scr*ipt*ed

"INFORMATION AND COMMUNICATIONS TECHNOLOGY FOR ENVIRONMENTAL REGULATION: DEVELOPING A RESEARCH AGENDA" WORKSHOP REPORT

Dr. Su-Ming Khoo[*] *& Dr. Kieran Hickey*[**]

---

[*] Lecturer, School of Political Science and Sociology, National University of Ireland Galway.

[**] Lecturer, School of Geography and Archaeology, National University of Ireland Galway.

The ways in which information and communications technology can be used to support environmental regulation were the subject of an international exploratory workshop in NUI Galway on 20–21 June 2013. The event, 'Information and Communications Technology for Environmental Regulation: Developing a Research Agenda', was funded by NUI Galway's Ryan Institute for Environmental, Marine and Energy Research, the Whitaker Institute for Innovation and Societal Change, and the Irish Research Council. It attracted over fifty international experts from Europe, the United States of America and Australia.

The delegates were experts in law, the physical and social sciences, information systems and web science. The lively discussions addressed topics such as real-time monitoring of air pollution through sensors; large-scale databases of geographical information on the health of rivers, lakes and beaches; satellite-based monitoring of farming patterns; and the provision of information on industrial pollution to the public through government websites. Speakers included academics, staff from non-governmental agencies and personnel from regulatory agencies. Slides and recordings from the event are available online at http://ict4er.org/ict4er-2013/

The workshop was opened by Professor Ciaran O'Neill, Dean of the College of Business, Public Policy and Law. The keynote speech was given by Professor Bradley Karkkainen, Henry J. Fletcher Professor in Law at the University of Minnesota, School of Law. Entitled '"You manage what you measure": Information, Incentives, and the Architecture of Environmental Regulation', he discussed his long-standing interest in the area and raised a number of intriguing issues which resonated through the discussions in subsequent panels.

Professor Karkkainen highlighted the connection between the provision of information on environmental issues and the incentives available to make use of them. He summarized the history of the Toxics Release Inventory (TRI), which was in many ways a response to the Bhopal chemical release disaster but was regarded with little enthusiasm by the United States Environmental Protection Agency as it could see no real purpose to gathering data for its own sake. However, TRI was used by NGOs, boards of directors and investors as a way of measuring whether polluters were improving their performance.

Developing the theme of 'you manage what you measure', he raised some caveats for those who were over-enthusiastic about the potential of informational regulation and ICT: that information is only half (or perhaps less than half) of the equation, with incentives also being significant; that measurement is pointless without management; and that what is measured must be carefully chosen as it determines what is managed (so, for example, mobile sources of pollution are not affected by TRI as they do not have to report). He concluded that information does not always lead to the desired effect, citing the example of Proposition 65 in California, which requires warning notices of products and business premises that use dangerous chemicals. This works well for discrete consumer products, where the potential buyer may choose a safer substitute, but not so well for indispensable items such as gasoline or hotel services.

The remainder of the workshop was structured along the following themes: Using Information Effectively, Access to Information, Information Driving Innovation, ICT in the Regulatory Process, Putting Information to Work, Gathering Information,

Privacy Issues, ICT and Environmental Management, and Enforcement. It concluded with a Rapporteurs' Report from Dr. Kieran Hickey and Dr. Su-Ming Khoo, which is summarised below.

The event was a valuable first step in mapping out a complex range of problems from the legal supports needed to develop this potentially valuable tool, to vital issues like privacy, along with the details of how the technology is used in practice. Attendees discussed topics such as the difficulties that can be caused by the differences between the pace of change in technology, which can be very rapid, and change in the law, which can be very slow; the difference between having data and having knowledge; and that we may drown in information but learn very little. They left with perhaps more questions than answers but with a wider understanding of the issues and a valuable range of cross-disciplinary perspectives on a multi-faceted area of rapidly-developing research.

1. Significant Themes

According to Dr. Hickey, workshop papers could be classified along four broad themes which could also translate into future research areas.

1.1 The issue of rates of change or timescale

It is clear that core components of the links between ICT and environmental regulation are operating at very different timescales. Monitoring can take place in real time, with data also available in real time. Using social media, an environmental problem can be identified and a campaign constructed around it within 24 to 48 hours, which is extraordinarily rapid compared to what was available in the past.

However the rate of change slows dramatically after this, even for urgent and critical issues. Regulatory change is slow; legislative change is even slower. Constitutional change is even slower still, operating over decades.

Clearly the availability of ICT and real time data has changed this landscape dramatically. Two phrases that emphasise this issue and what needs to be done were 'rapid but careful change' and 'the legal framework has to catch up'. With regard to the latter, catching up only brings us half-way; keeping up will be a major challenge, requiring much more flexible and reactive regulatory and legislative environment.

1.2 Data issues

The potential for large-scale data capture raises a number of difficult questions:

1. Data availability and the development of information tools.
2. Filtering of the huge amount of data that is becoming available – who is doing this and for what purpose?
3. Reliability of all this data, which now comes not just from established sources such as universities, research centres, and government agencies but also from citizens, NGOs and the private sector. Who is going to judge the reliability of the data?
4. Trust in the data, especially as it is and will be increasingly coming from a myriad of sources.

5. The regulatory and legislative status of the data from these sources – how quick or slow will a decision be made in a legal context? Can regulators and courts rely on crowd-sourced data in their deliberations?

A phrase which was repeated by several delegates which emphasised some of these core issues was 'the management of data is critical'.

1.3 The complexity of the data and environmental systems

An enormous volume of data is already captured. This will explode in the coming years. As a result of instantaneous monitoring, changes in environmental systems and the identification of significant environmental problems will be captured (both spatially and temporally) in a much more nuanced way. This will present a huge challenge of understanding at all levels in society from the citizen, scientist, policy analyst, regulator, politician, legal representative, judge and others. Two repeated phrases on this issue were 'engagement with the data' and, more importantly, 'engagement with knowledge'.

1.4 Data ethics

How to deal carefully, respectfully and legally with all of this data is a significant minefield for all concerned and various aspects of it were discussed in the workshop:

1. Issues of privacy – what should be private and who decides?
2. Access – should it be free, paid for, licensed? What limitations are to be imposed on the uses to which data is put? What if the taxpayer has paid for the data generation? How do we deal with databases with multiple contributors?
3. Disclosure of data stores – what are data gatherers not telling us and do we have a right to find out?
4. Usage – ethical versus unethical – who decides which is which and what penalties could apply to the latter, if any?
5. Issues around regulatory use, in decision-making processes.
6. Issues around legal use, as evidence in court proceedings.
7. How to deal with errors in the data or database, which could lead to adverse decisions being made that impacts on the rights of an individual or company?

There was little legal certainty around these questions, as there is a dearth of relevant case law.

2. Developing a research agenda

Discussion then turned to how to tackle these challenging questions. Dr. Khoo emphasised the enthusiasm of participants to speak across disciplines and step out of their 'comfort zones', the need to maintain this openness and the importance of identifying opportunities to make the 'right choices'.

Placing environmental regulation in a comparative perspective, she highlighted the way in which information triggers create and alter incentives to voluntarily produce or provide information. Useful information and tools create outcomes. Returning to Professor Karkkainen's keynote, she emphasised the message that 'You manage what you measure' but that information is a necessary, but not sufficient, condition for

good regulation. There are 'no silver bullets'. Care is needed in designing regulatory tools.

There are also persistent wicked, complex and blurry problems and issues that need attention. Data can elicit emotive responses, particularly the questions of trust, privacy and openness. Some sectors and actors are less regulated or not properly regulated. There are costly barriers to access despite advanced laws being agreed and promulgated. Gathering data places a burden on business, who may fear sharing. There are also ongoing doubts about the quality and ownership of data.

3. Key questions

Dr. Khoo also returned to the initial contribution of Professor Holly Doremus to stress the importance of identifying what we don't know and learning the possibilities for the future. She concluded with a challenging set of questions for further exploration:

1. What matters, what to measure and why?
2. How to make the invisible visible?
3. Who will use information and tools, how to determine the cost and ease of access, and why?
4. How do we have a conversation across a variety of perspectives: the importance of the rule of law, the need for reflexive regulation, how to encourage behaviour change, where the line should be drawn between citizen and consumer, and the progressive realisation of rights?
5. How to recognise the broader social contexts of legal provisions, standards, and enforceability?
6. What level of familiarity is needed with new tools and methods? How do we determine what is useful and their limitations?
7. What are the limitations and issues surrounding big, linked and open data, such as quality, ownership, engagement, privacy?
8. What is the legal acceptability of information, particularly where they may be doubts about its quality?
9. What are the limitations and issues surrounding synthesis, interpretation and diffusion of information?