

NETWORK MEDIA: EXPLORING THE SOCIOTECHNICAL RELATIONS BETWEEN MOBILE NETWORKS AND MEDIA PUBLICS

Rachel O'Dwyer

Considering 'media publics' as an assemblage of ICT networks, technological devices and human collectives, this paper explores the complex conditions across social and technical spheres that influence the character of contemporary media production, consumption and distribution on the go. Critiquing the current study of sociotechnical collectives it considers tactical media as one alternative approach.

Introduction

This paper concerns the sociotechnical relations between Mobile Information and Communication Technology (ICT) Networks and 'Media Publics', using a term to describe collaborative and non-proprietary practices emerging around the collectivised production, consumption and distribution of digitally networked media. In light of the ongoing integration of ICT networks into cultural practices, this paper calls for a critical theory of sociotechnical networks.

The following discussion critiques the epistemic frameworks available for the study of networked media, and in particular the intersection of technical and social apparatuses occurring around online culture. While the network as a cultural trope is prevalent in critical theory, the technical characteristics of network media (Infrastructure, topology, protocols and standards) are frequently 'black-boxed' in favour of overarching discussions of an immaterial network culture as it relates to broad frames of governance, subjectivity and political economy. By eliding a deep consideration of the material substrate of the network and subsequently the many ways in which media publics are generated in diverse relations between a range of actors, contemporary theory has failed to explore the complex ecologies of sociotechnical networks. Instead, in the literature of social media, we continually encounter linear causal models of analysis that all too easily equate centralised systems with proprietary cultures and decentralised networks with democratic media practices, failing to attend to the many nuanced ways in which the apparatuses of a communications network constrain or alternatively enable the formation of autonomous cultural collectives. If we really wish to explore the possibilities to design, implement and scale networks that support collaborative culture, we require a theoretical framework that traces agency through all layers of the network. Such a framework is still absent from network culture.

This theoretical gap will be illustrated with reference to an obviously sociotechnical assemblage, drawing on recent prototypes for episodic networks, a species of mobile ad hoc network that uses human proximity rather than fixed infrastructure to distribute data packets. Superficially these networks represent an ideal platform for the kinds of user-generated practices commonly associated with utopian accounts of media publics, suggesting a network topology that is fully distributed, supportive of peer-to-peer communications and dynamically self-organising. However, through an iterative analysis of the relations between different layers of the network, this paper explores how algorithms immanent to the substrate of the network expropriate user-generated content, monitor activity, shape future network behaviour and ultimately produce the network in ways that might advance proprietary interests and limit the agency of media publics.

This study demonstrates the need for appropriate frameworks and methods for research into networked media. While a number of approaches from technology studies and complexity are useful for the formation of a network media theory, this paper will conclude with a consideration of tactical art projects as one suitable approach.

Network Cultures

This discussion is situated within the disciplinary remit of 'network cultures' understanding new online media practices as endemic of a broader societal condition in which a distributed network topology supplants centralised and hierarchical models as the dominant cultural, social, political and economic organisational logic.

It is necessary, therefore, to begin with a brief disambiguation of the term 'network' as it is used within this paper. There are growing ambiguities around the term 'network' arising from its application across different disciplines: referencing a technical assemblage such as transport or electricity, or in the sociology of organisation, used to quantify institutions, markets and states, whereby the network represent an informal way of associating together human agents. In the context it is applied in this discussion, which draws from Manuel Castells onwards, the two meanings merge, since the 'network' becomes a privileged mode of organisation thanks to the very extension of Information and Communication Technologies. [1] A 'media public' therefore, as an assemblage formed around the production and distribution of online culture, is an example of one such network, including the producers and consumers of content, the content in question comprising text, voice or rich media, and the underlying technical assemblages which facilitates its transmission. This is comprised of contingent logical and physical strata; the higher level protocols and services implemented in software, and the lower substrate network, comprising tangible hardware such as user devices, transmission technologies and the available physical resources such as spectrum, bandwidth, real estate, man power and energy.

Its clear therefore that the 'media public' is a complex assemblage comprising not only human relationships but a whole range of logical and physical resources. These may be mutually supportive, but just as often they are structurally contradistinctive or otherwise opposed. Where the media public as a progenitor of a rich online culture is contingent on technical infrastructure, our analysis should also proceed towards the complex and iterative relations between network layers, in particular the mutual enforcements or structural antagonisms that might alternatively constrain or enable the emergence of an autonomous cultural collective.

Media Publics

Common terms for media publics such as Howard Rheingold's 'Smart Mobs', Mimi Sheller's 'Mobile Publics' and Kazys Varnelis 'Networked Public' model all converge on the idea that recent technological transformations inherent to ICT architectures herald a correspondent shift in the collaborative media practices developing over these. [2] [3] [4] The 'media public' emerges as a counter-capitalist ideology whereby technical affordances in the network are thought to disintermediate controlling interests and facilitate an autonomous networked information economy. [5] These affordances include a consumer electronics culture that places the means of immaterial production in the hands of a majority, the primacy of distributed topologies and non-discriminatory protocols over traditional centralised communications, and a consequential shift from the audience as passive consumer, towards the ambiguous subjectivity of the 'produser' as an active agent in non-proprietary culture. [6] These broad transformations

are in turn associated with peer-to-peer economies, an inherently democratic mode of governance, an invigoration of the public sphere, and the emergence of an online collaborative culture sustained through voluntary production over the network.

With the emergence of Web 2.0 platforms that emphasise collaborative production and content-centric architectures, and the subsequent progression of these activities beyond the desktop to mobile and pervasive contexts, the advocates of online collaborative culture identify a relative increase in the role of nonmarket practices taking place around the collective exchange of mobile information, knowledge and culture. These include frameworks such as Open Source, User-Generated content, DIY Production and Grass Roots Media. These theorists see the immaterial culture of the media public progressing outwards into hybrid space, as an online culture that has potential social, juridical and economic implications for real world cultures and material economies. Mobile networks are a space in which this intersection is thought to be particularly prevalent, representing a point of intersection between virtual and physical practices.

This paper identifies certain issues with the theoretical frameworks that underpin the dominant ideology of media publics. These are based on two interrelated criticisms:

The first claims that cultural studies of online media publics avoid a full consideration of the technological infrastructure underpinning online culture. While ICT technology is the necessary precondition for a networked public, its physical concatenations are again and again rendered immaterial in favour of the generalised tropes of links, webs and globalised interconnectivity. Network cultures frequently fail to take into consideration the politics of the material substrate, its counter purposes, proprietary origins and deep structural organisation, promoting instead a benign equivalence between superficial traits of the technical architecture and modes of autonomist social organisation. Too often the technical system is taken at face value and its agency is not fully explored.

Tensions frequently emerge between an online culture based on voluntary production and loosely woven collaboration and the organisational and economic logics of the material systems that underpin these media publics, such that a non-proprietary culture at a content layer might be subsumed, expropriated or otherwise conflicted by proprietary or controlling interests underpinning the network. An example of this can be gleaned from a consideration of current mobile networks. On the one hand, the distribution of networking capabilities within everyday spaces and contexts is frequently associated with new forms of collaboration, political economy and public activism. At the same time, it is increasingly clear that these networks are also aligned with new economic frameworks and powerful forms of governance that thrive on decentralisation, monitoring behaviours, extracting surplus value from user-generated content and otherwise surveying, exhausting and constraining online cultural activities. The reality is not a dialectic in which dominant or subaltern forces are externally located. Proprietary and non-proprietary, liberatory and controlling agencies are endogenous to the network, and frequently operate in symbiosis, producing complex and emergent behaviours.

Which brings us to our second criticism, namely an identification of alternatively social or technologically deterministic analyses in the literature on media publics. Research in social media continues to employ linear-causal models of analysis that all too easily equate centralised communication technologies with proprietary frameworks and the distributed topologies of communication networks with inherently democratic media practices, failing to attend to the many ways in which collaborative online culture is generated in diverse relations between human and non-human actors. Even as the research pays lip service

to the language of complexity or critical reflexivity, studies fail to account for the dynamic and iterative qualities of sociotechnical networks.

Episodic Networks

The complexity of the mobile publics can be illustrated with reference to an obviously sociotechnical assemblage: forms of mobile ad-hoc, and delay tolerant networks that are often termed episodic, opportunistic or pocket-switched networks. 'Episodic' describes a network whose topology is constantly performed and negotiated through pair-wise connectivity between mobile devices. Unlike the majority of networks that rely on relatively stable material infrastructure in the form of fibre-optics, cables, base stations and routers etc., episodic networks are by definition contingent, their elements dynamically re-configuring based on necessity and circumstance. Episodic networks route data through a network of mobile peers. Each peer (human) forms a node within the network, transferring data from device to device without the aid of a centralising relay structure. Nested in human interaction, the concept of the 'people as network' is increasingly resonant. These networks utilise everyday patterns of mobility and varied and sporadic forms of connectivity between strangers and familiars in dense environments to leverage a dynamic network topology for the distribution of media content. The value of the system is correlative with the user's social connection to others in a networked space. In principle they facilitate the production of self-organising groups, bypassing the hierarchical structure of traditional mobile communications to form peer-to-peer reconfigurable communications with individuals in proximity to a user.

The episodic network is discussed here more for its heuristic value than its relevance to current network architecture. However, there is evidence of the increased relevance of such topologies in future mobile networks, with 4G and LTE supporting various mesh-like topologies that resemble ad hoc modes of connectivity. Initially theorised in the 1970s as an emergency service and valorised in the early noughties, they are increasingly discussed as a viable component of future mobile media architectures. Principally designs for episodic networks concerned the exchange of text-based files or operational instructions for proximate devices in a user's environment, but more recently following the exponential growth of content-centric activities on mobile and wireless networks, the episodic network has re-emerged as a potential strategy for the dynamic exchange of rich media content in real spaces and a form of data-of-flooding for increasingly congested wireless network spaces.

Undersound is a proposal for music exchange on the London Underground. [7] It utilises an episodic network topology within the transport system itself for the opportunistic exchange of audio files. These files are associated with static terminals in train stations throughout the city. Users can upload and download tracks at these centralised points and exchange them using software on mobile internet devices such as a phone. Users on the tube can browse each other's playlists in transit and choose to share and distribute music between devices. The system also includes algorithms for monitoring media consumption/distribution patterns and the propagation of files throughout the network. When a user re-connects to an upload point at a station, therefore, metadata concerning file exchanges and relational patterns are also automatically uploaded to the network and subsequently used to model sociality and media-exchange occurring within the underground. The designers of Undersound theorise this data as informative to the future design of social media networks that utilise context-aware information to enable file transfers and opportunistic sharing. [8]

At first glance these networks are every promising architectures for the kinds of user-generated practices that are typically associated with optimistic accounts of media publics. It can be argued that the distributed topology of the network and the nesting of technical agency in everyday environments leverages a public brought together around the dynamic exchange of information and rich media content. But such an easy analysis fails to account for the complex characteristics of the network that emerge through the relations between the social and the technical. Through an iterative analysis of the episodic network, we can explore how social behaviours and everyday habits are aggregated by proprietary devices and platforms and subsequently utilised: as valuable metadata for proprietary interests, as dynamic information that informs decisions at the logical layer of the network, and as quantitative research that informs the design of future network architectures.

A large amount of information can be gleaned from episodic networks. These include a whole range of user-generated content both consciously and unconsciously produced from demographic, geographic, social and even biometric data. In terms of social network analysis, information about everyday sociality; who we come into contact with and for how long, what value we, as individuals, offer as a node in the network and broad mobility dynamics concerning our movement as a group are all important data for determining the reconfigurable topology and routing protocols implemented by the network, its efficiency, and overall performance. Secondly, meta-data collected through often deeply embedded processes running on proprietary devices or fixed points of infrastructure are lucrative forms of user-generated content. Just as this data forms the economic base of fixed internet conglomerates such as Facebook and Google, this mobile data is associated with a significant market value, further leveraged by context and geo-spatial data provided by a mobile network. Mobile episodic networks therefore provide ideal platforms for the expropriation of contextual metadata that can be sold to external corporations looking to enhance, rationalise and personalise marketing and advertising,

This raises some questions: How do these systems quantify human sociality as inherently productive of valuable? What kinds of collaboration or sociality are subsequently encouraged or normalised? How is the production of user-generated content on such a network used to advance the interests of corporations, expropriate the value of creative practices and ultimately constrain the formation of an autonomous culture?

The situation we witness therefore is not only the creation of new social practices, but furthermore, the controlling, monitoring and expropriation of these through mechanisms facilitated by the architecture of the network itself.

Conclusion

In the highly mediated spaces of online culture, it's clear that we require a critical awareness of the sociotechnical geographies of enablement and constraint operating across all layers of the network. The previous illustration still only gestures towards this complexity. We require approaches that can move across methods and trans disciplines traditionally aligned with the humanities or the sciences and appropriate complex, emergent behaviours.

While a number of approaches from the Philosophy of Science and the Science of Complexity provide useful starting points, the previous discussion points toward the need for practical methods that are themselves immanent to the network. Described as an intermediary between artistic and ethico-political activism, tactical media provides a frame from which to categorise a variety of extra-curricular methods

through which a sociotechnical system might be made visible. These include practices such as the tracing or mapping of connections, the fictionalisation, inversion or reflexive exploration of networks, and the misuse, recontextualisation, exploit, or abstraction of economic, social and political processes through technological media.

Umbrella.net for example is an episodic prototype developed by a team of artists working in the Network and Telecommunications Research Group in Trinity College Dublin[9]. The work in question comprises a coincident network in which everyday items, in this case an umbrella, activate an ad hoc network when they are deployed in public. The network itself, from a commercial perspective, can be theorised as a solution without a problem, (why would you need a network only when its raining?) but from a heuristic perspective it allows a user to trace the layers of contingency between social circumstances, and pervasive technologies, to expand forms of assembly and ultimately make mediators of constituents that would otherwise be intermediaries. While it is beyond the scope of this short paper to explore the spectrum of relevant work in detail, the reader is referred to a number of tactical media practices useful to the study of mobile publics such as work across Locative Media, 'Hactivism', forms of data sonification and data visualisation, and critical Net-Art. These propose oblique ways of critiquing, imagining and disassembling the mobile public in the character of the techniques and apparatuses that came to structure it.

References and Notes:

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