



**3<sup>rd</sup> International Conference  
on Public Policy (ICPP3)  
28-30<sup>th</sup> June 2017, Singapore**

**Panel T10P06 Session 1**

*Digital Methods for Public Policy*

**Title of the paper**

*Digital Methods and Public Policy:  
Tracing Networks, Assemblages and Devices*

**Author(s)**

*Jonathan Gray*

*Institute for Policy Research*

*University of Bath, UK*

*[j.gray@bath.ac.uk](mailto:j.gray@bath.ac.uk) / [jonathangray.org](http://jonathangray.org) / [@jwyg](https://twitter.com/jwyg)*

**Date of presentation**

*Thursday 29<sup>th</sup> June 2017*

# Digital Methods and Policy Studies: Tracing Networks, Assemblages and Devices

*Jonathan Gray*

*Institute for Policy Research, University of Bath*

## Abstract

How can digital methods and “born digital” data be leveraged in the context of policy research, and with what effects? How might we stage productive interdisciplinary encounters between digital methods and policy research? This paper looks at how emerging digital methods may be brought into dialogue with three approaches to the study of policy: (i) policy networks, (ii) policy assemblages, and (iii) policy devices. These three ways of looking at policy will be explored with reference to digital methods research on the actors, imaginaries, technologies, practices and infrastructures associated with open data.

**Keywords:** *Digital Methods; Policy Networks; Policy Assemblages; Policy Devices; Science and Technology Studies; Media and Communication Studies; Critical Policy Studies.*

## Introduction

It is no exaggeration to say that the world’s capacity to generate data is greater than at any other point in history. It is also no secret, and this development has led to a huge rise of interest around data and digital technologies in many areas of collective life. It should of course be noted that data is a flexible, extensible and malleable concept that can be creatively and retrospectively applied to many things – from tally marks and accounting figures

scrawled in pencil or carved into stone, to the outputs of national statistics offices or scientific equipment, to the binary code of digital files, to particular kinds of information organised in spreadsheets or relational databases. It also clear that data has been invested with a particular significance in the contemporary moment: it has become a kind of buzzword, or perhaps “keyword” as Raymond Williams might put it (Williams, 2014), and just like the machine age, space exploration or the personal computer, it has given rise to a whole new host of “socio-technical imaginaries” (Jasanoff & Kim, 2015) about new possibilities, horizons, visions, aspirations, risks, dreams and nightmares.

Yet even with these caveats and cautions against hyperbole in mind, it is still true to say that the volume of data being produced and the entanglement of data and digital technologies into so many aspects of our lives remains unparalleled. Data is not just created through processes of record-keeping, through ledgers, notebooks and monitoring equipment, or in the course of scientific or administrative processes. It is created through numerous mundane transactions: by going online, sending messages to friends and families, through the simple act of having a mobile phone in your pocket, opening a door, entering a subway, getting into a car, buying something in a shop, and soon, we are told, through using household appliances – by boiling a kettle, washing dishes or turning up the heat. Digital technologies, devices and sensors are becoming woven into the fabric of our social interactions, our physical environments and an increasingly large part of earthly life.

How might these developments change the way that public policy is done, and how we do research about it? Digital technologies and the proliferation of data are giving rise to not only new kinds of practices and counter-practices (from new marketing and surveillance techniques to new forms of data activism and data journalism), but also new ways of doing

and thinking about research. This includes everything from computational biology to the computational social sciences, from digital humanities and digital sociology to data science. It is crucial to note that these different approaches have different theoretical outlooks, methodological practice and cultures and styles of research – as there are many different ways of creating, analysing, exploring, interpreting and making sense with data and digital technologies.

This paper is a contribution to thinking about how productive encounters may be staged between these emerging digital research approaches and concepts and approaches in policy studies. In particular it looks at how three ways of looking at public policy – in terms of networks, assemblages and devices – can be elucidated by means of digital data and digital methods associated with the study of emerging technologies, platforms and media ecologies. It draws on a particular tradition of “digital methods” that has emerged and developed through a group of researchers and research centres located in the Netherlands (e.g. Rogers, 2013; Borra & Rieder, 2014; Gerlitz & Helmond, 2013), United Kingdom (e.g. Marres, 2017), France (e.g. Venturini & Latour, 2010), Italy (e.g. Mauri & Ciuccarelli, 2016), Denmark (e.g. Birkbak & Munk, 2017), and a growing number of other countries. This tradition explicitly draws on insights from fields such as Science and Technology Studies (STS) and Media and Communication Studies.

The approach that this paper takes is not simply to look at how digital methods may be instrumentally enlisted into the service of policy studies or vice versa, but to see how to stage substantive and productive encounters between them that recognise their specific outlooks, cultures and ways of doing research. For this reason, the following text takes as its starting point an orientation which will be more familiar to areas of policy research which have more

in common with the digital methods approach, or draw on common sources of inspiration – such as critical policy studies (e.g. Orsini & Smith, 2011; Fischer, Torgerson, Durnová, & Orsini, 2015) and the sociology and anthropology of policy (e.g. Wedel, Shore, Feldman, & Lathrop, 2005). Yet it also takes inspiration from long-standing calls from STS researchers to reflect on the performativity and effects of their own work – including its broader public mission and role in relation to public policy-making (see, e.g. Jasanoff, 1999). Hence the question becomes not only how digital methods may be carefully and effectively incorporated into the craft of studying public policy, but also what it means to produce accounts of policy and the social lives of policy issues, networks, assemblages and devices and what these accounts do in different settings – which includes thinking about the relation between policy research and policy practice.

The three sections of the paper are illustrated with reference to empirical work around the politics of open data. Over the past decade open data has dramatically (and improbably) ascended from niche idea in open source software, scientific and civic hacking communities to playing a prominent role in public policy at local, regional, national and transnational levels, in relation to a wide variety of issues and areas - from facilitating transparency, accountability and open government to fuelling the digital economy and scientific and technological innovation. Digital methods research around this topic is used to illustrate different aspects of the creation, circulation, adaptation and reconfiguration of open data policies - including associated visions, practices, infrastructures and technologies.

## Digital Methods and Policy Networks

One of the classic ways of looking at public policy-making processes is in terms of “policy networks” or “policy communities”. This is a range of different approaches that can be used to understand, broadly speaking, who is involved in policy-making processes, how they are related, and what their positions are in relation to the issue. It should be noted at the outset that there different, competing and in some cases contradictory conceptions and definitions of what “policy networks” and “policy communities” are and what these notions bring to policy research – including which is the subset of the other; their level of descriptive or explanatory ambition; how they should be theoretically or methodologically approached; their openness and boundedness; how they are delineated and held together; and whether they are best considered to constitute metaphors, analytical tools, theories, models, practical strategies or normative visions of how policy-making is organised (Atkinson & Coleman, 1992; Börzel, 1997; Thatcher, 1998; Peterson, 2003).

Whilst there also competing origin stories, genealogies and historical accounts of contemporary understandings of policy networks and policy network analysis, several readings suggest that they develop from parallel work on “policy communities” in the United Kingdom in the 1970s, and work on “issue networks” in the United States during the same decade (Thatcher, 1998). Both of these approaches sought to look beyond the formal institutions and processes of the state to understand which kinds of interests, expert groups and organisations were involved in the making of policy. On the one hand the “policy communities” approach emphasised the relationships between government departments and external groups – often highlighting the stability, boundedness and continuity of these communities (Jordan, 1990).

On the other hand, Hugh Hecló, who coined the phrase “issue network”, suggested that attempts to account for policy in terms of “closed triangles of control” were often “disastrously incomplete”, such that researchers would “tend to miss the fairly open networks of people that increasingly impinge upon government” (Hecló, 1978: 263). The development of issue networks is portrayed as a disruptive and troubling trend in American political life. In contrast with the comparative “fun” of the “clubby days of Washington politics”, Hecló paints a picture of “new forces” and gathering “clouds” who claim and clamour for what he describes as “compensatory policies” – such as in relation to civil rights, income equality, housing and the environment.

There is, as he puts it, a shift towards “more and more puzzling, unfamiliar policy issues” which are “thrust on government” through “more and more fluid groups” which are “unexpectedly mobilised” (269). Not only is there a rising tide of unfamiliar actors and new issues, but these issue networks are so open-ended, and their protagonists so diffuse, distributed and substitutable that “no one”, he says, “as far as one can tell, is in control” (275). Hecló claims that issue networks have the overall effect of making “democratic politics more difficult” by proliferating complexity and multiplying the number of available options, making consensus more difficult to obtain, undermining confidence and postponing closure (283-284). In other words, Hecló emphasises the open-endedness and heterogeneity of policy networks, which raises the cost of policy-making in democratic societies.

Quarter of a century later, two of the main pioneers of the “digital methods” tradition came to the same concept via a very different route, writing: “we took to the Web to study public debates on science and technology [...] we found ‘issue-networks’ instead” (Marres & Rogers, 2005). They arrived at the notion of “issue-networks” independently from an

awareness of Heclo’s work, drawing on the empirical work they were doing on hyperlink analysis as a means to delineate issues on the web.<sup>1</sup> In reading back to the “questionable origins” of the “issue network” as a concept, they question Heclo’s sceptical evaluation of the unaccountable influence of issue networks in policy, politics and public life, arguing instead that issue networks can be seen as a means to multiply and facilitate public involvement in public policy-making.

Drawing on a conception of democratic politics derived from the work of John Dewey, they looked at the how “collective practices of issue-making” and efforts to make issue networks “go public” can be studied through the analysis of hyperlinking patterns – including both how publics organise and are organised by issue work. Thus the analysis of issue networks and associated issue work can be considered not just in terms of a failure of democratic political systems and evidence of a kind of technocratic political capture (as per Heclo), but rather as a means to analyse the relations between different actors, publics and their issues, and to make space for reflecting on how these relations might be organised differently and how issue networks might be held accountable to the publics and beneficiaries that they are supposed to serve.

What might we learn from this digital methods approach to studying issue networks on the web in relation to policy research on open data? What might issue networks around open data look like, according to the web? How can data from the web be repurposed in order to understand issue networks around open data? Part of the craft of digital methods research is

---

<sup>1</sup> Confirmed through personal communication from Richard Rogers to author, 13<sup>th</sup> June 2017: “we first called what we found an issue network and subsequently went in search of any precedent”.



learning how to formulate and operationalise interesting and incisive lines of inquiry with an attentiveness to the specificities, capacities and limitations of the medium (in this case the web) – thus the notion that digital methods are “methods of the medium” (Rogers, 2013). Significant consideration should be given to “query design” and the selection of starting points and seed lists from which to start crawling, scraping and what Bruno Latour describes as “following the actors” (Latour, 2007) through digital media. The reason that it is so crucial to pay heed to these starting points, is that this this tradition of research is particularly interested in how different networks and groupings are produced socially produced and co-produced through different kinds of platforms, infrastructures and devices. In other words, as I shall explore further in the sections below, digital technologies are not considered as direct and transparent bearers of social groupings, but as active participants in organising issue networks and issue work. They should be read as mere proxies – secondary and virtual echoes of “real” issue networks – but rather as one amongst a number of sites where issue networks are organised and made public.

One approach to studying issue networks around open data policy – as per the work of Rogers and Marres on issue networks on the web – is to start with a number of “seed” hyperlinks and perform a certain number of crawls to a certain level of depth from the starting points in order to obtain a series of relational pictures of how they are “networked” which can be used to study the “politics of association” of different actors implicated in the issue (Rogers, 2013). There is usually a preference for well-sourced “emic” lists (e.g. compiled by issue experts, from participation in events, consultation responses, search engine results) rather than “etic” lists compiled by the researcher, as list-creation is not just part of research work, but can also be understood as a central aspect of the issue work being studied.

In the case of open data, for example, we can “triangulate” different lists of organisations who are most active around the issue in a variety of settings – from multilateral initiatives such as the Open Government Partnership, or who appear in search engine queries or Twitter bios. The resulting list of the most frequently appearing and frequently mentioned actors can serve as a starting point for web crawling – using tools such as the Digital Methods Initiative’s Issue Crawler or the Sciences Po médialab’s Hyphe tool. This returns a set of lists and network graphs – which can be used to understand relations in a given network, depending on the character of the crawl. In contrast to other styles of Social Network Analysis (SNA), the digital methods tradition often explores these networks through a combination of “visual network analysis” to explore rather than formally measure or quantify relations (Venturini, Jacomy, & Pereira, 2015), accompanied by qualitative interpretation and contextualisation of these relations.

An expanded crawl to understand the broader network around our starting list (as per Figure 1) shows us, for example, clusters of US government actors on the centre left hand side of the network graph; international organisations to the bottom left; UK and EU public bodies towards the bottom right; and towards the centre right a more densely linked cluster of international non-governmental organisations and civil society initiatives focusing on a range of adjacent issues – such as government transparency (Sunlight Foundation), free culture and open access (Creative Commons), free and open source software and open standards (Free Software Foundation) and web standards (W3C). Around the periphery we can see several prominent users and consumers of open data and public data – including “civic hacking” projects (e.g. mySociety, GovTrack, OpenCongress), companies (e.g. OpenCorporates), and data journalism initiatives (e.g. from ProPublica).



Figure 1 IssueCrawler network of organisations associated with open data.

A crucial point that we shall return to at greater length in the following two sections: the crawl tells us not only about public institutions, organisations and companies associated with the issue of open data, but also about technologies, media artefacts, social media platforms and online spaces through which “issue work” is being conducted. Thus we can see the presence of social channels such as Twitter, Facebook, Vimeo, Flickr and Github, as well as media outlets such as the New York Times. The centrality of Twitter indicates that this is a medium which is widely used across the network – marking it of potential interest for further investigation. A corpus of 2.2 million tweets about open data – including the phrase “open data” as well as the “#opendata” hashtag – harvested through the Digital Methods Initiative TCAT tool (Borra & Rieder, 2014) can give us a complementary picture of the issue network.

While with hyperlink analysis the focus was on how different actors were associated through linking patterns, with Twitter there are many different ways through which relations in an issue network may be explored, such as, for example, looking at: who follows whom amongst the network; who talks about which issues and topics in relation to open data and how they may be associated through these issues; how actors are associated by virtue of the media and media sources that they share (e.g. images, links, and the domain names of links). We can also undertake longitudinal analysis of Twitter datasets to understand the evolution of issue networks over time. The TCAT tool aims to provide a flexible set of tools for exploring these networks on Twitter, through design choices which “[emphasize] epistemic plurality by staying close to the units defined by the Twitter platform instead of storing aggregates, by allowing for a number of different sampling techniques, by enabling a variety of analytical approaches or paradigms, and by facilitating work at the micro, meso, and macro levels” (Borra & Rieder, 2014: 266).

These different lines of enquiry provide us with a series of different snapshots about the ways in which an issue network is organised and held together – including looking at how relations between actors in the network can be examined by means of different kinds of media objects and inscriptions such as images, links, hashtags, key words and phrases and so on. While classic network analyses often looked at structural features such as social ties (e.g. family relations), economic ties (e.g. financial flows), formal legal ties (e.g. ownership structures), professional ties (e.g. corporate board interlocks) in order to understand relations – digital methods analysts repurpose transactional traces in order to study relations through a broader variety of technological infrastructures, media systems and meaning-making activities which contribute to the organisation of issue networks. For example, in Figure 2, we can see a “co-hashtag analysis” showing some of the other hashtags associated with open data on Twitter.



## Digital Methods and Policy Assemblages

The second way of looking at and doing research about policy-making and policy that I would like to examine draws on the growing literature around “policy assemblages” (see, e.g. Prince, 2010; McCann & Ward, 2012; Ureta, 2014; Clarke, Bainton, Lendvai, & Stubbs, 2015; Baker & McGuirk, 2016; Mukhtarov, 2017). In the previous section we saw how policy networks sought to widen interest beyond the formal structures of state institutions in order to understand how policy is made, who is shaping it and how these different actors are related – in particular looking at “issue networks” in both digital methods and policy research. Drawing on research approaches from anthropology and sociology, the notion of policy assemblages aims to broaden the lens of policy research beyond the persons or organisations (whether public servants, companies or NGOs) who shape policy – to look at the diverse elements which must be assembled in order to make certain kinds of policy debate, policy work and policy outcomes possible.

Policy assemblage approaches thus aim to offer a “way of revealing, interpreting, and representing the spatially, socially, and materially diverse worlds of policy and policy-making” through the analysis of these heterogeneous networks of different elements – including, but not limited to, “humans, materials, technologies, organisations, techniques, procedures, norms, and events” (Baker & McGuirk, 2016). The value of the policy assemblage approach is often emphasised in relation to perceived shortcomings of previous formalist and rationalist accounts of how policies are made and how they move – suggesting the limitations of thinking of them as “internally coherent, stable ‘things’”, as “[emerging] fully formed in one particular place and then sometimes [moving], whole and unchanged, across space”, as “the pure application of rational guidelines” or as “the result of powerful individuals” (McCann & Ward, 2012; Ureta, 2014). Instead they can be understood, as one

proponent puts it, as “multifaceted processes in which a multitude of entities, all of them carrying different agencies, intervene and are continually reenacted, changing the policy’s outcome in accordance with the presence/absence of certain articulations and practices” (Ureta, 2014). In looking at policy work, policy assemblage approaches place an emphasis on being attentive to emergence, process, multiplicity, distribution, materiality, labour, practices, uncertainty and contingency of public policy-making.

Drawing on Science and Technology Studies, digital methods researchers often share a similar outlook, with an interest in a diverse range of actors, materials, elements and infrastructures which contribute to an issue, not just at the human beings and organisations. Thus media artefacts such as the hyperlink and the hashtag may be considered not just as proxies but as part of the *public articulation* of the issue.

From the hyperlink network in Figure 1 we can derive a picture of the various channels, technologies and mediators which are involved in public issue work. As well as indicating through which media (broadly conceived) the issue is publicly articulated (e.g. Vimeo, Facebook, Twitter and the New York Times), and the different institutions which are publicly associated with the issue (e.g. the World Bank, the US White House, the UK National Archives), we can also obtain a picture of some of the key practices and technologies involved in issue work – such as code sharing repositories (e.g. Github in top left of graph), data portal software (e.g. CKAN project, centre right), open data licenses, licensing practices and legal norms (e.g. Creative Commons, Open Data Commons and the Open Definition, centre right).

From the Twitter analysis we can see, for example, the presence of events and activities in hashtags in tweets associated with open data. These can be examined in relation to other topics, hashtags and media sources, as per network graphs such as Figure 2. We can also see the presence of many events and activities in the most frequently used hashtags per year, as per Figure 3 – including the Open Data Summit, the Open Data Index, Open Up, the International Open Data Summit, Open Data Day and Open Con. Such hashtags can be further studied in order to see the relations of links, users, hashtags and shared links. These provide us with a picture not just of the networks of key organisations, but of a relational ecology of a broad range of actors, activities, events associated with open data on Twitter.

2014	2015	2016	2017
opendata	opendata	opendata	opendata
bigdata	bigdata	bigdata	bigdata
opengov	opengov	opengov	smartcities
openseience	data	smartcities	ai
data	iodc15	godansummit2016	opengov
odisummit	openseience	data	iot
openaccess	bitcoin	cha	empowerment
openindex14	blockchain	iodc16	lgodf
dataviz	hackathon	openseience	cha
transparency	dceebrief	datascience	data
ebola	dataviz	opensource	datascience
opensource	datascience	openaccess	opendataday
ogov	opensource	smartcity	lombardia
smartcity	openaccess	iot	smartcity
smartcities	smartcities	dataviz	innovation
linkeddata	code2015	innovation	openseience
news	languagelearning	opendataday	analytics
openup14	iot	datosabiertos	dataviz
datascience	civictech	civictech	openaccess
iot	smartcity	ogp16	opensource
innovation	opendataday	transparency	odd17
privacy	transparency	analytics	tech
startup	datosabiertos	gis	civictech
transparencia	api	ai	datosabiertos
sce2014	innovation	agriculture	fintech
civictech	africaopendata	news	4org
trasparenza	tech	tech	center4oe
ddj	news	societing	machinelearning
india	rt	hackathon	saa2017
ebolaresponse	analytics	odd16	transparency
opendataroadmap	datarevolution	ddj	hackathon
goonbas	ogp15	lacura	opendataday2017
opencon2014	ddj	startups	tottoriken
datosabiertos	odd15	lidar	odcamp

Figure 3 Most prominent hashtags in tweets associated with open data in TCAT dataset from October 2014 to June 2017. Hashtags appearing in only one year are green; two years are red, three years blue and across all four years grey.



## Digital Methods and Policy Devices

The third and final approach to policy research that I would like to explore in this paper is through the notion of “devices”. I have been using the notion of “policy devices” in my own research around the politics of data – and have come across a handful of other mentions of the term from researchers who also draw on other studies on devices informed by work in Science and Technology Studies (see, e.g. Hirschman & Berman, 2014; Frankel, Ossandón, & Pallesen, 2016). While the notion of “policy devices” is currently comparatively marginal in policy research, researchers can draw on a strong tradition of work around, for example, “market devices” (Muniesa, Millo, & Callon, 2007), “research devices” (Law & Ruppert, 2013), “digital devices” (Ruppert, Law, & Savage, 2013).

Drawing on previous STS studies of “market devices”, Hirschmann and Berman look at the complementary notion of “policy devices” which they suggest includes: “the wide variety of sociotechnical tools that help policymakers see and make decisions about the world”, giving examples of GDP, unemployment rates and censuses (Hirschman & Berman, 2014: 782). They also mention Ian Hacking’s notion of “styles of reasoning” to explore how policy devices not only represent things, but also articulate and facilitate different backgrounds of reasoning and sense-making, in relation to which policies can be argued for and policy work can be conducted. As the authors summarise: “policy devices shape what we attend to” (800).

They can also be understood as collective accomplishments, requiring “the enrolment of many different actors—those who collect the information that goes into the device, the machines and procedures for producing the calculations, an audience that comes to demand the output—if they are to gain significance” (797). These devices are considered in political terms, as they “restructure the political relations around them” and “open up the possibility

for new kinds of politics” (799). Like the notions of “network” and “assemblage”, “device” is a broad and flexible concept which can be used to draw attention to particular aspects of the object of study – which in this case includes looking at the performative, productive, political and world-enabling capacities of techniques, technologies, practices and regimes of quantification involved in policy work which may often be read in more instrumental or technical terms.

The digital methods agenda can be considered not just in terms of mapping issue networks and tracing issue assemblages, but also in terms of exploring the politics and affordances of online devices, platforms and infrastructures – ranging from the web and search engines, to big social media platforms such as Twitter and Facebook, to “secondary” social media sites such as Instagram, Tumblr, YouTube, Github, to major peer produced web sites such as Wikipedia. A crucial part of the digital methods approach is to repurpose and enlist digital traces from these online devices in order to understand the role that they play in organising issues, networks and assemblages. For example, we might ask: how do search engines play a role in organising and mediating the issue of human rights online? What are the politics of climate change according to Twitter? How do the features of Github facilitate code work and data work? Though these kinds of questions we are invited to reflect on the more substantive roles that online devices may be considered to play in relation to the co-production of issues, and what it means to see the world in ways which they make possible (e.g. through search engine rankings, hyperlinks, hashtags, followers, stars, forks, channels, reposts, etc).

In my work around open data, I have been looking at the role of data portals as online “policy devices” in order to facilitate deliberation and action around different aspects of public sector information policy. Taking cue from other digital methods studies, one can repurpose digital



However, as many STS and information infrastructure studies scholars point out, there is a difference between how an infrastructure or a piece of software is configured, and how it is actually used in different settings – leading to a variety of “device cultures” and practices, including those which may innovate on or differ from the original intentions of the creators of a system (as in the case of the hashtag on Twitter, which was introduced by its users and is used in many different ways). Thus we can also extract “transactional” metadata from a given CKAN instance in order to see how different users interact with the system – such as how different actors are adding and processing datasets around different themes, in order to transfer the by-products of administration into “raw material” for data innovation (Figure 5).

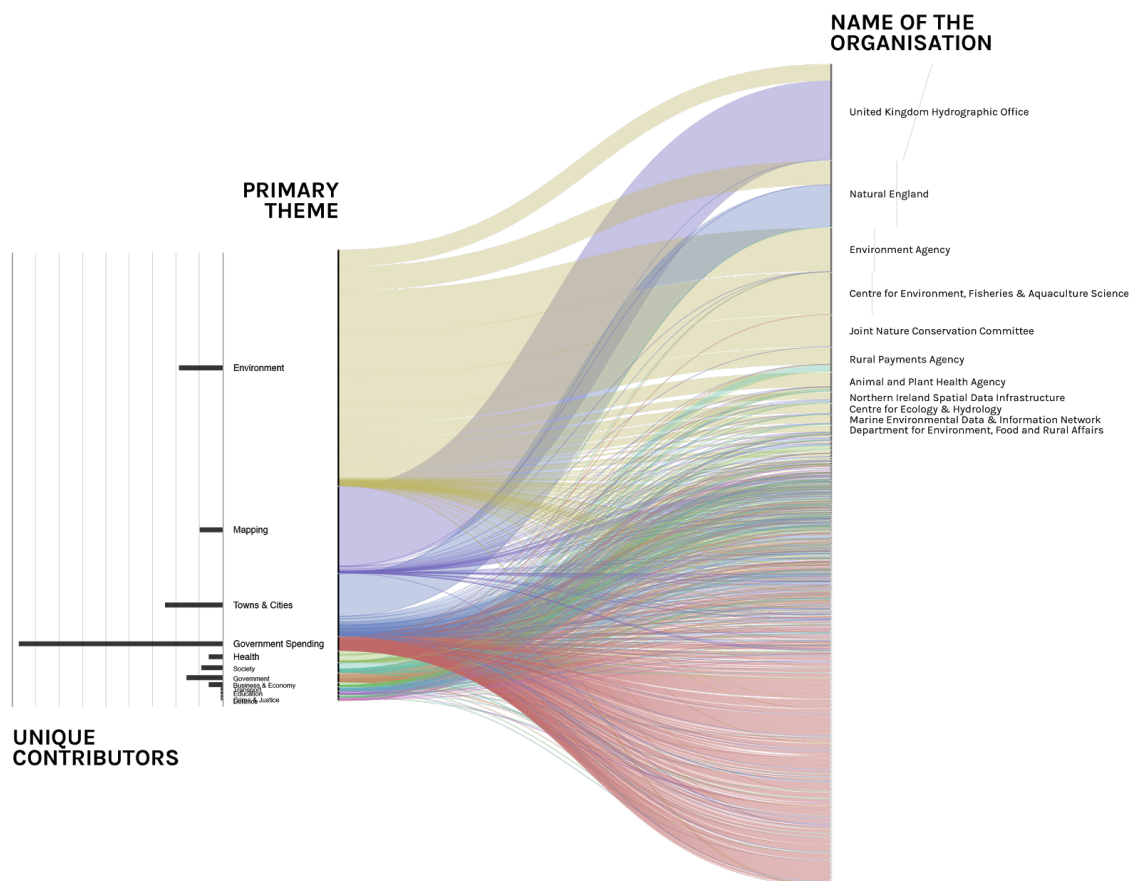


Figure 5 Alluvial chart showing relation between number of datasets added to Data.gov.uk by data "themes" (left) and public sector entities (right).

Data portals are not just used to coordinate the transformation of official information into data in order to advance a variety of information policy objectives (from facilitating economic growth and technological innovation to grassroots “civic hacking” and new kinds of digital public services) – but also to showcase how this data is put to work by different actors. Metadata from “app catalogues” can be repurposed in order to explore relations between tags and apps, giving us a picture of how public sector data is used to create novel kinds of experiences and capacities. For example, in Figure 6 we can see how many of these apps focus on providing personalisation and individual choice – including combining a number of different geospatial datasets and indicators in order to operationalise notions such as “walkability”, “liveability” and “pleasantness”.

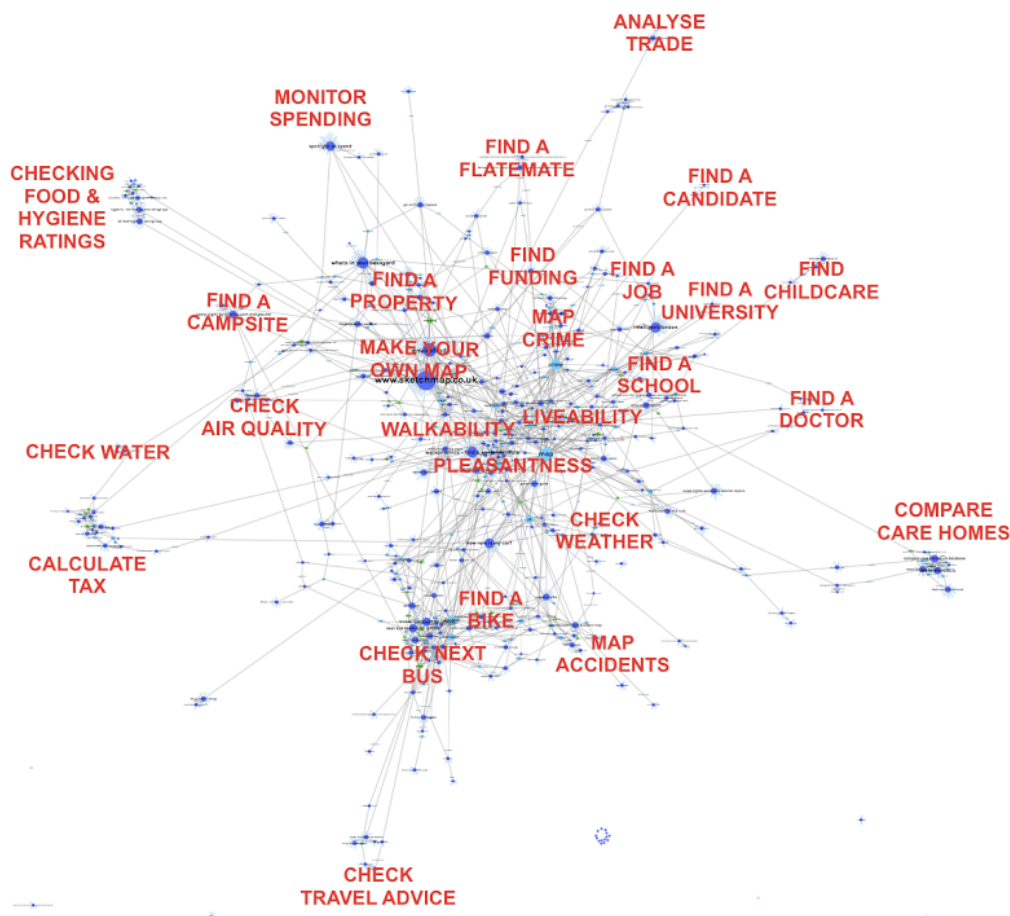


Figure 6 Bipartite network showing apps and user-generated tags associated with them from Data.gov.uk “app catalogue”. Created using the Gephi software, spatialised using the Force Atlas 2 graph layout algorithm [49] and annotated through qualitative analysis.

## Conclusion

In this paper I have suggested how digital methods might be brought into productive dialogue with policy studies in relation to three ways of looking at policy – in terms of networks, assemblages and devices. Drawing on approaches from Science and Technology Studies and ongoing digital methods research around the politics of open data, I have suggested how digital traces can be repurposed in order provide different perspectives on policy worlds as relational ecologies. This represents a different style of data work to other available approaches – such as more formal and quantitative approaches to network analysis or emerging practices of areas such as data science and computational social science.

The approaches to researching networks, assemblages and devices outlined in this paper may help to inform and enrich both policy research and policy practice. Researchers interested in the social study of policy can use digital methods to obtain pictures of the various kinds of actors, networks, assemblages and devices involved in an issue, and what these do. The repurposing of digital data using “methods of the medium” represents a shift from off the shelf tools and dashboards to “critical analytics” in order to study how digital devices, platforms and infrastructures are involved in the articulation and organisation of issues (Rogers, 2013, 2015; Borra & Rieder, 2014). Such approaches may also be used by policy practitioners in order to better understand areas that they are working in – as per the growing number of collaborations between digital methods researchers and non-governmental organisations, public institutions and others.<sup>3</sup>

---

<sup>3</sup> See, for example, the work of the Digital Methods Initiative (University of Amsterdam); the Density Design Lab (Politecnico di Milano), the médialab (Sciences Po), the Techno-Anthropology Lab (Aalborg University), the Centre for Interdisciplinary Methodologies (University of Warwick) and the Public Data Lab (a collaboration which includes researchers from many of the other labs).

In relation to policy research, we might well ask: how can we delineate between “policy work” and other kinds of “issue work”? As McCann and Ward comment: “the existence of an issue and its publics does not automatically imply the emergence of a policy assemblage” (2012). The three sections of this paper involve three shifts in focus regarding the way we look at policy: (i) from public institutions to a broader range of civil society, private sector and other actors (policy networks); (ii) from key individuals and organisations to the many diverse and heterogeneous elements and actors which are involved in policy worlds and making policy deliberation and action possible (policy assemblages); (iii) from just human judgement to the sociotechnical arrangements which underpin them, making possible different styles of reasoning, sociality and action (policy devices).

In light of these moves, how can we reconsider policy as a more distributed, collective accomplishment using digital methods? Where, when and under what conditions is something counted as policy? One way to approach this question is by means of the classic anthropological distinction between “emic” and “etic” which I alluded to earlier. One can see policy in emic terms as something which is delineated by social practices of different actors. Or one can see it in etic terms as something which is delineated for study by the researcher (through different evolving definitions and understandings of policy as an object of study). As with many other research approaches, with digital methods research one is always engaged in a mix of looking at how issues are defined and articulated by different actors and infrastructures on the web and digital media – as well as being attentive and reflective about decisions about how to study these through the research design process. We are always already in the process of making distinctions and “sorting things out”.

The relational ecologies around issues on digital media platforms offer new opportunities for bringing new actors and voices into policy work, as well as identifying who and what might be left out (as per Rogers and Marres’s early work on issue networks on the web). Just as digital traces from the web and social media platforms are repurposed for research, there are also similar experiments in the context of policy-making, such as in a growing number of “policy labs” – from the UK Cabinet Office’s Policy Lab to the EU Policy Lab to the UN’s Global Pulse project. While digital methods researchers are critically and creatively using digital devices as research devices, policy-makers are exploring their use as “policy devices” to complement or rival other ways of taking account of collective life in the service of policy deliberation and action. Here digital methods researchers may play a role in not only studying the politics, ethics and social lives of these digital devices – but also in shaping norms, practices and deliberation around how they are used, including amongst policymakers, public institutions and beyond. Just as with the emerging of research techniques such as the poll, the interview, the survey, the ethnography – digital methods can facilitate new kinds of listening, as well as changing what is hearable.

## References

- Atkinson, M. M., & Coleman, W. D. (1992). Policy Networks, Policy Communities and the Problems of Governance. *Governance*, 5(2), 154–180. <https://doi.org/10.1111/j.1468-0491.1992.tb00034.x>
- Baker, T., & McGuirk, P. (2016). Assemblage Thinking as Methodology: Commitments and Practices for Critical Policy Research. *Territory, Politics, Governance*, 0(0), 1–18. <https://doi.org/10.1080/21622671.2016.1231631>



Birkbak, A., & Munk, A. K. (2017). *Digitale Metoder*. Copenhagen: Hans Reitzel.

Borra, E., & Rieder, B. (2014). Programmed Method: Developing a Toolset for Capturing and Analyzing Tweets. *Aslib Journal of Information Management*, 66(3), 262–278.

<https://doi.org/10.1108/AJIM-09-2013-0094>

Börzel, T. (1997). What's So Special About Policy Networks? An Exploration of the Concept and Its Usefulness in Studying European Governance. *European Integration Online Papers (EIoP)*, 1(16). Retrieved from <http://eiop.or.at/eiop/pdf/1997-016.pdf>

Clarke, J., Bainton, D., Lendvai, N., & Stubbs, P. (2015). *Making Policy Move: Towards a Politics of Translation and Assemblage*. Bristol, UK: Policy Press at the University of Bristol.

Fischer, F., Torgerson, D., Durnová, A., & Orsini, M. (Eds.). (2015). *Handbook of Critical Policy Studies*. Cheltenham, UK: Edward Elgar Publishing.

Frankel, C., Ossandón, J., & Pallesen, T. (2016). Markets for Collective Concerns. Presented at The EASST 2014 Conference (European Association for the Study of Science and Technology).

Gerlitz, C., & Helmond, A. (2013). The Like Economy: Social Buttons and the Data-Intensive Web. *New Media & Society*, 15(8).

Gray, J. (forthcoming). What Do Data Portals Do? Tracing the Politics of Public Information Infrastructures on the Web.

Hecl, H. (1978). Issue Networks and the Executive Establishment. In A. King (Ed.), *The New American Political System*. Washington, D.C.: American Enterprise Institute.

Hirschman, D., & Berman, E. P. (2014). Do Economists Make Policies? On the Political Effects of Economics. *Socio-Economic Review*, 12(4), 779–811.

Jasanoff, S. (1999). STS and Public Policy: Getting Beyond Deconstruction. *Science, Technology and Society*, 4(1), 59–72.

Jasanoff, S., & Kim, S.-H. (Eds.). (2015). *Dreamscapes of Modernity: Sociotechnical Imaginaries and the Fabrication of Power*. Chicago: University of Chicago Press.

Jordan, G. (1990). Sub-Governments, Policy Communities and Networks: Refilling the Old Bottles? *Journal of Theoretical Politics*, 2(3), 319–338.

Latour, B. (2007). *Reassembling the Social: An Introduction to Actor-Network-Theory*. Oxford: Oxford University Press.

Mauri, M., & Ciuccarelli, P. (2016). Designing Diagrams for Social Issues. In *Proceedings of DRS 2016, Design Research Society 50th Anniversary Conference*. Brighton, UK.

Marres, N. (2017). *Digital Sociology: The Reinvention of Social Research*. London: Polity Press.

Marres, N., & Rogers, R. (2005). Recipe for Tracing the Fate of Issues and Their Publics on the Web. In B. Latour & P. Weibel (Eds.), *Making Things Public: Atmospheres of Democracy* (pp. 922–935). Cambridge, MA: MIT Press.

McCann, E., & Ward, K. (2012). Policy Assemblages, Mobilities and Mutations: Toward a Multidisciplinary Conversation. *Political Studies Review*, 10(3), 325–332.

Mukhtarov, F. (2017). Policies on the Move: Translation, Assemblages and Ethnography. *Environment and Planning C: Politics and Space*, 35(1), 191–194.

Orsini, M., & Smith, M. (2011). *Critical Policy Studies*. Vancouver, BC, Canada: University of British Columbia Press.

Peterson, J. (2003). *Policy Networks*. Vienna, Austria: Institut für Höhere Studien (IHS).

Prince, R. (2010). Policy Transfer as Policy Assemblage: Making Policy for the Creative Industries in New Zealand. *Environment and Planning A*, 42(1), 169–186.

Rogers, R. (2013). *Digital Methods*. Cambridge, MA: MIT Press.

Rogers, R. (2015) From Dashboards to Critical Analytics. Paper presented at Data Power Conference (University of Sheffield).

Ruppert, E., Law, J., & Savage, M. (2013). Reassembling Social Science Methods: The Challenge of Digital Devices. *Theory, Culture & Society*, 30(4), 22–46.

Ureta, S. (2014). Policy Assemblages: Proposing an Alternative Conceptual Framework to Study Public Action. *Policy Studies*, 35(3), 303–318.

Venturini, T., & Latour, B. (2010). The Social Fabric: Digital Traces and Quali-Quantitative Methods. In *Proceedings of Futur en Seine 2009* (pp. 87–101). Paris: Editions Futur en Seine.

Williams, R. (2014). *Keywords: A Vocabulary of Culture and Society*. London: Fourth Estate.