The Cultural Machine

The rendition of the and the virtual

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Abstract

The increasing possibilities of the ubiquitous world of the (internet of things) IoT, will not only be installed in our environment but also be attached to the human body. Generating services in which the participant has become as connective to its surrounding as the devices installed to serve them. Thereby expanding the reliance on the rapidly developing algorithms to advise and even control, human's daily lives, also known as algorithmic governmentality.

This new agency, that is participating/governing (in) present days ecologies, require a certain input in the form of data. Which depending on the agency's responsibilities and services could exist out of personal data, generating and the whole scale of technical, practical, social and ethical challenges. As these developments transition from the 'realm of artefacts' into the 'realm of architecture', it becomes the responsibility of the architect/spatial designer how to deal with this apparatus and the associated challenges. Unfortunately, the adaptation of these artefacts are predominantly focused on the optimization of efficiency, cost and sustainability, thereby ignoring the socio-spatial matters of architecture in terms of interactions between its inhabitants.

Prologue

Since the adaptation of humanity´s first versions of the artefact to survive the harsh and inhuman conditions of prehistoric times, man has transformed itself into a new species (Colomina & Wigley,2016).Mankind became a hybrid species, of an organic body with synthetic enhancements to compensate for their natural-physical shortcomings, thereby gradually becoming the predominant species of this planet (Picon, 2004; Ratti, 2015). This interwovenness of the artefact and their human adaptors conceived a symbiotic relationship of evolution.Each innovation of a new artefact would develop new conducts related to handling the implications and gradually evolving man, into whole new cultures and even species(Colomina & Wigley,2016).From this perspective inventors and designers gained an important role in society, they were indirectly reinventing humanity itself(Colomina & Wigley,2016). This evolution of mankind by designing artefacts to compensate for their physical limitations eventually transcended into the desires to extend their mental and social capacities. (Ratti, 2013) Thereby introducing the computational and digital modifications of artefacts. From the first computers supporting humanity in their conquest in analysing and recording all kinds of observation in this world. All the way up to an interwoven network of intelligent ubiquitous devices communicating with humanity and tracking any agencies, fluxes and movements. (Towsend, 2013)

Every action of a person made on the digital web left a trace of their existence behind. Each photo uploaded on any digital services created their own reality from their memories. Where this access to our digital lives used to be a stationary point, mainly through a desktop. With the development of digital mobile devices, a whole range of new capabilities to generate these 'digital pheromones' of human lives have become possible. (Ratti, 2013;Towsend, 2013) However, the resources and services that have made all this interconnectedness possible, have begun to show their liabilities and alternative implications. All these devices have transcended human life into a virtual version of itself, thereby leaving a digital trail of data for anyone to acquire and analyse. (Manovich, 2018) This generated digital data have become highly valuable and commercially profitable for any institution or service provider. (Lupton, 2016) As these services have been able to manufacture, personalised and optimised services to satisfy the everchanging needs and desires of current society. Unfortunately recent events -Cambridge Analytica and Facebook- have revealed that certain entities have abused these digital trails of social- networks and identities for political and cultural gain. (Schnädelbach& Kirk,2019) With the position of translator and communicator, these platforms granted themself a powerful position of corrupting any kind of translation into their own biases. Thereby being able to fabricate the entire nation's population into new cultural, political and social

convictions. (Doyle, Savíc, Bühlmann,2019) These events of ‘corrupted’ digital enhanced services have encouraged humanity to become more aware of their fabricated digital traces and convinced intergovernmental institutions to conceive data protection rights to grant the public control of their own personal data. (Manovich, 2018) Unfortunately, mankind will always perceive information subjectively out of the matter of abstraction, so even the most genuine/honourable will corrupt the observations. Full objectivity is perceived to be possible with the implication of the gradually more intelligent digital machines.(Carpo,2017) These machines are also known as algorithms are desired by man to be preform as ultimate tools to eradicate any human responsibility and friction from their lives. (Colomina & Wigley,2016 This externalisation of mankind’s bidding towards to machine will fabricate more homogenous cultures and conducts and eventually eradicate humanity’s purpose in this world. (Rouvroy,2016)

These events also reflect upon the realm of architecture. Since the possibilities of the technological advancements of the digital artefact have transcended to the realm of architecture. (Schnädelbach& Kirk,2019) Buildings have become gradually more interactive and adaptable to the desires and requirements of the human inhabitant (Colomina & Wigley,2016). Together with the datafication of society have caused a transition from facilitating activities in assigned location to more ambiguous spaces (Colomina & Wigley,2016). Unfortunately, the social significance of the interactive built environment and the digital artefacts adaptations are currently been looked over by architects. As through the adaptation of personal data these new services will communicate and even govern human inhabitants. Thereby conceiving a whole scale of technical, practical, social and ethical challenges. (Schnädelbach& Kirk,2019)

Knowledge, Information, Data

As the ubiquitous world scales and spread towards architecture and the built environment, data becomes more relevant and nuanced in architectural design than ever before. Digital data is becoming a predominant factor in many disciplines of science, politics and design. (Doyle, Savíc, Bühlmann,2019) Eventually also transferring into architectural design and policy-making of the built environment. However to adopt data as a design tool, one needs to understand how to handle the tool. Like carpenter has to understand how to handle a hammer, so will a designer that tries to handle data. (Bridle, 2019) Considering data is a very complex tool in comparison to any other technology, with many stakeholders and components to rely upon, and people's ignorance of the term data being either something ubiquitous or physical personal information. it will take more than just a simple description to understand the nuances of this novel tool in architecture.

There is a common misconception that data is a synonym of information, as a matter of fact, information is entropic, (Doyle, Savíc, Bühlmann,2019) it is 'produced knowledge', simplified and brought in to context, making it bias, as it has been processed and opinionated by subjective, politically and culturally charged findings retrieved from analysing data (Milan,S.2018;Kneidinger-Müller,2019) While data in its rawest form is decontextualized, it lacks meaning, it is unprocessed and ciphered as it entropic of origin, (Doyle, Savíc, Bühlmann,2019) as it is a collection of findings. Since the existence of civilised societies, mankind has gathered and analysed data. In ancient Egypt, they administrated resources, acreage and property for taxation. (Kitchin, Lauriet,2014) Classical philosophers as Aristotle started with early versions of taxonomies to divide all things/names into categories. (Carpo,2017) Over the centuries the data became more essential to society for governance, science and commerce. (Kitchin, Lauriet,2014) With eventually the philosophy of the Enlightenment being a large contributor to the value of data, as more knowledge /more information leads to better decisions. (Bridle,2019) Even though how precise the data had become, the observations were still handicapped by the human apparatus – the mind-. Because recording it manually will still rely on the subjectivity and precision of the operator's intentions and capabilities. As a mere human will still fail to comprehend the vast scale of information a device could handle. The first mechanical /digital devices were able to support mankind in recording more nuanced and larger observations. (Carpo,2017) The analysations of the operator were still limited by its human biases of thinking. As all the information sill had to be compressed and uncluttered for a human to comprehend. Thereby the implications of logarithms, encryptions and cyphers will compress and encode the observations.) And branched taxonomies or catalogues will categories the compressed data incomprehensible structures. (Carpo,2017;Doyle, Savíc, Bühlmann,2019This method of thinking got transferred to the early digital records, as devices weren't able to save large quantities of data. Due to factors such as cost, resourcing and technical limitations. Digital data was produced in tightly controlled ways using sampling techniques. (Carpo,2017) With the exponential growth and development of the digital infrastructure data grown enormously over the past 50 years. (Kitchin,2014)

While the production of data used to be a costly endeavour. In the early 1990s, the introduction of the publicly accessible internet and platform services established a new culture and economy. (Kitchin,2014) One where anyone could be both creator and spectator of content and data. These platforms like social media and content providers rapidly increased the production of data. (Ratti,2015) With the digitalisation of the world also introduced sensors and other ubiquitous devices to keep track of even the smallest physical objects and events. This information, also known as the Internet of Things, will eventually outnumber the data created by humans (Townsend, 2013). Therefore mankind has come at a turning point in history, by doubling each year the amount of overall produced of data of the entire history of mankind. (Carpo,2017;Ratti,2015) This abundance of data made the methods and quantities of data production before the 90's refer to as "small" data and current methods and sizes of data as " big data". (Kitchin,2014)The definition of small data does

not only imply to the mere volume of the collected information, as small data can also still exist of large datasets, like nationwide censuses. (Kitchin, Lauriet,2014) Small data is intentionally produced by individuals and (small)organisations and exists out of fewer data points then big data, making it more distinguished, identifiable and contextualised. (Lupton, 2016;Kitchin, Lauriet,2014) However small data will lack the velocity, the variety, the flexibility, -in some cases- the resolution and the relational aspects of big data sets. As besides huge quantities of volumes, big data can capture and exhaustive scope of precise and diverse information in near real-time. (Kitchin,2014) The precise and consistent indexes of big datasets, allow different sets to be easily merged and linked to each other. However small data doesn't have to be discarded out the fields of research and data science. As with the assistance of big data's qualities of generating an objective overview of large and nuanced informational patterns, small data's sampling technique can perform more precise and refined searches for specific answers. (Schnädelbach& Kirk,2019)

Personal data can be defined as both big data and small data. From origin personal data is small, as it is generated by individuals. (Lupton, 2016) However, with the increase of platforms and 'smart' devices, all personal data will be gathered and observed in big data sets. Personal data is the bridge between the gap of small and big data, it enhances the individual's data into large (inter)national wide observations. (Lupton, 2016) While before digital recordings any personally owned information would have referred to as personal data. In this day and age, personal data can be generated by any digital enhanced artefact and accessed by any provider, platform or institution providing the artefact. Europe's 2018 General Data Protection Regulations (GDPR) defines personal data, as any kind of information that can directly be associated with an identification of a natural person ('data subject'). (Schnädelbach,2019). This data consist of various forms of information's all (in)directly related to the human 'subject' and can be classified into three main categories: static, dynamic and derived(Schnädelbach& Kirk,2019). The first category (static) refers to data related to both offline as online identities, assets, physical, physiological, financial, legal, social, cultural and relational. Secondly, the dynamic data includes historical and real-time patterns, traces and flows of records and resources. Lastly derived data refers to analysed and processed profiles, routines and trends of the subject. Derived data could have circulated through many derivations, analysations and aggregations, thereby travelling through various physical and digital locations. (Milan,2018 ;Schnädelbach& Kirk,2019) The data eventually start to become its own living reflection of the natural person and can be referred to as lively data. (Milan,2018; Lupton, 2016)

Privacy of information used to be defined as hidden or withdrawn from the public by spatial or behavioural dimensions. But the introduction of mobile- and ubiquitous devices blurred the spatial constraints of privacy. Thereby the notions of privacy are now confined to the context of the information's relationship, interaction and subject. (Schnädelbach& Kirk,2019;Lupton, 2016) In Europe, any form of personal data, that can relate or identify a natural person/data subject, needs to compel to the GDPR's established legal privacy obligations of 2016. These will also include any data acquired of ubiquitous devices in the built environment. Beyond the 'standard' personal data, there are also more sensitive 'special categories' with more complex regulations. For instance, information related to any health, gender, sexual orientation, ethnical, cultural, political descriptions. (Schnädelbach& Kirk,2019) However, according to the GDPR, biometric data is categorised underneath the regular personal data, as it can be derived from processing the physical, physiological or behavioural characteristics of a person. Europe's GDPR has provided six legal bases when assessing personal data needs to compel to any legal obligations. (Schnädelbach,2019). Most of these legal bases include the governmental or public interests, except for contractual performances and the data subject's consent. However, given the GDPR's increased focus on protecting rights and providing control to individuals own personal data. (Schnädelbach,2019). Therefore the matter of consent or alternative approaches of justification by the individual is now required in analysing personal data. This leaves various services to alternative approaches, as

requesting an individual's consent can be impractical in certain public situations. (Schnädelbach,2019).

Pseudonymous or anonymous data, when approached carefully, might offer a good alternative in acquiring personal data for services. (Schnädelbach,2019). The GDPR defines pseudonymisation of personal data as a separation of specific attributes or traces of the data subjects. Thereby organisational and technical procedures have to prevent any additional information for re-identifying a subject to be stored separately. (Schnädelbach,2019). Anonymisation of data tries to completely eradicate any specifically identifiable traces of a person. Techniques to proceed anonymisation of data are for example: 'data masking' removing any specific identifiable information, 'aggregation' generalisation of all observations and 'derived data items' the metadata of the original source. (Schnädelbach,2019). However, the implementations of these procedures, in reality, seem to have their limitations and uncertainties. Most anonymisation techniques are fragile or misleading. For instance by 'singling out ' data subjects in data sets, or the ability to link various sets to the same subject and lastly values of an attribute can be deduced to other attribute's values of the subject. (Schnädelbach& Kirk,2019)

From a black box to a culture machine

Ever since the externalisation of mankind's mental capacities, through the artefact, scholars and practitioners have speculated on the notion of 'the black box'. The concept describes an opaque interpretation of a device that fabricates the desired output with just a simple input of information.(Kousoulas,2018) The black box will, according to this notion, fully operate autonomously without needing any further manipulations or actions of the operator. This interpretation describes an abstraction of any complex or substantive operation or entity and thereby also the digital algorithms and apparatuses of the current climate. (Kousoulas,2018) An abstraction of an artefact, that is so interwoven into today's fabric of society and environment, has granted it a certain mysticism towards the uninstructed public. (Mlynář ,2018; Kitchin, Lauriet,2014; Finn, 2017) These algorithms are being perceived as kinds of magical incantations with their mysterious runes of symbolic forms of programming languages. (Finn,2017) Thus further motivating the notion of the black box being some convenient, versatile and ultimate solution to whichever problem imaginable. (Finn,2017) This fascination has also drawn the attention of architects. Ever since the first operable digital devices, architects have speculated and developed architectural implications of the black box. Architects like Negroponte, Cedric Price and Christopher Alexander, even laid the groundwork in certain digital infrastructures.(Steenson,2017) With recent digital developments in the environment and the datafication of society. Mankind has stopped thinking about hardware and started thinking about software in forms of apps and services.(Ratti,2015) Moving architecture into this new digital turn awaken novel implications of the black box in architecture, ranging from adaptive architecture to participatory or democratic built or design services. (Carpo,2017)

The word algorithm derives from the Latin word Algorismus, a translation of the ninth-century definition for the process of calculating Hindu-Arabic numerals, associated with the revolutionary concepts of positional notation, the decimal point, logarithms and zero. (Finn,2017; Carpo,2017) Over the centuries 'algorithm' got defined as any set of mathematical instructions for manipulating, compressing and comprehending data, eventually developing into an essential feature in modern science. (Carpo,2017)Through computer scientist and mathematician Donald Knuth, algorithms became a fundamental part of today's computer science. The term algorithm in computer science became known, like its algebraic version, as a set of repeatable regulated rules and calculations to solve vast complex problems. (Finn,2017)

In the current age, we most often refer to algorithms in search engines, platforms and recommendation services, most often associated with big tech companies as Amazon, Facebook and Google. (Finn,2017) The latter even defines them: "Algorithms are the computer processes and formulas that take your questions and turn them into answers." (Finn, 2017, p18 ; Belinski, 2000, p305) However, how ambiguous and close to the notion of the black box this may sound, in the end, these sophisticated complex structures just exist out of a diverse array of Machine learning scripts and/or Artificial Neural Networks. (Kousoulas,2018) Machine learning, as the name implies, refers to a distinct mode of learning. The 'machine' learns through a set of iterative procedures. Unlike man's inductive logic of formulating a theory or statement by generalising an observation, machine preforms a deductive logic through an array of iterations to constantly reconfigure its formulation. A machine requires a symbolic approach to facilitate these iterations, by abstracting the formulated questions from a 'why' or 'how', into a 'truth' or 'falseness'. (Finn,2017; Carpo,2017)

The degree of independence from human input while operating these iterations, can categorise machine learning algorithms into three main categories: supervised-, reinforced- and unsupervised-learning. The first two categories demand a certain degree of manipulations from the operative entity, requiring a symbolic approach of abstraction to become operable. (Finn,2017) The last category of machine learning takes a connectionist logic. Artificial Neural Network is part of this

unsupervised learning approach and is currently replacing many of the old symbolic approaches for Artificial intelligence. (Kousoulas,2018) The connectionist logic acts upon the notion of nature and animal intelligence, by conditioning itself to repeatedly perform the same exercise, to recognize and complete patterns. (DeLanda,2019) This algorithm, like its organic counterpart, observes the acquired data through its input layer – often referred to as the retina - into the calculative part of the 'hidden layers'. The hidden layers operate like neural synapses as they are cascading into a boundless amount of synapsis, to dissect and analyse the acquired data into the most subtle details. (Kousoulas,2018) The machine stores, not the symbolic values, but the patterns of synaptic strengths to simulate the original pattern for the required outcome. The capabilities of forming a detailed and accurate outcome with minimum interference of a human operative bring artificial neural networks close to the notion of the black box and make them an increasingly predominant feature in algorithms. (Kousoulas,2018)

The autonomy of the black box separates these networks from humanity with the moment of actualisation. While the technical object, unlike man´s evolution of generalisation through externalisation of conducts, evolved by reduction and specialisation. (Picon, 2004) Abstraction causes the object to ascend from any materiality and technicity through the reduction of interference. (Finn,2017) As the manipulation of the object will allow the operative to gain an understanding of the object's ontology and it's mechanics. However, in a system of abstraction, there still will be a remainder. (Finn,2017; Rouvroy,2016) In the case of the black box, the creation of its functions happened in a serene ideal computable environment, thereby reducing chaos and unforeseen properties of culture in the physical realm. (Doyle, Savíc, Bühlmann,2019) This results in the emerging gap between the ideology of the virtual and the entropic cultural. (Finn,2017) The discarded aspects of information can be referred to as the différance and will allow for manipulation through the human operative. (Finn,2017) By being able to read and understand the capabilities and structure of the algorithms, the human operative can identify the gap located in the cultural space. (Doyle, Savíc, Bühlmann,2019) A gap doesn't necessarily have to be glitches, hacks or any other flaws in the system, it can be an opportunity for freedom of interpretation. While humans get climatized by operating with these gaps in the system, they configure new conducts, habits and even implementations for the algorithms. (Finn,2017;Rouvroy,2016)

Just understanding the interior mechanics of the black box would not suffice. The actual implementation of the box itself is as important as its mechanics. (Finn,2017) Particularly when the box begins to interact with the physical realm it reaches its boundaries. Since the actual physical world is entropic and unpredictable, requiring constant alteration and supervision. (Doyle, Savíc, Bühlmann,2019) The "implementation" is when the desires for effective computability get translated into the complex reality of the social networks of various (non)human actors in the cultural space. (Finn,2017; Rouvroy,2020) By taking into consideration the black box's inputs and outputs, the context of implementation will allow the algorithm to transcend to a cultural machine operating within the gap between digital and culture. Positioning itself in that gap allows algorithms and their adherent apparatus together with their human operatives to define new roles in society, as cultural machines, to translate the negentropic digital and the entropic physical conducts and desires. (Finn,2017; Manovich, 2018: Rouvroy,2020) The ideal implementation must be embedded into the fabrics of life itself. However, the reality of the implementation requires flexibility to comprehend with the new probabilities, responsibilities and complexities. Unlike the black box, the cultural machine is porous, acquiring and fabricating cultural and digital structures at every conjunction with other sociotechnical systems. (Finn,2017; Manovich, 2018)

The datafication of society

Since the first human species modified sticks and stones in the Palaeolithic era, to survive the harsh and inhumane condition of that time, man has distinguished itself from any other biological species. This adaptation of the artefact, even made it become the predominant species of this planet (Picon, 2004; Ratti, 2015). While mankind innovates new artefacts, it develops new conducts relating to these artefacts and gradually evolving into whole new cultures and even species, thereby connecting the evolution of the artefact to the evolution of mankind. “the human hand is human, because of what it makes not of what it is” (Colomina, Wigley, 2016; Andre Leroi- Gourhan,1993). This techno-social progress started with synthetic enhancements as an extension of limbs- to support mankind in their physical undertaking - into the enhancements of mental and social capacities. “Human progress was marked by the gradual externalization functions” (Antoin Picon,2003).
This introduces the computational or digital realm of the artefact, from the first computers through an interwoven network of ubiquitous devices in any ordinary object(Ratti, 2015). All densely packed with sensors, processors and other highly technological components, connected to a vast network of wire(less) infrastructure to render the physical into the digital. (Greenfield, 2017)This datafication of today’s civilisations allows gradually more intelligent algorithms do men’s intellectual biddings(Ratti, 2015). While these artefacts become more sophisticated, they also leave a more refined – almost surgical- impact on humanity. (Colomina, Wigley, 2016) With the first iterations of the digital enhancements having a more tangible and obvious impact as the increase of mobility and flexibility by mobile devices and wireless networks, to a more intangible and unseen impact as the eradication of human linguistics and intelligence by relying on the translation of symbolism of signals or sounds through algorithms. (Carpo,2017)

With the dawn of externalisation on ordinary functions and objects towards the digital. The introduction of mobile devices, in the past decades, eradicated the tyranny of the predetermined schedules and fixed meeting points. (Townsend, 2013). This allowed mankind to become as mobile and flexible as their nomadic ancestors, by being accessible anywhere, at any time of the day. Also known as the death of distances -and in some cases time- allowing for new approaches of living. Mankind could be in the most remote places, while still performing their daily responsibilities. This should have, in combination with the analogue predecessors that stimulates mankind’s mobility and flexibility like the automobile, the radio and the landline, exterminated the urban fabrics. (Ratti, 2016; Mitchel, 1999). But on the contrary, the mobilisation of digital devices allowed cities to flourish. The enhanced connectedness and mobility allowed their inhabitants to gain a grasp on chaotic urban lifestyle and even enhances it with various physical services transcending on to digital platform-based services, allowing the urban fabric to become a hybrid of the digital and physical (Ratti, 2015).

These mobile devices and the connection to the internet supported the existence of ‘platformisation’ of services to replace previous physical socio-cultural transactions between actors. While the first iterations of these platforms (forums) being primitive structure (see algorithm section), it set the groundwork for a neoliberal social and cultural medium, one that promoted the creations of content by its public, thereby causing a decentralization of power, influence and practice. (Manovich, 2018; Schnädelbach& Kirk,2019;Towsend, 2013) In contrary to its cultural predecessors - music, television and movie mediums- with a predominantly Western (American) culture, causing a global homogeneous perspective. (Manovich, 2018)The decentralization of the socio-cultural mediums stimulated the diversification and extension of communities and (sub)cultures, by eradicating the geographical physically bound locations. The platforms perform as a medium for individuals to discover and bond with like-minded folk and enabling them to raise public opinion, politically charged if needed. (Manovich, 2018;Colomina, Wigley, 2016)

When the algorithms and the interfaces of these platforms became more sophisticated and operable,these neoliberal structures caught on to the world's population. (Manovich, 2018) Stimulating users to transfer their daily routines and interaction onto digital technology will leave detailed digital traces. (Milan,2018) Thereby moving mankind into an era of abundance of data. This digital data have become highly valuable and commercially profitable when acquired and analysed, particularly aggregations of big data sets (Lupton, 2016). "An important element is the shift from commodifying workers' bodily labour to profiting from information collected on people's behaviours, habits and preferences" (Lupton, 2016, p44) Setting the stage for a new form of capitalism/consumerism called 'prosumption' – an ontology of the words 'production' and 'consumption'-, emphasising on people interacting with the digital artefacts to simultaneously consume and create digital content. (Lupton, 2016) Creating an entire industry of offering free services, which acquire and analyse digital traces to determine the users' behaviours and preferences, also known as datafication of behaviourism. (Kitchin, Lauriet,2014; Lupton, 2016; Manovich, 2018) With these services expanding to the physical realm of interactions with objects and bodies, it becomes about human life itself.(Lupton&Pink2018) Most often this data has been circulated through many derivations and analysations from the source, to determine predictions of social relationships and individuals. Thereby drawing on the notion of lively data, as these traces starting to live their own lives and become a hybrid of the physical user and the digital footprint. (Lupton, 2016;Lupton&Pink2018)

While data gradually becomes an accurate reflection of human life itself, it becomes interesting to analyse the philosophical, cultural and social ethos: "self-knowledge through numbers" (Quantifiedself ,2020) of self-trackers movements like the Quantified Self. (Lupton, 2016) The participants of self-monitoring practices, have fully embraced the datafication of their lives and applying lively data, as a means to measure components of everyday life and embodiments. (Kneidinger-Müller,2018)Most members have in comparison to ordinary humans an extended diversified array of (bio)sensor devices, to keep accurate track of any aspect of the human or non-human activity. (Lupton&Pink2018) Together with the capability of algorithms and other digital artefacts materialising this data into cultural readable symbolism(Lupton, 2016). Which allows the members to share their acquired and analysed lively data patterns with their community through platforms, forums and even physical gatherings. (Lupton&Pink2018) According to practitioners of the movement, the transparency and exchange of data motivate members to perform better and even grows bonds between members. The success of developing a better self through numbers draws strength from the theory of Social Translucence (ST) by Erickson and Kellog (2000). This theory implies that motivating the desired behaviour requires more than the exchange of the materialisation of one's behavioural data towards their social network. The social translucent system focuses on socially significant information and exists of three elements: visibility, awareness and accountability. Visibility refers to the transparency of the materialised behavioural data patterns towards all participants, rather than only the actor operating and tracking this behaviour. (Erickson,2008) The visibility works vice versa as spectators of the visible patterns will exchange symbolic traces and notifications of their presence and even their datafied behavioural patterns. (Erickson,2008) Awareness implies to the moment when participants exchange collective awareness of their shared data, in the context of the community could cause an interaction between actors. The interaction between participants can cause a feeling of accountability, assuming there might be consequences through the activated mechanisms of social control. (Lupton, 2016). This approach, by getting to know each other through numbers as the statement N=1 gains a social embedded value and could transcend from N=1 to N=all. (Kneidinger-Müller,2018; Manovich, 2018)

These neoliberal structures of personal data and social control are moving towards the ordinary public and can be positioned within the Foucauldian discourses of Biopolitics and Selfhood. (Lupton, 2016; Foucault,1997). The notion of selfhood is focused on the self-reflection of behaviour and body for the sake of personal-growth, achievements, health and well-being. This psyche has narcissistic tendencies in urging people to show a better self towards the public perspective out of vanity. (Foucault,1997) The increasing digitisation of society and (social) life in current climates stimulate this behaviour by making it possible to share every second of a person's life in real-time. Eventually, the enhancement of a better self exceeds from just being about physical appearances towards socio-cultural appearances with the reflection of becoming the perfect citizen or inhabitant of this world. This transaction of self-development acquires a certain level of self-knowledge, thereby empowering people's self-belief and socio-cultural positioning in this fluid world. This fits right into the neoliberal political apparatus of rather performing 'soft' than 'hard' power on the public. (Lupton, 2016)

Rather than disciplinary power being performed on populations, 'biopower' focuses on promoting self-regulation and self-management by surveillance. (Foucault,1997) The embedment of sensors into the environment and artefacts generating digital traces enhances this control in the form of; digital surveillance or 'dataveillance'. (Lupton, 2016) As this data is been shared on platforms it combines panoptic – the feeling of being observed from above - and sousveillance – the feeling of being judged from below- approaches. (Kitchin&Dodge,2011) Dataveillance blurs the spatial boundaries of confined public and private spheres in the physical realm. Definitions of privacy have thereby transformed from being defined by spatial dimensions, into notions of context, relationship and interaction of the 'subjects' data. (Kitchin&Dodge,2011; Lupton, 2016) Allowing the participants of platforms to conceal private behaviours and content from the public and the provider. Total transparency of the population is eventually inevitable, as the public opinion gradually changes, with the acclimation of the convenience of personalised services. (Lupton, 2016)

Whether or not the population embraces digital artefacts-such as smartphones- into their daily lives, the extent to which digital technologies are embedded in society and the environment, made the interaction inescapable. (Greenfield, 2017) With both public and private spheres in a current climate rendered into the digital realm, objects have gained the self-reliant capability to proactively communicate and interact with organic actors. (Kitchin&Dodge,2011; Lupton, 2016) These interactions go beyond the socio-material connections and interactions between humans and objects. (Latour,2005) Thereby affirming the actor-network-theory of non-human actors actively interacting with human actors as part of a heterogeneous and dynamic social network. (Kitchin&Dodge,2011; Lupton, 2016) The digital apparatus can adequate whole new social dynamics and ambiences in the public and private spheres, through the various medium outputs for interactions between human and non-human actor. Notions of social materialism of the digitally enhanced non-human actors go beyond the mere interaction and communication, as they affect the selfhood and embodiment of the individual and society. (Lupton, 2016;Latour,2005) Non-human actors being able to directly materialise data into various sensorial mediums, allowing it to reflect and even govern the behavioural performance of the human-actor and its social networks. (Lupton,2016) Thereby stimulating the psyche of self-reflection and personal growth, without the involvement of interaction of the human social network. The notions of social materialism that are enhanced through the renderfication of the physical into the digital will be discussed in further sections of this paper. (Lupton,2016)

The means of interaction between non-human and human actor also affected the communicative procedure between only human-actors, through digital apparatus. (Carpo,2017) Mobile phones and chat services already constructed an abbreviation of linguistical languages, for the sake of efficiency. (Colomina & Wigley,2016).Later this decentralisation of cultural or social media-induced the abstraction of human communication in the form of emotional and mental expression by symbolism

in the form of emoji's, memes and gifs. The implication of the camera and microphone into digital devices, even allow the human to share a straight verbal and visual expression of these emotions and thoughts. (Colomina & Wigley,2016). The more recent implication of abstracting communication has allowed the bilateral translation of audial and lingual mediums, by speech and pattern recognition algorithms. (Finn,2017) Mankind has acclimatised to the interaction and translation through the digital apparatus, optimising certain audial and movement patterns for comprehensible – non-human/human actor- communication (Colomina & Wigley,2016).This eradication of linguistics let mankind decrease into primal forms of communications through signals and sounds, thereby corresponding to the communicational and social networks of non-human actors (even organic actors). (Finn,2017)

With the algorithmic applications becoming more sophisticated and diverse the datafication of human life has allowed non-human actors to move into a more overseeing and governing role in society. (Rouvroy,2020) Algorithms have been adopted into various social, cultural and political institutions to perform an objective and very detailed observation of the population. (Rouvroy,2020; Manovich, 2018)Depending on its implications, these algorithms are shaping entire populations social and cultural perspectives, giving them the name 'cultural machine'. (Finn,2017) Unlike human operatives, these cultural machines -depending on the structure and implications- can perform without any alternative motives. (Finn,2017;Rouvroy,2020) The position of such operation as the translator of the digital data into information and implications gains a certain power when being believed. The operative can perform like a 'parasite', by translating the acquired knowledge into its own biases. (Doyle, Savíc, Bühlmann,2019) The corruption of such biased information could allow the actor to achieve its benefits and exploitations. Unfortunately, mankind will always perceive information subjectively out of the matter of abstraction, so even the most genuine and honourable information will corrupt the observations. (Doyle, Savíc, Bühlmann,2019) The cultural machine (or 'Black Box') in its most objective and autonomous form can perform like the 'holy fire' of the Pentecost, giving voice to the many without interferences. (Doyle, Savíc, Bühlmann,2019) In its most sophisticated form, the cultural machine will render the data of even the most correlated and microscopic anomalies into its observations for providing a detailed and optimised service, information or even policy. (Doyle, Savíc, Bühlmann,2019;Rouvroy,2016) This algorithmic governmentality, even though analysing a very accurate and detailed observation of lively data by each individual, is shaping a more homogenous culture through objectiveness.(Rouvroy,2016) The influence might then not be associated to a specific cultural or socio-political context. Depending on the scope of the context of implication it can assess whole aggregated population-wide datasets – unbound by geographical size and place- to define its services or policies. (Rouvroy,2016; Manovich, 2018) This results in the eradication of individualisation over a duration of time, as these services or policies will gradually advise and govern preferences towards common conducts and ideologies for the human population. (Rouvroy,2020)

The externalisation of mankind's bidding toward non-human actors, within a neoliberal political structure, has made life more convenient and comfortable for humans. (Rouvroy,2020)Automation grants them more spare time for leisure and pleasure to enjoy to its fullest, eventually eradicating the needs for human operatives in many industries, determining on how well the machine can proceed human forms of thinking. (Rouvroy,2020)The full dependence on the machine to perform even the simplest task in life will cause a decline in diversity and requirements of education and eventually a decrease in intellect. However, the Homo Faber mentality within humanity and its society will still force individuals to require a job. (Colomina & Wigley,2016).Thereby purposely and bureaucratically inflating industries/ economies, by creating redundant jobs to still satisfy the needs of the population. (Rouvroy,2020)

Rendering the digital

The dyadic relationship between the physical and the digital in an age of ubiquitous computing and artificial intelligence are blurring the dictions between realms. (Kitchin&Dodge,2011) Architects have been interested in these opportunities since the first notions of digital developments. With physical buildings and facilities being enhanced or fully replaced by digital artefacts and services. (Schnädelbach& Kirk,2019) Thereby gradually conceiving hybridity of both realms in the built environment and society. (Ratti, 2015)Digital artefact's impact on the desires and conducts of society will indirectly manifest in the physical realm. (Ratti, 2015)Like with their analogue predecessor -the automobile -changing entire urban fabrics and introducing new structures like billboards and malls. (Ratti, 2015) So will the digital apparatus intermeshed connectedness, rethink facilities and even entire urban fabrics, like the workplace or the library. (Colomina & Wigley,2016) Thereby introducing new hybrid services and buildings, with the flexibility and mobility of digital apparatus, like pop-up stores and drone ports. (Ratti, 2015) These services generate an abundance of data, that can be manufactured into customised and optimised services to satisfy the everchanging needs and desires of current society. Thereby setting the groundwork for living and dynamic buildings, like adaptive architecture, participatory mass customised buildings and augmented reality. (Ratti, 2015;Towsend, 2013)

The digital manifestation in the physical world can be distinguished into two main categories; forensic materiality and formal materiality. (Finn,2017;Kirschenbaum, 2008)The first category (forensic materiality) is the actual object or physical -traces- material that stores/preforms digital services. (Finn,2017) These physical properties of the object can directly be related to the digital performances of the service. As the electromagnetic circuits enable data to flow through a device, leaving a trail of its effects. (Finn,2017)For instance, the hard drive, where a database is stored having its own physical properties to perform the digital task. Secondly, the 'formal materiality' defining to the relational impact of digital performance on the physical world, and can also be defined as the friction it takes between the different digital processes to be performed. (Finn,2017;Kirschenbaum, 2008) That resonates into socio-material (traces) relations with the physical material. (Kitchin&Dodge,2011) The latter category will be more defined in the next section of the paper, as formal materiality is defined by the interactions taken place.

Forensic materiality can be divided into two categories again; the digitalised structures and the digital hybrid structure. (Kitchin&Dodge,2011) The first category is a digital manifestation were the digital matters in terms of production and function of the physical artefact, but the artefact doesn't rely on its digital counterpart and can function on itself. In current western society, it becomes rare for any physical object to not have been treated by some kind of digital process. (Colomina & Wigley,2016;Kitchin&Dodge,2011) For example in architecture, the introduction of digital drawing software gave a certain expected level of technicity to buildings. (Greenfield, 2017) The second category– digital hybrid structures- of the digital manifestation is a dyadic relationship between the digital and the physical were either one cannot exist/function without the other. (Kitchin&Dodge,2011)

The first notion of the digital manifestation, the digitalised structures, can be defined in various degrees of implications. Starting from the evolved modernist isolated approach-almost tabula rasa- of a Cartesian -a still frame- interpretation of the context. (Ratti, 2015;Carpo,2017; Moe,2019) Thereby introducing structures that could only have been designed in contextless virtual environments. (Kitchin&Dodge,2011) Like the ability of digital visualisation software to consistently reproduce difficult, incomprehensible and fluid surfaces, to create anamorphic structures referred to as blobs. (Ratti, 2015 ;Carpo,2017) A Eulerian approach – a still framed view with movements – implies the digital infrastructure of simulations and robust data mining to define more nuanced and optimised designs for structures. (Carpo,2017;Schnädelbach& Kirk,2019) For instance to

comprehend the complex movements and flows of large public structures, by generating digital simulations of acquired data of the situation's embedment and network. Another Eulerian approach will be utilizing 3D printers or robotics to fabricate through analysed personal data, mass-customized artefacts. (Carpo,2017;Lupton,2016; Moe,2019) Lastly a Lagrangian - a frame following the movements- will be the decentralisation of the design process through platforms and algorithms. (Moe,2019)This process also knew an Uberization or Post-Fordism allows for a participatory approach, whereby any actor engaged in the process will be able to opinionate and customised the services/artefacts to their requirements. (Carpo,2017;Schnädelbach& Kirk,2019;Greenfield, 2017)

The Lagrangian approach will fully strife in the digital hybrid structure, as the digital enhancements will allow the structure to become a living entity. (Schnädelbach& Kirk,2019) This form in architecture has gained many names over the last decades, as robotic architecture, generative architecture and interactive architecture, all of these can be categorized underneath adaptive design. (Schnädelbach& Kirk,2019) Whereby the physical built environment is supported by digital apparatus – in the form actuators- to alter in almost ad hoc the environment according to the desired situation given by recorded inputs from sensors and the occupancy's manual modifications in the settings. This kind of manifestations is progressively appearing more in the current decade with the increase of ubiquitous devices in the built environment. (Schnädelbach& Kirk,2019) But this typology of adaptation of the digital into the physical is not something new, as since the 60's architects associated with cybernetics, like Nicholas Negroponte, applied their architectural knowledge on the fields of cybernetics/computer science and speculated on the opportunities in architecture. (Ratti, 2015) These late modernist figures followed upon Le Corbusier's notion of a machine for living, where architecture was not only optimized on structural engineering and design but also from a perspective of mass production and social functions. (Ratti, 2015) This notion transformed into a living machine, where the environment responds to the social functions of the actors. Negroponte: "the fantasies of an intelligent and responsive physical environment are toe easily limited by the gap between the technology of making things and the science of understanding them" (Ratti, 2015) This gap has been slowly vanished, as the technicity of the adaptive environment is increasing. (Schnädelbach& Kirk,2019) With adaptive architecture being applied in even the most ordinary mundane situation, all been enabled by the increasing accessibility and computational powers of "smart" devices and new physical-material possibilities for the digital artefacts. (Ratti, 2015;Schnädelbach& Kirk,2019)

However, the ubiquitous environment of the internet of things (IoT) will keep track of more than just the occupancies of the environment. (Towsend, 2013;Greenfield, 2017) As the name of IoT implies; the internet of things creates the ability to translate physical 'things' into digital versions. The communication and sensing by devices can either be done passively or actively. (Ratti, 2015) The passive method exists of a machine-readable implementation into the objects like barcodes, QR codes, magnet strips or tokens/chips and requires active identification through scanning or contact. (Kitchin&Dodge,2011; (Greenfield, 2017) The active translation of the physical object into the digital is through the implementation of Radio Frequency IDentification (RFID) or Near-Field Communication (NFC) tags transmitting a "short-range" frequency. (Kitchin&Dodge,2011) These tags that can communicate and be sensed by sensors, like Beacons. (Towsend, 2013;Greenfield, 2017) Active devices can also record and translate the physical environment through a vast array of sensors, scanners, cameras and microphones. Most often combined to generate a detailed outcome of all aspects of the physical environment. These implications can now be seen in automated services like warehouses to support the non-human actor to communicate and sense the environment and the adherent social-network. (Greenfield, 2017; Schnädelbach& Kirk,2019)

The amount of technicity increasing in current ecology created endless opportunities for the applications of the apparatus. Thereby humanity is gradually accustoming to the notion of being

digitally recorded by any ordinary object. (Lupton,2016; Schnädelbach& Kirk,2019) However, there are also indirect manifestations of the physical into the digital. As the ubiquitous devices implemented in the environment would have picked up on other observations then intended. (Lupton,2016) The observations could have been made by analysing derived or indirect digital data of the tracked progress. These digital traces eventually translate other situations and activities, that might not have been allowed to be revealed. (Schnädelbach& Kirk,2019) In some cases these trails actually empowered and decentralised services like generating an accurate topographical depiction of entire countries, through digital generated traces of mobile phones. (Towsend, 2013;Lupton,2016; Greenfield, 2017)

An Interactive approach

Since the possibilities of the technological advancements of the digital artefact have transcended to the realm of architecture buildings have become gradually more interactive and adaptable to the desires and requirements of the human inhabitant. (Schnädelbach& Kirk,2019) Together with the datafication of society, this development has caused a transition from facilitating activities in assigned locations to more ambiguous spaces (Colomina & Wigley,2016). However, this transition to a dynamic and more fluid environment requires utilizing the biometric and personal data of the operator. (Lupton,2016) In doing so reconstructing the human inhabitant's life towards more liquidity and translucence. These personalised services and the aforementioned fluidity of structures are affecting the human inhabitant´s selfhood and sense of place. (Lupton,2016) Wrongly configured services could echo into a feeling of alienation and discomfort. (Carpo,2017;Schnädelbach& Kirk,2019) Unfortunately, the social-spatial significance of the interactively built environment and the digital artefacts adaptations are currently overlooked by architects. Even though the embedment of various interactive elements requires operating. Architecture is predominantly focused on technical, financial and sustainable optimisation. To comprehend the social-spatial significance of the interactive elements, architects will need to draw on the decades of Human-Computer Interface (HCI) research experience. (Alavi&Churchill, et all, 2016)HCI specialises in characterizing human behaviour, cognitive processes and operational routines of digital artefacts. (Dalton&Schädelbach, et all, 2016)

Advancements of digital infrastructure and computational performances have made it possible to produce interactions or artefacts, that are hard to grasp for the human level of cognition. (Carpo,2017) The occurring interaction or artefact can cause a feeling alienation, particularly when these perceptions are new for the human actor. (Schnädelbach& Kirk,2019) HCI's Usability Model can determine how comfortable human actors interact with digital artefacts. (Dalton&Schädelbach, et all, 2016) This model notates the capability of the actor to understand, learn and like the interaction, by analysing the efficiency, effectiveness, satisfaction, learnability and security of the artefact. Efficiency describes the quantities of actors performing the interaction with the artefact. Secondly, effectiveness is the amount of energy the artefact requires to perform the interaction. Satisfaction defines the number of actors being (un)satisfied with the interaction. (Dalton&Schädelbach, et all, 2016) The learnability is the ability of selfhood in both actors -artefact and human- involved in the interaction. (Lupton,2016) Lastly, security is the level of safety in performing the procedure. (Dalton&Schädelbach, et all, 2016) Altogether these aspects of usability can be assessed by the adoption of lively data, prototypes and simulations of the implementations. (Dalton&Schädelbach, et all, 2016;Lupton,2016) Eventually producing the most comfortable human-centric interaction possible. However, the lack of manipulation and friction in the interaction might cause dissociation of the artefact (Schnädelbach,2019;Colomina & Wigley,2016). Considering the human operative requires a certain level of cognitive friction to understand the significance of the interaction. (Dalton&Schädelbach, et all, 2016) This required friction in an interactive element has to be determined to the finest detail and frequency. For example, is an interaction too fast people won't be able to comprehend it, is it too slow the interval between actions can cause frustration. (Dalton&Schädelbach, et all, 2016;Greenfield, 2017)These refinements will cause interaction and the artefact to gradually become more opaque and fluid (Colomina & Wigley,2016).The formal materiality of the social connections and cognitions with the object will be as relevant, as the forensic materiality of physical perceptions of the object. (Finn,2017)

Social material aspects of the artefacts can be defined by a matter of affordances. (Dalton&Schädelbach, et all, 2016) These affordances are cognitive signals help to identify the capabilities of interactions with an object or actor. (Kitchin&Dodge,2011; Lupton,2016; Finn,2017)Thereby an object's affordance can govern the whole interaction between actors since a part of the person's perception of space is embodied with the social interactions and cultural

spheres between actors. Affordances can even be carried onto social-spatial notions of identifying the required procedurals and conducts in a certain environment. (Lupton,2016;Kitchin&Dodge,2011) While passive digital interactions exist out of structural, mechanical and forensic material or analogue cognitions. If due to technicalities or human errors the procedure does not go as smoothly as desired, the interaction can provoke a negative social perception of the proceeding space. (Kitchin&Dodge,2011) By utilizing lively data, a proactive digital artefact can perform personalised interactions with audial, visual, heath, vibration and aroma signals to the human social network. (Schnädelbach& Kirk,2019) While the first encounters will require a range of cognitive signals and interactions to perform the procedures and thereby risks of frictions. (Schnädelbach& Kirk,2019) The forthcoming procedures could perform a smooth interaction. Thereby stimulating the self-reflection of the selfhood and its embodiment into a more in-depth connection. (Lupton,2016) In all, these proactive procedures will transform a whole new perception of the interactions and the adherent social-spatial notions. (Kitchin&Dodge,2011)

In sociology, the social-spatial perception of dynamic activities is divided into four scales of social-temporal constructs. (Schnädelbach& Kirk,2019) As the social-spatial perception of a certain event can resonate into various renditions over time. (Kitchin&Dodge,2011) Each rendition will associate the perception of similar occurring events in different locations, thereby enlarging and abstracting the perception of the proceeding space. (Kitchin&Dodge,2011) This construct also becomes relevant for interactive artefacts utilizing lively data. With the first temporal scale 'micro mutations' being nuanced calibrations of the human's present needs and preferences during the procedure of the direct interaction. (Schnädelbach& Kirk,2019) The second temporal scale 'meso developments' will reconfigure a personalised interaction by analysing previous encounters. Lastly, the temporal scale 'macro evolutions' will form a profile or memory of the encountered actors. (Schnädelbach& Kirk,2019) In terms of spatial scale, the micro mutations will be associated with the specific interaction of the actors. The meso development and the macro development will aggregate data from multiple (groups of) actors and encounters. (Schnädelbach& Kirk,2019) While the digital apparatus will be able to assess a finely detailed recording of these interactions, in terms of time and location. Due to the exact technology, the human temporal-spatial perception of the exact location and moment of the interaction becomes harder to define. (Schnädelbach& Kirk,2019) Thereby causing the notion of fractured ecologies, as there is no assumption when or where a certain interaction has been taken place. (Schnädelbach& Kirk,2019) This could stimulate a feeling of estrangement to certain locations as humans will not entirely perceive the full reality of the physical construct anymore. While the digitally enhanced artefact recognizes the human actors and their behavioural routines. (Lupton,2018)

There are two approaches in the adaptation of lively data to generate a personalised interaction between the artefact and the human actor: personalised-interaction and open-interaction. The first procedure relies on the use of direct identifiable or biometric data of the human actor. (Schnädelbach& Kirk,2019;Lupton,2016) Due to the identification, a customised interaction can be performed with the artefact and a human. This interaction can vary from granting access to certain facilities to the adaptation of the environment according to physiological data of the occupants. (Schnädelbach& Kirk,2019) With the inter-connectedness of a digital hybrid social network, a procedure can also be traversed between human operatives. (Greenfield, 2017) With an intend to generate an interpersonal connection through addressing the selfhood of the operatives. (Lupton,2018) Open interaction has the intension of conducting completely anonymous assessments, by utilizing aggregated and encrypted datasets. (Schnädelbach& Kirk,2019) An open interaction can be implemented for the use of public interactive elements, thereby not requiring the consent of the human actor. (Schnädelbach& Kirk,2019) These interactions could consist of a simple proximity sensor enabling lighting, towards more complicated situations of crowdsensing to redirect actors from congestions. However, aggregate systems can feel disassociating and even

uncomfortable. Particularly when the interactive element performs a distinctly direct procedure that affects the whole spatial perception of the structure. (Schnädelbach& Kirk,2019)

All these new interactive elements in the built environment are fluidizing the spatial perception of the human inhabitant. The fluidity of space can stimulate estrangement and disorientation in an urban milieu. (Doyle, Savíc, Bühlmann,2019;Carpo,2017) The implementation of wayfinding mechanics of clear orientation points, open visual perception and (interactive) elements indicating direction could allow the occupant to orientate. (Doyle, Savíc, Bühlmann,2019;Schnädelbach& Kirk,2019) Although in most cases the dissociation with interactive elements by the lack of affordances will stimulate this disorientation in the environment. (Colomina & Wigley,2016).Occupants of the fluid environment are unable to take grasp of the ambiguity and the adapting environment. The interactivity of fluid spaces has the property to communicate and conduct new social experiences and atmospheres to the actors. (Doyle, Savíc, Bühlmann,2019) It allows the architect to narrate journeys and stimulate the actor to engage with the environment. This narrative of interactions will have to be approachable and recognizable for the occupants. (Schnädelbach& Kirk,2019) Mobile devices of the occupants could be able to connect to the environment to direct this narration. (Schnädelbach& Kirk,2019) Thereby accommodating the actors in orientating, connecting and anchoring in this fluidity. Designing spaces that will reinstate the empowerment of the actor's position in the flow of liquid society can stimulate emotional connections and serendipity. (Doyle, Savíc, Bühlmann,2019)

Conclusion

The abundance of digital data, generated in today's society and the advancing digital infrastructures have made it possible to eradicate the biased liabilities of abstracting observations. Digital data in its mostly derived forms can even detect the most nuanced unintentional patterns, to convey customised and emancipated services and policies. Thereby obliging humanity to convert into a more translucent and fluid lifestyle. While the externalisation of human responsibilities to the digital apparatus has made life more convenient. Algorithms and their adherent artefact will transcend into more predominant and governing roles in society. Thereby fabricating entire new conducts and cultures, on the basis of aggregated analysations of the human population's lively data. While still being able to accommodate empowerment and emancipation, for even the most extreme correlating deviations in the system. All these services are constantly optimising and assessing new requirements on the evolving society. Optimisations will eventually abolish any gap or friction in the implemented services. Thereby removing any opportunities of manipulations or interference from the human actor. A lack of manipulation will decrease cultural acceptance and can dissociate the non-human actor from the social network. Although the opaque ubiquitous world and its adherent algorithms are a promising solution in creating a cohesive participatory 'black box'. The lack of manipulation and interference by the human actor will argue the opposite. As the power of jurisdiction of an entire population will move from a human actor to a closed algorithmic system. Algorithmic governmentality will thereby determine the behaviour, conducts and the built environment of a society. The policies will moderately homogenise humanity, regardless of algorithms competence of generating a nuanced and derived appraisal. Absence of individualisation can be prevented with human actors own contributions. A black box will still operate out of a certain degree of biases, depending on how the algorithm is programmed. Without interference, translating an entire population desires will grant the algorithm a powerful position of 'the parasite'. While by taking up the role of a porous and operable entity an entire population can commission their opinions and contributions. Thereby the human and non-human actors transcend into a translucent and flexible cultural machine. Within such a translucent society, these contributions can even stimulate an individual's selfhood and embodiments in the cultural machine.
These events also reflect upon the realm of architecture. As the digital infrastructure will convert architecture's modernist's isolated Cartesian still frame of design towards a Lagrangian overview of

fluxes and flows. In the case of an adaptive environment, collective translucency of all actors will generate nuanced personalised adaptations. With this intention, the interactive elements will display clear cognitive affordances of the procedures. The clear reflection of the built environments acquired lively data, will stimulate the psyche of selfhood and interpersonal connections between actors. Such hybrid social-network governed by algorithms can benefit from capabilities of manipulation and own interpretation. This will convert the building and its inhabitants into a cultural machine, thereby stimulating creations of communities between occupancies and surrounding residents.

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Prologue

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