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Transcending Power

Investigating the European Union as a
Mouthpiece for Transhumanist Thought

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Abstract:

This study arises from an existential concern that there is an obliviousness in academia with regards to the recent eruption of the transhumanist movement—an ideological force imbued with potentially calamitous socioecological consequences. With the support from recent claims that the transhumanist ideology exerts powerful influence on Western politics, this study seeks to investigate how the transhumanist ideology has become diluted into parts of the European Union and why this should be a concern from a human ecology lens. This is done by conducting a genealogy and a Foucauldian discourse analysis from a poststructural and Buddhist ontological stance on selected documents published by the European Union. The results show that the European Union acts as a mouthpiece for transhumanist imaginaries, amplifying transhumanist concepts albeit in implicit ways. Using the theory of sociotechnical imaginaries (STIs) and Gramsci's theory of hegemony, I argue that the transhumanist ideology functions as a panoply of techno-prophetic imaginaries that, through the support of governments and Big Tech corporations, has successfully transcended into some of our most respected organisations such as the European Union. Finally, drawing from the results, this study critically discusses some socioecological implications that could follow should the transhumanist ideology continue to expand unabated.

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LIST OF ACRONYMS

AI	Artificial Intelligence
AGI	Artificial General Intelligence
EU	European Union
EC	European Commission
IoTs	Internet of Things
IoBs	Internet of Bodies
NSF	National Science Foundation
NBIC	Nanotechnology, Biotechnology, Information technology and Cognitive science

Keywords: *Foucauldian discourse analysis, transhumanism, the European Union, sociotechnical imaginaries*

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[The] ultimate end of this [authoritarian] technics is to displace life, or rather, to transfer the attributes of life to the machine and the mechanical collective, allowing only so much of the organism to remain as may be controlled and manipulated.

—Lewis Mumford, 1964, p. 6

A spectre is haunting Europe and the rest of our planet – the spectre of Transhumanism. Its priests and familiars inhabit some of our most prominent research laboratories, universities, major corporations and political institutions [...].

—In 'The Ghost of Transhumanism', Spiekermann 2017, p. 1

The best way to get out of an imaginary place is to realise it's imaginary.

—Paul Hedderman, 2017

1—Introduction

It is somewhat difficult to talk about the power of the transhumanist ideology without coming off as slightly paranoid. Academic scholars who critically study the pervasiveness of transhumanism habitually talk about "the spectre" or "the ghost" of transhumanism, the main reason being transhumanists' unequivocal political influence despite most people's knowledge of it (Spiekermann 2017: 1). The transhumanist movement, which seeks to bring about a radically new human being through the means of technology, has expanded in such magnitude that it should no longer be trivialized let alone ignored (Giesen 2018). Transhumanism radiates through advertisements about virtual reality, through Elon Musk's Neuralink project, and through research in nanotechnology or synthetic biology. Western society¹ has, to say the least, been brined in transhumanist narratives for decades, with an ongoing societal embracement of ultra-digitalization to show for it. Ever since the onset of the global network and the cyberculture in the 1960s, the transhumanist movement exploded (Coenen 2014a: 764; Hughes 2012: 758). Today, with their headquarters in Silicon Valley, transhumanism is buttressed by some of the world's wealthiest billionaires as well as overtly praised by Facebook, Amazon, Google, Apple, and Microsoft (Frodeman 2018: 10).

A common response to transhumanist ideas such as radical human enhancement or immortality is to view them as eccentric futurisms. However, leaving aside the contents of such imaginaries, the important thing is to question who supports them, why, and how they shape and construct the world. Transhumanism has expanded in such magnitude that it has become regarded as "the dominant ideology of the fourth industrial revolution" which is about to give rise "to a significant rupture in the evolution of capitalism" (Giesen 2018: 1). According to Antonio Gramsci, the

¹ In this thesis I use "Western society", the "Western world" or the "Global North" interchangeably, referring to the powerful and materially wealthy core countries of the world economy.

function of hegemonic ideologies is that they “‘organize’ the human masses, they establish the ground on which humans move, become conscious of their position, struggle [...].” (Gramsci 2007: 171). To some degree, then, transhumanism may arguably have a greater effect on the climate crisis, ecosystems, power relations and cultures than might be perceived. Consequently, on the basis that the European Union (EU) is one of the world's largest economies and a significant influencer not least in environmental politics (Selin & Vandeever 2015), any ideological inoculation within will inevitably lead to social and ecological ramifications.

What makes transhumanism a compelling ideology to study is due to its lavish production of imaginaries that function as goals worth pursuing despite looming threats of the climate crisis and the obliteration of ecosystems. We may already see signs of this, as human-made technomass quite recently outweighed the total quantity of the planet's biomass (Leinfelder 2021). In other words, as the machine world prospers, the biological world seems to dwindle. On that account, while environmentalists may cherish the supernova of electric vehicles as something benign and sustainable, an alternative viewpoint is to see it as yet another industrial thunderstorm of intensified capitalism ingeniously legitimized through implicit, globally disseminated, transhumanist rhetoric (Giesen 2018: 10). This is one of the reasons why Francis Fukuyama has labelled transhumanism "the world's most dangerous idea", stating that although the ideology hasn't yet come into full fruition, "it is very possible that we will nibble at biotechnology's tempting offerings without realizing that they come at a frightful moral cost" (Fukuyama 2004).

Correspondingly, the radical societal transformation as is promoted by transhumanists is conditioned by a radical reshaping of the political sphere (Szabados 2021). This compelled me to explore a particular conundrum: are politicians, researchers and environmental activists aiming at protecting our ecosystems unwittingly guided by a transhumanist philosophy which ultimately seeks to quench the biosphere and establish a technological caste system for the creation of a virtually constructed machine age? To that end, this thesis aims to

explore to what extent the European Union partakes in amplifying the transhumanist ideology. By conducting a genealogical analysis of the emergence of the transhumanist discourse since the year 2001, and a Foucauldian discourse analysis (FDA) of contemporary selected EU documents, this thesis examines the hypothesis that the European Union has served and still serves as a mouthpiece for transhumanist thought.

1.1 Relevance to Human Ecology research

In this thesis dedicated to the discursive power of transhumanism within a European context, it is important to slip in a few words from human ecology. Broadly speaking, human ecology is the study of how cultures, power relations and sustainability relate to technological development, economic expansion, and socioecological dimensions. For example, through the lens of world-systems theory, ecologically unequal exchange, and machine fetishism, a human ecologist generally looks at any given technology with a critical gaze, attempting to unearth its concrete, social, material and often industrial complexes upon which it was built (Hornborg 2015). As diametrically opposed to this, the transhumanist enthrones technology, even to the point of being deified, viewing it as the ultimate serum to any form of suffering (Latzer 2022).

As a powerful ideology, transhumanism intersects with culture and sustainability in a variety of ways, mainly as it seeks to radically transform modern society both academically, politically and socially. Transhumanism draws from an exobiological philosophy with emphasis on evolutionary enhancement through NBIC-technologies² and artificial intelligence (AI) to escape the confines of the biosphere. This zealous propagation for advanced technoscience risks legitimizing a technological acceleration without consideration for planetary and human consequences. If believing that technology in the future can revive extinct species

² The acronym "NBIC" refers to nanotechnology (N), biotechnology (B), information technology (I) and cognitive sciences (C).

and synthetically manufacture vanquished ecosystems (Van Est & Stemerink 2012), present-day ecological losses appear negligible. Indeed, a transhuman era would ultimately render disciplines such as human ecology meaningless as both humans and ecosystems as we know them would cease to exist. Transhumanism does not contend itself with commodifying resources for the accumulation of capital, it seeks to go beyond that: to significantly shift up the gears of the economy with the ultimate goal of reaching the so-called singularity.

1.2 Research Questions

This study is guided by the following three research questions (RQs):

1. In what ways did the NBIC initiative pave the way for present-day transhumanist practices within the EU?
2. What transhumanist discourses emerge within the EU's report 'Digital Futures' from the year 2016?
3. Building on the answers to RQ1 and RQ2, what can this tell us about viewing the European Union as a vehicle for transhumanist thought, and how can we understand these implications in a broader socioecological context?

1.3 Purpose

The main purpose of this thesis is to explore in what ways the transhumanist discourse influences policy making within the European Union. This thesis was sparked from an existential concern about the pervasive expansion of the transhumanist movement, an expansion which in many regards continues unabated. Resting on the premise that there is an ostensible obliviousness with regards to the transhumanist movement in modern society, I believe that the ongoing hyper-digitalization of the world—for example digital agriculture—is not an arbitrary,

natural result of economic growth but is deliberately accelerated by strong techno-religious ideologies such as transhumanism.

Another purpose for this study is to bring transhumanism to the table of human ecology and political ecology as I am of the firm belief that transhumanism signifies the ideological adamant spine of late capitalism. It offers highly enchanting tokens to be wrought from the furnace of technoscience: smart "green" megacities, euphoria pills, reversed aging, synthetic biology, the conquering of death, and infinite exploration of solar systems and beyond. As fascinating as these may be, an uncritical absorption of such imaginaries risks harbouring unexpected consequences. In the same way as steam engines in 19th century Great Britain were highly political and intricately tied to global asymmetric flows of labour and material (Hornborg 2015), so is, for instance, artificial intelligence (AI) indirectly tied to heavy industrial complexes, mining operations, deforestation and mercuric emissions (Dauvergne 2021).

As an incessant rhetoric flourishes in Silicon Valley with regards to "magical" nascent technologies promising to transform the entire food system or sharpen the economy for the better of mankind (Guthman & Biltekoff 2020), it is crucial to understand how discourses legitimize or restrict a given set of narratives. Conversely, I believe that in order to understand the supposed benefits of coming technological "revolutions", one must understand the ideological forces underpinning such revolutions. It is my hope that this thesis will contribute to such an understanding, as we navigate through the ideological maelstrom of late capitalist society.

1.4 Structure of thesis

This thesis is structured as follows. After the introductory chapter (1) follows chapter (2) which offers a review on previous literature, critiques and research gaps with relevance to this thesis. This is followed by chapter (3) which outlines the foundational theoretical framework of the thesis, which to a large extent orbits

around the concept of sociotechnical imaginaries (STIs) as well as Antonio Gramsci's theory of hegemony. Thereafter, in the next chapter (4), the research method is presented, including methodology, how the Foucauldian Discourse Analysis (FDA) will be conducted, and a section on limits and why I selected the given data. In the next chapter (5), the findings from the genealogical analysis and the discourse analysis are presented. This is followed by a discussion in chapter (6), in which the results of the FDA are interwoven with the theories and anchored to the research questions. The last chapter (7) offers concluding remarks drawing from both the research questions and the dilemmas as outlined in the introduction.

2—Literature Review

An extensive body of literature have offered critical perspectives on transhumanism as a movement, ideology and philosophy (Agar 2010; Annas 2010; Frodeman 2018; Fukuyama 2004; Habermas 2003; McKibben 2003; Sandel 2007; Schneider 2008; Winner 2004). More relevant for this thesis, however, is that during the past decade an increasing number of scholars have cautioned that the transhumanist movement is increasingly influencing academic work, science, education and policy-making (Spiekermann 2017; Coenen 2014a; Coenen 2014b; Ujéda 2019; Giesen 2018; Tafdrup 2023; Hurlbut & Tirosh-Samuelson 2016).

2.1 State of the art

The interdisciplinary volume *Perfecting Human Futures: Transhuman Visions and Technological Imaginations* by Hurlbut & Tirosh-Samuelson (2016) offers many perspectives on the ways in which transhumanism makes use of techno-utopianism and sociotechnical imaginaries to shape the course of scientific and societal progress. In another study in the same year, focusing on political parties, Benedikter & Siepmann suggested that transhumanist political parties "will play a role in the key policy decisions of the coming years" (2016: 47). Quite recently, Szabados conducted an ideological analysis using Michael Freeden's morphological approach, reaffirming such claims, arguing that the transhumanist movement "has recently grown political branches that exert influence on policy-making by inviting transhumanist topics into the political arena [...]" (Szabados 2021: 2).

Several explanations have been offered as to how transhumanists harness political power. Allen Porter highlights that the more we witness breakthrough advances in technoscientific areas—such as nanotechnology or artificial intelligence (AI)—the more we can expect transhumanism to expand in tandem, and since recent years have witnessed a conspicuous progress in the former, it is imminent to analyse the power of transhumanism (Porter 2017). Following this line, political scientist

Klaus-Gerd Giesen (2018) argues that partly due to society entering the fourth industrial revolution,³ transhumanism has grown into the dominant ideology of late capitalist society. In short, Giesen argues that the techno-solutionist narratives brought forth by the transhumanist movement reverberates in synergy with Big Tech conglomerates, in an accelerating positive feedback loop. Especially noteworthy for this thesis, is that Giesen claims that the Council of Europe has been heavily involved in facilitating a dissemination of transhumanist ideas into society, not least by supporting projects of converging technologies (Giesen 2018: 12-13).

Lastly, a contemporary study conducted a discourse analysis on Danish technology education, arguing that transhumanist-laden sociotechnical imaginaries convey "transhuman virtues" and discursively shape national education (Tafdrup 2023, *in press*). While the above examples critically analyse the transhumanist ideology as an influential force in political fields, they do not focus on the European Union specifically. Accordingly, from what I have gathered from the aforementioned literature, the transhumanist discourse makes itself visible through at least six pillars that can be summarised as follows:

- The transhumanist discourse is often used interchangeably with a "techno-progressive", "techno-utopian", "techno-solutionist, or a "posthuman" discourse.
- It puts a strong emphasis on radically envisioned and desired futures, especially in terms of human enhancement and transcendence through emerging technologies (Porter 2017: 253; Hurlbut & Tirosh-Samuels 2016: 144, 244).
- It puts a strong emphasis on technological convergence and NBIC technologies, including genetics, robotics, artificial intelligence (AI) and bionics (Evans 2019; Rozhkov et al. 2023).

³ Although still disputable if it has occurred, the fourth industrial revolution (Industry 4.0) is believed to blur the lines between the physical, digital and the biological.

- The aforementioned technologies are frequently highlighted as means to augment the human species as well as engineering biological life at the nanolevel (Torralba 2018: 13-14).
- It conveys a strong belief that 'nature' should not dictate over humans, but that humans should exploit and dictate over nature in order to harness any unfound powers residing therein (Torralba 2018: 14).
- It puts a strong emphasis on a societal need for embracing transhuman traits, and to allow technoscientific research to pursue unhindered with minimal juridical or state interference (Torralba 2018: 14).

2.2 Research Gap

For this thesis, the relevant question is how this influence is concretely taking place in large organisations such as the European Union. The aforementioned literature has in various ways confirmed that the transhumanist movement plays an increasingly important role in discursively influencing politics and policy making in the Global North. However, a gap can be found when it comes to how transhumanism influences the European Union specifically. Indeed, some literature pinpoints or critiques the European Union for having played a role in conveying transhumanist thoughts (Coenen 2014a; Hurlbut & Tirosh-Samuels 2016; Giesen 2018), yet this is usually given limited attention.

Moreover, to my knowledge, there is as of yet no published papers examining the transhumanist discourse from a lens of human ecology or political ecology, leaving the question of how to respond to it from these disciplines largely unexplored. Accordingly, by applying the above literature as a foundation for this study, and by closely investigating historical and present-day documents, this thesis may contribute to a research gap by shedding light on how the transhumanist ideology operates specifically within the context of the European Union.

3—Theoretical Framework

In this section I present the main theoretical foundation for this thesis. The first subsection concerns the concept of sociotechnical imaginaries (3.1); the second is concerned with Foucault's notions of power, ideology and hegemony (3.2). Particularly the theory of sociotechnical imaginaries stemmed from an inductive approach and was encouraged by the data.

3.1 Sociotechnical Imaginaries

Studies on imaginary futures and how they shape political and financial decisions in the present moment, as well as people's subjective imaginations, have regained popularity in recent years. Futuristic discourses are more than shared ideas and visions, they are performative: "Positive expectations about future technologies provide guidance for activities, attract attention, [and] mobilize political and economic resources" (Chiles 2013). It has been argued that the power of sociotechnical imaginaries lies in their ability to render technology as something social, conveying idealized images of it, in which humans as subjects relate to it socially and emotionally (Hurlbut & Tirosh-Samuelson 2016: 196).

The utilization of STIs has proven useful for studying how futuristic visions shape and affect policymaking in the present, thus shedding light on otherwise imperceptible connections between visions, social dimensions and material outcomes (Hurlbut & Tirosh-Samuelson 2016: 84). At the core of the concept of STIs is to probe why certain futures are pushed for, financed and placed at the frontier of scientific progress, while others are discarded, devalued or not mentioned at all (Martins & Mawdsley 2021: 4). Partly inspired by the concept of 'technoscientific imaginaries' (see George Marcus 1995), the concept of STIs is also concerned with how technoscientific utopias can become enmeshed in thought-processes within an entire population about a collectively held, planetary, and

benign future vision (Jasanoff & Kim 2009: 15). Accordingly, sociotechnical imaginaries (STIs) are defined as:

collectively held and performed visions of desirable futures [...] [that are also] animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology (Jasanoff 2015: 28).

What is at focus is how imaginaries serve as attainable futures embodying such an allure as to give states and institutions incentives to attempt to realize them (Jasanoff & Kim 2009: 120). Consequently, such imaginaries function to halt or accelerate a selected array of technoscientific decision-making processes and thus also shape society and science in a wider context (Martins & Mawdsley 2021: 4). Equally important then, is "asking *why* the imaginary futures of the past have survived into the present" (Barbrook 2007: 10, original emphasis). The concept of STIs bears resemblance with Foucault's concepts of 'technologies of power' and the alienating effects inherited in technological societies (Behrent 2013), and shares many characteristics with discourse, power and ideology (Jasanoff & Kim 2015: 29).

At the core of the concept of STIs is to regard imaginaries as being *performative*, that is, affecting dimensions at a societal, local and global level (Jasanoff & Kim 2015: 28). In the words of Barbrook, who focuses on the imaginaries of artificial intelligence, the present can be seen as "the future in embryo" which in turn "illuminates the potential of the present" (2007: 8). In this sense, the discursive power of transhumanism lies in its ability to convey alluring future scenarios, which, if given sufficient political attention, shape and mould the present (Dickel & Schrape 2017; Hurlbut & Tirosh-Samuels 2016: 13).

While Yaron Ezrahi's work *The Descent of Icarus* (Ezrahi 1990) depicted a positive perspective on imaginaries born out of technological advancement, Michel

Foucault's idea of 'panopticism', by comparison, became an example of a dystopian imaginary (see Foucault 1977). Moreover, even if Jeremy Bentham's design of the Panopticon prison ended as an overly expensive, failed and never-realized project, Foucault's aim was to show how the Panoptic model nonetheless played a role in shaping present society (Garland 2014: 374). In this regard, even if the transhumanist project will end up as a grandiose flop, my scope of interest is how the transhumanist discourses and its imaginaries shape society as well as our perceptions of our natural environments.

3.2 Foucault and Power

Both within Foucauldian and Gramscian perspectives, the notion of power draws from Machiavelli's concept of 'relations of force', in which power is perceived as splintered into millions of magnets diffused throughout society, ever-present, constantly pulling and pushing in all directions (Daldal 2014: 149). On this note, Kendall & Wickham suggest looking at power as a form of energy: volatile petrol fuel splashing inside a combustion engine. Thus, although power exists and is exerted in modern society, power is not necessarily harboured and possessed in solid form. Rather, systems of power are as fragile and imperfect as a petrol-driven combustion engine—a process rather than a thing, which, like that of a bicycle, requires constant motion not to dwindle (Kendall & Wickham 1999: 48-49).

3.3 Ideology and Gramsci's Notion of Hegemony

Drawing from Gramsci, ideology has been defined as "a conception of the world that is implicitly manifest in art, in law, in economic activity and in the manifestations of individual and collective life" (cited in Fairclough 2010: 62). Ideologies are representations which solidify the support for power relations and domination and can thus be seen as one modality of power. Ideology serves to sustain power relations by "producing consent or at least acquiescence" in a population (Fairclough 2010: 73). Within FDA, discourses are viewed as "great

ideologically laden forces" trickling down through human affairs and ways of seeing the world (Wooffitt 2005: 154). Any ideology effectively persists by being disguised as non-ideological, by maintaining a naturalised character of common sense within a population (Fairclough 2010: 67). While ideologies can be highly durable, especially those supported by hegemonic powers, they are simultaneously under constant threat to be rebuked.

In terms of understanding power as relational, Foucault and Gramsci shared many similarities, although Foucault placed less emphasis on ideology as a mediator of power (Daldal 2014: 165). Bluntly put, Foucault "leaves ideology alone" (McCoy 1988: 71). Althusser, for instance, building on Marxism, imbued ideology with omnipresence and as something 'material' and socially performative (Daldal 2014: 158-159). Yet, to Foucault, ideology is merely an abstraction, a mosaic of ideas, and insufficient to account for power relations in society (Daldal 2014: 166). On this note, however, this thesis moves closer to Althusser and Gramsci in terms of placing importance in ideology as materially and performative within society. However, it rejects Althusser's view, and stands closer to Foucault, on the idea that humans are bound to subject themselves to ideologies (Daldal 2014: 159).

While the idea of hegemony can be traced back to writings of Lenin, it was later crystallised by Antonio Gramsci while analysing capitalism (Fairclough 2010: 61). In the words of Gramsci, the State represents "hegemony protected by the armour of coercion" (Gramsci 1972: 263). Hegemony, thus, is perceived as a form of leadership, power and domination which seeps through economic, political and ideological domain of modern society (Fairclough 2010: 61). Often assuming a temporary and unstable nature, hegemony is constantly rejuvenated through the integration—rather than direct coercion—of subordinate classes. This integration and consent of the population is achieved through the means of ideology, which subsequently is embedded in discourse (Fairclough 2010: 61). Ultimately, the power of discourse lies in being perceived of as normal (Daldal 2014: 157; Fairclough 2010: 130).

In a Gramscian sense, the analysis of power relations from a 'top-down' perspective implies looking at how the 'political society' (e.g., the government or an institution) exerts domination by producing discourses which steer and direct 'civil society' (schools, churches, etc), thus controlling the overall population (Bates 1975: 353). Although Foucault rejected the idea that power is concentrated within the State, he adopted most of Gramsci's notions of hegemonic civil society (Daldal 2014: 162, 164). To that end, the analysis of this thesis will be carried out through a Gramscian understanding of hegemony as sustained through a selective set of discourses.

4—RESEARCH METHOD

In the foregoing sections, I have outlined my theoretical framework and key concepts. This section is concerned with the methods employed in the study, as well as selection of data and limitations.

4.1 A note on philosophy of science

In this thesis I will work within a poststructuralist and a Buddhist ontology. Poststructuralism, a foundational philosophy within Foucauldian theory, is concerned with the nature of knowledge, and where knowledge is subsequently explained through its relationship to systems of power (Robbins 2020: 71). In the poststructural approach one challenges societal categories of truth and knowledge which are often taken for granted (Robbins 2020: 71). Thus, poststructuralists epistemologically question Enlightenment concepts such as that of 'the grand narrative' and put emphasis on the power of language and discourse in terms of constituting the world and affecting the way people act and engage with it (Koch 1993: 12; Benton & Craib 2011: 166).

Lastly, I am deeply inspired by a Buddhist ontology, recognizing primarily the impermanence of things in nature, that reality is conditioned more by change than stability (Blomberg & Żywicznyński 2022: 485-486) and that human language itself can be an obstacle to our perception of reality (Inada 1988: 262). In the light of this thesis, the inspiration from the above philosophies implies that my analysis on transhumanist discourses will be made with a critical gaze on power structures as well as a habitual questioning of 'reality' and 'language' as human constructs.⁴

⁴ For an account on similarities between poststructuralism and Buddhist philosophy, see for instance Ng (2012), 'Buddhism, Poststructuralist Thought, Cultural Studies: A Profession of Faith'.

4.2 Data gathering methods

Foucauldian discourse analysis (FDA) may be carried out on a wide variety of data in the form of any symbolic system (Willig 2013: 130). Documents are generally viewed as reflecting reality and have been described as "windows onto social and organizational realities" (Foster et al. 2021: 514; see also Vaughan 2006). Since this research is concerned with a qualitative discourse policy analysis, the main sources are primary data in the form of policy documents.

The material selected for this study comprise reports and documents published between 2001-2023. This timeframe was chosen because the NBIC initiative was enacted first in the year 2001 which becomes the starting point for the genealogical analysis of this thesis, followed by a discourse analysis in a present-day context. Many of the reports were published on the official website of the European Commission (commission.europa.eu). For the genealogical analysis, a handful of reports stem from the US and the National Science Foundation, and a few other sources are oral presentations in text form (i.e., Italian Innovation Day), accessible through the internet. The conclusions are supported by secondary data derived from government sources or previously conducted research on the topic.

The main case for the discourse analysis constitutes the report 'Digital Futures: A Journey Into 2050 Visions and Policy Challenges' (European Commission 2016) which consists of 119 pages and is accessed through the archived platform of the European Union. This report can be regarded as a narrative which is part of a specific agenda (Willig 2013: 131). The reason why this report was chosen was because it proved to be a compelling example of an official EU report imbued with an explicit transhumanist agenda and beset with many futuristic visions, making it also an interesting case to study from the lens of sociotechnical imaginaries (STIs).

Rationale for adopting a Foucauldian-inspired analysis

Initially, I had decided to conduct a critical discourse analysis (CDA) using the framework of Norman Fairclough and his three dimensions of power. However, although they both share many similarities (Wooffitt 2005: 154), for this thesis I found FDA to be more suitable, mainly because FDA places more emphasis on the ways in which discourses lead to real-world effects (Foucault 1971). Moreover, a Foucauldian approach is particularly concerned with analysing power relations from a top-down perspective, in which both power and discourse are seen as being constantly transformed and thus also only fully understood if situated in a historical context (Foucault 2000: 343; Langdrige 2004: 341). I believe this historical focus is crucial for understanding present-day transhumanist practices on a deeper level. Lastly, in contrast to critical discourse analysis (CDA), I am less concerned with micro-levels of grammatical usage and vocabulary, and more interested in the 'macro-level', that is, the content of discourses, which makes FDA more fitting (Jones 2019: 78; Langdrige 2004: 338).

4.3 Data Analysis Method

Discourse

The definition of discourse varies widely across fields and this thesis will adopt a Foucauldian perspective. To Foucault, discourses are "ready-made syntheses, those groupings that we normally accept before any examination" (Foucault 2004: 91). Following Parker, a discourse is "a system of statements which constructs an object" (cited in Wooffitt 2005: 146). In this sense, a discourse is a panoply of practices and social relations imbued with identity and meaning to the extent that we operate within it (Heywood 2004: 128). Accordingly, language not only reflects our perception of reality but structures and shapes it (Foster et al. 2021: 484).

For these reasons, there is much value in analysing discourses as it can elucidate how they have been financially funded, ideologically promoted, and sustained by opaque power relations (Fairclough 2010: 100). Moreover, discourses can perpetuate inequalities as they facilitate or constrain what is being said and by whom (Wooffitt 2005: 156; Willig 2013: 130). This can be brought to the surface by exploring how particular societal systems make discourses "true" (Robbins 2020: 71), acknowledging that any object is invariably perceived by humans through a range of linguistic filters (Foster et al. 2021: 484).

Conversely, in the ways that "medical discourses about 'folly' and 'unreason' produce the mentally ill person", discourses are productive (Kendall & Wickham 1999: 34). Moreover, in a Foucauldian sense, societal order is maintained through voluntary internal discipline rather than external coercion. As Benton & Craib describe it:

We are not made to behave in a particular way, but *we make ourselves* behave in that way. We are not the more or less free-choosing agents of rational choice theory or any other of the interpretive approaches – rather, these very ideas of choice and freedom ensure our subordination (Benton & Craib 2011: 169, emphasis added).

With regards to this thesis, transhumanist discourses about *enhanced* humans, *synthetic* biology and *perfected* nature can produce a reality in which "normal" nature and "normal" humans appear increasingly defect, archaic and overall incomplete (Hurlbut & Tirosh-Samuels 2016: 7).

Foucauldian Discourse Analysis

Originating in Foucault's critique of power relations within psychiatry, and drawing from Derrida, FDA is discourse analysis which is Foucault-oriented, meaning mainly that it is concerned with discourse as understood by Foucault, and puts a

focus on power relations and politics (Langdridge 2004: 338; Wooffitt 2005). As Foucault was interested in the ways in which knowledge, power and discourse are interconnected, FDA shares many resemblances with other approaches such as critical discourse analysis (CDA). To name a few, in both FDA and CDA the analyst attempts to unravel implicit goals and ideologies veiled within discourses, seeking to expose forms of oppression be it racism, sexism, or other injustices. The researcher also takes a clear political stance (Langdridge 2004: 338). Moreover, it is commonplace within both approaches to apply a Marxist analysis on the ways in which capitalism determines social relations (Wooffitt 2005: 154).

As already emphatically stressed within academic literature employing FDA, there is no coherent method or methodology for FDA (Langdridge 2004). As there remains a constant debate about how "Foucauldian" the works of scholars really are, anyone determined to conduct an FDA will be presented with a myriad of examples of analysts who explicitly adopt Foucauldian ideas yet fail to actually incorporate them (Kendall & Wickham 1999: 49). This is equally relevant for this thesis, and I will start by stating generally accepted core principles of FDA.

Even if there is no mutually agreed template for FDA, there are many guidelines (Kendall & Wickham 1999; Potter & Wetherell 1987; Parker 1992; Willig 2013). Common within these guidelines is the notion to stick to an understanding of discourse as it was defined by Foucault (i.e., a "corpus of statements") and to focus on power relations both from a social and historical perspective. FDA is concerned with the so-called 'discursive economy' in a society, which implies the extent to which particular discourses are accessible to people (Willig 2013: 130). Also, it aims to identify discourses and explore how discourses function to *position* people in various ways (Langdridge 2004: 338). FDA puts emphasis on sociopsychological patterns in which relationships between discourse and subjectivity affect how people perceive the world, think and feel (Willig 2013: 130). Lastly, FDA involves a unique historical perspective where the analyst traces historical contingencies (Kendall & Wickham 1999: 5). For instance, it might be tempting to look at the

recent eruption of transhumanism as an inevitable outgrowth of capitalism, even if it might just as well be explained by, to borrow from Max Weber, "unintended consequences" (cited in Kendall & Wickham 1999: 6).

Foucauldian discourse analysis is heavily influenced by poststructuralists which since the mid 1900s and together with structuralists have contended that language constructs reality (Burr 2015). For instance, to Saussure, "language is not a function of the speaker; it is a product that is passively assimilated by the individual" (Saussure 2004: 59). Thus, language is taken to be closer to a technological tool which humans utilize to tailor a favoured reality. Says Foucault (1980: 131):

Truth is a thing of this world: it is produced only by virtue of multiple forms of constraint. And it induces regular effects of power. Each society has its regime of truth, its general politics of truth: that is, the types of discourse that it accepts and makes function as true.

Accordingly, one is interested in these taken-for-granted truths, with an underlying assumption that the more 'common sense' a discourse is, the more power is embedded beneath it (Burr 2015).

Willig's list

As a methodological framework, I will mainly make use of Willig's list which offers a six-stage approach to conducting a Foucauldian Discourse Analysis (Willig 2013: 131). This six-stage approach is an abridged version of a more extensive list by Parker (1992) yet is commonly used for FDA (Langdrige 2004: 339). Willig's six-stage analysis is summarised below (Table 1). Due to the agile nature of FDA, however, one should approach lists with caution (Langdrige 2004: 340), and while Willig's list may incorporate many essential parts in FDA it should not be seen as a complete formula (Shorthouse 2016: 65; Willig 2013: 136). To that end, Parker's

(1992) recommendation of including power of discourse will be considered in this thesis, as well as guidelines offered by Kendall & Wickham (1999: 42).

Table 1: Summary of Willig's six-stage approach.

Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
<u>Discursive Constructions:</u> How the object is constructed	<u>Discourses:</u> How these constructions differ and relate	<u>Action Orientation:</u> Achievement of construction in particular contexts	<u>Positioning:</u> Subject positioning and who we become within discourses	<u>Practice:</u> How constructions legitimize or prevent opportunities	<u>Subjectivity:</u> Social and psychological effects of discursive positioning

Genealogy

Genealogy is a form of critical history in that it "traces how contemporary practices and institutions emerged out of specific struggles, conflicts, alliances, and exercises of power, many of which are nowadays forgotten" (Garland 2014: 372). Inspired by Nietzsche, Foucault's genealogical analysis implies that "development is seen not as a smooth or dialectical process forward but as a series of discontinuous shifts" (Benton & Craib 2011: 167). Broadly put, albeit offering no chiselled-out procedure for analysis, the concept of genealogy allows the researcher to be suspicious and critical towards unfolding societal events both in the past and in the present (Bowman 2007). By tracing how past events have shaped, weakened or reinforced power relations today, one is able to conduct what Foucault called a "history of the present" (Garland 2014).

Since discourses are historically situated, paying attention to historical events is important as they may act as catalysers leading up to a particular contemporary discourse (Langdridge 2004: 341). According to Parker (2015) it is crucial to

include a historical perspective in FDA. A genealogical analysis has the potential to show "that institutions and practices we value and take for granted today are actually more problematic or more "dangerous" than they otherwise appear" (Garland 2014: 372). This also fits with this thesis's lens of sociotechnical imaginaries (STIs), in which the analyst is concerned with how hegemonic visions are historically produced and how they come to relate to power and technology (Martins & Mawdsley 2021: 12). Lastly, this shares common grounds with intertextuality which is a common concept in Critical Discourse Analysis (CDA), in which contemporary communicative events are related to earlier events (Jørgensen and Phillips, 2002: 74). The above perspectives will be considered for the genealogical analysis of the NBIC initiative.

4.4 Limitations, ethical considerations and reflexivity

There are limitations to this study. To begin with, while the analysis traces some instances of the transhumanist discourse, the findings are limited to a selected number of documents, and the results might have looked different had a larger body of material been incorporated. Moreover, the analysis could have been further strengthened if it included a financial analysis of the transhumanist movement to thoroughly understand its power relations (i.e., a "follow the money" approach). Also, in-depth discussions on philosophical, religious and ethical aspects of transhumanism have been omitted.

The concept of external validity is relevant for this thesis, as much of the analysis is based on one case study, from which the findings could be criticised for not being generalizable. Countering this, contrary to survey research, the evidence provided from my analysis aims more towards raising awareness than to produce generalizable findings (Foster et al. 2021: 61). Thus, the reliability and validity of this research involves a relation with the readers, both examiners and lay people, and in critically judging how it has been conducted as well as how trustworthy the results and findings are in relation to the analysis carried out.

The researcher should always consider how one's perspective may shape the outcome of research (Willig 2013). Due to the specific ideological nature of transhumanism, my background in human ecology is relevant. During the process of this research, I considered on several occasions how my interaction with the studied literature affected me, as I stumbled upon worldviews that in many respects contrast with mine. With regards to this, as a researcher, I have to the best of my abilities adopted an objective approach. Lastly, since the empirical basis for this thesis, and the analysis thereof, constitutes public official EU documents, no particular ethical aspects have been necessary.

5—ANALYSIS

5.1 Overview

Analysing discourse, in this case the transhumanist discourse, may unravel systematically constructed worldviews, imaginaries and 'truths' as mediated from powerful actors (Khan & MacEachen 2021). To that end, this section is divided into two parts. The first part (Part 1) seeks to answer the first research question (RQ1) by conducting a genealogical analysis on the NBIC initiative starting in the early 2000s. This will also situate the transhumanist discourse in a historical context to allow for a "history of the present" (Garland 2014: 367). The next part of the analysis (Part 2) interrogates the Digital Futures report (EC 2016) which is also the principal data for the discourse analysis. The data is systematically examined using Willig's abridged six-stage list, with key Foucauldian concepts in mind (Kendall & Wickham 1999). The discourse analysis seeks to answer RQ2.

The purpose of this thesis is to explore in what ways the transhumanist discourse influences policy making within the European Union. The research questions (RQs) are as follows:

1. In what ways did the NBIC initiative pave the way for present-day transhumanist practices within the EU?
2. What transhumanist discourses emerge within the EU's report 'Digital Futures' from the year 2016?
3. Building on the answers to RQ1 and RQ2, what can this tell us about viewing the European Union as a vehicle for transhumanist thought, and how can we understand these implications in a broader socioecological context?

5.2 Analysis Part 1: A Genealogical Analysis of the NBIC Initiative

To start with, 'NBIC' is an acronym for nanotechnology (N), biotechnology (B), information technology (I) and cognitive sciences (C). The idea of 'NBIC *convergence*' is that a fusion of these four research fields will create a technoscientific shockwave leading to highly powerful inventions. The main reason why the NBIC initiative is important for understanding contemporary power relations of transhumanism is because the NBIC initiative was one of the first explicit historical cases in which the transhumanist ideology transcended from cyberculture and was successfully inoculated into science and policy-making on a national level (Hurlbut & Tirosh-Samuels 2016: 181). The NBIC concept is not neutral but in many ways political and ideological, with its adherents hoping that modern technoscience, as a result of a convergence of disciplines, will steer society into a new era guided by transhumanism (Van Est et al. 2014: 12-13). On that note, following Barbrook, examining the NBIC initiative as a transhumanist forum to propagate their visions "is a requisite for understanding their contemporary iterations" (Barbrook 2007: 11).

The first signs of the NBIC initiative brings us to the US in the early 2000s. In December 2001, the National Science Foundation (NSF) organised a workshop with revered scientists, leaders from the military industry (DARPA) and the US government, including NASA, along with representatives from the Bush Administration and the US department of energy. The purpose was to discuss cutting-edge technologies and address ways to harness the potentials of these, in particular with regards to human enhancement, human-machine interface and radical life-extension. This was taking place during a time in which computer scientists' optimism of the global network and of post-industrial globalism reigned supreme—despite economic disparities and *jihadi* terrorism (Barbrook 2007: 8). Consequently, by facilitating the implementation of NBIC convergence in modern society, "organizers hoped to harness this new knowledge for a radical

augmentation of human form and function" (Khushf 2007: 185). The report also emphasized military benefits from NBIC convergence such as bioengineering, robots, and nanotechnology as well as equipping soldiers with exoskeletons and enhanced visual capacities (Khushf 2007: 188). Key organizers of the workshop were senior transhumanists Mihail Roco and William Bainbridge, who would later publish a hefty report of the workshop, titled 'Converging Technologies for Improving Human Performance' (Roco & Bainbridge 2002). This report has many radical concepts, and many transhumanist visions, including human-machine integration, radically enhancing human bodies, attaining engineered immortality, and embarking on interstellar travel. The report also taps into the sustainable development discourse (Khushf 2007: 187), highlighting environmental "benefits" such as genetically modified foods, digital agriculture and using "bionanotechnology for advancing sustainability". Speculatively, these can be seen as attempts to make transhumanism appear compatible with environmentalism. The report was summed up as follows:

Moving forward simultaneously along many of these paths could achieve a golden age that would be a turning point for human productivity and quality of life. Technological convergence could become the framework for human convergence [...] (Roco & Bainbridge 2002: 6).

In another report published the same year, Mihael Roco writes:

We envision the bond of humanity driven by an *interconnected virtual brain* of the Earth's communities searching for intellectual comprehension and *conquest of nature* (Roco 2002: 80, emphasis added).

The idea of an interconnected virtual global brain is a recurrent theme in transhumanist imaginaries (see Part 2). One to react to the NBIC report was the ETC Group, warning that "[if] government, academia and industry succeed to make

the [NBIC initiative] a reality", then much of the human species "will be firmly in the hands of a convergent technocracy" (ETC Group 2003). Moreover, according to José Julián López, the legitimacy of NBIC convergence technologies, such as nanotechnology, hinges on the ability to integrate in the discourse narratives such as risk, hype and "science as transcendence" (López 2008).

From a transhumanist perspective, the human species of the 21st century stands at a perilous crossroads between being stuck in a deadly embrace of decaying old lifeforms with only religion as a yardstick, or accelerating technoscientific advancement and subsequently treading into a cyborg transhuman paradise (Khushf 2007: 189; Frodeman 2019: 132). Referring to Nietzsche, Bainbridge writes: "Converging Technologies may be that tightrope, of which Nietzsche wrote, that can carry us to that other side" (ibid.: 189-190). However, should the tightrope of emerging capitalist technologies snap, and transhumanists fail in globally amalgamating academic disciplines, humans are forever doomed to dwindle within the thousand-year-old game of "unenhanced" nature, the circular flow of carnage, violence, suffering and death.

This unease of missing out on the big galactic shot, not least due to thermodynamic challenges, was accentuated more than half a century ago by astronomer Sir Frederick Hoyle:

With coal gone, oil gone, high-grade metallic ores gone, no species however competent can make the long climb from primitive conditions to high-level technology. *This is a one-shot affair*. If we fail, this planetary system fails (Hoyle 1964: 64, emphasis added).

This one-shot conundrum sheds light on a deeply ingrained accelerationist vein endemic in much of transhumanist thought (see analysis Part 2). With our backs still feeling the gutter from the arduous, cold Middle Ages, transhumanists cling to technoscience as the gateway into a sublime future, a perfected digital paradise—

also referred to as the Virtual Kingdom or the 'singularity'. The latter is an eschatological event when artificial intelligence (AI) bursts into a self-replicating intelligence supernova, which futurologist Ray Kurzweil predicts will occur in the year 2045 (Coenen 2014a: 767). William Bainbridge, having been diligently working on incorporating the NBIC initiative and transhumanist concepts into technological assessment policies within the European Union (Coenen 2014a: 756), writes that in the event of the singularity we should "no more lament the loss of the bodies that we leave behind than an eagle hatchling laments the shattered fragments of its eggs when it first takes wing" (Bainbridge 2004: 119).⁵

As Richard Barbrook explains, every step of convergence becomes one step closer to digital transcendence, "towards the final goal of artificial intelligence" (Barbrook 2007: 8). Little short of secular techno-faith, William Bainbridge firmly believes that technoscience will establish "a dynamic new creed to replace religion" (cited in Khushf 2007: 189). Philosopher Jean-Pierre Dupuy (another key role of the NBIC initiative), argues that NBIC convergence should not be seen as a novelty but rather a continuation of a long history of ideas going back to Kant and Rousseau, with the yearning for perfection and unshackling from nature as two distinct features of humanity—now spiralling of fear and excitement in the apogee of late capitalism (Khushf 2007: 189). Strains of proto-transhumanism can indeed be tied to Francis Bacon who believed that the main goal for humanity is to attain dominion over nature and the whole cosmos (Merchant 1990: 169). Conversely, the ideology of transhumanism has seized the Enlightenment mentality but elevated it to extreme measures (Allenby & Sarewitz 2011).⁶

If we look at the NBIC initiative as a procession of century-long ideas of enhanced humans stewarding evolution, how does the NBIC concept relate to transhumanism,

⁵ The religious aspects of transhumanism, commonly referred to as 'dataism', have been widely studied. See for example 'The Digital Trinity—Controllable Human Evolution—Implicit Everyday Religion' (Latzer 2022).

⁶ On this note, a true genealogical analysis on the NBIC discourse arguably stretches hundreds of years back in human history, and the events since the year 2001 and onwards offer critical insights but certainly not the whole picture of the roots of transhumanism.

and what influence can one assume that the NBIC workshop has had on modern society? It has been argued that the notion of NBIC convergence is not inherently transhumanist but that it has a propensity to circulate within documents and texts with clear transhumanist traits (Coenen 2014a: 761). Louis Ujéda, having analysed the NBIC discourse, goes one step further, arguing that "the NBIC convergence is not another term for interdisciplinarity or for the usual process of the integration of technology, it is *a transhuman utopia based on capitalism*" (Ujéda 2019: 58, emphasis added).⁷ For instance, according to the most influential transhumanist think tanks, the Singularity University (SU) founded in 2008, the "convergence of technologies" is their main goal (Singularity University 2023). Although the influence of the Singularity University on the European Union is yet to be thoroughly investigated, a simple search shows that executive officers employed at the World Economic Forum (WEF) are intimately associated with the Singularity University while also writing high-level reports for the European Union (World Economic Forum 2023).

As Bruno Latour has offered, technoscience has had a snowball effect for centuries, initially "a weak rhetoric becoming stronger and stronger as time passes" (Latour 1987: 103). Following this, Jürgen Habermas posits that the planned interdependence of science and technology has fused "into a primary force of production" (Habermas 1973: 5). The NBIC initiative, then, having been so persistently invoked by transhumanists, was not ephemeral but expanded outwards and reverberated internationally, soon being adopted both by Canadians, Russians, Swedes and Norwegians, as well as forming the basis for a High Level Expert Group within the European Union (Khushf 2007: 188).

According to Giesen (2018: 12), the Council of Europe has "expressed support for all projects working toward the convergence of [NBIC technologies]". However,

⁷ The term 'convergence' can certainly be used in a variety of other contexts, not necessarily having anything to do with transhumanism nor the NBIC initiative as such, for example the convergence hypothesis in economics.

under supervision by Alfred Nordmann, the EU took a more precautionary approach to the NBIC initiative, focusing more on a collective rather than individual enhancement, effectively muzzling the "transhumanist undertone" (Hurlbut & Tirosh-Samuelson 2016: 220). The 'Foresighting the New Technology Wave' initiative was established by the European Commission in 2004 to further investigate the potential effects as well as societal and ethical implication of Convergence Technologies (CTs), with the wish "to relate these CTs to the European environmental and policy goals" as well as help Europe "reap the considerable benefits of NBIC convergence" (Nordmann 2004: 11).

In the summer of 2005, during the United Nations conference 'the World Summit on the Information Society', focusing on strategies to boost the digital economy, the EU Commission confirmed that:

For many years, experts have been talking about digital convergence of communication networks, media content and devices. [...]. Today, *we see digital convergence actually happening*. Voice over IP, Web TV, on-line music, movies on mobile telephones – all this is now reality (cited in Barbrook 2007: 8, emphasis added).

The above quote points at EU's enthusiasm for the convergence concept, several years after the initial NBIC workshop. Not long thereafter, another report from the European Parliament (EC 2006: 4) states that "the first steps towards NBIC convergence have already been taken". At Lund University, the EU-funded "Artificial Hand" project, focusing on man-machine interface, is an example of an NBIC convergence project (Khushf 2007: 188; Lund University). Similar EU-funded projects have evolved, with the hopes of exhibiting a form of "research excellence" within the European Union. In 2012, on behalf of the European Parliament, the Rathenau Instituut released the report 'Making *Perfect Life*' (2012), in which the authors systematically present and envision how the NBIC convergence is a powerful phenomenon, stating also that redesigning life to become

perfect is "the ultimate goal" for technological development (Van Est & Stemerink 2012: 132). Another example was the flagship project called the Human Brain Project (HBP) in 2013 which received a funding package of €1.9 billion by the European Commission. This project would soon be subject to heavy criticism from media outlets for being evidently driven by a transhumanist agenda (Hurlbut & Tirosh-Samuels 2016: 232-233). Perhaps one of the most striking examples of an EU document with an incontrovertible transhumanist agenda is the Digital Futures report (EC 2016; see analysis Part 2). Not only does this report make several references to NBIC convergence, to transhumanism as a desired future and to the transhumanist association *Humanity+* (EC 2016: 49), but it also asserts that some form of digital utopia will arise in the coming decades as long as the European Union keeps "[f]ollowing the philosophical path of trans-humanism" (ibid.: 34).

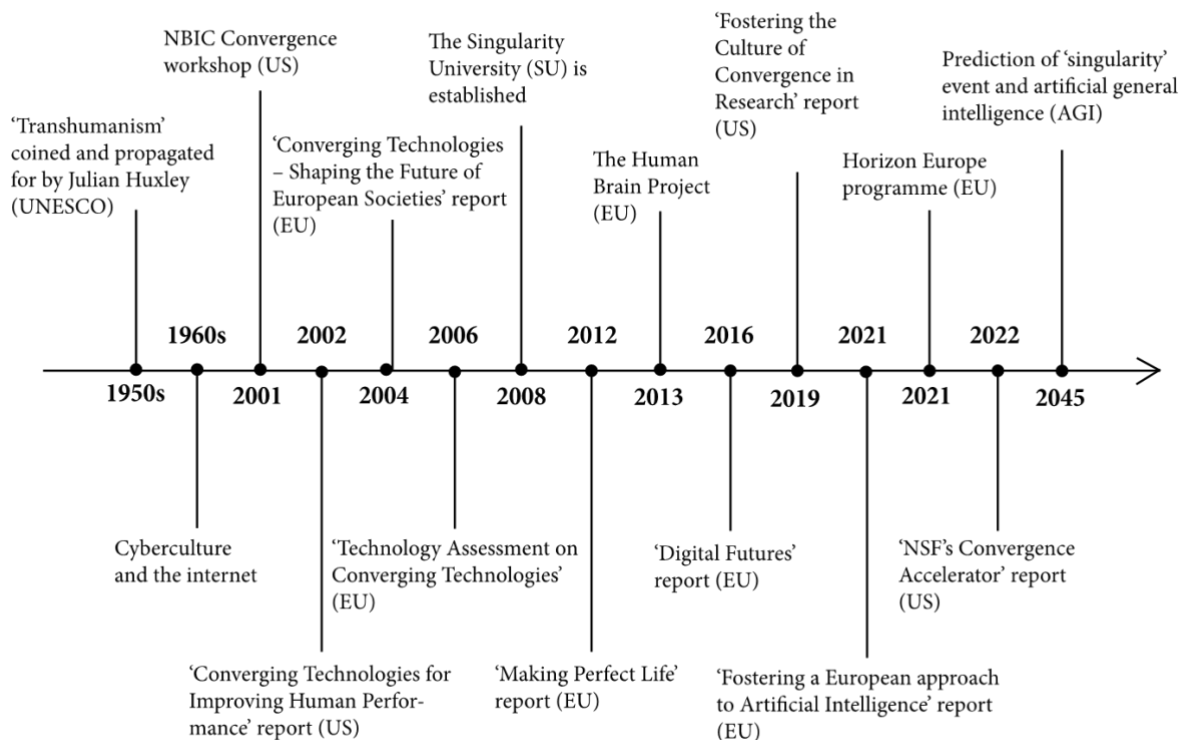


Figure 1 Timeline showing the survival and outgrowth of the NBIC initiative since the year 2001.

What signs are there then of transhumanist influence in contemporary publications? As of today, the NBIC convergence as a term might not be explicitly prominent in official documents, although the concept is far from being a thing of the past (see Figure 1). Speculatively, the NBIC concept has persisted and expanded, but shapeshifted and morphed into other more societally accepted discourses.

In the year 2020, transhumanist Mihail Roco, the co-founder of the NBIC initiative, stated that "[t]he tools of the digital economy, IT, and AI facilitate the establishment and operation of a global neural-like network [...]" and asserted also that the convergence concept remains a priority within the US academies (2020: 3-5). Other than passively espousing techno-utopias, there is a deliberate, performative steering to be observed (Giesen 2018). This is confirmed by the Rathenau Instituut, who admit that early documents produced from the NBIC initiative explicitly communicated wishes of "introducing transhumanist thinking into publicly funded research" (Van Est et al. 2014: 13). This is crucial to take into consideration when looking at contemporary cases. For example, the Research Council of Norway (*Norges Forskningsråd*) recently called for research proposals on "Technological Convergence", offering financial funding equal to more than €9.8M (Forskningsrådet 2022).

Within the European Union specifically, the concept of converging technologies still endures (see Table 2). In 2018, on mission by the EIT Digital, Europe's largest digital innovation programme, Roberto Saracco gave a highly optimistic and quasi-eschatological lecture about the imminent, European transhuman future, imploring people to embrace the golden digital age and to surrender to the machine (Saracco 2018). Recently, Finland urged the European Union to steer towards Industry 6.0 with a blazing focus on quantum computing, digital twins, and—in line with Robert Saracco—"the digitalization of everything" (Annanperä et al. 2021: 25). Moreover, the ongoing "Convergence Accelerator" programme executed by the National Science Foundation (Baru et al. 2022) is practically an effort to accelerate the transhumanist agenda.

In a report published by the US National Academies titled 'Fostering the Culture of Convergence' (2019) with senior transhumanist Mihael Roco listed as a participant (2019: 61), the report makes no mention of transhumanism, indicating that the convergence discourse is a way to speak about the fostering of transhumanism without having to mention transhumanism. For instance, the Digital Futures report (EC 2016) made it clear that the Horizon 2020 project of the EU will be "building on the eleven themes delivered" from the report—of which most are transhumanist themes (2016: 30, 119). However, skimming through reports from the Horizon 2020 programme, only scant traces of the themes appear. Presumably, this can be explained with a quote found in a report titled 'Convergence of Disciplines', published by Science Europe, in which the authors write that "Horizon 2020 is an excellent example of convergence *even though it is not specifically mentioned*" (Science Europe 2014: 4, emphasis added).⁸ All of the above cases can critically be seen as a panoply of ideologically biased reports with a clear intent of imbuing—however covertly—academic research with transhumanist traits.

Why would this be a priority for transhumanism as a movement? Put loosely, the emergence of NBIC technologies is not something which merely ameliorates the transhumanist foundation. It means more than that: transhumanism is wholly contingent on NBIC technologies and thus also dependent on financial funding of and discursive support for NBIC convergence. At the cornerstone of the movement, if not its very survival, lies the technological artefacts wrought from technoscience, because only nanotechnology, AI, digital twins and similar advancements have (so they believe) the potential to realize the goals of transhumanism, be it radical life extension or artificial general intelligence (AGI).

⁸ Another approach would be to look at the meaning of images on official websites of the European Union; many of which can easily be interpreted from a transhumanist lens. Take for instance the emblematic revision of Michelangelo's painting *The Creation of Adam* but where God's hand has been replaced by a robot hand, that is, the human-machine merging or more specifically the singularity. For reference, see the image under the section "The European AI Alliance" at: <https://digital-strategy.ec.europa.eu/en/policies/european-ai-alliance>.

The NBIC initiative thus becomes inexorable for the movement both discursively and technologically. Discursively, because these narratives render transhumanists as "master builders" of the planet (Venkatesan 2010: 6), and technologically because NBIC technologies are imbued with the gateway to materialize transhumanist imaginaries. For instance, synthetic biology requires the marrying of nanotechnology and biology (Roco 2002: 10), and the movement would thus have a propensity to convince modern researchers to focus on such converging aspects. If this doesn't succeed, transhumanist stand naked, as wizards with broken staffs, as powerless as 19th century industrialists would have been without the steam engine.

With this in mind, several scholars underscore that "transhumanist future visions have increasingly become relevant for policy actions dealing with new emerging science and technology" and that the NBIC initiative is a first example of this (Hurlbut & Tirosh-Samuels 2016: 181). The Defense Advanced Research Project Agency (DARPA) is generously funding the European Union for conducting research in NBIC convergence and other transhumanist projects (Hurlbut & Tirosh-Samuels 2016: 10). Accordingly, emerging technologies and much of technoscience are being shaped by techno-utopian ideologies, financed by governmental agencies and corporations, and ultimately fuelled by transhumanism (Dickel & Schrape 2017). As explained by Barachini & Stary (2022: 14), it is precisely the panoply of "biotechnology, robotics, information technology, molecular nano-technology, and artificial general intelligence" which constitutes the technological shockwave to achieve the goals of transhumanism.

Table 2: EU documents indicating clear transhumanist influence.

Document, year	Region	Stated purpose	Signs of the transhumanist discourse
Industry 5.0: A Transformative Vision for Europe (2022)	European Commission	Research and Innovation	Europe needs to "radically transform its economy" (p. 3) partly through "nanotech" (p. 12)
Draft Report: on artificial intelligence in a digital age (2021)	European Parliament	Special report on AI	Writes that the digital revolution is shaped by "fast convergence" (p. 8) and urges EU to "increase investment" in AI, robotics and nanotechnology (p. 29)
Fostering a European approach to Artificial Intelligence (2021)	European Commission	Guidance for AI development	"Developments in industrial and service robots are converging and reinforcing each other" (p. 45), the need to "accelerate" investment in AI (p. 2)
Our European Future: Charting a Progressive Course in the World (2021)	European Parliament	Developing innovative research	"Immortality" or "transhumanism" remains a quest "that will [...] require a robust debate" (pp. 8-9)
Building Trust in Human-Centric Artificial Intelligence (2019)	European Commission	Guidance for AI development	Exploring how "convergence can be achieved" with peripheral countries (p. 8)
Italian Innovation Day (2018) ⁹	EIT (body of the European Union)	–	Propagating for a future of "Augmented Humans" and "Transhumanism" (p. 20)
Digital Futures (2016)	European Commission	Foresight methodologies	Towards a "trans-humanistic era" (p. 7)
Foresight Services to support strategic programming within Horizon 2020 (2014)	European Commission/RAND	Foresight methodologies	Discusses transhumanism and "The path towards singularity" (p. 6)
Global Europe 2050 (2012)	European Commission	Research and Innovation	Converging technologies will "help Europe" with "societal challenges" (p. 34)
Making <i>Perfect</i> Life (2012)	European Parliament	Technology Assessment	NBIC convergence as "key factor" in science (p. 4)
Technology Assessment on Converging Technologies (2006)	European Parliament	Technology Assessment	A "vision assessment" with "possible strategies for European politicians, even a Transhumanist one" (p. 3)
Converging Technologies – Shaping the Future of European Societies (2004)	European Commission	Foresight methodologies	The aim "to relate [converging technologies] to the European environmental and policy goals" and "reap the considerable benefits of NBIC convergence" (p. 11)

⁹ For a full transcript of the lecture, see appendix.

This genealogical analysis suggests that the NBIC initiative since the early 2000s was a contingent event which reverberated from the USA, survived, and has since become a discursive channel for amplifying transhumanist ideas (see Figure 1). The present-day transhumanist ideology did not originate from the NBIC initiative but emerged from it stronger than ever, today backed by several multinational corporations, organisations and governments. The analysis thus points towards the likeliness that the NBIC initiative has extended its grasp in contemporary times, being still present in some of the world's largest political organs such as the National Science Foundation (NSF) and the European Union (EU) (see Table 2). The NBIC initiative, although largely forgotten today, served as a discursive catalyser, invoking the transhumanist ideology, with reverberating and still performative global political ramifications.

Viewed in the light of governmentality, the contingencies of the NBIC initiative continue to shape the present, steering modern research so as to remain within the 'directional beam' of transhumanism (Miller & Rose 1990: 1). This is the beam not only of capital productivity but of a normalization of digitalization, virtualization, synthetic biology and artificial intelligence. Moreover, the NBIC initiative might have been unexpectedly nurtured by the climate crisis, as the latter allows for technoscience to emerge as the solution. This is evident in the ways that transhumanist documents tap into the sustainable development discourse, arguing for "sustainable development using NBIC tools" (Roco & Bainbridge 2002: 9) or "eco-friendly" transhumanist megacities (EC 2016: 88). On that note, the recent evolution of the transhumanist ideology expresses itself in an intricate web of discursive and financial actors. Thus, transhumanism can be seen both as an outgrowth of capitalism and an exacerbation of a century-long mentality of the Enlightenment, although the significant power it harnessed from the NBIC initiative might have been aleatory.

To sum up, this genealogical analysis locates the NBIC initiative as a powerful discursive forum which historically allowed the transhumanist ideology to

erratically transcend its limited cybercultural confines, slowly permeating international bodies such as the European Union. With that in mind, the current flurry of transhumanist influence in universities, organisations and social media, should be seen as a process in motion, something which can gain even more momentum in the coming years depending on how much society allows for it, but it can just as well stagnate and fall. In the next part (5.3), using this genealogical analysis as a bedrock, the contemporary transhumanist discourse is examined within the context of the European Union.

5.3 Analysis Part 2: FDA on the Digital Futures (2016) Report

In the previous section the genealogical analysis of the NBIC initiative was related to present-day transhumanist practices. This section constitutes the discourse analysis of the Digital Futures report (2016), using Willig's six-stage approach (Willig 2013). The discursive object I have chosen is the 'transhuman transition' which is referred to both implicitly and explicitly throughout the report. The analysis was conducted using the following questions:

1. How does the report discursively construct the transition to a transhuman era?
2. What are the similarities and differences in the report's constructions also when located within wider discourses?
3. What does the report achieve by constructing the transhuman transition the way it does?
4. What are the subject positions in the report's constructions within a frame of techno-utopianism?
5. In what ways do the constructions within the report give space to or restrict opportunities for action?
6. By situating oneself within the given discursive constructions, what subjective ways of seeing and being are allowed with regards to the transhuman transition?

The Digital Futures report (EC 2016) was a foresight project on the initiative of the European Commission (ibid.: 5), mediated through the EU 'Futurium' platform. Launching in 2011, the project spanned over several years and engaged more than 3 500 participants, students as well as stakeholders (ibid.: 6). Although the Digital Futures project came to an end in 2013, the final report laid the foundation for the €80 billion budget EU Horizon 2020 research funding programme which is ongoing (ibid.: 20, 119).

Table 3: Structure of findings from the analysis.

Stage 1: Constructions	Stage 2: Discourses	Stage 3: Action Orientation	Stage 4: Positioning	Stage 5: Practice	Stage 6: Subjectivity
Transformative (converging) technologies	Medical	Powerful innovation	Brave and open-minded	Pushes NBIC and artificial intelligence (AI) research	Fascination for the fruits of capitalism, i.e., artificial intelligence (AI)
Embracing the transformation	Governance, feminist	Rational and courageous	Optimistic about development	Ignoring alternative, low-tech transformations	Hopeful about the future
Societal disruption	techno-utopian, governance	Imminent, desired and unpreventable	Brave and open-minded	Society guided by technoscience	Hopeful about the future
Accelerationism	Governance, economy, Promethean	Seizing the opportunity	Brave and opportunistic	Pushes NBIC and artificial intelligence (AI) research	Being part of the frontier of progress
Blurring of boundaries	Governance, economy	Signs of the 'singularity'	Brave and open-minded	Pushes for development in Internet of Things (IoTs) and Internet of Bodies (IoBs)	Intriguingly embracing a human-machine merging
Ultra-connectivity	Techno-utopian	Legitimizes acceleration of Internet of Things (IoTs)	Open-minded, philanthropic	Pushes for mass-digitalization in all aspects of society	Feeling connected with the world through the internet
Enhancement & augmentation	Medical	Humans becoming superhumans	Philanthropic	Pushes research in robotics, bionics and exoskeletons	Intrigued by visions of transcendence and posthumanism
Sustainability	Sustainable development, techno-utopian	Reconciling 'NBIC' and 'smart' with 'sustainable'	Responsible	Pushes research in nanotechnology and geoengineering	Tranquilizing climate anxiety and eco-anxiety

Stage 1: Discursive constructions

The first step involves identifying how the report talks about and discursively constructs the transhuman transition, both implicitly and explicitly.

How does the report discursively construct society's transition to a transhuman era?

Transformative (converging) technologies

The report focuses heavily on transformative technologies as one of the crucial elements to reach the transhuman era. The report refers to 'NBIC-convergence' (pp. 34, 36, 51, 104) and the moment 'when science will converge' (pp. 10, 112). It refers to using NBIC-convergence' to 'enhance our intelligence [...] and industrial productivity' (p. 36). The report views particularly information and communications technologies (ICTs) as something which will lead to a 'disruptive technological change' (p. 2). ICTs and other technologies such as synthetic biology and nanotechnology will 'drive major social transformations' (pp. 10, 112), 'improve the human condition', 'enhance' human capacities' and 'eliminate aging' (pp. 10, 112). The report refers to ICTs as 'the technological gateway' to a transhuman era (p. 10), and 'digital technologies' as 'the cornerstones' of this transformation (p. 117). Ultimately, the report claims that these technologies will lead to 'a new form of humanism'—a 'trans-humanism' (p. 112). The report refers to ICTs as something which will 'become an integral part of a peaceful and harmonious world' (p. 112). The report refers to a 'programmable bio-chemistry' (p. 9) which can be used for 'cleaning the environment' (p. 9). And 'industrial robots' will 'revolutionise manufacturing, agriculture, safety [...]' (p. 9), and 'nano-robots' and 'swarm intelligence' (p. 9) will be 'defeating cancer forever' (p. 36). There will be 'unlimited computing power' (p. 112). The above references construct the transhuman transition as a major societal event coming to fruition through the convergence of transformative (NBIC) technologies.

Embracing the transformation

The report refers to the need for European governments 'to embrace the opportunities of the digital transformation' (p. 5) from which we 'see the benefits every day' (p. 2). The report refers to 'regulatory systems' which will be created 'to allow mainstream use of enhancement technologies' (p. 37), and that there will be a '[w]idespread adoption of enhancement implants by students' (p. 36). The report states that since the world is changing rapidly, 'Europeans need to embrace change and look at the future with mindfulness and responsibility' (p. 116). The world will need to agree on new 'rules of the game' (p. 95). There will have to be 'a new alliance between science and society' (p. 82).

The report refers to the 'adoption of empowering technologies' as something which will require 'right timing' and not assume a 'too-rapid development' (p. 67). Eventually, 'people will trust the invisible, embedded, ubiquitous ICT infrastructure that makes it all possible' (p. 113). The report writes that 'EU values' will have to be 'encoded' into the future transhumanist design (p. 102). An 'open' ethical framework will be 'celebrated [...] by the masses' (p. 103). The report also refers to the '[d]igitalisation of life' which 'supports growth of equality' (p. 69), partly because '[w]omen [...] have a greater voice in a digitised world' (p. 69). The report constructs the transhuman future as challenging but as something which will eventually become normatively accepted, celebrated and culturally embraced.

Societal disruption

The report writes that the 'singularity is approaching' (pp. 6, 116). It refers to radical life-extension creating 'super-centenarian societies' (p. 7) and 'ultra-centenarians' (pp. 39, 57). It refers to the transition to 'a trans-humanistic era' (p. 7) and 'a society with neither classes nor hierarchies' (p. 8) in which citizens will 'do what they like' (p. 7). The report refers to the 'potential, emerging trans-humanity' (p. 33) in which

the most advanced 'cyborgs' and 'robots' will 'reach self-awareness' (p. 34). It says that the 'mechanisms of life' will be 'fully understood' (p. 39) and that there will be 'an end to terminal illness' (p. 40). It refers to 'data' as becoming 'the new currency' (p. 72). It refers to AI's ability to quickly 'make fact-based decisions'. Consequently, it refers to a time when the '[f]irst cyborg leader (Artificial Intelligence) is elected' (p. 78) which will be 'a victory for public acceptance of cyborgs/AI [...]' (p. 78). It refers to 'a vision' beyond the digital transformation and 'a preferred future' in which 'humans [...] and living organisms' will 'be enhanced with nano-scale devices' (p. 112). This could 'dramatically change our existence' (p. 113). It refers to the technological potential 'to transform [...] fiction into reality in less time than people may imagine' (p. 113). The report refers to 'a new European renaissance' and writes that humanity 'is at a turning point' (p. 117). These aforementioned references construct the transition as unstoppable, emerging, preferred and guided by AI.

Accelerationism

The report writes that since digital technologies are 'the cornerstones' of the transhuman transition, they 'should be at the centre of political debate, and provide a foundation for the political agenda at all levels' (p. 117). It writes that Europe and the rest of society needs to be 're-thinking social contracts to adapt to the digital transformation' (p. 68) as society will be 'massively multi-cultural' (p. 101), and there is a 'need to take faster decisions' (p. 68). The report states that obstacles to the transition are 'conservative values' (pp. 68, 101). Society will have to be 'speeding up production' to complete the transformation (p. 88). The '[a]ccelerated technological progress' will be best approached through 'digital literacy' (p. 117). The report states that Europe 'requires more visionary and agile policies' in which policy makers need to 'put science and technology at the centre of future policies' (p. 116). It writes that EU policy makers should '[b]e courageous and put their hands into the promethean flame of disruptive innovation' because 'the time for action is now' (p. 118). The report stresses the need to spread the digital transformation to 'under-served populations' (p. 61). The report writes that states should not adopt a

'reactive strategy' but should be 'planning for the best' rather than 'attempting to avoid the worse' (p. 114). The above references discursively construct the transition to a transhuman era as something which should be scientifically, culturally and politically accelerated.

Blurring of boundaries

The report writes that the transformation will lead to a 'blurring [...] between reality and virtuality' (pp. 8, 9), and 'between human, machine and nature' (pp. 8, 35). In education, 'boundaries will increasingly blur' due to 'digitally enhanced classrooms', 'virtual education spaces' (pp. 7, 61), and 'neuro-implants' (p. 61). Also, 3D printing technology will be 'blurring the roles of consumers and producers' (p. 7). The report refers to the ways in which future human enhancement 'blurs the notion of identity' and 'what it means to be human' (p. 32) partly due to 'the contamination of biology with technology' (p. 32). Consequently, there will be a need for 'ethical governance' when the 'integrity of all beings [...] as interconnectedness between humans, machines, and other life forms accelerates' (p. 32). The report refers to a 'watershed' in how humans will relate to nature, as people will increasingly see themselves as 'a part of nature' rather than 'outside of it' (p. 96). The report refers to ICTs as something which will 'very soon [...] permeate people's lives so deeply that they no longer distinguish digital technologies from their environment, or even from themselves' (p. 110). It refers to the 'next great technological revolution' where 'ICT and biology blend' (p. 110). In the transhuman era, 'the border between global and local, virtual and physical dimensions will disappear' (p. 112). The above references construct the transhuman transition as something to do with a total blurring of boundaries.

Ultra-connectivity

The report writes that the internet will expand into a 'global connector' through which humanity will evolve into a 'hyper-connected human' (pp. 7, 96). The internet

will 'connect bits and atoms at the speed of light' (p. 7) and will 'continue to grow' and 'connect everything' (p. 9). It refers to a 'policy making 3.0' based on the idea of a 'collective brain' and 'emerging collective intelligence' (p. 13). It refers to a future 'super-internet' (p. 46) and that society will need to ensure that there will be 'internet access for both people and machines' (p. 47). The report refers to this new 'ultra-connectivity' as something which will lead to 'The Singularity' when 'computers will surpass the human brain' and humans 'augment [...] themselves' (p. 49). Moreover, data will be 'hyper-distributed' and will be mined at 'ultra large scale' (p. 50). Consequently, 'many facets of life' will move into 'Massively Online' platforms (p. 50). The report states that by 2030 'everything will be interconnected' (p. 50) and humans will spend more time inside 'virtual worlds' instead of with 'flesh-and-blood people' (p. 79).¹⁰ It writes that 'virtual relationships' will become 'prioritized' (p. 80), as the new generation of children will be 'born digital' (p. 110). The report refers to 'ubiquitous advertisements' (p. 79) and that Big Data will lead to 'the quantified self' in which both personal and physical data becomes 'an accepted part of life' (p. 85). Ultimately, the report writes that the 'future network paradigm' will 'connect anything, anybody, anytime, anywhere on any device' (p. 92). The above references construct the transition as a positive event of technologically conditioned ultra-connectivity.

Enhancement & augmentation

The report writes that in a few decades, 'a new form of human - a trans-human - will emerge' (pp. 7, 32) which will lead to an 'Enhanced Mankind' (p. 34). It writes that 'ICTs and bio-medicine will fundamentally improve the human condition and greatly enhance [...] [our] capacities'. In short, humans' abilities 'will be augmented' by the means of 'technological implants' (pp. 7, 32). It writes that people will be 'more empowered than ever' (p. 7), and 'future cyborgs' and 'soft robots' will be 'built out of biological components' (p. 32). It writes that most of the world

¹⁰ The Metaverse can be seen as a clear effort to achieve this goal.

population will become 'Genetically Enhanced Humans (GEH)' (p. 34). Moreover, digital fabrication will 'empower individuals' (p. 77). It writes that 'neurological download or other enhancement' will allow any human to be engineered into a 'creative genius' (p. 79). It refers to the 'augmentation of humanity' (p. 96). These aforementioned references construct the transhuman transition as an event which will greatly enhance and augment the human species to nearly supranatural heights.

Sustainability

The report writes that 'trans-humanism' might 'reduce dependency on unsustainable technologies [...]' (p. 33). It writes that radical life extension will 'create new worldviews' in which people will be 'embracing [...] sustainability' (p. 40) and that photonics technologies will solve issues of 'energy efficiency and carbon emissions' (p. 50). It refers to megacities which will be 'eco-friendly' and 'energy-sustainable' (p. 88). It refers to sustainable transportation achieved by 'the large scale implementation of electric cars' (p. 92). It refers to 'smart homes' and 'smart cities' and a DIY economy which 'will flourish' (p. 117). There will be 'carbon neutral cities and green cities' and citizens will eat 'healthy gene-based food' (p. 93). It refers to a transition from 'industrial, centralised agriculture to permaculture', turning 'everything around us into a food-producing resource' (p. 96). It refers to a 'Hydrogen Society' (p. 97). It writes that fusion and hydrogen will begin 'weaning the world from fossil fuels' (p. 98). It writes that 'biotechnology' will offer solutions to climate change and will thus become 'more frequently applauded than protested by most people' (p. 99). It refers to advancing development in 'green technologies' such as solar panels (p. 98), and that megacities will 'maintain bio-diversity and functioning eco-systems' (p. 103). It writes that researchers will build 'digital [...] models of the world' to perform 'simulations of natural phenomena' (p. 111). It refers to a transhuman future in which technology 'will become energy-positive and environmentally-friendly' by 'harnessing potential energy sources at the nano and micro scale' (p. 112). The above references construct the transition as the

completion of a truly sustainable, environmentally sound society in which advanced technologies, hyper-digitalization, megacities and biodiversity flourish unitedly.

Stage 2: Discourses

In what ways can the above constructions be related to wider discourses? And what are the similarities and differences between the report's constructions of the transition to a transhuman era? The transition to a transhuman era is constructed in at least eight different ways, as having to do with **transformative (converging) technologies, embracing the transformation, societal disruption, accelerationism, blurring of boundaries, ultra-connectivity, enhancement & augmentation, and sustainability**. This second stage is concerned with locating the aforementioned constructions within wider discourses in modern society, and then juxtaposing the constructions to see how they contrast with each other. The constructions will be highlighted in bold, and wider discourses in italics. The following wider discourses bear resemblance and resonate with the identified discursive constructions.

Prometheanism

The Promethean discourse holds that economic prosperity has no limits and ought to be a key priority in modern society. Processes are often spoken of in mechanistic metaphors, and the world is seen as a machine whose bits can be rearranged and tailored to our needs.

Sustainable Development

The sustainable development discourse puts focus on sustaining capitalist progress without compromising the health of ecosystems. Although there are holistic tendencies, humanity is generally regarded as hierarchically above the natural world.

Feminism

The feminist discourse revolves around understanding the ways gender, beliefs and stereotypes relate to power dimensions and class structures.

Medical

The medical discourse in its broadest sense is concerned with curing, healing, therapy, suffering and disease.

Governance

The governance discourse focuses on interactions between state-society, institutions and partnerships.

Techno-utopianism

The techno-utopian discourse refers to a future utopia created through the means of advanced technoscientific development.

Similarities and differences between the various constructions: The constructions resemble and differ from each other in the following ways.

The **transformative technologies** construction is compared with **embracing the transformation**. When the report talks about **transformative technologies** it draws from the *medical* discourse on several occasions, for example by claiming that converging technologies will 'eliminate aging', 'improve the human condition', (pp. 10, 112), and that they will be 'defeating cancer forever' (p. 36). This differs slightly from the **embracing the transformation** construction which relates more to the *governance* discourse, referring, for instance, to forming new 'regulatory

systems' in order 'to allow mainstream use of enhancement technologies' (p. 37) and '[w]idespread adoption' within the population (p. 36). It also discusses the need to prepare communities and states for the transformation (p. 68), for instance, by forming 'a new alliance between science and society' (p. 82). The report also taps into the *feminist* discourse, stating that the '[d]igitalisation of life' will lead to 'growth of equality' as women will 'have a greater voice in a digitised world' (p. 69).

The construction **societal disruption** is compared with **accelerationism**. These two are somewhat linked. The **societal disruption** construction depicts an imaginary of a glorified future and strongly draws on the *techno-utopian* discourse, as modern society is said to be at the brink of 'the start of the next age' and the coming of 'a biotechnology age', or a 'golden age' (p. 110). It also draws on the *governance* discourse by predicting that governments will experience a 'significant devolution of [...] responsibilities' (p. 103). On this note, the **accelerationism** construction describes the way to realize the utopia. It draws both from the *governance* discourse and the wider *economy* discourse, as society needs 'to take faster decisions' (p. 68) and industries need to be 'speeding up production' in order to 'complete the transformation' (p. 88). It also locates itself within the *Promethean* discourse, defining a need for EU policy makers to 'put their hands into the promethean flame of disruptive innovation' (p. 118).

The **blurring of boundaries** construction is compared with **ultra-connectivity**. When the report writes about **blurring of boundaries**, it taps into the *governance* discourse, stressing the need for 'ethical governance' due to blurring of spaces, things and entities (p. 32). It also draws on the *economy* discourse as new technological inventions will be 'blurring the roles of consumers and producers' (p. 7), and it coincidentally taps into an education discourse such as predicting the norm of 'virtual education spaces' (p. 7). This differentiates from the **ultra-connectivity** construction, which draws mainly from the *techno-utopian* discourse by elaborating how technology will eventually 'connect everything' (p. 9), leading to 'The Singularity' (p. 49).

The **enhancement & augmentation** construction is compared with **sustainability**. The **enhancement & augmentation** construction draws from the *medical* discourse by referring to 'bio-medicine' as something which 'will fundamentally improve the human condition' (p. 7) as well as the 'enhancement of safety and healing' (p. 33). In contrast, the **sustainability** construction differs by strongly tapping into the *sustainable development* discourse, referring to future cities becoming 'eco-friendly' and 'energy-sustainable' (p. 88) and 'carbon neutral' (p. 93). Conversely, this construction draws from the *techno-utopian* discourse since the envisioned sustainable utopia is spoken of as being established only through unhindered technoscientific progress.

Stage 3: Action orientation

What does the author(s) of the report achieve by constructing the given discursive objects the way that has been done?

This stage is concerned with examining what is gained by constructing the transhuman transition as it is done through the different constructions and their positions within the report. As outlined earlier, eight constructions have been identified: **transformative technologies, embracing the transformation, societal disruption, accelerationism, blurring of boundaries, ultra-connectivity, enhancement & augmentation, and sustainability.**

In the foreword, Neelie Kroes writes that our age is "characterised by disruptive technological change" from which we "see the benefits every day" (p. 2). Although transhumanism isn't mentioned explicitly, in the third paragraph we are told that digital technologies "will continue to affect every aspect of our lives" and that there are "powerful forces in play" which will "trigger [...] massive innovation" (p. 2), thus relating to the **societal disruption** construction. She also writes that due to technology, "centenarians [will become] common place" in the future (p. 2), which

connects to the **transformative technologies** construction. Further down, she claims that the report has "scientific rigour" (p. 2), which seems to aim at informing the reader that despite the unprecedented, fantastical or frightening changes embedded in transhumanism, they are rooted in scientific ground and are credible. She also taps into the *economy* discourse by stating that our "enthusiastic adoption of ICT translates into economic growth" (p. 2). Lastly, she writes that those reading the report "will find their minds opening wider to the range of potential outcomes" (p. 2). This last sentence relates to the **embracing the transformation** construction, in which we are encouraged to adopt an "open" perspective to embrace the transition more light-heartedly (p. 103). I interpret the above settings as the author aiming to prepare the reader for the report, planting a seed of the transhuman transition as something societally disruptive, imminent, powerful and exciting.

Further down in the report we read that future megacities will be "eco-friendly and energy-sustainable" thanks to a system in which "[a]ll elements of the city will be connected to a higher supra-network" (p. 88), thus embedding both the **sustainability** and the **ultra-connectivity** constructions within the same paragraph. This can be interpreted as an attempt to reinforce an argument that sustainability is reconcilable and compatible not only with a hyper-connected society and smart megacities but also with a transhuman society.

In the end of the report, under the title "Three messages from futurizans", the author reproduces the **embracing the transformation** construction, stressing that "Europeans need to *embrace* change" (p. 116, emphasis added). Further down on the same page, the author refers to futurologist Ray Kurzweil, probably to substantiate the following claims that "[t]he singularity *is* approaching" and that humans "*will be enhanced* with bio-technological add-ons" (p. 116, emphasis added), thus connecting to the **societal disruption** and **enhancement & augmentation** constructions. The prediction of the singularity also acts as an example of **blurring of boundaries**. The author also takes an approach of opportunism, stressing that policy makers "need to seize the opportunities" of the

transformation (p. 116). On the following page, the author asks: "What should be the rules of the game in a hyper-connected society?" (p. 117), thus tapping into the *governance* discourse. The author also makes use of the **ultra-connectivity** construction, which justifies technological advancements such as the Internet of Things (IoTs). On the same page further down, we are reassured that "humanity is at a turning point" and that the transhuman transition will be realized insofar as we let "digital technologies [...] be at the centre of political debate" and accelerate technoscientific progress (p. 117), thus reiterating the **accelerationism** construction.

The above segments are interpreted as an attempt to persuade the reader of the report's main message: that the transhuman era, and the singularity, are unstoppable forces approaching modern society at a rapid pace, but that these changes, albeit challenging, should be embraced and yearned for. Moreover, in the end of the report, the future scenarios such as the singularity are spoken of as scenarios which *will* happen, instead of in other places in the report when it is posed as a question ("Is society reaching a "singularity point"?") (p. 113). The report thus manages to make the transhuman transition appear as taken for granted.

Stage 4: Positionings

Having previously identified and compared constructions within the text, and located them in wider discourses, in this stage we are concerned with *subject positions*, that is, the ways in which people identify themselves through the scope of various discourses.

By locating oneself within a techno-utopian discourse, one positions oneself as positivist, optimistic, philanthropic, as walking at the forefront of evolution, as directing society, and as being adequately "courageous" to "point the wind of progress in a new direction" (p. 114). One is not afraid of disruptive transformations and challenges but embraces the changes through an "exploratory mind-set" (p. 12),

in other words, brave and open-minded. This distinguishes one substantially from stubborn conservatives and luddites (p. 68). This also draws on a wider Promethean discourse, as one is brave enough to seize the "opportunities" (pp. 46, 114) of change, be it electricity, digitalization or nanotechnology. The **embracing the transformation** construction positions the majority of the world population as "diverse, maybe wise even [...]" (p. 115), which puts them in need of guidance.

Stage 5: Practice

In this stage we examine how discourse relates to practice. Through the various constructions and subject positions highlighted in the previous stages, in which a particular worldview is created, we are here concerned with how the report's discursive constructions either enable or restrict opportunities for action.

The identified discursive constructions (Stage 1) allow for an accelerationist and uncritical approach to, and funding of, technoscientific progress. They allow for pushing policymakers and politicians to buttress and reinforce nanotechnology, bio-engineering, mass-digitalization and artificial intelligence (AI). However, it restricts alternative views that would question the validity of accelerating economic growth or the validity of advancing high technology in general, in a time of uncertainty and ecological degradation. Moreover, spiritual perspectives are not included in the report. For instance, the idea of augmenting humanity could imply something entirely different from a Buddhist perspective, having nothing to do with neither digitalization nor any set of advanced technologies. When the report argues that digital technologies "should be at the centre of political debate, and provide a foundation for the political agenda at all levels" (p. 117), it obstructs voices and opinions of people who have a completely different political and philosophical view on technology and progress. To sum up, the discursive constructions in the report legitimize capitalist acceleration, and notions of sustainability and welfare are constructed as something which can only be achieved through technoscience such as nanotechnology or geoengineering.

Stage 6: Subjectivity

The final stage is concerned with tracing the power embedded in discourses by analysing how they relate to and affect personal experience, that is, subjectivity. Since discourses enable and reinforce certain worldviews, both in terms of seeing the world and in being part in it, discourses construct social and psychological realities. Conversely, in this speculative stage we are interested in the consequences of adopting subject positions with regards to someone's experience: what is being felt and experienced as a result of taking up certain subject positions?

As the report highlights, the emerging digital transformations come with challenges in terms of ethics, cultural views, equality and climate change (p. 2). The report constructs the severity of these sets not as obstacles but as challenges which will be overcome through co-operation, courage and embracement of technoscientific artefacts. Consequently, by positioning oneself within a techno-progressive or transhumanist discourse, one might feel genuinely calmer about the state of the climate crisis and the world in general, since the report depicts a scenario in which such problems will be easily tackled as long as digital technology can advance unhampered and engineering is endowed with unequivocal trust. Since the report constructs the transhuman era as imminent and buoyant, it would be both futile and unintelligent as an individual to resist it. The transformative and benign nature of digital technologies (human enhancement, life extension, etc) is paramount throughout the text, leaving those who would contest it as expressing signs of conservatism, short-sightedness, irresponsibility and cowardice. Correspondingly, the report's subject positions allow for a perspective on technological progress as filled with excitement and good-natured change.

Summary

The findings of my research were presented based on Willig's (2013) six-stage method. The Digital Futures report (EC 2016) offers a variegated assemblage of constructs, scenarios and imaginaries that draw especially from the Promethean, techno-utopian and transhumanist discourse.

6—Discussion

6.1 Overview

This section provides a discussion of my research findings that will be interrogated through the lens of sociotechnical imaginaries (STIs) and Gramsci's theory of hegemony. Mainly, I interpret how the European Union amplifies the transhumanist ideology and subsequently aids in reinforcing a particular regime of truth. This chapter addresses the last research question: is the European Union acting as a vehicle for transhumanist thought, and how can we understand these implications in a broader socioecological context?

6.2 The European Union as a mouthpiece for transhumanist thought

The purpose of this thesis was to examine whether the European Union to some degree functions as a vehicle for the transhumanist ideology, and why this should be a socioecological concern. The analysis was carried out from a poststructuralist perspective, recognizing that politics are "involved in the shaping of meaning" and that power instigates itself by being involved in the creation of dominant discourses (Bacchi 2009: 267). The findings from the analysis indicate that the European Union has acted, and still acts, as a mouthpiece for transhumanist thought.

To begin with, the empirical data from the genealogical analysis (Part 1) reinforces the notion that the transhumanist discourse in the past decades has shaped technoscientific development (Coenen 2014a; Giesen 2018; Benedikter & Siepmann 2016). Conversely, the transhumanist discourse was deliberately expounded by the US government in the beginning of the 2000s, and henceforth transcended into more agile forms, being adopted by the EU and in a few cases explicitly inoculated into EU-published documents such as the Digital Futures report (EC 2016). This also supports the claim that the transhumanist influence into global politics and education is an ongoing phenomenon (Szabados 2021; Tafdrup

2023). From a top-down Gramscian perspective (Bates 1975; Daldal 2014), transhumanism can be seen as a dominant ideology which harnesses power by embedding itself in discourses. Moreover, its exerted power becomes increasingly volatile the more the imaginaries become 'common sense' (Burr 2015). For instance, the more the EU invests in and channels the transhumanist discourse—in which one of the core aspirations are to radically steer modern society into "a biotechnology age" (EC 2016: 110)—the more the EU helps in normalising the transhumanist ideology. This would strengthen Foucault's notion that dominant discourses are *deliberately* manufactured by governments and experts to construct social realities and perceptions of the world (Foucault 2000: 345).

Secondly, what is noteworthy with the case of the Digital Futures report (EC 2016) is not necessarily that the document discursively radiates a transhumanist agenda, but rather that it gained such strong support from the European Commission (see Analysis Part 2). Not only was the document a crystallization of the 'Digital Agenda for Europe', but it expresses an explicit aim to inspire EU policy making to adopt so-called "desirable visions" (EC 2016: 5). These desirable visions, as it turns out, appear to imply a peculiar one: a "trans-humanistic era" (2016: 7); a hyper-digitalized 'Virtual Kingdom' which is to be achieved by placing the European Union on "the philosophical path of trans-humanism" (2016: 34). Consider then that Neelie Kroes—then Vice President of the European Commission—praises the report for being mind-opening and deems it to be "scientifically grounded" (2016: 2). Even more noteworthy is that the report claims to have laid the foundation for the European Horizon 2020 programme (2016: 119). This leads us to the "*how*"-question, that is, how does the transhumanist discourse manage to influence contemporary policy making? Or more specifically, is there reason to believe that the ongoing Horizon Europe programme until the year 2027, with a budget of €95.5 billion to be invested in research and innovation, is steered within a directional beam of the transhumanist ideology?

One way to approach this question is with a theoretical support of sociotechnical imaginaries (STIs). The essence of STIs lies in understanding how financially and discursively supported future visions are placed at the frontier of scientific progress (Martins & Mawdsley 2021: 4). As Jasanoff highlights, STIs are used to "preexist and channel the spread of science and technology" (Jasanoff & Kim 2015: 33). Consider now the report by Science Europe which claims that the Europe Horizon 2020 programme is "an excellent example of [NBIC] convergence" even if it isn't mentioned (Science Europe 2014: 4). On the grounds that the NBIC discourse is synonymous with the transhumanist discourse (see Analysis Part 1), this would imply that the ongoing Horizon Europe programme has successfully adopted and perpetually reinforces transhumanist goals *without employing any explicit transhumanist discourse*. Adding to this the theory that sociotechnical imaginaries are collectively held imaginations mirroring technological projects (Jasanoff & Kim 2015), we may expect that the collective imaginations of the European population will unknowingly become shaped by transhumanist ideals and visions. This ties into the notion in political ecology that "the politics that govern the fate of natural systems are secured without resistance to the degree that this constructedness is hidden from view" (Robbins 2020: 120).

Yet, as much as this should potentially be a topic of concern, how hidden is the transhumanist discourse within EU policy documents? While the Digital Futures report (EC 2016), or the EU-backed transhumanistic lecture conveyed during the Italian Innovation Day (Saracco 2018), are both evident examples of the transhumanist ideology enthroned by European Union delegates, other documents are considerably more difficult to pinpoint. In point of fact, I would speculate that the signs are so scant that without the few meticulously selected documents brought up in the analysis, my argument would be building on sand.

However, another approach would be to look at the discourse on artificial intelligence (AI) within the EU, which has gained a striking momentum in recent

years.¹¹ To begin with, while AI is not necessarily a transhumanist achievement, it is regarded as a form of NBIC convergence and as one of the main goals of transhumanism (Venkatesan 2010). We can thus extrapolate that transhumanists would want organisations to prioritise AI development. We are also informed that transhumanists expand by adopting a "solutionist" strategy which fractures into wider discourses (Giesen 2018: 1). Lastly, we are told that "transhumanism exploits a collective imagination that privileges "innovation" as the agent of progress" (Hurlbut & Tirosh-Samuelson (2016: 14). Now, consider the following excerpt taken from a fairly recent EU report on artificial intelligence (AI):

The *fast* development and uptake of *innovative* AI in the EU can contribute to *solving* key societal challenges and *accelerate* the digital and green transitions at a time when the global AI landscape is evolving *fast* (European Commission 2021: 57, emphasis added).

With the transhumanist discourse in mind, three constructions emerge from the above citation: (a) the emergence of AI is rapid, imminent and seemingly unstoppable, (b) AI will solve socioecological challenges, and (c) the digitalization of society should be accelerated. We can thus conjecture that the current approach adopted by the EU when discussing AI and digitalisation is conditioned by transhumanist influence.¹² Arguably, on the basis of the genealogical analysis (see Part 1), the transhumanist ideology justifies continued late capitalist expansion, controls populations and surreptitiously steers civil society into a presupposed beam towards a transhuman era.

Assuming this were to be true, this brings us to the last question: how can we understand these implications within a broader socioecological context? Due to the

¹¹ Through the Artificial Intelligence Act, the European Union aims at becoming a world-leading hub of excellence for artificial intelligence.

¹² There are certainly other factors to consider. For example, the European Union has a vested interest in AI development for military and financial reasons, as a way to prevent becoming digitally subordinated to China.

scope of this thesis, and since this question demands a deep understanding of transhumanism as an ideology, only a few points will be made. To begin with, the discursive power of transhumanism should not necessarily be seen as something possessed by a powerful elite, but just as much as something which potentially affects people on a daily basis. Moreover, while transhumanist literature tends to offer a tapestry of utopias, the question of who will partake in these utopias is often left unanswered. As the discourse analysis shows (see Table 3), technological convergence appears as an impregnable future which modern society is inevitably steering towards—a virtual society beset with advertisements, synthetic artefacts and humanoid robots.

Some of the essential concerns raised from such a scenario are a fundamental threat to democracy, severe social inequalities arising from the clash between "normal" humans and radically "enhanced" humans, but also an unprecedented intensification of late capitalism (Frodeman 2019: 24; Giesen 2018: 10). Particularly the latter point could ignite a corollary of environmental harms (Varona 2021) in the forms of intensified ecological degradation,¹³ an eruption of seabed mining, and an unfathomable aggravation of alienation from the natural environment due to mass-adoption of virtual reality goggles combined with mass-migration into "smart" megacities. Following this, what is rarely touched upon is the material foundation embodied in nanotechnology, bioengineering, IoTs, and artificial intelligence.¹⁴ To put it differently, and a question in need of more research, how much fossil/renewable energy, water, soils, cheap peripheral labour, and critical rare-earth minerals will be needed for the creation of a global

¹³ I am aware that many researchers posit technological innovation as the key to reduce the ecological footprint of economic expansion. Yet there are others who assert that if measures such as embodied energy, ecologically unequal exchange or world-systems theory are included, the proposed efficiency of technological innovation dwindles. See for instance *The Ecological Rift: Capitalism's War on the Earth* (Foster et al. 2010).

¹⁴ For instance, Ray Kurzweil's techno-prophetic book *The Singularity Is Near: When Humans Transcend Biology* (2005) talks vividly about the theory of the law of accelerating returns, but not once does it mention the law of diminishing returns, supposedly because the latter risks undermining the futuristic optimism which transhumanism rests on.

technoscience consortium? How much more ecological degradation would a transhuman era necessitate?

Lastly, even if transhumanist imaginaries remain as merely imaginaries, they could still wreak havoc within and outside the concentric circles of present human society, as they encourage humans to uncritically embrace any emerging technological artefacts desperately conjured by late capitalism, making it harder for alternative views to mature without being culturally castigated. For instance, a Degrowth perspective on economic growth, or a Buddhist way of frugal living, are inherently impeding the transhumanist project—which ones do we want the European Union to espouse? Perhaps the greatest danger to be highlighted is the possibility of transhumanist constructions becoming societally "taken-for-granted" truths (Burr 2015). As large organisations amplify transhumanist imaginaries, it becomes incrementally difficult for the lay person to explore other alternatives, with the risk of credulously conceding to a nanotech-dependent virtual society. A society born not necessarily from the willpower of the population but rather from the furnace of a meticulously deployed techno-obsessive ideology.

7—Conclusion

This study provided some preliminary results indicating that the European Union acts as a mouthpiece for the transhumanist ideology. The discussion concluded that a more thorough analysis including a range of other data would be needed to better support the results. On the whole, these findings contribute to increase our understanding about how sociotechnical imaginaries such as those produced by transhumanist actors operate, as well as how similar powerful ideologies throughout time change appearances, transcend into political areas, and make use of large organisations as mouthpieces for a particular set of visions. The findings also add support for the claim that transhumanism has grown into a dominant ideology of late capitalist society (Giesen 2018).

The purpose of this study was to explore in what ways the transhumanist ideology fractures into policy documents published by the European Union in the light of recent critiques. This was developed out of the concern that the transhumanist ideology is increasingly shaping politics on a global level, with subsequent effects on people's subjective worldviews. Due to the accelerationist approach emblematic of the transhumanist ideology, its discursive influence on politics could also have calamitous consequences on our biosphere, as it may allow for technoscientific development to advance unhindered in spite of potentially irreversible socioecological implications such as resource exhaustion or species extinction. Accordingly, based on these results, the following four concerns were identified with regards to the research questions:

- With the help of the NBIC initiative in the early 2000s, the transhumanist ideology successfully transcended from cyberculture into large political bodies, and still radiates through reports published both by the NSF and the EU. Transhumanism offers a valuable asset to states, companies and organisations as it exhibits a cornucopia of optimistic futures. These may, however, only be realized by gravely accelerating technoscientific

development as well as radically reshaping society, politics and ethics, thus potentially undermining democracy.

- Moreover, transhumanism becomes particularly powerful by tapping into wider discourses such as the sustainable development discourse, enabling a green-coated transhumanism—i.e., digital agriculture, precision farming, nanopillars in photovoltaic solar cells, mass-production of electric vehicles, bionanotechnology, sustainable artificial intelligence, and 'smart' megacities. Ultimately, the transhumanist ideology is synchronously empowered by the green transition.
- Consequently, transhumanist imaginaries are effectively trivializing any socioecological ramifications that erupt from the slipstreams of continued capitalist expansion. In other words, transhumanist visions act as an ideological cushion to instil hopes for a brighter future and calm our senses in the face of planetary meltdown.
- Lastly, the European Union has for the past two decades acted, and still acts, as a vehicle for transhumanist thought. This is particularly alarming since the clandestine practices of the transhumanist ideology make it increasingly difficult for politicians, researchers, environmental activists and especially lay people to become knowledgeable about its existence and pervasiveness.

For anyone concerned about the state of the planet's ecosystems or equality, the rise of transhumanism should be a matter of concern. Within a transhumanist philosophy, biological life is not something to be cherished as it was by 18th century naturalists; nor is it to be dominated in a Promethean sense; instead, life is to be mercilessly subordinated, transformed and engineered to the fullest until rendered disposable like a thrashed piece of cloth, pointlessly dissolved under a machine-reigning solar system. When Lewis Mumford warned about modern society entering a perilous path of authoritarian technics which expresses itself in its "deep hostility to life" (1964: 4), he essentially cautioned against allowing technological development to tread into dimensions beyond the control of humans. Today, as artificial intelligence (i.e., ChatGPT) is placed in the limelight, it is imminent to

understand how technologies are exceedingly political and often wobble on top of ideologies, heavy industries and rhetorically alluring imaginaries. Thus, future research could aim at furthering our understanding about how the transhumanist ideology operates in modern society, how it affects our perceptions of reality, how it relates to ecological degradation, as well as examining the materialistic, embodied energy of technoscientific industries. As present-day society finds itself in a blazing vortex of technological novelties—in presumed syncopation with social distress and diminishing ecosystems—it is imperative to pierce through and dethrone any hegemonic imaginaries that justify technological advancement at whatever cost.

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Appendix

<p>Italian Innovation Day presentation (2018) Funded by EIT (a body of EU) Speaker: Roberto Saracco</p> <p>Available at: https://www.eitdigital.eu/fileadmin/files/2018/events/innovationdays/italy/IID2018_-_Presentation_Roberto_Saracco.pdf</p>	
<p>Front slide (slide 1):</p>	<p>Title: 'EIT Digital – Italian Innovation Day (2018): Digital Transformation and the Future of Jobs', followed by 'Trento, 29 Nov. 2018' and 'Roberto Saracco' (the lecturer).</p> <p>To the left of the slide we see a photograph of a cluster of people, men and women, attending the Innovation Day, standing by various large screens with smartphones and other similar motives. Layered on the photograph is a design of turquoise luminous dots, lines and sexagons, reminding of a connected digitalized network.</p> <p>In the top right corner we see the EIT Digital logo, with its subtitle "Driving Europe's Digital Transformation" (this logo is present on all slides).</p>
<p>Slide 2:</p>	<p>"The Future is already here, it is just ... not evenly distributed"</p> <p>Three points thereafter:</p> <p>"It is Happening" "If you can't beat them ..." "Education is crucial"</p> <p>To the right we see the same photograph as in the front slide.</p>
<p>Slide 3:</p>	<p>"It is Happening"</p>

	<p>And a figure depicting a sketch of a cloud and formations, with the words: "World of Atoms → Sensors → World of Bits → Actuators" In the middle of the cloud there is a smaller cloud with the text: "Atoms & Bits".</p>
Slide 4:	<p>"It is Happening"</p> <p>"According to WEF" "Jobs grow pushed by - Young demographics in emerging Mkts - Growing women role - Rapid Urbanisation - Tech evolution /IoT-Mobile-Data"</p> <p>"Jobs decrease because of - Artificial Intelligence - Geo-political volatility"</p> <p>Accompanied by the text to the right we see an image of statistics from 'The Future of Jobs Survey, World Economic Forum'.</p>
Slide 5:	<p>This slide is about the impact of AI automation in terms of jobs.</p> <p>"It is Happening"</p> <p>Referring to Gartner, we are told that "The worst might be over" but that "It might not be true for all".</p>
Slide 6:	<p>This slide is about the relationships between manufacturing output increasing while employment is decreasing.</p> <p>"It is Happening".</p>
Slide 7:	<p>This slide is about the same topic, here showing a picture from Bloomberg, saying "JOBS AT RISK OF AUTOMATION".</p> <p>"It is Happening".</p>
Slide 8:	<p>This slide is also about employment.</p> <p>"It is Happening".</p>
Slide 9:	<p>This slide changes topic. We see a dark blue to white gradient background, with</p>

	<p>clusters of different keywords, with the middle saying "MAP OF FUTURE JOBS". Examples of these future jobs are: Robotics; energy & the environment, Life coach, Virtual teacher, Biomedical Engineer, Shale gas engineers, Sustainability consultant, Professional gamer, Space clinicians, Asteroid miner, exobiologists, avatar developer, genetic counsellor, ubiquitous computing developer, robotics.</p>
Slide 10:	<p>This slide appears to be about the decrease in jobs in US in the future, showing a picture of the company Uber and 'THE GIG UNIVERSE'.</p> <p>"It is Happening"</p> <p>"No. Of US workers with a permanent job in 2030: 9%" (compared with present-day which is around 40%).</p>
Slide 11:	<p>This slide shows a figure of future disruptive changes that will transform employment, such as "extreme longevity", "computational world", "globally-connected world", "superstructured organizations" and "rise of smart machines". The figure is borrowed from Institute for the Future, a think tank.</p> <p>"It is Happening".</p>
Slide 12:	<p>This slide shows a conceptual map of technologies and drivers, with 'HUMANS' starting on one side, and 'MACHINES' starting on the other. Humans move towards 'AUGMENTED HUMANS' and 'DIGITAL TWINS'. Machines go towards 'MACHINE SWARMS', 'MACHINE AWARE'. To the right, both humans and machines end in 'SYMBIOTIC AUTONOMOUS SYSTEMS'.</p> <p>Examples of technologies are 'MECHATRONICS' and 'CRISP/CAS' and examples of drivers are 'DIGITAL CONNECTION'.</p>

	Moreover, in the top it says "If you can't beat them ...".
Slide 13:	<p>This slide shows again the new headline "If you can't beat them ...", followed by "Use them for strength".</p> <p>We also see a photograph of an industry worker repairing or assembling a big machine hovering above his head. The man (white), with blue jeans and dark blue sweater, is equipped with an exo-skeleton by the brand 'ekso'.</p>
Slide 14:	<p>Again the headline "If you can't beat them ...", followed by "Use them for accuracy".</p> <p>We also see a photograph of four doctors performing a surgery with the aid of highly advanced precision technology and AI.</p>
Slide 15:	<p>"If you can't beat them ...", followed by "Use them for Knowledge boost".</p> <p>We also see a big image of Elon Musk's NEURALINK and its logo.</p>
Slide 16:	It says "Education is Crucial" above a graph with Knowledge on the x-axis and Year on the y-axis. Both School, university, technology knowledge and Professional and IT expertise drastically fall during the coming two decades.
Slide 17:	"Education is Crucial", followed by "A lost battle" and a graph about acquisition and depreciation of knowledge, the latter falling in the coming years.
Slide 18:	<p>"Education is crucial", followed by "Distributed knowledge".</p> <p>We then see two pictures on top of each other. The first one is a graph with the text "The unbelievable growth of scientific knowledge", showing a drastic upward trend between the 1986-2010 (based on total PubMed citations per millions).</p> <p>The other image behind the first one shows a large pool of fish and a big white text</p>

	saying "UNANIMOUS AI – We Amplify Intelligence" (a company which provides artificial swarm technology).
Slide 19:	"Education is Crucial" followed by the text "IEEE Initiative". We then see a figure of a conceptual map with "IEEE" highlighted on several places, such as "Academia, IEEE, Industry", and "IEEE Repository", "Digital Twin", "Knowledge Obsolescence", "Knowledge Needs" and "AR/VR".
Slide 20:	<p>"Education is Crucial" followed by "IEEE Initiative", "EIT Professional School", "Digital Transformation: 108 Modules, Customisation, Industry driven, PA".</p> <p>We also see three different tables showing the total 108 modules.</p> <p>A knit-picking of the modules are as follows (the ones in italics are highlighted in color on the slide):</p> <p>Under the bracket "Digital": Transformation, Technology, Evolution, <i>Physical space and Cyberspace</i></p> <p>Under the bracket: "What is the Digital Transformation?"</p> <p><i>AI/AGI/ASI</i> <i>impact on jobs</i></p> <p>Moore's Law Fueling [sic] evolution beyond ICT Nanotech <i>Sensors/IoT</i> <i>Autonomous Systems</i> <i>Genomics</i> <i>Digital Twins</i> <i>Virtual Twins</i> <i>Augmented Machines</i> <i>Context Aware Machines</i> <i>Machine Awareness</i> <i>Machine Swarms</i> <i>Bio-Augmented Machines</i> <i>Augmented Humans</i></p>

	<p><i>Symbiotic Autonomous Systems</i> <i>Transhumanism</i> <i>Education</i></p> <p>Under the bracket: "Introduction to key Enabling technologies for Digital Transformation"</p> <p>Under the bracket: "What are the key enabling technologies?" The new frontier of manufacturing Industry 4.0 Digital transformation and smart cities Digital transformation to save resources and energy Digital transformation to improve elderly people life style Digital transformation and [precision] agriculture</p> <p>Under the bracket: "DT and ES" Under the bracket: "Why ES?".</p>
<p>Slide 21:</p>	<p>"Something to think about", followed by a graph in Italian showing public spending on education, in which US and Sweden are one of the leading ones and Italy and Portugal stand as some of the lowest.</p>
<p>Slide 22 (last slide):</p>	<p>"Thanks for your attention!". In the bottom right we see the blue logo of the European Union and the text "EIT Digital is supported by the EIT, a body of the European Union".</p>