Article

Profiling Phorm: an autopoietic approach to the audience-as-commodity

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Abstract

As advertisers' media spend on online advertising continues to increase, there exists a need to update the means by which we understand and critique advertising. Reliance on textual analysis and visuality is of little use in a milieu increasingly predicated on technics and surveillance. A post-hegemonic critique is advanced here that argues for a stronger understanding of feedback relations and the means by which we as users contribute to heterogeneous advertising experiences. This paper progresses and updates Dallas Smythe's (1977) audience-as-commodity argument. It examines developments in online behavioural advertising that employs deep-packet inspection (DPI), which has caused consternation to technologically savvy consumers, privacy activists and regulators. Drawing upon the case study of Phorm that received national media attention in the UK and policy-maker attention in Europe, this paper highlights key features of DPI-based advertising, non-personally identifiable profiling and their implications for contemporary commercial autopoietic feedback relationships where users themselves are a fundamental component of online behavioural advertising practices.

Introduction

As Ball et al. (2006) recognise, critical accounts of surveillance technologies benefit from an understanding of technological and political specifics, as well as theoretical conceptualisation. This paper thus initially offers a detailed exposition of behavioural advertising technologies, drawing on the privacy situation in Europe involving Phorm, the behavioural advertising company whose intentions to roll out deep-packet inspection (DPI) across the most popular UK broadband providers received a severe reception from interested citizens, privacy activists and the European Commission alike. The paper then proceeds to articulate these relations of political economy in light of wider interest in recursive media, coproduction and post-hegemonic critique.

Where advertising is traditionally critically analysed through explications of surfaces and visuality conceived of semiotically, what is argued for here is an account based on materiality, immanence, feedback, autopoiesis and the means by which interiority is externalised. This inverts perceptions of advertising as being something "out there" to it being a metaphor for something "in here". In this view, behaviourally targeted advertising has less to do with spectacular representation and the narration of a given worldview, and more to do with the premise that users are immanent commodities that aid in constituting cycles of feedback, targeting and the delivery of advertising in nigh on real-time. Such a conception is not unique and finds its inception in Dallas Smythe (1977) and his insistence that we better understand the audience-as-commodity. Although Smythe opened up space for a less visually dependent

way of looking at advertising, there are distinct differences between his account and this account, particularly in regards to constructivism and the nature of how users' data flows are scrutinised.

Understanding web-based versus internet-based behavioural advertising

Unlike “traditional” online targeted advertising where advertising is served on the basis of the contextual material a user is looking at on any given page, behavioural advertising is predicated on *who* is looking at a particular web page. For example, a scholar of surveillance studies might conceivably be presented with advertising for books on politics and philosophy from a well-known online bookstore whilst searching for plumbers to fix a blocked drain. Behavioural advertising draws less on users' reservoir of social and cultural references (unlike textually-rich or financially well endowed spectacular advertising), and more on the aggregated wanderings of users' data-doubles, involving a more abstract instrumental function (Hier, 2003) and surveillant assemblages that involve the self being broken up into a series of data flows (Haggerty and Ericson, 2000). Arvidsson makes a similar point regarding the now well-known practices of profiling through credit card records, mailing lists, customer benefit programs and barcode scans, commenting that ‘our flaneuring life off-line also generates its virtual double in the form of a data trail to be processed and commodified’ (2004, 457).

Such processes of profiling, surveillance, sorting and rendering consumers transparent through data mining processes are now understood in some detail¹. The notion of a virtual data-double should not be confused with that of a doppelganger, in that behavioural profiling systems are predicated on aggregating systems that reveal little, if anything, of a user's real world self. Rather, they tend to have to do with traces and signifiers based upon non-personally identifiable information (Hildebrandt and Gutwirth, 2008). The Deleuzian (1992; 2003) language of assemblages is more accurate in that it highlights the malleability and utilitarian nature of identity under the aegis of digitally enhanced capital that involves articulation, re-articulation and de-articulation as required. For example, the web-based behavioural advertising network AudienceScience² describes itself as an aggregator of “anonymous behaviors” on the basis of 386 million individual users. Behaviour is ascertained through the processing of internet protocol (IP) addresses, and sites and pages the user is reading and looking at. Other factors include what users are shopping for, search terms they are using and behaviour they are exhibiting that signifies intent. This data, in the case of AudienceScience, is then tabulated into a taxonomy represented by a Periodic Table style of segmentation. Moreover, in addition to the standard array of segments, they also allow clients to construct custom segments ‘on-the-fly to satisfy any marketing objective’.

There are three main types of online behavioural advertising that work somewhat differently, although all use past behaviour to determine advertising content. As the Internet Advertising Bureau's “A Guide to Online Behavioural Advertising” (n.d.) describes, these types can be defined as:

1. First-party web-based behavioural advertising: this is where a web publisher (or a company working on its behalf) collects users' browsing data from its own web domain and serves advertisements accordingly across a site.
2. Third-party web-based behavioural advertising: this involves an additional party in the form of advertising networks. Advertising networks are companies that connect web publishers and media owners with relevant advertisers. Their success stems from the number of web publishers they have signed up to their services. They collect and use browsing data when an internet user visits one of a number of websites participating in that particular network.

¹ See Gandy 1993; Clarke 1998; Lyon 2001; Elmer 2004; Lace 2005; Ball et al. 2005; Turow 2006 for only a handful of examples.

² See: <http://www.audiencetargeting.com/>

3. Third-party internet-based behavioural advertising: this uses internet traffic that passes through the gateway of an internet service provider (ISP). An advertising provider via deep-packet inspection scans packets of data that passes through the gateway and marries suitable data with relevant advertising.

Web-based behavioural advertising (that is, types 1 and 2, above) that collects information from users' cookie-enabled web browsers, including types of sites visited and pages viewed, are represented by search engines such as Google, Yahoo and Microsoft's Bing. It also involves advertising networks such as adknowledge, AudienceScience, Burst Media, Omniture, Tacoda and a multitude of other firms who measure audiences, sell inventory and deliver advertising across a range of website publishers (for example The Daily Mash, CNN, The Sun, the Onion, ITV and other companies looking to extract revenue from their online offerings). Online behavioural advertising companies do not overtly disclose themselves, although use of Ghostery, a Firefox browser add-on, will reveal web-based data miners and advertising networks tracking one's data.

The type of online behavioural advertising that forms the main focus of this paper is the third type, involving internet service providers (ISPs) and behavioural advertising companies such as Phorm who wish to serve advertising at an ISP's communication chokepoint, through which all traffic must pass. Recognising that the internet represents a network of computers and devices able to use IP addresses, and that the web is a means of sharing information over the internet, behavioural advertising that uses deep-packet inspection entails the use of software and hardware installed in ISPs' networks to intercept webpage requests generated by subscribers carrying a Phorm cookie as they peruse the internet. This is the more novel version of the three online behavioural techniques, and certainly the most controversial. Although Phorm in the UK, and the now defunct NebuAd in the US, have received attention from the European Commissioner, US Congress and privacy groups alike, these two companies represent only the most visible surface of a range of companies interested in access to network infrastructure as a means of delivering advertising. The following two sections discuss the Phorm controversy in greater detail so as to provide a specific factual base from which to evaluate the updated audience-as-commodity thesis.

Phorm and Digital Britain: a confluence of interests

Gandy's (2009) commentary in *Surveillance & Society*, designated "What the US can learn from the UK about the protection of privacy", is an interesting title given the current stand-off between the UK and Europe over data protection in relation to online behavioural advertising. Praising the role of the Information Commissioner's Office (ICO) he contrasts what he describes as the UK's commitment to privacy with the Federal Trade Commission (FTC). He observes the latter as appearing to regard 'techniques of marketplace surveillance and consumer segmentation as an enhancement of business capacity and a spur to the efficiency of markets, while the protection of privacy is generally seen as a burden that has to be minimized' (2009, 309). Although noting that the UK is not an EU leader in privacy, on the whole he is relatively praising, at least by dint of comparison to the US. This view of the UK may be contrasted with those of campaigners such as Alexander Hanff of pressure group NoDPI, who spearheaded a campaign in the UK against Phorm in an episode where the UK government and its agencies were accused of siding with industry against the British public³.

In 2008 and 2009 Phorm (formerly 121Media, which was blacklisted by Symantec and F-Secure for use of spyware) raised much ire from privacy campaigners and also stirred the major broadcast news agencies.

³ The most significant other campaign group is the Open Rights Group (ORG), with whom NoDPI have a strong affective alliance. Other organizations of varying degrees of influence among policy makers and the media, include: AntiPhorm, Anti Phorm League, BadPhorm - When Good ISPs Go Bad!, Deny Phorm Blog, Dephormation, InPhormationDesk, Phorm Watch, in addition to a range of groups created on commercial social networks. NoDPI and the ORG most successfully engaged policy makers.

This was due mainly to the carrying out of secret trials of advertising systems in 2006 and 2007, where, in both cases, customers were unaware of the tests and thus had not actively given consent. The first test was for a contextual advertising system called PageSense aimed at delivering per-user profiled and individualised advertising, and the second for an advertising platform based on DPI. Three of the UK's largest ISPs (British Telecom (BT), Virgin Media and Carphone Warehouse's TalkTalk, which as a group account for around 70 per cent of the UK broadband market) were planning to sell users' browsing history to Phorm so as to build up a profile of subscribers' interests and deliver advertising targeted by behaviour over a period of time. BT was first to pull out due to consumer resistance, despite two years of secret experimentation with Phorm's systems, and was soon followed by Carphone Warehouse and Virgin Media, although neither of the latter two had conducted tests on the public.

The UK government appeared to be positive about Phorm's systems that dovetailed chronologically with the Digital Britain report delivered by Stephen Carter, the Minister for Communications, Technology and Broadcasting in June 2009. This report sees Britain as being in a transformational period and has the view that a successful Britain must be a Digital Britain, with the state playing a supporting role to 'complement and assist the private sector in delivering the effective modern communications infrastructure' (Department for Culture, Media and Sport 2009). The report and wider initiative seeks to address what it describes as market failures standing in the way of a full roll out of digital infrastructure. This vision of Digital Britain is driven by an understanding that the UK's digital economy accounts for around 8 per cent of GDP, that the digital and communication sectors are worth over £52 billion a year, and that by 2012 £1 in every £5 of all new commerce in this country will be transacted online (ibid).

The Digital Britain report recognises the centrality of advertising to the digital economy. Indeed, the UK is first to have seen online advertising overtake television as the medium of choice amongst advertisers; as of the first half of 2009, it held the highest proportion of UK advertisers' media budget at 23.5 per cent, outranking all other media forms. The Digital Britain report also notes that as digital outlets and platforms have increased, so too have the methods of delivering advertising. It further states:

The challenge is to demonstrate value to consumers while ensuring that there is no risk of abusing personal data, for example by developing mechanisms to ensure transparency, and at this stage the industry has yet to bridge that gap.

In developing a digitally engaged community in the UK, and allowing the development of new businesses to generate economic growth and innovation, the Government of course needs to uphold protection of privacy and the principle of transparency. This will always remain a guiding principle. But we also need to ensure that apparent concerns are properly assessed and understood, and that artificial barriers do not spring up (ibid).

Yet, there are potentially non-neutral interests behind the Digital Britain report. While there is no evidence of inappropriate behaviour, it is pertinent to note that The Register⁴ highlights that Kip Meek, a member of Phorm's board, has also worked on the Digital Britain review. In Kip Meek's defence, a spokeswoman for the Department for Business, Enterprise and Regulatory Reform (BERR) maintained there is no conflict as 'Kip Meek is not working on delivering universal broadband', and is instead working on the division of the radio spectrum among mobile phone operators. The Register also reports that Stephen Carter limited his direct public pronouncements on Phorm, describing it as an 'interesting and innovative business' to a parliamentary committee in March 2009. However, prior to becoming a peer (via a period of leading the Number 10 strategy unit), Stephen Carter was chief executive of PR and lobbying group Brunswick, whose clients have included Phorm. Stephen Carter also returned to the private sector after

⁴ The Register: a UK IT news and opinion website known for satire and criticism of corporations who is considered by Phorm to be the media mouthpiece for privacy activists.

delivering the report.

Furthermore, legally, Phorm's activities are questionable. In addition to contravening European Directives 1995/46/EC and 2002/58/EC, they also fall foul of the UK's Regulation of Investigatory Powers Act 2000 (RIPA) and Section 6 of The Privacy and Electronic Communications Regulations 2003 (PECR). This states that 'a person shall not use an electronic communications network to store information, or to gain access to information stored, in the terminal equipment of a subscriber or user'. Section 6(2) moves on to require that 'the subscriber or user of that terminal equipment – (a) is either provided with clear and comprehensive information about the purposes of the storage of, or access to, that information; and (b) is given the opportunity to refuse the storage of or access to that information'. Under RIPA interception of communications without warrant or consent is illegal unless both sender and receiver agree to have their communications intercepted. Section 2(2) of RIPA highlights that interception is characterised by modification and interference of a system or its operation, the monitoring of transmissions made by means of the system, and when some or all of the contents of the communication is made available – whilst in transmission – to a person other than the sender or intended recipient of the communication.

In arguing for the legality of DPI-based data processing, Phorm contended that there was possibility of misinterpretation of RIPA and that they consulted with the Home Office, which is responsible for this area. In a document published by Cryptome, Simon Watkin, senior policy advisor at the Home Office, in regards to RIPA and the interception of user logs and e-mails, advises that behaviourally targeted advertising is lawful when consent has been given for interception and/or interception is for purposes connected with the operation of the telecommunications service. His assessment of the legality of interception also counsels that interception should be provided with the explicit consent of ISPs' users or by the acceptance of the ISP's terms and conditions. Furthermore, ISPs, and those contracting services and making them available to their users, 'should then – to the extent interception is at issue – be able to argue that the end user has consented to the interception (or that there are reasonable grounds for so believing)'.

According to NoDPI and the European Commission, the UK government and the Information Commissioner's Office (ICO) have displayed a lack of enforcement of privacy directives. This has led to a standoff and legal action between the EU Commission and the UK government in the form of an infringement proceeding against the UK, although the ICO in April 2008 stated that Phorm's system would only be legal under UK law as an opt-in service (Marsden 2010). In correspondence between Frank Rizzo (a member of an internet forum called Cable Forum) and the ICO in mid-2008, the ICO recognised that Phorm should have told users about trials. It stated that 'if an organisation collects information using cookies they have to tell people about that, and advised them how to prevent operating [sic]' (Frank Rizzo, Cable Forum, document posted April 2008). They also suggested in the letter to Frank Rizzo that if he believed he suffered quantifiable damage as a result of a breach of the Regulations and is considering pursuing this matter he should seek his own legal advice. This has led other posters on Cable Forum to accuse the ICO as being "toothless" and too ready to defend business, thus serving no useful purpose to the tax-paying public.

Phorm's system and deep-packet inspection

Concern and anger centred on the fact that trials were carried out without clear consent, and that DPI-facilitated advertising gives companies undue access to communicational gateways. DPI is the process of analysing internet traffic at deeper levels of the Open System Interconnection (OSI) Reference Model layers so as to tell more about the content of packets of information. DPI-based advertising thus involves intercepting users' internet traffic, and scanning and copying the content that passes between an end-user and a website. It is the means by which users unwittingly or wittingly are signed-up to advertising systems that generates advertising that reflects their communication flows and expressed interests as they navigate the web.

Comprised of seven layers, the OSI layers are split into two stacks. Four of these are the transport set (layers 1 to 4) and three are the application set (5 to 7). The transport layers involve (1) *physical properties* of the network (such as voltage); (2) *data* and the type of physical protocol that needs assigning to the data; (3) *network* and the manner in which the data will be sent to the recipient device; and (4) *transport* where flow control of data is managed, errors are checked for, and data is examined to see if it is coming from more than one application so as to integrate each application's data into a single stream for the physical network.

Deep-packet inspection represents the ability to drill down through the application set, the three layers that tell more about the content of the packets and the type of destination. These are (5) *session* that maintains and ends communication with the receiving device; (6) *presentation* that takes information from the application layer (the next) and converts this into a form that all the layers below can understand. Last then is (7) *application* which interacts with the operating system, or application brought into play when a user wishes to transfer files, read messages or perform any other network activity (also see Blank 2000; Erickson 2003).

The privacy concerns, raised by groups including the Open Rights Group and NoDPI, are based on the potential for DPI equipment to look inside all of these packets and put them together to form a legible record of e-mails, web browsing, VoIP calls, and passwords. Phorm are adamant that users are stored as a unique random number rather than a name, that it does not gather personally identifiable information and that it does not store IP addresses. Furthermore, Phorm's system, called Webwise, only inspects traffic through Port 80, the port used for Hypertext Transfer Protocol (HTTP). Traffic through other ports such as those used in banking and email are ignored. In addition, only text-based (text/html) content is processed and other content extensions, such as images, are ignored. Richard Clayton, a security specialist from Cambridge University UK and advisor to the Open Rights Group, who Phorm invited to inspect their systems, confirms that they do not permit Phorm to identify individuals. He also verifies that they meet and exceed all necessary Data Protection 1998 regulations, thus partly agreeing with Phorm's repeated claims that their system improves on other advertising platforms that profile internet users. However, Clayton comments that, overall, 'I learnt nothing about the Phorm system that caused me to change my view that the system performs illegal interception as defined by s1 [section one] of the Regulation of Investigatory Powers Act 2000' (Richard Clayton, Light Blue Touchpaper, posted April 4 2008).

In a report titled "The Phorm "Webwise" System", Clayton describes that the system works by breaking down individual pages into words. Useless words such as and/but/the/or/a/etc. are excluded, as are those words only stated once. Words are then ranked by frequency and form the basis of what the page is about. This is done by a machine at the ISP called a "Profiler" that is aware of a user's IP address. It also picks out the UID (the unique identifier through which Phorm processes data) that identifies the user from the cookie on a user's computer that accompanies a webpage request. A record of the URL that was visited, the search terms (if any), the top 10 words and the UID are passed to a machine called the "Anonymiser". This passes the data onto another machine called the "Channel Server". Although running software provided by Phorm, the ISP controls the Profiler and the Anonymiser, with Phorm controlling the Channel Server. This takes the URL, search terms, UID and words-based records and processes this against a database to determine all of the "channels" that match and connect advertisers with users (in the form of their UID). Having established matches between words on webpages and words that define a channel, the channel, UID and datestamp are saved to disk to be called up when an advertiser makes a request for a particular audience. These records (channel, UID and datestamp) are discarded within six months as this is the maximum amount of time permitted for targeting. Furthermore, words are vetted so as to not identify individuals and advertising is not served until it matches 5000 UIDs, so as to reduce possibility for identification.

Advertising is delivered through HTML tags containing advertisements served by the Phorm Webwise system and fetched by a user's browser, for example ``. This is similar to how other online advertising systems render display advertising. The request from the browser is sent to the Anonymiser that forwards the UID to the Channel Server so as to protect the IP address from being passed onto Phorm. The Channel Server then determines which advertisers are looking to advertise to that specific type of user. A real-time auction amongst advertisers is then held so as to determine which advertiser's advertising is displayed to the user. The most profitable for Phorm is chosen and displayed to the user. Certain websites, such those involving adult material, alcohol, tobacco, gambling, medical or political content are excluded from the web viewing profile and advertisements. Sites where people can read and compose email are also excluded, as are posts in web forms (that may contain personal data). This means that advertisements will not be served for this kind of content, nor would Phorm match words with these themes so as to build profiles.

Revisiting the audience as commodity

Such developments in advertising practice re-invoke the original critiques of advertising involving the audience-as-commodity (Smythe 1977). In the UK, Curran (1981) and McQuail (1997) made similar observations about ratings discourses, the allocation of advertising, and how media competition for this allocation has influenced the character of the British mass media. Smythe's is a view that sees information and services as a means of "bribing" audiences to offer their attention, time and "labour" to advertising. More recently Bermejo (2009) has similarly traced media history from broadcasting to Google and situates contemporary notions of manufactured audiences in light of Smythe's (1977) insistence on examination of the buying, selling and construction of audiences. In this view, the audience, or at least their potential attention-time, thus becomes a commodity or product to be sold to advertisers. Although the force of the critique is now somewhat dampened given the relatively recent intensity of interest in consumers/users/audiences/citizens as configured within marketing, biopolitics and governmental databases (Deleuze 1992; Poster 1995; 2006; Lyon 2001; Elmer 2004; Arvidsson 2006; McStay and Bakir, 2006; Rabinow and Rose 2006; McStay 2009; Zwick and Denegri Knott 2009), it was one of the first critiques of advertising (as distinct from the wider enterprise of marketing) *not* to foreground textual analysis.

Smythe's (1977) critique also applies well to the features and characteristics of online behavioural advertising. This is due not only to the fiscal value of audiences for advertising networks, but also to the decrease in importance of representation in favour of relevance and timing. However, there are differences between accounts of televisual advertising audiences described by Smythe and those of an online behavioural form. Whereas television audiences receive no other type of televisual advertising, there is a multitude of ways in which online display advertising may be targeted and delivered – not to mention the vast array of other online formats at advertisers' and agencies' disposal. In addition, while there is a clear reward structure for television viewers, the benefit of a DPI-based behavioural model to Internet users is less clear, although ISPs state that behavioural advertising will generate additional revenue per user (ARPU) and thus improvements in services. Moreover, with television there is an unwritten but well recognised contract between viewers, media owners and advertisers and it is uncontroversial to suggest that viewers participate in their own subjectification in televisual audience monitoring. However, there is little in the way of reward for internet users subjected to behavioural advertising beyond the greater refinement of targeting. In addition, consumer awareness of the interrelationship between viewers, advertisers, advertising networks, and media owners, publishers and fiscal value of data is very low (Turow et al., 2008). Unlike adware services of years gone by (which Phorm, in their former incarnation as 121Media, were involved with), users do not initiate monitoring by downloading applications, software or "rewards" but rather are unwittingly imbricated in an opt-out situation. Phorm, trade associations and web-based behavioural advertisers continue to lobby for opt-out arrangements, so to suggest users are willing collaborators in their own subjection is a difficult position to maintain in this particular regard.

Beyond seduction: an autopoietic account

In long-established forms of advertising, both advertising critique and practice have more to do with a semiotic logic (Williamson 1978; Wernick 1991; Forceville 1996; Odih 2007) whose mode of address forcibly attempts to fuse often hitherto non-established links between disparate signifiers and signifieds (i.e. the creation and maintenance of brand identities for products). Traditional branded advertising provides mini-lessons in consumption that invite their audiences into the frame so as to adopt a particular subject position. Like zip files, once engaged with, a multi-layered information structure of referents is opened. This perspective on advertising finds its most forceful expression in Debord (1992) who in the 1960s offered a depiction of advertising and society that places the spectacle (involving advertising, news, entertainment and other elements of the communications industry) as the dominant model of life. This view not only saw the pre-eminence of representation, but also the folding of life into representation. However, whereas Debord and subsequent semiotic conceptions of advertising place representation and the spectacle as the leading productive force in society, in the 21st century information and feedback systems are making themselves more pronounced.

What is presented here involves less overt emotional or ideological investment, or visual and aural stimulation on the part of the user. Similarly, Miles (2007) in discussing cybernetics and online advertising argues that it is in feedback-oriented models of advertising relationships where we may find modes of grasping contemporary advertising communication. As Elmer (2004) also highlights, there is a need for fresh critique of advertising that relies less on ideological and textual critiques of consumer culture in media and cultural studies, and more on the details of consumer profiling, solicitation, feedback, and mapping technologies. This is not to suggest succession, particularly as feedback relations have characterised media and advertising since its professionalisation in the early 1900s. Instead, what is called for is a change in focus regarding whether we privilege the means by which the spectacular is produced or the more obvious spectacle itself.

Advertising systems augmented by DPI, such as Phorm's, are of a different order to those that Debord witnessed and described. Traditionally, advertising texts targeted through broadcast and narrowcast media have vied for attention by means of seduction and simulation. A cybernetic understanding relies less on message-based and symbolic approaches and more on one interested in media structure and autopoietic conceptions. These involve feedback processes in which content entices consumers, relevant advertising is served, consumers give attention to content, data about audiences is generated, and advertising is again served on the basis of data generated. Whereas feedback relations in advertising have until recently been used as a means of experimentation and testing so as to gauge reception, this is not the remit of nascent forms of systems of feedback such as Phorm's that have more to do with real-time automated reflection, data processing and circulation of advertising material via DPI.

In this milieu the image-makers of the advertising industry became strangely redundant and it is we who step into their place, in that experiences of advertising are generated as a concatenation of traces created as we traverse the web. This process has implications for the development and employment of critical theory, and how we think about notions such as coproduction, the nature of affect, relations between subject and object, and interrelationships of culture, power and theory as understood by reference to the concept of hegemony (Venn, 2007). Whereas traditional conceptions of hegemony have to do with the naturalisation of ideological viewpoints (see Ewen 1977 [2001]; Williamson 1978; Kellner 1990; Fowles 1996 for examples in relation to advertising), behavioural advertising and its encroachment into core nodes of communication networks requires a new modality of critique. This is in addition to – rather than in substitution for – accounts of advertising drawing on semiotics, [post]structuralism, feminism and other critical social theories that seek to unravel articulations of social being that support prevailing capitalist relations of power. However, critical accounts involving microanalysis of individual advertisements to account for effects or indications or social politics are less than fruitful in relation to behavioural

advertising.

In behavioural advertising we see a new configuration of power and servitude predicated on technics, cartographies or diagrammatics (Elmer 2003; 2004) and what Andrejevic (2007) terms a digital enclosure, or a condition of surveillance predicated on relations of feedback. Whereas traditional notions of enclosure have to do with fences, walls, confinement, boundaries and the means by which these affect labour relations, following Deleuze (1992) Andrejevic refers to the manner in which digital enclosures forgo physical boundaries. He argues they allow 'for the spatial dispersion of institutional control – the dissolution of the walls of the enclosure' (2007, 107). The legacy of the Phorm case is thus a tangible manifestation of an endeavour to leverage asymmetric power relations and implement an enclosure without boundaries via the mining of telecommunications travelling through ISP gateways. Whereas web-based behavioural advertisers such as AudienceScience raise significant questions and concerns regarding opt-out approaches, DPI-facilitated advertising such as Phorm's facilitate access to *all* Port 80 traffic across a network, although not all of this may be used for advertising purposes.

Lash (2007) asks us to acknowledge the importance of cultural studies and related political analysis from the 1960s, but also urges critical commentators to recognise its limitations with regards to informatics and telematics. Correspondingly, we ought to see that the means by which we should critique advertising is also undergoing development, particularly in regard to the impact of new means of soliciting audience feedback and autopoietic behavioural advertising systems. As Lash highlights, hegemony has traditionally operated through the visual and the symbolic. In advertising this may be perceived in terms of myth, fantasy, dream-making and the strategic use of symbols, displacement, condensation, juxtaposition, exaggeration, paradoxes, metaphors, suggestion and the absurd all played out on the terrain of the hyperreal. What is sought instead here is an appreciation of advertising that relies less on linguistic constructions and articulations, and one that better appreciates the materiality and factuality of advertising today as expressed and circulated through the networks. Although autopoiesis shares similarities with traditional cybernetic approaches, cybernetic systems are self-regulating but not self-organising. Cybernetics always has reference to its environment as it proceeds towards some goal and adapts to that environment. An autopoietic system is different in that it is its internal structure that determines change in a way that concurrently maintains its identity (Humberto and Varela 1980; Mingers 1995).

This process has to do with a highly dynamic and, in the case of online behavioural advertising, a constructivist view of audiences and markets. In contrast to the imagined certainties of old, audiences and markets are now better seen as being in flux, where elements will converge and come together for a given strategic objective, and disassemble when no longer necessary. In reference to products, Slater (2003) likewise argues that consumer objects undergo a process of stabilisation and destabilisation as the needs of branding, product positioning and economic action require. Such a flexible approach is, as Slater acknowledges, related to Callon et al.'s (2002) "economy of qualities." This involves the view of a product as a process where the economic good undergoes metamorphoses, transformation and change for the purpose of any given economic agent. In these relationships, the divide between supply and consumption is much less distinct.

Whereas a sociological view of consumption is conceived through differentiation and status, in coproductive accounts consumption is thought of less in terms of social positioning and more in terms of the 'joint work of a host of actors' (Callon et al., 2002, 203). It is however not enough to simply notice coproductive occurrence; rather we should be able to critically isolate, evaluate and subsequently contextualise coproductive relations, particularly when, as in the case of opt-out DPI-based behavioural advertising and Phorm, practices are illegal. In advertising terms, the relations of feedback become much more distinct in contemporary autopoietically coupled accounts as does the notion of work and labour (Lazzarato, 1996). Although Debord's social organisation of appearances always depended on participation, there was a definitive division between cause and effect with spectacular results privileged

over the means by which participation fed back into cycles of production. We may instead better understand that at the heart of consumption of advertising is participation. Rather than autopoietic accounts progressively displacing the spectacular, we are witnessing a change in the nature of participation predicated on coupled relations not only of a more intimate nature, but that are direct expressions of our own interiority.

Online behavioural advertising invokes coproduction and a recursive logic that blurs the distinction between beginning and end, or production and consumption. This is instead a mode of self-production where both input and output belong to the same entity, one that derives sustenance from the wider informational environment. While there is a temptation to scale up the reach of behavioural advertising as an autopoietic system – to include the role it plays within market-based economies; relations of power/knowledge; biopolitical accounts; the manner in which it is regulated, and the capillary-like means in which capital reproduces itself – in doing so we begin to blunt the usefulness of the biological and informational analogy. A more accurate application of autopoiesis involves recognition of novel relations of feedback and the means by which we externalise interiority as we negotiate, create, search, deal with information and progressively couple with behavioural advertising systems.

This is primarily due to the question of boundary and how we distinguish between a system itself and the environment in which it operates. On a plane best thought of in terms of immanence, the network itself constitutes the boundary of behavioural advertising systems. To unravel the assemblage of discourses and practices that give rise to behavioural advertising is to inquire into allopoeitic systems that are best characterised by relations between parts that produce something other than themselves. The distinction is not one of value or importance but rather of definition and analytical usefulness. Moreover, the delineation of boundary is not to suggest that autopoietic systems may act in isolation, as any given system will require sustenance and an environment in which it exists. Like any autopoietic system, behavioural advertising requires sustenance. In our case, it is in the form of new life experiences, interests, and lines of informational inquiry so as to engender richer profiling, fresh clusters, new advertising opportunities and avoid system inertia or atrophy.

Online behavioural advertising and recursive form

Jhally (1990) notes the rise of narrowcasting in the 1980s and describes increases in surplus value generated through refined categorisation and profiling. This value is increased in online behavioural advertising, due to precision of targeting, perceptions of relevance, higher click-through rates and improved consumer/brand engagement (also see Plummer et al. 2007; Rappaport 2007; McStay 2009). Phorm similarly cite a market report from ChoiceStream employing a demographically diverse sample finding that 41 per cent of internet users pay more attention to online personalised advertising. Mosco (2009) argues that new media amplify Smythe's (1977) arguments and that the recursive nature of digital systems expands the commodification process. This is then a feedback and reciprocal process involving audiences, advertisers, advertising networks, web publishers and other media companies. More important than ideological positioning of content, at least for a critical understanding of contemporary advertising, is the production and sale of audiences as a commodity (in the true sense of exchange value), and also the symbiotic relationship between the organic (users) and the inorganic (advertisement-servers). As Zwick and Denegri Knott (2009) similarly highlight in relation to marketing databases, such a view of advertising represents not discipline but rather the manufacturing and management of audiences and advertising in a media environment predicated on heterogeneity. Moreover, such an enterprise has real-world effects, as we have little recourse to challenge the construction of these profiles or understand the politics, heuristics, biases and articulation of their construction. This then is a distinctly different media environment to the one that Smythe (1977) saw before him.

It is perhaps now clearer to see that users are structurally coupled immanent commodities that are

constituted by, and aid in constituting, the cycle of feedback and commodity production. These deterritorialised audiences only exist in a simulational and cartographic sense of course. Aggregation processes must omit much detail and only include what is deemed necessary for the pre-determined goal. These goals subsequently entail the process of reterritorialisation that involves recoding databases for a given purpose or business objective (Deleuze 1977; Zwick and Denegri Knott 2009). This materialist argument is of more use, at least with regards online behavioural advertising, than one that oscillates between understanding audiences of advertising as somewhere on a continuum between being inert, active, or co-producers in the sense of user-generated content. With users themselves constituting a key component of online behavioural advertising, based on their behaviour, ideological examination of texts and audience positioning is far less important than awareness of delivery systems and the power, privacy and profiling relations that exist beneath hybridised behavioural advertising-machines.

Conclusion

This paper has sought to redirect attention from ideological and textual approaches to advertising that have predominated across the twentieth century to one based on a premise that acknowledges contemporary systems of audience production and management. Whereas traditional critique has tended towards an ontological approach, analysis of behavioural systems requires more careful exposition of detailed practice so as to better understand systems of audience production on a heterogeneous plane characterised by immanence. The audience-as-commodity is to be found within an enclosure without boundary which, as Lash (2007) points out, involves recognition that power operates from “within” rather than from a visually and linguistically-oriented hegemonic “without”. Behavioural advertisers and data miners are much less interested in watching over than establishing coupled relations with interiorities.

The paradox, however, in the cultivation of relations to mine interiority, is that behavioural advertisers do so through non-personally identifiable information. Although traditional large-scale branded advertising requires consumers to help facilitate the teleonomy of brands, in online behavioural advertising this aggregation of preferences is arranged through reterritorialisation and deterritorialisation. The current condition of online behaviourally targeted advertising then involves less need for semiotic analysis understood in terms of Debord's spectacle, and more comprehension of data-driven relations as established by behavioural advertising operators at an internet-based level (e.g. Phorm) and web-based level (e.g. AudienceScience). In both versions, feedback systems are intensified far beyond traditional systems of (re)production and involve autopoietic modes of production where systems produce more of themselves in a recursive fashion, albeit in a somatic fashion mostly unnoticed by coupled users.

As highlighted, Phorm raise some fair points in their fight for recognition: their services are not dependant on personally identifiable information but rather group profiling, although conducted on higher levels of OSI data passing through ISP gateways. Perhaps now reduced to a historical case study in the trajectory of behavioural advertising, Phorm illuminate well the intentions of the advertising industry to mine our every digital movement. With the centrality of advertising to the digital economy now explicitly confirmed, a keen regulatory, systemic and critical awareness is vital as advertising firms, enabled by supportive governments, seek to harness communications gateways through autopoietically coupled online behavioural advertising relationships.

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