

Theorising digital society

In this chapter I introduce the dominant theoretical perspectives that will be drawn upon and developed further in the other chapters. These perspectives are by no means exhaustive of all the interesting work that has been published relating to digital society, but they represent some of the approaches that I have found some of the most intriguing for developing digital sociology.

THE GLOBAL INFORMATION ECONOMY AND NEW FORMS OF POWER

Contemporary social theory has increasingly represented societies in the developed world as characterised by networks, across which information circulates and spreads. The emergence of new ways of developing social networks via online technologies such as social media platforms has inspired many sociologists and other social theorists to devote their attention to how these technologies are shaping and reshaping social lives.

Manuel Castells is one influential writer on the sociology of digital networks. His concept of 'network society', as expressed in several books and articles (e.g. Castells 2000a, 2000b, 2012), positions networks as the basis for contemporary societies' structure and power relations. In what Castells characterises as 'the information age',

industrial processes have been superseded by electronic communications facilitated by the new information technologies. Power is now multidimensional, residing in networks such as the global financial, political, military–security, information production, criminal and multimedia networks. All these networks are involved in defining the rules and norms of societies. Castells asserts that digitally mediated information has become key to economic productivity. Knowledge-based information technologies produce even more knowledge and information, contributing to a new information-based economy that is dispersed globally and is highly interconnected, using digital and other networking technologies and practices. According to Castells, digital technologies such as social media have played a major role in creating a new social structure, global economy and a new virtual culture. His work has led the way in acknowledging the importance of these technologies in contemporary social formations.

The features of new ways of knowing about the world, new forms of information and novel commercial uses for digital data have received attention from several other sociologists. They have argued that digital technologies have changed the ways in which economic value is produced and distributed and commodities conceptualised (Beer 2013a; Featherstone 2009; Lash 2007; Mackenzie 2005; Savage and Burrows 2007). According to these writers, knowledge itself has become transformed via these processes. Many cite Nigel Thrift's (2005, 2006) writings on the information economy and what he entitles 'knowing capitalism' to support their position. Thrift argues that the capitalist economic system is increasingly turning to information as a source of profit, underpinned by increasing the rate of innovation and invention through refigurings of space and time. The affordances of the internet have contributed to this move. Digitisation has the effect of rendering knowledge into information that can easily be accessed via digital technologies. The internet is configuring a new scholarly apparatus that engenders different modes of research, scholarship and communication (Featherstone 2009).

The internet empires (or 'megaplatfroms') of the Google, Facebook, Apple and Amazon companies have dominated the digital world and changed the ways in which knowledge is produced and reproduced. The term 'Googilization' (Vaidhyanathan 2011) has been used to describe the ways in which the Google company has expanded its influence into many domains of social, economic and political life. Google is viewed as exerting a powerful effect not only on the ways in which search engines operate and the aesthetics of platforms and apps, but also education, academia, information services, social research, advertising, geographic services, email, publishing and web commerce.

On a broader level, each act of communication via digital media has become a valuable entity by being transformed into digital data that can be aggregated into massive data sets. Whether it is a like on Facebook, a comment on Twitter or a search engine enquiry, these acts of communication have become commoditised. Many commercial and government agencies and organisations now collect and use digital data as part of their operation. A digital data economy has developed, built on techniques of accessing digital data from the various archives in which they are stored for commercial purposes. Where once it was the physical labour of workers that produced surplus value, now the intellectual labour of the masses has monetary value, constituting a new information economy in which thought has become reified, public and commodified (Smith 2013; Thrift 2005, 2006).

It has been contended that power relations are shifting now that the digitised coding of people, things and places has become ubiquitous. Power now operates principally through modes of communication (Lash 2007; Mackenzie 2005; Mackenzie and Vurdubakis 2011; Smith 2013). Instead of the structural model of power that tended to represent societies as systems of largely fixed hierarchies, this approach views power as horizontal, rhizomatic, fluid and dynamic. The mass media are no longer viewed and theorised as 'top-down' mass persuaders, able to manipulate the masses to which they are disseminated and representative of the monopolistic concentration of power over public representations. Rather, it is acknowledged that the new mobile and interactive media embodied in Web 2.0 platforms and devices are dispersed, multimodal, a web of nodes that incorporate prosumption but also constant surveillance and information-gathering on users (Beer 2013a; Beer and Burrows 2010; Lash 2007; Smith 2013). The old media exerted power over the content of the messages they disseminated but had little knowledge of their audiences. In contrast, the new media not only incorporate content from their audiences but know their audiences in ever finer-grained detail (Beer 2013a; Best 2010; Featherstone 2009).

This is a perspective that adopts a Foucauldian approach to power in its emphasis not on the merely repressive dimensions of power relations (the traditional sovereign model of power in which an authoritative individual or group exerts power coercively over subjugated citizens), but on its everyday, dispersed and often voluntary nature. Power produces capabilities and choices at the same time as it delimits them (Foucault 1995). Lash (2007: 70) argues that via the newly digitised information economy and its 'neo-commodities' of data, a type of 'post-hegemonic power' operates in increasingly subtle ways. This 'leaking out' of power from the traditional hegemonic

institutions to everyday, taken-for-granted practices means that the age of ubiquitous computing and ubiquitous media is also that of ubiquitous politics. Power becomes immanent to forms of life, and thus is not recognised as such because of its invisible and taken-for-granted nature (Lash 2007: 75).

For Lash (2005, 2006), the global information society is characterised by openness of systems, non-linear movement and flux as well as flows of information. Lash (2006) notes that flux is characterised by tensions, struggles for power, whereas pure flow presupposes unrestricted movement. He argues for the importance of 'putting flux back into the flows': to problematise the smoothness of flows of information, 'to develop a global politics of flux versus flow' (Lash 2005: 17). This distinction between flux and flow of digital networks and data is an important one. It contravenes a dominant representation of digital data as circulating freely (as in the more utopian visions of writers such as Castells), and emphasises that there are difficulties and blockages in the flows inherent to the global information society.

DIGITAL TECHNOLOGIES AND DATA AS SOCIOMATERIAL OBJECTS

The focus on the ceaseless movement of digital data, while accurately articulating the networked nature of contemporary societies and the speed and ease with which information travels across the networks, also tends to obscure certain dimensions of digitisation. As sociologists and other social theorists have begun to argue, digital data are neither immaterial nor only minuscule components of a larger material entity. This perspective adopts a sociomaterial approach drawn from science and technology studies, an interdisciplinary field which has provided a critical stance on media technologies in general, and computerised technologies more specifically. In recent years, actor network theory, drawing on the work of sociologist of science Bruno Latour (e.g. Latour 1987, 2005), has achieved a dominant position in science and technology studies. In emphasising the role and agency of non-human actors in shaping human actors, actor network theory directs attention at the materiality and heterogeneous nature of human experience and subjectivity. Exponents contend that humans are always imbricated within networks comprised of human and non-human actors and cannot be isolated from these networks. This perspective has proven to be an insightful approach in scholarship on digital society, particularly in relation to understanding such digital phenomena as networks, social media platforms and data.

The concept of the assemblage is a useful way of understanding the hybrid phenomena that form when human and non-human actors

interact. Drawing on actor network theory as well as Deleuzian philosophy, the assemblage concept denotes an intermingling of the human and non-human in various dynamic ways (Haggerty and Ericson 2000; Latour 2005; Latour *et al.* 2012; Marcus 2006; Palmås 2011). The assemblage provides an approach to understanding the individual's relationship to and use of digital technologies that emphasises that each actor, whether human or non-human, shapes the other in a mutually constitutive relationship. It also provides a theoretical basis for understanding how nonhuman actors interact with each other, as takes place in the Internet of Things.

Assemblages are viewed as 'messy objects' in their complexity and mutability (Fenwick and Edwards 2011). Thus, for example, Fenwick and Edwards (2011) discuss the ways in which data and the devices used to create them have become a driving force in contemporary education, shaping decisions about what to teach students and how to use resources. By this process, the education system is rendered accountable to the data that are collected, used to monitor and calculate student learning outcomes. This massive and complex data-gathering assemblage used for governance purposes, however, is precarious, open to contingencies and messiness by virtue of its sheer size and complexity, its enrolment of many diverse agents and the possibility for gaming the system or engaging in resistant acts: cheating on test scores, for instance, or when teachers refuse to administer standardised tests, or when the data are subjected to contestations and challenges about what they really demonstrate. Counter-networks emerge to challenge existing networks, so that the power of a network of actors is never assured.

In this literature, the digital data objects that are brought together through digital technologies – including 'like' or 'share' buttons, individuals' browser histories, personalised recommendations and comments on social media posts as well as the hardware and software that structure the choices available to users – are assemblages of complex interactions of economic, technological, social and cultural logics (Caplan 2013; Langois and Elmer 2013; Mackenzie 2005; Mackenzie and Vurdubakis 2011). Representing digital phenomena as objects serves the purpose of acknowledging their existence, effects and power (Caplan 2013; Hands 2013; Langois and Elmer 2013; Marres 2012).

The cultural and political analysis of computer software is sometimes referred to as software studies. Writers in software studies place an emphasis not on the transmission or reception of messages, as in the old model of communication, but rather have developed a socio-material interest in the ways in which acts of computation produce

and shape knowledges. Computer codes are positioned as agents in configurations and assemblages (Fuller 2008), producing what Kitchin and Dodge (2011) refer to as 'coded assemblages'. Indeed, the pervasive nature of software in everyday life is such that Manovich (2013b) argues that it has become 'a universal language, the interface to our imagination and the world'. He contends, therefore, that social researchers should be conceptualising people's interactions with digital technologies as 'software performances' which are constructed and reconstructed in real time, with the software constantly reacting to the user's actions.

Software is no longer static: it is constantly responding to inputs from its users and from other networked systems: updating data, recognising location as the user moves around in space, noticing what activities the user is engaging in on her or his device (Helmond 2013; Manovich 2013a; Rogers 2013). Manovich (2013a: 36) gives the example of a user engaging with the Google Earth platform. Due to the constantly updated nature of Google Earth, each time the user accesses the platform she or he is viewing a 'new Earth', with new data available. Similarly, many Wikipedia entries are dynamic, being updated or edited regularly. Users can also create 'mashups' by bringing information from a range of digital platforms together in completely new and individually customised ways. Because these technologies are interactive platforms, they are subject to constant renewal and change, including changes contributed by users themselves. This is a completely new way of understanding and experiencing the nature of 'information' itself. As Manovich (2013b) comments, humans and software interact in ways that can be difficult to disentangle from each other:

What are interactive-media 'data'? Software code as it executes, the records of user interactions (for example, clicks and cursor movements), the video recording of a user's screen, a user's brain activity as captured by an EEG or fMRI? All of the above, or something else?

Digital data are also positioned as sociomaterial objects in this literature. Whereas many commentators in the popular media, government and business world view digital data as the ultimate forms of truth and accurate knowledge, sociologists and other social theorists have emphasised that these forms of information, like any other type, are socially created and have a social life, a vitality, of their own. Digital data objects structure our concepts of identity, embodiment, relationships, our choices and preferences and even our access to services or spaces. There are many material aspects to digital data. They are the

product of complex decisions, creative ideas, the solving and management of technical problems and marketing efforts on the part of those workers who are involved in producing the materials that create, manage and store these data. They are also the product of the labour of the prosumers who create the data. These are the 'invisible' material aspects of digital data (Aslinger and Huntemann 2013).

Algorithms play an important role in configuring digital data objects. Without the knowledge of digital technology users, algorithms measure and sort them, deciding what choices they may be offered. Digital data objects aggregated together, often from a variety of sources, configure 'metric assemblages' (Burrows 2012) or 'surveillant assemblages' (Haggerty and Ericson 2000) that produce a virtual *doppelgänger* of the user. Algorithms and other elements of software, therefore, are generative, a productive form of power (Beer 2009; 2013a; boyd and Crawford 2012; Cheney-Lippold 2011; Mackenzie 2005; Mackenzie and Vurdubakis 2011; Ruppert *et al.* 2013).

Scholars who have adopted a sociomaterial perspective have also highlighted the tangible physicality of aspects of digital technology manufacture and use. Despite the rhetoric of seamless, proficient operation that so commonly is employed to discuss the internet and ubiquitous computing, the maintenance that supports this operation is messy and contingent, often involving pragmatic compromises, negotiations and just-in-time interventions to keep the system working. Geographical, economic, social, political and cultural factors – including such basic requirements as a stable electricity supply and access to a computer network – combine to promote or undermine the workings of digital technologies (Bell 2006a; Bell and Dourish 2007, 2011; Dourish and Bell 2007). The materiality of digital hardware becomes very apparent when devices that are no longer required must be disposed of, creating the problem of digital waste (or 'e-waste') that often contains toxic materials (Gabrys 2011; Miller and Horst 2012).

Given the high turnover of digital devices, their tendency towards fast obsolescence and the fact that they are often replaced every few years in wealthy countries by people seeking the newest technologies and upgrades, vast quantities of digital waste are constantly generated. The vast majority of discarded digital devices end up in landfill. Only a small minority are recycled or reused, and those that are tend to be sent from wealthy to poor countries for scrap and salvaging of components. When they are outmoded and discarded, the once highly desirable, shiny digital devices that were so full of promise when they were purchased simply become another form of rubbish – dirty, unsightly and potentially contaminating pollutants (Gabrys 2011). The

electricity supplies that power digital technologies and digital data storage units themselves have environmental effects on humans and other living things, such as the release of smoke and particles from coal-fired electricity generating plants. 'The digital is a regime of energies: human energy and the energy needed for technological machines' (Parikka 2013).

The materiality of digital objects is also apparent in debates over how and where digital data should be stored, as they require ever-larger physical structures (servers) for archiving purposes. Despite the metaphor of the computing 'cloud', digital data do not hover in the ether but must be contained within hardware. Furthermore, digital data are very difficult to erase or remove, and thus can be very stubbornly material. At the same time, however, if stored too long and not used, they may quickly become obsolete and therefore useless, if contemporary technologies can no longer access and make use of them. Digital data, therefore, may be said to 'decay' if left too long, and may be lost and forgotten if they are not migrated to new technological formats. Digital memory is volatile because the technologies used to store and access data change so quickly. Analogue materials that are rendered into digital form for archival purposes and then destroyed may therefore be lost if their digital forms can no longer be used (Gabrys 2011).

PROSUMPTION, NEOLIBERALISM AND THE SHARING SUBJECT

As noted above, in the global information economy a kind of digital vitality has been generated, in which information and data have taken on value in themselves. The practices of prosumption are major contributors to this economy, providing constant streams of information about the preferences, habits and opinions of digital technology users that can then be used for targeted marketing, advertising and other commercial promotional purposes (Beer 2009; Beer and Burrows 2013; Ritzer *et al.* 2012). Many users of social media enjoy creating content such as writing comments or blogs, producing fan sites or making mashups or digital graphic visualisations. Such activities can be a form of creative work. The opportunity for others to acknowledge or demonstrate their appreciation of the content can be a powerful motivating force for prosumption (Beer and Burrows 2013).

Some writers on digital society have discussed the broader political implications of the use and impact of digital technologies. Several have remarked upon the ways in which these technologies serve a neoliberal

political mode of governance. Neoliberalism is a political orientation that has taken hold across the developed world. Its main tenets are the notion of the atomised human actor who is responsible for her or his life chances and outcomes, the power of the market economy and competition in achieving the best outcomes for all and the withdrawal of the state from providing support services to the socioeconomically disadvantaged. The ideal subject, according to neoliberal principles, is self-regulated and takes responsibility for her or his own destiny. Individuals are expected and encouraged to be self-reflexive, or to view their lives as projects that require entrepreneurial investment of time and energy (Ventura 2012). Neoliberalism underpins many dimensions of sociological theorising in response to digital technologies, including sociologists' identification of the ways in which the surveillance and monitoring functions afforded by these technologies may be used in the interests of promoting self-management and competitive behaviours over state regulation and intervention.

Prosumption may also be theorised taking up Foucault's work on the practices of selfhood that make up human actors: those activities that are directed at self-care or self-improvement (Foucault 1988). Through these technologies, people learn about their environment and the other people with whom they share their lives. Indeed, it has been argued that social media platforms such as Instagram and Facebook encourage the production and circulation of greater intimate knowledge about and between participants than ever before. These technologies, via status updates and visual imagery, allow friends and family members who may not live in the same geographical area and who rarely meet face-to-face to engage regularly with each other across space and time. They construct a chronological account of various aspects of a person's life that they wish to share with friends or followers: in the terminology of Facebook, indeed, a 'timeline' combining words with photos or videos to present the user's persona. However, the regular and continued use of these technologies also demands a type of work – social labour – to conform to the demands of these media and those with whom users interact (Fuchs 2012; Lambert 2013; Marwick 2012; M. Sauter 2013).

Foucault's writings on the confession in his *History of Sexuality* (1979) have also been taken up to theorise the ways in which people configure and represent themselves on social media sites as part of ethical self-formation. It is argued that as part of the moral economy of many forms of social media, users of these media are incited to confess or reveal aspects of their private lives to other observers, who may choose to comment on or otherwise demonstrate approval or disapproval through such functions as 'liking' or sharing the content.

By both revealing the intimate details of their lives and responding to others' reactions, users may engage in self-reflection and self-improvement as well as participating in the evaluation of others' actions and practices. Such social media use may therefore be thought as an ethical and social practice that contributes not only to self-formation but the reproduction of social norms and expectations to which people are expected to adhere (Boellstorff 2013; Marwick 2012; T. Sauter 2013).

Theorists who have sought to position social media participation in the context of the global knowledge economy have contended that digital entrepreneurs and companies are able to sell more to consumers through the harnessing of the enthusiasms of consumer communities, the automating and mass dissemination of 'word of mouth' and the use of algorithms to make suggestions about future purchases based on past choices. The commodity is not only the item that is sold but information about the item and its consumers as well as the communities that form around consumption that themselves generate value by producing information and innovative ideas as well as generate experiences for the consumers involved that have value for them (Beer 2013a; Beer and Burrows 2013; Thrift 2005, 2006).

Cultural studies scholars such as Henry Jenkins and his collaborators (Ford *et al.* 2013) are interested in what they term 'spreadable media' or media produced digitally that circulate or 'spread' across multiple sites, platforms and cultures in messy and difficult to govern ways. They contend that users' choices about sharing digital content with others are reshaping the media landscape, representing a shift from distribution to circulation. Producers of content attempt to make their content in ways that will inspire users to share it with their friends or followers via social media. To achieve this, the content has to be meaningful in some way to the person who redistributes it, thus involving active participation and decision-making on their part (Ford *et al.* 2013). The term 'spreadable' is used to denote the properties of media content that render it more or less easy to share and distribute. It includes technical resources, economic structures, attributes of the content itself and the social networking devices and software that facilitate circulation. It differs from, although is related to, 'sticky' content or 'destination viewing' – content that is located in a specific media site to which the content producers attempt to attract audiences. 'Sticky' content becomes 'spreadable' when it moves from a static position on a media site to other destinations across the cultural landscape (Ford *et al.* 2013).

The concept of the sharing subject is central to spreadable media. The sharing subject seeks to recirculate content as part of their identity

and participation in social networks and communities, harbouring the belief that such sharing will have an impact on their networks and contribute to conversations (John 2013; Payne 2012). In 'communicative capitalism' (Payne 2012), media companies and corporations actively seek to monetise content sharing and circulation – to achieve 'virality' – and to direct this in ways that contribute financially to themselves but not to the creators of the content. The media industry quickly learned to co-opt the creative efforts of fans engaging in prosumption, for example, as part of their attempts to sell ever more products to these fans. Fans were manipulated into becoming the marketers for media products, helping to publicise them by their prosumption practices and their generation of metadata (Bird 2011).

Thus simultaneous discourses of participatory democracy (Beer 2009, 2013a) and (far less overt) that of capitalising upon and delimiting this freedom operate in many social media platforms. Critics contend that these technologies are one dimension of a vast network of systems of monitoring, measuring and regulating the population and subgroups within the population that direct attention at individual behaviours rather than social processes. Social media, for example, are often represented as promoting individual creativity and freedom via the opportunities they offer for prosumption. But there remain well-defined limits to how this creativity and freedom of expression are allowed to operate. Some writers draw on political economy perspectives to highlight the lack of access many people still face and the discrimination and exploitation that are inherent in many digital relationships and in the manufacture of the technologies themselves. Marxist thought lives on in several critiques of digital technologies, as particularly exemplified by the work of Fuchs and collaborators, who have written about the exploitation of prosumers on sites such as Facebook and also the poor working conditions faced by paid workers engaged by the computer hardware and internet empires (Fuchs 2011, 2012, 2014b; Fuchs and Dyer-Witheford 2013).

These commentators emphasise that many platforms that encourage prosumption practices are also attempting to monetise these activities in classical capitalist endeavours. Counter to the idealised notion of the sharing subject that can be creative and resistant to dominant discourses, industry has begun to use this ideal for its own ends. Differential power relations and exploitation, therefore, are reproduced on the internet just as they are in other social sites, challenging taken-for-granted assumptions about the 'democratic' nature of the internet. The interests of the corporate entities that established the Web 2.0 tools and platforms that encourage content creation and sharing often differ from those who are creating the content, who are

seeking democratic participation and support the ethos of sharing as a gift (John 2013). The 'moral economy' of content creation and sharing conflicts with the capitalist economy of those who seek to gain financially. Content producers and sharers are engaging in unpaid labour which, to them, has affective and moral value, the surplus value of which financially benefits others (Bird 2011; Ford *et al.* 2013; Fuchs 2012; Fuchs and Dyer-Witheford 2013; Lupton 2014a; Payne 2012). The terms of service of the platforms that prosumers use are more frequently making clear that the content they contribute to these platforms does not belong to them, but rather to the developers of the platforms (Lupton 2014a). People's creative efforts, therefore, have become harnessed to the media and data industries, but many of them may not be fully aware of this, particularly if they do not closely read the terms and conditions of the platforms they use or if the platforms are vague about how they use the data that are uploaded by users.

THE IMPORTANCE OF THE ARCHIVE

The specific features of how digital data are produced and the ways in which these data are now archived are vital to how they are understood as new forms of social data. The internet is a living archive: it generates, stores, distributes and transmits data (Smith 2013). Online archives have become complex and self-referential, such that 'There are archives on the Internet. There are archives of archives on the Internet. There are archives of the Internet. And then there is the Internet itself as an archive and as archival' (Smith 2013: 383). Digital archives render digital data searchable and distributable, both essential features that contribute to their apparent value. Given that the current global information economy depends on these processes, questions arise concerning the politics of the knowledge kept in these archives, the politics of ownership and control of these data and the politics of the human, or the privacy rights and identities that may be challenged by the existence of these archives (Smith 2013).

Beer and Burrows (2013) identify four components of popular cultural digital data archives. These components include profiles, or the information that users enter about themselves to take part in online activities and linkages and data intersectionality, or the connections that are made between digital devices, sites or platforms, each containing data derived from different methods. Another component feature of digital data is metadata or tagging practices. The final component feature is that of play: the ludic dimensions of using digital media as part of popular culture that generates data. Beer and Burrows

then go on to outline a framework of four interrelated and overlapping types of digital archives related to popular culture in which these data are stored, based on the content. The first is that of transactional data, or data produced via the vast range of routine activities in which computer users engage online, whether using their own device or as part of a broader organisation's digital system. These data are produced via such activities taking place online as banking and purchasing, searches, customer loyalty programmes, ticket booking, interactions with government agencies and the like. Examples of these types of archives include Amazon, Spotify and iTunes. These archives contain both the cultural forms that are consumed and the data that users generate as part of their consumption (on their preferences, for example). Next, Beer and Burrows suggest the archive of the everyday, in which digital data about people's everyday activities, social relationships, likes, friends and followers are stored via such platforms as Twitter, Facebook, Tumblr, YouTube, Flickr and Instagram. The third type of digital archive they identify is that comprised of viewpoint or opinion commentaries, typically expressed on digital forums such as online news sites, blogs/micro-blogs and websites that specifically elicit users' opinions or ratings on goods, products, services or celebrities, such as Patient Opinion, Amazon and Trip Advisor and various websites that have been established for the fans of celebrities or sports teams. Finally, there is the crowdsourcing archive, created by users contributing data specifically to create new forms of knowledge via aggregates of data or to raise money for enterprises. Examples of this archive are Wikipedia, Kickstarter, Quora and PatientsLikeMe.

Many other digital data archives that are not directly related to popular culture exist, such as those generated by government agencies, educational institutions, healthcare services, security organisations and corporations. Many organisations are realising the value of digitising and archiving data. Census data, for example, is archived by the government agency that collects it. Increasing numbers of digital data sets are collected by educational institutions to monitor and track their students' progress by creating 'learning profiles'. Various healthcare agencies and services are attempting to bring together medically related digital data on the patients they treat, including electronic medical records. Museums and libraries are increasingly using digital methods to preserve material in their archives. Organisations such as the New York Philharmonic have created digital repositories for such material as programmes, scores, images, business documents and audio material. Universities use e-repositories to collect their researchers' output, and academic journals now publish their material online in searchable archives.

Much of this material remains accessible on the web, perhaps permanently, meaning that retrospective surveillance over a historical time period can easily be performed. What has been described as ‘the right to be forgotten’ has subsequently received much attention by media and legal researchers as part of the new legal specialisation of digital privacy rights (Rosen 2012). It has been argued, indeed, that we are now living in an era characterised by ‘the end of forgetting’, in which digital data linger indefinitely as forms of recording and archiving information (Bossewitch and Sinnreich 2013). Because they are machines, and not the fleshly brain-matter upon which traditional memory relies, digital technologies are viewed as providing more accurate records of events. Digital technologies act as ‘cognitive prostheses’, their records extending, enhancing and even replacing memories (Bossewitch and Sinnreich 2013: 226).

DIGITAL VEILLANCE

Another important theoretical perspective that is relevant to digital sociology is that offered by scholars contributing to the literature onveillance (watching) in contemporary societies. Due to digital and other surveillance technologies, the social sphere has become heavily mediated, with new technologies extending the field of vision in public space and opportunities for monitoring and recording the actions of individuals (Biressi and Nunn 2003; Bossewitch and Sinnreich 2013). Watching in everyday life, frequently undertaken using digital technologies, has become normalised as a life-practice, part of the constellation of the configuration of identity and embodiment (Ball 2014; Rosenzweig 2012).

It has been observed by many commentators that the vast masses of digital data that are generated by security technologies, devices and apps and stored on platform archives may be used for various forms of watching. The data that are collected when people use the internet, as well as the content that they upload and share with others as part of their prosumption practices, are subject to monitoring and oversight by various other actors, including digital developers and companies and one’s friends and followers on social media. Indeed, this type of monitoring and collection of data on the users of online technologies has become a central dimension of the digital information economy. Digitalveillance is not only an apparatus of government security agencies, but is integral to the commercial economy and such institutions as healthcare, policing and the education system. Facilitated by the internet, a global surveillance economy and multifaceted

surveillant assemblage has developed, in which nations both collaborate in providing digital surveillance systems and advice and monitor each other using these systems (Ball and Murakami Wood 2013). The full extent of espionage activity that is undertaken using access to digital data has only recently been revealed by the Snowden files, which demonstrated that many nations are engaging in major, detailed digital surveillance of their own citizens.

Writers on the social, cultural and political dimensions of veillance have identified a number of different modes. In simple terms, surveillance denotes 'watching over', or 'watching from above', usually in relation to those in power watching over others (Mann and Ferenbok 2013). Digital surveillance is undertaken using technologies such as CCTV cameras, radio frequency identification chips (RFIDs) and the biometric monitoring that is undertaken by various agencies as part of security arrangements, as well as the surveillance practices carried out by commercial enterprises seeking to extract monetary value from digital data created by users. Sometimes people are aware that they are being watched using these technologies; sometimes such surveillance is covert. Digital surveillance may be coercive, used to punish or overtly discipline individuals or social groups, or it may be benign, a form of security or governance designed for efficiency and promoting economic growth or physical wellbeing.

Digital surveillance technologies differ from previous forms of watching in their pervasiveness, the scope of data they are able to collect and store, their potential longevity and the implications for privacy they evoke. These types of surveillance operate via digital recording of people's activities, the storage of these data in archives and the use of algorithms to generate and manipulate the data and to make predictions about people's behaviour. These surveillance data have a much longer life and capacity to be disseminated across time and space than previous forms of surveillance (Bossewitch and Sinnreich 2013; Mann and Ferenbok 2013; Werbin 2011).

Lyon and Bauman's (2013) book on 'liquid surveillance' makes extensive reference to the ways in which digital data circulate as part of systems of veillance. Building on Bauman's extensive writings on 'liquid modernity' and Lyon's body of work on surveillance societies, this book emphasises that due to the new practices and technologies emerging in late modernity, surveillance has become uncontained and pervasive. Liquid surveillance is the apotheosis of the move towards monitoring and measuring humans and non-humans. The mobility and ubiquitous nature of new surveillance technologies (many of which are digital) mean that it has become increasingly difficult for people to know when they are being monitored. Surveillance, thus, is

‘seeping and spreading into many life areas where once it had only marginal sway’ (Lyon and Bauman 2013: 3).

Digital technologies have intensified or generated new forms of veillance. I referred earlier in this chapter to the term ‘surveillant assemblage’, which has been employed to describe the ways in which digital data are used to create ‘data doubles’ (Haggerty and Ericson 2000). The surveillant assemblage is configured via the production and aggregating of various forms of digital data, producing a new kind of assemblage that is constantly changing as more data are produced. Bodies and identities are fragmented into a series of discrete components as digital data and reassembled via this process of reconfiguration. This assemblage then becomes the target of various forms of intervention: greater security measures, increases or reductions in social security payments, medical therapies, educational interventions and so on. Groups that once were not subject to routine surveillance are now targeted by the dispersed liquid technologies of digital surveillance (Haggerty and Ericson 2000).

Foucault’s writings have been very influential in writings on veillance, including those referring to digital devices. His work on biopolitics and biopower in particular has delineated the forms of watching and exclusion that involve the detailed monitoring of both individuals and populations. Foucault’s writings on governmentality, or the managing of populations by specific political rationalities, have also been taken up by scholars writing about forms of veillance that are used for such management. The influential concept of panoptic surveillance (Brignall 2002; Elmer 2003) draws on Foucault’s use of the metaphor of the panopticon in his *Discipline and Punish* (1995), itself derived from the writings of the English philosopher Jeremy Bentham. Panoptic surveillance is a feature of non-coercive disciplinary power involving the few watching the many. The panopticon is an exemplary prison in which a small number of prison guards watch a large number of prisoners from a central hidden position. The idea of this concept of watching is that because the prisoners are never able to tell when they are being watched, they learn to engage in self-discipline, internalising the guards’ regulatory gaze. The concept of CCTV cameras as a security measure relies to some extent upon this assumption: we are never quite sure if an operator is monitoring the images produced by the cameras, or even if they are actually turned on, so we may modify our behaviour accordingly.

Panoptic surveillance contributes to a politics of exclusion and inclusion that continues to operate in relation to the field of public visibility configured through and with digital surveillance technologies. People from specific social groups that are categorised as

the undesirable Other by virtue of their race, ethnicity or nationality, age or social class are subjected to far more intensive monitoring, identification as 'dangerous' or 'risky', and exclusion on the basis of these factors than are those from privileged social groups (Biressi and Nunn 2003; Werbin 2011). The term ban-optic surveillance (a variation of panoptic surveillance) has been employed to more specifically describe the use of data to ban or exclude certain individuals and social groups from particular regions, countries or public spaces, or from access to employment, social services, insurance and so on (Ajana 2013; Pavone and Esposti 2012; Sutrop and Laas-Mikko 2012).

Panspectric veillance (also sometimes referred to as dataveillance) refers to a broader range of digital technologies and uses of data. The panspectron is a concept developed by DeLanda (1991), again in response to the concept of the panopticon. DeLanda contrasted the panspectron with the panopticon, noting that the latter relies on human senses (mainly vision), while the former uses mostly digital sensors and signals to create large data sets for veillance purposes. DeLanda was writing almost twenty-five years ago, when the use of personal computer technologies was in its infancy, the internet was not available for widespread access and social media had yet to be invented. A more recent application of his concept of panspectric veillance notes its relevance to contemporary business practices involving the generation and use of large digital data sets about consumer behaviour. This generation of data also often involves the use of RFID chips embedded in consumer products to trace their distribution and consumers' buying patterns (Palmås 2011).

It is here that big data, algorithms and predictive analytics are playing important roles. Given these developments in the use of digital data, I would argue that yet another form of veillance using digital technologies has developed that is used increasingly more often as part of dataveillance and ban-optic surveillance: that of algorithmic veillance. The algorithms used to make decisions and predictions about the value of some consumers compared with others, based on their digital consumption activities, or even in some cases about the threat they may pose to others (as in identifying potential terrorists, criminals or illegal immigrants), act to exclude some individuals at the same time as they privilege and work to include others (Crawford and Schultz 2014; Lyon and Bauman 2013).

The practices of sousveillance (literally meaning 'watching from below') have also been promoted by the emergence of digital technologies that provide ordinary people with the means to watch others. Sousveillance involves citizens not only watching each other but also

conducting surveillance of those in authority. Many people now have access to devices such as smartphones, wearable computing (like Google Glass) and sensor-embedded technologies to capture images or information for their own use. It is often used in relation to citizen participation, citizen journalism and political transparency, as it is argued that the democratisation of surveillance has the effect of empowering citizens to watch and report on abuses of power on the part of the powerful (Ganascia 2010; Kingsley 2008; Mann and Ferenbok 2013).

Some writers have used the term *synoptic veillance* (Doyle 2011), the inverse of *panoptic veillance*, to describe social and other forms of watching which involve the many watching the few. This takes place in relation to fandom cultures, for example, in which celebrities post content on social media that is viewed and followed by many others. It also occurs when material that individuals who are non-celebrities have uploaded to social media sites such as YouTube 'goes viral', or attracts many viewers or followers. More specifically, a further new concept of *veillance*, *social surveillance* (Marwick 2012), has been employed to describe the interactive watching of each other that takes place on social media sites. Social surveillance may be viewed as one form of *participatory veillance*, which involves the voluntary engagement in watching or being watched by others. Participatory *veillance* is a feature of signing up to use social media platforms, when people consent to their data being collected as part of the conditions of their use of these sites, or other technologies, such as customer loyalty schemes (enshrined in such features as 'terms and conditions' and 'privacy policy' that are included on digital sites or agreement to the acceptance of 'cookies') (Best 2010; Lupton 2014a). It also takes place when people engage in self-monitoring practices of their bodies or everyday habits (Lupton 2012) or share their geo-location details with others (Hjorth and Pink 2014).

Another form of *veillance*, dubbed *uberveillance*, is also often participatory, but can be used for imposed, covert or coercive surveillance measures that may challenge people's rights to privacy. This term has been invented to denote, in particular, the use of tracking technologies that can be inserted within or worn upon the body. These include wearable computing used for monitoring biometric data and identifying spatial location, as well as RFID chips. RFID chips are being used increasingly in such technologies as electronic passports, credit and debit cards, motor vehicle driving monitoring systems and medical technologies such as heart pace-makers and prosthetic knees to assist with post-operation analytics and for monitoring patients with dementia. These devices can be used to track individuals'

movements and activities in real time. Many users of such technologies are unaware of the capacity of the digital signals they emit to identify their geo-location and the ways in which these data may be used for surveillance purposes (Michael and Clarke 2013; Michael and Michael 2013).

THEORISING DIGITISED EMBODIMENT

From the perspective of the sociomaterial approach, the ways in which nonhuman actors interact with humans are a central topic of understanding social life, subjectivity and embodiment. This approach moves away from a focus on the discursive that had dominated social and cultural theory for some time, to addressing the material dimensions of social relations and human experience. So, too, the sociology of the body that was a dominant interest of scholars at the end of the last century has engendered a greater awareness of human embodiment and interembodiment: the fleshly dimensions of human subjects and their interactions with others' bodies and with objects.

Theories of material cultures and consumption in anthropology and cultural studies are also enlightening to understand the ways in which the new digital media are 'appropriated' or 'domesticated' into everyday practices and routines (Hartmann 2013). Scholars who are interested in material culture focus their attention on the ways in which material artefacts are invested with social, cultural and personal meaning when they are manufactured and used as part of everyday life. They contend that study of such things is vital to understanding both the ways in which cultures are enacted and reproduced and the significance that objects have in specific cultural contexts. Many digital anthropologists are associated with this approach (Miller and Horst 2012). Writers in cultural and media studies have focused attention for some decades now on the ways in which people engage with and use media as part of their everyday routines in the home and at work, including digital devices (Lupton and Noble 2002; Richardson 2009; Salovaara *et al.* 2011). The concept of appropriation refers to the incorporation of objects into habitual practices, while that of domestication relates to the ways in which objects are altered in some way via these routine practices.

Importantly, this research emphasises the active participation of individuals in taking up media. It goes beyond the prosumption perspective by contending that *all* consumption involves some kind of work on the part of the user when they are incorporating an object into their everyday routines. It focuses on the enabling and constraining

dimensions of the use of objects and how objects shape or discipline users just as users reconfigure objects. From this perspective, consumption is viewed broadly as the interaction of human bodies with objects in specific contexts and spaces. People consume objects by incorporating and domesticating them, bringing them into their everyday worlds, melding them to their bodies/selves and bestowing these objects with their own biographically specific meanings. They become 'territories of the self', marked by individual use, and therefore redolent of personal histories (Nippert-Eng 1996). This concept of territories of the self acknowledges that bodies and selves are not contained within the fleshly envelope of the individual body, but extend beyond this into space and connect and interconnect with other bodies and objects. These processes are inevitably relational because they involve embodied interactions and affective responses at both the conscious and unconscious levels.

The period spanning the two decades from the early 1980s to the first few years of the twenty-first century was the era of 'the cyber' in social, cultural and political theory and research. During this cyber era, frequent references were made not only to the cyborg but also to cyberspace, cyberfeminism, cybercultures, cybercrime, cyber-racism, postcolonial cyborgs, cyberpunk, cyber-queer, cyber-bullying and so on. Cyberspace was portrayed as a virtual, non-physical network in which users interacted with each other by employing computer technologies. The term at first tended to suggest an experience that was disembodied, comprised of one's digital avatar moving through another world that was entirely separate and different from that of the material world. The term 'virtual reality' also signified an experience that was different from material reality, not quite real.

Despite the cultural currency of all things cyber late last century, it is clear that these terms and their accompanying theoretical insights have lost momentum, and now have 'almost an antique feel' (Bell 2007: 2). These days, referring to cyberspace seems inappropriate, old-fashioned and clunky, too closely tied to the imaginaries of science fiction and failing to recognise the ordinary and taken-for-granted nature of computer technologies. The terms 'posthuman' and 'transhuman' also circulated in earlier writing on technocultures, and continue to be frequently used in the literature on the human-technology encounters. Yet these terms too fail to recognise the routine incorporation of new digital technologies into everyday lives. To be human, as I argued in Chapter 1, means for many the use of digital technologies on a regular basis. More contemporary terms focus on the technical features or capabilities of the technologies rather than attempting to position these technologies as somehow offering an alternative world separate from a

more 'real' experience (Paasonen 2009). There is no need to jettison cyber theory altogether, however. Indeed, I would assert that there is significant value and scope in revisiting cyborg theory in the light of new technologies that have become so seamlessly incorporated and domesticated into everyday life.

The technoscience feminist scholar Donna Haraway's seminal writings on the cyborg remain important in conceptualising the ontology and politics of human–digital encounters. Her essay 'Manifesto for cyborgs' (Haraway 1985) is one of the most influential pieces of writing in cyberculture studies. In this work, Haraway argues that there are two types of cyborg that operate at different ontological levels. One type is the material cyborg that is configured via the military–industrial–entertainment complex. In the 1980s, when Haraway was writing, this was the cyborg of science-fiction films, the warrior macho human–machine or the medicalised body that is normalised by technologies and earns profits for pharmaceutical and medical device companies. This literal cyborg continues to exist and has become increasingly digitised in the context of mobile and wearable digital devices.

The second type of cyborg identified by Haraway, and the one that represents her substantial contribution to the theoretical literature on technocultures, is that of the metaphorical or ontological cyborg. The cyborg is a figure that challenges assumptions and binaries, that is politically disruptive, progressive and oppositional in its hybridity and liminality. It is this cyborg as metaphor that Haraway seeks to take up and use to support her theorising of the interrelationship of humans and nonhumans. Haraway adopts a strongly relative sociomaterial perspective on human actors as they interact with other actors, both living (such as animals) and non-living. In her concept of the cyborg she is trying to express the broader idea that no human bodies/selves are stable or natural. Rather, we are multiple bodies and multiple selves, depending on the context in which we find ourselves and the other bodies and nonhuman entities with which we interact.

The material cyborg is only one such assemblage that may be configured. For Haraway, therefore, the cyborg represents the actor–network assemblage both literally and metaphorically (and, indeed, she acknowledges the influence of Latour in developing her ideas; see Penley *et al.* 1991). In an article published in 2012, Haraway notes that she no longer views cyborgs as machine–organism hybrids 'or indeed hybrids at all', but rather as 'imploded entities, dense material semiotic "things" – articulated string figures of ontologically heterogeneous, historically situated, materially rich, virally proliferating relatings of particular sorts' (Haraway 2012: 301). Haraway's reference to 'string

figures' relates to the cat's cradle game, played using string manipulated on the hands to produce complicated patterns, and which can be swapped from one pair of hands to another as part of sharing the creation. She employs this metaphor in her later work as a means of emphasising the intertwinings, complicated patternings, knottings, webbings and collaborations of technoscience and the bodily assemblages it configures.

The metaphor of entanglement is now frequently adopted in sociomaterial writings. Like Haraway's cat's cradle metaphor, the entanglement metaphor emphasises the inextricably intertwined relationship of human subjects with material objects. However, the entanglement metaphor, more than that of the cat's cradle, bespeaks messiness, occasional chaos, disorder. Unlike the cat's cradle, which is highly ordered and patterned, entanglements may be completely spontaneous and unanticipated and therefore unpredictable in their forms and consequences. Unlike metaphors such as 'cloud computing', which tend to represent digital technologies as seamless, stable and pure, the entanglement metaphor acknowledges the heterogeneity and instability of technological agents' interactions with human actors (Shepard 2013).

This chapter has covered an extensive theoretical ground. All of the approaches and perspectives I have discussed have much to offer a sociocultural analysis of the politics of digital technologies; new forms of knowledge formation and power relations in digital society; the various ways in which digital veillance operates; and how computer software and hardware act to configure subjectivity, embodiment and social relations. In the next chapter I discuss research methods, but do so in a way that also incorporates social theory. A body of literature in sociology has developed that has begun to theorise methods of research, thus breaking down the traditional distinctions between theory and method. As this chapter shows, the scholars who have contributed to this literature offer a way forward for both conceptualising and undertaking digital sociology research.