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**Market Innovation as Framing, Productive Friction and Bricolage: An
Exploration of the Personal Data Market**

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Market Innovation as Framing, Productive Friction and Bricolage: An Exploration of the Personal Data Market

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Abstract

This paper explores the possibilities offered by recent Science and Technology Studies (STS) research on markets for engaging with market innovation. Although there exist few reflections on how innovation happens in markets, market innovation has not been singularly theorised in STS inspired market studies. In this paper we explore the potential analytic utility of different sets of ideas in the field of market studies, such as ‘framing’ (Callon 1998, 2007), ‘productive friction’ (Stark 2009), and ‘bricolage’ (MacKenzie and Pardo Guerra 2014). Drawing on our research into the online personal data industry and start-ups developing personal data control products, we put together five sensibilities that we think are of use for broader considerations of market innovation.

Keywords

market innovation, science and technology studies, online data industry, personal data control products, privacy

Introduction

This paper explores the possibilities offered by recent Science and Technology Studies (STS) research on markets for engaging with market innovation. The paper takes as its empirical focal point, market-based innovation by start-up companies in the online data industry. We suggest that online data provides a valuable entry point for addressing how processes of market innovation take place. Innovation in the online data market is comparable to other sites of innovation in that it is distributed across various sites, through multiple forms of action and attributions of value. However, the online data market is still in the early stages of development, meaning that nascent innovation is readily available to study.

In this paper we will explore the emerging market among start-up data firms and their attempts to innovate through new data products and services. In particular, the paper investigates the apparent problem mapped out by data start-ups, of control over online personal data. The nature of the problem, as we will show, is framed by various participants as a form of ‘market failure.’ That is, the market for personal data is said to not value individuals’ online privacy (often invoked as lack of control over their data), amid an allegedly inadequate legal framework for data protection. The paper will explore the means by which an alternative to this market ‘failure’ is put forward: a series of market-based innovations mostly developed by online data start-up firms

who position themselves as both critics of the online data industry and seek to innovate to address the apparent market failure. One way they suggest to enable control over personal data is to relocate value from residing in data itself to data usage, while simultaneously re-conceptualizing what online privacy means. We will draw on three ideas central to recent STS research on markets in order to explore ways of engaging with market innovation: framing, productive friction and bricolage.

The paper begins by engaging with the field of online data, setting out prominent critiques and (mostly regulatory) means to address critiques. The paper will then draw together literature predominantly from STS on markets and innovation. Through the authors' recent empirical engagement with regulators and start-ups in this field, the paper then presents an account of data start-ups' market innovation and attempts to deal with data control and privacy. The paper concludes by proposing five sensibilities for navigating studies of market innovation.

Markets for online personal data

There is currently a lack of empirical research on both markets for online personal data and critics of these markets who propose new personal data control products. This could be partly explained by the fact that the market that originates in digital data mining lacks transparency, (Brill 2013, FTC 2014). Furthermore, personal data control products are a rapidly developing field, and have thus far defied attempts at comprehensive mapping. As one participant in the field commented: 'in the US and the UK there is a new launch of a new service about once a week, there is an explosion of interest in this market at the moment.'¹ Studies of online data that are available are concerned with the political economy of privacy. Here the central focus tends to be on the 'commodification of privacy', and 'the Panopticon of online surveillance' (Campbell and Carlson 2002), characterized by alienation and exploitation in the online economy (Andrejevic 2011), which is said to be dominated by a 'possessive individualistic privacy discourse' that needs to be rectified by new public policies that encourage non-commercial Internet services (Sevignani 2013). Although these studies of online privacy and surveillance provide one framing for the problems faced by online users, they do not focus on attempts to transform concerns with online users' data through a form of market innovation. In our research (as we will show) market innovation seemed to be central to both critiquing the current situation and proposing new ways forward. However, prior to detailed consideration of the critiques, we will start by providing more detail on online data markets.

Online data is entangled with a number of market-based activities. The free flow of online data, which is gathered, stored and analysed, is what feeds into the personal

¹ From an interview with a founder of a business consultancy and market research company based in London (October 2013), but see also Angwin and Steel (2011), Brustein (2012), Robin (2013).

data market. Data is collected through: ‘cookies’ (issued by third parties, which sit on websites (second parties) visited by users (first parties)), ‘browser fingerprinting’ (through collecting information, or the ‘fingerprint’ of one’s browser), ‘deep packet inspection’ (where internet service providers offer online activity information to third parties), ‘history sniffing’ (allowing a website to run a code that gets information on hyperlinks that a user clicked on), and the collection of data through mobile devices (for example, through mobile phone users’ geographical location; Tene and Polenetsky 2012).

Data mining is the process which then turns this free flow of data into a commodity. Data mining involves a ‘computational process that discovers patterns in large data sets’ with the help of different types of algorithm based on classification, clustering, regression and anomaly detection (PCAST 2014: 24). Such data mining is then central to the management of forms of online behavioural advertising. Behavioural advertising involves data broker firms observing ‘the behaviour of individuals over time’ (Article 29 Data Protection Working Party 2010), to categorise consumers into ‘data segments’ (for example as ‘Thrifty Elders’ or ‘Pennywise Mortgagees’)². Information on behaviour and data segments is then sold by data brokers to advertisers, retail companies, other data brokers, financial services and political campaigners. Furthermore, the data is sold with a right to own the data, re-sell it, or just use it (FTC 2014). Data might flow freely as a raw material, then, but its mining and processing turns it into a tradable commodity.

In order to maintain a competitive edge in this data market, data brokers continually change their practices. For example, social networks such as Facebook now work with data brokers to link shopper loyalty card schemes with Facebook profiles and have platforms designed to enable advertisers to target Facebook users not just on the Facebook website, but everywhere on the web and on all devices as well as offline (Constine 2014; Delo 2013; Goel 2014). As the CEO of a data broker company BlueKai, put it: ‘It is a sea change in the way the industry works. [...] Advertisers want to buy access to people, not Web pages,’ (Angwin 2010). The result of maintaining this free flow of data into the data brokers so that it can be commoditised, is that the data broker industry is estimated to be worth around \$150bn (Steel 2014), with one data broker’s sales revenue at \$101bn (Acxiom 2013) and US internet advertising outperforming broadcast and cable television advertising (IAB, 2013). However, alongside this dramatic growth in the data broker industry, a number of concerns have been raised.

Online Data as a Matter of Concern

² Data brokers (e.g. Acxiom, Datalogix, ID Analytics, PeekYou, Epsilon, Experian) reveal little information on the way they function. There are not many studies of data brokers and a report issued by the Federal Trade Commission (2014) could be viewed as the most up-to-date and detailed study of the industry. For more information on the outline of the online data see [Author Reference 1].

Neoclassical economics has provided a particular conception of the relationship between the free flow of data, markets and privacy. Posner (1978, 1979, 2001, 2008) argues that any impediment to the free flow of information reduces market efficiency. Privacy in this approach is then defined as the ‘concealment of information’ (Posner, 1981: 407), which is then understood as a hindrance to the market and a restriction on economic growth. However, critics of the online data market continue to view the free flow of online data and its transformation into a commodity as central to concerns with online data and its (mis)use. For example, a PCAST³ report on data collection, suggests that current Notice and Consent policies for online users create ‘a non-level playing field’ through a lack of clear information, placing the burden of protection on the individual, offered in take it or leave it terms. These issues, the PCAST report suggests, amount to: ‘a kind of market failure’ (PCAST 2014: xi-xii). In effect, the free flow of data is in one direction, from users to data brokers. Furthermore, the Federal Trade Commissioner Julie Brill (2013) has written an opinion piece highlighting the opaque and exploitative nature of online personal data mining and called for more transparency in data collection by data brokers. And a Senior White House Counsellor suggested: ‘average consumers are unlikely to be aware of the range of data being collected or who is holding it; [...] there’s a kind of asymmetry of power between the people who are collecting and the people who are giving up that data’ (cited in Dwoskin 2014)⁴.

The data brokers have been fast and vocal in their response to suggestions that the industry depends on a non-level playing field and a form of market failure in order to commoditise data, that the industry lacks transparency, and generates an asymmetry of power between brokers and users. The President of the Direct Marketing Association (an alliance of data-driven marketers), in a direct return to Posner, argued that unfettered data is a prerequisite for economic growth, insisting that: ‘third-party data use and sharing are essential for business success in today’s information economy’ (Wooley 2013).

The paper we will engage with this field not in order to map or produce a comprehensive description of the emerging industry that tries to address asymmetries in the online personal data market. Instead, drawing on a range of points made by our interviewees with regard to the software products that they develop, we explore the analytic utility of market innovation as a theoretical concept for analyzing some of the current and on-going changes in online data markets. Consequently, we look at market innovation in this complex and emerging area, exploring the tension between controlling, or even restricting, the free flow of data and economic growth and the efforts by start-up data firms to alter the terms of debate surrounding the online data industry. We will address the ways in which start-ups are seeking to alter relations

³ President’s Council of Advisors on Science and Technology

⁴ See Brunton & Nissenbaum’s (2015) discussion on how to ‘counteract information asymmetry’ through obfuscation.

between data brokers and online users and relocate value. In order to do so, the paper draws on data collected from conducting 37 semi-structured interviews with entrepreneurs, regulators, start-up venture capital investors, researchers in large corporations, and academics in the US and Europe. We will also draw on three industry events organized by start-ups and a business consultancy and market research company, attended by one of the authors (SM). But first, we will turn attention to the recent STS literature on markets as a basis for exploring market innovation work.

Market-driven innovations: framing, productive friction and bricolage

Concerns regarding markets, how they form and endure, the location and relocation of value have been central to recent moves made by Science and Technology Studies (STS) scholars to broaden the focus of STS work to incorporate economic phenomena. These moves have seen a pronounced focus on how market emergence and formation involves the work of economists, calculative collective devices, socio-technical agencements, and valuation sites (see for example: Callon 1998, Callon and Muniesa 2005, Callon 2007, Callon et al. 2007, MacKenzie et al. 2007). We will suggest that treating the market as accomplished work, is particularly useful for our efforts to engage with start-ups' efforts to alter existing market relations. Rather than assuming the world is governed by pre-existing economic rules, this STS approach recommends getting close to the market work of actors in the field. Within the emerging field of STS work on the economic, there are a number of concepts that can be used to analyse the practices of market innovation. However, in our view, market innovation has not been singularly theorised in STS inspired market studies. Innovation is crucial for our paper as online start-ups position themselves as both critics of the current online data industry and seek to use innovation as a means to reimagine the future of data, privacy and value. As one of our interviewee, a UK based entrepreneur, suggested: "We are the drivers of innovation".⁵

⁵ The notion of innovation is central for the entrepreneurs and their products. For example, in positioning their products the start-ups discuss their impact on the economy as economic 'growth through innovation' (<https://mydex.org/the-economy/>, accessed 4 September 2015). Or in their utilization of the alleged friction between data protection laws and economic growth: 'We are completely in accordance with any new laws that are coming in, and in fact, we even go further than the new laws, demonstrating the innovation. People have been moaning about the new laws because they say it's going to break the market. I say bollocks. You've got to innovate. [...] We've innovated and we said "no, if the user owns data the market can only explode, absolutely explode". [...] So we have changed the paradigm, and innovation is always required to move you to that next level' (from an interview with a UK based entrepreneur, London, 9 May 2014). Here we should also note that despite the transatlantic differences in privacy and policy cultures that are widely acknowledged and extensively analysed by legal scholars, political scientists, etc., these differences do not seem to concern the start-ups. When asked about data protection laws, they either emphasise their compliance (as in the quote above), or explain that the issue at stake is data control in a form of 'captured value' (from an interview with a start-up founder based in New York, 4 November 2013). For the start-ups compliance is the minimal form of engagement required for addressing regulations, whereas their interest is in a broader transformation of market terms.

In particular, three sets of analytic resources can help us to engage with this kind of market innovation. First, in the work of Callon we can note his analysis of the emergence of new forms of market. Of particular importance for our pursuit of online data markets, is Callon's idea of innovators as 'orphan groups'. Callon suggests orphans are the product of framing, a process that defines boundaries and stabilizes (temporarily) the entities considered to be internal to the market. Market framing thus produces: 'certain worlds, with their goods, agents and attachments,' (2007:142). Framing temporarily excludes all other potentialities and it is these cut off and abandoned potentialities, that form the basis for orphan groups, representing 'matters of concern' that might seek inclusion in market re-framings (Callon 2007: 140-142). In this approach, dynamic framing and reframing through the efforts of externalized orphan groups is what leads to market innovation.

This dynamism of market framing and re-framing is useful for us in thinking about the fast changing nature of online data markets, where framing, what gets included and excluded in moments of exchange is continually at stake. For the start-up which also operates as a critic of online data markets, the notion of re-framing also seems to capture one of their market concerns. As we will go on to show, for start-up-critics a crucial move in online innovation is to try and reformulate what is included and excluded to take privacy (mostly in the form of data control) into account.

However, for our focus on online data markets, a critical question appears to be: on what terms does market framing and reframing take place? If online data start-ups are both an important source of critique of the data broker industry and those seeking to change market relations in favour of their start-up firm, then we need to pay attention to the ways in which market framing and reframing – even in moments of critique – can itself be a business proposition. The terms of reframing in online data markets are not just critique, but a critique directed toward the formation of a new business. They are also a critique which stands in contrast to Posner's opposition between privacy and economic growth; for the start-up-critics, privacy might instead form an aspect of economic growth.

A second approach which has affinity with recent STS work on markets can aid us in working through these terms of market innovation. Here we turn to the accounts of entrepreneurial innovation in the work of Stark (2009). Stark (2009:18, emphasis added), suggests entrepreneurship is an ability to spawn a new way of thinking 'by fostering a *productive friction*' between two conflictual modes of valuation. Stark draws on Boltanski and Thévenot's (2006) sociological conceptualization of value, which is based on an idea that evaluation takes place through utilizing more than just one principle, or 'order of worth'. Blending this with Dewey's ([1938]1998) focus on the productive properties of indeterminate situations, Stark suggests viewing multiple orders of worth as a conceptual tool that does not, as Boltanski and Thévenot argue, resolve uncertainty, but creates it. This friction of rationalities is where entrepreneurial innovation originates, it is the set of circumstances that makes

innovative thinking and action possible⁶. This account evolved from studies of innovation in different fields, including financial innovation (Beunza and Stark 2004). The continual inclusion, exclusion, framing and reframing of Callon's market innovation, is augmented here through a focus on friction and the utility of uncertainty.

Inclusion, exclusion, framing and reframing might be augmented, then, by exploring the ways in which start-ups attempt to productively utilise (rather than reconcile) oppositions. In this way start-ups might be said to productively oppose their critique of the online data industry against their continually emerging business propositions, and various notions of privacy versus economic growth. In place of considering how start-ups which also act as critics of the online data market, might reconcile their relocations of value and redefinitions of privacy while maintaining economic growth, Stark's approach to innovation suggests instead investigating the productivity of the uncertain and unreconciled – that start-ups might reframe the terms of online data markets through creating new relations between privacy and economic growth.

Although engaging with market reframing and productive friction sets up some interesting possibilities for engaging with online data start-ups and their practices of market innovation, we also need to pay attention to the ways in which these practices are caught up with technological innovation. That is, crucial to producing new terms for market relations are new ways of managing, processing, storing, collecting and mobilizing online data. A third focus for STS-inspired work on markets as sites of innovation, might prove helpful here. MacKenzie's work is focused on market-driven financial innovations. These include new financial products and trading practices, devices and techniques. Consequently, the question of innovation in markets become a task of investigating how: 'market technologies are created, selected and grow to become dominant', with market technologies understood in a broad manner, as a range of devices (legal, technological, infrastructural) that enable a certain trade, a product, a market to happen (MacKenzie and Pardo-Guerra 2014: 157).

Drawing on the STS rejection of a linear concept of innovation, financial innovations are viewed as forms of bricolage. Bricolage, MacKenzie and Pardo-Guerra (2014:157) argue, is 'the creative ad hoc re-use of existing resources (ideas and other cultural resources as well as artefacts), not the mechanical implementation of a grand plan nor simply logical deduction from existing scientific theory'. The Black-Scholes option pricing equation is bricolage in the sense that the problem of finding option pricing mathematical formula similar to the existing pricing model for stock was

⁶ Here we should note that Stark's notion of innovation resonates with an account of innovation put forward by Suchman and Bishop (2000). In their study of 'organisational and technological' innovation they suggest to distinguish between superficial, and 'indigenous' innovations. The former might be announced by an organisation as an innovative achievement, whereas in fact it maintains existing 'orders' without producing anything new. The latter is 'a matter of [...] artful integrations', where 'new things are made up out of *reconfigurations* and extensions to *familiar environments and forms of action* (Suchman and Bishop 2000: 332, emphasis added).

solved by ‘tinkering inspired by an exemplar’; that is, employing all available concepts to replicate the success of a previously found solution to a similar problem (MacKenzie 2003:857).

In this way, start-up firms, their critiques of the online data industry and their attempts to engage in practices of market innovation, could be approached not just on the basis of continually and dynamically reframing market inclusions and exclusions (although they do this, as the analysis will go on to demonstrate). The start-ups’ work of market innovation, and efforts to relocate value, could also be viewed as a form of tinkering and on-going bricolage. Such efforts might not be solely restricted to local practices of tinkering. In a second example of bricolage, MacKenzie suggests that in a trading venue called Island the notion of bricolage could be used to help understand how at first a marginal trading practice spread out to become an exemplar through which: ‘share trading at large ... [became] more like trading on Island’ (MacKenzie and Pardo-Guerra 2014:172).⁷ In this way, the start-ups’ attempts to re-devise online data markets, relocate value and redefine privacy might be treated not just as a relatively local piece of tinkering – for example with a particular data management tool – but as a form of exemplar building.

Our analysis will explore further the framings and re-framings, productive friction, bricolage and tinkering of market innovation work in the field of online data. Drawing this literature together in the following analysis, we ask: How might the market be reframed to incorporate ‘orphan’ users (Callon, 2007), whom start-ups (and online regulators) suggest suffer from an uneven playing field? How might the opposition posed between the free flow of data for economic growth and the concealment of data for privacy protection produce a productive friction (Stark, 2004) for those seeking change in the online data market? What forms of bricolage might lead to market innovations in the redistribution of control over online data (MacKenzie, 2003; MacKenzie and Pardo-Guerra, 2014) and how might this address the forms of market failure highlighted by critics and policy makers?

Market Innovation: From the Personal Data Market to ‘Personal Information Economy’

In this section we will present an analysis of the empirical data we have gathered from our study. The data has been drawn together into three themes that enable us to address our research questions. In the following analysis we will explore the analytic utility of framing, productive friction and bricolage as a basis for understanding market innovation work. In the paper’s conclusion we will draw the analysis together into five sensibilities that can be further explored in market innovation work.

⁷ For more on bricolage, see Engelen et al (2010; 2011).

Market framing

Start-up data firms in our research appeared to act as critics of both the data broker industry (for example, in terms of asymmetrical relations with users) and the current terms of debate on online privacy (for example, in viewing privacy as a form of concealment opposed to economic growth). Such start-ups were also some of the most prominent actors seeking to constitute a change. As one CEO pointed out: ‘It’s our role to transform the situation’⁸. To ‘transform the situation’, we will suggest, was to seek a change in the terms of relations between data brokers and users, a transformation of the basis for market framing. To explore this work of market framing further, we can return to the work of Callon (1998, 2007). Callon (1998) draws on the history of Actor-Network Theory (ANT) to treat markets as assemblages of heterogeneous entities. Such assemblages do not just emerge, but are continuously made and re-made through the work of market framing. Through this approach we could start to look at the online data industry as an assemblage of data brokers, online advertisers, users, the free flow of data into brokers, its commodification and sale to a range of firms. Online personal data would provide the focal point for framing.

However, market assemblages, according to Callon, are not neutral but instead establish various boundaries between those entities included and those excluded from a market framing. Expanding on the idea of framing, Callon looks to reposition the notion of an externality. In place of a conventional economic notion of an externality equating to something outside the accounted costs of an organisation, comes the notion of entities externalised by market framings. In this way framings are not neutral: ‘framing constitutes powerful mechanisms of exclusion, for to frame means to select, to sever links,’ (2007: 140). Callon uses the term orphans to describe those entities rendered external. Orphans are the un-framed entities on the outside of market assemblages. Orphans can be enraged by their externality to the market assemblage or ‘choose to engage in a strategy of construction of the worlds in which they want to live,’ (Callon, 2007: 141). Such strategies can then be used to participate in endeavours of inclusion. For the data start-ups, strategies of inclusion involve a reframing of the terms of market action. In place of privacy being treated as an externalized matter, a threat to the free flow of data, comes a reframing of the market in which privacy as a form of data control is central to market relations. What we term reframing here, was described by various start-ups in their reflections on the origins of their products, or how they direct their products toward change:

You go to one website like Crunch, and there is this other invisible website, Facebook, tracking you [provided you’re still logged in to Facebook]. Then you go to the New York Times and Facebook is there tracking you, and it’s not just Facebook, it’s hundreds or thousands of different companies that are doing this. I don’t have a problem with the first party tracking where you’re

⁸ Quote taken from Personal Information Economy Event (Ctrl-Shift, 2014).

just in the store, you're directly on the website. You expect that when you're on facebook.com, Facebook is going to track you. Where it gets weird is when there is stuff happening, third party across websites. So I still use Facebook personally, I have no issue with it, I just don't want Facebook to track me when I am on other websites, like I am not using them anymore, they don't have a right to know what I am doing. (from an interview with a founder of a California-based start-up, San Francisco 14 November 2013)

In this excerpt, the entrepreneur seeks to reframe the terms of exchange. It is not a move toward no exchange or absolute concealment of data. Instead, the suggestion is made of a move toward data only being collected by those sites a user is visiting, with that data only used by those sites the user is visiting. In place of a free flow of data comes a new framing of relations with data flows circumscribed and the user placed in a new position of knowledge in relation to online advertisers and data brokers, and their data collection activities. To draw on Callon's (2007) terms, users and their privacy represented by the start-ups are the externalized orphans seeking inclusion through market reframing and it is the start-ups that will now enable that reframing and inclusion through representing users' interests in new ways through new products. Similar points were made by other start-ups in discussion of what their product does:

There is stuff that I want when I want it, and what I want to have is a means by which I can let people... I've got a decent car, I don't want another one. Why are you advertising a car to me? Yeah? And it's all that noise that I want to stop and our technology will enable customers to switch that stuff off. But switch it on again when they want a new car. And then switched off again once they've got the car. (from an interview with a UK-based entrepreneur, London, 11 October 2013)

Here the entrepreneur aims to enable the user to be in a position whereby they can cut the free flow of data and then re-start that flow of data as they wish. The reframing of market relations is toward users being put further in control of their data. Other start-ups sought to further utilize the notion of control as a basis for internalizing privacy into market relations, effectively relocating value in privacy (rather than viewing privacy as an impediment to growth) by developing a software product that reveals who is tracking the user⁹:

We are really focused on transparency – in our mind a user should be able to make an informed decision about whether they want their data to be collected or not. [...] So we recognised early on that if we ship our tool and block everything by default, it would keep things from working on the web like people expect them to work.[...] Whereas if we show you what's happening, it

⁹ See discussion of the products on pp. 17-18

leads people down a road of saying, ‘Okay, I see all of this happening’, then they make a decision. [...] So our sort of tag line is knowledge and control is people’s privacy – *knowledge plus control equals privacy*. You can’t just have control, right? You can’t just block. Because without understanding what you’re blocking... Blocking is not meaning more private. (an interview with a senior product manager at a New York-based company, New York, 5 November 2013)

The attempt to reframe the exchange of data and the market for online data more generally, involves a change in the nature of relations between data brokers and users that is oriented toward user knowledge as a basis for user control. This excerpt explicitly demonstrates the move by start-ups in this field to reposition the terms of privacy as part of their criticism of the online data industry and the terms of debate between online advertisers (and data brokers) and regulators.

What we can note from these excerpts is that start-ups were seeking to change market exchanges in the online data industry. These changes focused on relocating value in privacy. In place of the free flow of data, comes a concern with managing data, putting in place controls and enhancing users’ knowledge of online data tracking. In place of a lack of transparency and an uneven field of play which operates to the apparent detriment of users, comes users in control of their data. In place of orphaned concerns (users, their data, and their privacy) comes a market reframing which seeks to internalize these concerns. In place of the market being assembled as an online data industry, comes the market reframed as the ‘personal information economy’. The latter is presented as both a critique of the existing industry and as a step toward a reframed future of data exchanges where users’ data becomes an asset that they manage. The critique is designed to frame a specific set of entities and the desired formation of relations between those entities. But, as we will note in the next section, to achieve this kind of reframing required drawing up a set of terms on which newly reframed market relations, incorporating privacy, could now operate. Drawing up terms, we will suggest, utilized a productive friction derived from unreconciled principles.

Productive friction

In the preceding section we noted that reframing the online data market involved work by start-ups to internalize privacy into exchange relations. However, achieving such a reframing, as we will go on to show, also involved setting up new terms for the market exchange of online data in which privacy would now be noted as a location for the generation of value, as a market opportunity. Drawing on Stark’s (2009) work, we can note that this changing the location of value into privacy (as a form of data control), drew on a kind of productive friction. As a business consultancy and market research company noted in its report on the changes it observed in the marketplace:

it's innovation and growth VIA privacy, not [growth] OR [privacy] (Ctrl-Shift 2015, emphasis in original).

Here emphasis was placed on growth *and* privacy, changing the continuing opposition between privacy and growth that dominates existing discussions of online data. Looking to use growth and privacy as an unreconciled opposition was one way in which start-ups in our research looked to reframe the privacy debate. As we noted in the preceding section, instead of presenting the debate in terms of privacy versus economic growth, start-ups sought to transform privacy focused on concealment to privacy understood in terms of user knowledge and/or control. User knowledge or control would not reconcile or resolve tension between privacy and economic growth, but would reposition privacy in market relations between the online data industry and users in such a way that privacy (as knowledge or control) might still enable economic transactions to take place, if approved by the user. The terms of market exchange would thus be recast in favour of the user:

The common assumption at the moment is that the data is a commodity, which is going to be monetised in some way. Another way of thinking about it, however, is that it's not the data that's a commodity - it's uses of the data that are potentially where the real value lies. So it's the service that can be created using the data. [... The] service to an individual which an organisation can provide. [...] Privacy implies that it's all about what *other* people do with my data. And the big market that's opening up here is what *I* do with my data. (an interview with a UK-based start-up founder, London, 14 October 2013, emphasis added)

In this excerpt the terms of exchange were further changed, not through reconciling privacy and economic growth, but through shifting the focus for value from data itself to its *use*. To continue to focus on knowledge and/or control under these terms would be to broaden the focus for what was known or controlled, from knowing or controlling what data was collected, to knowing or controlling the uses to which that data was put. To shift attention toward data use, was to further change the terms of exchange. However, the precise terms of exchange differed between start-ups. Along with knowledge and/or control, came a focus on transparency:

The issue is captured value, right? The issue is there is value derived from your data and you don't get to participate in it... So you want transparency, you want access... Data capture is going to happen. If you think you can stop somebody from tracking you, you're crazy. Instead of saying, 'You can't track me,' it's 'I must see whatever you track'. Right? So, 'I must know whatever you look at of mine'. (an interview with a founder of a New-York-based start-up, New York, 4 November 2013)

Transparency here is presented as the basis for continuing the themes previously highlighted for changing the terms of market exchange. Transparency becomes the ground for reworking the opposition between privacy and growth, to establish new terms for data exchange whereby users either approve the terms for economic growth (a control situation) or at least have the opportunity to know about such uses of data (a modified focus for knowing, in which transparency presents users with the opportunity to know if they so wish). This notion of transparency was a theme continued by other start-ups:

it just kind of hit us along the way that we need to build a stripped-down, two-sided, very simple to understand and use exchange... we all speak the language of transaction, which is to say, you know, 'If I give you this phone, and you give me that pen' – we all understand what's going on. We may not want to make this transaction, but if I offer this phone to you, and you offer me that pen, everyone understands what a transaction is. It's a very ubiquitous language... (an interview with a start-up founder based in New-York, 5 November 2013)

What we can note is that this particular start-up did not seek to escape the language of economics which other start-ups noted as problematic in terms of the opposition between privacy and economic growth. Instead, this start-up sought to utilize the 'language' of transaction as a basis for promoting transparency – that users would be able to make sense of their online activity if it were presented in this apparently common language. Rather than focus on privacy as concealment or knowledge or control, the emphasis here was on a kind of universal free flow of data. In place of a free flow of data that only travelled toward the online advertisers and data brokers, would come a free flow of data in every direction, enabling users to become more active participants in data exchanges.

It becomes clear that although start-ups were seeking, to use Callon's (2007) terms, a reframing of market relations, the new terms for data exchange that they sought to establish were varied. Each sought to utilize an apparent tension between privacy (in various senses) and economic growth as a basis for proposing a change. However, no reconciliation of the two principles was sought. Instead, drawing the principles together produced, drawing on Stark's terms – a 'dissonance', a 'friction of rationalities' enabling start-ups to come up with various ways in which users might stay in control of, or at least be aware of, personal data and its value, while simultaneously enabling start-ups to get on with economic growth.

What our research suggests is that there are a number of different activities among start-ups which each seek to reframe market relations and draw up new terms of exchange for online data. Start-ups emphasised knowledge or control or transparency as central for rethinking privacy, producing new terms of online data exchange and creating new market innovations and opportunities. In this way, data start-ups: 'are

not proponents of a particular mode of valuing but are exploring the uncertainty of multiple modes of valuing' (Stark 2009: 19). This exploration is attuned to critiquing the existing online market at the same time as proposing new market relations. In the next section we will explore how this reframing and recasting of the terms of market exchange were tied to technological innovations.

The Emergence of new Data Control Products as a form of Bricolage

Reframing and recasting the terms of exchanges in the online data industry as a form of critique of existing market relations seems central to the kind of market innovation that data start-ups were seeking to bring into being. However, this reframing also required new forms of technology for the start-ups to translate their critique into a business proposition. This translation, we will argue, can be treated as a matter of bricolage – ad hoc tinkering through which innovation can take place.

MacKenzie and Pardo-Guerra (2014: 157) suggest that 'successful innovation is nearly always bricolage'. In this approach, innovation is not considered through the strategic implementation of plans, but instead bricolage is used to explore the creative utilisation of ideas, artefacts and other types of resource in an ad hoc manner. In this way the data start-ups' work to relocate value in privacy and transform the nature of exchange relations between online users and data brokers need not be seen as a single, coherent scheme. Instead, their work might be viewed as a number of forms of tinkering through which existing technologies and relationships could be changed or at least oriented toward new ways of understanding and using online data. This was most clearly visible in early attempts to re-purpose existing technologies as a basis for transforming online activities which effectively maintained privacy as a form of concealment. In the following excerpt, the CEO of a data start-up based in California suggests concealment technologies could provide an answer to online data problems:

The VPN [Virtual Private Network] is an answer. If you are not hiding your IP address [Internet Protocol address allocated to a device that uses the Internet], which is what the VPN does, you are not hiding anything. Because almost everyone has a static IP address, at least at their house. So you delete all your cookies – boom! – they're on you again instantly, because they recognise the IP address. It's sort of the starting point. If you are not doing that nothing else is effective, so you have to do at least that (from an interview in San Francisco, 14 November 2013).

Another data start-up based in Boston continued with much the same approach to privacy, describing their online technology as providing a number of forms of concealment. The company differentiated its products in terms of blocking all tracking ('all the analytics and data gathering that happens in [a] browser'), data masking ('all the information that [one] explicitly give[s] out that is most important, so when you go to register on a website ... you're often forced to give out your

username, email address, password'), and the deletion of personal information ('all the opt-outs that a lot of these data brokers sites make available' -from an interview with the start-up founder, Boston, 11 November 2013). As a form of bricolage, this activity made sense as it offered the opportunity to repurpose technology to fit an existing understanding of privacy concerns. However, as a form of bricolage that would bring about the kind of market innovation that would dramatically reframe the online exchange relationships of users and the online data industry, these technologies were limited. As MacKenzie and Pardo-Guerra (2014) argue, history matters: these technologies could not be repurposed to do just anything and their legacy appeared to hold in place what other start-ups were beginning to perceive as an outdated approach to privacy.

In our research we found start-ups were beginning to tinker with technologies that more explicitly reframed the nature of online privacy. For example, a series of products have been developed based on data retention, sharing, management and control. We can crudely divide these into two types of products: tracking protection and data vaults. One data firm, offered a tracking protection technology that contained profiles of over 1900 online trackers to enable users 'to make informed decisions' on how to stay private online while enabling products and services to be used. This product worked through a feature that enabled users to opt-in to donate an anonymous version of their data to the firm. Once users had opted in, the firm compiled anonymous data on how those users were followed online in order to improve the firm's ability to block tracking and thus maintain its privacy product. The donated tracking data, in turn, also became a product. The owner of the firm analysed the anonymous tracking data and sold its reports to advertising businesses so that they could optimise their return on investment.

Online firms offering these forms of tracking protection were seeking to reframe market relations and recast the terms of data exchange in an attempt to give form to the notions of knowledge or control or transparency we noted in preceding sections. In this way data was collected from the firm's users, but only if they opted in (a form of control), and it was collected in an anonymous form. Users were then informed (transparency) of when they were tracked and presented with options to stop that tracking (knowledge combined with control). At the same time, users could carry on with all of their usual online activities and the anonymous data itself was used to advise online advertisers; enabling the tracking service to be offered to individual users free of charge. It took tracking protection firms some time to get to this stage with their tinkering; it was through on-going bricolage that they had reached a point where reframing (to include a concept of privacy as internal to the market) and recasting of the terms of market exchange (in order that users had some say in what happened to their data) became a feasible business proposition.

Another variety of data control products is data vaults. The latter took a number of forms, but typically involved, first, offering users the chance to securely store their

data.¹⁰ This type of store was similar in many ways to ‘personal cloud’ products. Second, data vaults also offered to manage consolidated data. The tinkering and re-purposing of existing technology was quite diverse here, but generally involved moving away from absolute concealment of data towards managed data sharing. For example, a US-based start-up we interviewed suggested that their data vault enabled a user to get their share of the personal data market, by ‘understand[ing] the types of data that you feel safe and comfortable trading, and they also understand what an advertiser wants’ (from an interview in New York, 4 November 2013). In this way a data vault company could ask its members if, for example, they planned to go on holiday in the next year. If 10,000 members suggested they wanted a week’s break in Spain in August, the data vault company could then go to travel companies and seek the best rate for such a holiday, which they would then offer to their members. Members’ personal data would never leave the vault and indeed users themselves would no longer have to carry out online searches. What data vaults proposed was not limited to a transformation in the nature of privacy from concealment to user control; they also sought to reposition privacy as the future of marketing.¹¹

Such a broad transformation of activity could still be open to treatment as a matter of bricolage. For example, MacKenzie and Pardo-Guerra (2014) treat the transformation of share trading through electronic exchanges and its consequent transformation of associated markets as a form of bricolage. In this way, the work of data start-ups could be approached as concerted efforts to bring about the kinds of broad re-framings their critiques pointed towards. As the following New York-based entrepreneur suggests, what we term bricolage work, was oriented toward building an opening into the online data industry:

It’s not like I woke up one morning and said, ‘Aha! I know what we’re going to do. We are going to build the personal data exchange!’ It was more of thinking about problems out there that exist in personal data... and continually reading and researching. I can’t tell you how much of my job is reading. And just knowing what’s going on, knowing what people are doing in technology, how they are applying personal data, what’s currently happening with personal data, who are all the players in the ad tech ecosystem, and the advertising infrastructure in general. Understanding those kind of things have been hugely helpful for me to figure out where our opportunity points. You know, that place in the wall where we can kind of try a little wedging, there is a vulnerability and then chip away so we could slowly build out that wedge and make that hole bigger so we get [to] plug ourselves in.

¹⁰ See, for example, products developed by Dashlane (<https://www.dashlane.com/>), or Personal (<https://www.personal.com/>).

¹¹ Further enhancing the aim of some start-ups to ‘catalyse a revolution in marketing’ (Personal Information Economy event held in London in March 2014).

What we can note in this excerpt is that the start-up entrepreneur read up on the data industry, maintained a knowledge of competitor's actions, figured out the 'ad tech ecosystem' and how advertising worked 'in general' in order to figure out from where to 'build out.' Bricolage was more than just a matter of technical tinkering, then, it was about pooling and reusing knowledge of the market, competitors, technical know-how and what seemed like an opportunity. It was bricolage through drawing together these diverse resources that appeared to offer the way forward for this start-up.

In this section we have noted a number of different forms of bricolage which each seek to bring into being a form of market innovation. Bricolage has ranged from small scale tinkering with existing technologies which maintains privacy as a form of concealment to attempts at broad changes in the nature and future of marketing. In the Conclusion we will turn to considering five sensibilities for navigating research on market innovation, assessing the analytic utility of framing, productive friction and bricolage.

Conclusion

We will conclude this paper by drawing together five sensibilities¹² from our analysis of market innovation through framing, productive friction and bricolage, which we think are of use for broader considerations of market innovation. First, in our study, market framing provided a means to make sense of the ways in which data start-ups sought innovation through market critique. The critique of who and what was included in the market became the basis for a proposed reframing of market relations. The free flow of data was to be replaced by data management or control, attempts to enhance users' knowledge of tracking online through greater transparency and a series of moves to address the apparently uneven playing field of data exchanges. Instead of these concerns being orphaned (outside market framings), attempts were made to internalize these concerns in moving toward a transformed 'personal information economy'. It seems to us that this is not untypical of online start-up firms which seek to combine a mission statement and a business proposition to create a new market framing¹³. It would thus be possible to explore critiques as the basis for market reframing among other start-ups seeking to innovate in the market. It would also be possible to explore reframing more broadly as a form of market innovation, providing researchers with a general sensibility to consider the ways innovators seek to reframe who and what is included or excluded from market participation.

¹² A sensibility here is not a rule or instruction, but denotes a way of navigating or thinking about research which retains flexibility between locations (it gains some of its meaning from each empirical location in which it is used) but also maintains sufficient coherence between locations that it remains recognisable.

¹³ This trend still continues with one recent entrepreneur seeking to 'sell' his start-up online infidelity business on the basis of its profit making potential and its social impact – by providing equality of opportunity for men and women to be unfaithful to their partners.

Second, our study utilized productive friction or dissonance as a basis for working through a particular aspect of market innovation. We suggested that the data start-ups sought to utilize and even capitalize the continuing tension between privacy and economic growth (which, as we noted, has been characteristic of economic and policy discussions since at least the 1970s). In place of trying to reconcile this tension and bring about a happy accommodation of privacy and growth, the start-up firms in various ways sought to come up with innovative ways of repositioning value (and hence growth) in relation to new conceptualizations of privacy. In this way, start-ups sought to innovate the *terms* on which participants would enter into and possibly gain from data exchanges.¹⁴ Although Stark highlights the analytic utility of productive dissonance for considering innovation within the firm, we suggest that a sensibility for considering productive dissonance in market innovation (possibly in relations between firms, between users, customers, clients and so on) would be of broad analytic utility.

Third, the start-ups were attempting what we have termed bricolage in relation to a number of distinct types of re-purposing activity that needed in some way to be coordinated. For example, start-ups in our research sought to *repurpose* existing technologies and software as we have noted. But at the same time, start-ups also sought to *realign* existing data and data relationships and forms of exchange, and both harness existing recognition that data has value, but also relocate that value in privacy by shifting relations of data control away from online advertisers and data brokers, and towards users. Start-ups were also looking to *utilize* awareness of contemporary advertising industry activities in order to build a business that might provide both a critique of existing online data trading relations and attractive to the advertising industry.¹⁵ Alongside these activities, several start-up CEOs presented themselves as addicted to creating start-ups, looking to repurpose previous expertise in starting up firms in this new realm of online data. In this way, a sensibility oriented toward the local tinkering work required to repurpose, for example, knowledge, devices, forms of exchange and previous experiences appears useful for further research on market innovation.

Fourth, coordination of these various focal points for bricolage also operated at the same time as the organizations in our study were experiencing continuous change. What we have termed ‘bricolage’ did not cease. Different start-ups came and went and each organization’s use and re-use of existing technologies led to a number of changes in the technologies under development. How start-ups were positioned in relation to other emerging competitors and the online data industry, and what

¹⁴ In a way this resonates with Nissenbaum’s (2010) ‘framework of contextual integrity’ that, in its analysis of what privacy is, emphasises the importance of appropriate use of information, rather than restriction of any use of it. It also speaks to Maurer’s (2015) understanding of data as relations that are produced in practices.

¹⁵ The notion of bricolage (as repurposing, realigning and utilising) also talks to the notion of kinship evoked by Seaver (2015) in ethnography of big data.

reference they made to privacy and what expectations they had of market innovation and transformation were each subject to change. In a similar manner to MacKenzie and Pardo-Guerra's work, the start-ups were not involved in 'simply random or opportunistic bricolage, a mere response to immediate demands and opportunities' (2014: 169). Bricolage was guided, often through the critiques and attempts at discursive market re-framings that the start-ups themselves produced. In this way, a sensibility for considering continual change as the basis for innovation work seems to have some analytic utility for us. If change is considered as the norm rather than the exception, then research must be considered as nothing more than a moment that is captured and held stable (for example in journal articles). However, we would suggest going beyond assuming that there is nothing constant except change. We would suggest a sensibility oriented toward considering change in market innovation that is in some ways guided or made coherent by participants; it is the effort to maintain change as a coherent phenomenon that appears to us central to the participants in our research.

Fifth and finally, it seems clear that there is yet to emerge a successful privacy-focused data start-up which might operate as what Kuhn (1962) termed an 'exemplar'. Certainly the start-ups featured in our research were yet to achieve the status of an exemplar. In bricolage terms, an exemplar 'is not a template, and bricolage is not simple copying.' (MacKenzie and Pardo-Guerra, 2014: 172). However, it still seems of use to us to have a sensibility which can orient research toward considering the possibility and grounds on which an exemplar might emerge. In this way, a market innovation exemplar would stand as a recognised coupling of problem and solution that has worked to achieve an outcome for one set of actors and can be drawn on as a basis for making sense of other actions. The exemplar would not provide a set of instructions in how to solve a problem, but would provide, for example, evidence that something could work or the terms for rethinking a problem-solution relationship through something that has been recognised as working well. For the start-ups, operating without an exemplar at the same time as tinkering with a broad number of different types of activity (data, software, technology, relationships, markets, privacy and previous start-up expertise) that presented coordination difficulties, was an ongoing, unresolved challenge for market innovation.

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