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Can Crowd Wisdom Solve Regulatory Problems?

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Can crowd wisdom solve regulatory problems?
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Over the past decade, the idea of using media technologies to solicit the views and opinions of "lay people" has gained prominence in a variety of contexts. Buyer feedback on eBay, product reviews on Amazon, lawyer ratings on Avvo, PageRank on Google, photo scoring on HotorNot, user-generated articles on Wikipedia: there hardly is a service on the web these days that does not claim to aggregate the scattered wisdom of its users. The list of terms that try to capture this phenomenon is long. Besides the popular "wisdom of crowds" (Surowiecki 2004), suggestions range from "swarm intelligence" (Kennedy 2006), "crowdsourcing" (Howe 2008) and "collective intelligence" (Segaran 2007) to "peer production" (Benkler 2006), "user communities" (Von Hippel 2005) and "distributed problem-solving" (Dutton 2008). While most of these schemes have been developed in commercial contexts, they public sector has started to embrace them only recently. Going beyond conventional technologies of participation like citizen juries, consensus conferences or public consultations, the idea of mobilizing "crowd wisdom" as a techno-scientific solution to regulatory problems is gaining interest from researchers and policy-makers alike.

At the moment, thinking about this new mode of regulation is still in its infancy. Early trials are spread out across the globe and include examples like electronic rulemaking, legislative drafting in open wikis, assessment of patent applications by "lay" experts or web-based feedback on healthcare, policing or school services. However, despite their limited scope so far, a lively debate has developed about their benefits and challenges. While some have hailed the use of "crowd wisdom" as a way of generating superior knowledge, fostering transparency, enabling participation and "ushering in a new world of accountability" (HM Government 2009, p. 4), others have been less enthusiastic. Concerns have been raised about the accuracy and reliability of crowd-sourced data, the ways in which it can be used in practice, the potential for bias and manipulation and the lack of transparency in increasingly complex socio-technical systems.

This paper will tackle these issues head-on and ask to what extent crowd wisdom can solve regulatory problems. What is the currency and status of the "crowd" in recent discussions of governance and regulation in digitally networked environments? What kinds of applications are already out there and what can we learn from them? What are the requirements and implications of using "crowd wisdom" as a techno-scientific solution to public problems? And what are the conceptual, analytical and methodological devices to answer these questions? The goal here is not to come up with ultimate conclusions, but rather to offer an initial overview of the field and suggest directions for future research.

After a brief overview of existing literatures on crowd wisdom and regulation (I.), I shall discuss a small number of schemes that can be regarded as recent applications of the idea (II.). Based on this overview, I shall discuss key themes and tensions and identify promising avenues for further research (III.). Finally, I shall conclude by reconsidering the initial question and asking how such a research program can most usefully be tackled (IV.).

I. Current thinking about crowd wisdom in regulation

Interestingly, the "crowd" has been mostly thought of as a source of regulatory problems.[1] In a number of areas of regulatory activity, the idea of loosely coupled groups of users acting collectively through new media technologies has been a cause of concern. Peer-to-peer file-sharing, hate speech and data protection are just some examples in which the idea of uncoordinated, spontaneously associated "crowds" has been thought to challenge existing regulatory institutions. However, more recently authors have called for a different perspective and proposed to find ways to harness the "wisdom of crowds" as a *solution* to regulatory problems.

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[1] This idea is especially prominent in early sociological treatments of the crowd (see, e.g., Le Bon 1897, Canetti 1962).

As a starting point, I will review some key contributions that speak to the issue of crowd wisdom and regulation.[2] While the concept of crowd wisdom has gained wide popularity in the popular press, academic studies are scattered across a number of fields.

a) Founding narratives of "crowd wisdom"

Arguably the best-known rendition of the idea of crowd wisdom has been offered by James Surowiecki (2004) in his book by the same name. In the opening chapter, Surowiecki recounts the story of Francis Galton, who provided a founding narrative of crowd wisdom. In a 1907 paper in *Nature*, Galton reports on a weight-judging competition at the "Fat Stock and Poultry Exhibition" in Plymouth (Galton 1907). For a fee of six pennies, visitors could submit an estimate for the weight of an ox and received prizes for the most successful guesses. Galton obtained the 800 tickets submitted after the competition and analysed their distribution.

> It appears then, in this particular instance, that the *vox populi* is correct to within 1 per cent. of the real value, and that the individual estimates are abnormally distributed in such a way that it is an equal chance whether one of them, selected at random, falls within or without the limits of -3.7 per cent. and +2.4 per cent. of their middlemost value. The result is, I think, more creditable to the trustworthiness of a democratic judgment than might have been expected. (Galton 1907, p. 451)

Struck by the accuracy of the crowd's judgment, Surowiecki explores the idea of soliciting and aggregating the views of a large number of people in a variety of areas, including prediction markets, jury decisions, search engines and *Who Wants to Be a Millionaire*. Surowiecki suggests that in order for a crowd to be useful, a number of conditions must be met:

> diversity of opinion (each person should have some private information, even if it's just an eccentric interpretation of the known facts), independence (people's opinions are not determined by the opinions of those around them), decentralization (people are able to specialize and draw on local knowledge), and aggregation (some mechanism exists for turning private judgments into a collective decision) (Surowiecki 2004, p. 10).

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[2] With this focus, the paper differs from and complements the work of Schildhauer et al. (2011), who focus on the role of user participation in innovation processes.

While this is a rather schematic rendering of what appear to be quite complex socio-technical interactions, Surowiecki's and Galton's accounts can be considered influential in that they are standard references for discussions of crowd wisdom and have achieved a somewhat iconic status.

An area that has picked up on the idea of using technology to harness the decentralized contributions of a large number of people is management and innovation studies. Eric von Hippel (Von Hippel 2005, Von Hippel 1976), for example, has long studied the capacity of communities of users and especially "user-innovators" radically and rapidly to innovate products in ways that outperform the development teams of manufacturers. Aided by "improvements in computer and communications technology", von Hippel suggests that user innovation communities are "democratizing innovation" as a driving force behind product development in industries ranging from kite surfing to medical equipment (Von Hippel 2005).

Similarly, students of management information systems considered the "digitization of word-of-mouth" (Dellarocas 2003) and explored the potential of new methods and procedures to generate useful information and make it travel to facilitate individual decision-making. In much of this work, the task is turned into an engineering challenge variously described as "crowd sourcing", "decision support" or "reputation systems" that combines basic hypotheses about human behavior with the design of algorithms, databases and user interfaces (Jøsang, Ismail et al. 2007). Especially the latter has been an ongoing focus in more design-oriented fields (Jøsang, Ismail 2002cf., Steinbrecher 2006).

In contrast to these technical disciplines, economists have focused on notions like "reputation" that connect questions of design with economic theories about the role of information in markets. In a seminal paper, Paul Resnick and Richard Zeckhauser suggest the idea of using "reputation systems" like eBay's Feedback Forum as a decentralized technology to overcome lemons problems and information asymmetries (Resnick, Kuwabara et al. 2000, Avery, Resnick et al. 1999). A key focus in this strand of literature is not just on

how to produce useful information, reputation and recommendations, but also to extend the idea of "wisdom" to mechanisms by which a crowd can police itself and provide incentives for "good" behavior and build "trust" (Ostrom 2003, Riegelsberger, Sasse et al. 2003). Accordingly, a sizeable literature has turned specifically on questions of "bias", "manipulation", "reliability" and the "quality" of information (Gasser 2006, Friedman, Nissenbaum 1996, Skitka, Mosier et al. 1999).

Already this cursory and highly selective review is instructive for considering some of the assumptions that are commonly associated with the idea of crowd wisdom. First of all, the popularity of Surowiecki's international bestseller and the flurry of recent writing on the topic indicate a widespread fascination with "crowds" and the seemingly "magic" operations through which it produces useful knowledge. An allegedly "simple" idea, built upon popular stories like the ox weighing competition, has appealed to a wide range of audiences and captured their imagination. This is itself an interesting phenomenon, which warrants further consideration. Second, it is striking to see how "the crowd" (or "*vox populi*") emerges as a new actor on the scene. The crowd is variously attributed agency, the capacity to make a "democratic judgment" (Galton 1907, p. 451) or "democratize innovation" (Von Hippel 2005) and a level of "intelligence" or "wisdom" that exceeds that of the individual. Third, a universal, but rarely explicated assumption is that "crowds" are not "naturally" wise, but need to be organized and coordinated for wisdom to emerge. In order for a crowd to be useful, a tight regiment of conditions must be met that is more reminiscent of the rigor and confines of a laboratory experiment than the ongoing contingencies of everyday social interactions. Thus, while "crowds" or "user communities" are often portrayed as a "natural" phenomenon and resource that simply needs the be "harnessed", the vast literatures on this topic in design, economics and human-computer interaction indicate that actually a lot of energy and thought is needed to establish this resource in the first place and making it work to meet some pre-defined goals. Fourth, the contributions almost universally suggest that "crowd wisdom" is best understood as a form of knowledge or information that results from the careful solicitation and aggregation of individual opinions. This knowledge is then assumed to be essential for different occasions

of human decision-making, be it in government, web search, supermarkets, investment banks or a televised quiz shows.

b) Participation, knowledge and technology in regulation

The narratives and models of "crowd wisdom" sketched in the previous section speak to a number of corresponding trends and concerns in regulation, public policy and governance, specifically treatments of user participation, the role of knowledge and new media technologies.

A first line of thinking concerns the idea of user participation in regulation. In particular, the solicitation of lay views and opinions has long been observed as a trend or even "new orthodoxy of governance" (Lezaun, Soneryd 2005). Work in the area of techno-scientific governance and the public understanding of science, for example, has explored technologies of participation such as consensus conferences, public hearings, ombudsmen or citizen juries (cf. Irwin, Michael 2003). Authors in policy studies and political scientists have studied the idea of "multistakeholder regulation" in an attempt to involve users (see, e.g., O'Rourke 2006). These ideas have been especially prominent in the context of Internet Governance and the regulation of communications networks (Kleinwächter 2007). Further, it could be argued that the participation of citizens in collective decision-making has been a much broader and long-standing concern in political philosophy and democratic theory. Prominent examples include discussions of deliberation and the public sphere (Habermas 1998, Habermas 1991) or procedural approaches to democratic authority (Estlund 2009).

Further, there is a sizeable literature in political science, sociology and policy analysis that has focused on the role of knowledge and information as the basis for regulatory decision-making. While some have shared a concern with "information asymmetries" or examined the role of markets in explicating "tacit knowledge" in the form of prices and other information (Hayek 1945), others have focused on the role of "knowledge gaps" and "expertise" in political decision-making (Harding 2002, Stiglitz 1999). A well-known example

here is James Scott's analysis of the limitations and pitfalls of "seeing like a state" (Scott 1998).

A final strand of research has attended more specifically to the role of information technology and its implications for government and democracy (see, e.g., Fountain 2001). Others have studied the phenomenon of "e-government" and "digital era governance" (Dunleavy, Margetts 2006), although the focus here has often been on the digitization of existing administrative procedures through large-scale IT systems and the reconfiguration public administration as a "citizen service" (cf. Mayer-Schönberger, Lazer 2007). Others have adopted even broader perspectives and discussed the role of information technologies in creating an "information politics" in which government makes extended use of information flows through electronic surveys or polling mechanisms (Castells 2004, pp. 309-353, see also Rogers 2004). A further area of research is the emerging focus on "e-democracy", which studies the implications of digital media for democratic governance and decision-making (see, e.g., Coleman 1999, Chadwick 2003, Gibson, Ward 1999).

In sum, there are a number of connections between existing research on regulation and governance and ideas of "crowd wisdom". These concern a focus on participation and the utility of "lay views" in collective decision-making, a key role attributed to knowledge and information, a view of digital media as a tool for achieving this and a shared understanding of what counts as "useful information", "wised crowds" and a "regulatory problem".

c) Crowd wisdom and regulation

With these themes in mind, we can now turn to a small number of contributions that have addressed the issue of crowd wisdom in regulation more specifically. On of the few more explicit treatments to date is Beth Noveck's conception of "wiki government". Noveck proposes to adopt a strategy of using technology to foster "collaboration as a distinct form of democratic participation, visual deliberation, and egalitarian self-selection" (Noveck 2009, p. 18). In her view, "Wiki Government explores many examples of ordinary people joining together to do extraordinary things coordinated via the Internet" (Noveck 2009, p.

19). In her analysis, Noveck draws mainly on the Peer-to-Patent project, which has been run as a pilot project in U.S., "a paradigmatic case of database programmers and wind-farming experts working with patent examining professionals to make a better decision" (Noveck 2009, p. 19). As Noveck emphasizes, her concern is not so much with "crowdsourcing" in the form of simple judgment aggregation across a network, but with "collaborative democracy" which "does not so much imply throwing people at a problem as coordinating the right people into different roles" (Noveck 2009, p. 18). The focus of wiki government, Noveck suggests, emphasizes "shared work by a government institution and a network of participants" (Noveck 2009, p. 18).

A related contribution is Cass R. Sunstein's discussion of the possibility of an "infotopia". Working from the perspective of behavioral law and economics, Sunstein mobilizes ideas from social theory to explore ways of harnessing the "advantage of the widely dispersed knowledge individuals have" (Sunstein 2006, p. 197). Building on the Condorcet Jury Theorem (cf. Mueller 2003, p. 129), Sunstein suggests that "groups will do better than individuals, and big groups better than little ones, so long as two conditions are met: Majority rule is used, and each person is more likely than not to be correct" (Sunstein 2006, p. 25). Moving on to consider how such "statistical groups" might work in practice, Sunstein wonders what happens when deliberation is added to the process and discusses what he regards as the four main problems of such an approach: the risk of amplifying errors, hidden profiles, informational cascades and group polarization. In doing so, Sunstein attributes a prominent role to the work of economist Friedrich Hayek. Hayek coined the idea of markets as institutions for generating information, especially the "very important but unorganized knowledge which cannot possibly be called scientific in the sense of general rules: the knowledge of the particular circumstance of time and place" (Hayek 1945, p. 521). A key question for Sunstein is thus to understand how online media can best be used to facilitate the process of collaborative knowledge creation and make many minds work together for the common good.

A further contribution, though with a slightly different focus, has been made by Jonathan Zittrain (2009). While Zittrain's main concern is to preserve what he calls "generative technologies" that make it easy for users to tinker, adapt and innovate, he also addresses the role of these technologies in addressing some of the very issues they are thought to cause (Zittrain 2009, pp. 175 ff.). Thus, rather than regarding many of the popular web-based services as a threat and root cause of problems, Zittrain suggests to consider focusing on the design of so-called "civic technologies" that harness and channel some of the very unruliness and creativity usually considered a problem and make it useful by promoting responsibility and an ethos of "netizenship" (Zittrain 2009, p. 142). As he suggests, "[w]e must use the generativity of the Net to engage a constituency that will protect and nurture it" (Zittrain 2009, p. 246). In contrast to Noveck's notion of wiki government, Zittrain mainly views these mechanisms as situated outside conventional institutions of regulation like state agencies, supra-national organisations and multistakeholder-processes. In his view, "[t]hey can help reinforce the conditions necessary for generative blossoming, and they can also step in … when mere generosity of spirit among people of goodwill cannot resolve conflict" (Zittrain 2009).

Yochai Benkler has approached the phenomenon of online collaboration from the perspective of political economy as a mode of social production, which prominently includes knowledge production. In doing so, he coined the concept of "commons-based peer production" (Benkler 2006), which he regards as one of the most important socio-economic transformations in the networked information economy. According to Benkler, "commons" are a specific institutional form in which no single person has exclusive control over the use and disposition of any particular resource (see also Ostrom 1990). As a subset of commons-based production practices, Benkler calls those production systems peer production "that depend on individual action that is self-selected and decentralized, rather than hierarchically assigned" (Benkler 2006, p. 62). In contrast to market or government-coordinated systems, peer production systems are seen as "collective action practices that (…) do not rely on either the price system or a managerial structure for coordination" (Benkler 2006, p. 63). Although such reasoning is not entirely new, Benkler suggests that

this mechanism for the production and ordering of information has dramatically gained importance with the advent of electronic technologies and web-based platforms that "afford" them and can be used strategically for public policy and regulation.

d) Conclusion: A research field in construction

As this brief and selective review has shown, studies that speak to the issue of crowd wisdom in regulation can be grouped around a number of themes. First, there is a focus on the production of knowledge or information, which is variously considered useful for an underlying model of decision-making. Second, there is the idea of lay people associating around a matter of concern and in some form collaborating to create that knowledge. Third, there is a strong concern with the role and potential of new media technologies as the primary means for organizing and facilitating this process and a corresponding interest in questions of design. And fourth, there is a strong normative assumption that crowd wisdom is a beneficial and useful resource and serves some common good.

While these themes run across the writings, there are also a number of puzzles which are not further specified and left unclear. First, it is not clear what the status of the "crowd" is. While prominent across a range of writing, the concept is not usually specified further. Authors variously talk about "groups", "communities" or a "network of participants". While the basic idea seems to be one of people associating more or less spontaneously around an issue of concern, it is unclear how exactly the collective is organized and interacts in practice. Second, it is not clear what the scope for applications of crowd wisdom in regulation is and how it relates to the process of "regulation". While Noveck's draws a distinction between regulatory institutions and groups of ordinary people and conceptualizes "wiki government" as a technology-based collaboration between the two, others like Zittrain situate crowd wisdom outside the state and regard them as institutions in their own right. Third, despite a heightened interest in these issues, it is not clear what the utility and implications are of such mechanisms, how they are best designed and how they actually work in practice. While there are a few early attempts at operationalizing the

idea of crowd wisdom in contexts of regulation, the practical experience with such schemes is limited.

II. Some exemplary applications

A number of initiatives have attempted to put the idea of "crowd wisdom" as a techno-scientific solution to regulatory regulatory into practice. The following section presents some recent applications and the claims they make about regulation. The goal is not to provide an exhaustive overview, but rather to exemplify the scope and diversity of existing initiatives.

a) Peer To Patent

One of the best-known and most advanced initiatives is arguably the Peer To Patent project. Peer To Patent is a pilot project by the United States Patent and Trademark Office (USPTO) that aims to open the patent examination process to public participation and draws on the expertise of lay people to judge the novelty of a patent (Noveck 2009).[3]

> Peer to Patent is an online system that aims to improve the quality of issued patents by enabling the public to supply the USPTO with information relevant to assessing the claims of pending patent applications.
>
> This pilot project connects an open network for community input to the legal decision-making process. The community supplies information and research based on its expertise. The patent examiner makes the final determination on the basis of legal standards. This process combines the democracy of open participation with the legitimacy and effectiveness of administrative decision making. (Peer To Patent Website, 2011)

The initiative can be regarded as an example of using the ideas and comments from a large number of people as an "input" into an existing regulatory process. Drawing on social media technologies, the initiative set out to create an online community of amateur examiners who contribute and collate information as part of the patent application procedure. While the hope is that the user community will contribute useful information and insight, the

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[3] The idea of Peer To Patent is currently being implemented in Australia and Japan. For an overview, see Peer-To-Patent Australia, http://www.peertopatent.org.au/ (last visited Sept. 15, 2011) and Peer-To-Patent Japan, http://www.iip.or.jp/e/e_p2pj/ (last visited Sept. 15, 2011).

ultimate decision is left with the patent examiners. In other words, the crowd can be described as a collective clerk who contributes to the work of the patent examiner. Since the initiative has been conducted in collaboration with researchers, a number of initial studies and reports are available (New York Law School 2009, New York Law School 2008, Noveck 2006).

b) The New Zealand Policing Act Wiki

Another initiative that has experimented with the use of computer-facilitated crowd wisdom in government can be found in New Zealand (New Zealand Police 2007). In 2007, the New Zealand police launched an open wiki and asked everyone to edit and comment on the 50-year old New Zealand Policing Act as part of its review. The press release read:

> Today's launch of a Policing Act wiki gives Kiwis an innovative way to suggest the wording for a new Act of Parliament.
>
> The wiki is the latest step in a comprehensive review of the 1958 Police Act.
>
> The officer in charge of the review, Superintendent Hamish McCardle, says the wiki provides an online space, similar to a whiteboard, where anyone can post their ideas on what a new Policing Act should say. (…)
>
> "Launching a wiki version of a statute is a novel move, but one we hope will yeild [sic] a range of views from people interested in having a direct say on the shape of a new Policing Act," Superintendent Mccardle says.
>
> If successful, one outcome is for the wiki Act to be given to the parliamentary select committee considering the official Policing Bill next year, along with other consultation information generated during the 18 month long review. (New Zealand Police 2007)

While the experiment does not seem to have been accompanied by further analysis or research, it demonstrates another way of "sourcing" crowds in regulatory policy. In this case, the goal is not make an administrative decision, but to draft a piece of legislation using a popular software for collaborative editing of text. Again, it appears that the input of contributors is not given any special status in the legal process. In fact, it is not even clear to what extent the comments need to be considered by the legislating body at all. This is different from, for example, the e-rulemaking process in the U.S. (cf. Coglianese 2004).

Similar initiatives to employ wiki software for the drafting of legislative texts include a privately operated wiki for the Telemedia Act in Germany (Telemedicus 2008) or even the collaborative drafting of an entire constitution that has recently been launched in Iceland (Siddique 2011).

c) Web-based patient feedback for the NHS

A further example of mobilizing crowd wisdom in the public sector is the use of web-based patient feedback about the National Health Service (NHS) in the UK. A number of organizations are currently facilitating this process. The idea was first tested in 2005 by Patient Opinion, a social enterprise based in Sheffield that allows patients, carers and their relatives to share their experience with health care on a website and promises to route these stories to relevant staff in hospitals, GP practices and Trusts in NHS.

> Patient Opinion is about honest and meaningful conversations between patients and health services. We believe that to deliver the best care possible, healthcare staff need to know about the experiences of their patients. We have lots of fantastic examples of where staff have listened to their patient's feedback, and have changed their services for the benefit of everyone. …
>
> Tell your story, and make a difference. (Patient Opinion)

Since then, the Department of Health started its own "feedback" section on its NHS Choices website. Also commercial providers like IWantGreatCare or RateMDs.com now operate similar schemes. The common goal is to solicit pseudonymous feedback from patients and service users about the care they received and use the ratings and reviews to identify problems in the health care system and improve the quality of care.

In contrast to Peer To Patent and the New Zealand Policing Act Wiki, the idea of using crowd wisdom to improve health services in the UK has not been introduced by the government. Neither does the scheme feed directly into any formal legal or administrative procedure. Rather, it was initiated by a social enterprise set up by concerned citizens and only later adapted by the Department of Health. Not surprisingly, a key point in discussions was the question of who is in the best position to run such schemes. Specifically, concerns have

been raised about government schemes crowding out third sector operators, a potential lack of independence on part of state-run schemes or the ability of bureaucracies to build dynamic and user-friendly websites rather than administering another "large-scale IT project" (Hodgkin, Munro). On the other hand, it has been suggested that, in contrast to a social enterprise, the Department of Health has actually the power to require service providers to take feedback seriously and should be the first to harness patient feedback anyway.

d) Web of Trust

A fourth scheme moves even further away from government involvement. Web of Trust (WOT) is a service run by WOT Services Ltd, a private company based in Helsinki, Finland.[4] WOT calls itself a "safe-browsing tool" and is basically a piece of software that allows users to do two separate things: on the one had, users can rate websites in terms of trustworthiness, privacy and child safety. On the other hand, they can view the aggregated "reputation ratings" for a website and also display these with any search engine results pages.

> The WOT add-on shows you which websites you can trust for safe surfing, shopping and searching on the web. With the WOT add-on, you can see the website's reputation based on other users' experiences and carefully chosen trusted sources, such as phishing and spam blacklists. You can also rate websites yourself based on your own experiences. The WOT add-on can be installed in the Firefox, Internet Explorer, Google Chrome, Opera and Safari Internet browsers. (Web of Trust)

The service can be seen as one in a series of attempts to use user-generated ratings to label content for a common good, in this case in the name of child safety and privacy. Rather than constituting an expert committee or public agency to make such evaluations, the decision about what counts as potentially harmful to minors or encroaches on personal privacy is delegated to pseudonymous users whose judgments are aggregated by statistical means. In contrast to the previous initiatives, the focus here is not primarily on contributing to an established legal procedure or professional practice, but to feed into a recursive and

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[4] Web of Trust, http://www.guardian.co.uk/society/2007/may/16/epublic.technology (last visited Sept. 15, 2011).

potentially self-reinforcing process of labeling and evaluation, which is largely independent from conventional regulatory institutions.

e) Observations: Crowds and regulatory problems

Already this brief overview shows the range of crowd-related mechanisms and possible intersections with regulation. The following table summarizes some of the main points from the discussion (Table 1).

Case	Peer To Patent	Web-based patient feedback	Web of Trust	Police Act Wiki
Facilitator	U.S. Patent Office agency	Department of Health, Patient Opinion	Web of Trust Services Ltd.	New Zealand police
Policy area	patent law, intellectual property	health care	child safety, privacy	public order, policing
Expected user contribution	expertise	experience	rating	texts edits and comments
Regulatory purpose	selective input into existing administrative procedure	public feedback to make health services better	ratings collected and aggregated to guide future users	broad input into and brainstorming for the legislative process

Table 1: Overview of selected crowd wisdom schemes

Two issues seem worth attending to. The first observation concerns the ways in which the "crowd" is viewed and organized in terms of its utility for improving the common good. In the case of the Web of Trust ratings, the crowd is conceptualized as a statistical construct that provides countable units of information, which can then be aggregated in a central database and processed according to mathematical models. Users are conceptualized as rationally-minded individuals that make up their mind about a website independently of each other. In the case of web-based patient feedback, the emphasis is on individual experiences and stories that would otherwise be remain unheard. Again, users are conceptualized as singular individuals, who are assumed to report on their experience "as it happened". In the case of Peer-to-Patent, issue-centered user communities are created to allow people to contribute their expertise to a pre-defined problem. Users gather around issues they care about and build their reputations as "experts" in their fields. Finally, a

similar rationale applies to the New Zealand Policing Act Wiki, where people are invited to edit, review and comment on a single text. In addition to these different modes of "wisdom", the crowd is generally regarded as a check on authority, exerting a subtle form of "sousveillance" (cf. Mann, Nolan et al. 2003).

A second set of observations concerns the various ways in which collaboration between "conventional" regulatory institutions and "lay citizens" is organized. Again, a broad spectrum of options can be identified. In the case of Peer-to-Patent, crowd wisdom is considered as a novel element that is added to an administrative process. The issue at stake is well defined and the task for collaboration clear-cut. The example of the New Zealand Policing Act Wiki leaves the task a bit more open by asking citizens to comment on and change the text, although there is still a well-defined object of knowledge production in the form of a legislative draft. Further, the interface between crowd wisdom and regulatory agencies is less outspoken in the case of web-based patient feedback. While NHS Choices may be regarded as a informal tool for a public institution to interact with its users, the connection is less clear in the case of Patient Opinion. Rather than feeding into an existing regulatory process, feedback is brought to the NHS from an "outside" organization, which in this particular case happens to be a social enterprise. Finally, in the case of Web of Trust, feedback addresses a common concern of regulation, namely the labeling of content as potentially harmful. However, it does not do so by using the tool box of conventional regulatory instruments, but provides an automated algorithmic mechanism for displaying them in users' web browsers.

The initial overview has shown that existing initiatives that claim to use crowd wisdom to solve a regulatory problem come in many shapes. The status of the "crowd" and the "wisdom" it produces are far from clear and range from statistical and deliberative to expert and experience-based conceptions with varying emphases on collaboration, deliberation and aggregation. Also the nature of regulatory problems differs widely, not just in terms of policy areas, but also in terms of their relationship with what might be called conventional

forms of regulation. The spectrum ranges from crowd wisdom as a rather narrow input into existing legal procedures to distributed and commercially operated labeling schemes.

III. Key themes and provocations

Against this backdrop, it is now possible to discern a number of tensions and puzzles in current thinking about crowd wisdom as a techno-scientific solution to regulatory problems. The goal here is not so much to answer these issues, but to sketch promising directions for future research and potentially even open up some new perspectives on an elusive topic.

a) Tracing the trajectory of a regulatory idea

A first theme that springs to mind is the widespread enthusiasm about notions of crowd wisdom and lay participation in recent writing on regulation and governance. In both scholarly and trade publications, a flurry of buzzwords has emerged that in one way or another draws on the phenomenon. "Crowd sourcing", "open government" and "wiki government" are just some examples. Rather than taking these notions at face value, it seems promising to start by taking a step back and examine the currency and status of these concepts in their own right:

> *What accounts for the rise of "crowd wisdom" as an object of interest in regulatory policy?*

In a sense, the current interest in aggregating individual judgments is quite striking. For example, it could be argued that participation of lay people in regulation is what democratic governance is all about. While the use of technologies to solicit views, expertise and opinions is not exactly new as the examples of citizen juries, consensus conferences or public consultations suggest, the archetype of judgment aggregation would arguably be voting (cf. List, Goodin 2001). A question, then, is what is actually special about the idea of using "crowd wisdom" in regulation.

At this point, one could come up with a range arguments about what makes the schemes above so special. This may be the use of social media, the potential of employing large-scale databases or the speed and ease with which people can contribute to the regulatory process. However, looking at these arguments it becomes clear that they are exactly that: arguments that are employed to make a difference where one seems suitable. In other words, what happens if we take a step back and turn these questions into a topic?

It seems that – like any other area of scholarship and practice – also regulatory policy is subject to certain fashions. An increasing literature attends to the role of fashion in research and management (cf. Czarniawska 2011) or the widespread phenomenon of hyperbole in relation to new media technologies and especially the Internet (cf. Woolgar 2002). An interesting project would therefore be to take a closer look at the claims and promises that come with supposedly "new" regulatory ideas like "crowd wisdom" and try to understand the circumstances, narratives and claims that accompany their rise in current political and academic debates. What counts as "crowd wisdom" in different contexts and for whom? How did the idea develop and enter discourses on regulation and policy? What accounts for its current status and popularity? How can we think about claims to "novelty" in the regulatory process and what are the implications?

Studying the trajectory and implications of "regulatory fashions" could not only contribute to a better understanding of innovation in governance, but also give policy-makers and regulators a better grip on their day-to-day work.

b) Understanding crowd wisdom schemes in practice

Despite a growing number of publications and initiatives, the notion of "crowd wisdom" and its use and utility in regulation remains conspicuously blurry and exhibits many of the characteristics of an "elevator word" (Hacking 1999). As the examples have shown (II.), the crowd is variously regarded as a statistical, experiential, expert or deliberating entity and imputed with various degrees of agency. Underlying these models are strong assumptions about the role of knowledge in even larger models of collective action and control. Not

surprisingly, a key theme that runs through accounts of crowd wisdom in different disciplines is thus an analytic view of crowds as a whole that is constituted of individual human beings as its parts. This model favors explanations that build on standardized ideas of the identities and audiences involved. For examples, the analytic status of "the user", "the web", "the state", "the decision-making regulator" or even "useful information" is largely taken for granted without attention to the specific circumstances under which these processes actually take place.

Such reasoning may suit the largely analytic enterprise of political science and information systems research. Specifically, it can be argued that regulatory arrangements depend on a minimum of predictability and therefore stable, coherent and commonly accepted realities. However, the risk in taking these entities as starting points for inquiry is that we miss important insights into the more mundane activities that go into maintaining and participating in these schemes on a day-to-day basis. At the moment, there is only little empirical research on the everyday socio-technical interactions that constitute crowd wisdom schemes. Looking at regulation *in practice* could draw on a range of existing studies and approaches (see, e.g., Neyland 2006, Cheniti 2010) and provide a valuable resource for better understanding the impacts and implications of existing as well as designing future crowd wisdom schemes. A further question could therefore be:

What is the day-to-day work that goes into establishing, maintaining and participating in a crowd wisdom scheme in practice?

Adopting a focus on practices would have a number of benefits. First, it would give both researchers and policy-makers a more realistic picture of the work it takes to operate these schemes. As previous research on crowd wisdom schemes in the private sector has shown, asking users for their opinion

> do[es] not function straightforwardly as a democratic pooling of expertise. As we have shown, users who write product reviews are engaged in a variety of activities: promoting agendas, carrying out personal attacks, boosting their own and others

> reputations, building their own identities as reviewers, experiencing for the first time the empowerment of publication and so on. (David, Pinch 2006).

Another example of an underestimated aspect is the effort needed to solicit feedback and engage users in the first place. Turning citizens or users into contributors is costly and requires considerable skills – a problem rather far away from the usually clinical descriptions of crowd sourcing methodologies as a *technical* problem. Thus, a better understanding of the practical work involved could not only help regulators make better use of their resources, but also built a more specific basis for assessing legal challenges and requirements. Second, in-depth empirical investigations of crowd wisdom schemes would be useful for deflating some of the grandiose concepts that have dominated the discussion, including "open government" or "collaborative democracy". Rather than using these concepts as blanket terms in political arguments, an empirical focus would allow us to understand their status as discursive resources and their important role in the design and implementation of such schemes. Third, a focus on practices would allow us to shed light on some of the interesting, but often neglected aspects of crowd wisdom in regulation. Rather than imputing ideas of utility and impact in our theoretical and normative models, it would be possible to ask what counts as "accurate" or "useful" knowledge in specific locales and situations. Even more importantly, it would allow us to ask how the line between "good" and "bad" is drawn in everyday practice and how this might interfere with legal or constitutional requirements.

In sum, a deeper empirical appreciation of the operation of crowd wisdom schemes will not just contribute to existing research at the intersection of law, public policy, information systems research and sociology, but also feed directly into the development and design of new schemes and applications.

c) Exploring the nexus between knowledge and politics

A further theme concerns the relationship between epistemic processes of knowledge production and political processes of regulation and control. As the previous sections have shown, knowledge and information have long been awarded an important status in the

regulatory process and are widely regarded as an essential resource in legislative, administrative and judicial decision-making. This tends to be particularly emphasized in areas considered "technical" or "scientific", but also applies to more mundane issues such as planning permits or movie ratings. In these discourses, knowledge is conceptualized as an essential ingredient or variable of regulation that is nevertheless produced externally.

Yet, already the brief overview of research and existing applications above has painted a slightly different picture. As has become clear, a key concern in crowd sourcing schemes is actually the organization of the process of knowledge production, often under conditions that bear close resemblance to the controlled environments of laboratory experiments. The features of this process are highly contested. Concerns include what counts as "useful" as opposed to "biased" knowledge, how can the privacy of participants be protected, what can be done to prevent libel and defamation and how can the process be protected against "abuse" and "manipulation" and ensure "legitimacy". In other words, knowledge does not just present itself as a useful input into regulatory processes, but is itself heavily regulated and subject to a politics of laws, negotiations, rules and technical design.

So what happens if we abandon the idea of knowledge as an *external* resource for a moment? What if it turns out that the production of knowledge is itself political and that the boundary between inquiry and control is not as clear-cut as expected? What if inquiry and knowledge production do not just serve as punctual injections into an otherwise independent legal process, but are in fact deeply entangled with these activities?

Research in areas like Science and Technology Studies (STS) has long started to develop strategies for understanding the relationship between epistemic processes of knowledge production and political processes of regulation. If truth is the basis for political action, then how we arrive at this truth matter. In this sense, establishing "the facts" of a case are as important as the application of the law itself – in fact, they are closely intertwined (Lange 2002). An alternative way of looking at regulation would thus be to view it as an ongoing

struggle over establishing and maintaining coherent realities (cf. Mol 1999). Another promising question is therefore:

How can we understand the relationship between processes of knowledge production and processes of regulation?

To illustrate this theme, consider an example taken from one of the crowd sourcing schemes above. What counts as good health care and what needs to be improved? Asking patients to assess the quality of care can lead to surprising insights. For example, is the lack of decaffeinated coffee in the hospital cafeteria an example of bad care? According to a user by the name of "cleo", the answer is clearly yes.[5] From the perspective of a state regulator this might be considered an "unimportant" feature since it does not register with the "official" policies around mortality rates and hygiene ratings. But when the posting is publicly available as a concern, a hospital is likely to react. As the example shows, it is thus far from clear what counts as care in any given situation. In fact, it could be argued that this is what the scheme is largely about – challenging the official understanding of a "regulatory problem". The results is a *de facto* respecification not just of the hospital's performance, also the nature of the regulatory problem.

In other words, with new knowledge practices come new knowledge objects and thus new valuations and priorities about what counts as good or bad. These operations are political in a way that cannot be captured with the current vocabularies of regulatory and socio-legal studies. The use of crowd wisdom might not just be a tool for solving predefined regulatory problems, but actually turn out to be one aspect in the ongoing respecification of what counts as a regulatory problem in the first place. An alternative way of thinking about crowd wisdom schemes would therefore be to regard them as sites for the production of regulatory realities – with considerable practical implication for the regulatory process. Attending to the ways in which technologically mediated knowledge practices are not just external contributions, but activities at the heart of the regulatory process offers thus an

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[5] Patient Opinion Website, "Why no de-caff at Shotley Bridge?", http://www.patientopinion.org.uk/opinions/32473 (last visited Sept. 15, 2011).

opportunity to reconsider and develop the nexus between knowledge practices and regulation.

d) Rethinking participation and democracy

A further theme concerns the ways in which the phenomenon of crowd wisdom challenges and expands our understanding of participation and democracy in the regulatory process:

> *How do crowd wisdom schemes challenge our understanding of participation and democracy?*

The range of exemplary applications has shown that different perspectives on the phenomenon are possible. Specifically, it is not clear what counts as participation in the context of these schemes and in what ways this participation deserves the label "democratic". In fact, as has been mentioned above, soliciting views and opinion in the first place is hard work and requires considerable resources and skills that are not traditionally regarded core competencies of public administration. This is especially true for initiatives, which rely on explicit user feedback. The New Zealand Policing Act Wiki or the Peer-To-Patent project would not exist without the investment of dozens of volunteers who donated their time and energy. Also in the case of Patient Opinion, "patients" and "citizens" need to be turned into "authors" who write up stories of their care. But what if not everybody wants to be "empowered" or be given "a voice"? What are the implications for conceptions of democracy that built on equality and representation? Are these new modes of participation in the regulatory process still "legitimate"? And what counts as "legitimate" or "democratic" participation anyway in digitally networked environments?

These questions become even more complex when one considers the role of technology in this process. Besides explicit user contributions, most crowd wisdom schemes also collect "implicit" feedback through tracing, indexing and algorithmic processing of data as in the case of Web of Trust or simply by counting the number of opinions on a specific hospital in the case of web-based patient feedback. In addition, the boundaries between explicit and

implicit participation are not always clear. The search engine Google, for example, considers hyperlinks as "votes" and thus mobilizes a vocabulary of democracy. But how are we to think about issues of participation, democracy and legitimacy when the "crowd wisdom" produced is equally a product of human beings *and* machines? What counts as "participation" in socio-technical systems, in which even seemingly "explicit" contributions are processed by a range of algorithms, databases and computers? How to think about democracy when citizens turn into cyborgs?

While most accounts of the existing applications cater to a modernist conception of democracy that demands a form of truth as the basis for political action, it seems that the idea of crowd wisdom provides a promising field for furthering our understanding of democracy and participation. For example, what would the implications be if we considered proposals like a "democracy of groups" (Noveck 2005) or new forms of democratic engagement through "issues" rather than organization and procedures (Marres 2007)? Again, connecting existing research with a close view on the practices of crowd wisdom schemes would not just allow us to generate new theory, but also clarify legal and constitutional requirements.

e) Engaging in design and experimentation

A final theme concerns the question of *how* we as scholars of regulation can actually engage crowd wisdom schemes, given that they are still largely ideas rather than observable phenomena. As has been shown (II.), most initiatives are still in a state of experimentation or run as prototypes or pilot projects. Maybe with the rare exception of the Peer-To-Patent project, these initiatives have not been extensively studied or assessed. Specifically, there is only little empirical material on the day-to-day workings of these schemes (see III. b) above). An important question is therefore:

> *How can we study a phenomenon that is still "under construction"?*

As far as existing schemes are concerned, it seems useful to engage in empirical research as suggested above to learn more about the actual practices involved in running them. An example would be an in-depth case study that makes use of participant observation of management and legal teams, interviews participants about their experiences and motivations or analyses of available legal and technical documents. A further option would be to learn from more in-depth studies of similar schemes in the private and third-sector.

To the extent that such research opportunities are not available, it seems worthwhile to consider an alternative approach that has gained attention recently. Specifically, one might consider the design of and experimentation with these schemes as a mode of inquiry in its own right. While the production of academic knowledge and its practical application are often strictly separated, this does not need to be the case. In fact, the collaborative design of new systems and high-caliber research can be fruitfully combined. While research in design, the arts, computer science as well as parts of media studies have long cultivated the idea of "laboratory-style" inquiry through building things, the idea has only recently entered the more traditional social sciences disciplines. Recent examples include the Berkman Center for Internet and Society at Harvard University that has a range of initiatives, including the Open Net Initiative, the Herdict project or StopBadware, which have combined academic research and practical design in a way, which could be described as design-as-inquiry.[6] Another example of a single project is the "How's My Feedback?" initiative at Saïd Business School at Oxford University that has addressed recent discussions about the social, legal, economic and ethical implications of web-based rating schemes by engaging researchers, users and practitioners in the collaborative design of a rating website for rating websites.[7] This mode of inquiry through design and prototyping is currently being trialled at a number of universities. Especially prominent is the idea of a "lab" that brings together multidisciplinary teams of academics and practitioners to define and tackle a problem and *in doing so* doing research. Besides well established institutions like the MIT Media Lab[8], there

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[6] For an overview, see Berkman Center for Internet and Society, http://cyber.law.harvard.edu/ (last visited September 15, 2011).
[7] How's My Feedback?, http://www.howsmyfeedback.org/ (last visited September 15, 2011).
[8] MIT Media Lab, http://www.media.mit.edu/ (last visited September 15, 2011).

are recent foundations like the Harvard innovation lab[9] or a similar initiative in Communication, Culture & Technology at Georgetown University[10].

Against this backdrop, it seems worthwhile to consider the possibility and prospect of engaging a multidisciplinary team of social scientists, legal scholars, interaction designers, web developers, policy-makers and users in exploratory prototyping of crowd wisdom schemes in practice. This would not just ensure the practical relevance of projects, but also provide a space for experimentation and tinkering in this increasingly important area.

V. From wise crowds to wiser research?

So what are the prospects of using crowd wisdom to solve regulatory problems? As the analysis has shown, the question is not as straightforward as it seems. A review of current thinking and early applications has indicated a number of different conceptions of the crowd as a statistical, experiential, expert or deliberating construct that poses a sophisticated engineering challenge for designers, managers and policy-makers alike. The notion of a "regulatory problem" presents itself as similarly blurry. While a narrow understanding would suggest to limit such problems to those defined as such by public regulators, this would exclude a range of sophisticated initiatives, such as peer-to-peer labeling or web-based feedback schemes, which all have obvious regulatory implications.

In order to engage in and expand ongoing discussions on the topic, the paper has identified a number of directions for future research. Apart from tracing the trajectory of "crowd wisdom" as a regulatory idea, a key theme concerns the need for in-depth empirical studies of the day-to-day practices that go into establishing, maintaining and participating in crowd wisdom schemes. This will not only benefit current academic thinking at the intersection of knowledge, politics, technology and participation, but also inform the work of politicians, regulators and designers. Further themes include the recursive relationship between epistemic and political processes, the challenge of rethinking participation and democracy in digitally networked environments and the invitation especially for social scientists to engage

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[9] Harvard innovation lab, http://i-lab.harvard.edu/ (last visited September 15, 2011).
[10] Communication, Culture & Technology, http://cct.georgetown.edu/ (last visited September 15, 2011).

in the practices they study – possibly in a multidisciplinary laboratory-style setting that draws together regulation scholars, policy-makers and developers to engage in new forms of inquiry though design, experimentation and exploratory prototyping. Some exemplary research questions could therefore include:

- What accounts for the rise of "crowd wisdom" as an object of interest in regulatory policy?
- What is the day-to-day work that goes into establishing, maintaining and participating in a crowd wisdom schemes in practice?
- How can we understand the relationship between processes of knowledge production and processes of regulation?
- How do crowd wisdom schemes help us rethink our current understanding of participation and democracy?
- How can we study a phenomenon that is still "under construction"?

Overall, the topic provides an excellent opportunity to not just interrogate novel phenomena like "crowd wisdom", but also our received notions of the role of knowledge, technology, participation and democracy in regulation. Rather than understanding "crowd wisdom" as a merely technical, legal or engineering challenge of information production, it seems reasonable to move on to a more in-depth understanding of the complex interactions among users, designers, policy-makers, lawyers, databases, computers, algorithms and policies. A key challenge will therefore be to not just consider these problems in the abstract, but engage in the very practices we set out to understand.

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