Till data do us part: Understanding data-based value creation in data-intensive infrastructures

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ABSTRACT

Much of the literature on value creation in social media-based infrastructures has largely neglected the pivotal role of data and their processes. This paper tries to move beyond this limitation and discusses data-based value creation in data-intensive infrastructures, such as social media, by focusing on processes of data generation, use and reuse, and on infrastructure development activities. Building on current debates in value theory, the paper develops a multi-dimensional value framework to interrogate the data collected in an embedded ethnographical case study of the development of *PatientsLikeMe*, a social media network for patients. It asks when, and where, value is created from the data, and what kinds of value are created from them, as they move through the data infrastructure; and how infrastructure evolution relates to, and shapes, existing data-based value creation practices. The findings show that infrastructure development can have unpredictable consequences for data-based value creation, shaping shared practices in complex ways and through a web of interdependent situations. The paper argues for an understanding of infrastructural innovation that accounts for the situational inter-dependencies of data use and reuse. Uniquely positioned, the paper demonstrates the importance of research that looks critically into processes of data use in infrastructures to keep abreast of the social consequences of developments in big data and data analytics aimed at exploiting all kinds of digital traces for multiple purposes.

1. Introduction: Value questions in data infrastructures

After little more than a decade of wondering at their might, we have come to think of web-based social media networks as quintessential environments of emergent collaboration. Social media have powered innovative social and organizational experiments (Aaltonen & Lanzara, 2015; Benkler, 2007; Howe, 2008; Shirky, 2008, 2010) in which users collaborate with each other or with provider organizations (Boyd & Ellison, 2008; Treem & Leonardi, 2012) and employees collaborate with colleagues or other organizations' employees (Kane, 2015; Leonardi, 2014). The constant updatability of web applications allows social media organizations to let users get to grips with technology, make meaning, discover affordances and invent workarounds that can later be integrated into the formal offering of the social media platform (Faraj, Jarvenpaa, & Majchrzak, 2011; Gillespie, 2012; Majchrzak, Faraj, Kane, & Azad, 2013; van Dijck, 2013). Users are able to access information resources generated by the network that otherwise would be very cumbersome, if not impossible, to generate. New forms of community life and sociality can emerge and be supported on an unprecedented scale (Bowker, 2013; Kallinikos & Tempini, 2014). The capacity of collaborative interactions to cut across boundaries has helped elevate these phenomena through the promise they hold for a more connected society and new forms of emancipated

sociality (Feenberg, 2010; Feenberg, Licht, Kane, Moran, & Smith, 1996; Josefsson & Hanseth, 2000). Explaining in detail the forces and phenomena that shape this fabric of new infrastructures is still, however, a largely incomplete task (Edwards et al., 2013).

One way in which the literature has been trying to address this gap is through analyses of social media that theorize the creation and exchange of value between the end user and the managing organization. A number of scholars have recently developed arguments based on Marxian understandings of value, asking questions as to whether or not user activity on social media constitutes exploitation and labor captured in the absence of remuneration (Ekbia & Nardi, 2015; Nardi, 2015; Jin & Feenberg, 2015; Rigi & Prey, 2015). Zuboff (2015) has coined the term *surveillance capitalism* to describe the institutional shift brought into being by companies that construct web-based infrastructures to extract value by (silently) witnessing, predicting and generating the unfolding of their users' lives (Cheney-Lippold, 2011; Negri, 1999). Social media are "inclusionary" (Ekbia, 2016:168) towards the surveilled public, and organizations relentlessly tweak and refine the technology to improve their grip on the data and shape user behavior (Aaltonen & Tempini, 2014; Gerlitz & Helmond, 2013; Kramer, Guillory, & Hancock, 2014; Tempini, 2015). Organizations are entirely dependent on data to fuel value creation processes and, as such, control of the infrastructure is key (Andrejevic, 2015; Tilson, Lyytinen, & Sorensen, 2010). Social media technology is seen as an "empty container" that depends on user participation to be able to generate value for the managing enterprise (Ekbia, 2016:170; Ekbia & Nardi, 2014:9).

And yet, Ekbia (2016) observes that users are excluded by the economic riches that these infrastructures generate. They trade economic value for emotional satisfaction (Ekbia, 2016). Other *dimensions of value*, besides the economic, underpin their actions (see also Heaton & Proulx, 2015; Stark, 2000). Jin and Feenberg (2015) point out that the value generated in a social media network also relates to a certain potential for users to organize community life. Value is generated by enabling social processes and interactions that would otherwise be impossible. This dimension of value relates to the intermediation and enablement of the public sphere for political and community living (Jin & Feenberg, 2015:53). However, as some have argued, we need empirical confirmation (Andrejevic, 2015; Ekbia, 2016) of the convergences that make or unmake social media-based communities. We do not fully understand how these spaces are constructed and how they survive over time. This is what this paper addresses. A first step to do this is to try and relate economic value creation to other dimensions of value creation. The existence of value dimensions other than the economic is not *alien* to its system of commensurations; rather, it is the basis for its legitimacy (Boltanski & Chiapello, 2005; Stark, 2009).

Crucially, in this respect, literature has not fully problematized the role of data in the simultaneous creation of multiple dimensions of value. This is peculiar since, ultimately, digital infrastructures are all about data generation, circulation and computation. And, as this paper will demonstrate, once these processes are taken into account, their role in shaping the social convergence that they support is impossible to ignore – as much as the shaping of the infrastructure as a result of data use practices. Much of the literature on value creation in social media has instead only touched on data where economic value extraction is concerned (Culnan, McHugh, & Zubillaga, 2010). It assumes that the exploitation of data is mono-dimensional, unilateral and linear, and is owned by the organization developing the infrastructure. The value that users get out of participating in social media seems to result from unrestrained and unstructured social interaction (Jin & Feenberg, 2015) that takes shape despite data-based processes, such as surveillant tracking and profiling (Andrejevic, 2015), and not because of them. However, users are using data directly and indirectly when they engage in social interaction and self-representation over social media, and their use shapes infrastructure and data-based organizational processes (Tempini, 2014).

Helgesson and Krafve (2015) suggest looking at the *modes of data transfer* to unpack the workings of composite networks of data sharing and reuse, and trace the configuration of what data are made available, the participating partners, their relationships and the practical data sharing arrangements to understand what is considered valuable in each setting (Ankeny & Leonelli, 2015). This paper aims to fully take this suggestion in the context of social media networks. It looks at data generation, use and reuse through a longitudinal perspective (Pollock & Williams, 2009) to attend to the creation and making of value *in practice*: "articulations, choices, exchanges, hierarchizations, sortings, displacements, and commensuration of value lend themselves to understanding how values are made" (Dussauge, Helgesson, & Lee, 2015).

If we are to understand the social implications of big data and datafication, we need to put data and their processes at the center of our analyses. Social media are just one, perhaps the most prominent, stage where these innovations are going to show their power and be appropriated. This is a great opportunity for the IS field, but one that cannot be fully taken advantage of if the movements, uses and powers of data are not put at the center of the conversation. Researchers of IS (and neighboring fields such as STS) must ask questions that open up the complexity of the relationship between the participating actors, the multiple dimensions of value, and the data and data structure forms through which situations and people are related with one another in data-intensive infrastructure projects such as social media.

2. Theoretical framing

Against this backdrop and to illuminate an ethnographic case study of the prominent health research and social media network *PatientsLikeMe* (PLM), I set to ask "*How is a social media-based data infrastructure developed to create value in multiple dimensions and for different participating actors, and, conversely, what are the consequences of value creation for infrastructure development?*" The aim of this paper is to further open up the relationship between value creation and the development of a social media infrastructure. When value judgments are many and respond to different needs, explaining infrastructure development becomes a complex task worth investigating.

A recently published study has started to make inroads in this same direction (Barrett, Oborn, & Orlikowski, 2016) to analyze value creation in health social media. The authors conceptualize online community value as "performed through the ongoing