

YouTube and the protocological control of platform organisations

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Abstract

Purpose – This paper aims to examine the recommendation system of the video-sharing website YouTube to study how control of users is effected on online platforms.

Design/methodology/approach – This paper conceptualises algorithmic systems as protocols – technological and social infrastructures that both facilitate and govern interactions between autonomous actors (Galloway and Thacker, 2004, 2007). It adopts a netnographic approach (Kozinets, 2002) to study not only the formal, technological systems of the platform but also the systems as they were made sense of, understood and enacted upon by actors. It relies both on information as revealed by the organisation itself, as well as discussions between lay users in online forums and press coverage.

Findings – The results of this study indicate that the ways in which platforms selectively facilitate interactions between users constitute a form of control. While maintaining the appearance of an open and neutral marketplace, interactions on the platform are in fact highly structured. The system relies on the surveillance of user interactions to rapidly identify and propagate marketable contents, so as to maximise user “engagement” and ad revenue. The systems place few demands or restrictions on individual users, instead control is effected in a probabilistic fashion, over the population of users as a whole, so as to, in aggregate, accomplish organisational goal.

Originality/value – This paper contributes to the literature on accounting and control practices in online spaces, by extending the notion of control beyond overt rankings and evaluations, to the underlying technical and social infrastructures that facilitate and shape interactions.

Keywords Algorithms, Neoliberalism, Platforms, Biopolitics

Paper type Research paper

Introduction

Some of the largest and most profitable corporations in the world today have platforms at the core of their businesses, that is to say they own and operate technical *and* social infrastructures upon which actors may interact (Srnicek, 2017). Whether they are social media services such as Facebook, marketplaces such as eBay, or companies in the “sharing economy”, they share a common characteristic – they all rely in their value creation process on the media contents, products, services and indeed the information and data, generated by external actors who may or may not have any direct economic relationship to the owners of the platform (Srnicek, 2017). While the companies owning and operating the platforms are quite invariably fairly conventional and well-defined hierarchical organisations, the



platforms themselves are often rather different (Kornberger *et al.*, 2017). A significant part of the value creation process is externalised to users outside of the formal organisation; meanwhile, there is a degree of “openness” in terms of access to platforms, i.e. there is usually little-to-no vetting of prospective users before they are admitted to the platforms; moreover, an often significant portion of the userbase do not have any direct economic relationship with the platforms or their owners (e.g. no money changes hands between YouTube and an ordinary viewer on the site); nor are most users legally bound to the platforms beyond a terms of service agreement (Bhimani and Willcocks, 2014; Kornberger *et al.*, 2017; Srnicek, 2017). In other words, what we have before us is a form of organisation that challenges our conventional understanding of control as a phenomenon within well-defined organisational spaces.

As Srnicek (2017) alludes, the fact that platforms are ostensibly “open” in this manner does not render the concept of control irrelevant. Indeed, as profit-driven businesses, it is very much in the owners’ interest to control the nature of interactions on platforms (Kornberger *et al.*, 2017; Srnicek, 2017). The relevant question in this context is how control is enacted on platforms, as well as the implications this has on our understanding of control as social technology in general. Using the case of YouTube, I will henceforth argue that the platforms’ systems of technical and social infrastructures effect a novel form of control, one that does not so much discipline individuals in enclosed organisational spaces, but rather facilitates interactions differentially and directs the flow of resources and people, and in so doing achieves organisational goals in a probabilistic fashion over a population as a whole.

Platforms, control and biopolitics

There is now a not-insignificant body of research on the issues of control and various forms of information technology, which have highlighted some of the issues associated with these types of organisations. For example, within organisations, decentralised information systems can (often unintentionally) create multiple centres of calculation, lateral networks of surveillance and rhizomata controls, irrespective of formal organisational hierarchies (Brivot and Gendron, 2011; Quattrone, 2016; Quattrone and Hopper, 2005). The notion of control as enclosed within organisational boundaries is also eroding. Beyond the enclosure of organisations, social media and crowdsourced review and ratings sites are increasingly providing channels through which voices from outside of organisations are enabled to enact something akin to disciplinary power, as actors, with or without formal association, generate a plurality of viewpoints that may have material impact on the operations of the organisation (Agostino and Sidorova, 2017; Arnaboldi *et al.*, 2017a, 2017b; Arnaboldi *et al.*, 2017a, 2017b; Brivot *et al.*, 2017; Jeacle and Carter, 2011; Scott and Orlikowski, 2012; Viale *et al.*, 2017). In other words, the binary distinction between the centre and the periphery is blurred with the creation with multiple, intertwined centres of calculation (Agostino and Sidorova, 2017; Arnaboldi *et al.*, 2017a, 2017b; Brivot and Gendron, 2011; Kornberger *et al.*, 2017).

At the same time, the individual is increasingly subject to intersecting systems of control (Deleuze, 1992; Martinez, 2011). Businesses come to increasingly rely on the constant, technology-enabled surveillance of the individual as a source of data and insight (Agostino and Sidorova, 2017; Bhimani and Willcocks, 2014; Brivot *et al.*, 2017; Fourcade and Healy, 2013; Viale *et al.*, 2017). Closely related to this and the aforementioned erosion of organisational boundaries, the categories of individuals being subjected to surveillance and control have also been expanded, whereas earlier efforts have focused on actors with whom the firm has had some form of transaction, e.g. subcontractors, employees

or customers, there is now a movement towards any and all users of platforms (Agostino and Sidorova, 2017; Bhimani and Willcocks, 2014; Brivot *et al.*, 2017).

Thus, whereas more traditional conceptualisations of control envision enclosed, calculable organisational spaces within which individuals are subject to assessment and comparison by hierarchical, panoptic surveillance, according to some stable set of standards, platforms present the possibility of organisations without clear boundaries, without clearly defined roles for actors, and with multiple centres calculations. Yet this does not eliminate the need for control. To the contrary, far from being neutral marketplaces, platforms are deeply shaped by the intentions and goals of the platform owners (Galloway and Thacker, 2004, 2007; Kornberger *et al.*, 2017; Srnicek, 2017). Consequently, the pertinent question is rather how control is enacted on platform, and what this implies for our understanding of control as a social practice.

Of course, accounting as a discipline is no stranger to the notion of control outside of the confines of hierarchical institutions. As Munro (2012) and Cooper (2015) made clear in their reviews of the use Foucauldian theories in management and management accounting studies, respectively, much of the theoretical inspiration for the notion of control as predominantly occurring within enclosures came from Foucault's writings on the use of disciplinary power in early-modern institutions (Hoskin and Macve, 1986; Munro, 2012; Cooper, 2015). Yet towards the end of his life, Foucault was also keenly aware that new systems of power were emerging, not wholly replacing the old, but increasingly existing beside and transforming the ways older forms of power are exercised. Much of Foucault's later writings on biopolitics were concerned with systems of power that operate not within enclosed spaces and on individual bodies, but rather seek to organise the circulation of resources and people. Through technologies such as statistics, a new subject is constituted, that of the population as a whole – a quasi-biological superorganism, comprised large number of interacting individuals (Foucault, 2008; Munro, 2012; Cooper, 2015).

Foucault links the rise of modern biopolitics with the ascendancy of neoliberalism as a system of normative political-economic reasoning. To Foucault, two key elements differentiate between early-modern liberalism and modern neoliberalism – that of the market, and those individuals that operate within them. Whereas liberal thinkers such as Adam Smith saw the market as naturally occurring, naturally self-regulating, and over time would tend to produce the greatest collective benefit if only left alone, Foucault (2008) argues that neoliberal theorists tend to view the market as requiring continuous and covert interventions to promote competition and entrepreneurship, so that it may operate *as if it is naturally self-regulating* (Munro, 2012; Cooper, 2015). Moreover, whereas individuals were previously conceived merely as parties in exchange relationships, under neoliberalism individuals are re-imagined as entrepreneurs of the self, active economic subjects constantly seeking to maximise the returns on their *human capital*, that is to say their innate or acquired abilities (Foucault, 2008; Munro, 2012; Cooper, 2015). Instead of confining bodies and subjecting them to discipline, entrepreneurial subjects “are being encouraged to circulate, to exchange and, most importantly, to compete” (Munro, 2012, p. 353).

The exercise of biopolitical power then, lies in part in intervening in the market environment so that entrepreneurial individuals acting in self-interest would tend to, in aggregate, make decisions in ways that are socially and economically desirable, and in part in instilling and normalising an entrepreneurial spirit in the individuals, so that not only would they seek to maximise their own economic interests but also respond to modifications to the market environment in a desirable manner (Foucault, 2008; Munro, 2012; Cooper, 2015). And herein lies also the inherent contradiction of neoliberal biopolitics – while the individual is cast as the empowered entrepreneur, free to pursue their own self-interest,

ultimately they must do so under market-like contexts not of their own choosing, and whose design may embody interests incongruent to their own (Cooper, 2015). Entrepreneurial subjects are encouraged to circulate, to exchange and to compete, but the manners in which such circulation, exchange or competition can occur are subject to continuous interventions.

While the rise of neoliberal ideology predates today's internet-based platforms, as Van den Bussche and Dambrin (2020) contend, these organisations nevertheless exemplify neoliberalism in the post-industrial age. In particular, in their reliance on user-generated contents, products and services, platforms provide the infrastructure through which personal properties and abilities become assetised and monetisable (Van den Bussche and Dambrin, 2020). The individual user is recast as an active market participant, empowered to maximise the return on their assets, whether tangible or intangible, innate or acquired. Moreover, as Arvidsson (2005) and Srnicek (2017) note, platforms users contribute to the value creation process not only through material labour, but increasingly through immaterial labour as well – not only do users provide media contents, products and services, they are also increasingly being relied upon to produce trust, affects, cooperation and a sense of community and shared meaning, all of which can become sources of value for platform owners. Indeed, platforms such as TripAdvisor unambiguously market themselves not only as services but also as communities of like-minded individuals, inherently more trustworthy than distant experts (Jeacle and Carter, 2011; Scott and Orlikowski, 2012).

While few accounting studies on platforms have drawn explicitly from biopolitics (Van den Bussche and Dambrin, 2020, notwithstanding), a number of works have highlighted the complex nature of neoliberal subjectivity on platforms. Across a number of platforms, instead of anonymous providers of goods and services, users are encouraged to distinguish themselves as unique, identifiable individuals. Thus for example, on TripAdvisor (Jeacle and Carter, 2011; Scott and Orlikowski, 2012) and IMDb (Bialecki *et al.*, 2017), users can create highly detailed personal profiles and leave lengthy written reviews; similarly, users on TripAdvisor, eBay (Kornberger *et al.*, 2017), and Amazon (Jeacle, 2017) can earn various “badges” from the platform and fellow users. Here, the notion of the user as an entrepreneur of the self is closely linked to immaterial labour – the sense of trust and community is contingent upon the presence of unique, identifiable individuals on the platform, who are as much a part of the value proposition of the platforms as the goods or services themselves; users are drawn to these platforms not merely because they offer the possibility of transactions, but because these transactions are between ostensibly unique, identifiable and relatable individuals, as opposed to faceless businesses (Jeacle and Carter, 2011; McDaid *et al.*, 2019; Van den Bussche and Dambrin, 2020).

This also serves to highlight a natural point of intersection between biopolitics and the study of management control as a phenomenon, namely, that of the practice of mutual evaluation between platform users. On open peer-to-peer platforms such as Airbnb and eBay, systems of evaluation are vital in transforming uncertain and unknowable online spaces populated with distant actors into (what appears to be) functioning marketplaces and safe communities (Kornberger *et al.*, 2017; McDaid *et al.*, 2019; Van den Bussche and Dambrin, 2020). Part and parcel of the constitution of the entrepreneurial subject is the mobilisation of accounting devices such as reviews and ratings to visibly assign values to the users' human capital (Van den Bussche and Dambrin, 2020). Mutual evaluation is even present on platforms where users do not provide products or services to each other. In Jeacle and Carter's (2011) case for example, while the objects of evaluation on the platform TripAdvisor are ostensibly hotels and restaurants, users nevertheless engage in mutual evaluation, so as to form a picture of the relative trustworthiness of each other, and by

extension, each other's judgement. Similarly, [Bialecki et al. \(2017\)](#) find that reading user-generated reviews on the film review site IMDb often involves reading the profile of the authors, to gauge whether the authors' interests and tastes align with that of the reader. Indeed, as [Jeacle's \(2017\)](#) study of Amazon reviews illustrates, even user-generated evaluations themselves can become the object of evaluation, with users leaving rating for each other's product reviews.

This in turn has consequences for interactions on these platforms. For example, [McDaid et al. \(2019\)](#) and [Van den Bussche and Dambrin \(2020\)](#) find that reviews on Airbnb overwhelmingly trend towards the positive, which the authors argue is a consequence of the reciprocal nature of reviews on the platform – accommodation providers and guests on the platform leave reviews for each other, and as these evaluations are public and closely linked to identifiable individuals, as opposed to faceless organisations, there is a tendency among users to avoid conflict and confrontation. The market thusly constituted is at once dysfunctional, in that it is difficult for users to judge the quality of the services based on the review scores alone, yet also ultimately in the interest of the platform owners, in that the marketplace appears safe and friendly. ([McDaid et al., 2019](#); [Van den Bussche and Dambrin, 2020](#)).

The cases of [McDaid et al. \(2019\)](#) and [Van den Bussche and Dambrin \(2020\)](#) are suggestive – the nature of user interactions on Airbnb is inextricably linked to the peer-to-peer character of its marketplace. Yet the marketplace of AirBnB is neither naturally occurring nor neutral. Rather, the rules of interactions (mutual and public) in the marketplace embody the politics and interests of the platform owners ([Srnicek, 2017](#)). And in as much as the nature of the marketplace is shaped with the accomplishment of organisational goals in mind, it ought to be viewed as a form of control ([Van den Bussche and Dambrin, 2020](#)). From this perspective, it becomes apparent that while previous studies in control on platforms have emphasised the constitution of entrepreneurial subjects through evaluations, relatively little attention has been directed at the exercise of control through interventions in the marketplace in areas other than those of evaluative mechanisms. Evaluations are but one facet of the marketplace of platforms, and it seems at least plausible that other mechanisms are also at work in shaping the actions of users. Indeed, theoretical works such as those by [Kornberger et al. \(2017\)](#) and [Srnicek \(2017\)](#) propose that control on platforms goes beyond distributed and crowdsourced evaluations; rather, platforms, through their myriad underlying mechanisms exert control over users by selectively creating relationships between users; in [Kornberger et al. \(2017\)](#)'s words, it "is not the clear and parsimonious one of ranking and ratings, but rather a complex set of possibilities for making connections" (p. 87).

In summary then, whereas earlier works on platforms have focused on rankings and evaluations, Foucault's concept of biopolitics suggest that other mechanisms of control are at work – the control of populations as a whole is not merely a question of fostering entrepreneurial subjects through the disciplinary power of evaluations but also how such subjects are made to circulate and are brought together. This is to say that while overt evaluations on platforms must not be overlooked, as far as control is concerned analytical attention must also be directed at the wider range of devices that connect users to one another. The ways in which users are connected to goods, services, media contents, and ultimately each other, are not incidental, but rather a matter of design. While this theme of circulations and interactions has been elaborated upon in theoretical works such as [Kornberger et al. \(2017\)](#) and [Srnicek \(2017\)](#), it remains empirically under-explored. This paper addresses this lacuna, by asking, *beyond evaluations, how is the control of users effected on platforms?* And it does so by examining the video-sharing platform YouTube

and its systems, through the theoretical lenses of [Galloway and Thacker's \(2004\)](#) notion of the protocol – systems of technical and social infrastructures that both facilitate and govern interactions, and highlight the ways in which such systems effect rigid yet decentralised control on platforms.

Theoretical framework

[Galloway and Thacker \(2004, 2007\)](#) coined the term “protocol” to refer to the inseparability between all types of technical and social constructs that facilitate interactions between interconnected-but-autonomous actors, *and* the ways in which these constructs shape interactions. Just as the person of the sovereign and sovereignty as a form of power, or disciplinary technologies and disciplinary power, are mutually constitutive and inseparable, so are the means of interactions and the logic through which interactions are governed ([Galloway and Thacker, 2007](#)). This conceptual congruence is not incidental, as [Galloway and Thacker \(2007\)](#) view protocol as a development of Foucault’s notion of biopolitics. Protocol shares with biopolitics a concern for the operation of power over the population as a statistical whole, as well as the ways in which such a body is constituted and made amenable to intervention through the production of various forms of numerical information.

With this as the starting point, [Galloway and Thacker \(2004, 2007\)](#) argue that in modern, networked settings, protocol is one way to understand the constitution of such biopolitical bodies and the means through which interventions are made possible. While biopolitics does not supplant discipline entirely, and the two modes of power operate side-by-side, under biopolitics the subject of control is no longer the individual body but the population as a whole, ([Foucault, 2008; Munro, 2012](#)). As [Deleuze \(1992\)](#) argues, human actors are increasingly divided, surveilled, reduced to quantifiable measures, and aggregated to produce the “population”; and this in turn produces a new form of subject, the “dividual”, who does not exist within the system as a distinct individual, but solely as a particular set of generalisations derived from the population as a whole. The ontology-epistemology relation between the individual and the population becomes uncertain – on the one hand the population is a statistical aggregation of numerous individuals, yet on the other the individual becomes only knowable as a set of statistically derived traits.

Thus, for example, the individual becomes an “under-performer (in relation to the population”, “heavy user (in relation to the population)”, or “early adopter (in relation to the population)”. This, [Galloway and Thacker \(2007\)](#) argue, is the central premise of the notion of protocols – that under a protocological system of control, there is no meaningful difference between life and life-as-information, and that this informatics-based perspective on life enables systems to effect rigid control in open systems, without a central authority; they do so by facilitating interactions differentially, not between identifiable individuals as such, but between “individuals”, that is to say, in terms of reducible and quantifiable traces left by the individuals.

To illustrate this, [Galloway and Thacker \(2007\)](#) use the metaphor of biology. In a strictly physical sense, the cell is a liquid-filled space enclosed by a permeable lipid layer. Yet, cellular biology can be conceptualised as a protocological system, in that even though their motions within the intra-cellular fluid are random, the interactions between cellular components are governed by some basic and universal principles. Any number of molecules can and will enter into the cell, come into contact and interact with one another, but only some of these interactions are thermodynamically favoured and form stable bonds. Errors are not physically impossible (and are in fact fundamental for mutations and ultimately, the process of evolution), but are infrequent because they are thermodynamically unfavourable.

What this metaphor illustrates are some of the features of the concept of protocol. First, protocols as systems of control are inextricably linked to an informational view on life, in a manner analogous to the Foucauldian notion of power-knowledge. The regulation of cellular functions cannot be understood fully except as expressions of the molecular genetics of the DNA (and more fundamentally, thermodynamics/statistical mechanics), that is to say the cell as a system of information as encoded in the DNA. Just as biopolitical power and statistical knowledge are inseparable and mutually constitutive, so too is the protocol and life-as-information – the protocological system of control is fundamentally reliant on the reduction of life to its calculable and combinable digital traces. Second, protocols are relational, in that they are manifest only in the ways in which actors interact. Any number of interactions between molecules is possible, but some are statistically more favoured. Protocols govern interactions by facilitating them differentially, and their effects are probabilistic. In the cellular metaphor, the laws of genetics or physics are not “things” separate from the objects which they govern, but are made manifest in cellular activities. Along this vein, the protocol cannot be reduced to the technical and social constructs that facilitate interactions, but rather describes the ways in which these constructs are embedded, embodied and enacted by actors in encounters with each other. Third, what this regulation of interactions accomplishes is rigid control, not through a central authority, but distributed agencies. In the strictest sense, as mere collections of molecules, the cellular components obviously have no agencies of their own – their motions are entirely random, they do not “know” what to do or where to go. But they can also be said to possess a form of distributed material agency – in that the laws of physics are not enforced by any central cellular authority, but are embodied in the ways in which individual atoms within molecules interact with one another; likewise, genetic expressions are not governed by any central biological authority, but are made possible by the genetic material, i.e. the DNA, within every cell of the body as a whole. This distributed form of control is effected by systems of protocols, acting in conjunction with each other.

Of course, human actors are not cells, nor do they operate (solely) through laws of physics. To the extent that human actors interact through social and technical constructs, the concept of protocol denotes all of these apparatuses *and* the ways in which they facilitate and shape interactions (Galloway and Thacker, 2004, 2007). Thus, to use another example, interactions between actors on the internet is facilitated and governed by a host of technical (e.g. Telnet, TCP, IP) and social (e.g. laws, rules and etiquettes) protocols. These can be regarded as systems of protocols because they simultaneously make interactions possible and impose a certain kind of logic to said interactions. Thus, video-sharing/streaming sites would not be possible without technical systems such as DASH, an agreed-upon set of technological standards that enables the delivery of audio-visual content over the internet, or social systems such as copyright laws or social mores. Moreover, in line with the informational view, these are not interactions between individuals *per se*, but rather the flow of digitalised information traces generated by individuals as they interact with systems, and it is precisely their informational nature that renders them amenable to transfer and governance. It follows that the concept of protocol can be understood as the epistemological construct that denotes the practices through which subjects are governed in networks, at once reliant upon and yet irreducible to technological and social infrastructures. In other words, the “protocol is a technology that regulates flow, directs [space], codes relationships, and connects life forms” (Galloway and Thacker, 2004, p. 10).

To Galloway and Thacker (2007), systems of protocol are in constant states of dynamic tension. For one, the ontological statuses of the individuals and the network can never be fully resolved. Protocol as a form of control acts upon the network as a whole. In one sense,

the network is composed of a number of autonomous but interconnected individuals, and thus the individual precedes the network. But on the other hand, as far as the network is concerned, the individual only exists within the network in terms of their interactions as mediated by the system of protocols (i.e. one is not connected to a computer network merely by the act of physically connecting a network cable, rather presence on the network is contingent on sending and receiving data through the network). They who are present are the Deleuzian “dividual”, the digitalised, combinable traces left by individual networked actors; one is at once a “unique visitor” as well as part of an overall “network traffic” (Galloway and Thacker, 2007).

Furthermore, the central role played by technical and social constructs highlights a tension between two forms of control, that which is within the network and that which is “over” the network. Control within the network itself is decentralised – for example, network protocols on the Internet are not enforced by a central authority, but are rather embedded in the software and hardware configuration of individual networked computers. Yet, at the same time, the technical and social infrastructures upon which protocols rely are not laws of nature, but rather human creations that embody the politics of their creators. The distributed agencies of networked individuals and the materialised agencies of the owners of the infrastructures are thus in a constant state of negotiation (Galloway and Thacker, 2007). While the infrastructures of network often appear as opaque, inaccessible and non-negotiable, seemingly imposed by the owners of the platforms, the protocological systems that emerge from them are oftentimes more indefinite in character – the protocol is always accompanied by the counterprotocol (Galloway and Thacker, 2007). The protocological system relies on an informational view of life as quantifiable and digitalisable traces, yet it does not always succeed in imposing this epistemology universally. Nor is there one singular, sanctioned mode of interaction, but multiples, as actors within the network find shortcuts, loopholes, workarounds and exploits (Galloway and Thacker, 2007). To Galloway and Thacker (2007), counterprotocols represent resistance within networks, resistance to the ways in which life is co-opted by power through quantification; those who engage in counterprotocols do not seek to efface the networks, but to find other ways of being and interacting within them.

In relation to the research question behind this paper, namely, that how the control of users are effected on platforms, this paper contends that platforms such as YouTube can be viewed as a system of protocological controls consisting of overlapping layers of infrastructure, some of which technical, others social, all emergent and subject to negotiation, which together governs the interactions on the platform. In the analysis that follows, I will describe the various systems on YouTube in terms of the technical and social infrastructures which facilitate and govern interactions on the platform and demonstrate how these systems work together to effect a decentralised, protocological form of control, one that shifts its focus away from the evaluation of users as individuals, and instead aggregates and processes digital traces left by platform users and in so doing achieves organisational goals.

Research methods

As is common amongst platform organisations, YouTube is generally reluctant to speak of its systems in detail, which poses considerable challenge to prospective researchers. Earlier studies in YouTube have often relied on the platform’s open-access Data API to quantitatively reverse engineer its algorithms, (Bishop, 2018; Smith *et al.*, 2018; and van Kessel *et al.*, 2019; but also “lay” researchers outside of academia, such as Gielen and Rosen, 2016; Sybreed and Sealow (pseudonyms), 2021). While such an approach has provided

valuable insights into the inner workings of the platform, as [Bishop \(2018\)](#) points out, an unavoidable shortcoming of relying on YouTube's own interface is that the underlying algorithms are constantly revised and experimented upon by YouTube itself, and any data thus gathered can only be considered provisory. Moreover, as protocols, YouTube's systems are as much social as they are technical, and the social infrastructures of the site are a collective accomplishment, not only of YouTube and its formal organisation but also of all of its users, through their interactions with the platform and each other ([Galloway and Thacker, 2004, 2007](#)). Indeed, in this sense control is not solely the purview of the controller, but relies also on the intentions and actions of the controlled, and contingent upon the ways in which they are understood by the rank-and-file users ([Ahrens and Mollona, 2007](#)). The opacity of the algorithms, the piecemeal and equivocal ways in which they are revealed by the platform, and the ways in which users make sense of and navigate around the formal systems are all integral parts of YouTube's system of protocols, as much as any part of the technical infrastructure. Furthermore, as alluded to earlier, though contingent on formal, technological infrastructures of the platform, the protocological system is irreducible to formal systems; the system is only protocological when it is "live" – when they are embodied and enacted by networked actors in their interactions with each other ([Galloway and Thacker, 2007](#)). This is to say that, while not disregarding the formal, technical systems, to study YouTube as protocological system of control, one need to go beyond the formal and examine the experience of the lay users of the platform.

From this perspective then, it becomes imperative to examine not only the technical infrastructures of YouTube but also the wider system around it – the ways in which it is presented to users, talked about among users and the public at large, and the manner in which it is understood, worked around, and allowed to influence actions. Thus, going forward, this paper will adopt a "netnographical" approach, that is to say one that adapts ethnographic techniques to study computer-mediated communications within internet-based communities ([Kozinets, 2002](#)). The empirical focus is not only on the technical infrastructures as such but also the ways in which they are communicated to the users of the platform, and how such communications are understood and talked about by users. The goal is to understand YouTube not only in terms of a formal system of protocols but also more crucially how such a system shapes interactions with and on the platform in practice.

The data collection process is as follows. First, I familiarised myself with the general functionalities of YouTube as a platform, both from the perspective of the user as viewer and as content creator [1]. Second, I looked to the information made available by YouTube regarding its systems and algorithms. In this regard, [Covington *et al.* \(2016\)](#) constitute a crucial first-hand source of the inner workings of YouTube, as the authors were engineers at YouTube. Furthermore, material was also gathered from the official support page for YouTube [2], YouTube's own tutorials for content creators [3], the organisation's official blog [4] and the various official YouTube channels operated by the platform itself. The importance of these lies not only in their *prima facie* value as first-hand descriptions of the systems but also represents the ways in which the inner workings of the platform are communicated to platform users, a form of social action important in its own right ([Kozinets, 2002](#)).

Third, and in line with the recognition that protocols are social accomplishments as well as technical ones, I have conducted observations on commentaries left by users of the platform, both on YouTube itself in response to various videos, official and unofficial, touching on YouTube's systems of protocols, as well as posts on a number of sub-forums (so called "subreddits") particularly popular with YouTube users on the internet forum platform Reddit [5]. The choice of these specific research sites is to a large extent influenced

by Kozinets' (2002) exhortations in terms of the selection of online communities – in general, it behoves the researcher to direct attention to online communities that have a focus that is closely related to the research topic, have relatively high traffic and numbers of discrete users, and consequently large number of social interactions between users.

Fourth, I have also examined the press coverage of YouTube and its algorithms, both in mainstream press, as well as more specialised, trade media. These not only form an important source of secondary data on the platform itself, but are also important resources for platform users, and are thus often the subject of discussions among users. In this sense, they can be viewed as an integral part the “YouTube community”. Lastly, I looked to existing academic literature on YouTube in the field of new media studies, a discipline more accustomed to the exploration of media in the internet-era. In general, the empirical focus is on information made available after 2016, as this particular year marks the point in time at which YouTube transitioned toward deep learning technology based on artificial neural networks, and much of the underlying algorithms of the platform were overhauled in the process (Covington *et al.*, 2016). All of the netnographic data were bookmarked and saved as screenshots, one for each web page. All in all, a total of more than 250 pages were saved in this manner.

Drawing on this body of netnographic data and informed by the relationality of protocological systems, the first step in the analytical process focused on identifying technical and social infrastructures that facilitate interactions between platform users, whether as content creators, viewers or advertisers. As can be expected for an online platform, these interactions are not directly between users *per se*, but are rather in the form of digitalised information and mediated by the platform. The focus on interaction highlighted the commonality in a range of seemingly disparate devices and systems. In this light, mechanisms such as the search function, advertisements, comments, the subscription/notification function and livestream chats all serve the same overall purpose – to connect users to each other via user-generated digital contents, be they in the form of videos, advertisement, comments or chat messages. From this starting point, discourses in internet communities such as Reddit as well as in press coverages were analysed to place the systems in their proper context, not as mere descriptions, but as they are made-sense-of, understood, worked around, and otherwise enacted by users in their everyday interactions with the platform. In other words, what emerged was the protocological system in action – a network of independent actors whose interactions are at once facilitated and constrained by the formal systems. Thus, for example, it became apparent that for smaller creators, the major challenge is managing one's own visibility and accessibility within YouTube's Search and Discovery system, and far from being a neutral search function, the Search and Discovery system constitutes a form of control that governs content by selectively enabling interactions.

Findings

YouTube as technical infrastructures

YouTube is the world's most popular video-sharing service and the second most visited website on the Internet. At the most basic level, it provides hosting and streaming for user-created video contents and generates revenue through advertisement. Users may “like” and “dislike” videos, leave comments, subscribe to channels, create playlists, share videos on social media platforms and report videos for inappropriate or abusive content. It can be analysed as a system of protocols because fundamentally it facilitates interactions between users-as-content-creators, users-as-viewers, as well as advertisers, and it does so in a highly

structured manner, chiefly through two systems of automated algorithms, officially referred to as “Search and Discovery” [6] and “Monetisation” [7].

Search and Discovery is the general term used by YouTube to refer to all facets of the platform relating to its search and recommendations functions. It presents search results when users enter queries into the search bar at the top of the page; it makes personalised video recommendations on the front page, on the pages of individual videos, and at the end of videos; and it queues the next video to be played if the “Autoplay” feature is enabled. YouTube describes the function of Search and Discovery as twofold: “[to] help viewers find the videos they want to watch, and [to] maximize long-term viewer engagement and satisfaction” [8]. The most detailed and up-to-date account of the Search and Discovery system comes from Covington *et al.* (2016). In the paper, the authors note that as of 2016 the YouTube Search and Discovery system comprises two separate artificial neural networks, *candidate generation* and *ranking* (Covington *et al.*, 2016). During the candidate generation phase, a user query (for example landing on the YouTube front page or a search query using the search bar) is processed together with the user’s search history, watch history, feedbacks (“likes”, “dislikes”, etc.), demographics (age, gender, etc.), geographic location and other personal contextual information to generate a list of “hundreds” (p. 2) of candidates from a video corpus of “millions” (p. 2) (Covington *et al.*, 2016). The candidate generation algorithm also takes into account the “age” of the videos, i.e. the time since the videos were uploaded (Covington *et al.*, 2016).

During the subsequent ranking phase, videos in the candidate list are winnowed further to “dozens” based on user data, as was done in the candidate generation phase, as well as “hundreds” (p. 5) of criteria for each and every video in the candidate list, including channel and video watch times, thumbnails, languages, tags, descriptions, automated closed captioning texts and other content characteristic (Covington *et al.*, 2016). At the end of the ranking phase, the final results are presented as a hierarchical list of videos to the user, with those videos thought most likely to generate “engagement” placed at the top. The candidate generation and ranking algorithms are continuously refined in real time, using live A/B experiments – the algorithms record and measure user “engagement” in terms of “click-through” (i.e. the videos actually selected and viewed by the user), as well as the watch time for each selected result (Covington *et al.*, 2016). Furthermore, Covington *et al.* (2016) note that although various explicit feedback mechanisms exist on YouTube (as best exemplified by the “likes”/“dislike” buttons), these are outnumbered by several orders of magnitude by implicit feedbacks that do not explicitly ask the user to rate or assess the videos (as exemplified by the metrics of watch time and watched-to-completion), and that YouTube as a platform is increasingly relying on implicit feedbacks, as these appear to reveal more about user preference than explicit feedbacks.

YouTube’s main source of revenue is advertisement, and this is the domain of the Monetisation system. To advertisers, YouTube offers skippable and un-skippable video ads placed before, during, and after eligible videos, masthead ads on its front page, as well as appearing next to related videos and search results [9]. The system is broadly based on parent company Google’s AdSense technology. Eligible content creators are paid a share of the ad revenue through the so-called YouTube Partner Program [10] [11]. Advertisements can selectively target specific audience groups based on geographic regions, demographics (age, gender, marital and parental status, interests, etc.); individual user data such as operating system, browser types, browsing and search history can also be used to select for suitable ads [12]. Ads can also be placed to target particular types contents – from specific videos or YouTube channels, to videos on specific topics, or based on criteria such as watch

times, thumbnails, languages, tags, descriptions, automated closed captioning texts and other content characteristics of particular videos [13][14].

Besides the two large systems of Search and Discovery and Monetisation, operate a whole host of smaller ancillary systems and devices. Thus, on any given page for a particular video, one finds a row of four buttons beneath the lower right-corner of the video window – “like”, “dislike”, “share”, and “save”. Users can show approval or disapproval for a particular video by interacting with the “like” and “dislike” buttons, beside which the total number of likes and dislikes are displayed. To the right of these is the “share” button which, as the name implies, enables the video to be shared on social media platforms and messaging services. Further to the right is the “save” button, which allows the user to add the video to their own customised playlists. Further down the page is the red “subscribe” button, which allows the user to subscribe to the channel of the video creator. Once subscribed, the channel becomes directly accessible as a link on the user’s front page, and the user is then able to choose to receive notifications when new videos are uploaded to the channel.

Users are also able to interact with creators and other users somewhat more directly via comments and chats. Unless disabled by the video creator, viewers and content creators alike can leave comments to videos and reply to other’s comments, and the comments themselves can be liked or disliked. Moreover, the order in which the comments are displayed is structured – comments written by or replied to by the original video creator are always displayed at the very top, other comments are then listed according to some combination of numbers of replies and likes, and the age of the comment, with newer and more popular comments displayed higher up on the page. Furthermore, during live broadcasts (“livestreams”), viewers are also able to type messages direct into a chat window, which automatically scrolls and displays messages in chronological order. Beginning in early 2017, a Super Chat feature was also added – viewers of the live broadcasts can pay to have their chat messages pinned to the top of chat window; the revenue from the Super Chat is then shared between the creator of the broadcast and YouTube [15].

Together, Search and Discovery, Monetisation, and the various ancillary systems form the algorithmic infrastructure of YouTube, one that regulates flows of net traffic and creates spaces for interactions between creators, viewers and advertisers, not directly, but mediated through digital contents in the form videos, comments, chat messages and ads. And it does so through algorithmic surveillance of the behaviours of users, whether as viewers or content creators, and reduces said behaviours into combinable and calculable digital traces (Deleuze, 1992; Galloway and Thacker, 2004, 2007; Martinez, 2011). As Covington *et al.* (2016) reveal, the systems do not facilitate interactions neutrally, but rather seek to maximise viewer “engagement”. YouTube representatives have at various times claimed that, above all, the algorithms prioritise watch time, that is to say the length of time spent watching a particular video, and that total watch time has been a key performance metric for the company (Goodrow, 2017; Meyerson, 2012). Thus, Search and Discovery constantly seeks to learn user preferences and presents results most likely to maximise watch time for each particular user, and is continuously refined through live tests. At the same time, newer contents are constantly introduced into the results, so that their characteristics relative to viewer preferences can be identified and categorised. The end result is that as the user engages with the platform, the systems progressively present the user with longer and more popular videos (Smith *et al.*, 2018)

YouTube as social infrastructures

YouTube as a system of protocols is both technical and social in nature, and while the Search and Discovery and Monetisation systems certainly play a critical role, the platform’s

functioning is contingent on a degree of cooperation from users, not the least because it depends entirely on user-generated contents. Thus, on top of the technical protocols of Search and Discovery and Monetisation, YouTube uses a host of services that selectively disclose the workings of the technical systems. First, YouTube has separate guidelines for acceptable behaviours on the platform – “Community Guidelines” apply to all users on the platform, whether as content creators, viewers, or advertisers [16]; whereas “Advertiser-friendly content guidelines” govern the types of content that can be monetised [17]; meanwhile ads must adhere to Google’s general advertising policies [18]. Second, there is the official support page for YouTube, which offers information on a range of topics, including “Create and grow your channel” and “Monetise with the YouTube Partner Program” [19]. Third, YouTube has created a so-called YouTube Creator Academy, in which much of the information found in its guidelines and support pages are presented as dozens of short “courses”, each subdivided into shorter “lessons”, often accompanied by videos, and ending in “exams” consisting of a number of multiple choice questions [20]. Lastly, YouTube operates a number of “official” YouTube channels, such as TeamYouTube [Help] [21], Creator Insider [22] and YouTube Creators [23]. Between them these channels have hundreds of uploaded videos, covering topics such as “What’s the Ideal Video Length”, “How to improve your YouTube recommendations and search results” or “MYTHBUSTING #4: Do Ads affect Search and Discovery (S&D)?”, often featuring well-known content creators or YouTube employees.

These features often take on a distinctively prescriptive tone, with titles or headings that begin with a verb in the imperative mood. For example, the support page titled “Discovery optimisation tips” has subheadings that implores the content creators to “Create descriptive and accurate titles and thumbnails”, “Keep viewers watching with video techniques”, “Organise and program your content” and “Use reports to see what’s working” [24]. Similarly, the “course” titled “Grow your community” on Creator Academy asks the users to “Connect with your community”, “Reach beyond YouTube”, “Foster a positive community”, “Interact with your audience with new Community posts” and “Express yourself with Stories beta” [25]. Yet contradictorily, these features are also notable for their brevity in terms of concrete information regarding the workings of the Search and Discovery and Monetisation systems. For example, the support page titled “Monetisation systems or ‘the ads algorithm’ explained” is a single page of less than 400 words, which broadly states that “[o]ur systems look at your content and channels in different ways, and at different stages. For creators in the YouTube Partner Program, our monetisation systems can impact both your content and your channel”, followed by a few sentences describing how the systems scan for advertiser-friendly content, as well as viewer engagement [26]. The YouTube Creator Academy “lesson” on “Ads on YouTube” is equally laconic – it consists of a brief description of video advertising and different ad formats and a list of factors that can impact advertising (i.e. whether the content complies with Community Guidelines and Advertiser-friendly content guidelines, whether the content complies with copyright, and whether it is suitable for all audiences) [27].

The social infrastructure of YouTube also extends beyond the platform itself. Given the paucity of concrete information regarding the workings of YouTube’s systems, it is perhaps unsurprising that various online communities have sprung up to perform some function of collective sense-making. Many of these are to be found on the forum platform Reddit, with the largest being r/YouTube, with over 560 000 members, and dedicated to general “meta-discussion about YouTube as a platform, including its features, bugs, and business decisions”, for viewers and content creators alike [28]. Smaller forums include for example r/NewTubers and r/SmallYTChannel, with over 230,000 and 114,000 members, respectively,

created specifically to provide collaborative resources and feedback for new creators wishing to refine their content and reach larger audiences [29].

A significant portion of the discussions on these forums are centred on the algorithmic systems of YouTube. The topic is often brought up in relation to issues important to many newer content creators – growing one’s channel and reaching new audiences. Thus, for example, user duugan asks on r/NewTubers:

Do YouTube and Google consider video length as ranking factor?

Currently, my videos are around 1:00 to 1:30 minutes, because I post them also in Facebook (shorter videos work better in Facebook for us). But I am now diversifying my video traffic source and would want to optimise my videos in YouTube.

Two users respond:

Since the algorithm changed, watch time is a big part of YouTube’s determining factor for your videos’ search and discovery. They favour videos with longer watch time, because views could be misleading or subject to abuse.

We all know they actually did it because. staying on a video longer means you’re using their site longer which in turn gives a higher chance of you going onto the next video. – user Turtle_Co

YouTube favors videos with more watch time. I have some videos that are only a couple minutes [...] I have some that are almost an hour. It’s what is appropriate for the video. Don’t force your videos to be longer for watch time. Audience retention is also a factor. My average videos are usually around 10 minutes and have decent audience retention. If you are making a video and it makes sense to have it longer, do it. Any length can be good if the video is engaging.

The main problem with mainly having short videos is having enough watch time to be or stay monetised [...] you need a lot more views to get to the 4,000 hours annually. – user FandomSpotlite

[All quotes as originally appeared]

Similarly in response to one user’s question of whether changing video titles and thumbnails would improve traffic, one user responds:

Changing thumbnail hell yes, for obv reason, the better your thumbnail the better your CTR [click-through rate]. Thumbnail as no effect on search and discovery. So you can even change the thumbnail on your best video with weak CTR it can only get better.

Changing title hell yes again, the more searchable is your title the more you will get find. But contrary to thumbnail if you change your title the algorithm reset that video from a min or two up to few hours depending on how different the new title is. So probably worth doing that at 3 am, lol. I would not change the title on a high performing video because of the small algorithm reset. – user MaxSujoy_React

[All quotes as originally appeared]

It is also in communities like these that one often finds rather ambitious instructions or tutorial on how to “make it” on YouTube as a content creator, which nearly always address the platform’s technical systems in some manner, building on bits-and-pieces of information from YouTube’s communications, trade publications and personal experiences. For

example, one widely shared post by user *tlo_oly*, titled “How To Gain 90,000 Subs In 3 Months [A Case Study]”, is over 5,700 words in length, and touches on topics ranging from social media platforms on which to promote one’s channel, monetisation strategies, YouTube’s Search and Discovery algorithms, to analytics data. One of the most popular posts on *r/NewTubers*, by user *dangelowallace*, titled “How I went from being a NewTuber to a [...] Not-As-NewTuber (75k subs, 10 months)”, at close to 3 300 words, provides twelve pieces of advice, organised into trios of “Facts”, “Goals” and “Objectives”. Almost all of these posts adopt the form of step-by-step advices, ostensibly based on the personal experiences of content creators who have had some degree of success.

More ambitious still are the various attempts by lay users to reverse-engineer the YouTube Search and Discovery and Monetisation systems, for example those by [Gielen and Rosen \(2016\)](#), [Gielen \(2017\)](#) and *Sybreed and Sealow* (pseudonyms, undated). These invariably rely on YouTube’s own application programming interface (API), and attempt to piece together a picture of the functionalities of the algorithms through automated data extraction. While some, notably [Gielen and Rosen \(2016\)](#) and [Gielen \(2017\)](#), are published in trade publications, much of the research of this type are instead shared informally through discussions on platforms such *Reddit*, *Twitter* or *YouTube* itself.

The frequency and the popularity of these types of discussions attest to the important role that they play in the protocological system of *YouTube*. More than the terse and ambiguous language of official communications, the lay user’s understanding of the platform is often informed by these heuristics derived from informal research, educated-guesses, personal experiences and hearsays; and in the sense that these types of discussions affect the manner in which users interact with the platform and each other, they are as much a part of *YouTube*’s protocological system as the technical systems, official rules and guidelines and communications.

At the same time, while these types of contents are shared widely across communities, and receive hundreds of “upvotes” and comments each, a not-insignificant portion of the discussions in these communities show a spirit of resignation in relation to *YouTube*’s algorithms. For example, user *digidv85* posts:

Sadly this has a completely negative effect on me. Right now I’m past the three year mark with my channel, I have 1,634 videos made in that time frame. Watch time for the past 12 months is 3.5K. Total views are 46,630. Yet my sub count is only 276. Nothing I do attracts people anymore. I’ve watched countless “help” videos on growing a channel. I’ve spent three months doing 50+ overhauls of thumbnail designs alone.

Likewise, user *TheRealBluefire* notes,

Hello I’ve had my channel since 2015 and it’s been pretty slow, nowadays I’m only getting about 5 or 10 Views Tops and my channels stuck at 107 Subscribers, I’ve tried a few things like Uploading Two Videos a Week, Sharing My Videos On Social Media’s and even adding as many tags as possible in my videos that fit the video itself but I’m still not doing well, is their anything I can do? I’ve always had the dream too become a Popular YouTuber and I feel like my dream might end.

[All quotes as originally appeared]

Specifically, the tendency among many is to ascribe popularity on the platform partly or wholly to luck of the draw:

Sometimes it’s just pure luck I mean I gave one of my music in a guy to put in his videos (i do that a lot) and he got to videos picked up by the algorithm maybe cause he was a channel with 100

subs back then and the videos were 30k - 60- views and that's when a lot of people came to me and I reached 1k on that track. – user KrzGhost

[All quotes as originally appeared]

In a sense, the two sets of discourses reveal the core experience of many content creators on YouTube. On the one hand, YouTube's own communications portray its algorithmic systems as straightforward, coherent and understandable. Creating and sharing videos are easy and accessible to all. Whether the user simply wishes to find an audience for their content or actually earning an income, success is portrayed as possible or even plausible, so long as one understands the system and puts in the requisite effort. This creates an environment which encourages content creation and sharing, and some basic level of compliance with the platform's rules and guidelines, particularly in relation to advertiser-friendly content. Many of the user-created tutorials and guides, particularly those appearing on forums such as r/NewTubers, mirror YouTube's own communications in their portrayals of the algorithmic systems as straightforward, coherent and understandable, albeit in far greater detail; and this is echoed by the vernacular culture of a significant portion of the content creator communities. The ephemerality of the creative process, of personal charisma, popularity, recognition, and success are brushed aside, and reduced and concretised to a series of steps, the first of which is understanding the algorithms. Yet on the other hand, understanding the system is precisely that which is difficult, because so little is revealed by the platform itself. What is known is pieced together from official communications, informal research on the system (which may or may not have changed since) and personal experience and best-guesses. And thus, beneath the veneer of the possibility of success is always the undercurrent of incomprehension and distrust – the system is arbitrary, ever-changing, largely unknowable and often indistinguishable from luck.

YouTube as a protocological system of control

Some patterns begin to emerge as we view YouTube's various systems as protocological control. First, as [Galloway and Thacker \(2004, 2007\)](#) note, protocols as a form of control exemplify the inseparability between life and life-as-information in an age in which interactions are increasingly mediated by information technology. Controls on YouTube rely on algorithmic surveillance of the behaviours of users, whether as viewers or content creators, and systems such Search and Discovery reduce said behaviours into combinable and calculable digital traces. As automated algorithms, Search and Discovery does not and cannot understand creativity and the myriad ways in which audiences engage with creative works. Rather, interactions between viewers and content creators are instrumentalised and quantified as “engagement”, primarily in the form of watch time. Individual users exist within the algorithms solely as particular sets of statistical generalisations, derived from the user-population as a whole – click-throughs, thumbnails, languages, tags, search histories, watch histories, feedbacks, demographics and geographic locations, all ultimately in relation to the central metric of “engagement”.

Second, YouTube as a system of protocological control is relational, that is to say it is manifest in the ways in which it facilitates users' interaction. It is a system of rankings, calculations, and evaluations that is not so much concerned with referentiality towards objective criteria of “good”, but rather facilitates the creation of relationships between users, both as content creators and viewers, by generating and revealing a humanly comprehensible landscape of media content for each individual user, out of potentially billions of videos ([Kornberger et al., 2017](#)). In most concrete terms, the Search and

Discovery system connects users by delivering user-generated content (primarily videos, but also comments, chat messages and even ads) to other users; it controls what users see on the platform. Yet it in no way guarantees that each and every video will be seen.

The crux of this lies in the fact that the platform does not facilitate interactions in a neutral fashion. The Search and Discovery system prioritises viewer “engagement”, particularly in terms of watch time, over all else. And this has had noticeable effects on the behaviors of users-as-content-creators and the types of contents created (Bishop, 2018; Burgess and Green, 2018; Gillespie, 2010; Postigo, 2016; Rieder *et al.*, 2018). For example, it is widely believed that changes made to the Search and Discovery system in 2013–2014 were to a large extent responsible for the decline of animated videos, a popular genre in the early days of the platform. As one animator notes on the Reddit forum r/animation [30]:

The problem is YouTube itself. It's build for creators that can do a lot of new releases. Like video bloggers. At least once a week. Animation is very time-consuming field. We just can't afford to release that often and thus can't get enough money from channel monetisation to survive. I do myself animation channel and it's still alive (its non-english, so no link) and life is really tough for me as creator. “On the edge” I would say. And at the same time my buddy is making “talking head” chanel stupid as hell, just bla-bla-bla channel, but he survives pretty well 'cause he releases new videos every 4-5 days. That's reality now.

[Quote as originally appeared]

As Search and Discovery changed to prioritise frequent uploads and longer videos, original animated content became largely invisible within the system, as animators were unable to frequently upload new content due to the time-consuming nature of animation production. Search and Discovery controls the type of content that is visible on YouTube, and in the long run, “unpopular” content disappear from the platform as they become difficult, if not outright impossible, to discover.

In this sense, YouTube's Search and Discovery and monetisation systems can be viewed as systems of controls geared towards the accomplishment of the organisational objectives, in this case the maximisation of watch time, by selectively facilitating certain types of interactions. This can be contrasted with the business model of traditional media organisations, which relies extensively on pitch meetings, test screenings and focus groups and stringent project management; YouTube on the other hand is, for a lack of a better word, more probabilistic in nature (Bishop, 2018). The focus of YouTube as a platform is “bootstrapping and propagating viral content” (Covington *et al.*, 2016, p. 3), that is to say to encourage the creation and upload of content, to rapidly identify commercially viable media out of this vast library, and then with equal speed present them to a large audience. Rather than setting and communicating clear objectives and rules of conduct to ensure compliance on the part of individual content creators, YouTube's system of protocols discloses enough information to facilitate some basic level of compliance in terms of the minimal acceptable set of behaviours, and crucially, to create the illusion of perceivable consequences and meaningful actions, and in turn, the possibility of success on the platform. The qualities of any particular video or channel are less important than being able to rapidly identify valuable content among the masses and present these to potential audiences.

Fundamentally, the power of the Search and Discovery system lies in a kind separation-through-sheer-abundance. Although it is possible to access any specific video directly through a shared link or the video's URL, in practice interactions between content creators and viewers most often *must* rely on the Search and Discovery system. While creators may seek to promote their contents directly, for example through social media, in most cases they must rely on the Search and Discovery system to reach potential audiences. Moreover, this

separation is not only apparent from the perspective of content creators. Whether using the search function or clicking on suggested videos, the viewer most often does not and cannot access the corpus of billions of videos directly. While new content creators struggle to connect with an audience, a large number of viewers complain of the difficulty of finding new content to watch – on the general YouTube discussion forum r/YouTube, a significant portion of the discussion around the algorithms centers around viewers' experience of the Search and Discovery system, and the difficulty of finding new content. For example, in a thread on r/YouTube titled *What is up with the recommendations algorithm? It mostly shows me videos I've already seen*, users write:

Why do I keep seeing the same 30 videos (or so) day after day after day no matter what I watch? At some point when it does a "refresh" (no idea what triggers it), it latches onto whatever last few videos I watched, gets 1-2 similar videos for each, and keeps showing that set over and over and OVER. Even when I don't click them or add them to Watch Later [...]

I should probably use "Not Interested" more, but it's [...] It's all YouTube's fault for being exceedingly stupid. I'm not not interested in that stuff forever. You just can't fixate on a set of recommendations for so long. It's bonkers. – user Enamex

It's becoming so much harder to find new and interesting content outside of the channels I'm already subscribed to.

I've been pigeonholed into an echo chamber of my own creation, with no way to get out. And its ruined YouTube for me. – user Dannyboi93

Also illustrative in this instance is the aforementioned function of the Super Chat. Chat messages during livestreams (live broadcasts) are one of the few ways in which viewers can interact (somewhat) directly with content creators, yet during popular livestreams dozens of messages scroll past in the chat window every second, far too fast to be read. For a small fee, users can purchase "Super Chats", messages that are pinned to the top of the chat window. During livestreams, it is not uncommon for content creators to only respond to pinned Super Chat messages, if for no other reason than that of legibility. In other words, users are separated from each other by the sheer abundance of user-generated contents, whether in the form of videos, comments, or chat messages. The protocological systems of YouTube facilitates human interactions, but on its own terms. Interactions are always possible, but they come at a price, either indirectly, as when one views popular, monetisable content, or directly, as in the Super Chat.

Third, this protocological form of control exists in a state of dynamic tension between centralisation and distributed agencies. On the one hand, there is little doubt that YouTube maintains ultimate control over its Search and Discovery, Monetisation, and other ancillary systems as whole. On the other hand, the day-to-day functioning of the systems relies on the distributed agencies of its community of users and their collective sensemaking. This has a number of consequences for the platform as a whole. For one thing, the systems themselves exist in a state of tension between visibility and opacity – they are by no means secret, yet relatively little regarding their inner workings is revealed at any given time. Explicit feedbacks in the form of the "like" and "dislike" buttons are highly visible, yet the Search and Discovery system of today prioritises implicit signals such as watch time, watch-to-completion, and frequency of visit. Similarly, content creators are encouraged to tag their videos with a number of keywords, so as to aid the Search and Discovery system in identifying the content of the videos [31]. However, as [Bishop \(2018\)](#) notes, keyword tags were made invisible in 2012, so as not to mislead viewers. Visibility facilitates perceivable

consequences and compliance, but also opens the systems to manipulation. Opacity and the constantly changing nature of the algorithms is part and parcel of protocological control – a system that cannot be understood and cannot be seen cannot be subverted. Yet it must remain sufficiently visible so as to retain the human interactions it requires for day-to-day functioning – compliance and cooperation become impossible if the system is perceived as overly arbitrary or indistinguishable from pure luck. Thus, the platform owner is constantly engaged in a back-and-forth between visibility and opacity, constantly tweaking the system and selective communicating changes to users.

Moreover, the protocol's governance over interactions is not total. In one sense, some amount of workarounds is already built-in – once a particular channel or video is discovered, the subscription and share functions circumvent the Search and Discovery system entirely, by offering direct access to the content. The most tangible marker of success on YouTube is one's number of subscribers, and indeed the platform awards physical trophies for 100 000, 1 million, and 10 million subscribers [32]. Paradoxically, becoming successful as a content creator on the platform involves attracting an audience, a community of users who access one's content directly, outside of the structured interactions of the protocological system. In a broader sense, as YouTube's system of protocological control extends beyond the boundaries of the platform itself, the boundary between the notions of the protocol and the counterprotocol is also blurred – even as the system reduces individuals and their activities to digitalised, calculable traces to facilitate and govern interactions, it does not succeed in imposing this power-knowledge relationship everywhere. Whether it is to promote one's own channel and content, or to collectively make sense of the platform, even as users negotiate the system of YouTube, they discover means to connect elsewhere, on their own terms, on third-party platforms such as Reddit, independent of YouTube's algorithms.

This is of course not to suggest that other platforms are free from protocols – Reddit, Twitter, Facebook each have their own set of algorithms that facilitates and governs interactions. In a Foucauldian sense, power and knowledge are always mutually dependent and mutually constitutive, and there is no fundamental mode of “life” that is discoverable and knowable independent of power structures – other platforms too will inevitably transform life into life-as-information so as to facilitate and govern, if only in somewhat different manners. Yet, the space between platforms offers the opportunity for different modes of interaction, not entirely governable by any one system of protocols. On the one hand, these interactions are inherently subversive, as they resist the co-option by any single system of protocols. Yet on the other hand, to the extent that platforms exhibit a high degree of mutual dependence – e.g. many platforms rely on YouTube for video hosting, while others use Reddit for its forum functions – it can be said that they too form an integral part of protocological control. Thus, the notion of the counterprotocol, that is to say interactions outside of the protocological system of control, is ultimately inseparable from that of the protocol.

In summary then, the findings of this study suggest that the control of users on YouTube is effected through a protocological system that places few explicit demands or restrictions on individual users, but instead selectively facilitate interactions between them. It does so through the algorithmic surveillance of user behaviours, and transform said behaviours into combinable and calculable data, all to maximise “engagement”, that is to monetisable interactions between users; it is a system that is not concerned with any objective criteria of quality beyond the possibility of a profitable match. It is equally worth noting that such a system extends beyond the formal, technological infrastructures of the platform; rather, it is also a social accomplishment in that it has to be made sense of and enacted by its users in their interactions, and is thus constantly reinterpreted and renegotiated.

Discussion and conclusion

While previous studies in accounting and management control on platforms have highlighted the role of evaluative practices in effecting neoliberal forms of government on these platforms and the constitution of users as entrepreneurial subjects, the nature of these market-like spaces and the interventions made to them by platform owners remain underexplored. While the marketplace of platforms may appear as a neutral space, it embodies the politics of those who hold power over such spaces and it requires continuous interventions so that it may continue to operate as if it is naturally self-regulating (Munro, 2012; Cooper, 2015; Srnicek, 2017). In this sense, YouTube is the archetypal neoliberal marketplace – while presenting itself as a platform on which any creator can succeed on their own merits, the scope of interventions is near-total. And it is interventions in terms of strict control over interactions and the creation of relationships. Most interactions between users are facilitated, governed and surveilled by, and feed directly back into the protocological system of control. Platforms portray themselves as spaces where relationships can develop organically, but such relationships are in fact strictly regulated, on the platform's own terms, towards the platform's own goals

This conceptualisation of control in turn has implications for our understanding of the governance of these platforms in particular, and the neoliberal marketplace in general. First, it shows the limitations of (overt) evaluative practices as a frame of analysis in the study of platforms. Though applying different theoretical approaches, McDaid *et al.* (2019) and Van den Bussche and Dambrin's (2020) studies of Airbnb both come to a similar conclusion – the mutual and public nature of the evaluation process results in largely positive reviews, thus rendering review scores themselves largely meaningless. When large number of objects receive similar review scores, what other devices are at work to direct users towards one object or another? Likewise, when platforms trade not in products or services, but evaluations as such from lay experts, as in the cases of Jeacle and Carter (2011), Bialecki *et al.* (2017), and Jeacle (2017), the experts, and by extension their evaluations, become objects of evaluation. Yet to what extent can this form of secondary evaluation be meaningfully carried out when platforms such IMDb and TripAdvisor offer huge numbers of user-generated reviews? As the present case demonstrates, the governance of platforms extends beyond the referentiality of evaluations. When a search query on any given platform is likely to generate hundreds, if not thousands, of results, *which* results are displayed and *how* matter. It is, in Foucauldian terms, the flow and circulation of objects and human capital, in a seemingly-random-yet-clearly-regulated fashion (Foucault, 2008; Munro, 2012; Cooper, 2015).

Second, the platform user as a subject is in a peculiar place. While platforms transact in user-provided products, content and services, and are indeed reliant on user interactions for protocological control, ultimately the individual user matters little to the platform except as a set quantifiable traits that can be matched with those of another set of users. Success in the platform economy is probabilistic, it is statistically predictable but individually unpredictable – any user can in theory become successful; with the help of the algorithms some are certain to become successful; but not all can be successful. Moreover, this places new demands on the individual as participants in the platform economy. As the present case shows, considerable work on the part of the users' centres around creating connections outside of the formal systems of the platform, whether it is to promote one's content and gain subscribers or to collectively make sense of the systems themselves. To perform as a neoliberal subject goes beyond producing goods and services, but rather also involves managing one's own movements and interactions in the marketplace. In a system mediated by technology, more than the ability to perform physical and intellectual labour, that which

has been put to work is also human sociality – the ability to interact, to form relationships and communities. Whereas earlier studies by [Jeacle and Carter \(2011\)](#) and [Scott and Orlikowski \(2012\)](#) contend that the sense of community engendered an unique form of trustworthiness and accountability, the present case suggest that it is human connection itself that is monetisable.

Thus, [Galloway and Thacker's \(2004\)](#) contention that the protocological system is always being in a state of tension, between the day-to-day functioning of the system based on decentralised agencies, and the centralised control over the system as a whole exerted by the owner/operator of the infrastructures, mirrors the social contradiction of neoliberalism in which ostensibly free, entrepreneurial subjects are constituted in a context fundamentally not of their own choosing, and over which they can exert little control ([Cooper, 2015](#)). The notion of the subject being unique and free is essential for encouraging participation in the neoliberal marketplace of platforms, but also remains illusory, as this uniqueness and freedom of the individual conceal the coercive nature of opaque and non-negotiable systems of protocological control. This of course is not to say that platforms are in some ways uniquely neoliberal, but rather that they are deeply embedded in the dominant neoliberal rationalities of today, and that this is reflected in their technical and social infrastructures, and the ways in which these infrastructures shape our lives as social beings. Whereas Foucault saw biopolitics as the “empirical description of the government of population” under neoliberalism, to [Galloway and Thacker \(2007\)](#), the systems of protocols of platforms exemplifies biopolitics in an age in which human interactions and relations increasingly come to be mediated by information technology.

This paper only scratches the surface of the issues at stake, and further research is needed on a range of topics relating management control on algorithmically controlled platforms. First, YouTube as a content platform is relatively unique. For example, interactions and transactions on the platform usually have very low stakes to the consumer of contents – it cost next to nothing, except time, to view contents or subscribe to channels. Nor are the majority of content creators interested in earning income from their videos. It would be interesting to extend protocological analysis to other platform organisations, where the nature of interactions is fundamentally different. Second, there is ample room for studies on the nature of subjectivity under automated, algorithmic control. Controls on platform are uniquely automated, opaque and non-negotiable ([Scott and Orlikowski, 2012](#)). Consequently, this is an area that can benefit from more ethnographic research that directly explores the lived experiences of users of platforms. Third, [Galloway and Thacker \(2004, 2007\)](#) theorise that resistance to protocols takes the form of counterprotocols – selectively manipulating and bending the protocols to other ends. There is already an emerging body of literature in the field of new media studies looking at how various actors have attempted to manipulate the protocological systems of YouTube for economical and political gains ([Lewis, 2018](#)). Furthermore, the success of membership platforms such as Patreon, which offers the possibility of monetisation outside of YouTube's Monetisation system, also suggests that resistance is mounting against what many content creators have beginning to see as digital exploitation on the part of YouTube ([Hern, 2018](#)). This represents another area to which I believe critical scholars of accounting can make useful contributions.

Notes

1. It was not possible to study the monetisation functionalities of YouTube first-hand, as at the time of writing, monetisation is only available to users or channels with at least 1000 subscribers and 4000 hours of watch time over a 12-month period.

2. <https://support.google.com/youtube> (accessed 24 March 2021).
3. <https://creatoracademy.youtube.com> (accessed 24 March 2021).
4. <https://blog.youtube> (accessed 24 March 2021).
5. www.reddit.com/r/NewTubers/ and <https://www.reddit.com/r/NewTubers/> (accessed 24 March 2021).
6. E.g. <https://support.google.com/youtube/answer/9269747> (accessed 24 March 2021). <https://creatoracademy.youtube.com/page/lesson/discovery> (accessed 24 March 2021).
7. <https://support.google.com/youtube/answer/9269689> (accessed 24 March 2021).
8. <https://creatoracademy.youtube.com/page/lesson/discovery> (accessed 24 March 2021).
9. <https://support.google.com/google-ads/answer/2375464> (accessed 24 March 2021).
10. <https://support.google.com/adsense/answer/72857> (accessed 24 March 2021).
11. <https://support.google.com/youtube/answer/72857> (accessed 24 March 2021).
Videos are automatically screened for suitability for advertisement in terms of non-offensive and non-controversial content; ads can be placed in all suitable videos; however, only those in the YouTube Partner Program (YPP) receive a share of the ad revenue. As of 2021-03-24, to be eligible for YPP the channel must have acquired 1,000 subscribers and 4,000 hours of watch time in the past 12 months.
12. <https://support.google.com/admanager/answer/1143651> (accessed 24 March 2021).
13. <https://support.google.com/youtube/answer/9269689> (accessed 24 March 2021).
14. <https://support.google.com/youtube/answer/2454017> (accessed 24 March 2021).
15. <https://blog.youtube/news-and-events/can-we-chat-hello-super-chat/> (accessed 24 March 2021).
16. <https://www.youtube.com/about/policies/#community-guidelines> (accessed 24 March 2021).
17. <https://support.google.com/youtube/answer/6162278> (accessed 24 March 2021).
18. <https://support.google.com/adspolicy/answer/2679940> (accessed 24 March 2021).
19. <https://support.google.com/youtube> (accessed 24 March 2021).
20. <https://creatoracademy.youtube.com> (accessed 24 March 2021).
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22. www.youtube.com/channel/UCGg-UqjRgzhYDPJMr-9HXCg (accessed 24 March 2021).
23. www.youtube.com/user/creatoracademy (accessed 24 March 2021).
24. <https://support.google.com/youtube/answer/141805> (accessed 24 March 2021).
25. <https://creatoracademy.youtube.com/page/course/fans> (accessed 24 March 2021).
26. <https://support.google.com/youtube/answer/9269689> (accessed 24 March 2021).
27. <https://creatoracademy.youtube.com/page/lesson/ad-types> (accessed 24 March 2021).
28. www.reddit.com/r/youtube/ (accessed 24 March 2021).
29. www.reddit.com/r/NewTubers/ and <https://www.reddit.com/r/SmallYTChannel/> (accessed 24 March 2021).
30. See also, for example, *Algorithm Killed the Video Star*, www.youtube.com/watch?v=9e-WJHC_WRA, and *Is YouTube Killing The Animation Industry or Not?*, <https://vidooly.com/blog/>

[youtube-killing-the-animation-industry-top-animation-channels-on-youtube/](#) (accessed 24 March 2021).

31. <https://support.google.com/youtube/answer/146402> (accessed 24 March 2021).

32. www.youtube.com/creators/how-things-work/programs-initiatives/awards/, viewed on 2021-07-20.

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