

Chapter 3: Understanding Openness

The two previous chapters have examined the historical development of the institutions and processes that are involved in creating and distributing academic research. This has helped to contextualise the main topic of this thesis, open access, by showing where the impetus for a new way of doing things has come from and demonstrating what open access is a reaction against. Before going into detail about the political and policy side of open access in subsequent chapters, this chapter builds on the overview of open access given in the Introduction by thoroughly examining just what is meant by the ‘open’ part of the term open access. The importance of *access* does not disappear from this discussion, not least due to the sometimes exclusionary nature of participation in open movements, as discussed below. However, since openness is a term with a variety of meanings and connotations, it is important at this stage of the thesis to have a clear understanding of the origins and meaning of openness in the particular sense used by the open access community.

To begin this discussion of openness, a natural starting point is free and open source software (F/OSS).¹ The use of the word *open* in later movements² (open access, open data, open education etc.) originates here, and the form and rhetoric of contemporary open movements draw heavily on advocacy for openness of software. It is in the free and open source software movement that we first encounter the importance of copyright and licensing to creativity in the digital age; the distinction between free and open, and the sometimes antagonistic arguments surrounding these terms; and the formation of strong global communities of advocates connected by the digital technologies that make open possible in the first place. As Kelty argues in his ethnography of the F/OSS community *Two Bits*, it is not the software itself that is culturally important but the practices involved – of ‘sharing source code, conceptualizing openness, writing copyright (and copyleft) licences, coordinating collaboration, and proselytizing for all of the above’ – which represent a ‘reorientation of power with respect to the creation, dissemination, and authorization of knowledge’ (Kelty 2008: x, 2). Kelty’s book focuses extensively on the ‘modulation’ of free software to other domains, and in this chapter the relationship between F/OSS and open access will be outlined in detail.

This chapter will primarily address the nature of openness, and the politics of openness will be at the forefront throughout. By understanding the history of openness – *how* and *why* it developed into an identifiable concept with widespread support – it becomes clear that it

1 The acronym FLOSS is sometimes used, which stands for ‘free/libre open source software’.

2 By ‘later’ I mean they were *self-understood as movements* later. For example, the Open University was founded in the 1960s with the aim of expanding access to higher education, but open education came into its own as a movement in the 2000s (Weinbren 2014; Weller 2014: 34–43). Use of the term ‘movement’ is discussed by Kelty (2008: 98, 113–15) who sees its birth in 1998.

cannot be understood without reference to the political. Examining the extent to which openness can be placed within the liberal tradition provides a crucial backdrop to Chapters 4–6 that examine neoliberalism and its effect on open access policy. This chapter can be read in parallel to Chapter 4, which discusses issues around freedom and centralised control within neoliberal ideology. By comparing these two kinds of freedom or openness – firstly as advocated by the F/OSS (and related) communities, and secondly as advocated by neoliberal theorists – the complexity of the ‘openness’ that underlies open access is laid bare.

Free and open source software

The origins of the free and open source software (F/OSS) movement can be traced back to the mid-1980s and the work of Richard Stallman. By this time, software development was a well-established domain of activity, as digital computing had advanced considerably since its beginnings around the time of the Second World War. In those early decades of computing (1940-1970s), software was generally written and used by people in universities or the military, as well as in some private companies,³ and it was not yet explicitly covered by intellectual property law⁴ so users were free to share and adapt source code as they wished (Coleman 2012: 64–65). Therefore in the early days of computing it was assumed that software was not ‘locked down’ and engineers would be able to examine source code and modify it. One project that exemplified this stance was UNIX, a modular⁵ operating system originally created by the researchers Dennis Ritchie and Ken Thompson at Bell Labs⁶ in the early 1970s (see Salus 1994). The culture of UNIX development encouraged sharing and modification, leading to a variety of different versions (Ceruzzi 2003: 283–285; Moody 2001: 13–14, 142–144). But during the 1970s the commercial side of software development became more important and some programs began to be released under copyright, and therefore with legal restrictions on sharing and usage – a practice enabled by new intellectual property legislation in the US (Coleman 2012: 65–68). It was during this era (late 1970s/early 1980s) that Stallman began his politically-oriented work as a reaction against what he saw as an encroaching enclosure of source code. Stallman used the term ‘free software’ to name the kind of work he was advocating. The Free Software Definition was originally written by Stallman and is maintained by the Free Software Foundation, a non-profit organisation that he founded in 1985, and is a clear statement of intent:

A program is free software if the program’s users have the four essential freedoms:

- The freedom to run the program as you wish, for any purpose (freedom 0).
- The freedom to study how the program works, and change it so it does your computing as you wish (freedom 1). Access to the source code is a precondition for this.

3 The first personal computer available for general sale was the Altair 8800, released in 1975 (Abbate 1999: 137; Ceruzzi 2012: 105), so before this date computing took place almost entirely within institutions.

4 Although software was not explicitly covered by legislation at this time, as a creative output it could potentially have been treated as intellectual property in the courts.

5 See Russell (2012) for more on the importance of modularity to the design of computer systems.

6 Bell Labs was the research division of the US telecommunications company AT&T.

- The freedom to redistribute copies so you can help your neighbor (freedom 2).
- The freedom to distribute copies of your modified versions to others (freedom 3). By doing this you can give the whole community a chance to benefit from your changes. Access to the source code is a precondition for this.

(Free Software Foundation 2015)

The first free software license was the GNU General Public License (GPL) created by Stallman (Kelty 2008: 15; 189). Perhaps even more so than his considerable work as a coder (see Levy 1984: 426), Stallman's key innovation was 'hacking' copyright to create copyleft. Stallman created a license – the GPL – that builds on existing copyright law by allowing creators to give extra permissions in the use of their work – permission to use, reuse, and modify the code – so long as the same conditions are maintained in subsequent copies and modifications (Kelty 2008: 182; Moody 2002: 26–27).⁷ If copyright is 'the right to exclude and control' (Coleman 2012: 1), then copyleft aims to give permission to act freely [although... GPL less free than MIT. Different meanings of freedom: free as in beer/speech.]. A wide variety of other software licenses have been created since the GPL, such as the even more permissive BSD (Berkeley Software Distribution) license and the MIT License. These allow people who use or modify the code to use it however they wish, including – unlike the GPL – incorporating it within proprietary software. Open licensing became an essential component of both F/OSS and the other open movements that followed (see below).

Much of the internet's architecture is run on F/OSS, including Apache web servers, the Sendmail email routing program, and BIND Domain Name System (DNS) software (Moody 2002: 120–130). The operating systems used on desktop PCs and laptops for consumer use, on the other hand, are dominated by the proprietary Microsoft Windows OS (Statcounter 2017). However, for mobile devices, the Linux-based Android operating system is now run on more internet-enabled devices than any other (Gartner 2016; Statcounter 2017a). Linux is a Unix-based operating system, begun by Finnish programmer Linus Torvalds in 1991, which is licensed under the GPL. The creation of Linux was a pivotal moment in F/OSS development: 'Unhitched from the sole province of the university, corporation, and stringent rules of conventional intellectual property law, Linux was released as a public good and was also produced in public fashion through a volunteer association' (Coleman 2012: 34). The collaborative process used for LINUX, in which Torvalds received contributions from numerous developers from across the world, became frequently adopted by other F/OSS projects (Kelty 2008: 212–222). By the late 1990s this distributed development process had become so common in the F/OSS community that it could be seen to be almost as fundamental to F/OSS as open licensing. In fact, histories of F/OSS are often centred around these two key facets: firstly, the practice of sharing source code under open licenses (with discussions on the history of copyright and political arguments around intellectual property); and secondly, new decentralized methods of organising labour outside of market incentives or

⁷ This contrasts with 'shareware', which is proprietary software that creators allow to be shared freely but remains under copyright and users are expected to make a voluntary donation to the creators (Hui, You, & Tam 2008).

hierarchical organisational structures. For instance, Weber (2004) discusses the interplay of a new intellectual property regime based on permissions rather than exclusion, and the new collaborative organisational structures that both arise out of and create a new mode of governance.

Although the activism of developers like Stallman highlighted a tension between the culture of programmers and the commercial imperatives of businesses that owned and sold software, the political perspective embodied by free software was not shared by all software developers. In light of this, an alternative way of referring to free software was sought that would be more appealing to commercial users. The term *open source* was thus coined in 1998 by Christine Peterson – president of the Foresight Institute, a nanotechnology non-profit (Moody 2002: 167; Open Source Initiative 2012) – and popularised by libertarian developer Eric Raymond to distance the movement from Stallman’s ideological prioritisation of freedom, and to explicitly make F/OSS software more attractive to commercial users (Weber 2004: 114). An Open Source Definition was published by the Open Source Initiative (2007), an organisation founded to promote the use of the term ‘open source’ and encourage uptake of F/OSS software more widely, including by business and government (Open Source Initiative 2012). As Coleman has argued, by this ‘linguistic reframing’ of replacing ‘free’ with ‘open’:

They wanted the word open to override the ethical messages and designate what they were touting simply as a more efficient development methodology. They knew, however, that creating a new image for open source would “require marketing techniques (spin, image building, and re- branding)” (Raymond 1999, 211)— a branding effort that some of the participants were more than willing to undertake.
(Coleman 2012: 79)

Raymond makes his attraction to free market capitalism explicit in his writing (2001: 52–54, 107) and makes the analogy that free software collaboration and free markets are both self-organising systems:

The Linux world behaves in many respects like a free market or an ecology, a collection of selfish agents attempting to maximise utility, which in the process produces a self-correcting spontaneous order more elaborate and efficient than any amount of central planning could have achieved.
(Raymond 2002: 52)

Raymond’s allusions to self-organisation have been critiqued by Weber (2004: 131–133) who argues firstly that the term is used as a kind of ‘black box’ to sidestep the need to provide more detailed explanations of *how* organisation arises out of individual actions, and secondly that self-organisation is claimed as a ‘natural’ process which should not be interfered with⁸ – a

8 Raymond uses naturalistic claims throughout his writing, for instance arguing that the ‘gift culture’ used by hackers is the ‘optimal social organization for what they’re trying to do, given the laws of nature and the instinctive wiring of human beings’ (Raymond 2001: 107).

claim which conveniently aligns with Raymond's political perspective. If organisation is seen as spontaneously and naturally arising then scrutiny of power relations is deemed unnecessary; Raymond attempts to back up this stance by claiming that the only kind of power is overt coercive power so in voluntary free software development power relations simply do not exist (Raymond 2001: 51).⁹ This is an argument often used in right-wing rhetoric which ignores the diversity of meanings of power (see Cairney 2012: 48–49).

The terminological distinction between *free software* and *open source* highlights the ideological difference between the two approaches. Free software is used to highlight the 'freedom' aspect, and Stallman has been the most vocal and persistent advocate for its use (see Free Software Foundation 2015a [1985]). The forking of free software and open source occurred in 1998 (Kelty 2008: 99) when open source was coined as a 'non-political' alternative term which de-emphasised the freedom aspect. One of the key early proponents of open source, Eric Raymond,¹⁰ 'emphasize[d] the centrality of the novel forms of coordination over the role of novel copyright licenses or practices of sharing source code' (Kelty 2008: 109). However, the F/OSS divide between 'moral and utilitarian logics' is usually blurred (Coleman 2009), and Moody has argued that the tension between the two camps in the pragmatist/idealist divide has actually been essential for driving progress (Moody 2002: 256, 259).

Coleman explicitly places the ethos of F/OSS within the liberal tradition. In particular, the community focuses on the importance of free speech ('code is speech') since the 1990s when 'the link between free speech and source code was fast becoming entrenched as the new technical common sense among many hackers' (Coleman 2012: 2–3, 9). Although Coleman argues that the hacker critique of intellectual property was a critique of neoliberalism, a close ideological cousin of neoliberalism – libertarianism – also has a strong presence in the internet social imaginary (see Borsook 2000; Mathew 2016), as demonstrated by Raymond's political views. Libertarianism is a political philosophy that advocates absolute minimal involvement of government in individual's lives (Brennan 2012). Yet on occasion, hacker politics has a socialist tinge: hackers insist 'on never losing access to the fruits of their labor — and indeed actively seeking to share these fruits with others [...] free software developers seek to avoid the forms of estrangement that have long been nearly synonymous with capitalist production' (Coleman 2012: 15). Coleman goes on to say that 'While developers enunciate a sophisticated language of freedom that makes individual experiences of creation intelligible, their language also elaborates on ideals that are more collectivist and populist in their orientation— such as cooperation, community, and solidarity' (Coleman 2012: 44). The complex interplay of individualism and collectivism expressed in the politics of the F/OSS community is perhaps a defining feature of openness, and can be seen in other open movements such as open access.

9 [link Raymond's ideology to Chapter 4]

10 [get rid of the repetition]

F/OSS collaboration can be viewed as a change in the mode of governance¹¹ so we can consider whether this is related to neoliberal governance. *Governance* in this sense refers to ‘setting parameters for voluntary relationships among autonomous parties’ (Weber 2004: 172) – so in a neoliberal mode of governance, the prioritising of market logic means that all social relationships are imagined as *market* relationships [although thinking of these in terms of ‘voluntary’ relationships might be a bit of a stretch] (see Chapter 4). In F/OSS coordination, ‘adaptability is privileged over planning’ (Kelty 2008: 222), a phrase which echoes the opposition to planning found in the writings of Hayek (see Chapter 4). F/OSS ideology values ‘what works’ over planning and the lack of goals is considered a virtue. [although, ‘Through Debian’s tremendous growth, developers have cobbled together a hybrid organizational structure that integrates three different modes of governance—democratic majoritarian rule, a guildlike meritocracy, and an ad hoc process of rough consensus’ (Coleman 2012: 126), as demonstrated in its Constitution. cite formalised Debian ethical stance laid out in the Social Contract and DFSG (Debian Free Software Guidelines).] If open access, as a movement inspired by F/OSS, is based out of this same social imaginary, then the ‘non-political’ or ‘non-ideological’ rhetoric is at the forefront. This is what is facilitating the slippage away from the social justice ideals of those more politically engaged open access advocates. However, Kelty argues that free software represents ‘an imagination of how to change an *entire market-based governance structure* – not just specific markets in things – to include a form of public sphere, a check on the power of existing authority’ (Kelty 2008: 308). Under this mode of governance, the consent of the governed relies on allowing the governed to create and modify the system of governance themselves. Self-governing communities existing within markets is closer to Hayek’s theoretical economic ideal than to what neoliberal governance has now become (see Chapter 4 for more on the anti-democratic nature of contemporary neoliberalism).

[‘Stallman did not launch a radical politics against capitalism or frame his vision in terms of social justice. Rather, he circumscribed his political aims, limiting them to securing a space for the technocultural values of his passion and lifeworld— computer hacking’ (Coleman 2012: 70).] [Most hacker are not driven primarily by a sense of justice; as Andrew Ross states, theirs are “voices proclaiming freedom in every direction, but justice in none” (Ross 2006: 748). ‘If Ross faults free software for its supposed political myopia, others shine a more revolutionary light on free software and related digital formations, treating them as crucial nodes in a more democratic informational economy (Benkler 2006), and as allowing for novel forms of group association and production (Shirky 2008). If one position demands purity and a broader political consciousness from free software developers, the other position veers in the opposite direction: it has free software perform too much work, categorizing it and other digital media as part of a second coming of democracy, shifting in fundamental ways the social and economic fabric of society.’ [Coleman 2012: 63]]

[discuss Weber¹²]

11 [expand]

12 [The inversion of the traditional intellectual property regime under copyleft has been analysed by Weber in political economic terms [...] (Weber 2004: 4–5 [also 182–83])
- ensuring no-one has monopoly control over the means of production

This section has outlined the origins of F/OSS, the first open movement, and explored the difference between the terms free and open in this context. In the following section,

The concept of openness

The term ‘open’ has now been applied to numerous domains beyond open source, including open access, open education, open data, open government, and open science. In this section, the commonalities between these different areas are explored in order to move towards a more thorough understanding of just what is meant when people use the word open in this sense. As will become clear, the term is a complex one that evades simple definition. Weller makes this explicit and accepts that ‘it is a vague term, with a range of definitions, depending on context’ and prefers to consider a range of motivations for openness: increased audience, increased reuse, increased access, increased experimentation, increased reputation, increased revenue, increased participation (Weller 2014: 29–30). This breadth of motivations for openness goes some way to explaining the divergent approaches to achieving it. For instance, those who have attempted to define open rigidly have often taken a *content-driven* perspective. This is particularly clear in the the Open Definition (see Open Knowledge International [n.d.]) which was created by Open Knowledge, formerly known as Open Knowledge Foundation (OKFN), an organisation which is involved in all of the areas discussed in this chapter. Summarised as ‘Knowledge is open if anyone is free to access, use, modify, and share it — subject, at most, to measures that preserve provenance and openness’, the Open Definition makes frequent declarations of what an open work *must* do. It also states that ‘this essential meaning matches that of “open” with respect to software as in the Open Source Definition and is synonymous with “free” or “libre” as in the Free Software Definition and Definition of Free Cultural Works.’ The fact that it the Open Definition claims to be the same as the definitions for both free software and open source software shows just how much a content-centric definition leaves out – as shown in the previous section, while free software and open source may often reach the same result at a practical level, they have highly divergent meanings. Since relying on a static definition for openness written by self-appointed experts at a particular moment in time is problematic, especially given that openness to participation is generally regarded as central to the concept, the rest of this section will look to a range of different thinkers in different domains to provide a more expansive view of openness.

Peters and Roberts in *The Virtues of Openness* (2012) discuss the meanings and motivations

- says nothing about how surplus is distributed
- first paragraph p.225
- difference between creating software and research: the end goal of each software project is a single thing which many people contribute to; in research the equivalent end goal of a particular process is the individual article itself without *necessarily* needing to think deeply about its place in the overall system in terms of functionality and compatibility (this does occur but is not as highly prioritised perhaps).
- free riding is not a problem in F/OSS, it enhances the product.
- price mechanism as a ‘thin’ metric which leaves out so much information; an uninteresting remnant of low-bandwidth thinking? pp.256-57.]

for openness at length...¹³

Openness is closely related to the legal ownership status of works. Licenses – legal documents that assign certain rights or permissions to determine what people are allowed to do with a work – are an essential part of all open movements, and often form a central part of open definitions. As with so many aspects of openness, it was in the F/OSS movement that the first open licenses were developed (see above) and by the turn of the twentieth century software developers often had to be legal experts on intellectual property (Coleman 2012: 63, 86–88, 162–168). The most important development in licensing for the spread and harmonisation of open movements was the founding of Creative Commons and its suite of licenses. Founded in 2001 by legal scholar Larry Lessig, Creative Commons released its first set of copyright licenses in 2002 (Creative Commons [n.d.]) and these have now been through multiple iterations.¹⁴ They are based on the principle of ‘some rights reserved’, which means that they build on top of the ‘all rights reserved’ position of copyright by allowing additional permissions (Lessig 2004: 283). The only Creative Commons licenses that follow the copyleft principle of the GPL are the ‘share alike’ licenses (CC BY-SA and CC BY-NC-SA) that allow people to copy and adapt works so long as the same license is maintained for any copies or derivatives; the most notable use of the CC BY-SA license is Wikipedia. The Creative Commons Attribution license (CC BY) is the most permissive license available and is the one most commonly used for open access (Redhead 2012).

The term *open access* was originally defined in 2002 by the Budapest Open Access Initiative, which opened with the memorable line: ‘An old tradition and a new technology have converged to make possible an unprecedented public good’ (Chan et al. 2002). This statement highlights the role of technology as an enabler while simultaneously proclaiming the ethical and social nature of open access. The Budapest Declaration was followed by two further declarations – the Bethesda Statement on Open Access Publishing (Brown et al. 2003), and the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities (2003). These three declarations – referred to by Peter Suber as the ‘BBB definition’ (Suber 2012: 7) – helped to define open access as a ‘movement’¹⁵ and provide a common touchstone to conceptualise it. Eve draws on these definitions, and the work of Suber, to claim that ‘regardless of the nuances and complexities [...] ‘open access’ can be clearly and succinctly defined. The term ‘open access’ refers to the removal of price and permission barriers to scholarly research’ (Eve 2014: 1). This does indeed provide an accurate definition, though

13 [I need to re-read this book, I think it will be very useful]

14 The six licenses, in descending order of permissiveness, are the Creative Commons Attribution license (CC BY), Creative Commons Attribution ShareAlike license (CC BY-SA), Creative Commons Attribution Non-Commercial licence (CC BY-NC), Creative Commons Attribution NoDerivatives license (CC BY-ND), Creative Commons Attribution Non-Commercial ShareAlike license (CC BY-NC-SA), and the Creative Commons Attribution Non-Commercial NoDerivatives license (CC BY-NC-ND). The current version is 4.0 so the full name of each license is, for example, Creative Commons Attribution 4.0 International (CC BY 4.0). The organisation also provides the Creative Commons Zero Public Domain waiver (CC0) – this is not a license, but a legal waiver to all legal and moral rights to a work in order to release it directly into the public domain.

15 See Kelty (2008: 98, 113–15).

only if the ambiguity of the term ‘removal’ is accepted; there has been vigorous debate within the open access movement as to whether the absolute removal of *all* permission barriers is necessary before a state of open access is reached and the term can be used, or whether a removal of *some* barriers in a process of ‘opening’ is acceptable. This has resulted in some open access advocates arguing that if a work is not licensed under a Creative Commons Attribution license (CC BY) then it is not truly open access, a position which would unfortunately include the vast majority of works that have been archived in open access repositories.¹⁶

F/OSS and open access are related in ways that go beyond just licensing (Willinsky 2005). This is particularly clear in the parallels between the two domains in arguments around free versus open. In F/OSS, free refers to the *freedom* to do what you like with the software and places the emphasis on ethical and political dimensions of software, whereas open refers only to legal status, with open source proponents emphasising software development models (Kelty 2008: 109) and making no overt moral claims about freedom. But for academic research, the ethical arguments are reversed: it is the term open access that refers to work that is openly licensed with liberal permissions and is the site of an ‘open access movement’ that places focus on social justice issues and makes political and ethical claims (see Chapter 0), whereas the term ‘free access’ is used to refer to publications that are free-to-view online but not openly licensed. Even so, whether open access advocates use ethical or utilitarian logics in their arguments – and as with F/OSS, use of these differing logics does not always fall neatly into opposing camps – does not change the importance of open licensing, because those who are more concerned with doing ‘better science’ (see Kansa 2014; [add others]) than with social justice still advocate liberal licensing and especially the use of CC BY.

Whether or not it matters that either instrumental or ethical arguments are used to achieve open access if the practices are the same is a question that is also raised in the similar arguments within F/OSS. Disparate political positions can result in identical practices in terms of software creation (Stallman 2016 [2007]), and as Kelty states:

If two radically opposed ideologies can support people engaged in identical practices, then it seems obvious that the real space of politics and contestation is at the level of these practices and their emergence. These practices emerge as a response to a reorientation of power and knowledge, a reorientation somewhat impervious to conventional narratives of freedom and liberty, or to pragmatic claims of methodological necessity or market-driven innovation. Were these conventional narratives sufficient, the practices would be merely bureaucratic affairs, rather than the radical transformations they are.

(Kelty 2008: 117)

The open access social imaginary is similarly heterogeneous as that of F/OSS.

16 [citation needed]

[The talk of ‘layers’ in Kelty (2008: 235) is related to Bilder, Lin, & Neylon's infrastructure position. If there is freedom within one layer, but it is reliant on a non-free layer below, then is the freedom compromised? Within scholarly publishing, the freedom to publish any *ideas* (academic freedom) is reliant on a communication layer (journals) which is not entirely free. That communication layer itself rests upon deeper levels of infrastructure with varying degrees of freedom.]

The progress of open access has been consistent but slow, with an annual growth rate for gold¹⁷ open access of an estimated 18% per year during 1996–2012, which translates as around one percentage point a year¹⁸ (Archambault et al. 2014: ii–iii). And despite decades of progress and adoption in the policy environment (through mandates etc.) there is little chance of a 100% open access scholarly communication system in the near future; proclamations such as Austria's 2015 announcement that they are aiming for 100% gold open access by 2025 (Bauer et al. 2015) or the OA2020 initiative which sets a date of 2020 for the same goal (EU2016 2016) are aspirational, and not a realistic goal.¹⁹ There are valuable lessons here to be drawn from the F/OSS world; after 30 years, Linux servers dominate the web infrastructure and Linux-based Android dominates mobile, but there is still a mixed economy of open and proprietary software with both simultaneously existing and prospering (Weber 2004: 37). There is no ‘natural’ best way of creating software because it depends on the creator's priorities; it is possible for open source communities to prioritise important features better than a proprietary product, and vice versa (Tamary and Feitelson 2015). [Weber (2004: Ch.5 [esp. 153–56]) has a discussion about individual motivations for participation in F/OSS that is relevant for thinking about motivation/collective action w/r/t open access.]

A useful way of distinguishing between different instances of the word open is the typology of openness used by Corral and Pinfield (2014) – open content, open process, and open infrastructure. Content refers to ‘stuff’ (whether physical or digital) and its availability; process includes openness to participation; it may be more difficult to define what counts as infrastructure. This typology can help to clarify links between different open movements. For example, a key difference between open source and open access is that open source is first and foremost a development methodology – a means of organising labour. Open access, on the other hand, is much more strongly focused on content. Perhaps a closer parallel between open source and openness within academia can be found in ‘open science’, or open research, which is the name given to the attempt to make the entire scientific process more open at every stage such as using open lab notebooks, preprints, and open data.

The commonalities between F/OSS and open access show that openness, in this sense, has a coherent meaning which can transcend cultural boundaries. [more explicit articulation of where open process sits within this – there can be open software without open process.] This

17 [‘gold’, ‘green’ etc. are defined in Chapter 0]

18 I.e. if in 2011 it was 12%, then in 2012 it was 13%.

19 [qualify this with references on uptake]

can be seen in the proliferation of other contemporary open movements in recent decades, such as open data and open education. Although there is not space in this thesis to discuss these areas in any detail, the next section highlights some of the common features – in theory and practice – that position them in close relation to the openness of F/OSS.

Open education and open data

Open education encompasses a variety of practices broadly centred around open content (such as Open Educational Resources (OER) and open textbooks) and open process (such as open pedagogy), although these divisions are often blurred. For instance, MOOCs (Massively Open Online Courses) are distance-learning courses delivered online with no formal barriers to participation that use open course materials (Weller 2014: 4–7).²⁰
[Wiley’s 5Rs of Reuse ([n.d.):

1. Retain - the right to make, own, and control copies of the content (e.g., download, duplicate, store, and manage)
2. Reuse - the right to use the content in a wide range of ways (e.g., in a class, in a study group, on a website, in a video)
3. Revise - the right to adapt, adjust, modify, or alter the content itself (e.g., translate the content into another language)
4. Remix - the right to combine the original or revised content with other material to create something new (e.g., incorporate the content into a mashup)
5. Redistribute - the right to share copies of the original content, your revisions, or your remixes with others (e.g., give a copy of the content to a friend)]

Like other open movements, open education has attracted significant attention from the tech industry. This is most strongly evident with the hype surrounding MOOCs and their potential to ‘fix’ a ‘broken’ education system, in what Weller has termed the Silicon Valley narrative (Weller 2014: 117–133). Online distance-learning start-ups such as Udacity and Coursera are for-profit organisations that aim to ‘disrupt’ traditional education, following Christensen’s ideas on ‘creative disruption’ (Christensen 1997). The dangers and failures of this model have been outlined by Watters (2017; see also Selwyn 2015), who is particularly scathing of the suitability of hyper-capitalist organisations such as Uber as a model for education. While the hype surrounding MOOCs may have faded somewhat since 2014, they have become an embedded part of the higher education landscape with some traditional universities taking a keen interest.²¹

The content-focused and profit-driven nature of such enterprises contrasts strongly with the ethical drivers for open education described by Jhangiani and Biswas-Diener (2017):

²⁰ [Read Farrow 2015, Peter and Diemann 2013]

²¹ [cite Knox 2013, 2017]

The open education movement offers one possible, partial remedy to educational inequality. The most obvious benefit of open education is in its low cost. The word ‘open,’ in this sense, means ‘allowing access to’ although it is also often equated with ‘free of cost.’ In fact, most open education resources are freely available and even in cases where they are low cost, they still help to drive the market toward a lower price point. By removing or substantially reducing the expense normally associated with software, textbooks, and course fees, education becomes more accessible to more people. The open education movement can also help raise the quality of education for all students because instructors are better able to share and build on one another’s pedagogical innovations. It is here, in the second sense of ‘open,’ meaning customizable by and shareable among instructors, that we have the potential to design more engaging, locally relevant, interactive, and effective teaching resources.

It is for precisely these reasons that open education often seems like a crusade. It is a values-based and mission-driven movement every bit as much as it is practical and technological. The voices of open advocates and champions are often impassioned in the way typical of people who are in the throes of rapid and successful social change.

(Jhangiani and Biswas-Diener 2017: 4–5)

Open data is hard to define without resorting to tautology – it is about opening up data, with ‘open’ used in the same sense as throughout this chapter, and ‘data’ referring to a set of quantitative or qualitative facts, measurements, or statistics. Different categories of open data, such as open research data, open government data, open financial data, or open health data, often overlap. In terms of research, open data (see Moore 2014) can be seen as a corollary to open access – one is about providing access to research publications, and the other is about providing access to the data that is produced, collected, and analysed in the process of conducting research. Open data plays a key role in the broader open science/open research movement.

Open government data is itself part of a broader open government movement working on a range of issues, including access to law, Freedom of Information, and increasing levels of democratic participation.²² The umbrella term *open government* includes both open content (e.g. data government data) and open process (e.g. open policy-making). The relationship between open government data and neoliberalism has been explored by Bates (2013), whose work will be returned to in Chapter 6 in the discussion on neoliberalism and openness. [see also Fröhlich, Pelham & Tichem 2014, Gray 2014]

Obama’s Open Government Initiative: ‘We will work together to ensure the public trust and establish a system of transparency, public participation, and collaboration. Openness will

22 [citation needed]

strengthen our democracy and promote efficiency and effectiveness in government' (Obama 2009).

[Ties between movements: they all rely on open licensing for legal grounding; and they often build on each other such as the important of open data to open government and open access, and the use of open source software in government, research, and open data tools (Peter & Diemann).]

One sign that openness has become accepted practice within its various domains is its use by corporate marketing departments. The term *openwashing*, a play on greenwashing (whereby corporations pay lip service to environmentalism rather than actually implementing practices to minimize environmental impact, see Dahl 2010), was popularised²³ by Audrey Watters (2012;²⁴ see also Wiley 2011) to describe the process whereby proprietary practices are given an open spin. Kelty (2008: 149) describes the same practice occurring in the software industry with regards to open systems in the 1980s.

[move to introduction?: 'The ideals of openness fit equally as comfortably in the spirit of entrepreneurial capitalism as they do in the liberatory impulse of the hacker ethic' (Russell 2014: 280).] [Lanier claims that F/OSS has been conservative (2011: 124–126).]

[more about change in mode of governance in open source; ability to participate]

[movement/community – e.g. OpenCon (reference inclusion doc), conferences sustain community (see Coleman 2012: 49–60).]

The exclusionary nature of participation in open movements (Dryden 2013; Reagle 2013).

[F/OSS may be 'open to everyone', with generous community/mutual aid (Coleman 2012: 106-108), but it requires a high level of technical knowledge to participate. Open access research requires high level of knowledge for authorship.]

[Kelty 2008. Recursive publics. To what extent is open access a recursive public? (see p.113, 302–04, 309–10) Or – is the academic community a public, and through open access it becomes recursive?

Kelty (2008: 54) discusses how the development of the read/write culture of the internet has altered our relations to the public sphere; the gatekeepers of culture have less power to decide who is able to speak. This points to one of the potential roles of open access.]

So far in this chapter, the meaning of openness has been explored, along with discussion about the origins of the concept and its expression through a variety of contemporary open movements. Since the overall focus of this thesis is on the ways in which openness – and open access in particular – is related to neoliberalism, it is appropriate at this point to turn to the specific political issue of *control* as it relates to openness. As will be examined in the next chapter, the neoliberal conceptions of liberty and openness focus on their role as instruments

23 Is it not clear who first coined the term; it is often attributed to Watters but there is a far earlier reference online (Thorne 2009).

24 This tweet was deleted in March 2017 (see Watters 2017a).

of capital, i.e. as a means for the control of wealth and power. The following section shows how the ‘open system’ of the internet, on which all open movements depend, was forged in circumstances tightly controlled by the US government.

Systems of openness and control

Governments of the Industrial World, you weary giants of flesh and steel, I come from Cyberspace, the new home of Mind. On behalf of the future, I ask you of the past to leave us alone. You are not welcome among us. You have no sovereignty where we gather.

(Barlow 1996)

Despite the techno-futurist sentiment expressed in texts such as John Perry Barlow’s *A Declaration of The Independence of Cyberspace*, which perpetuated the myth that the internet inherently gives everyone freedom, the origins of the internet were in military funding from the US government. The US Department of Defence created ARPA (Advanced Research Projects Agency) in the 1950s to develop technology that would aid the US in the Cold War (Abbate 1999: 36; Edwards 1996: 64, 260–261; Russell 2014: 164). Through strong links with university researchers, ARPA developed various projects, including Arpanet (founded in 1969) to link up different institutions with a computing network (Abbate 1999: 43–46; Moody 2001: 120; Russell 2014: 166; Weber 2004: 33).²⁵ Computing networks rely on protocols, which Galloway defines as ‘a set of recommendations and rules that outline specific technical standards’ (Galloway 2004: 6), in order to transfer information between different computers. One set of protocols that became essential for digital networking are those used for packet switching.

Packet switching is a process that transmits data through networks by segmenting it into ‘packets’, which can then take different routes through the network before being reassembled in the correct order at their destination. Since packet switching works via a distributed network, it does not rely on any individual node in the network (as long as there is sufficient redundancy) and is therefore more resistant to failure of any particular node (Baran 1960, 1964). The protocols used for packet switching on Arpanet’s successor, the internet, are the TCP/IP protocols originally written by Vint Cerf and Robert Kahn. The development of TCP/IP was initially organised by the Network Working Group, an exclusive closed group comprising of expert network engineers from the organisations – universities and private military contractors – who used Arpanet (Hafner and Lyon 1996: 145–148; Russell 2014: 168–169). The Network Working Group later became part of the International Network Working Group (INWG) which in 1973–76 worked on the TCP/IP protocols with the aim of making them the international networking standard (Abbate 1999: 123–131). However, the international collaborative process of INWG did not lead to the results desired by ARPA, so Cerf and Kahn eventually ‘abandon[ed] the international standards process in order to build a

25 Arpanet remained under military governance until 1990 when it was decommissioned (Abbate 1999: 195).

network for their wealthy and powerful client, the American military' (Russell 2014: 190, 233). The subsequent attempt to create agreed international standards for computing networking through the formal open standards process, the OSI (Open Systems Interconnection) committee founded by the International Organization for Standardization, failed due to the technical and political complexity of the project (Abbate 1999: 172–177; Kelty 2008: 167–171; Russell 2014: 197–228). Instead, it was the internet (then under centralised control) and its TCP/IP protocols that won over. So although many consider the internet to represent a decentralised democratic means of connecting people, it was designed and built in a closed process: 'the Internet was nurtured in an *autocratic* setting, sponsored lavishly by the American Department of Defense and administered by a "council of elders" who flatly rejected basic features of democracy such as membership and voting rights' (Russell 2014: 201).

By the late 1980s, there were two distinct modes of governance at work in organisations involved in internet engineering: the autocratic leadership of ARPA-based engineers in institutions such as the Internet Advisory Board that made high-level architectural decisions, and the decentralised Internet Engineering Task Force (IETF) that was spun out of IAB as a means to include those engineers who worked on the implementation of networking protocols (Russell 2014: 240–241). The more participatory and consensus-driven approach of the IETF that became the dominant mode of internet governance by the 1990s has been held up as a means of organising that is intrinsic to the internet, but in fact it only emerged after two decades of centralised leadership at ARPA.²⁶ Despite the fact that the internet was but one potential way for digital networking to be designed and implemented – as opposed to the various other protocols, architectures, and institutional processes that could have occurred in its place given different political circumstances – Russell argues that not only has history been framed to make the internet appear as a singular technical accomplishment, but its evangelists 'have been able to convince outsiders that the Internet standards process could be a model for future attempts to create a technologically enabled style of open, participatory, and democratic governance' (Russell 2014: 257–258). This myth has in turn become embedded within the F/OSS social imaginary, in which the organisational strategies of the F/OSS community are positioned as a 'natural' way of organising online, even though openness was not a 'fundamental principle of the internet's design' (Russell 2014: 261). It could be argued that although openness is not *inherent* in the internet, F/OSS organisation shows that it *can* be

26 The origins of the organisational structures of internet governance, in which associations of professionals determine standards by consensus (such as in the case of the Internet Engineering Task Force), were not new or unique to the internet but rather can be traced back to the standards committees formed by electrical engineers in the late nineteenth century US: 'Standards committees constituted an expansive network of institutions between markets and hierarchies – a network where no one institution had complete control. Of course, not all nodes in this network were equally powerful [...] But even in sectors where ownership was highly concentrated (such as the American telegraph industry after 1866), no single organisation monopolized standardization' (Russell 2014: 56–57). According to West, 'Standardization is an important prerequisite to the deployment and use of a shared infrastructure', whether for transport, energy, or digital network infrastructures (West 2007). Open standards for digital infrastructure, developed through a process of consensus decision making, are a means of control outside of both centralised control (whether corporate or government) and untrammelled markets (Russell 2014: 19–20, 34).

present – the possibility exists, under the right political conditions; but it needs to be actively constructed (much as neoliberal theorists recognise that market freedom needs to be actively constructed, see Chapter 4).

One of the fundamental issues that arises when discussing the technical standards and governance structures of the internet is that of control and centralisation. Although “decentralised” is sometimes used as an umbrella term for both decentralised and distributed networks (see Institute of Network Cultures [n.d.]), there is an explicit difference between the two terms. In Baran’s (1964) original formulation (see Fig 1.),²⁷ a centralised network has a single authoritative centre with all nodes connected directly to the centre and not each other; a decentralised network has no single centre but consists of multiple centres that each have nodes connected to that particular centre and not to each other; and in a distributed network, each node has an equal relationship to every other node – there is no hierarchical relationship between them so in theory any node could connect to any other node. The internet is structured as a distributed network.

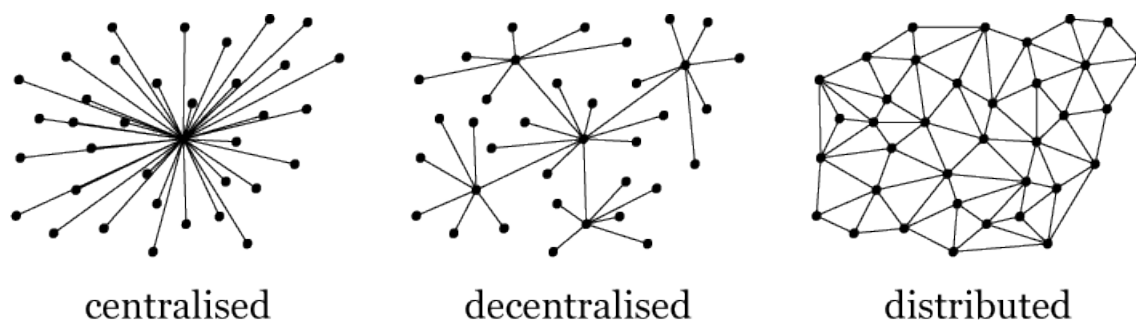


Fig 1. Centralised, decentralised, distributed. Image by 1983~enwiki at English Wikipedia, licensed under the Creative Commons Attribution-Share Alike 3.0 Unported license (<https://creativecommons.org/licenses/by-sa/3.0/deed.en>).

Open distributed systems are sometimes positioned in opposition to, and as a critique of, centralised control. In this view, networked digital technologies comprise a ‘communication infrastructure that has the potential to evade the ability of established authorities to control, censor, or ignore’, and openness ‘conveys independence from the threats of arbitrary power and centralized control’ (Russell 2014: 2). So, in theory, distributed networks result in distributed power. But although in a distributed system control may shift, it does not disappear – some co-ordination between nodes is still necessary and so mechanisms exist to facilitate it. Instead of the hierarchical ‘command and control’ methods of centralised systems, in a distributed system control is enacted through protocols (Galloway 2004: 8). Indeed, Galloway refers to protocol as ‘a management style for distributed masses of autonomous agents’ (Galloway 2004: 87). In other words, it performs a function similar to the liberal idea of ‘rule of law’ (see Chapter 4), whereby a formal code determines the ways in which people can behave – whether a legal code in liberalism, or computer code in a protocol-based network.

²⁷ Fig. 1 is an openly-licensed image based on Baran’s original.

So centralisation and distribution are both techniques of control, and thus both may have unequal power relations between nodes/constituents/stakeholders. Part of the rhetoric about the supposedly ‘democratic’ nature of the internet results from ignoring the fact that even within a distributed system, some nodes can still have more power than others.

[Be clear that the web is different to the internet – unlike the net, it *was* begun by scientists as an open system. But it still tends towards federation. The important question is: Does it matter that open systems have ‘dark origins’, or contain elements of closure/control?]

There are clear centres of power within the distributed system of the internet as it stands today. Formal centres of power, based on the physical and technical properties of the network, include the Domain Name System (DNS) that acts as the ‘address book’ for the internet and routes users to their desired destination (see Galloway 2004: 9–10; Mockapetris and Dunlap 1988). They also include the control of an individual network; the internet is made up of multiple linked networks, hence *inter-net*, and some of these networks are maintained by agents such as authoritarian states who are to some extent able to exert control over what happens on their network. As Kalathil and Boas (2003: 1–42, 136–142) have outlined, despite the opportunities offered by internet access to give voice to diverse perspectives, authoritarian regimes such as China have found ways to censor the internet,²⁸ control access to it, and use it to support their own political aims (see also Lorentzen 2013; Wacker 2003). And Lessig has written about how the internet is far from being the ungovernable space that some cyberlibertarians imagined it to be and in fact regulation²⁹ constrains the ways in which the internet can be used by shaping its technical and legal architectures (Lessig 2006: 2–8). So although it is true that the governing protocols of the internet (e.g. TCP/IP) cannot be centralised (Galloway 2004: 11), centralisation can still occur in the network in other ways, particularly by exerting control over the flows of data. This is a lesson that powerful internet companies such as Google and Facebook clearly understand; many of their products are ‘free’ for people to use without monetary payment, but in exchange they require users to give up both their privacy and control of their data. Critics such as Morozov (2012) and Lanier (2014) have long argued that corporate and state surveillance of the internet may well mean that the internet greatly restricts peoples’ freedom, rather than enhance it. The Snowden revelations regarding the extensive surveillance powers of the US security agencies have brought these concerns into wider circulation.

So power and control are central concerns of any attempt to understand the effect of the internet on society. As outlined above, the process of protocol design is highly political – control within networks lies not necessarily in the content of messages but rather in the design of the protocols that govern interaction, and in the ability to monitor and analyse data flows.

28 Although as Kalathil and Boas describe, the Chinese government asserts control more through regulatory and disciplinary measures to encourage *self-censorship* by users rather than overt censorship of content.

29 Lessig asserts that on the internet, regulation occurs not only through legal mechanisms but also through code itself, hence his phrase ‘code is law’ (Lessig 2006: 5). In this view, political ideals will only be realised through the internet by purposively building them into its architecture.

This last point is particularly important for understanding the behaviour of corporations online, including within the realm of scholarly communication. Perhaps more than any other major publisher, Elsevier has been proactively diversifying its business strategy away from a focus on owning and publishing content and towards piecing together a collection of products and services for use at all stages of the research workflow (Moody 2017; Schonfeld 2017³⁰). Springer Nature and its affiliated company Digital Science have also been taking this approach. The nature of these corporations' control of scholarly information flows, and the infrastructure that governs these flows, is highly problematic for critics of the current scholarly communication system who wish to see control in the hands of researchers themselves.

Conclusion

Openness as understood by the open source, open access, and other 'open' communities is a complex concept rooted in various political ideologies from libertarianism to socialism. This goes some way to explaining why open practices have been adopted among people from varying political affiliations. While openness avoids easy categorisation in traditional political terms (including binaries such as left/right, or collectivist/individualist), many of the aspects that identify a work or practice as open are related to the liberal tradition.

Openness is fundamentally an issue of ownership and control. There are also some clear boundaries that define what openness is *not*; as Kelty says, 'The opposite of an "open system" [is] not a "closed system" but a "proprietary system"' (2008: 149). Issues around legal rights to access and modify 'intellectual property' are at the core of the open/proprietary binary. So openness is closely related to freedom, and the relationship between freedom and openness is

[Three types of control systems: markets, hierarchies, and distributed networks. Consensus decision-making and distributed networks may provide a very different process to either markets or centralised hierarchies, but they are still systems of control.

The neoliberal ideology examined in Chapter 4 emphasises a binary choice between free markets and central governmental control, so organisational forms and governance structures beyond this binary – especially as they relate to scholarly communication – will be explored in further detail in Chapter 7.]

[Is closure actually always present in openness? Draw explicit parallels with neoliberal conceptions of openness.]

... It is important to examine the relation between openness and neoliberalism. As the following chapter shows, neoliberalism is intensely involved with issues of freedom/liberty, and liberty is conceptually close to openness. But the kind of 'open society' desired by neoliberals is very different from the ideals embodied in contemporary open movements... In the next chapter, the history and ideology of neoliberalism will be examined in depth...

30 [also cite Penny]

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