



Simondon, Control and the Digital Domain

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Abstract

Deleuze put forth a description of fluid control in computerized society in his text ‘Postscript on Control Societies’. With the help of the philosophy of Gilbert Simondon, we can broaden and complexify this view and understand digital systems through the concept of modulation. These modulatory systems intervene in human individuation by controlling individuals as ‘dividuals’. In contemporary digital technologies, like blockchain platforms, the modulatory dividual control can be fierce and even total. Simondon’s concepts of pre-individual, individuation, and transindividuation present us with an ontology for this contemporary mode of control and enable us to better understand the complex relations between the being of humans and technical networks.

Keywords

blockchain, control, dividual, modulation, Simondon, technology, transindividual

Introduction

Algorithmic systems, like AI applications, social media platforms, appliances of IoT and, more recently, blockchain technologies, have conquered many aspects of our daily life (e.g., Bambara and Allen, 2018; Quiniou, 2019). This has raised concerns about, among other things, privacy, energy consumption and the control that these systems exercise. This article focuses on one of the most pressing of these issues: control. However, instead of technical analysis, we are more interested in the philosophical ponderings that provide a foundation for a type of control that these systems exercise. Already at the beginning of the 1990s, philosopher Gilles Deleuze had laid out a possible form of control that digitalized systems would practise. The central concept was ‘modulation’, a fluid and dynamic type of control that grasped not individuals but what Deleuze called *dividuals*, a term especially familiar to anthropologists. In the control society, postulated by

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Deleuze, the control was constant and complete as modulation created the possible conditions of action. Thus, the individual did not need to be disciplined – there were only a certain number of ways to act.

To fathom the many-sidedness of this dividual(ity), it is necessary to understand the background of the concept which lies partly in anthropology but more importantly in philosophy. Deleuze was influenced by his contemporary, a philosopher of science and technics, Gilbert Simondon, and occasionally referred to his works. The concept of dividual has some connections to Simondon's ideas of the individual, pre-individual, and transindividual. Yet, there is no clear evidence that Deleuze ever read, for example, Simondon's (2010) text 'L'amplification dans les processus d'information' (orig. 1962), which offers a key reference point especially for the concept of modulation. According to Simondon (2010), the modulation works as 'the model of control of authority in the social domain' (pp. 173–4). The text and Simondon's ideas offer the foundation for a more robust conceptualization of dividual control, which is closely connected to the idea of decentralized control that characterizes especially contemporary digital systems. The connections between Simondon's concepts and Deleuze's dividual have been developed (e.g. Bruno and Rodríguez, 2021; Ott, 2014, 2018), but in most cases, the references to 'L'amplification dans les processus d'information' are lacking. Yet, these secondary texts offer important analyses of the relation between Simondon and Deleuze. In addition, they offer analysis on the importance of affect in connection to dividu-als (e.g. Ott, 2014, 2018), which we are not focusing on here.

First, we lay out some definitions of the concept of dividual as understood in anthropological studies and in Deleuze's thinking. Next, the article moves to summarize Simondon's concepts that can offer us insight into the dividuality, especially modulation. In addition, we underline some of Simondon's theoretical points on technics that are relevant in the context of the article. This leads us, with the help of some contemporary researchers, to analyse the present technological situation and show how the digital climate presents us with an even more radical environment for dividuality and modulatory dividual control. Finally, the article gives, as a practical example, a short account of a new technological system, the blockchain, in the light of modulation and dividuality.

On the Concept of Dividual

In general, the dividual can mean, for example, something 'divided, shared, or participated in, in common with others' (Choe et al., 2016: 301). This definition is in line with what anthropological studies have understood, starting at least from the 1970s, as dividual(ity). Most of these studies are connected to Melanesian traditional societies, but occasionally to some cultures of India, and they often compare Melanesian and Christian dividuality (see, e.g., Marriott, 1976; Mosko, 1992, 2013; Rohatynskyj, 2015; Strathern, 1990). However, the term dividual was already used by Roman writers and medieval philosophers in the sense of opposing indivisible [*individua*] with divisible [*dividua*] (e.g., Raunig, 2016: 46–7; also, Ott, 2018). Especially in anthropological studies, the concept of dividual is mirrored against the Western, 'liberal' idea of the 'possessive individual' (e.g. Macpherson, 1992). The individual is generally viewed as a whole that can be identified in space and time (Raunig, 2016: 67). Thus, it is 'an individual through the

complete fullness of its substantial and accidental properties, a fullness that divides nothing' (Raunig, 2016: 67). In this sense, the concept of individual rests on two characteristics – intrinsic unity and autonomy – and is usually conditioned by law (Mosko, 2013; Rohatynskyj, 2015: 319).

Smith (2012) summarizes that, in anthropology, the dividual is generally 'considered to be divisible, comprising a complex of separable – interrelated but essentially independent – dimensions or aspects' (p. 53). For example, in rituals, the Melanesian person is seen as a dividual, that is, multiply or plurally constituted of distinct elements or the earlier contributions and relations of other persons (Mosko, 1992: 698; also, Strathern, 1990: 14–15). In rituals, usually that which is given to God is 'a dynamic part of some apparent whole', parts that carry their own energies or vitalities, for example bodily remnants such as nails, hair, or skin (Appadurai, 2016: 26). The ritual usually includes a sorcerer who operates from a distance to affect the source of these leavings: the sorcerer strives to exert influence or *control* on the individual through his parts. In this view, also the person's internal capacities are understood as previously composed of the actions of other persons, and agency is a process of personal decomposition. Thus, as Rohatynskyj (2015) states, dividuality can also mean that a 'number of persons or elements of others act through the singular person' (p. 322). In addition, Kubes and Reinhardt (2021) remind us that dividual means, in anthropological circles, 'designating a person as [a] conglomerate of *transferable* particles that build his or her personal substance' (p. 98; emphasis in original). In this view, 'the person' stems from 'the deconstitution of a multiplicity of potentialities' (Kubes and Reinhardt, 2021). The body has a singular form because of other body-wholes – there is always an aspect of relationality in this conception of 'dividedness': it can be thought of as a process through which persons 'relate *with other persons*' (Kubes and Reinhardt, 2021; emphasis in original).

Although Deleuze does not refer to any anthropological texts in his essay on control societies, there are similarities between the conceptions. Of course, as Michaela Ott reminds us (Ott, 2018: 76), Nietzsche, who was a great influence on Deleuze, already used the notion of dividual as close to this sense (Nietzsche, 2007 [1878]: §57). Deleuze uses the concept of dividual already in his book *Cinéma I*, but in aesthetic context (Deleuze, 1983; see also Ott, 2018: 35, 138–9). However, the most widely cited use is in 'Postscript on Control Societies' (Deleuze, 1995). In this very short text, Deleuze formulates the concept of dividual in relation to a new form of society, the control society, which partly opposes and partly updates Michel Foucault's idea of the disciplinary society, which was the successor to sovereign power (e.g. Williams, 2015: 211; see also Patton, 2018). To Deleuze (1995), in control societies the language of control is constituted by a code that indicates who has access and to where (p. 180). Individuals are now 'dividuals' and masses 'become samples, data, markets, or "banks"' (Deleuze, 1995: 180). The new society depends on 'continuous modulation' or 'universal transmutation' as a means of control. As Bogard (2009) points out, 'modulation is not intended to produce an individual' (p. 22) but rather to influence, track, surveil and, finally, control *dividuals*. However, at the same time, these 'dividuals' are 'products of new "dividing practices" [a Foucault's concept], ones that distribute information rather than bodies' and 'that use networks . . . to separate and distribute functions' (Bogard, 2009: 22; also Bruno and Rodriguez, 2021: 34).

In this sense, dividuals are not subjects as they are not self-controlled but rather controlled in advance (e.g. Bogard, 2009: 22). Control addresses the simple ‘numerised relations’ and, thus, ‘the profile automatically constructed by machines through pattern analysis’ (Hui, 2015: 85). This control can be exercised, for example, through simulation and modelling, and thus, in the present reality, dividuals are more like ‘database constructions’ derived from data which, in turn, is derived from the actions of individuals. One example of dividuality, to follow Bogard as well as Lazzarato (2012: 147–8), is when a person uses an ATM machine (or, nowadays, maybe online banking). In this case, the individual has signed a legal contract, but the machinic assemblage of the ATM, through bank data, uses the individual through the individual’s ‘dividual parts’. Lazzarato summarizes: ‘[w]hen you use an ATM, it asks you to respond to the demands of the machine, which requires you to “enter your code”, “choose your amount”, or “take your cash”’ (Lazzarato, 2012). These operations are simple and need to be executed quickly and without errors; otherwise the individual is ‘excluded from the system’ (Lazzarato, 2012). The one who acts here is not precisely the individual but a dividual ‘that functions in an “enslaved” way to the sociotechnical apparatus of the banking network’ (Lazzarato, 2012).

In general, ‘dividuals are not whole subjects but partial subjects defined by certain functional aspects identified in relation to particular ends’ (Patton, 2018: 195). In the digital domain, they are something constructed out of code and data (e.g. Savat, 2013: 40). They are the products of, for example, data-mining, search engines, and advert profiling (Bogard, 2009: 22). ‘A dividual is a data distribution open to precise’ control and ‘stripped down to whatever information construct is required for a specific intervention, task or transaction’ (Bogard, 2009). A human creates, as an individual, a social media account (e.g. in Facebook), but the system creates these dividual parts of the person, which in no sense represent the open system of the real, concrete individual. As Appadurai (2016) writes, ‘[d]ividual is like the material substrate from which the individual emerges’ (p. 17). However, social media platforms create ‘the desire to publicly communicate oneself [. . .], to divide oneself’ into data (Raunig, 2018). In addition, systems make recommendations and suggestions through dividual data, as if making a probabilistically achieved model out of future becoming. The space is ‘modulated by a machine that records the position of the single elements in an open milieu’ (Raunig, 2018), as if the whole space is spatialised as a collection of differentiated elements – that is, like a probabilistic mode of dividual parts and not a collection of dynamic and changing processes.

Michaela Ott points out, in addition to the criticism, the positive qualities of the dividual and, especially, dividualisation. To her, this latter conceptualization refers to something ‘more complex than [. . .] Simondon’s [. . .] individuation’ (Ott, 2018: 33). It is an individual entity in its ‘becoming’, an entity ‘that is aware of its qualitatively diverse and variously sized participations not only in the socio(techno)logical, but also in the bio(techno)logical realm, resulting in a greater complexity of its affective, imaginary and cognitive cohesion’ (Ott, 2018: 33). However, the concept of dividual and its networks requires us to understand that the individual – the perceived individual – is always a phase of an ongoing process of *individuation* and not the whole of an individual (which is an open system). To enhance this understanding, we turn to Simondon.

The Elements of Individuation: Pre-individual, Individual and Transindividual

In his philosophy of individuation, Gilbert Simondon strives to overcome the matter-form duality of hylomorphic tradition (e.g. Aristotle).¹ To Simondon, hylomorphism, although a useful viewpoint, cannot describe the process of individuation *itself*, as it always deals with already formed individuals. Thus, the individual is always *just a phase of a process of individuation*. However, if the individual cannot work as a model for the individuation, we need a dimension of reality from which the individual emerges. Simondon thus introduces – more like a conceptual tool – the idea of ‘the pre-individual’. Although the pre-individual ‘cannot be known’, according to Simondon, for example, quantum mechanics refers to this domain of reality (a field with potentialities) (e.g. Simondon, 2020: 17). Individuation is used to ‘describe the processes whereby individuals and collectives take form as they concretize from a pre-individual’ domain (Gabrys, 2016: 9).

We must understand that the individual is, for Simondon, a composite of the individual-milieu system, which, in itself, is an assemblage of different relations – and *it is also the relation itself*. Thus, the individual is a system that is constantly in formation and that cannot be detached from its *milieu*. Simondon (2020) writes that the individual should be grasped ‘as the singular point of an open infinity of relations’ (p. 407). The pre-individual is a domain full of potentials that are always attached to the individual. This enables the individual to be in constant process: it is a *metastable* system, one that is neither stable nor unstable. The living being, like a human, is in constant metastability and it constantly resolves the tensions – this can be thought of as its ‘living’. The hylomorphic form-matter model grasps this individual in its presumed whole, but really can only comprehend an aspect of it.

At all levels, physical, biological/living and psychic-collective, the pre-individual potentials are at work. The individuation can be understood as a resolution to the problematics that the milieu and/or other individuals pose to the individual: the individual ‘resolves’ tensions that the pre-individual potentials pose. However, the ‘resolution’ *does not exhaust the potentials*, but the system (e.g. the individual) modifies its structures so that they are *compatible with the tensions*. Thus, a certain degree of the system’s metastability remains. The psychic-collective individuation continues the ‘initial individuation’, that is, those at the more primordial levels. Although there are simple inter-individual relations (e.g. rigid economic relations), the ‘true’ collective individuation is what Simondon calls *transindividuation*. One way to briefly describe this is as a collective relation that enables individuals to overcome problems or tensions *that they cannot overcome by themselves*. An example could be organizing global communication with the internet. However, it is important to understand that transindividuation is an ongoing process without any clear endpoint. In transindividuation, individuals co-individuate as a collective and share their pre-individual potentials. In other words, individuals’ singular pre-individual potentials are connected and, at least partly, pooled for the use of other individuals.

To Simondon (2017), technical objects, such as motors, are – as a solution to problematics – a symbol and medium for a ‘transindividual’ relation (p. 252). The objects are

constantly empowering individuals to realize their pre-individual potentials and thus overcome their problematic field. Transindividuation is, in a way, ‘packed’ inside practical technical objects because they are created through the physical and cognitive labour of individuals, that is, through a network of different elements, individuals and environments. Technical objects represent the collective efforts of human beings to overcome problems that they encounter as individuals but cannot resolve by themselves. The network of technicity constructs a milieu that conditions human individuation and action.

Simondon underlines that the technical object, to be technically efficient, must have a certain degree of indeterminacy: it must be, at least to a certain degree, open to outside information (e.g. Simondon, 2017: 17). Furthermore, machines, as technical objects, are always more than their automated functions. This openness or indeterminacy is the key to why they can be connected but also to their possibility of creating the conditions for transindividuation. This indetermination also connects humans as the organizers and living interpreters of the inter-relations of machines – the machines also could be open to the processes of other machines (Gabrys, 2016: 258; also Simondon, 2017: 18). In addition, according to Simondon, in the 20th century, and especially with the development of cybernetics, the tools and instruments are partly mixed. Instruments are primarily used for scientific investigation (Simondon, 2017: 131), and they have ‘profound cognitive connections’ (D’Amato, 2019: 303) as information devices. However, Simondon (2017) underlines that ‘[t]he tool is at once tool and instrument, which is to say a means of action prolonging the organs and a channel of recurring information’ (p. 139). In digital technology, although the cognitive element is highlighted, the technologies, such as blockchain, work both as a tool and an instrument (in the Simondonian sense).

Digitality itself works as a technical mode of being that – through its tool-instruments, platforms and even environments – ‘bridges two different orders of magnitude’ (Hui, 2016: 30), the physical and the digital. Firstly, the technologies mediate distributed information between the parts of the system and between the individuals connected to the system. Secondly, they work to prolong or assist the physical and biological individuations (the initial individuation(s)). Systems similar to blockchain create a network which is a key element for the system to work as a medium for transindividuation. Simondon writes that through technical networks ‘the human world acquires a high degree of internal resonance’ and ‘technicity [becomes] not only an ensemble of means, but an ensemble of conditionings of action and of incitements to act’, leading technical networks to ‘take on [. . .] normative power’ (Simondon, 2017: 229).

Returning to the concept of *dividual*, we can see that it has a connection with Simondon’s understanding of the individual and transindividuation. For example, Rohatynskyj (2015) underlines that ‘material substances move between bodies and recreate in other bodies something of the person from whom they originated’ and that ‘the actor contains within herself those processes that go on between actors’ (p. 321). The individual is constructed through *dividual* relations and is constantly changing or transforming, that is, *individuating* or maybe also ‘*dividuating*’ (see Ott, 2014, 2018). It seems that individuality, *dividuality* and *transindividuality* are all modes of being. The pre-individual reality can be considered – at least at the level of the collective – constructed as *dividual* relations that appear as parts of a composite individual. The term *dividual* ‘covers a range of meanings, from conventional notions of relations between individuals

in a group, to the more radical idea of a number of persons, or elements of others, acting through the singular person' (Rohatynskyj, 2015: 322). Simondon's idea of transindividuality works in a similar way as a process whereby an individual overcomes its own limits – although not completely dissolving itself. Again, here are at work the pre-individual relations and parts.

As a mode of thinking, hylomorphism refers to the traditional understanding of society as a collection of fully formed individuals. However, the individual is a singular point that is an open infinity of relations: it is made up of a constellation of relational parts – this is its 'dividuality'. The disciplinary society was effective, but not as much so as the control society. The former strived to get hold of the individual but only had an image of it, a hylomorphic 'aspect' of the individual. The latter focuses on modulation, that is, the control between open constellations of dividual relations. In other words, individuals do not need to be understood completely, just in their partial relations, their dividual parts, through and by controlling their conditions of being.

Dividual and Individual in the Digital Domain

In connection with individuation, Simondon describes *transduction*, which means a movement of information between different levels of reality. However, it is worth summarizing Simondon's notion of information. For Simondon (2020), information is 'relational signification of a disparation' (p. 359). There is information where there are two systems (or, e.g., parts of a system) in a metastable state, with pre-individual potentialities, that is, tensions (rising out of disparation). These tensions can be 'resolved only through amplification' (Simondon, 2020). Information is an operation that is an aspect of the individuation: it is 'the way in which an individuated system affects itself by conditioning itself' – the system has internal resonance (Simondon, 2020: 371). Signals are not information but they work as 'information mediators' (Simondon, 2020). Through information the being – the individual – *becomes*. Simondon underlines that information is 'the schema according to which a system has successfully individuated' (Simondon, 2020). Therefore, it is significant: it can become the schema for another system, for example, through amplification. In addition, information always refers to a vaster system since it is always already a resolution to another (sub)set (in the system) (Simondon, 2020: 372–3.)

In the case of crystallization, the seed germ enters the metastable solution triggering structural changes in the whole system. In this case, the germ works as the emitter, the metastable solution or *field* is the receiver and the limit between the two is *the modulator* (Simondon, 2020: 673–4). The start of a transductive operation establishes the limit that works as a modulator. Transduction and modulation, the 'amplifying operations' of information (e.g. Simondon, 2010, 2020), can be thought of as 'chronological', although they usually overlap. We can summarize the differences between the two as follows. The transductive process is communication between different levels by being the propagation of information *as a constructive and usually singular process that changes the structure(s) of a receiver*. This leads to stabilization. Other examples that Simondon offers are the propagation of nerve impulses and a forest fire (Simondon, 2010: 162–3). Modulatory amplification, on the other hand, is obtained by

‘domesticating’ transduction. While the transduction could be considered a singular event, modulation is achieved when the transductive process is controlled and made to ‘work’ under regular conditions (Simondon, 2010: 165).

The modulation is a moving limit ‘where two energies influence each other’: ‘one being future support of information and other is the already informed’ (by a signal) (Simondon, 2020: 679). In other words, the limit is between the already stable part and the metastable part of the domain (Simondon, 2020: 689–90). In the metastable field, between the parts there is reciprocity, and they can form a circuit. Here lies what Simondon calls the tension of information. This tension is (information) schema’s ‘property to structure a domain [. . .], to *organize* it’ (Simondon, 2020: 689). The tension ‘contributes a certain “arrangement” . . . that can modulate’ (Simondon, 2020). Although it is customary to think that, in information theory, systems are in communication and thus information transmission requires shared code, Simondon underlines that his notion of (tension of) information ‘*supposes that the possible series of receivers are open: the tension of information is proportional to a schema’s capacity to be received as information by receivers that are not defined in advance*’ (Simondon, 2020: 689). Yet, the ‘germ’ that triggers the transductive propagation of information can deviate ‘too much from [. . .] the structurable field’ and ‘no longer’ possess ‘any tension of information with respect to this field’ (Simondon, 2020: 692). It is possible to establish new connections through transductive amplificative resolution of tensions, but the system cannot resolve ‘any germ whatsoever’ (Simondon, 2020: 691). The new form *or code* is established in form-taking, the resolution of tensions, that is the propagation of information in a domain. The transductive operation of this propagation is singular, yet the modulation – the limit between stable and metastable parts – creates certain constancy in the mix. However, it is worth underlining that information is something that is constituted through resolution of tensions. These resolutions are the information in the system, new singular beginnings or amplifications to further individuations.

Simondon (2017) underlines that the machine ‘essentially uses forms’ and is ‘constituted with forms’ (p. 150). The living transforms ‘information into forms, the *a posteriori* into *a priori*’ (Simondon, 2017). This is the transductive propagation of information with modulation. And it happens at different levels: a human can invent technical elements (parts), which are ‘determinations of forms’, or the living can create new structures (forms) (Simondon, 2017). According to Simondon, it is the human that converts ‘the forms deposited into machines into information’ and that the machine ‘cannot give rise to true information signals for another machine’ (Simondon, 2017). However, one could argue that systems using (especially unsupervised) machine learning algorithms are able to create new forms out of heterogenous data. On the other hand, the significative processes in the digital system happen in the data structures, not by information (as understood by Simondon). Yet, the system has a margin of indeterminacy: that is, it is at least somewhat open to outside information. This information is modulated by the limit (realized by technical devices) between the outside and inside, the physical and the digital. The system is affected by the information and modulated by the limit: but it can only, as Simondon underlines, work with forms (like categories) that are embedded in the data.

In a way modulation decreases the possibility of transformations: it determines the new according to the structure of the old it regulates (Simondon, 2010: 173–4). Thus,

the modulation is ‘a model of control’ or ‘authority in the social domain’ (Simondon, 2010: 174). This is because modulation is a model for conditioning, with minimal energy, the transition from a potential state to the current state (Simondon, 2010: 190–1); it is a governed and regulatory mode of conditioning or actualization. Finally, organizational amplification integrates these two elements as processes through which a system, network or a domain structures itself (Simondon, 2010: 191; also, e.g., Hui, 2015: 82). This is the arrangement and organization made possible by the tension of information.

The modulation in technical systems, or between a human individual and a technical system, does not completely realize the concept of modulation as understood in the organic world (like in crystallization). Yet again we can follow Simondon and state that there is an *operational analogy* between (1) modulation as control between a digital system and a living being and (2) modulation as a limit in the crystallization process. The key analogical operations are the interaction and the conditioning. In addition, by creating the circuit between the individual and the digital system and furthermore the social reality, the system conditions and organizes the being of the individual.

Deleuze also uses the concept of modulation to describe social control. In this modulation, the different levels construct the individual through dividual parts or relations (see, e.g., Savat, 2009: 59). The modulation ‘acts on patterns of code across which “we” are distributed as dividuals’ (Iveson and Maalsen, 2019: 332). These dividuals, that is, partial relations that create the individual, are datafied into the different databases and systems: ‘each database offers the opportunity to control the social via modulatory means, acting not on individuals but via the distribution of personhood into dividuals monitored and modulated by different digital systems’ (Iveson and Maalsen, 2019: 334). Again, it is not strictly the individual that is controlled, yet it is affected through parts.

Modular dividual control creates a dimension in which the individual still is understood through its dividual relations, such as, for example, its place of living, (usually binary) gender, or individual preferences. Social media platforms and search engines thus modulate and mediate dividuality (e.g. Raunig, 2016: 124; also Hansen, 2012: 57). These ‘dividual persons’ are data-doubles of individuals (Iveson and Maalsen, 2019: 336–7). This construction is twofold: First, individuals are used through their dividual parts/relations. Secondly, these individuals are themselves constructed ‘images of individuals’ (through collected dividual data) (see also Rodríguez, 2016: 224; Hui, 2015: 86). However, the modulatory control can be considered horizontal and decentralized (e.g. Savat, 2013: 43). The modulatory control creates conditions that allow only certain functions. It focuses on the functionality itself through, for example, simulation and modelling (Savat, 2013: 49; Bogard, 2009: 22). Examples could be systems of monitoring, mobile phone tracking, biometrics (e.g. facial recognition) and algorithmic bias (see, e.g., Celis, 2020; Eubanks, 2017; Hietanen et al., 2022; Noble, 2018; Williams, 2015: 212). In Finland, for example, a person applied for credit to buy building materials online. The system in question denied his application because he checked too many categories – dividual parts – which included, for example, gender, place of living and even spoken language (see Ruckenstein and Lorenz, 2018; for other cases see, e.g., Algorithm Watch, 2020.) In this example, the individual was controlled through dividual parts.

Like Simondon's the pre-individual reality, the dividuality is understood as the dynamic relations that make up the individual and is something that cannot be known as such (e.g. Rohatynskyj, 2015: 320). Processes of modulation work, in technical systems, through dividual partial relations or parts. The key problematic of dividuality is the idea of incorporating the other in the one person. In Simondon's notion of transindividuality, this is laid out in the sense that the process of transindividuation leaves the individual as transformed but still as an individual; in other words, the individual is capable of continuing its initial individuations because of these pre-individual potentialities that are pooled together in collectivity. These potentialities are like dividual dynamic parts or relations. In modulatory control, however, it is 'the general' – *or that which is seen and understood as the general* – that strives to control the individuals through partial relations. In practice, the general refers here to data that is made up, for example, of certain classes. These classes or categories can be thought of as forms ('a mold' or 'a rigid enclosure') (Bogard, 2009: 22). The digital domain grasps dividual parts in their digital counterparts. This, in turn, leads to individuals that are also digital versions of open systems that are real, physical and living individuals. The modulatory control effects the material world through controlling and regulating this composite individual; the modulation itself is not 'intended to produce an individual' (Bogard, 2009: 22). In addition, as Iveson and Maalsen (2019) conclude, 'the powers of assembly and re-assembly [. . .] enable some authorities to move between modulatory and disciplinary power – in particular through the extraction/reconstruction of individuality out of coded dividuality' (p. 332). The technical systems modulate the individual's conditions of action and being through pre-established forms – the possibility for a singular triggering transductive event is decreased. These forms are dividual parts, or *imagined dividual parts made by calculating the data*. The modulation is the ever-increasing and moving limit between the individual and the technical or digital domain.

Yet, the modulation is always a mixture of hylomorphic and non-hylomorphic forms, which are not mutually exclusive (e.g. Savat, 2013: 57). This is clear, for example, in the organic (physical) world: in modulation, as stated earlier, the two, stable and metastable, influence each other. Williams (2015) states that, with control societies, 'we move from closed centralized institutional sites with determinate rules to an open-ended system of relatively decentralized "smart" control, where all systems are relatively interoperable and put into communication with one another' (p. 212). To continue, we can turn to Alexander Galloway's idea of decentralized control, which he, for example, describes in the work of internet protocols (DNS, TCP/IP). To Galloway (2004), these protocols are management styles, and the concept of a distributed network can be seen as a structural form (pp. 3–4). The new apparatus of control is created through the interplay of digital computer, structural form and protocol. The protocol can be seen as having an operational analogy to modulation: it is a technique or collection of techniques that achieves 'voluntary regulation within a contingent environment', and it is 'a distributed management system that allows control to exist within a heterogeneous material milieu' (Galloway, 2004: 7–8). Galloway (2004) sees these distributed networks as 'native to Deleuze's control societies', and '[e]ach point in a distributed network is neither a central hub nor a satellite node' (p. 11). As Hui (2015) underlines, the control society might have 'specific modes of modulation, that produce a homogenous individuation' (p. 77). To

summarize, in the distributed network, the control is in the whole of the network; that is, the network itself is the controller. In the decentralized network, there is no one controlling authority or node (see, e.g., Galloway, 2004: 12). In this kind of a system, the nodes exist 'inseparably from a set of possibilities and parameters' (Galloway and Thacker, 2007: 40); they are subject to choice from a possible set of functions. The key is to understand that, for example, in internet protocols, the control is possible because they are not completely decentralized. However, the blockchain platform strives, at least in theory, to achieve a more veritable decentralization.

Modulatory Decentralized Control in the Digital Domain: The Case of Blockchain

Next, we present, as *an example* of modulation in a distributed or decentralized digital system, a summary of blockchain technology. Here, although presenting some technical details, we continue our theoretical viewpoint and do not dwell on some problems (e.g. energy consumption, level of decentralization, etc.) of these systems (important as they are). Some systems have offered, at least at one time in their history (e.g. Bitcoin), veritable decentralization close to ideals cultivated in rhetoric around the system. However, the most important parts are, on the one hand, the total modulatory dividual control that can be achieved by these systems and, on the other hand, the mediatory power that these platforms can cultivate (in the form of offering ways of achieving transindividuation).

We can summarize the blockchain as a decentralized peer-to-peer database that is administered by the users and 'admins' that ensure the working of the proof mechanism. There are various proof or consensus mechanisms that differ in their working methods, like proof-of-work, proof-of-stake, and proof-of-space (e.g. Xiao et al., 2020). For example, in Bitcoin's proof-of-work system, these admins are called 'miners' who distribute their computer's calculation power for the use of the network (Nakamoto, 2008). The database, or 'ledger', is constantly updated to all users to ensure it is not tampered with. The miners' calculation power is used to solve pre-determined but constantly changing mathematical problems that ensure the system is up-to-date and secure. In the case of Bitcoin, the miners' computation power will proof the transactions of the users as valid. To make the system effective, only 51% of the miners have to agree on the validity of a collection ('block') of transactions.

In Bitcoin, the blockchain is quite simple, as the system basically only offers a cryptocurrency. However, as Bitcoin's blockchain is open source, it made sure that other applications followed. The most important one was Ethereum (2012–). This system introduced 'smart contracts' that were, as the name suggests, automated and programmable contracts. More importantly, Ethereum was able to execute code inside the blockchain database. This paved a way to theorizing more profound systems. One of the key innovations was introducing decentralized autonomous organizations (DAOs), that is, organizations that could work by themselves and even (theoretically) own themselves (De Filippi and Wright, 2018). Today, there are a lot of systems calling themselves DAOs, yet most profound automated organizations are still theoretical in nature.

One key element of creating Bitcoin and thus blockchain was the need to have a decentralized system which was outside of the control of any nation, bank, or other institution. Controlling the whole system of Bitcoin is practically impossible as it is decentralized to users and miners all around the world. However, at least in theory, there are ways to overcome the system and influence it. One way is the so-called ‘51% attack’, which means that if over 50% of *all of the miners’ computing power* is in the hands of one person or a group, they are in theory able to influence the blockchain (e.g. they can basically double-spend already-used currencies). This was probably relatively easy to do in the first years of Bitcoin. As the number of users and miners grew, this became harder and harder, and it is now practically impossible. However, as the miners are using special equipment and are usually part of ‘mining pools’ – services that collect the mining power of different users together or invest by themselves into mining – centralization of the network has risen. As Sai et al. (2021) states, ‘[i]n Bitcoin the top 4 mining pools control over 53% of the hashing power, whereas in Ethereum the top 3 mining pools control over 61% of the hashing power’. In addition, there are semi-decentralized and centralized blockchains. These differentiate from the decentralized ones for being either developed and controlled by one party (centralized) or developed and, for example, updated but not totally controlled by a party (semi-decentralized).

From the perspective of the blockchain platform, the individuals connected to it are communicated with as individuals. The modulation happens, or is the limit, between two different levels, the physical world and the digital realm. However, the modulation also works between individuals and between the system and the individual. As Hui (2015) reminds us, ‘[t]he logic of modulation does not only operate through infrastructures such as networks but is rather embedded in all types of apparatus (for the purpose of data collection, recommendation, restriction)’ (p. 85). Blockchain is a modulatory platform: it intermediates activity and information. Yet, in the case of the digital domain, the information is not information in a Simondonian sense. It is the data that moves and structures or restructures in the domain. However, the digital platform does regulate or modulate the potentialities or conditions of potentialities of an individual. The *form* of the modulatory structure gives all the possible actions – or the field of action. The individuals are seen through their actions, that is, usually transactions, or maybe through being a part of a smart contract execution.

In addition, physical assets can become digital assets and thus ‘dividual assets’ as well (e.g. Käll, 2018: 135). For example, when a land register is updated to a blockchain or a commodity is represented by a cryptocurrency of a blockchain system, this affects the physical world in that the physical can be controlled through the digital. This also leads the physical property to ‘dividualize’ as a collection of certain relations. In addition, the digital realm is now constructed with more elements than just a collection of dividual parts/relations of an individual or an ecosystem of dividual parts/relations (Käll, 2018: 137–8). Thus, the system can track the whole of these relations between individuals and between physical assets and grant access to property or even space (Käll, 2018: 139). However, it is possible to conceive theoretically more complex blockchain systems, like the beforementioned DAOs. One key example of such an organization is a part art, part research project called Terra0 (see Seidler et al., 2016). The project describes a Ethereum-based blockchain that works for a management system for an area of land, to be precise,

a forest. This small piece of forest can, in theory, even own and utilize itself. In the case of Terra0, the forest is gradually given over to itself (by the developers). Although it is controlled through algorithmic rules designed by the developers, the system enjoys a certain degree of autonomy. The modulatory control focuses here on a part of an environment. As Käll (2018) points out (p. 139), '[i]t is already obvious that market actors will utilize blockchain technologies to code and control emerging posthuman spaces'. These spaces, if we follow Simondon, are constructed through the network of the technical individual: the collection of human action (and meaning-making), the techno-geographical milieu (associated milieu), the technical object and its elements (parts) and pre-individual potentials (Simondon, 2017; also, Gabrys, 2016: 11–12).

DAOs are one way to automatize new emerging smart cities, new digital commons, or the complete institutions, in which automated algorithmic systems, such as blockchains, will control the boundaries between persons and property (e.g. De Filippi and Wright, 2018; Herian, 2019; Muilu, 2020). Iveson and Maalsen (2019) state that 'the digital territorializes, creating and perpetuating boundaries and borders', and 'it continues to lend itself to individuation through algorithmically enabled social sorting as well as modulation of dividualised populations' (p. 338).

The modulatory control in blockchain happens at different levels. First, the system penetrates conditions of being of the individual through taking part of its individuations by modulating its information take. The platform is also one form of milieu between the individuals taking part of its functions. Although the modulatory limit is between the individual and the system, it functions through the dividual parts, elements, or relations of the individual. Secondly, the system can control the individual's literal access to places or objects (to a commodity or even area). One key element that differentiates the blockchain control from control in other digital systems is that, in the decentralized blockchains like Bitcoin, the executions (and transactions) *are final*, and, in a sense, the control of the system is also totally automated (Käll, 2018: 139). The 'database' of blockchain – written by the co-actions of human-users, admins (that are basically technical and computational entities), and the technical network itself – is a long immutable history of actions.

If a blockchain were to be used to automatize any larger institutional processes, it could replace some of the present practices and maybe even laws (see, e.g., De Filippi and Wright, 2018, Reijers et al., 2016). The key element is that there would be no more changes in deciding whether to follow a rule: the system would simply execute the code, and there would be no other possibilities to choose from. The system would thus control the possibilities of action and functioning, that is, the horizon of possible action and, in a way, the very being of the individuals. With platforms like blockchain, the modulatory control is continuous. In decentralized systems, the structure is pre-given and so, thus, are the possible actions – it is not possible to make errors. In (semi-)centralized systems, the structure is pre-given, but the central authority can restrict the access at will.

Although there are many ways to create effective modulatory control through digital technologies such as blockchain, it is still possible to create systems that strive to underline certain forms of democratic processes. In the case of blockchain, the system can have, for example, voting processes in which the users (with one vote each) can have an influence on updating the rules of the system. Thus, we stress that it is possible to see the

blockchain platform as a way of cultivating transindividuation. This, however, requires that we see dividuality (parts/relations) progressively: co-individuation must be understood in itself and not through frameworks such as economics or rationalization (which work at a level of inter-individuality). Otherwise, the deterministic nature of automated algorithmic systems and platforms enforces the world in which subjects are under ‘machinic enslavement’: digital systems use dividuality by assembling dividual parts/relations to make images of individual consumers that are considered individuals as a whole (see, e.g., Iveson and Maalsen, 2019: 341; also Hietanen et al., 2022). Yet, if practical systems like blockchain applications wanted to cultivate transindividual relations – that is, work as a medium for this relation – it would require keeping the concrete system open, for example, by enabling open-source based code or even possibly to take part in technical updates *in addition* to the system’s inner voting processes. The veritable resistance towards total control lies in the possibilities and cultivation of transindividuation – the dynamic space of open possibilities and potentialities. This means that not *one unchanging and rigid practical system* can be thought achieving, at least not permanently, resistance and freedom. In addition, achieving more lasting transindividuation requires a new, open attitude towards the digital domain in general.

Conclusions

There is no evidence that Deleuze had read Simondon’s (2010) ‘L’amplification dans les processus d’information’, yet the concept of modulation it presents has similarities with Deleuze’s. However, Deleuze does not develop the concept of dividual or modulation extensively. Simondon, on the other hand, offers us a grand theory of individuation and the conceptualization of the individual as a relational, metastable system with pre-individual potentialities. This form already has connections, as presented earlier, with dividuality. In addition, this analysis creates a foundation for the robust conception of individuality and dividuality as well as their connections with digital technology and other entities. The Simondonian viewpoint also offers a complex understanding of technology that applies the ideas of dividual control to even contemporary technologies. The dividual, as an ontological concept, is not *only* negative but neutral: it is a certain mode of being of an individual.

However, the new technologies are constantly striving to find ways to widen the sphere of control, and the dividual control hits right at the heart of processual being and its potentialities: that is, the foundations of the possibility of action and being. The modulatory dividual control focuses on the processes and parts, and through these parts, it constructs a *conceptualization* of an individual, which might have connections and relations to the ‘real’ individual (an open system). Precisely because of the partiality, therefore, the control is never ‘total’. Yet, the present-day forms of decentralized control, provided by digital platform-tools, seem to enclose certain spaces and domains that make ‘total’ control a more pressing threat.

The human, as an open system that is the individual, must cultivate the variation between transduction and modulation, the constant process of the resolution of tensions rising out of the pre-individual potentialities in a metastable milieu. Complete modulation would mean complete, rigid control, but complete transduction would mean

complete jumping from singularity to singularity – that is, the invention of new forms every second without establishing a modulatory structure. The dividuality is part of being a human and it is connected to an open communal being, transindividuality. This mode of being is something that enables the cultivation of the pre-individual potentials between individuals without forcing them to break apart into atomistic relations or fall under one structure of being and thinking.

Acknowledgements

The authors would like to thank Dr. Arvi Särkelä for his comments and the various commentators at the SPT 2019 conference. In addition, both authors would like to thank The Ella and Georg Ehrnrooth Foundation for funding their PhD work during the planning, writing and revising of this article. Juho Rantala would like to thank also projects DIGITO (funded by the Kone Foundation) and CIDS (funded by the Research Council of Finland) and the Muilu project ‘Politicized Loneliness’ (funded by The Emil Aaltonen Foundation) for their support.

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Note

1. The summary of Simondon’s theoretical points presented in this chapter is also based on: Bardin (2015), Combes (2013), Hansen (2009, 2012), Hui (2016), Mills (2016), Simondon (2017, 2020); also see summaries in Rantala (2019, 2020).

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