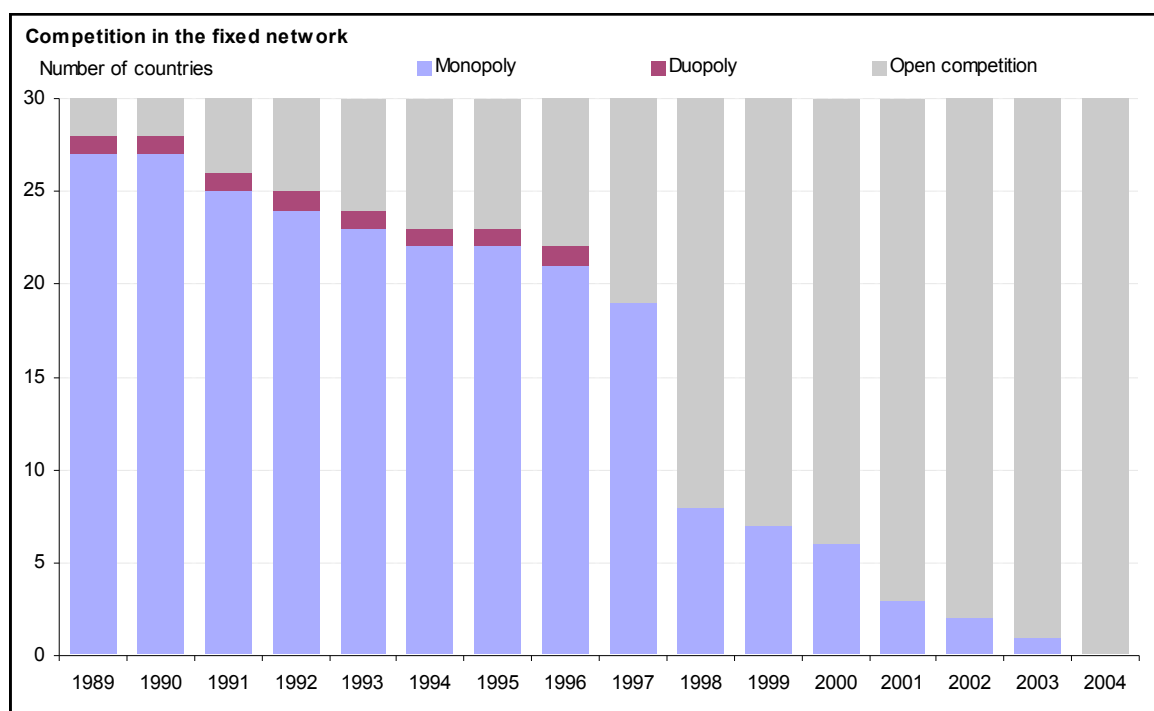
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– the OECD (Organisation for Economic Cooperation and Development)<sup>2</sup> that conducts work in support of 30 Member countries. The implementation of openness is illustrated by 3 streams of work that collectively begin to constitute important elements of cyberinfrastructure: the communications infrastructure, public sector information and scientific research data. From these 3 cases some common elements can be identified that may provide a roadmap for implementing openness in other fields.

### Open access to the physical infrastructure

3. For a good part of the 20<sup>th</sup> century, regulators treated telephone networks as natural monopolies and policy makers commonly assumed that markets could only support one infrastructure provider. This all changed during the past twenty years as the idea of liberalizing telecommunication markets has taken hold. One of the key elements of this liberalization process was the opening up of existing infrastructure to competition – essentially allowing start-up telecommunication operators to sell their own services over the incumbent's copper wires for a rental fee.

Figure 1. Evolution of competition in the fixed market



4. We take it for granted today, but only 10 years ago most OECD countries still had a tightly regulated monopoly providing fixed telephony. Today, the situation has changed drastically (see Figure 1). All OECD markets are now characterized as being fully competitive for fixed-line telephony and there are markets with broadband bundles offering video, voice and data for prices comparable to the price of a standard telephone line during the monopoly period.

5. The cyberinfrastructure has been extended to the masses allowing collaborative and user / consumer innovation on a huge scale. In this sense, important attributes to openness include

affordable access, the ability to exercise choice and the opportunity to actively participate and not simply be a passive subscriber to an asymmetrical connection.

6. How did this happen? The history of the liberalization of the telecommunications sector is well known with technology, legal challenges and competition policies all playing important roles. But the impact of these forces on regulatory regimes, the pace of liberalization and the emergence of openness is less clear and far from uniform across the OECD. The transformation of markets from monopolies to competition gained speed during the mid 1990s and was led by countries such as the United States, Canada, the United Kingdom, Australia and Denmark.

7. The OECD played a role in this process by creating a Working Party on Telecommunications and Information Service Policy (TISP) in 1988, as a subsidiary body of the Committee on Information, Computer and Communications Policy (ICCP). The mandate of this working party was to promote exchanges of experience among member countries and review recent developments in the field of communication infrastructures and services policy. In fulfilling this mandate, the Working Party evaluated markets across the OECD, identified and focused on “best practices” and then disseminated its research to member countries and to the public.

8. The research commonly focused on various themes that were important in telecommunication markets across the OECD. These themes included the benefits of liberalization, the importance of telecommunication to the economy as a whole and policies to ensure that everyone in the society could get access to telecommunication services.

9. This work led to the establishment of standard indicators and methodologies for their calculation so that by the early 1990's, the OECD was publishing indicators on the level of competition in markets (fixed, mobile, data), penetration rates for telecommunication technologies, pricing, revenues, investment and telecommunication trade. These indicators fed into empirical analysis that contributed to governmental decisions to liberalise markets. By 1991 these indicators and associated analysis led to the bi-annual publication of the Communications Outlook which quickly became a “flagship” publication of the OECD both in terms of sales and press coverage. The institutionalization of these internationally comparable metrics and the widespread availability of the cross-country analysis provided pressure for those countries that had not liberalized to either justify why that had not or put into place a plan to do so. While a number of other factors such as the initiatives of the European Commission and decline of competitiveness strategies based on “national champions” were instrumental in the liberalization of the telecommunications market across the OECD, in nearly all these cases, the OECD data and associated economic analysis were used to formulate policies that led to a more liberalized market.

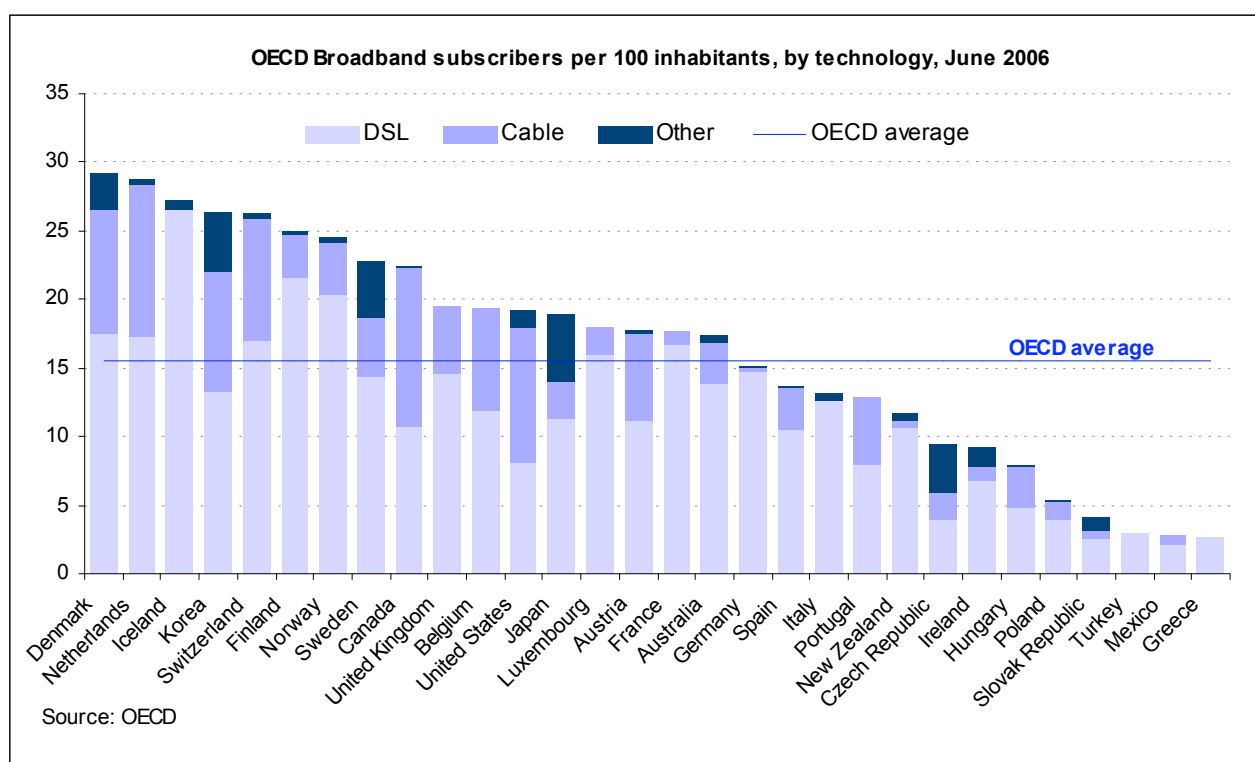
10. By 2004, open competition reigned in the markets for fixed and mobile telephony in all 30 OECD Member countries. The value associated with this “concretizing of openness” is evident across a number of indicators, but perhaps most fundamental is the huge gain to consumers as the price of placing a phone call dropped dramatically. In the space of 15 years, international fixed-line calls between France and the United States that would have cost USD 1.40 per minute in 1991 are now commonly included for free part of a monthly fixed-line subscription.

11. But by 2004, the market had changed so that fixed-telephony was an increasingly less important part of the market basket of communications that consumers were purchasing. The focus had shifted to mobile communications.

12. In 2007, the OECD will release its 7<sup>th</sup> bi-annual edition of the Communications Outlook and with its focus on the availability of high-capacity, broadband Internet access and the phenomenon of “convergence” where previously separate platforms for voice, video and data converge to one network using the Internet protocol. As broadband technologies continue to develop, broadband speeds have increased, different services have become available and prices have dropped significantly. This combination reflects the extension of real cyberinfrastructure to the masses which could have significant implications for systems of innovations<sup>5</sup>

13. While this development is largely a result of market forces, OECD analysis shows that the characteristics of this development, and thus the degree of openness in terms of access to high-speed Internet at a low price, differs significantly across the 30 Member countries

**Figure 2. Broadband subscribers per 100 inhabitants, June 2006**



14. As this technology develops, the OECD looks for interesting policy experiments to share, all of which aim to increase openness and provide access at the lowest price. For example, the city of Amsterdam’s (Netherlands) open-access project called Citynet (<http://www.citynet.nl>) will install fibre-to-the-premise in the city using a public/private sector partnership. The network will be "open access", meaning that any competitive operator will be allowed to interconnect and sell services over the network. Another example comes from the customer-owned Danish power utility, SEAS-NVE, which is building a fibre-optic network to users that should extend to 50% of

its subscribers in the next ten years. The Danish company TRE-FOR is also building out broadband connectivity, but alongside the three other utilities (electricity, gas, and water) that it already delivers to a community of about 300,000 customers.<sup>9</sup> Finally, some municipal governments such as in Paris, France have embraced "openness" in telecommunications by literally opening up their sewers and ducts under streets to any telecommunication provider wishing to install equipment<sup>10</sup>. The largest component of telecommunication network rollouts is commonly the cost of digging up streets to lay cable. Cities are helping spur investment in new infrastructure and working to ensure vibrant competition for the telecommunication market by allowing operators to use existing tunnels, ducts, and poles. Essentially they increase competitive "openness" by providing physical openness.

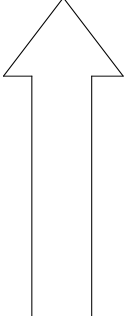
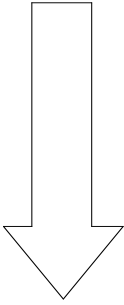
### **Open access to data and research**

15. While the opening of the communications infrastructure to competition has been a focus of OECD work for decades, recently work has begun that examines access to public sector information such as weather data or geographical information as well as access to scientific research data. While not as developed as the work in communications, the approach is similar and the experience may provide lessons that are applicable to other efforts to inject openness into components of the cyberinfrastructure.

### ***Public Sector Information***

16. The public sector has a major role as a producer and user of digital content and applications (see Figure 3 for examples). For example, data is collected to support formulating regulation, to provide information for research, to preserve cultural heritage, to allow taxation or simply for registration and administrative purposes. The public institutions involved are local and national governments, non-departmental public bodies, research organisations as well as executive agencies and international organisations.

**Figure 3. Public information/content pool**

<b>Commercial re-use of PSI</b>  	Geographic Information	cartographic information land use info (cadastral data) spatial data/geographical coordinates administrative and political boundaries topographical information elevation data	
	Meteorological and Environmental Information	oceanographic data hydrographic data environmental (quality) data atmospheric data meteorological (weather) data	
	Economic and Business Information	financial information company information economic and statistics industry and trade information	
	Social Information	demographic information attitude surveys data on health/illness education and labour statistics	
	Traffic and Transport Information	transport network information traffic information transport statistics car registration data	
	Tourist and Leisure Information	hotel information tourism statistics entertainment (local and national)	
	Agricultural, Farming, Forestry and Fisheries information	cropping/land use data farm incomes/use of resources fish farming/harvest information live stock data	
	Natural Resource Information	biologic and ecologic information energy resource/consumption information geological and geophysical information	
	Legal System Information	crime/conviction data laws information on rights and duties information on legislation information on judicial decisions patent and trademark information	
	Scientific Information and Research data	university research publicly-funded research institutes governmental research	
	Educational Content	academic papers and studies lecture material	
	  <b>Making available PSC</b>	Political Content	governmental press releases local and national proceedings of governments green papers
		Cultural Content	museum material gallery material archeological sites library resources public service broadcast archives other public archives

Source: OECD

17. Given the availability of information and communication technologies (ICTs), public sector information can play an important role in producing innovative value-added services and goods. Importantly, in the new digital content context it should be emphasized that PSI and content is no longer only a rich input to established firms. Today, the Internet makes everyone potentially a broadcaster or an entrepreneur, on the basis of adding value to / reconfiguring existing data. Moreover, these technologies also provide a wider population better access to educational and

cultural knowledge (including for example content of public broadcasters). Both commercial opportunities and the wider spread of information have positive economic and social benefits.

18. However, publicly funded digital content is often not easily accessed by the general public or firms. At the outset, public sector information has been produced for internal use only. As a consequence, public institutions are often not used (or even reluctant) to allowing access to content. In some OECD countries such as the United States access regimes allow commercial re-users to have cheap and readily available access to PSI. But access to actual data and content may be easier in some sectors (e.g. weather data) than in others (e.g. detailed demographic information or museum content). In other OECD countries there are access regimes where the public sector holds public sector information for its own use or employs cost-recovery strategies that allow only limited and potentially expensive access. Often this calls for a mindset change in the public sector and a rearrangement of the structure of public information. Challenges are in changing budgetary practices and public sector culture for information sharing, as well as establishing the necessary legislation, guidelines and governance principles. The question that arises under various approaches is which model serves citizens, industry and overall welfare better?

19. Recognizing these opportunities and challenges, the OECD embarked on work in this area in 2004. To date, the work has followed two distinct phases:

- a analytical phase (PSI study) that has focused on developing definitions, doing analytical background work, drawing on national experiences and available data while identifying challenges to access and re-use of PSI.
- a set of workshops based on above analysis to identify and elaborate on further work, best practices and the possible development of proposals for policy in the form of guidelines or commonly agreed principles.

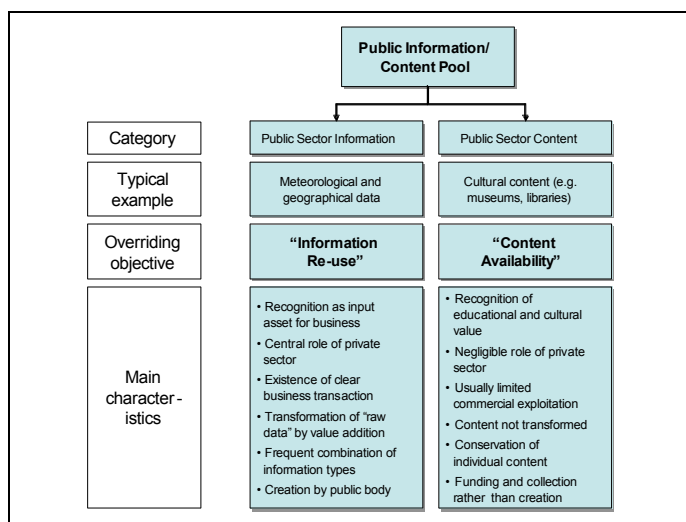
20. An essential first step is to develop a taxonomy of different types of PSI and public content to help identify their similarities and differences. As often in the openness debate, there is no standard terminology for the whole public information/content and its subsets and a common understanding on what free access would mean. In Korea reference is made to “public knowledge information resources”, in the United States the terms “public information” and “government information” are widely used and in the European Union one mostly refers to the topic of ‘commercial re-use of public sector information’ while excluding content of cultural and educational institutions at this stage.

21. To move forward, a working definition has been adopted that splits the issue into tractable pieces that adhere to different policy regimes (see Figure 4):

- *Public sector information* which often has characteristics of being: dynamic and continually generated, directly generated by the public sector, associated with the functioning of the public sector (for example, meteorological data, business statistics), and readily useable in commercial applications; and
- *Public content* which often has characteristics of being: static (*i.e.* it is an established record), held by the public sector rather than being directly generated by it (cultural archives, artistic works where third-party rights may be important), not directly

associated with the functioning of government, and not necessarily associated with commercial uses but having other public good purposes (culture, education).

**Figure 4. Categorisation and characterisation of the public information/content pool**



Source: OECD.

22. The first category comprises public sector “knowledge” which may be the basis for information-intensive industries; these employ the raw data to produce increasingly sophisticated products. The second refers to cultural, educational and scientific public knowledge where wide public diffusion and long-term preservation (*e.g.* via museums, libraries, schools) are major governmental objectives.<sup>11</sup>

23. Having established a taxonomy, analysis has been launched to better understand the ramifications of improved access, freedom of information and the potential for commercial re-use. In the case of PSI, an analysis of particular domains of PSI to increase understanding of business sector value-adding activities was conducted while looking at existing public content projects and programs and relating challenges. This work revealed that PSI constitutes a “raw material” for a variety of products and services in applications across a wide range of industries, and that it is an important economic asset (see Table 1 for products based on PSI). The analysis also identified that geographic and meteorological information have the greatest potential for PSI, that their use has had positive impacts on employment, growth (notably by the rise of intermediary entities which add value to government data), and the development of innovative products such as location-based services, and products which increasingly cater to mobile networks. In short, geographic and meteorological information are the “low hanging fruit” of PSI, providing an entry point for a broader analysis.

**Table 1. Examples of products based on PSI**

Products based primarily on one information type	Products combining various information types
Company profiles including financial analysis	"Intelligent" navigation systems helping to avoid traffic jams and to increase safety
Enhanced legal text databases for research	Geo-marketing (e.g. combining geographic with demographic data)
In-car navigation systems	Property evaluation (e.g. combining notary and geographic information)
Personal navigation (e.g. PDAs, mobile phones)	Location-based information on events, hotels, restaurants to handheld device
Digital online maps	Location-based information on doctors and pharmacies etc.
Geographic Information Systems (e.g. for network planning)	Location based services at big events/sites for orientation
Weather risk management (e.g. protection of crops)	Location-based tourist recommendations taking into account weather situation
Weather forecasts for different platforms (e.g. mobile phones)	Freight and transport management (e.g. combining geographic with weather data)

Source: OECD.

24. The study identified the main policy issues in these two areas: unclear access regimes for potential distributors (who has access and by what criteria), conditions of access (competitive access for further distribution, or monopoly arrangements on the side of government or single distributors), discouraging pricing mechanisms (pricing at total cost recovery plus return on investment) and inefficient distribution to final users (limited access for final users, lack of variety in distribution channels, pricing policies which decrease use).

25. The work on access to public sector content is still at an early stage, although agreement has been reached to continue this work in 2007-08 and organize a workshop with the intent of exploring the possible development of international principles and guidelines (e.g. an OECD Recommendation on PSI Principles) that would establish some broad principles for access to PSI that would in turn establish a framework for the development of indicators and further analysis which would measure the economic and non-economic benefits from different access and use regimes.

### **Access to publicly funded digital research data**

26. Throughout OECD Member countries, continuously growing quantities of data are collected by publicly-funded researchers and research institutions. This rapidly expanding body of research data represents both a massive investment of public funds and a potential source of the knowledge needed to address the myriad challenges facing humanity.

27. To promote improved scientific and social return on the public investments in research data, OECD member countries have established a variety of laws, policies and practices concerning access to research data at the national level. In this context, it was recognized that international guidelines would be an important contribution to fostering the global exchange and use of research data.

28. At the outset, the third OECD Global Research Village Conference addressed policy implications of the use of Information and Communication Technologies (ICT) for the global science system in 2000.<sup>18</sup> In particular, the conference discussed issues of access to publicly financed research related to ICT as for instance access to intellectual property and data resources. In 2001, the OECD's Committee for Scientific and Technological Policy (CSTP) agreed to the

establishment of a Working Group to draw up commonly agreed principles to guide access to publicly financed research. Access to and sharing of research data from public funding was chosen as the most appropriate focus for the activities of the Working Group.<sup>19</sup> Collaborations with similar working groups such as CODATA<sup>20</sup> were sought.

29. In 2004, OECD Science and Technology Ministers declared that fostering broader, open access to and wide use of research data will enhance the quality and productivity of science systems worldwide. Ministers adopted a Declaration on Access to Research Data from Public Funding, asking the OECD to take further steps towards proposing Principles and Guidelines on Access to Research Data from Public Funding, based on commonly agreed principles to facilitate optimal cost-effective access to digital research data from public funding, and taking into account possible restrictions related to security, property rights and privacy (Annex 1).<sup>22</sup> It recognizes “that open access to, and unrestricted use of, data promotes scientific progress and facilitates the training of researchers” and “will maximize the value derived from public investments in data collection efforts”, and entrusted the OECD’s Committee for Scientific and Technological Policy (CSTP) to work towards the establishment of access regimes for digital research data from public funding. The Ministers asked for the guidelines to be endorsed by the OECD Council at a later stage.

30. An expert group was formed to support this objective of translating Minister’s goals into an OECD policy instrument. The objective of the Expert Group is to draft useful and relevant guidelines that can be used by national governments and a wide variety of research organizations to facilitate and improve the international sharing of, and access to, digital research data gathered with the assistance of public funding.

31. The nature of “public funding” of research varies significantly from one country to the next, as do existing data access policies and practices at the national, disciplinary and institutional levels. These differences call for a flexible approach to data access and recognition that one size does not fit all. Moreover, the balance between the costs of improved access to research data and the benefits that result from such access will need to be judged by individual national governments and their research communities. Technological issues involved related to appropriately designed technological infrastructure, broad international agreement on interoperability, and effective data quality controls. Furthermore, national laws and international agreements, particularly in areas such as intellectual property rights and the protection of privacy, directly affect data access and sharing practices, and must be fully taken into account in the design of data access arrangements.

32. Other sticking points in this work have been:

- scope and definitions: the scope of ‘research data’ and ‘publicly funded research data’ needed to be better defined,
- issues of proprietary data (i.e. the legal rights and legitimate interests of all stakeholders in the public research enterprise), the protection of intellectual property and privacy, confidentiality, security matters which need to be addressed,
- the question of how governments and institutions can resolve the funding issues that arise in facilitating access to research data, and

- related institutional and managerial issues.

33. Moreover, it was agreed that research institutions needed to be involved in the consultation process toward developing the Guidelines. A survey of current practices and issues in data access among the member countries' policy makers and research institutions as well as a workshop were undertaken.

34. Since, essentially a "double track" approach has been followed. The first track continued to discuss and revise the draft guidelines. The second track undertook analytical and survey work to inform the content of the guidelines. The stakeholders in this process included research funding bodies, public research institutions, private sector entities dealing with data management, universities, and legal experts.

35. By the second half of 2006, the two streams of work had been completed and were reintegrated, resulting in the formation of "OECD Recommendation on Access to Research Data" the main features of which are to:

- Promote a culture of openness and sharing of research data among the public research communities within Member countries and beyond;
- Stimulate the exchange of good practices in data access and sharing;
- Raise awareness about the potential costs and benefits of restrictions and limitations on access to and the sharing of research data from public funding;
- Highlight the need to consider data access and sharing regulations and practices in the formation of Member countries' science policies and programs;
- Provide a commonly agreed upon framework of operational principles for the establishment of research data access arrangements in Member countries; and,
- Offer recommendations to Member countries on how to improve the international research data sharing and distribution environment.

36. The CSTP approved the draft Recommendation on Access to Research Data and forward it to the OECD Council which endorsed the recommendation in December 2006. The CSTP will have to monitor the implementation of the Recommendation perhaps in collaboration with other groups (e.g. the Global Information Commons for Science Initiative).

## **Conclusion**

37. This paper has examined the implementation of openness across three components of the cyberinfrastructure: the communications infrastructure, access to public sector information and access to scientific research data from an international perspective. Our experience reveals that it is not broad overarching actions leading to such openness but detailed, sustained work in very specific areas. The real implementation of openness requires embedding it in institutions, processes and bureaucratic procedures. While broad generalizations are dangerous, a general recipe for accomplishing this as follows:

- split the issue into digestible, manageable bits. This both aids analysis as well as the isolation of divisive issues and limits the diversity of stakeholders, helping the process of reaching consensus.
- identify leading, “best practice,” examples of how to deal with the issue, providing a “poster child” for the work. Ideally this example should be from a recognizable peer group (e.g. OECD Member countries);
- the best practice should be amenable to clear-cut economic analysis that allows the empirical calculation of costs and benefits.
- based on this analysis, definitions and methodologies should be developed that allows the construction of indicators that can be institutionalized and used to benchmark the peer group.

38. Change is fast paced in the area of cyberinfrastructure requiring a high-degree of awareness and flexibility as the issue evolves and technology changes the debate (e.g. fixed-telephony to mobile-telephony to broadband).

## ANNEX BOX 1 2004 OECD MINISTERIAL DECLARATION ON ACCESS TO DIGITAL RESEARCH DATA FROM PUBLIC FUNDING

On the 30th January 2004, 34 governments committed to work towards the establishment of access regimes for digital research data from public funding in accordance with the following objectives and principles:

**Openness:** balancing the interests of open access to data to increase the quality and efficiency of research and innovation with the need for restriction of access in some instances to protect social, scientific and economic interests.

**Transparency:** making information on data-producing organisations, documentation on the data they produce and specifications of conditions attached to the use of these data, available and accessible internationally.

**Legal conformity:** paying due attention, in the design of access regimes for digital research data, to national legal requirements concerning national security, privacy and trade secrets.

**Formal responsibility:** promoting explicit, formal institutional rules on the responsibilities of the various parties involved in data-related activities pertaining to authorship, producer credits, ownership, usage restrictions, financial arrangements, ethical rules, licensing terms, and liability.

**Professionalism:** building institutional rules for the management of digital research data based on the relevant professional standards and values embodied in the codes of conduct of the scientific communities involved.

**Protection of intellectual property:** describing ways to obtain open access under the different legal regimes of copyright or other intellectual property law applicable to databases as well as trade secrets.

**Interoperability:** paying due attention to the relevant international standard requirements for use in multiple ways, in co-operation with other international organisations.

**Quality and security:** describing good practices for methods, techniques and instruments employed in the collection, dissemination and accessible archiving of data to enable quality control by peer review and other means of safeguarding authenticity, originality, integrity, security and establishing liability.

**Efficiency:** promoting further cost effectiveness within the global science system by describing good practices in data management and specialised support services.

**Accountability:** evaluating the performance of data access regimes to maximise the support for open access among the scientific community and society at large.

They also pledged to: seek transparency in regulations and policies related to information, computer and communications services affecting international flows of data for research, and reducing unnecessary barriers to the international exchange of these data; take the necessary steps to strengthen existing instruments and – where appropriate – create within the framework of international and national law, new mechanisms and practices supporting international collaboration in access to digital research data; support OECD initiatives to promote the development and harmonisation of approaches by governments adhering to this Declaration aimed at maximising the accessibility of digital research data; and consider the possible implications for other countries, including developing countries and economies in transition, when dealing with issues of access to digital research data.

Source: OECD Ministerial Declaration at [www.oecd.org/document/15/0,2340,en\\_2649\\_33703\\_25998799\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/15/0,2340,en_2649_33703_25998799_1_1_1_1,00.html) .

## ENDNOTES

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- 1 Dan Woods, "Guns, Germs, and Open Source: Yali's Question for the Software Business," 19 June 2005, [http://www.oreillynet.com/onlamp/blog/2005/06/guns\\_germs\\_and\\_open\\_source\\_val.html](http://www.oreillynet.com/onlamp/blog/2005/06/guns_germs_and_open_source_val.html), last visited 8 January 2007.
- 2 [www.oecd.org](http://www.oecd.org)
- 5 Eric von Hippel, "Democratizing Innovation," (2006) MIT Press, Cambridge, MA
- 9 See "Utility broadband the TRE-FOR Way", Light Reading, 10 August 2006 at: [http://www.lightreading.com/document.asp?doc\\_id=97370](http://www.lightreading.com/document.asp?doc_id=97370).
- 10 See "Paris Sewers Give City of Light A Fiber-Optic Edge", Wall Street Journal, 10 November 2006, at: [http://online.wsj.com/article/SB116311331721719120.html?mod=googlenews\\_wsj](http://online.wsj.com/article/SB116311331721719120.html?mod=googlenews_wsj).
- 11 The dividing line between allowing for commercial re-use and making public sector content available to the general public is sometimes hard to draw as governments do both at the same time. Hence, the OECD project also took into consideration that for example cultural and educational information is increasingly used to produce commercial products.
- 18 See [www.oecd.org/document/37/0,2340,en\\_2649\\_34269\\_1880805\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/37/0,2340,en_2649_34269_1880805_1_1_1_1,00.html).
- 19 For the working group see <http://dataaccess.ucsd.edu/groups.html>.
- 20 See [www.codata.org/](http://www.codata.org/).
- 22 See [http://www.oecd.org/document/15/0,2340,en\\_21571361\\_21590465\\_25998799\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/15/0,2340,en_21571361_21590465_25998799_1_1_1_1,00.html) for the declaration.