THE QUIET MEDIUM: A QUALITATIVE APPLICATION OF MARSHALL MCLUHAN'S THEORIES TO SOFTWARE

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Abstract

Software dominates the current state of society, yet, it does not receive much attention as being a vastly influential medium (Manovich, 2013). This paper analyses software in the context of Marshall McLuhan's statement, "the medium is the message" (1964, p. 7). Hereby, I investigate and question Lev Manovich's statement that "software is the message", which he intended as an approach to update McLuhan's ideas in Understanding Media (1964). Does Manovich challenge the idea of software not being a medium? In the process of my analysis, I draw on McLuhan's theories in a wider context of his general work, the focus, however, lies upon the background of the "the medium is the message". My aim is to test Manovich's theories in saying that software is such a pioneering medium which is so different from all previous media that McLuhan's theory of the medium being the message needs to be rethought. Software is an influencing and powerful technology that dominates and revolutionizes the contemporary cultural landscape. However, I argue, it could still be regarded within the framework suggested by McLuhan in the 1960s, and any claim that software is a different form of media, such as for example in the works of Lev Manovich, are overestimated. The paper offers a perspective on how past concepts around media can be applied to and interpreted in contemporary media.

Keywords

Digital media; software; media philosophy; digital humanities; media theory; new media

БЕЗМОЛВНЫЙ ПОСРЕДНИК: КАЧЕСТВЕННОЕ ПРИМЕНЕНИЕ ТЕОРИЙ МАРШАЛЛА МАКЛЮЭНА К ПРОГРАММНОМУ ОБЕСПЕЧЕНИЮ

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Аннотация

Программное обеспечение доминирует в современном обществе, но ему не уделяется должного внимания как чрезвычайно влиятельному средству массовой информации (Manovich, 2013). В данной статье анализируется программное обеспечение в контексте заявления Маршалла Маклюэна "the medium is the message" (медиа – это послание) (1964, с. 7). Автор исследует и подвергает сомнению утверждение Льва Мановича о том, что "программное обеспечение - это послание", которое он намеревался использовать для уточнения идей Маклюэна в "Понимание медиа" (1964). Ставит ли Манович под сомнение идею о том, что программное обеспечение не является носителем информации? В процессе своего анализа автор опирается на теории Маклюэна в более широком контексте, однако фокус, тем не менее, лежит в тезисе "медиа - это послание". Цель работы – опробовать теории Мановича, заявив, что программное обеспечение является новаторским медиа, которое настолько отличается от всех предыдущих СМИ, что теория Маклюэна нуждается в переосмыслении. Программное обеспечение - это влиятельная и мощная технология, которая доминирует и изменяет современный культурный ландшафт. Однако, автор утверждает, что его все еще можно рассматривать в рамках, предложенных Маклюэном в 1960-х годах, и любое утверждение, что программное обеспечение является другой формой медиа, как, например, в работах Льва Мановича, переоценено. В статье представлен взгляд на то, как прошлые концепции медиа могут быть применены и интерпретированы в современных медиа.

Ключевые слова

Цифровые медиа; программное обеспечение; философия медиа; цифровые гуманитарные науки; теория медиа; новые медиа

INTRODUCTION

Text Content usually distracts from its medium which results in underestimating or not even noticing the medium's influence. Certainly, the content itself can wield influence, only to a certain extent, however. Content influences differently and dependently and sometimes, not at all. What definitely influences all of its audience or users is the technological environment that surrounds them. The effect this technological environment has on people became even more vast, caused by seemingly ubiquitous software that found an entry into all domains of culture, economy, and politics.

Quietly, software developed to be the core medium of the present point in time – without being given further notice (Manovich 2013, p. 4). This is one of the reasons software has become such an influential medium. Furthermore, software comes in many appearances, as it has numerous different functions and features. This greatly changed the way people interact with and perceive mass media. Most people around the globe interact with software every day (Kemp, 2019). They do so, without really questioning the technology that enables almost all of their media consumption. In fact, software has merged and replaced many media technologies, enabling a media convergence.

Philosopher and communications theorist Marshall McLuhan's theories on media revolve around the idea that it is the medium that affects people most. The content, however is incidental. Therefore, he reasons, it is the medium that is the message. This statement is framed by his conclusion that all media "[…] are extensions of the physical human body or the mind" (McLuhan and McLuhan, 1988, p. 93). In the following, these ideas will be applied to the contemporary concept and position of software.

Although the computer was already in use as a utilitarian tool throughout the twentieth century, McLuhan did not consider it within his work around media as much as the TV or newspaper, for instance. This is simply, because the computer as such was not a mass medium at that time. Throughout McLuhan's lifetime, it was solely used by small groups of mostly scientists. It was just shortly after his decease in 1980 that the computer advanced to become a personal tool for the regular person. With the introduction of the computer as a personal device in the 80s, software evolved to become a mass medium for a variety of purposes and therefore having a vast effect on its users.

Intangible technologies other than digital software were also mentioned by McLuhan. He pointed out several intangible technologies, "such as theories or laws of science, philosophical systems, remedies or even the diseases in medicine, forms or styles in painting or poetry or

drama or music, and so on" (McLuhan and McLuhan, 1988, p. 3). Essentially, any tool or concept one cannot feel or smell. These however, were until the 19th century exclusively stored and memorised in people's minds and in written form. Today, a limitless amount of files can be stored digitally and made accessible, because of software.

In his mini article, *The Software is the Message* (2013) Manovich challenged McLuhan's theories in *Understanding Media* (1964) and how they must be updated to be applied to software as contemporary mass medium:

> *[…] its [sic] time to update Understanding Media. It is no longer the medium that is the message today. Instead, the software is the message. And continuously expanding what humans can express and how they can communicate is now our "content"* (Manovich, 2013).

This paper will analyse Manovich's argument in context of McLuhan's statement "the medium is the message" (1964, p. 7) and his broader theories that formed and influenced this assumption.

Apart from software, this paper frequently uses the terms media, technology, and tools, which is why it is essential to clarify how they are defined here. To McLuhan the terms medium, technology, and even tool are somewhat synonymous, yet, he uses them distinctively and interchangeably, depending on the context. This paper goes with the interpretation of these terms as physical and mental extensions of humans, and consequently sees technologies and tools as media. Media are extensions of ourselves and thus, technologies and tools are subcategories of media. Mass media, such as newspapers, television, or social media platforms are to be understood differently than media as a term in general.

Software could be easily explained as a computer programme. However, software as a term, encompasses many different layers and subcategories itself. It is a medium, as described in the previous paragraph. This means, depending on how it is used and built, it can be a technology, a tool, or a mass medium. Here software is seen as an intangible medium that goes through various layers and domains. Therefore, it resembles McLuhan's concept of the electric technology.

> *The medium, or process of our time – electric technology – is reshaping and restructuring patterns of social interdependence and every aspect of our personal life. It is forcing us to reconsider and re-evaluate practically every thought, every action, and every institution formerly taken for granted […]* (McLuhan, 1967, p. 8).

Hence, software in general is the source of various formats arising from it. These can be seen as distinct software categories and the effect they bear. New mass media, like Facebook, Instagram, or YouTube, and their influence are results of software. Digital communication, enabled through messenger platforms, like WhatsApp or Viber are results of software. Online shopping, on-demand entertainment providers, or search engines are results of software. These examples serve very distinct purposes, yet, they are enabled by a single medium that is malleable and adaptable.

In the aforementioned context, this paper will analyse how appropriate Manovich's statement "Software is the Message" to an application of McLuhan's theories to software is. The objective is it to test Manovich's assumption about the difference of software to previous media and if it would be fit as an attempt to update McLuhan's theory of the medium being the message. In order to do this, it will be adhered to the two key scholars of this paper McLuhan and Manovich. Additionally, Matthew Fuller's book *Software Studies* (2008) serves as a lexicon for the technological background of software, and Douglas Rushkoff's *Program or be Programmed* (2010) offers a critical perspective of software's present-day use in society.

McLuhan's theories encounter the context of contemporary digital media with application to software as particular medium. Evidently, Manovich already started covering this ground to a degree. Now, this paper tests his thoughts on the topic and see whether and to what extent they are appropriate in context of McLuhan's understanding of media. Predominantly, however, an explanation on how McLuhan's concepts of media can successfully be applied to the software medium will be provided.

UNDERSTANDING MARSHALL MCLUHAN'S MEDIA

"Content couldn't matter less"

Marshall McLuhan's thought provoking theories around media technologies, and their impact on society and culture, are still discussed in application to media technologies that emerged long after his death in 1980. He died just at the edge of rising computerised media technologies for personal usage, which brought significant change to societies and made them reform around digital technology (Levinson, 1999, p. 1). Yet, it seems that McLuhan made many predictions about the media that are being used

today. Viewing media historically allowed him a more accurate prediction of what could occur in the future.

McLuhan did not include the computer as a medium a lot within his theories. This had the simple reason that during the time of his research it was a technology which was not used by the mass but rather by a selected group of people for professional purposes. He mostly looked at media and technologies that were in broader use and thus influenced whole societies (Manovich, 2013). The computer, however, was not a mass medium at that time.

According to McLuhan, it is not the content that affects and shapes people but the media themselves that are used to consume or create the content. This becomes clear throughout his statement "the medium is the message" (McLuhan, 1964, p. 7). Although content can have an extensive reach and influence varying to people, particularly via social media networks, it is the media technologies that shape the production, the dissemination, and the consumption of that content and thus how the consumer perceives it or interacts with it. Throughout a lecture recorded by ABC Radio National Network on 27 June 1979 in Australia, McLuhan answers a question regarding why it is the medium that is the message, in saying that the technologies which surround people physically and the effect of that technological environment on someone personally is vast, but that the effect of the content is incidental (mywebcowtube, 2011).

Applied to the contemporary media environment, his argument becomes quite clear, as the content is personalised, it is available on demand, and thus ubiquitous. Specifically, present-day mass media usage has become so diverse and filled with all sorts of content that it became a paradox of choice to choose how or what to consume. This shows that it is exclusively the technology that enables such a variety of diverse content for everyone to consume. Content of contemporary digital media is displayed uniquely to every user, because of different user behaviour and preferences. It is this data that generates the algorithms integrated into the software and enables such a targeted and individualised consumption display. The fact that online content is increasing and shifting at such a speed only proves how irrelevant it truly is. What does not diminish as content but continuously improve and therefore influence people tremendously are media technologies – and these have predominantly become software. Hence, by now content has become as redundant as ever.

As users have easy access to so much content, the amount of content users take in every single day on so many levels changed the content's value even more vastly. It is simply not possible to be influenced by each piece of content that is consumed. Therefore, it is taken for granted and

thus subsidiary. Everything of it can be replaced, copied, or modified. It is clear however, how everyday-life is continuously being adapted to the software medium on many different levels. It has always been this way with emerging technologies; "Societies have always been shaped more by the nature of the media by which men communicate than by the content of the communication" (McLuhan, 1967, p. 8).

John Culkin explains in his article *A Schoolman's Guide to Marshall McLuhan* (1967) that the medium is not something neutral, but it rather does something to people. He further points out that media shape people *and* content.

> *We shape our tools and thereafter they shape us. These extensions of our senses begin to interact with our senses. These media become a massage. The new change in the environment creates a new balance among the senses. No sense operates in isolation. The full sensorium seeks fulfilment in almost every sense experience. And since there is a limited quantum of energy available for any sensory experience, the sense-ratio will differ for different media* (Culkin, 1967, p. 70).

In application to digital media today, it can be said that it is the technology that enabled such a high degree of user interaction, or rather media concepts that operate by user interaction and therefore offer such a diversity in content.

Extensions

To fully understand what McLuhan meant by the medium being the message, it is necessary to reach back to early human-made tools and the physical human body itself. It is crucial to comprehend that media are all connected to our senses, as this is how we perceive the world. We do it exclusively via senses and this is why any extensions affect those senses. McLuhan argues that "The study of human media and technologies must begin with their humanity and remain steeped in the study of the senses. […] Any extension, whether of skin, hand, or foot, affects the whole psychic and social complex" (McLuhan and McLuhan, 1988, p. 4). By using tools, humanity started the continuous process of scientific and technological advance. This is because humankind created tools to enhance themselves, physically as well as mentally: "[…] all technologies are extensions of our physical and nervous systems to increase power and speed" (McLuhan, 1964, p. 90).

Tools enabled humans to reach areas and simply do things that their physical body would not suffice for. Tools also enabled developing more

tools for different purposes and these became more and more sophisticated. This process also applies to mental subjects. Media are built upon each other, each new one stems from its predecessor models. Certainly, did these tools not only affect humanity's environments, but to a considerable level, themselves. Tools are the reason cultures developed and therefore the reason for change and progression in civilisation over time.

All of man's artefacts – whether language, or laws, or ideas and hypothesis, or tools, or clothing, or computers – are extensions of the physical human body or the mind. Man the tool-making animal has long been engaged in existing one or another of his senses and faculties (McLuhan and McLuhan, 1988, p. 93).

At some point tools evolved to technologies and with growing progress, the pace of further advancement rapidly increased. With greater progress comes greater influence, meaning that more advanced technologies have an even more considerable impact on human culture and it is and will be further expanding.

When looking at social media platforms for instance, media do not only determine the way users interact with it and each other but also how we behave "offline", in order to find the best way to represent oneself "online". However, in many cases there is no true state of being offline anymore. Rather users find themselves in a constant situation of connectiveness to the Internet, to other people, and to other media.

[…] the space that the computer screen invites us to join is indeed everywhere, but unlike the space on the television screen, it is potentially of our own making – we create it and remake it by using it – just like the acoustic space of the pre-literate environment. Further, the notion of being in cyberspace is much less counter-intuitive than being in the acoustic space of television. We go from one place to another on the Web and we feel as if we are moving through that space – a sense we do not usually have when we are jumping from one television station to another (Levinson, 1999, p. 6).

The feeling of moving through the digital space that Levinson describes has also to do with the change of media usage and content creation of today's mass media. Digital social mass media technologies do not provide content anymore, but a platform for its users to generate content with which they constantly interact and through which they disseminate and increase this content. Therefore, a ubiquitous feeling of

connection is enabled, when using the software medium and all its resulting subcategories.

The fact that "[…] the key "media companies" of our time such as Google, Facebook, or Instagram do not create content [and] constantly refine and expand their software tools used by hundreds of millions of people to make content and to communicate" (Manovich, 2013) implies a change in business models. The users of these mass media are not the customers anymore, rather they serve as fuel in order to keep the software media machinery going. They do so in willingly providing personal data. The data in turn is sold to the real customers of this time: companies and corporation that seek to target users for advertising or even political purposes. Thus, these extensions, as other mass media before, are designed for propagandistic purposes – not to act in our favour: "News feeds are purposely designed to auto-refill with reasons to keep you scrolling, and purposely eliminate any reason for you to pause, reconsider or leave" (Harris, 2016). Digital mass media make themselves seem indispensable and give us the idea of a truly needed extension with questionable effects.

To McLuhan, the terms media and technology are to a greater or lesser extent synonyms and he defines them all as extensions of men. His understanding and definition of media being extensions of people's physical and mental selves is the core to all of his ideas. "[…] the wheel extends our feet, the phone extends our voice, television extends our eyes and ears, the computer extends our brain, and electronic media, in general, extend our central nervous system" (Bobbitt, 2011). McLuhan suggested that all extensions, no matter if integrated in our body or created artificially, affect "the whole psychic and social complex" (McLuhan, 1964, p. 19).

Although language itself, for instance, does not require any external tool, McLuhan considers it as a medium, a software one in fact, as it allows communication of ideas: "It is the extension of man in speech that enables the intellect to detach itself from the vastly wider reality. Without language […] human intelligence would have remained totally involved in the objects of its attention" (McLuhan, 1964, p. 79). Hence, language is the core medium that triggered the development of humanity in evolutionary terms. Most importantly, language was the medium that enabled culture, which in turn allowed an advance in building sophisticated media.

At the same time, McLuhan thought about the future of people's extensions and it could be considered that he predicted software and the internet in a way:

Rapidly, we approach the final phase of the extensions of man – the technological stimulation of consciousness, when the creative process of knowing will be collectively and corporately extended to the whole of human society, much as we have already extended our senses and our nerves by the various media. Whether the extension of consciousness, so long sought by advertisers for specific products, will be a 'good thing' is a question that admits a wide solution. There is little possibility of answering such questions about the extensions of man without considering all of them together (McLuhan, 1964, p. 19).

McLuhan even stresses the fact that within studying all aspects in media, in this case an ethical questions regarding the next step in extensions, it is crucial to consider all media, no matter their occurring time. All media are connected and contributed to the constant process of human advance. Douglas Rushkoff seemed to have picked up on this formulation, as regarding digital media technologies he wrote: "Just as words gave people the ability to pass on knowledge for what we now call civilization, networked activity could soon offer us access to shared thinking – an extension of consciousness still inconceivable to most of us today" (2010, p. 8). Therefore, McLuhan's mindset can be applied to future media scenarios, as it worked for his predictions, while talking about "the extensions of man" and the medium being the message.

LAWS OF SOFTWARE

Software and Hardware

Early software concepts are considered to have first arisen in the 19th century for a planned analytical engine, where the outline of a first piece of software was written by Ada Lovelace (Science Focus, 2018). The first theory about software, even prior to computers as we know them today, was proposed by Alan Turing in 1935. This set the starting point of computing and software engineering and studies. Subsequently, software developed to be a pioneering technology. However, other than most tools and technologies, its fundamental nature operates in the background, without most of its users truly understanding it, yet, being present in all aspects in society.

Software today is in use for a variety of purposes and enabled easier access to many domains for most people that are able to operate a computer.

When you write an article in Word, you are using software. When you are composing a blog post in Blogger or WordPress, you are using software. When you tweet, post messages on Facebook, search through billions of videos on YouTube, or read texts on Scribd, you are using software […] (Manovich, 2013).

Although it is involved within most structures in contemporary civilisation, it was a process and for it emerged as a process, permeating all of society, it expanded relatively unnoticed (Manovich, 2013). Quietly, one might say, software wields vast influence. Most users do not necessarily question the depth of the technology they are using for almost anything these days. There does not seem a need to interrupt this convenience that user-tailored software, created by corporations, offer.

Software alone, however, cannot function without other technological layers involved in order to access it. It operates through a range of technologies that influence and rely on one another to allow the user to access content. There are different stages that enable the connection to the digital space. The user connects to the content they want to access through different layers. These aiding layers include interfaces that may differ and are continuously updating. In Matthew Fuller's "lexicon" of Software Studies, Fuller and Florian Cramer define these interface layers as follows:

In computing, interfaces link software and hardware to each other and to their human users or other sources of data. A typology of interfaces thus reads:
1. hardware that connects users to hardware; typically input / output devices such as keyboards or sensors, and feedback devices such as screens or loudspeakers;
2. hardware that connects hardware to hardware; such as network interconnection points and bus systems;
3. software, or hardware-embedded logic, that connects hardware to software; the instruction set of a processor or device drivers, for example;
4. specifications and protocols that determine relations between software and software, that is, application programming interfaces (APIs);
5. symbolic handles, which, in conjunction with (a), make software accessible to users; that is, "user interfaces," often mistaken in media studies for "interface" as a whole. (2008, p. 149)

The regular user usually attends to the input / output devices, as described by Fuller and Cramer, and the application software, that can also be called end user programmes. Generally, application software may be defined as any programme designed for the end user. These programmes can range from word processors to web browsers. Application software being a subset of software, again contains a number of categories (Manovich, 2013, pp. 5-6).

In *Software Takes Command* (2013), Manovich named one subcategory of application software, most relevant to mass media usage for regular people, "media software". According to him, media software is software that is used for creating and interacting with media objects and environments. (2013, p. 26) Examples of media software include programmes like "Word, PowerPoint, Photoshop, Illustrator, After Effects, Final Cut, Firefox, Blogger, WordPress, Google Earth, Maya, and 3ds Max" (2013, p. 2). Thus, essentially, he describes programmes as media software "that enable creation, publishing, sharing, and remixing of images, moving image sequences, 3D designs, texts, maps, and interactive elements, as well as various combinations of these elements such as websites, interactive applications, motion graphics, virtual globes, and so on" (2018, p. 2). This includes software applications that provide access to media content, like web browsers, email and chat programmes, or other news, information, and entertainment apps. It is the application software that the user contacts directly but not the only software that affects its users. The underlying binary code, which is not visible to the user, is the trigger for all digital influence on society.

There is a shift in importance of tangible to intangible technologies. Certainly, there can be some kind of personal affiliation to personal devices, like smartphones or laptops, hardware, however, is replaceable and therefore circumstantial. Nevertheless, it is not expendable, for hardware is needed to access digital files physically, and is involved in the aforementioned process of layers to make software operate. But, it does not come down to individual hardware devices. Almost any computational hardware device can be used to access nearly any software by now.

It is predominantly the concept of software that has brought change to culture, media consumption, and many more cultural and economic spheres.

Outside of certain cultural areas such as crafts and fine art, software has replaced a diverse array of physical, mechanical, and electronic technologies used before the twenty-first century to create, store,

distribute and access cultural artefacts, and communicate with other people (Manovich, 2013).

This indicates that there is no risk about almost any of these cultural artefacts getting lost anymore, for any digital file can be saved, stored, and made available in form of 1s and 0s. Binary code determines the current state of the world and certainly this has a reasonable effect on culture.

McLuhan views intangible and tangible technology as equal, as to him they seem to contribute essentially as extensions that constitute humans.

It makes no difference whatever whether one considers as artefacts or as media things of a tangible 'hardware' nature such as bowls and clubs or forks and spoons, or tools and devices and engines, railways, spacecraft, radios, computers, and so on; or things of a 'software' nature such as theories or laws of science, philosophical systems, remedies or even the diseases in medicine, forms or styles in painting or poetry or drama or music, and so on. All are equally artefacts, all equally human, all equally susceptible to analysis, all equally verbal in structure (McLuhan and McLuhan, 1988, p. 3).

However, software is neither of these examples. It has become more of a media entity and driving power that enabled several sub technologies in itself, which are highly adaptable and make societies form around them. Software as a medium can thus be seen as very similar to how McLuhan described the electric technology.

Manovich, however, sees software as a new dimension that was added to culture:

Another term that we can use in thinking about software is that of a dimension (think of three dimensions that we use to define space). We can say that at the end of the twentieth century humans have added a fundamentally new dimension to everything that counts as culture – that of software (Manovich, 2013).

This is a valid contention, but this is not the first time a medium exerted such an influence on society. It happened several times before and is part of the overall process of human advance. Examples include speech and language, writing, print, and electricity.

"Software is the Message"

In his mini article for the software studies initiative, Lev Manovich describes how software has affected culture and changes the way mass media work. The content of the article stems mainly from his book, *Software takes Command* (2013). Fundamentally, he claims that, because software is unlike any previous media, McLuhan's ideas on media need to be rethought and that

> *[…] its [sic] time to update Understanding Media. It is no longer the medium that is the message today. Instead, the software is the message. And continuously expanding what humans can express and how they can communicate is now our "content"* (Manovich, 2013).

Manovich starts the article with stating McLuhan's lack of consideration of the computer as a medium. He argues that McLuhan did not include computers as heavily in his theories as other mass media, like the television or newspaper, for during McLuhan's time, the computer was not a mass medium. Hence, Manovich claims that McLuhan's thinking, despite his awareness of computers existing, was not influenced by it as a medium. However, it is necessary to stress here, and Manovich did not mention this, that McLuhan did not consider mass media as media exclusively. To him the definition of what a medium is, is synonymous to technology and tool, no matter if of hardware nature or software nature (McLuhan and McLuhan, 1988, p. 3). Furthermore, McLuhan viewed media or technologies in their context, and describes how it is the environment that impacts people's perception and understanding of that medium (Bobbitt, 2011). Although, he did not only view mass media exclusively, the computer was not as mentionable to him, for it was not widely in use. Thus, it did not have the effect it reached decades later on the masses.

Manovich introduces software as the new main media form of our time that emerged since the invention of the PC, as it "replaced a diverse array of physical, mechanical, and electronic technologies used before the twenty-first century to create, store, distribute and access cultural artifacts, and communicate with other people" (2013). For this statement, he provides several examples of scenarios in which the regular person is using software in everyday life. He specifically discusses the software category referred to as "web applications" or "webware", so basically any software that can be accessed by web browsers. Manovich is concentrating on software, designed for the end user in general, which is application

software. Application software has several subcategories, and in his writings Manovich describes the part of application software he is setting his focus on as "media software". This includes software for mass media consumption, as well as media production.

He then gets back to McLuhan and describes how software, just as the new media at McLuhan's time, needed time to develop and mature to the dominating point it is by now. Here he draws on different functions the software technology bears and how these influence our behaviour, the content, and how we generate and interact with this content. Manovich reasons here that "McLuhan's theories cover the key "new media" of his time […]" (2013), which is not the case. McLuhan refers to new media at his time, but he also does so to previous forms of media. Furthermore, the core of McLuhan's theories around media is the consideration of media development in a historical concept.

To Manovich, software even reached the point of being "the interface to our imagination and the world" (Manovich, 2013). He continues that it is a "universal language" that makes communication over the entire globe possible, and he even speaks of it as a "universal engine" which drives the world and leads it to function. This reminds of McLuhan's concept of the "global village" which is considered to be a prediction of the internet, and the Internet is one of the results of software.

Manovich introduces the idea that software can be thought of as a dimension, with the consideration of thinking of three dimensions that are used to define space. He argues that "[…] at the end of the twentieth century humans have added a fundamentally new dimension to everything that counts as culture — that of software" (Manovich, 2013). Manovich speaks of a "cultural software" that is not merely a new object "dropped into the space which we call "culture"." He further points out that viewing only the "culture of software", as in values, practices and ideologies of software companies and developers, leads to overlooking the actual importance of software:

Like the alphabet, mathematics, printing press, combustion engine, electricity, and integrated circuits, software re-adjusts and re-shapes everything it is applied to—or at least, it has a potential to do this (Manovich, 2013).

In giving this explanation, Manovich expresses the argument that by "adding" software to a culture and adding the new dimension software brings, it changes "the identity of everything that a culture is made from" (Manovich, 2013). This resembles McLuhan's idea on how electric

technology re-shaped and re-structured all aspects in society and people's personal lives (McLuhan, 1967, p. 8).

Manovich further points out himself how software relates to McLuhan's work:

In this respect, software is a perfect example of what McLuhan meant when he wrote that the "message of any medium or technology is the change of scale or pace or pattern that it introduces into human affairs" (Manovich, 2013).

Now, pointing it out in this way just presents how software is actually not that different from other media in human history. Every medium influenced culture and humanity in general to a certain extent. Although most media might not have been as influential as software, it still stems from predecessor media. Software is yet another augmentation to the process of all media that are equally connected and all took part in influencing culture and bringing change. Culture is changing constantly, with the technological environment changing.

Naturally, Manovich has his reasons for providing this argument. He argues that the advance and "current hegemony of software" (2013) do not flawlessly exemplify McLuhan's ideas bur rather test them. In giving these reasons for this claim he goes back to the roots of software writing and argues that Ted Nelson and Alan Kay were already proposing in the 1960s that computers had the possibility to become a cultural medium. Following their example, he explains that designers produce programming technologies and users of these invent new media whilst using the technologies. Manovich explains that Kay named "[…] computers the first metamedium whose content is "a wide range of already-existing and not-yet-invented media."" (2013)

Manovich states that this thinking has had vast influence on how the software as a medium works at present time. This is because once computers were commonly used, accessible to a variety of people, creatives started to rather develop new structures and techniques in form of programmes instead of generating content by using existing tools: "During the 2000, extending the computer metamedium by writing new software, plugins, programming libraries and other tools became the new cutting-edge type of cultural activity" (Manovich, 2013). He names examples for open source software sharing platforms, like GitHub, and explains that producing new software is essential for fields like digital humanities or software art. He leaves out the fact, however, that writing software is not something everyone just simply does. Most people who use software in any

way are people that do not know anything about programming and buy, literally as well as metaphorically, software that is modified in a certain way to make it more "user-friendly". This enables the companies that sell software to integrate their bias. Therefore, they make a massive impact on to how people use the software and determine what they have to give for it, like private personal data.

Following this, Manovich stresses the fact that key player media companies (such as Google or Facebook) do not create content anymore but rather provide platforms for users to generate content. Their success comes from continuously improving their software to enable an environment for users to constantly communicate and share content, he argues. He also does not include how this still comes at a cost. In previous mass media eras, the audience always had to pay, so naturally there has to be a way with new mass media to make profit. There is not much literal payment coming from the users anymore, which makes the media "freely" accessible. The difference to other mass media forms is that the form of payment has changed and the role the masses play in these media.

Subsequently, it is the change of content creation that makes Manovich assume McLuhan's ideas need to be rethought and "updated". To Manovich, software is the message instead of the medium, as it reached a "new dimension" and increasingly advances in providing a space for humans to express themselves and to communicate with each other. This, he asserts, "is now our "content"" and this is why he argues *Understanding Media* needs to be modernised.

THE MEDIUM IS QUIET

The Software Era

Software enables new forms of media consumption, and this massively impacts users' behaviour inside, as well as outside of the digital space. It does differ vastly from media prior to software and the computer in general. However, it is not the first time a media revolution happened. The current one has much more influence than previous ones, but this is part of the process that is found in all media and technology historically. Technological change happens, and the effect, influence, and usage of media increases. Nevertheless, this does not mean that McLuhan's ways of thinking have become obsolete.

[…] we have undergone such profound shifts before. […] In the long run, each media technology offers people an entirely new perspective through which to relate to their world. Language led to shared

learning, cumulative experience, and the possibility for progress. The alphabet led to accountability, abstract thinking, monotheism, and contractual law. The printing press and private reading led to a new experience of individuality, a personal relationship to God, the Protestant Reformation, human rights, and the Enlightenment. With the advent of a new medium, the status quo not only comes under scrutiny; it is revised and rewritten by those who have gained new access to the tools of its creation (Rushkoff, 2010, p. 12).

Every revolutionary medium brings something new and this is how it always has been. There is obviously a change and the fact of it being *new*; McLuhan looked at these shifts that media brought upon society in general. Thus, his theories can be applied to any technology after his time:

Societies have always been shaped more by the nature of the media by which men communicate than by the content of the communication. […] The alphabet and print technology fostered and encouraged unification and involvement. It is impossible to understand social and cultural changes without a knowledge of the workings of media (McLuhan, 1967, p. 8).

As it has also always been with influential media, a selected group of people wields most influence over the medium. Although it might have taken them a few years to find out how to exploit this medium properly, and use it in an influencing and propagandistic way. The way of controlling this medium however, changed with what the technology enabled it to do. This might be one reason for why it was able to get into its users' minds and other aspects in society so unobtrusively. The way Manovich presents software in his article, seems opposing to the idea of mass media's power, the way it used to be. Almost all mass media are influential, propagandistic, and biased, based on those who distribute it. Manovich stresses the fact that it is the user now that generates the content, in producing, sharing, and communicating over software because this technology allows it. It is in fact true, however, that does not mean that users can move freely throughout the software era without being influenced by a group of people that actually exerts power over this medium. There might have been a small window when software seemed a "free" medium in a sense, especially, when people still had to write software themselves, while using computers.

With the introduction of the PC however, corporations needed to find a way to make computers accessible and usable to more people than only those who knew how to programme. First of all, they produced smaller

computers and secondly, they hired people to write operation system software that could be used by people without programming knowledge. This perceptibly evolved and more and more computer programmes arose from operating system software. Operating systems facilitate many things for their users, but it also limits them to access the full potential of software. Rushkoff (2010) argues that the actual property of the current media era is programming, but that most users do not know how to do it and thus do not use the entire capability of this era.

> *We simply use the programs that have been made for us, and enter our text in the appropriate box on the screen. We teach kids how to use software to write, but not how to write software. This means they have access to the capabilities given to them by others, but not the power to determine the value-creating capabilities of these technologies for themselves* (Rushkoff, 2010, p. 13).

This thinking defies Manovich's idea of software, to some extent. His claim that software enables people to create and share media, as well as communicate to one another, is true. Yet, he does not state the fact that users are limited by what software producers create for them, and how this includes the creator's bias. In fact, it is yet another medium that is controlled by a certain group of people that might not even reveal the entire impact of it. Users do create the content of contemporary media but they are marionettes of corporations in a new design, as most users do not actually know much about the technology they are using.

Because software introduces a new model of media production, and is so hidden in layers of other technologies, it evolved unnoticed, yet persuasively. Quietly, it influences its users, because it convinces them of them having control over the medium. At the same time, it makes the users as vulnerable as ever. It already became clear what data collection through software does to our privacy and in the instance of Cambridge Analytica and Facebook it is already shown that this has a tremendous political impact. Nonetheless, people have given and still do give their personal data away so willingly. It mainly enables a higher level of convenience that is mostly, if one actually thinks about it, entirely unnecessary.

The way contemporary business models function has changed vastly through software. It is not its audience that is the customers anymore, rather the audience provides the propellant software runs on, as users continue to feed it with data, valuable personal data. Even if people realise this, by now, it is too late to annul it. As McLuhan described, we build our societies around media and the restructuring and reshaping of software is

already too deeply ingrained in society. This new business model needs people to create content that they share in order to get their private data and it does its best to keep its users in doing so. This does not only apply to social media platforms but to all application software, for it is exclusively interactive.

This however, was not always the case. When new digital media were in process, it took capitalism some time to shape this model to be as beneficial for corporations as it can be.

Early computers were built by hackers, whose own biases ended up being embedded in their technologies. Computers naturally encouraged a hacker's approach to media and technology. They made people less interested in buying media and a bit more interested in making and breaking it. They also turned people's attention away from sponsored shows and toward communicating and sharing with one another. The problem that all this communicating and sharing was bad for business (Rushkoff, 2010, pp. 134-135).

Hence, more complex interfaces were created and a transparent medium started becoming a cryptical one. Hardware companies employed companies that created software for them to make their operating systems more "supposedly "user friendly" while the real workings of the machine got buried further in the background" (Ruskoff, 2010, p. 135). This is how Microsoft started becoming extremely successful and valuable as a business, for instance.

By now, all people using a computer do so via operating systems and software programmes that stem from these, but most of the users do not know how to write the software, only how to use what is shown to them and what is produced for them. It was chosen what is and is not allowed in using software and corporations are simply being trusted. In fact, this limits the user and societies in general tremendously. There is much more that could be done with software, if the regular user knew more about programming it. Usually what is embedded in the software cannot even be accessed. Rather, the users are being instructed on where their limits of usage are in software.

We remain unaware of the biases of the programs in which we are participating, as well as the ways they circumscribe our newfound authorship within their predetermined agendas. [...] we are now capable of some active participation, but we may as well be sending text messages to the producers of a TV talent show, telling them which

of their ten contestants we think sings the best. Such are the limits of our interactivity when the ways in which we are allowed to interact have been programmed for us in advance (Rushkoff, 2010, p. 140).

Predominantly, the regular user does not actually make a noticeable difference or impact with content production. Software however, has a massive impact on society and it bears the instructions corporations are giving people, without them actually noticing.

Software's Reshaping and Restructuring

Another powerful shift, which influencing technologies wield, is the restructuring and reshaping of the environment. From the point where it starts and some changes are being made, this process goes on continuously, adapting the environment to the medium, "For the "message" of any medium or technology is the change of scale or pace or pattern that it introduces into human affairs" (McLuhan, 1964, p. 8). This can be seen in how places are shaped around power-outlets and Wi-Fi-availability, for instance. McLuhan already described this phenomenon with the introduction of the railway.

The railway did not introduce movement or transportation or wheel or road into human society, but it accelerated and enlarged the scale of previous human functions, creating totally new kinds of cities and new kinds of work and leisure. This happened whether the railway functioned in a tropical or northern environment, and is quite independent of the freight or content of the railway medium (1964, p. 8).

Because of software, environments are generally being made to be more interactive. In many cases, it does not seem necessary anymore to have people take on professions that can be easily replaced by software, which all members of society are capable of operating. This can be seen happening in fast food franchises, luggage check ins at airports, ticket machines, self-checkouts at supermarkets, and many more instances. This kind of automation is happening as a result of software.

It is software that changed the way mass media work at present time, and these mass media concepts have always changed and will change continuously. In the wake of the Internet, resulting in the Web 2.0, and framed by software technology, a whole new consumption pattern was introduced not only to mass media, but to the workings of all businesses: user interaction and active participation with the content. It has further

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found its way into all spheres of society, making environments digitally interactive. Thus, software, being involved in all sorts of other domains, integrates its way of workings to all those areas:

> *[...] if we want to understand contemporary techniques of control, communication, representation, simulation, analysis, decision-making, memory, vision, writing, and interaction, our analysis cannot be complete until we consider this software layer. Which means that all disciplines which deal with contemporary society and culture—architecture, design, art criticism, sociology, political science, art history, media studies, science and technology studies, and all others—need to account for the role of software and its effects in whatever subjects they investigate* (Manovich, 2013, p. 15).

Software is connecting these previously distinct fields and makes them more easily accessible within a society to interact with.

For software is too entangled in social and economic structures, it has become a vital part of the overall system. Without it, these structures will not be able to operate anymore and it would evoke chaos in a civilised society.

> *If we were to turn off the computers that manage these networks, the complexity of the modern world would come crashing in some cases, quite literally, to an abrupt halt. And yet, this is not the whole story, for each of the computers and technologies is actually mediating its own relationship with the world through the panoply of software. These computers run software that is spun like webs, invisibly around us, organising, controlling, monitoring and processing.* (Berry, 2011, p. 3)

McLuhan's argument about the content being incidental becomes very clear, when viewing the changes software made to people and their surroundings. It would be easy to assume that the content people consume and interact with everyday today affects them significantly. However, it is the medium, the software that affects people most significantly and by now, it has become indispensable.

CONCLUSION

Software is a revolutionary medium that restructured and reshaped whole societies as well as its individual users. It therefore, also changed the way that people use mass media and technologies. Yet, Manovich's claim

that "Software is the Message" (2013) is according to this analysis, a misinterpretation of McLuhan's statement "the medium is the message" (1964). Manovich suggests that, because the content is now created by its users, *Understanding Media* needs to be updated. The audience generating the content does not imply that the meanings of McLuhan's ideas have changed. Software could even be considered as the medium that McLuhan described futuristically as an extension of people's consciousness, for it definitely is an extension of the mind.

Manovich reasons that the software is the message now, as it massively changed the way media consumption works. Software as a medium enables its users to create and interact with content themselves. What McLuhan meant by "the medium is the message" is that it is the medium behind the content that carries the actual message in influencing people entirely and not the content itself. It is true that now the users create the content and thus have more impact on what they are creating, which leads to more diversity in mass media content. However, it is still very apparent how influencing the media behind this are. Software, as well as other layers of media technology, like the hardware, affect people tremendously in the way they create and perceive content. What also affects people is the fact that the content is not (necessarily or solely) created by corporations and this gives the audience many different perspectives. Software has thus changed and impacted culture, economy, and politics.

Manovich concludes that the computer as a medium did not influence McLuhan's mindset; "[…] his awareness of computers did not have significant effect on his thinking" (Manovich, 2013). McLuhan did not consider the computer as much as other influential mass media at his time, for it was not a mass medium and did not nearly have the influence that it wields today. However, McLuhan always looked at media in context of time and environment. Thus, a medium did not affect his thinking without any other factors, as a medium only. It is problematic to categorise McLuhan's thoughts in a linear way, as they all require individual judgement. He did not talk about medium by medium and how each of those affected him or the audience specifically. Rather, he was talking about media as a whole and how these shape a society. "McLuhan's theories rest on the universal affectivity of technology on man, not just in particular instances" (Friesner, 2005). Most importantly, he considered media historically in terms of their emergence, not exclusively the modern ones of his time. In other words, McLuhan was looking at the bigger picture and his thoughts can therefore be applied to all technologies and media being and those that are coming.

Media are constantly changing and with them culture changes. Software is a result of a perpetual state of change. Hence, software is a result of previous media and further underlying technologies. Software is yet another layer to the process of all technology, tools, and media that are equally connected and all take part in influencing culture and thus bringing change. Previous media stay, as they are what following media consist of and stem from, like the electric technology, that McLuhan presented as a highly impactful medium. As other revolutionary media, it is still integrated in civilisation and clearly an essential ingredient of society. All media build upon each other and contribute to the continuing process of technological advance. Software emerged as a result of electricity. It is a very influential and revolutionary technology but so where many media before, and McLuhan built his argument around media in a greater context, being aware of what media revolutions have brought before. He was not merely looking at contemporary media technologies of his time, but also at the development of tools historically. This is why his arguments can still be applied to software today and media that are to come. Within this ongoing process, extensions will never fail to affect humanity vastly. This is also what McLuhan understood several decades ago.

The new media era that brought digital tools, is in terms of its effect on culture, principally no different to other eras in history. It is more advanced and thus brought more change in general, but that is part of the advancement due to technology as a whole. Using fire as a tool was the first big step towards advance, as was language. Following this, revolutionary tools have always come up, such as in the invention of the wheel, advancements in weaponry, the first industrial revolution, the second industrial revolution that involved electricity, and currently it is software that runs through all domains in society. New tools will bring the next media revolution and it will be even vaster in its effect. This medium will be built on the previous and existing ones, and thus continue the process of technological progress.

Social media platforms have received quite a lot of attention as a radical form of mass media. They are entirely different in terms of content production to every form of media that have existed before. But they are merely a result of the software medium. Software merged various mass media channels and brought connectivity between all kinds of computer programmes. The striking difference to old forms of media is that, because of software, various products became ubiquitously accessible and connected digitally. Software brought digital interaction to all domains in cultural products:

[…] all social, economic, and cultural systems of modern society—run on software. Software is the invisible glue that ties it all together. While various systems of modern society speak in different languages and have different goals, they all share the syntaxes of software […] (Manovich, 2013, p. 8).

The way Manovich portrays software, it seems, gives its users control over the media. This is not the case at all. The overall model of a small group of people being in control of mass media has not changed – on the contrary, it has refined. The content people create is just the catalyst for contemporary digital media to function. Regular people are marionettes of big corporations and this is something that has not changed in regards to mass media of McLuhan's time. It does not matter whether McLuhan was influenced by computers as mass medium or not, for he was not only viewing mass media of his time, but thought about media in the wider context of all tools and technologies in history. Societies have always formed and still form around media.

All media work us over completely. They are so pervasive in their personal, political, economic, aesthetic, psychological, moral, ethical, and social consequences that they leave no part of us untouched, unaffected, unaltered. The medium is the massage. Any understanding of social and cultural change is impossible without a knowledge of the way media work as environments (McLuhan, 1967, p. 26).

Therefore, software can be applied to McLuhan's ideas about the medium being the message. McLuhan was not looking at particular mass media of his time, he viewed tools, technologies, and media historically and generally. Therefore, no matter the development in technology, the idea of the medium being the message and extensions of ourselves can be applied to them all.

The way that businesses operate new forms of media is another indicator for a systematic repetition in history. How media function, always involved biases that were integrated in, but also hidden behind the content. Because media change, however, the way that people perceive this changes, as well. The content of software is the usage and interaction of it by its users, not the content that the users create. Thus, the way that the medium affects and shapes people and societies, has not changed and will not change. McLuhan's idea of the medium being the message is applicable to all media; those in the past, at present, and in the future. Throughout the overall process of media advance, software reinforced another medium that

has, as a concept, been existing for longer than one can think, yet, obtaining its most powerful artificial form through software. This medium is the algorithm. As software it is already present as well as vastly influential. Furthermore, it is very likely to dominate the next media era, that has already begun developing, quietly.

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