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Environmental communication in the Information Age: Institutional barriers and opportunities in the provision of river data to the general public

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ABSTRACT

In an era of increased human pressure on planet Earth, sound environmental governance regimes are more important than ever. Digital technologies are increasingly turned to by environmental regulators to aid governance and communication. We examine the 'behind the scenes' institutional dynamics of a public body in its digital information provision (specifically dynamic river level information). Based on in-depth interviews with staff across a large environmental regulator we have brought to light four pivotal areas of institutional dynamics: (1) institutional priority and path dependency; (2) management and resources; (3) institutional identity and interdepartmental dynamics; and (4) ability and willingness to change. We gained insight into explicit and covert barriers and opportunities in relation to digital information provision that are likely to occur in other public institutions too. Besides identified barriers that were of a technical, structural, managerial or cultural nature, arguably the most important barrier was conceptual, i.e. the prevalence of 'efficiency and efficacy' perspectives on information and communications technology (ICT) amongst staff, in which ICT is primarily perceived as a neutral solution in itself to a wide variety of issues. Opportunities were nonetheless present in the form of enthusiasm and some critical thinking about digital innovation among staff, and an emphasis on the importance of stakeholder inclusion in the design of ICT. We conclude that there is a need to connect institutional social learning with the development of 'conceptual perspectives' on ICT, in which ICT is not seen as a solution in itself, but as a set of tools in a wider transformational process, or as a lens to look at existing or new practices. This is more likely to strengthen cornerstones of contemporary environmental governance, such as improved information access and reconceptualisations of 'traditional' barriers of uncertainty, liability and distrust in relation to information provision.

1. Introduction

1.1. Government, governance and ICT

The impacts of Anthropocene human activity are putting 'planetary boundaries' under pressure (Galaz, 2014). The role and influence of national states to address society's failure to deal with environmental challenges (the 'Anthropocene Gap') is subject to debate (cf. Armitage et al., 2012; Duit, 2014). Still, states remain a prominent coordinator of environmental governance, i.e. "the set of regulatory processes, mechanisms and organisations through which political actors influence environmental actions and outcomes" (Lemos and Agrawal, 2006: 298). But their current approaches to facilitating interactions with and between markets, communities and international organisations (Eckersley, 2004; Galaz et al., 2012) often reveal 'democratic deficits', making them ill-suited "to respond to ecological problems in a reflexive and

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concerted manner" (Eckersley, 2004: 14). A potential route to overcome such deficits may be through the adoption of information and communications technologies (ICTs), which have revolutionised the capacity to gather, analyse, disseminate and use environmental information (Esty, 2004; Mol, 2006). Indeed, Castells' notion of 'the Information Age' – in which the development of ICT has become a shaping principle of contemporary societies (Castells, 2010) – is also befitting the environmental domain, as ICT increasingly structures environmental management and governance (Mol, 2006, 2008). The latter has also been transformed under the influence of macro-level political reform from the 1990s onwards, partly in response to mounting public criticism and growing socio-ecological conflicts (Blackstock et al., 2005; Ioris, 2008). Many Western states are believed to move away from conventional forms of government as a result of so-called governance shifts (Keulartz and Leistra, 2008). These are supposed to represent a move away from centralised, top-down and expert-based regulation to an agenda of participatory and inclusive forms of governance (Van der Zouwen, 2006; Pahl-Wostl et al., 2011).

One level on which such governance shifts could take place is that of national public bodies or institutions (i.e. organisations invested with authority to perform tasks on behalf of society – Castells, 2010) responsible for environmental policies and regulation. Their environmental information provision to the general public is an area potentially strongly impacted by ICT developments, as well as by governance shifts. Such communication is expected to move away from a traditional one-way model of information provision in which recipients are treated as silent, passive and uniform. Instead, there would be increased sensitivity to the needs, identities and discourses of different user groups, and attempts to move beyond one-directional channels of communication in favour of open dialogue and interaction. One of the main rationales is that the users' input may lead to a higher degree of citizen engagement, so that 'passive' users become 'active' stakeholders in integrative environmental management with enhanced outcomes (Mostert, 2003; Mackay et al., 2015). The growing body of literature on e-governance (and e-government) is testament to these developments in changing modes of communication (Marche and McNiven, 2003; Torres et al., 2006). The adoption and promotion of e-governance has been claimed to be one of the greatest innovations in the public sector (Chadwick, 2003), with (potential) benefits including heightened levels of transparency and accountability of the public sector (Potnis, 2010), increased efficiency, reduced operational costs, and corruption prevention (Saxena, 2005). On the other hand, many challenges remain (Dawes, 2008), including the protection of citizens' privacy (Jho, 2005), and the actual implementation of technologies (Allen et al., 2001).

While improved information provision may be a matter of self-interest for public authorities to increase public participation, it may also be a necessity to help maintain public support and legitimacy when dealing with complex, multidimensional environmental issues. Underpinned by the possibilities of the Internet and other ICTs, and in line with international legislations, conventions and programmes that promote public access to information (Mathur, 2009), innovation in institutions' policies and practices may often be required to reach higher standards of information provision.

1.2. Institutional reform and ICT adoption

Environmental public authorities face new questions about how to improve information communication in ways that foster stakeholder engagement and increase the efficiency of public policies and regulation (Paavola et al., 2007; Mathur, 2009; Arts et al., 2015). Mol (2008) shows how traditional approaches revolve around command-and-control mechanisms, economic cost of information provision, strict regulatory action, and information ownership regulation. Under new conditions of the Information Age and governance shifts, these approaches are inadequate to deal with contemporary socio-environmental challenges relating to, for example, information disclosure, transparency and reputation (Mol, 2008). Barriers are also constituted by institutions' habitual modes of operation. In the face of complex, multi-level problems with high levels of uncertainty, public sector organisations often embody a culture of compromise. Dominant values such as standardisation and formalisation add to stability and predictability but discourage individual initiative and risk-taking and are therefore not conducive to innovation; such risk avoiding cultures have been called "rather dynamic in their conservatism" (Bekkers et al., 2006: 13).

A requisite for public bodies to improved information provision in the Information Age is the adoption of novel ICTs (Mathur, 2009). But this may not be a straightforward process, as it can break accepted patterns and influence practices beyond its own realm (Lanzara, 2009). Here, we examine public body reform in relation to an institution's capacity to adopt digital innovation, and ask: *What are the institutional dynamics relating to digital information provision by an environmental regulator, in the context of the Information Age and governance shifts*? To increase the scope for depth of understanding of this fundamental relationship between institutional dynamics and information provision, we take a case study approach (Flyvbjerg, 2006) and focus on an environmental regulator in the United Kingdom (UK).

1.3. Context of study

In their evaluation of ICT modernisation across several European countries, Bekkers and Korteland (2006: 41–42) typified dominant political values in the UK as "responsiveness, efficiency, and value for money", and they identified the dominant shift as one "towards citizens". The goals identified by these authors comprise: meeting the demands of citizens and businesses, improved public and civil service delivery and Information Age government. Our focus is on Scotland, a country that has been part of the UK since 1707, but that has been in the process of Devolution over the last decades (e.g. Scottish Parliament was re-established in 1999). In this semi-autonomous form, Scotland has responsibilities over environmental policies and environmental regulation, and relatively new governmental bodies that aim to progressively implement the supposed 'positives' implied in the discourse of the governance shifts (Scottish Government, 2009; Arts et al., 2014). The Scottish Environment Protection Agency (SEPA – established as a result of the Environment Act, 1995) is an executive non-departmental public body of the Scottish Government and Scotland's main authority on environmental regulation. For this reason, and because of its sheer size as a public body in the Scottish context (22 offices and around 1300 employees), SEPA is an appropriate case study on ICT related issues.

Water management is arguably one of the most dynamic parts of SEPA's regulation duties. Being the leading agency responsible for the implementation of the EU Water Framework Directive (2000/60/EC), SEPA was required to construct a novel set of governance mechanisms. Before this, water management had been the exclusive task of technical experts (Pahl-Wostl et al., 2007), but now SEPA had to take into account socio-economic aspects of environmental systems (Blackstock et al., 2005; Tippett et al., 2005; Macleod et al., 2007). It appeared that such aspects were hard to achieve in practice (Mostert, 2003; Blackstock et al., 2005, 2006; Ioris, 2008).