Digital notation and spectral meaning

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Abstract: In this paper, we introduce the concept of spectral as a mode of meaning-making in digital media that is at odds with former theories for the emergence of meaning. The concept described in this paper relies on the connection between mediascapes and meaning production as originally described by Friedrich Kittler, for whom the writing/notation systems (*Aufschreibesysteme*) enforce new discourse possibilities. In addition to the concept of notation systems, the spectral meaning is described as a by-product of the theories of Gilles Deleuze and Niklas Luhmann that allow for a theory of meaning not based upon semantic or hermeneutic interpretation of phrases. The last topic of this text describes the mechanics of meaning generation in digital media through a sociocybernetic framework.

1 Spectral

In this paper, we describe the concept of spectral as a mode of meaning-making in digital media that is at odds with former theories for the emergence of meaning. The connection between a given mediascape and a particular pattern of meaning production was first suggested by Kittler (1985), for whom the writing/notation systems (*Aufschreibesysteme*) would impose new discourse possibilities. As a result, technical inventions and the rise of new media would have a direct impact on new forms of writing and understanding. This relationship is described by the invention of the typewriter, which as a writing capacity drives the flow of dictation words directly transferred to the paper. Language, including

written language, proves to be no longer the medium of a spirit that grasps the truth, but rather the product of an arbitrary dictation, that is, the product of a writing/notation system.

Following this reasoning, Kittler suggests a relationship between media and the material organisation of society. The object of analysis is not the discourse or the information conveyed by a message, but the notation systems that deliver specific cultural forms. This definition of meaning is still connected to the discursive formations, but they are also all-embracing, all-encompassing, and all-inclusive. According to Futterknecht (1987), the notation systems produce new forms of meaning and restructure interpersonal relations on all levels, transforming the transmission of knowledge and the modes of operating with texts. Therefore, the emergence of a new notation system allows for new forms of speaking, writing and reading; in short, they produce an interactive chain of functions that establish and reinforce the new discursive system as universal reference. Epochal time divisions allow the discourse analyst to track down shifts in notation systems by contrasting different discursive functions over time.

Wired systems, for instance, are based on a coding between sender and receiver mostly defined in spatial terms. As in the model of Claude Elwood Shannon and Warren Weaver, each peer relies on another peer to exchange data. Wireless broadcasting systems, on the other hand, are based on a coding between sender and receiver that is one-way and yet mass-distributed. Broadcasting societies are to a large extent the result of this schema in which senders operate any number of channels and are not affected by the feedback of receivers. The networking systems, however, transform the coding procedures by introducing substantial computer and network technology. In these societies information and understanding are the effect of digital routines of processing and filtering. These three notation system can be related to three different processes of meaning-making. The first one, of wired systems, is based on emission. The second one, of wireless broadcasting systems, is based on propagation. The third one, of networking systems, is based on clustering.

The writing/notation system of the networking society became clear to the public opinion in 2006, when the Time's Person of the Year was not an individual. With a cover depicting a computer and the pronoun 'You', the magazine made the buzzword 'Web 2.0' hit the headlines. According to Time Magazine (2006) will be remembered as a year of community and collaboration on a scale never seen before. According to the magazine, the so-called new web would have brought together small contributions from millions of people and make them matter. Intensifying productivity and innovation, this massive social experiment would also be capable of building a new kind of international understanding. Even if the magazine ignores that this description also applies to the internet at large, the Web 2.0 reinforces the assumption that the internet not only changes the world. It also changes the way the world changes.

The idea that what changes is not only the world, but the very process of changing, points to a larger question about the nature of digital technology. Computers and internet reorganise the processes of communication and affect not only contents and writing styles, but also the meaning of acts of communication (Baecker, 2005). The Web 2.0 is not just a buzzword. It is a moment of mesmerising surprise when the public opinion acknowledges a modification both in the components of the writing/notation system and in the meaning process across the mediascape. The attention of the general public is drawn to the emerging technologies and the excessive flow of meaningful forms only made available because of the new notation system. According to Luhmann (1997), this

process requires a cultural form that can cope with the surplus of meaning brought by new media. In fact, only a cultural form can contain the surplus of meaning generated by the emergence of new media.

Spectralisation is both something relating to a spectrum, as in 'the spectrum of colours', and something characteristic of a phantom, as in 'spectral emanations'. The use of the word to address meaning within digital media refers to this twofold suggestion, and intends to describe both an environment and a dynamic that clusters meaning. When Marx wrote in The Communist Manifesto that "A specter is haunting Europe. The specter of Communism," the phrase was supposed to portray an imminent danger to Europe that could not quite be localised nor otherwise eliminated. The 'specter' was not an imminent attack or a threat, as there is no predictable menace in the phrase. The wording suggests a feeling of haunting, that is, a force as possibility and environment. Derrida (1967, 1993) has also explored the term as a core operation of deconstruction, connecting the spectral to the *différance* as something without presence or absence, and whereof significations are created in reference to spectral vestiges.

But it was Kittler (1993) who brought this epistemological approach of the spectral together with an investigation of technology. The German media theorist mentions the fear Balzac felt regarding photography, as he claimed the daguerreotype would slowly peel off the human body. If the human body is made of thin layers of specters, ponders the writer, then the daguerreotype is a trick that steals one layer after the other until nothing remains of the specter but a photographed image. In contrast to the arts, says Kittler, media reconstruct bodies not only as a symbolic system, but also as a reality in which the resemblance is guaranteed because the product turns itself into the object. Virilio (1984), in a similar way, maintained that communication and telematics complete the circle of 'deanimalisation' initiated with the telegraph and the train. Not only would animals give way to machines, but technical communication itself would have the tendency to disappear as a result of radio and radar signals made possible with electronics.

2   Meaning

The spectral meaning is not related to the content conveyed by a sentence, but to the media writing/notation system that provides a form to media contents. In other words, media rely on writing technologies because they supply a horizon of meaning that is not restricted to semantic or hermeneutic meanings. Spectral describes the conditions for the emergence of structures related to the materiality of meaning. Therefore, we refer to a concept of meaning that is not limited to the linguistic aspect of the sign. This understanding of meaning relies, on the one hand, on Luhmann's definition of the concept as something that connects the non-structured elements of communication to a form. On the other hand, it relies on the logic of sense presented by Deleuze, whose idea of meaning is both wider than the sign and yet propositional (that is, pertaining to the nature of a proposition).

Meaning for Deleuze is a change in the arrangement of signs and bodies. This change happens due to an incorporeal transformation caused by a random event. Deleuze does not prescribe any intentionality between consciousnesses, but only the sharing of a horizon of possibilities. Because meaning for Deleuze is propositional, the regime of sign

is described as the outcome of the meaning-making event. Meaning would blossom out of anamorphous continuum in which all signs are signs of other signs, and the signifier would be the sign in redundancy with the sign. This meaning-making process depicts a serial sequence of connections; it comprises an adjunction of signs that yields a network without beginning or end (Deleuze and Guattari, 1987).

Deleuze (1967) argues that meaning works both on the creation of phrases and on the act of communication. Meaning is produced when signification expresses something and when information refers to a plane of immanence (*plan d'immanence*) that attracts one's intentionality to what is expressed. Deleuzian philosophy understands meaning as an inference of the incorporeal into the corporeal, an inference that also takes place when making sense of information. There would be a difference of degree between one and another, but not a difference of nature. Information involves both personal and social levels and the passage from one level to another is the event of communication. Meaning flows through the components of language similarly to the way it flows through channels of communication. When information comprises my stream of consciousness, it pushes me towards a series of surfaces and circles, and the intersection between planes is the ultimate accomplishment of meaning as it relates both to the production of sense and to the process of communication.

An entirely different concept of meaning is presented by Luhmann, who claims meaning should be one of the basic concepts of sociology, as social processes consist of communication and meaning. Even though Luhmann bases his understanding of meaning on Husserl (Paul, 2001), the concept is not limited to subjective perception or the cognition of actors, clearly exemplified by Luhmann's (1990) controversial assertion that human beings do not communicate; only communication communicates. Meaning is thus only generated in relation to a dynamic that is produced and reproduced socially. As a horizon of possibilities, meaning is the constant actualisation of potentialities and everything has meaning only within a horizon of possibilities. Luhmann avoid the background of action theories and subject-centred perspectives with respect to the process of communication, thus allowing for an framework based upon the units of communication with reference only to the social system that produces them.

Luhmann's theory maintains that there can be no communication without human beings even though they do not take part in the process. Communication is depicted as an operation not based upon agreement, consensus or persuasion, and meaning represents the principle of selection that divides information into what is meaningful and what is not. Selection, on the other hand, is internal to the system and operates according to a virtual horizon of meaning, which is not the same for all systems. That is, an observation is made only with reference to one horizon of meaning that other systems cannot recognise. This hypothesis of multiple axes of meaning came from Talcott Parsons and constitutes the principle of functional differentiation, where meaning processing is expressed through a variety of enfolding axes that hardly overlap. Different codes are processed according to numerous horizons of meanings and one does not exclude the other.

Luhmann's conception of meaning offers a perspective detached from hermeneutics and the subject-centred perspectives. According to hermeneutic tradition, meaning was rooted in the subject and not in the object, which only gains properties by the attribution of a Cartesian agent. This agent is *res cogitans* and not *res extensa*, that is to say, it was the spirit that conducted operations of meaning attribution. This hermeneutic topology has enforced the correspondence between expression and interpretation and resulted in a

concept of meaning that is subject-centred and significance-oriented. None of these inferences exist in the theory of Luhmann (1997). Meaning is once and for all an operation of systems.

3 Computer

Luhmann ignored in most of his works the computer-mediated communication, but there are some allusions in his work that enigmatically discusses CMC. In the chapter *Auswirkungen auf die Evolution des Gesellschaftssystems*, Luhmann (1997) offers support for reevaluating the role of computers in contemporary society. Such ideas are based upon a historic view regarding media and the self-organisation of society. In this view, Luhmann claims society needs a cultural form to survive every novel pattern of communication. The form is what enables society to deal with the surplus of meaning brought by new technologies. Luhmann (1997) argues that Aristotle's principle of *telos* managed to contain with the surplus of meaning brought by writing technologies, and that Descartes' principle of a self-referential consciousness has given society a way to deal with the surplus of meaning brought by printed communication. Based on that, Luhmann (1997) argues that there needs to be a way to deal with the surplus of meaning brought by computers and the internet.

The catastrophe that computers created would be especially interesting since it adds reflexivity to communication autopoiesis, hence establishing for the first time a competition with consciousness. Computers and the internet would not only carry out distribution, transmission and understanding of information. They would also change information and understanding, which from now on would be grasped by electronic routines of processing and filtering. This historic approach is presented by a distinction among three major cultural forms in history. The first is the literary society of antiquity, the second is the printing-press society of modern Europe, and the third is the computer society of contemporary globalised world. Luhmann refers to these media as cultural forms because they deal with the surplus of meaning in specific ways. Discussing the Catastrophe Theory of Rene Thom (1983), Luhmann claims society over came the first catastrophe (the writing) by creating a *Hochkulturen* that organised society in layers. The second catastrophe, the press, introduced the possibility of comparing and analysing manuscripts since then standardised and mass-distributed across social layers, hence jeopardising previous forms of classical authority.

Baecker (2004) agrees that the third catastrophe is the integration of computers into communication processes. The introduction of computers reorganised communication styles and contents and resulted in substantial reconfigurations of the process of understanding. Every period finds a way to deal with the problem of meaning, and the introduction of computers is yetto find its way. Some messages are going to be taken seriously and others are not. There are criteria regarding what to pay attention and what messages to accept. Even though the introduction of computers put an end to the former meaning-processing paradigm, it is not yet clear how the current mediascape, which was formed not only by computers but also by the internet, is organising form and content.

Another interesting dimension of Luhmann's theory regarding computers and the internet is the possibility to describe the internet as a medium, which means something rather different to the concept of medium in communication research. For Luhmann

(1994), a medium is always presented in relation to a form. There is no form without a medium and media only exist because of forms. The famous example is the footprint left in the sand when walking on the beach. The sand represents loosely coupled elements which are grouped together by something more solid – that is, the foot. The sand is thus a medium of the form imprinted on it, and the footprint is a form that only exists because of the sand. The dynamic between medium and form is the same one described in Luhmann's concept of meaning. The medium is what is possible and the form is the actual structure.

According to Andersen (1998), even though Luhmann's remarks on communication and systems cannot be automatically extended to the web or to the internet in general, there are strong reasons to consider it as a subclass of autopoietic systems. The World Wide Web is, after all, built upon recursive processes through components that influence each other. The operational boundary is also the environment and there is no central control or intentional agency. Even if the web cannot perform processes autonomously, the mechanics of the internet is heavily dependent on self-development and auto-reproduction. Moreover, self-reference and self-observations produce a level of reflexivity that is necessary to depict this medium as a system that differentiates itself from the subsystems. For that reason, Luhmann's theory of social systems offers an important contribution to describing meaning and communication as a sociocybernetic operation.

4   Spectral meaning

Spectral meaning relates to communication on two levels: the process of production and circulation of messages and the level of understanding and intentionality. On the one hand, there is Luhmann's view of meaning circulation: constructivist, evolutionist, unpredictable and contingent. On the other hand, there is Deleuze's understanding of meaning generation: environment-open, embryonic, rhizome-like and propositional. The word 'spectral' is important to stress the absolute lack of actual utterances. Also, it leaves out the principle of efficiency upon which previous communication models were based. In fact, the flow of digital data is not dependent on messages or utterances, but on a spectrum of inferences from one peer to another. The gap between the concepts accounts for how data creates meaningful communications.

Luhmann revised the fundamental elements of the communication process to offer the concepts of *Adressat* (Ego) and *Mitteilender* (Alter), thus replacing the concepts of sender and receiver and establishing the situation of a double contingency. Ego and Alter do not make reference to people and Luhmann chose these terms to avoid any anthropomorphic suggestion. They refer to systems in a given context that share no contact with one another, for Ego and Alter process information independently and autonomously, a distinction Luhmann made to set information apart from message. Consequently, Ego and Alter do not perform transmissions by turns and are created only through their frame of reference that is the process of communication.

Double contingency also means that Ego waits for Alter to do a first move, and vice versa, so that nothing happens if there is no suggestion of understanding, acceptance and purpose. This scheme creates a circular and auto-referential dynamic of information, inasmuch as Ego and Alter understand each other as communication points and rely on the process as a nexus that creates both communication and communicational 'agents' all

together. Luhmann describes this process as steady sequences of connections that binds one act of communication into the next and creates a dynamic for which communication stages are exterior to the very process of communication. From the point of view of understanding, acceptance or refusal of messages corresponds to the difference between information and message towards the reduction of complexity.

The concept describes the inner operations of meaning towards the environment. As an open horizon of possibilities, meaning provides a connection between system and environment that does not assume the world as a central or sole point of reference (Izuzquiza, 1990). Instead, it allows for the selection and actualisation of psychic and social systems towards a decentralised complexity. Luhmann also argued that meaning and the continuous reproduction of systems are the same process. The auto referential reproduction of the system evaluates the possibilities of establishing connections and assigning meaning to raw information. This constant movement of the system is what Luhmann understands as communication, which operates both at the social system level (as communication) and at the psychic system level (as consciousness). Therefore, the concept of meaning refers to an internal operation of the system that lacks crossover properties and cannot account for the coupling of terms traditionally associated with meaning-making.

Deleuze (1967) on the other hand, offers an understanding of meaning that relates propositions and messages as a global process of meaning-making. Meaning is not an entity, but rather an effect of the relationship between a proposition and the world – or information and environment in Luhmannian terms. In contrast to the autopoietic view presented by Luhmann, Deleuze presents a rhizome-based concept in which the minimal units are not words or signs, but couplings; that is, the moment when an expression makes sense and renders a meaningful statement. To put it another way, expressions are the outcome of couplings and the coupling of words expresses meaning. While meaning according to Luhmann depicts a sequential network, meaning for Deleuze is a surface of upcoming events. Therefore, the hypothesis of spectral meaning is an outcome of Deleuzian and Luhmannian theories assembled together. It offers a view over meaning that is not necessarily based upon semantic and hermeneutic interpretation of words and phrases.

According to Bogue (1989), Deleuze calls diagram the association between non-linguistic substance and the thought that forms language and propositional meaning. The diagram comes back again in social meaning processing. In this latter stage, the linguistic content is rearranged and reorganised as an abstract surface where meaning is to be produced. At this moment the diagram between corporeal and incorporeal series takes place again and linguistic codes are used to generate communication events from raw information. This diagram is thus a linking attribute that associates propositional with social meaning and information with social communication. The same meaning mechanics were also addressed by Boulding (1956), who argued that the meaning of a message is the change produced in the image of communication. In other words, the meaning of a message is a global change in the effect of the message. In this paper, we describe this process in digital media as a clustering of meaningful chunks of data.

The networking clustering of data, or simply netclustering, is accordingly a particular method of tagging and routing incoming data transfers. Similarly to the serial distribution and transference of data, it integrates a model of filtering information that creates opportunities for random data to become a trending topic or to go viral. In contrast to the

world of news organisations and universities, in which fact-checking or deep analysis prevails, netclustering nourishes a continuous echo through the system. When news breaks in the blogosphere, it flows like in the telephone game so that in each retelling made by peers the facts go further afield from where they started. Netclustering is a process that every peer is not only capable of, but is also entitled to, and its image can help understanding the link between meaning and messages that is not described in Luhmann's theory.

The term netclustering is supposed to contrast with the idea of crowdsourcing, a term coined by Howe (2006) to target a particular distributed problem-solving and production model. If crowdsourcing suggests the broadcasting of problems to an unknown group of solvers in the form of an open call for solutions, netclustering suggests the temporary gathering of online users to pass on information. Netclustering suggests both a group of elements gathered together and a disperse amount of similar things to be brought together, assembled together, and finally clustered together. To put it another way, at the same time systems are working in an operationally closed way, the process of meaning-making is open to the environment.

Netclustering is consequently a process that is paradoxically both closed and opened to the systems. The general idea is fairly similar to the concept of communication presented in media studies literature and to the concept of meaning presented in Luhmann's work. A cluster is open to the environment because its processing is coordinated by the environment and the system autopoiesis closure. In Luhmannian terms, it consists of interpenetrations between the systems-closed dynamics and the environment-opening chaos. Netclustering temporarily groups the system to the environment, and because of that, meaning is processed according to the system selections but oriented towards the inputs from the environment. The process of netclustering also reproduces what Luhmann described as a double contingence, seeing that the clusters can be addressed only during the very process of communication.

5   Digital notation

The internet was first defined as a network of networks operating under the Transmission Control Protocol/Internet Protocol (TCP/IP) by the Federal Networking Council and the RFC 2026 of the Internet Engineering Taskforce (IETF). The most radical outcome of internet, in comparison to previous business models, was to put an end to the audience as a thermometer for media economics. The concept of audience ceased to provide meaningful feedback given the lack of a clear public opinion or a physical commons. Instead, users were positioned to feed a matrix of digital media with instantaneous connections between nodes that pass information forward and disappear afterwards. Nodes are always given in this temporary settling: they pop out, and the general design of a node prevents any subjectivity-oriented hermeneutics. A node is, after all, a knot whose existence depends on a multitude of nodes within a network.

But the inner structure of the internet dates back to December 1969, when a group of researchers sent via the newly operational ARPANET a draft of network protocol standards called request for comments (RFC). The first RFC was called 'host software' and it established a less formal written style that has since then become typical of internet draft documents. These memorandums described methods and feasible innovations regarding the rules by which computers exchange information. After a period of few

years, these guidelines were applied to the internet and internet-connected systems at large. What is interesting about the RFCs is that they do not address anything related to the content distributed by internet, only to the standards by which the internet works. This is interesting because although there is no mention to content across the RFCs, they became an underlying principle of the internet regarding the organisation of data. This underlying principle shares strong resemblance to the communication process depicted by Luhmann, as the content of the message and the process of communication are independent processes altogether.

Each RFC, for instance, was assigned a unique serial number by an RFC Editor. Once this number was published, it could never be rescinded or modified. The subsequent versions were published as a revised document in such a way that one RFC supersedes the other (they become deprecated or obsolete). The serialised RFCs dispose a continuous historical record of the evolution of internet standards and practices. A similar system of RFC was established by Wikipedia in the early years of 2001 as an informal process for requesting outside input about article content, particularly in regard to dispute resolution or user conduct in view of Wikipedia policies and guidelines. Because of that, any article on Wikipedia has a continuous record available to the public on the tab 'history', a feature very similar to the serialisation of the RFCs that deliberated about communication between computers.

The serialised and overlapping RFCs are to a certain extent analogous to the process of meaning-making described by Luhmann (1998) and the image of an endless input of new elements. New elements are necessary because storage is limited and the systems need to constantly renew the amount of selected elements. For both systems the loss of data and the input of new elements is a condition for subsistence and existence. To put it simply, without the continuous loss of elements the system would continuously accumulate data and eventually risk the internal order. Luhmann (1998) also understands that meaning is associated with instability in the selection of elements. Dynamic systems operate in view of this instability and the continuous flow of new inputs, so that the centre of meaningful experiences is not stationary but rather regularly altered. This process is useful for describing communication and meaning-making in the internet as an autonomous system that reproduces itself. After all, meaning is what connects system selections and links internet messages, so that the connection between one input of information introduced by a medium and the reverberation provided by another medium is similar to the Luhmannian concept of meaning.

As a result, information transmitted over the internet only generates meaning in as much as one node passes it to another in a chain of multiple and steady interactions. This chain of serialised interactions is both what allows information to travel between nodes and what creates a horizon of meaning. It is somehow like a dialogue in which one phrase relies on the previous phrase in order to give continuity to the conversation. This general regulation of selections implies, firstly, that meaning is not given in the act of understanding; secondly, that the process of communication is detached from any direct-action based on bilateral and at-hand participants; and thirdly, that interactions are shaped as a sequence of links between themes that builds a memory without any action of agents. This molecular sequence of communications is possible because technology gives form to the unshaped medium of nodes/users. These nodes comprise an unstructured gathering of individuals and can be grouped around a number of configurations or

arrangements, such as comment boxes in blogs, Twitter hash tags and other temporary gatherings that might as well soon cease to exist.

It is easy to exemplify this dynamics. After a TV network broadcasts a major event, news websites follow the reporting and add information. Regardless of its digital or printed format, media companies work out an arrangement that makes the system grow inevitably bigger by the time other sources join the reporting, consequently enlarging the mediascape. This progression of adding another medium to the system in order to broadly spread the information resembles an example that Luhmann used to describe something external to agents and observations. In a given classroom there is a teacher and his or her students. Beyond that, there is the interaction between teacher and students and this very interaction observes both parties (Luhmann, 1995). The interaction senses the imminent system to come and promptly starts projecting possible meanings.

6   Digital notation and spectral meaning

The framework based on clustering of meanings depicts a notation system that is at odds with the forms associated with emission and broadcasting. The press is still an important player and a newsroom may begin to process news information any time based upon an alert that initiates the process of newsmaking. From the system's point of view, an alert is sent out every time a journalist or a news editor stumbles upon a breaking story. The broadcasting notation system changed what was previously a unidirectional procedure based on phone calls to a heterogeneous matrix of media working together. But now the same alert can be sent via mobile phones, smart phones or any handheld device. It might be sent by SMS text or by e-mail, news updates or even as a tweet or RSS feed, thus instantly notifying the recipients.

Lewin (1947) first used the term gatekeeping to describe the wife as a person who decides which foods end up on the family's dinner table. The gatekeeper was consequently the person who decides what should pass through each gate section, of which there are several in any process. Later on, White (1964) would seize upon Lewin's comments and relate them to journalism, thus describing the decisions that determine which information will go forward and which will not. Gatekeepers were responsible for choosing which inputs were eligible to enter the information system, and by doing that they controlled the flow of reported events based on principles of news values.

Gatekeeping still occurs at all levels of media structure, only now it has been enlarged to incorporate a multitude of senders and receivers – or Alter and Ego according to Luhmann's terminology. The function of gatekeeping, which the traditional media previously performed alone, has been promptly redesigned to embody a multitude of sources. Users have since then taken part in the story and redesigned the process through which ideas and information were filtered for publication. What was before an internal decision-making process within newsrooms of relaying or withholding information to people is now a decentralised and dynamic process of following up on a story, with an updating structure that resembles the permanent imputing capacities of an e-mail thread or blog.

It is interesting to note that gatekeeping for computing sciences implies a different set of operations. A gatekeeper is a device that manages domains and provides call control, providing address information to terminals within the zone and to gatekeepers managing other zones. Gatekeepers control the gateways which, in telecommunications terms, are

the devices that interface two different zones and convey the actual information. The understanding of a gatekeeper, according to media theory, resembles otherwise what is usually depicted as a small network. As network scaling with gatekeepers grows to a medium or medium-large network, the gatekeepers fade away and turn into a variant of another gateway.

This particular clustering of electronic data could explain why the peers have no control over the serialisation of signals, or to say it another way, why the nodes re-tell the previous facts while also adding some more. This is because gatekeeper and gateway in digital media are roles performed by the same nodes, and a given peer cannot know the extent or the consequences of a given thread. This contingent feature of data interchange has deep impact on internet conversations because threads are not defined by its commencing, but rather by its flow. The result is that any simultaneous interactive interface looks like a cross-talk in looping effect; any given phrase is crossed-over by a multitude of messages in the screen. Not only the messages but also the contexts from which these messages come are frequently crossed-over.

The process of communication over the internet can thus be depicted as a sequence of messages that move across time while journalists are reporting to editors or users are stumbling upon a news story (viewing it on a mobile phone or writing about it on a blog). At the same time that the internal structures of news corporations are processing data through editorial decisions that determine whether a story is worth publishing or not, users are feeding the internet without any clear filter. Once the data reach the internet, they are equally ranked in regard to technical distribution within the mediascape. The data is continuously clustered throughout the system, thus providing a variety of meanings to different inputs regardless of its digital, printed or broadcasted form. TCP/IP protocol and hypertext structure provide links to a wide variety of documents and organisations, and their digital status allows a perfect integration among peers, so large in number that the separation between system and environment is not effective or operational.

As a result, a particular story can be linked to the source material of a company or government website. Later on, witnesses can directly join in the process and the story background might be fed by links to archives. Commentaries from observers add perspective into a growing accumulation of data. The press still plays a major role, but it is surrounded by peers and media devices that are not press themselves. The story turns into a living organism whose nurturing process is composed of several stages that continue after publication. Reporters, editors, witnesses, archives and commenters add different elements, and it is not always clear who is gatekeeping the final material. According to Shank (1993), the key feature of multilogue is that once a story is published on the internet, the author loses control of it. Control, subsequent comments and responses to the story are shaped as an independent process that no one owns and that rapidly slips away.

An internet viral is, after all, a snapshot of these molecular cycles. E-mail, Twitter, RSS updates or social networks allow users to drill down into the information of a particular story. This communication process turns the inverted pyramid – once the main model of news making – into a normal pyramid attached to an inverted pyramid. Users take part in the story and redesign the process through which ideas and information are filtered for publication. What was before an internal decision-making process by the media of relaying or withholding information to the masses is now a decentralised and

dynamic process of following up on a story, with an updating structure that resembles the permanent imputing capacities of an e-mail thread or a web forum – models that bear a resemblance to the RFC standards. This illustrates the iterative process of new media as a story that is forever unfinished and that can always be updated.

This general description of the Internet Protocol (TCP/IP) shares a resemblance to the central problem discussed by Luhmann (1999) that consists of establishing the differences between psychic and social systems. For Luhmann, both systems operate on the basis of meaningful self-reference reproduction, and because of that psychic systems must reproduce consciousness through consciousness as a consequence of self-reference. To say it another way, psychic systems must be able to exchange information without sharing any 'consciousness'. This suggests the image of a thought producing the next thought in a chain of events that are consistent with founding principle of autopoiesis as depicted by Luhmann. Although it is a thought that produces the next, they are closed inwards and cannot reflect what they are not and cannot see what they do not see. Each thought distinguishes itself from previous thoughts and is only linked to other thoughts by the sequential operation that produces them.

There is no mechanical transmission of information, but a double contingency in which every node is a selection both within itself and in relation to the others, as well as being an object to itself and to the others. This Luhmannian insight allows for a description of the nodes as the elements that account for the realisation of potential communications given within a horizon of meaning. That is, the nodes work between the projected value of potential connections and the actual value of active connections between nodes. Finally, this distinctive serialisation of nodes that connects different communications is what allows the fusion effect, that is, the gathering of different media, regardless of their digital or paper-based nature, to provide the internet with new and unpredictable contents.

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