

To: Prof. Dr. Richard Rogers

Tutorial paper

*From Medium to Meta-Medium: Theorizing
Specificity of Media*

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INTRODUCTION

Medium-specificity as a concept is mostly related to art forms, practices and artwork interpretations: “Medium specificity suggests that a work of art can be said to be successful if it fulfills the promise contained in the medium used to bring the artwork into existence.¹” According to Emma Bernstein², specificity has been used in defense and promotion of abstract painting as an expression of the ‘pure’ form that does not communicate anything besides its self-contained properties. Abstract painting, like music, was conceived as the essence of the medium, as being ‘indescribable’ through any other media. The concept of medium specificity has also been used to assert photography as a separate art form, defined through its own capabilities/properties. With developments in the art platforms (interactive/new media art), the concept of medium specificity based on ‘purity’ of the form has gradually become irrelevant. Theorists as W.J.T. Mitchell (“Ut Picture Theoria: Abstract Painting and Language”, 1994) or Rosalind Krauss (*A Voyage on the North Sea: Art in the Age of the Post-Medium Condition*, 2000) argue that specificity of this kind, located in the artistic materials and methods, is no longer adequate since medium specific practices are often replaced or combined.

In the field of media studies, Marshall McLuhan and Raymond Williams were the first to focus on how a medium should be theorized. McLuhan located specificity in the medium ‘effects’ (since the content is always content of another medium). Williams, on the other hand, defined it as an outcome of the ways in which social and cultural context shapes the medium. Similarly to art theory, after the ‘rise’ of computer media, specificity could no longer account only for the ‘purity’ of the medium. Katherine Hayles, for example, appeals for *media*-specificity: “Literary analysis should awaken to the importance of media-specific analysis, a mode of critical attention which recognizes that all texts are instantiated and that the nature of the medium in which they are instantiated matters.”³ While Hayles still defines the media based on its properties, she broadens the scope by exemplifying how hypertext and literary text can be *both* specified through their instantiations in print and computer media. In *Software Takes Command* (2008) Lev Manovich takes media-specificity even further, claiming that previous known media (print, animation, motion films, pictures, etc.) is no longer specific when it appears in computer media: “Software production environment allows

¹ http://en.wikipedia.org/wiki/Medium_specificity, accessed on 13th of May, 2009

² <http://csmt.uchicago.edu/glossary2004/specificity.htm>, accessed on 7th of June 2009

³ Hayles, K. (2004) “Print is Flat, Code is Deep. The Importance of Media-Specific Analysis”. *Poetics Today* 25:1

designers to remix not only the content of different media, but also their fundamental techniques, working methods, and ways of representation and expression”⁴. Medium specificity has become *media*-specificity, has become *non*-specificity in the software that remixes content, techniques, methods and ways of representation previously specific to different media.

Current analysis will trace the change in theorizing medium specificity through comparative reading of several core media studies’ texts. How do theorists approach medium specificity? What do they focus on? How do they position their theories in relation to other media scholars? What methods and case studies do they use? Do these theorists map a change in the medium-specific discourse? Although this analysis is not aimed at providing coherent ‘grand narrative’ of medium specificity (its definition, systematization, categorization, etc.), it will work with the hypothesis that computer media has challenged the conceptualization of the medium as self-contained entity. Following Manovich’s argument, the specificity of the medium is no longer located in its properties since the computer offers their endless variations. The research method used for this analysis is comparative reading of a sample of six texts. The authors and their texts that have been selected are: Marshal McLuhan’s “Television” (1964); Raymond Williams with part of *Television: Technology and Cultural Form* (1974); Katherine Hayles’s “Print is Flat, Code is Deep. The Importance of Media-Specific Analysis” (2004) and part of *My Mother was a Computer* (2005); Matthew Fuller’s *Media Ecologies. Materialist Energies in Art and Technoculture* (2005), Manovich’s online published draft of *Software Takes Command*, and Richard Rogers’s “The End of the Virtual: Digital Methods” (Inaugural speech, 2009). These texts will be interpreted and compared through the features of authors’ focus, method, case studies and relevance of the theory.

MCLUHAN’S SENSORIAL MEDIUM

As a starting point of analysis, I would like to use Marshal McLuhan’s text. In the chapter “Television” (from *Understanding Media, The Extensions of Man*, 1964) he conceptualizes specificity of the medium in relation to the way it impacts the human senses. McLuhan differentiates between ‘hot’ and ‘cool’ mediums, depending on whether (or not) they evoke participation of the audience: radio is a hot medium, it has a low degree of participation and therefore it can serve as a background. Television, on the other hand, is seen as a ‘cool’ medium; it will not work as a background because it constantly engages its users. It “is above all, an extension of the sense of touch, which involves maximal interplay of all the senses”

⁴ Manovich, L. (2008) *Software Takes Command*. published online, pp. 27

(McLuhan: 364). Television works with 'depth structures' to reinforce its engaging capabilities. The 'effect' of television is aesthetically described as "hard to grasp for various reasons" (McLuhan: 345). The medium is defined as an extension of our central nervous system. Comparing the resolution in film and in television, McLuhan concludes that the participatory nature of television's experience is due to its lower resolution, while the high filmic resolution pre-supposes only passive consumption of actions. It is interesting to hypothesize how McLuhan would respond to the introduction of high resolution television as an enhancement of viewers' interaction and to the 'cinematic' experience at home. However, more valuable for the analysis here is to point out that resolution and depth are aesthetically conceptualized as overwhelming, numbing the viewer. McLuhan's methodology includes research on university students: they were required to summarize and fill in questionnaire about a story channeled through different media (print, radio, and television). He also incorporated comparison between the development of print, radio, film and television (in Europe and US), interpretation of the televised 'effects' on the American lifestyle (on cars, clothing, housing), studies on children watching violent films on television and analysis of the representation of Nixon-Kennedy presidential campaign. McLuhan also conceptualizes the relation between children and television in terms of educational potential of the medium. He focuses on the differences in the way young and adults watch and experience TV. Television reflects on the children's needs and expectation in 'real' life: "The TV child cannot see ahead because he wants involvement, and he cannot accept a fragmentary and merely visualized goal or destiny in learning or in life"(McLuhan: 366).

How does McLuhan position his research in relation to other analytical work regarding media from around that time? McLuhan rises awareness to the 'causes' of the television's experience: its depth and resolution. Similarly to him, few decades later Manovich will call for acknowledging the materiality of software beyond engineering: "If we don't address software itself, we are in danger of always dealing only with its effects rather than the causes" (p.8). However, the main McLuhan's contribution to medium specificity is bringing the centrality of the medium itself. He motivates his approach by giving an example of political scientists that mostly focus on the content of the media while remaining unaware of its effects. "Nobody has been willing to study the personal and social effect of media apart from their 'content'" (McLuhan: 352). Conceptualizing the medium and its materiality as sensorial effects is McLuhan's theoretical contribution and innovation. Many theorists will come back to him (Hayles, Fuller, Hansen, etc.), for reclaiming the importance of materiality. Methods for data collection have been also built upon the notion of the medium that impacts the senses. Although usability tests or eye-tracking are mostly used for analysis of web media (not

television), the influence of McLuhan's approach can be still found even there. On the other hand, McLuhan's focus on sensorial effects of the medium has been used from Raymond Williams as a point for initiating a long-lasting debate in media studies about how a medium should (not) be theorized.

THE MEDIUM SHAPED BY THE POWER

In *Television: Technology and Cultural Form* Williams traces a new field of research by criticizing McLuhan for deriving specificity of the medium (speech, print, radio, television) from its form not from its content or practices. He takes McLuhan's argument about the sensorial effect and drives it to the extreme, showing that if media is essentially properties 'working' on individual (not collective) level, then media content becomes irrelevant. Williams tries to point paradoxes in McLuhan's approach: since all media effect is desocialised ('simply physical events in an abstracted sensorium', (Williams: 121), how can McLuhan project images of society ('global village', 'electronic age', etc.)? McLuhan's theory is interpreted as representation of technology as a cause, while for Williams the medium specificity lies in the effects of particular social order. It can be suggested that he defines the medium as neutral; its properties can be activated and used by power structures (commercial or military interests). Williams is focused on intentionality: what are the goals of the 'actors' that produce and distribute television's content? Media is seen as being in service of forces (Hegelian, impersonal ones) and the 'evidence' of this is the 'flow'. Williams defines the 'flow' as central to television experience. He briefly follows developments in magazines, newspapers and radio programming to highlight the centrality of public communications to social life and to map the replacement of timed units in the TV programming by flow series. The competition between different channels has necessitated the flow as a way to keep the audience tuned in for a long succession of time. The flow is maintained within the programme and the various items in it, and within the actual image and words in the items. The method that Williams uses to support his claims (apart from comparison with radio programming) is based on an empirical collection of data. This includes registration on the distribution of programmes on five television channels (British and American, public and private ones) for a sample of one week. Williams also carries out a 'long-range analysis' of the sequence within the items of the five programmes and a detailed registration of the flow 'in' and 'between' the items on one of the programme for a day. He has gathered this quantitative collection of data by himself and has recorded it on detailed time tables.

Williams's contribution to medium specificity can be seen in claiming back the importance of social and cultural mechanisms that shape the content of the medium. Even today we can

find his approach to be relevant for analysis of *Gmail* for example, in which the advertisements are embedded within the personal inbox and they match the keywords of the e-mails. Or the flow can be found on the online platforms of the broadcasting media, maintained by the way they link out to a very limited number of websites, trying to keep the readers only on their corporative pages⁵. Theoretically, Williams can be also useful for web media analysis: “if we are to focus on social and political aspects of contemporary media culture and ignore the questions of how media looks and what it can represent – asking instead about who gets to create and distribute media, how people understand themselves and the world through media, etc. – we may want to put *networks* (be it web of the 1990s, social media of the 2000s, or whatever will come in the future) in the center of discussions” (Manovich:99). However, even though the vast ‘impersonal’ forces still play a role in the way computer or web media is shaped, it is no longer relevant to center specificity primarily on them.

Going back to Williams – McLuhan debate, by initiating it, Williams calls for sub-division within the field of media studies. Although he largely criticizes McLuhan for his theory and approach, on a meta-methodological level they both work with a-historical frameworks, based on observations. Both of them also interpret cases of violence on television, defined by Williams as source of moral panic and by McLuhan as an example how watching television, as an act engaging the senses, is generationally ‘framed’. Children watch violence on TV differently that adults. They focus primarily on the facial expressions of the actors not on their actions. Both authors also rely on the properties of the medium for their theorizing: for Williams, content and flow are the main characteristics, while McLuhan aesthetically positions resolution and depth central to television experience. It can be suggested, however, that Williams and McLuhan provide different reading of the media ‘effect’. For Williams, media is affected by commercial and military interests and the evidence for it is the shift from timed units to flow series. McLuhan, on the other hand, has found a niche in the media discourse for the personal (and social) effects of television. Although, this argument has not been ‘resolved’ by prioritizing one approach over the other, it clearly shows how sometimes, the most fruitful theoretical practice is to place your scope in opposition to dominant paradigms. Following the same pattern, Katherine Hayles acknowledges the shortcomings of literary analysis based on an unawareness of the materiality of the medium in which a text is instantiated.

⁵ <http://www.seoco.co.uk/blog/2008/07/16/how-good-is-the-mainstream-media-at-linking-out>

COMPUTER MEDIA AND LITERARY TEXTS

In “Print is Flat, Code is Deep, The Importance of Media-Specific Analysis” (2004) she goes back to McLuhan’s materiality of the medium to define materiality of the text as inter-play between its physical and signifying characteristics. For her theoretical framework, Hayles incorporates also Barthes’ conceptualization of the text as rhizomatic structure with multiple authorship. Additionally, she includes Bolter’s (1991) and Landow’s (1997) applications of Barthes’ multiple authorship on electronic hypertext. Apart from materiality of text as physical and signifying characteristics, Hayles’s theoretical innovation in relation to media-specificity can be found in the way she positions specificity in the dynamic relations between different media. Relying upon Bolter and Grusins concept of remediation, she argues that: “media constantly engage in a recursive dynamic of imitating each other, incorporating aspects of competing media into themselves while simultaneously flaunting the advantages that their own forms of mediation offer” (Hayles: 69). This theoretical framework pre-supposes Hayles’ methodology. She approaches literary and electronic hypertexts through ‘comparative’ analysis or through ‘holding’ literary hypertext constant and exploring how it varies (is it constrained or enabled) across print and electronic media. For the first part of the analysis, Hayles defines materiality by following the historical line of debates about disembodiment/embodiment of the literary text. She comes to determine it as a “dynamic interplay with content, coming into focus or fading into the background, depending on what performances the work enacts” (Hayles: 71). The case studies that support this definition are electronic works (*Uncle Buddy’s Phantom Funhouse* (1993), and *Lexia to Perplexia* (2000)) that combine natural language and computer code. Materiality as physical and signifying practices enables interpretation. Apparatus cannot generate interpretation alone and without signifying it will be an endless list of material units (“from chemical formulas for the polymers used in computer cases to the electronic conductivity of computer chips”, (Hayles: 71). On the other hand, theorists and artists acknowledge the importance of materiality because it specifies their practices.

Hayles approaches the second part of her media-specific analysis through print and electronic instantiations of ‘hypertext’. Her case studies vary from encyclopedia based forms (*Dictionary of the Khazars: A Lexicon Novel* (1989)) to the multimedia text of Ursula Le Guin’s *Always Coming Home* (1987) or Philip Zimmerman’s artist’s book *HighTension* (1993). The method of analysis is based on Bolter&Grusin notion of ‘re-mediation’: “My technique, then, amounts to constructing a typology of electronic hypertext by considering both the medium in itself (its instantiation in digital computers) and the extent to which its effects can be simulated in print” (Hayles: 73). Hayles continues with specifying nine medium characteristics

of electronic hypertext: it is dynamic images, it consists of both analogue resemblance and digital coding, it is generated through fragmentation and recombination, it has depth and operates in three dimensions, it is written in code and in natural language, it is mutable and transformable, a space to navigate, written and read in distributed cognitive environments and demands cyborg reading practices. These nine characteristics are 'applied' on different electronic literature cases that 'feedback' on the specificities of both print and electronic hypertext. Therefore, Hayles works with reverse remediation to define literature hypertext through electronic one and even constructs her analysis in a reversed way: instead of grounding the hypertext characteristics after researching the case studies, she preliminarily defines them and applies them as a 'grid' on the examples.

Hayles continues working with similar methodology further in her book *My Mother was a Computer; Digital Subjects and Literary Texts* (2005). She focuses on constituting subjectivity through computational perspective by showing the interplay between traditional and computational frameworks. Since hypertext is instantiated in material books, how does it affect the subject of reading? The case studies are again print novels and electronic literature, although this time they are 'backed up' with analysis of computer simulation used in scientific research. Hayles defines three modalities of constituting subjects and texts through the 'traffic' between language and code: making, storing and transmitting. Her theoretical framework bears similarities to the one used in "Print is Flat, Code is Deep, The Importance of Media-Specific Analysis". The reversed remediation of Bolter&Grusin, however, here is transformed into intermediation. Intermediation does not prioritize the starting point of the remediation cycle. It features complex transactions between bodies and texts as well as between different forms of media, deriving "its motive force from complex feedback loops between language and code, print novels and computer programs" (Hayles: 10). Creating a theoretical framework in which subject and computing, language and code can be 'systematically thought together', Hayles expands intermediation to embrace systems and modes of representation (analog and digital ones). She 'builds' her digital subject on Kittler's notion of the constitution of the bodies by the media they use and Hansen's recognition of the centrality of the embodied subject. Moreover, Hayles positions the subject's 'formation' in relation to code. Code is addressed both to humans and intelligent machines. It exceeds speech and writing (conceptualized through Saussure and Derrida) due to its ability to endlessly gain new characteristics. Hayles defines code as complex, dynamic systems that have performative functions (cause things to happen) and hierarchies, 'high level of literariness' (simple rules, complex behavior), etc. Programming languages as C++ are purposefully modeled after natural language which for Hayles feedbacks on how

natural language should be understood. This also suggests different reading techniques that play important role in the formation of digital subjects.

Hayles' contribution to media-specific analysis can be seen in raising awareness about its importance and the way she positions it as dynamic inter-play between different media. She 'opens' up medium-specificity to consideration of other media. Hayles acknowledges that computer media characteristics such as hypertext or code do take part into defining specificities of text or subjectivity. She incorporates computer media into her analysis, exemplifying how hypertext gains different characteristics if its instantiated in print or in electronic text. She reclaims the materiality of media as physical characteristics and signifying practices. Hayles deposits nine features on hypertext in order to read contemporary literature. Similarly, she projects characteristics of code so that she can conceptualize digital subjects through the changing reading practices (showing how the embodied instantiations of media can be studied). However, in Hayles's analysis media is still specified through its properties.

Her method is based on comparative analysis, grounded in both online and offline realms. In "Print is Flat, Code is Deep, The Importance of Media-Specific Analysis" (2004) she conceptualizes literature through defining the characteristics of hypertext. In *My Mother was a Computer; Digital Subjects and Literary Texts* (2005) above all, Hayles contributes to the notion of viewers/users, defining them in line with the humanistic tradition of subjectivity. Online audience is comprised by digital subjects, modeled by continuous interplay between language and code. Moreover, in both the analytical works, she builds her theoretical framework upon well recognized and cited media texts. Unlike Williams and McLuhan, Hayles does not rely on grounded research or historical overviews of media developments. What she does is close reading of texts (electronic and print) from literary and computer studies. Hayles works with interesting methodology: what hypertext can tell us about print literature or language/writing about code? Her comparative approach can be seen as a relevant theoretical contribution. For example, similar comparative approach can be used to analyze printed blogs-newspapers⁶ through depositing features on online newspapers to study contemporary developments in print media. This framework is useful to gain insights of the media format through its inter-relation to other media formats. On the other hand, if we change the overall discourse as Manovich proposes, we can no longer specify blogs and newspapers as media based on distinguishable properties. In the software environment

⁶ In a search for innovative business models for newspapers, collaborative news blogs have been weekly published (*The Printed Blog* for the areas of Chicago and San Francisco, *Der Freitag* in Germany).

(through which they are maintained or produced with), blog's and newspaper's content, techniques and methods are getting remixed and appropriated. It seems that since Manovich has proposed quite radical approach toward specificity of media, previously conceived theoretical frameworks and methodologies have started to lose their relevance.

MEDIA AS 'BECOMING'

In *Media Ecologies. Materialist Energies in Art and Technoculture* (2005) Matthew Fuller positions Katherine Hayles as a representative of: "a thread of study in which literature becomes a part of subset of media, and thus of discursive storage, calculation, and transmission systems" (Fuller: 4) that have substantial insights to offer. Fuller sees the contribution of this 'school of thought' in the way it relates electronic or code-based composition with cultural analysis, thus opening domain of studies for humanities scholars that used to be reserved for the sciences. Similarly to Hayles, Manovich also approaches software from a cultural perspective, acknowledging the need for conceptualization that goes 'beyond engineering'. Fuller, on the other hand, focuses on materiality of 'real' media objects, asking: "what are the different kinds of such qualities in media systems with their various and particular or shared rhythms, codes, politics, capacities, predispositions, and drives, and how these can be said to mix, to interrelate, and to produce patterns, dangers, and potentials?" (Fuller: 2). It can be suggested that for Fuller media specificity is derived from the contact between media objects and their parts and elements. Media does not equal whole forms but apparatuses composed by other apparatus that (re)assembles others, etc. Their bits and parts do not stay separate; they inter-play in a way that the outcome of interaction always exceeds the sum of what they are as a set. In this way, Fuller revises McLuhan's notion of rearview mirror (every new media develops on the norms of previous media). Media for Fuller is not a self-sustained 'wave' that follows the previous one; it is rather a composition of different parts, drives and compositional terms (that include arbitrary coming into 'contact' with each other or being purposefully arranged).

Staging the ground for his theoretical innovation, Fuller relates to another prominent theorist-Stuart Hall. According to Fuller, in his essay "Encoding/Decoding", Hall proposes communication model that consists of five linearly arranged elements – source, transmitter, channel, receiver, and destination. The middle three have been replaced by the 'message'. Hall follows how meaning is produced through the five elements, focused on the practices of reading and coding. For Fuller, Hall's model is too centered on the form-content division and on interpretation, thus undermining the potentiality of media practices. Fuller, on the other hand, acknowledges the five elements without 'anchoring' their form and the content. In the

ecology of media, content and form float unrestricted, obtaining possibilities for ‘becoming’ and shaping-in-motion. Moreover, he focuses on conceptualizing the ‘missing’ elements: receiver, channel and transmitter through Deleuze&Guattari’s notion of ‘machinic phylum’ that enables an insight of how: “medial dynamics in combination generate behaviors, qualities, and openings that are more than the sum of their constituent, codified paths”. (Fuller: 24).

Fuller supports his theoretical revisions through five case studies that follow Hall’s elements: source (London-based pirate radio), transmitter (John Hilliard’s *A Camera Recording Its Own Condition (7 apertures, 10 speeds, 2 mirrors)*, 1971), channel (*The Switch*), receiver (*by the way, BITRadio*), and destination (*CCtv-world wide watch*). The ecology of contemporary pirate radio explicates the multiplicity of networks of production, locations and medial forms. It is both legal and illegal, private and public, investment and potential escape from it, stylistic innovation and traditionalism, “always more than it is supposed to be” (Fuller: 53). *Camera Recording...* contributes to the understanding of apparatus as multiple programs, medial drives and possibility for their activation. *The Switch* stands for the hidden potential in conventionally used technology, enabling choice and decision-making into previously centralized automatically generated system. *BITRadio* and *by the way* acknowledge the dynamics of the receiver that undergoes “a process of recursion, twist it, and feed the results back into the ongoing composition” (Fuller: 107). *CCtv* exemplifies how the ‘outcome’ can be produced, formulated and shaped through medial devices, representational forms, protocols and data organization and this process can be addressed to a very limited audience (police stations). “The work butts media systems up against each other, makes them produce seams. It dials the wrong number but in doing so reveals something of the dimensions of relationality composing any such number, string of characters or protocol. In forging temporary media ecology out of few wrong bits and connections it is possible to patch together something of another order”. (Fuller: 165).

Does Fuller conceptualize media in terms of specificity? For sure, he expends theory to ecology and his media objects belong to a list of materiality. Through his case studies, Fuller completes a ‘micro’ ecology, restoring the missing link in Hall’s communication model. Following the tradition in critical theory, he reclaims back the transmitter, the channel and the receiver. In terms of specificity, Fuller revises the static notions of content and form based on the practices of coding and interpretation. He makes the move from media properties to media possibilities. When media objects come into contact or are being exposed to arrangement, they exchange elements/particles/drives and generate energies. Therefore, media objects (and their content and form) for Fuller inherit possibilities to evolve endlessly

because they are not pre-defined through the set of properties but dynamically become aggregated. They come into being through the practices of arrangement but also through interpretation, layering and reuse. Fuller also takes into account the 'invisible' layering: in the way HTML or frequency modulation work as compositional 'force'.

Fuller's contribution to media theory can be found primarily in his method but also in his focus: "One of the concerns of this book is to develop arguments for a machine, digital and electronic aesthetics" (Fuller: 6) and theoretical revisions. In *Software Takes Command*, Manovich acknowledges the 'ecological' list as an adequate method to study web media: Software programs and web sites do not function in isolation: "they participate in larger ecology which includes search engines, RSS feeds, and other web technologies; inexpensive consumer electronic devices for capturing and accessing media (digital cameras, mobile phones, music players, video players, digital photo frames); and the technologies which enable transfer of media between devices, people, and the web (storage devices, wireless technologies such as Wi-Fi and WiMax, communication standards such as Firewire, USB and 3G)" (Manovich: 33). Another reference to Fuller can be found in the way Manovich conceptualizes conversations that are enabled by Web 2.0 applications. Similarly to Fuller's receiver, social network's conversations get twisted, feeding back in to the composition (by comments), evolving in different form (tokens), becoming able to continue and change endlessly. Or the 'message' the user receives (bearing resemblance to *CCtv*) is not only a matter of interpretation but actively managed/arranged/controlled (Manovich: 8). It can be suggested, therefore, that Fuller's methodological and theoretical relevance is exemplified through Manovich's references (although he does not explicitly give the credits for this to Fuller).

SPECIFICITY OF THE METAMEDIUM

On the other hand, how does Lev Manovich approach medium-specificity? In the online published book *Software Takes Command* he positions his argument in relation to the work of other media theorists. Who does or does not include software in his/her research and is it important to do so? Katherine Hales, Mathew Fuller, Alexander Galloway, Ian Bogust, Geet Lovink, Paul D. Miller, Peter Lunenfeld, Katie Salen, Eric Zimmerman, Matthew Kirschenbaum, William J. Mitchell, Bruce Sterling apparently do so (driven by their personal experiences), while Jay Bolter, Siegfried Zielinski, Manuel Castells, and Bruno Latour do not. Manovich goes further acknowledging the importance of software as the 'key' to understand contemporary media representation, communication, simulation, analysis, techniques of control, etc. In doing so, he selects to focus on software applications for content creation.

It can be suggested that Manovich builds his argument on several layers: the first one include conceptualization of the computer as metamedium though the work of its pioneers and through several characteristics (deep remixability, hybridity, meta language); the second one focuses on what happens to previously known media forms under the software environment and the third one centers around the shift from professional media authoring to consumer media and social web. Manovich argues that specificity based on properties is no longer an adequate framework to analyze computer media since new properties or software can be easily added or invented. He proposes, instead, the research focus to be placed on the outputs as well as on the form of production in a new medium - 'metamedium'. Manovich conceptualizes the metamedium as a 'new stage' of media hybridization that appropriates not only the content of the different media but their inherited techniques. He sees its 'newness' not only in its content but in the software tools used to create, edit, view, distribute and share this content (Manovich 2008: 71). In comparison to Hayles, Manovich no longer accepts that different media are in a constant inter-play/feedback loop. Instead, he suggests that computer media is one metamedium that should be seen as simultaneous instantiation of content and forms of production.

Manovich positions his research focus on the particularity of 'cultural software' used to create and access media environments and objects. For his theoretical framework, he introduces the works of the pioneers of 'cultural computing': J. C. Licklider, Ivan Sutherland, Ted Nelson, Douglas Engelbart, Seymour Paper, Nicholas Negroponte, and Alan Kay. If we compare Manovich's and Hayles's approach again, we can see how the first almost 'theologically' relies on texts, hardly known and popular outside particular circles, while the later builds her argument upon well-known and vastly cited works. It can be suggested that Manovich attempts to trace the genealogy of the metamedium through the texts of researchers involved in its conceptual and practical development. He also introduces different stages in the metamedium development: the first one goes back to the beginning of 'cultural computing' through the works of the pioneers. The second one takes place in the early to late 90s (software's 'Velvet Revolution') and the most significant change then is the emergence of new visual language due to systematical use of media authoring and editing software from video artist, filmmakers, designers, etc. The third stage involves "the move from desktop applications to webware (applications running on the web), social media sites, easy-to-use blogging and media editing tools such as Blogger, iPhoto and iMovie, combined with the continuously increasing speed of processors, the decreasing cost of notebooks, netbooks, and storage, and the addition of full media capabilities to mobile phones – that have transformed how ordinary people use media" (Manovich: 31).

For Manovich, the metamedium can be characterized through the notions of 'deep remixability' ("Software production environment allows designers to remix not only the content of different media, but also their fundamental techniques, working methods, and ways of representation and expression" and "Once they were simulated in a computer, previously non-compatible techniques of different media begin to be combined in endless new ways, leading to new media hybrids" Manovich: 28), 'hybridity' ("in hybrid media the languages of previously distinct media come together. They exchange properties, create new structures, and interact on the deepest level" Manovich: 89), 'metalanguage', etc. His case studies are brought to support the specificities of the cultural software (deep remixability, metalanguage) and to define the aesthetics of the new 'media' visual language (hybridity) that the software produces. Manovich's main case studies are *After Effects* program, Blake's *Sodium Fox* and Murata's *Untitled (Pink Dot)* videos, *Go* music video (directed by Convert/MK12, Kanye West), Taschen's *Graphic Design for the 21st Century: 100 of the World's Best Graphic Designers (2001)*, *The Matrix* that go hand in hand with 'minor' examples in *Photoshop*, *PDF Acrobat*, *CAD*, *Final Cut*, *Google Earth*, etc.

Manovich builds his argument upon several core considerations: media hybrids offer new representations, interfaces, tools and ways to navigate by combining and/or reconfiguring familiar media formats. Software enables previously non-compatible techniques of different media to be appropriated and exchanged. What get endlessly invented are not new types of media but new elements and their constellations. Similarly to Fuller, Manovich considers media to be no longer self-sustained set of form and content. In the computer metamedium, media 'breaks' down to separate blocks: "These building blocks include algorithms for media creation and editing, interface metaphors, navigation techniques, physical interaction techniques, data formats, and so on" (Manovich: 98). Gathered under the computer metamedium, the separate media forms of cinematography, animation, special effects, graphic design, typography, etc. lose their previous atomized specificity since their elements can appear simultaneously in one frame under a software programme. Designers are now enabled to mix any number of visual elements regardless to their original media and to control each element in the process. The composition window becomes the center of the interface; designers work in 'real time', creating moving images out of multiple animation layers. The moving image gets augmented by the 3D layering: "From the concept of the 'moving image' understood as a sequence of static photographs we have moved to a new concept: *a modular media composition*" (Manovich: 161). Manovich proceeds with endless examples how the software enabled deep remixability and hybridity erases the previously known media specificity.

He also incorporates another framework to support the stated above. Relating to the core of McLuhan's argument, Manovich conceptualizes that although today the resolution, contrast, colour reproduction between print and the television's, computer's, mobile phone's screens is still different, we find similar visual strategies applied across these media. For McLuhan, the medium specifies the content, while Manovich acknowledges the irrelevance of this framework by explicating the opposite: the medium varies but the content stays the same. He gives as an example, advertising campaigns that often work 'across media' or the 'cross-over' model in which techniques previously specific to one media are applied to others. To Manovich this signals that the aesthetics of hybridity dominates contemporary media context. Moreover, the appropriation of similar techniques, compositions and iconography in any media affects the designing workflow: "While these operations continue to be used in relation to their original media, most of them are now also used as part of the workflow on any design job content and the practices of the media become unspecific in computer media" (Manovich: 174).

The corpus of *Software Takes Command* is centered on studying the changes in the visual representation due to systematical use of media authoring and editing software from video artist, filmmakers, and designers. This is where Manovich undergoes the revisions of media and medium specific theories. Software challenges the previous specificity of media since it incorporates blocks of techniques and content that gets appropriated and remixed. Moreover, practices such as 'across media' or 'cross over' additionally contribute to the relevance of Manovich's claims. Analyzing the 'affect' of cultural software on the Web, however, he seems to get closer to Fuller's notion of media-becoming. Moving from media authoring to the users' generated content, Manovich proposes communication model in which information gets atomized. He applies the notion of "media mobility": "A message never arrives at some final destination as in broadcasting / mass publishing model. Instead, a message continues to move between sites, people, and devices. As it moves, it accumulates comments and discussions. Frequently, its parts are extracted and remixed with parts of other messages to create new messages" (Manovich: 223). Relating to all of the information is no longer necessary since atomized elements can be accessed separately. Manovich concludes that it is possible to get content without the need to individually visit each web site. Examples for this can be found everywhere on the Web: from RSS to emails with the comment left on your personal page. *Google Wave* clearly exemplifies this tendency. The so called 'extensions' enable users of the *Wave* to post blog entries or comments without accessing the blog page or to generate tags in real time on *Flickr* without going to the *Flickr's* page or search *Twitter's* updates through login from the *Wave*.

What is Manovich's contribution to theorizing media specificity? Methodologically, he provides genealogy of computer media and conceptualizes its characteristics (deep remixability, hybridity, metalanguage). Theoretically, Manovich is very close to Fuller: they both claim that media is no longer static set of priory embedded properties. Fuller, however, positions the media objects he is analyzing according to the ecology they participate in. Manovich on the other hand, 'grounds' the media blocks in the software, in the computer metamedium. He provides its historical line of developments and focuses on the media authoring and editing software to defend its characteristics. Manovich explicates the change that computer metamedium has brought. Media properties are no longer seen as central to medium conceptualization. Revising Hayles's approach, Manovich suggests that different media do not inter-play; their content and practices co-exist, change and evolve simultaneously. On the Web, he finds the same pattern: content and software applications are part of dynamic ecology that constantly remixes outcome and techniques. There is a certain paradox in Manovich's claims for the end of specificity. On one hand, previously specific media become blocks of content and techniques (i.e. non-specific) that on the other, builds up a 'new' specificity, the one of the metamedium (with its deep remixability, hybridity and metalanguage). Therefore, it can be suggested that Manovich has shifted the discourse from medium (McLuhan and Williams) or media (in Hayles) to metamedium specificity where the media blocks are no longer defined through their properties but through both their techniques and content (input and output).

Manovich's analytical approach is also significant: theoretical framework is based on the works of the computational 'pioneers', structured in a way to finally produce the 'history of cultural software'. The selection of his case studies, however, can be seen as limiting. Manovich focuses mostly on visual forms and software, motivated by the lack of research in this area and his personal affiliations. Is his argument relevant? If we take example outside of the computer metamedium, we will most likely find that his claims provide useful 'grid' for analysis. *Google Wave*, for example, remixes practices and content previously embedded in instant messages, email, tags and also challenges the interpretation of personal blogs or *Twitter's* account as independent web sites that you need to access to be able to post entry, comment or search previous content. *Twitter*, on the other hand, remixes the practices of sms and blogs and has evolved over time from social network to news dissemination platform. What Manovich misses in his overall argument, however, is relevant methods to study the new metamedium. Williams, for example, introduces qualitative registration as a mean for data gathering in media studies or Hayles coins 'intermediation'. Manovich acknowledges that software can be studied by using already existing methods (Manovich: 8),

although “the existing work in software studies already demonstrates that if we are to focus on software itself, we need a new methodology” (Manovich: 9). What kind of methodology is he considering or what is it (not) possible to consider?

SPECIFICITY OF THE ‘ONLINE’

In “The End of the Virtual: Digital Methods” (Inaugural speech, 2009), Richard Rogers specifically focuses on the need for new methods to research web media. He grounds his claims through two propositions: Internet is no longer considered to be virtual realm existing independently from our social and cultural context. This reflects the questions of study: they move from “*just* online culture” to “how to diagnose cultural change and societal conditions with the Internet” (Rogers: 3). Secondly, he differentiates between two types of methods that can be used to study the Web: ‘digitized’ and ‘natively digital’. Although there is no ontological difference between digitized and digital, Rogers argues that since the objects of research exist only on Internet (hyperlinks, tags, archived Websites, etc.), we need to develop ‘online’ methods that follow the ‘online’ objects. He gives examples of how this can be carried out: commonly the ‘hyperlink’ is studied through hyper textual literary theory or social networking theory with methods originally conceived outside of the digital realm. Rogers, proposes instead, the hyperlink to be studied through *Issue Crawler*, software developed specifically to evaluate inlinks and outlinks as markers of impact and reputation. Websites, on the other hand, are commonly analyzed through usability tests with registration approach. Rogers argues that they can be also analyzed as an archival object made retrievable through the *Wayback Machine*. For example, the history of Google’s Web directory can be captured as a line of moving snapshots explicating societal change: the replacement of the human editor by the back-end algorithm. Rogers provides a long list with successfully carried projects that have developed “online grounded” methods for studying the search engines (with *Issue Dramaturg*) or social networking sites (as providing post-demographic data) or *Wikipedia* edits (through *Wikiscanner*). All of them provide significant cultural and social insights that might have been omitted if they were studied with digitized methods.

Therefore, Rogers’s argument meets a very important need to conceptualize online phenomenon in alliance to its ‘native’ techniques. Many media theorists acknowledge, for example, the lack of this approach in studying citizen news blogs. Although this media format has become significantly popular, most of the research done on it is based on comparative studies approach. Citizen news blogs have been compared with the broadcasting model and thus analyzed through ‘imported’ notions of ‘gate keeping’, ‘narrative structures’, ‘objectivity’,

'accuracy', etc. Studying them differently (through digital methods), may actually provide answers (which so far have not happened) why news is so much on demand now, given the fact that there is an overload of information? Apart from the possibility to ask different questions and answer them with methods following online objects, Rogers contributes to the theories of media specificity 'opening' it up for epistemological claims. As we have seen so far, media theorists tend to approach specificity through theoretical proposition, revisions, innovative approaches, etc. With the focus on the methods, Rogers suggests that specificity can also lay in the methods we use and propose to analyze media objects.

CONCLUSION

This analysis was aimed to trace how prominent media theorist define media in their studies, how they approach its specificity, using methods and case studies, positioning themselves in relation to other theories and suggesting shifts in the media discourse. I have applied the method of comparative reading on six texts (Marshal McLuhan's "Television" (1964); Raymond Williams with part of *Television: Technology and Cultural Form* (1974); Katherine Hayles's "Print is Flat, Code is Deep. The Importance of Media-Specific Analysis" (2004) and part of *My Mother was a Computer* (2005); Matthew Fuller's *Media Ecologies. Materialist Energies in Art and Technoculture* (2005), Manovich's online published draft of *Software Takes Command*, and Richard Rogers's "The End of the Virtual: Digital Methods" (Inaugural speech, 2009), proving the hypothesis that computer media has challenged the conceptualization of the medium as self-contained entity based on properties. Medium specificity (of McLuhan and Williams) has become *media*-specificity (in Hales), has become *non*-specificity in the software that remixes content, techniques, methods and ways of representation previously specific to different media. In the same time, 'new' media specific frameworks have been proposed. Fuller argues for specific 'ecology' (grounded in the source, transmitter, channel, receiver, and destination), Manovich for specific computer metamedium (in its outputs and forms of production) and Rogers for specific digital methods to follow 'natively' the objects of study.

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