

Master Thesis

# Deconstructing the Transhumanist Narrative: Origins, Characteristics, and Presence in Contemporary Popular Science Media

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## Abstract

The idea of transhumanism is on the rise. Especially the narratives in popular science media have contributed for a decisive part to the popularity of transhumanism. But what is transhumanism? What are the consequences of this new, technology-centered ideology? And why are they simply adopted and passed on by authors of popular science media? This thesis examines the question of whether and to what extent popular science media buy into transhumanist narratives and with what basic attitude they pass them on to their recipients. For this purpose, two research materials, on the one hand the world best-seller *Homo Deus* by the Israeli historian Yuval Noah Harari and on the other hand the ARTE documentary *iHuman* by the Norwegian film director and producer Tonje Hessen Schei, were analyzed with the help of a computer-assisted content analysis using the program *ATLAS.ti*. As a result of the analysis, the transhumanist narratives of both research materials could be identified and categorized accordingly in order to define the authors' attitude towards the narratives. Furthermore, the analysis has made it possible to formulate additional correlations to the narratives.

# 1 Introduction

The age of the *superhuman* seems to have arrived - at least that is what the technology industry is telling us with its developments in the fields of robotics, machine learning, and artificial intelligence. The current rapid technical developments and the predictions of what is conceivable and feasible in the future are triggering cultural and social discussions in every social class. Transhumanism, i.e. the idea of overcoming human limitations with the help of technology [25], is not only of interest to scientists or technological utopians like Ray Kurzweil or Nick Bostrom. Philosophers, too, have been trying for some time to emphasize not only the increasing opportunities but also the risks of this development [21].

The media in particular have contributed decisively to the virality of artificial intelligence and transhumanism as the subject of sociocultural debates by using narratives. Fictional narratives in particular play a central role. Corresponding narratives can be found, among others, in literature, in movies as well as in computer games. Especially in science fiction, technological futures are often integrated into the plot. To name just a few: The computer game *BioShock* (2007, 2010, 2013) thematizes a submerged, transhuman society in which the inhabitants of the underwater city of *Rapture* have manipulated their genes to the point of uncontrolled developments that ultimately herald the demise of humanity. In the 1997 dystopian science fiction film *Gattaca* by Andres Niccol, humanity has succeeded in deciphering the genetic code to such an extent that fatal hereditary diseases, lanky physiques or limited intelligence can no longer be inherited. People know their expected lifespan before they are born. Few people are still conceived in the "conventional" way, and those who are, have genetic defects. These people, known as "invalids", live in the shadows of society. The Culture of Iain Banks (ten novels and short stories during 1987 - 2012), gives insight into a futuristic social utopia told from ten different perspectives. Racism, sexism, and speciesism have long since ceased to exist in the Culture. This is because genetics has developed to such an extent that every individual can change his or her appearance as he or she wishes. If you like, you can grow limbs, be transformed from a humanoid into a fish, or even live as a table. Moreover, artificial intelligences are recognized as life forms, have rights, exist as sentient robots or even control units of gigantic space stations. Money and fixed laws do not exist. Death is more of an inconvenience thanks to brain backups, and war is only a means of self-defense.

What all these media formats have in common is that the thematization of artificial intelligence and transhumanism - even and especially where it takes place in purely fictional form - has a social impact. These narratives



simulate a future reality of life by dealing with the optimization of the world and of human beings. They show us how technical developments not only change our environment but also the fundamental ideas of being human, and in this way confront the recipients with basic ethical and moral questions. The relevance of such fictions can be seen, among other things, in the fact that experts from the transhumanist spectrum take up fictional technology scenarios and propagate them as a prognosis of future reality. In doing so, fictional reflections on technology often emphasize the dangers rather than the possibilities, as numerous publications show.

Thus, narratives convey coherence, meaning, motivation, and knowledge. In social structures, narratives provide belonging, motivation, and decision-making, but they can also exclude and be destructive [56]. It depends on which narratives are transported and how they are presented. There are many examples of how powerful narratives can be and how much they can unite or divide the community. We are currently experiencing this in the debate about vaccinations. Particularly in the case of complex and abstract topics such as climate change, it is even emphasized to convey knowledge not only in the form of factual reports and controversies, but also through fictional forms of representation such as narratives [75]. Narratives can thus be understood in a very broad sense as a fundamental form of accessing the world and are therefore of eminent importance when it comes to the representation and constitution of knowledge.

How effective the idea of transhumanism has become is shown by the concepts that are linked to it. Transhumanism, based on developments in the fields of robotics and artificial intelligence, is aimed at overcoming human limitations against the background of a mostly unreflective optimism towards technology [47]. Central to this are concepts of so-called human enhancement, which stand for bringing about a technological change in the sense of improving or expanding a person's physical and mental performance [65]. Such a way of thinking thus stands for optimizing and overcoming the present form of human beings through enhancement technologies, thereby intervening in evolution and achieving a state of the posthuman. This way of thinking corresponds to a demand made by the biologist Julian Huxley in the 1950s who decisively coined the term transhumanism [37]. Since transhumanism is directly oriented towards the future of human living conditions and possibilities, it is necessary to elaborate corresponding narratives, which are discursively unfolded, by means of analytical procedures in order to complement the technological discourse in the field of transhumanism. Media that take up these topics implicitly position themselves within the debate about these technologies by designing worlds in which, influenced by contemporary developments, opportunities but also dangers are reflected in equal

measure. Starting from the societal debates on artificial intelligence, robots and transhumanism in particular, the research materials of this thesis focus on the technologies and concepts of transhumanism. In doing so, it questions whether popular science media buys into transhumanist narratives.

In recent years, there has been a veritable boom in media dealing with the topic of transhumanism. To name just a few examples: *Our final invention* by James Barrat [3], *Life 3.0* by Max Tegmark [76], *Heart of the machine* by Richard Yonck [84], and countless other books, movies and games. The critical examination of this technological phenomenon and its reflections in the most diverse media is a challenge to be taken seriously. Accordingly, this thesis sets itself the task of analyzing and interpreting the mentioned technologies on the basis of contemporary media debates. The focus is on transhumanist narratives and how they are embraced by the media as a given future. For this purpose, media from popular science literature as well as from the public broadcasting space were selected. Methodologically, the underlying approach of this thesis is situated in the field of qualitative content analysis.

For the analysis conducted in this thesis, the following research question was developed to be answered using the method of computer-assisted content analysis:

*Are popular science media buying into the transhumanist narrative?*

In answering the research question, it is not a question of whether transhumanism is covered in popular science media, but primarily how much the transhumanist narratives, which will be defined and explained in the course of this thesis, have crept into the research materials and secondarily how and whether these narratives are supported, rejected or treated neutrally by the respective authors. Additionally, the general attitude of the authors towards the narratives is defined in terms of their tonality.

## **1.1 Thesis outline**

Figure 1 provides an overview of the main elements of this thesis and aims to better categorize and understand the general approach and the individual sections used:

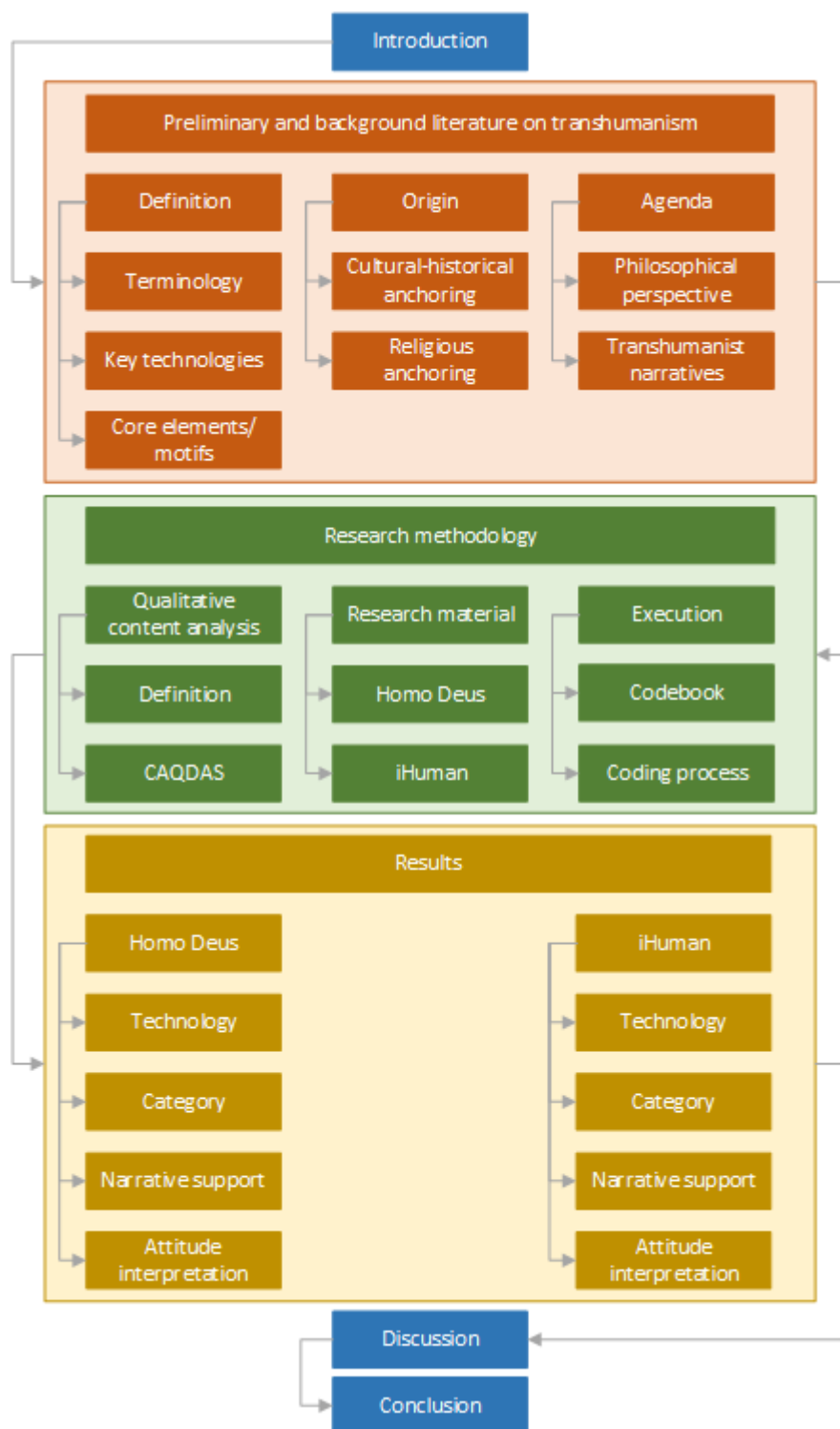


Figure 1: Thesis outline

## 2 Preliminaries and Background Literature

The research question of this thesis deals with the ideology of transhumanism and the narratives that are associated with it, which are considered in context and explained in more detail in the following literature review. In doing so, the definition, origin, and agenda of transhumanism will first be addressed. This includes, among other things, the core elements/motifs of transhumanism, but also a brief philosophical discussion of the topic. In a further step, the cultural-historical as well as religious anchoring of transhumanism is treated. In a last step, the derivation and definition of the transhumanist narratives are described.

### 2.1 Origin, definition, and agenda of transhumanism

The term *transhuman* was presumably first used from a translation of a passage from Dante Alighieri's *The Divine Comedy* [14]. In it, Virgil and Dante roam through the three realms of the afterlife and reach paradise at the end of the story, where Dante must shed his bodily form and transform himself to be able to continue through the highest heaven, the Empyreum. This process is called *Trasumanar* by Dante, which has been translated as *Transhuman* in English. The term then migrated from this philological context into the hands of certain eugenicists, such as Julian Huxley, who is one of the main figures responsible for coining the term *transhumanism* in the 1950s. Huxley advocates the idea that people should use the new possibilities of biotechnology, then called eugenics, to overcome the limitations of human beings. This approach should therefore no longer be called humanism, but transhumanism, with the core idea that if people overcome their limitations, they will then come to a full development of their possibilities [37]. By limitations, Huxley means that people can become ill, old and frail, and in principle everything else that characterizes human vulnerability. This is exactly what transhumanism wants to overcome and very often uses the narrative, as does Julian Huxley, that people are frustrated because they have to constantly struggle with diseases or have to deal with the inevitable death. Transhumanism says that human beings do not have to endure these impositions, but that they can finally find technical solutions to overcome this eternal suffering of their own miserable existence [36].

#### 2.1.1 Transhumanism as a philosophical school of thought

Transhumanism is based on humanism as a philosophical school of thought with representatives from various disciplines that developed in the mid-20th

century and has experienced a significant upswing in recent decades due to advances in biotechnology, medical technology, digitalization and artificial intelligence [25, 54]. Transhumanism aims to evolve, optimize, modify, and enhance the physical and cognitive capabilities of humans [71, 81]. In its essence, transhumanism understands human evolution as unfinished. The goal is the technological transformation of humans into posthuman beings or posthumans. In both transhumanism and posthumanism, posthumans characterize the target conception of human development. In this sense, transhumanism does not aim to overcome humans, but to develop humans in their current form into posthuman beings [27, 62, 83]. Therefore, machines are subordinate to humans within the transhumanist ideology because it is ultimately technology that optimizes humans. [47].

In contrast to transhumanism, a final transformation of the human being is sought by posthumanism, which rejects traditional categories and the thinking associated with them. In doing so, posthumanism achieves a philosophical position that exceeds current knowledge about human beings [82]. Janina Loh and Stefan Herbrechter define this posthumanism, which criticizes the conception of humanism, as critical posthumanism [34]. Critical posthumanism also has a vision of the posthuman, but it is not anchored in an improved version of the present human, as in transhumanism, but in a completely new understanding of the human as we do not know him or her today. [26, 57]. Unlike transhumanism, in critical posthumanism technology generally stands as a competitor to nature. For this reason, machines are neither consistently evaluated negatively or subordinated to humans as tools, but are viewed critically in each individual case or interpreted as a neutral counterpart to humans [47].

In addition to transhumanism and critical posthumanism, there is another philosophical school of thought, technological posthumanism [34, 62]. The goal of technological posthumanism is the creation of a general artificial intelligence that will replace humans as a species in due course. Because humans benefit from technological achievements along the way, the modification of humans in technological posthumanism represents a positive byproduct. For this reason, technology is seen as an purpose rather than a means in technological posthumanism [47].

Table 1 shows an overview of the presented terminologies and summarizes their goals, roles, and methods:

	Transhumanism	Critical posthumanism	Technological posthumanism
Goal	Improved humans	New understanding of the human being	Artificial general intelligence (replacing humans)
Role of technology	Is understood as a tool and is thus subordinate to humans	Is understood as a neutral counterpart to humans and is critically questioned	Is understood as a better species to humans and is thus glorified
Method	Technological transformation of humans	Overcoming humans through critical contemplation	Overcoming humans through the creation of new (technological) entities

Table 1: Terminology overview [47]

Critical posthumanism is not considered further in this thesis since it is another variation of posthumanism. Analysis as well as the philosophical argument will be limited to transhumanism and (technological) posthumanism, whereby transhumanism is used as an umbrella term for these two terms in the further course of this thesis.

### 2.1.2 Core elements of transhumanism

Referring to the transhumanist manifesto [85] and other fundamental sources on transhumanism [7, 11], transhumanism can be divided into the following core elements:

1. Extension of the life span until the overcoming of death
2. Optimization through fusion of humans and technology
3. Creation of a being superior to Homo sapiens
4. Human enhancement (medical improvement)
5. Creation of extended spaces of experience
6. Copying or simulation of human intelligence on computers and getting rid of the biological body (mind uploading)

### 2.1.3 Institutionalization of transhumanism

Transhumanism is already institutionalized in various forms. There is a non-profit international educational organization called *Humanity+* (formerly *World Transhumanist Association*) which, in addition to its educational mission on transhumanism, aims to improve the human condition through the use of technology. In addition, there are various universities such as the *Singularity Education Group* (better known as *Singularity University*), which is dedicated to transhumanism and offers continuing education programs and innovation consulting to leaders from all disciplines, or the interdisciplinary research center *Future of Humanity Institute* at the University of Oxford, which deals with the big questions of humanity and its future prospects and risks, whose director is the Swedish philosopher Nick Bostrom. There are also all kinds of biotechnology institutes like *Calico*, which develops methods against human aging, and others which are led by leading transhumanists like Ray Kurzweil. From this broad institutionalization it can be deduced that transhumanism is a movement that must be taken seriously, since influential people who actively represent and pursue transhumanist ideologies are located in decisive centers of technological development.

### 2.1.4 Key technologies of transhumanism

**Mind uploading.** Mind uploading is a silicon-based technology in which, according to the idea of transhumanism, it would be possible to download the personality anchored in the brain to a hard disk after a brain scan and, if necessary, to integrate it into a new organism - this may be physical or also in cyberspace [78]. Sudden death from accidents or from disease could become unlikely, according to transhumanist understanding, because there would be "backup copies". This technique presupposes a substance-dualist understanding of anthropology, in which the mind or even personality is considered to exist independently of the corporeal body. However, some transhumanists, such as Max More, see this as more of a functionalist philosophy of mind, which is quite different from a dualist one and close to a materialist understanding of body and mind [54].

**Cryonics.** Cryopreservation means the vitrification or freezing of the body or cells after the death of a human being in liquid nitrogen, in the hope that the body parts can be healed and revived in due time. Since in some conceptions of transhumanism the head is seen as center of the personality, some transhumanists assume that it would be sufficient to preserve only the head and to transfer the personality into a new, younger and healthier body or another "carrier" as quickly as possible after a brain scan [20].

**Cybernetics.** A cyborg is a hybrid of human (the physical and mental parts) and technology. The cybernetic procedures of improvement thus act as an interface between the "organic world" and the "realm of digital and mechanical technologies [71]." In contrast to silicon-based technologies, cyborgization is a process which is compatible with a naturalistic, materialistic understanding of human nature, because "without a body, you can't be a cyborg." The cyborgization of humans includes both internal (e.g. pacemakers) and external technologies (e.g. metallic prostheses) that function as part of the body [77].

**Human Enhancement.** Human enhancement refers to technologies that are used to improve human beings. A distinction is made between different areas. Physical or morphological self-enhancement includes already widespread measures such as cosmetic surgery, doping in sports, digital self-measurement and also aspects of cyborgization, some of which are already in use. Neuro-enhancement refers to improved, cognitive, emotional, moral, sensory, motor skills and performance through pharmacological or neurophysiological methods, such as increased concentration and performance through Ritalin. Genetic enhancement concerns the fields of eugenics, such as genetically modified organisms [19].

## 2.2 Cultural-historical anchoring of transhumanism

The idea of leaving the human body behind and transcending the human being seems to be deeply rooted in Western culture. This can already be observed in *Paul's letter to the Ephesians*, which represents a kind of conversion commandment:

"that ye put away, as concerning your former manner of life, the old man, which waxeth corrupt after the lusts of deceit; and that ye be renewed in the spirit of your mind, and put on the new man, which after God hath been created in righteousness and holiness of the truth [59]."

This book of the New Testament can be interpreted as physically leaving the old human being behind and becoming a new human being in the sense of the new Christian faith. Such conversion commandment runs through cultural history in all sorts of variations. In a somewhat more secular variant, this idea is also found in the well-known poem by Rainer Maria Rilke about the *Archaic Torso of Apollo*, where at the end of the poem, the viewer of the sculpture is urged: "[...] You have to change your life [63]." The German philosopher and self-confessed posthumanist Peter Sloterdijk calls this



passage in his book of the same name "the command from the stone [68]." Here, too, humans are called upon to become different.

Another fundamental Western commandment that is found in transhumanism in a perverted form is the commandment of self-creation. A central example of this is the *Oration on the Dignity of Man* by Giovanni Pico della Mirandola, a Renaissance text that appeared at the end of the 15th century and is therefore of great importance because many transhumanists refer to this text, which, however, represents one of the central anthropological basic texts of Western culture anyway. It is a fictitious speech of God to the first human being, to Adam, whom God gives on the way after the creation that all other creatures of God have their firm place in the cosmos, however, not humans. Humans are called to determine themselves freely according to their own will and their own nature. This is a fundamental text of modern anthropology, demanding that humans have to determine their own nature: "[...] in order that you may, as the free and proud shaper of your own being, fashion yourself in the form you may prefer [16]." In other words, God commissions Adam to form himself, to give himself the shape that he wants. Although this statement is probably meant metaphysically in this context, the transhumanists interpret this passage literally in their favor. This self-creation and self-transcendence continues in other contexts, such as biotechnology. One of the key texts of the 19th century for this is *Faust II* by Johann Wolfgang von Goethe, which very early and already very cleverly sums up the transformations in this period, the formation of modern technology and the natural sciences. Particularly interesting is the scene in which Homunculus is created. This leads to a conversation between Wagner and Mephistopheles that is very revealing, for in just a few verses a paradigm shift can be observed very concisely:

Mephistopheles: "What might it be?"

Wagner: "A man is being made."

Mephistopheles: "A man? And what loving couple have you got hidden, up the chimney?"

Wagner: "[...] we, as men, with all our greater gifts, begin, to have, as we should, a nobler origin. [...] And brains, with thoughts to celebrate, in the future, a thinker will create [29]."

After Mephistopheles first ironically hints at the sexual creation of humans, Wagner imagines in the further discourse the vision that human beings should not merely be dependent on this "dirty" sexuality, but ideally must be created by "clean" technology. This scene shows that this is a discourse, whereby self-creation is imagined biotechnologically. Thus, the old idea that

humans give themselves their form is reinterpreted biotechnologically in the sense that humans are headed toward a future in which they actually create themselves technically. The German philosopher Günther Anders sums up this process particularly well in his interpretation of Fichte, claiming that Fichte's *self-positing I* is nothing more than a speculative paraphrase of the human being who neither wants to become nor to be born, but desires to owe himself to himself as his own product [1]. This is a very precise formulation, whereby similar to transhumanism a paradigm shift takes place; the human being no longer simply wants to be born, but the pride of the human being is that the human being owes himself/herself as a technical product. In other words, the human being is able to generate his own existence. This paradigm shift is confirmed by a series of approaches in the 1950s through the 1980s in which the manufacturing paradigm became very central in life sciences. For example, a narrow view was made that humans can actually only understand what they have manufactured, which remains a guiding paradigm in the philosophy of science until today's synthetic biology. Hans Moravec describes exactly this process in his book *Mind Children*, in which he claims that our future children will be "as children who are not shaped by our genes, but whom we have built with our hands and with our minds [53]." This kind of self-creation vision, can be noted in various forms since the 20th century. Already Darwin said in *The Descent of Man* that:

"Man may be excused for feeling some pride at having risen, though not through his own exertions, to the very summit of the organic scale; and the fact of his having thus risen, instead of having been aboriginally placed there, may give him hope for a still higher destiny in the distant future [15]."

This idea is interpreted by transhumanists as a kind of self-evolution imperative. Transhumanism assumes that natural evolution is in many respects not a reliable but random process. For this reason, human beings are forced to take evolution actively into their own hands, not least thanks to the new technological possibilities. This shows a very strong devaluation discourse in relation to nature. Stefan Lorenz Sorgner, one of the leading German-speaking transhumanists states:

"It is naive to assume that *Homo sapiens sapiens* will still exist in 6 million years. Species need to adapt in a consistent way. Either a species adapts or it goes extinct. Therefore, it is necessary to constantly resort to and develop new techniques. [72]."

Sorgner also talks about this mandate for humans to use technology to drive evolution according to their own desires.

Another key cultural-historical phrase often quoted by transhumanists is Friedrich Nietzsche's *superman* in *Thus Spoke Zarathustra* (for reasons of gender-neutral language, the term is replaced by *superhuman* in this thesis, only in direct quotations the term *superman* is to be used.): "I teach you the superman. Man is something that is to be surpassed. What have ye done to surpass man [58]?"

Among transhumanists themselves, there is a debate to what extent Nietzsche contributed to the ancestral research of transhumanism, respectively, to what extent Nietzsche can be considered a precursor of today's transhumanism. This debate is divided into two opposing positions; Bostrom argues that Nietzsche has no role for transhumanism because he claims that Nietzsche's *superhuman* has a different function. Ultimately, he argues, it is not a matter of technological transformation, but of cultural refinement of exceptional figures who must "overcome the life-sapping 'slave-morality' of Christianity." Transhumanism would stand in a tradition of the enlightenment and is thus closer to the English liberal thinker and utilitarian John Stuart Mill than to Nietzsche [6].

This is contrasted with Sorgner's *Nietzsche, the Overhuman, and Transhumanism*, where Sorgner agrees with Bostrom that Nietzsche does not refer to technological means of improvement, but neither does he exclude the use of technological means to improve humans. Sorgner sees the self improvement of humans as a central dynamic and explains Nietzsche as a source in this context. According to this, all things, whether humans or other beings, are permanently subject to change and should always develop and improve their nature [69].

How complex the relationship between the superhuman and transhumanism is, is illustrated by an opening passage in *Thus Spoke Zarathustra*:

"Man is a rope stretched between the animal and the Superman, a rope over an abyss. A dangerous crossing, a dangerous wayfaring, a dangerous looking-back, a dangerous trembling and halting. What is great in man is that he is a bridge and not a goal: what is lovable in man is that he is an over-going and a down-going. [...] What is the ape to man? A laughing-stock, a thing of shame. And just the same shall man be to the Superman: a laughing-stock, a thing of shame [58]."

Regardless of who takes which position in this debate, the concept of the superhuman, which Nietzsche puts into the world, is a thoroughly problem-

atic concept, especially with regard to the devaluation of human existence and the normative that the human being is "not a goal" in itself but only a "bridge". Sloterdijk calls this the pontifical existence of the human being and interprets this bridging function as follows:

"In truth, the crossing from nature to culture and vice versa has always stood wide open. It leads across an easily accessible bridge: the practising life. People have committed themselves to its construction since they came into existence - or rather, people only came into existence by applying themselves to the building of said bridge. The human being is the pontifical creature that, from its earliest evolutionary stages, has created tradition-compatible connections between the bridgeheads in the bodily realm and those in cultural programmes [68]."

The human being is denied the original timidity and is merely sketched as a kind of transitional figure. Furthermore, with Nietzsche's comparison of the superhuman to the human and the human to the ape, the human being emerges as a biological being in a perspective that is contemptuous. In this sense, Nietzsche at least supports a discourse that discredits the present existence of the human being in a certain respect, even if only rhetorically.

To what extent transhumanism presents a technological misinterpretation of the superhuman is certainly debatable, nevertheless the superhuman has a problematic legitimizing function in the transhumanist discourse, which should be taken seriously.

### **2.2.1 Transhumanism as a promise of salvation**

Another important aspect is the inclusion of techno-religious dimensions, which are regularly characterized by transhumanist agendas.

If we look at transhumanism from a religious perspective, transhumanism seems to be based on a human condition, which in principle is of biblical-Christian origin. For also according to Pauline understanding humans are after the paradise in an imperfect, redemption-needy condition [66]. In transhumanism, however, it is not God who reconciles himself with humans through his devotion in Christ and frees them from their sinful and mortal state. But the human being itself is able to redeem itself from suffering and death. Transhumanist technologies such as mind uploading and cyborgization are closely related to such religious concepts of transcendence and redemption. What makes transhumanist promises of redemption interesting is that they do not refer to a transcendent afterlife, but are tangible and human-made

to be hoped for in this world [45]. In the transhumanist conception of humanity, human beings can free themselves from their flawed existence by being God themselves through the scientific revolution [31]. If we interpret this transhumanist idea theologically, humans could redeem themselves from their sinful, i.e. flawed, state by elevating themselves to God and Redeemer through technologies [67].

In his text *Man and Technics*, Oswald Spengler summarizes this techno-religious character of the belief in progress as follows:

”To build a world oneself, to be oneself God - that is the Faustian inventor’s dream [...]. The successor of those Gothic monks was the cultured lay inventor, the expert priest of the machine. Finally, with the coming of rationalism, the belief in technics almost becomes a materialistic religion. Technics is eternal and immortal like God the Father, it delivers mankind like God the Son, and it illumines us like God the Holy Ghost. And its worshipper is the progress-philistine of the modern age which runs from La Mettrie to Lenin [73].”

Spengler describes the idea that technological progress can be transformed into a faith in progress, with old motifs of the religious reappearing in the context of technological reflection.

Since the treatment of the techno-religious dimension would go beyond the scope of this thesis, it will not be further elaborated and only serves to explain and deepen the topic in general.

## 2.3 Core motifs of transhumanism

Given this background, self-enhancement and self-perpetuation seem to be core motifs of transhumanism.

A central element of transhumanism is thus the affirmation of the use of new technologies because they promote the probability of a good life [70]. Although it is not entirely clear what is meant by the ”good life” in this context, a closer look at this motif reveals a number of very remarkable reflections on it. For example, Nick Bostrom, one of the world’s leading transhumanists, claims that the application of future technologies will enable humans to make human experiences much more vivid, so that at some point humans will hear music so complex and so great that Mozart will seem like bad elevator music [8]. In a similar form, this is also found in a statement by Ray Kurzweil:

”[...] human emotions like beauty, love, but also jealousy or humor - all these are things that the human brain produces. They are the epitome of human intelligence. We’re going to figure out how they work and be able to enhance them so we can create even more beautiful music, even more powerful poetry, and even more impressive art [35].”

It seems to be a core idea of transhumanism that humans should increase their expressiveness in an immeasurable way. Thus, this form of self-enhancement of one’s creative abilities forms the first motive.

Another motive is that through transhumanism, humans finally no longer have to die. According to Max More, the scientific overcoming of biological aging and death is one of the central points of the transhumanist agenda [55]. About overcoming death, Ray Kurzweil says the following:

”Death is difficult to imagine, because our self-perception, our consciousness, does not seem transient to us, but permanent. Nevertheless, we must observe that people do not live forever [...]. It is denied everywhere that death is frightening and tragic - not to mention the suffering that the process of dying brings. Instead, the problem is rationalized by saying that death is good. And people are very attached to this rationalization because it allows us to go on in the face of the looming tragedy. As long as we had no alternative, that was reasonable. But today we have an alternative [35].”

With this statement Ray Kurzweil describes that in all their time people would have persuaded themselves with culture and religion that death has its meaning, but humans would not need this excuse anymore, because transhumanism can ensure that humans can live forever.

For this reasons, it can be stated that a central element in transhumanism is the expansion of the human experience sphere. Furthermore, there seems to be a suffering from the intermediate state of evolution, whereby a strikingly regressive relationship to death and dying can be observed.

It is precisely this deficient conception of humanity in transhumanism that makes its problems so obvious. The posthuman should no longer die, if possible no longer have a body and be self-sufficient from other people. Here, important features of human existence and dimensions of the human condition, such as the fact that humans are embodied beings embedded in social contexts or that humans are very fundamentally characterized by signatures of

contingency (corporeality, finitude, vulnerability), are completely suppressed by transhumanism.

## 2.4 Philosophical perspective

The previous chapters have shown that the term transhumanism covers a number of theories whose common denominator is to improve humans technologically in order to raise them to a higher level - to the posthuman. Transhumanism proclaims human improvement through human enhancement, which entails philosophical misunderstandings with regard to the controllability of the biological naturalness of humans. Nevertheless, transhumanism is neither a philosophically sophisticated nor a unified position, which makes philosophical debate extremely difficult, but also urgently necessary.

The founding fathers of *Humanity+* (formerly *World Transhumanist Association*) declare how transhumanism is to be understood:

”Any scheme of thought or action based on rational use of science, technology, creativity, and other means that seeks to overcome human limitations by extending maximum life expectancy, increasing intelligence, and improving human beings physically and psychologically [11].”

Hence, the goal is to achieve human development guided by science and technology. Bostrom further states that human potential has hardly been exhausted, understanding science and technology as the engine of human development promises to overcome the naturalness of humans in their limitations. Consequently, the human biological endowment should no longer be seen as destiny, but as a scientific and technological challenge toward the posthuman [11]. Crucial to the transhumanist debate is that these developments appear within reach today, at least that is how they are presented. Humans have reached a decisive point in history. Due to the scientific-technical possibilities they can now become the creator of themselves, they can and they should take their development into their own hands in order to lift themselves to the next level. Science and progress are the guiding principles and in this respect transhumanism is not to be understood as anti-humanist, but on the contrary, transhumanism is more radical, because it promotes not only the traditional means to improve human nature, but also the direct application of medicine and technology to overcome some of the basic biological limits humans have [7]. While humanism aimed at the improvement of humans through enlightenment, education and cultivation, transhumanism

pleads for further advancing the improvement of humans by means of science and technology. Accordingly, transhumanism sees itself as the next stage of humanism, as a continuation of humanism with scientific-technical means.

In this sense, transhumanism is a counterpart of (technological) posthumanist approaches that do not strive for a better humanism but, on the contrary, philosophically criticize humanism because humans understand themselves as the center of reality [33].

Transhumanism has been seeking philosophical justification for some time. At the turn of the millennium, it wanted to arm itself as a philosophical player in the ethical dispute over stem cell research and be perceived as such [54]. Bostrom formulates that humans have always been on the track of defying their natural conditionalities and wanting to transform themselves as a species, and therefore should now move toward a transhuman existence through technology [6]. This kind of philosophy narrative is rehashed in terms of the logic of progress. However, while foregrounding the non-necessity of everything that exists and the philosophical or metaphysical position that all phenomena in the world can be traced back to a single fundamental principle, the Cartesian distinction between mind and body, which was shaped by Descartes, is questioned. Instead, Bostrom finds a number of transhumanist milestones in Western philosophical history, like Immanuel Kant or Giovanni Pico della Mirandola [10, 6].

The transhumanist ideologies can be seen as another narrative that in the 21st century now exchanges humans as the heroes of knowledge and history for humans as the heroes of evolution through technology. Ray Kurzweil says in this regard that humans have now taken evolution into their own hands [43]. It is suggested that technology is the continuation of the evolution with better means, humans are to get their own development under control, by setting themselves technologically to the improvement of humans.

## **2.5 Transhumanist narratives**

Based on the literature review conducted and the insights gained into the various aspects of transhumanism, four core transhumanist narratives were defined for the analysis section of this thesis, which form the heart of the analysis and are thus elementary for answering the research question:



1. Reductive view of humans, human institutions, and biological organisms
2. Aggrandized view on technology
3. Enhancement imperative
4. Inevitability

One of the central requirements in defining the transhumanist narratives was to be able to substantiate all narratives via reference citations. For this reason, statements from well-known and avowed trans- and posthumanists were used to derive the transhumanist narratives. Recurring statements were categorized accordingly, until the list of transhumanist narratives could be broken down to a manageable number, the result of this process are the narratives mentioned above. The following list is intended to provide information about which statements were considered:

*Note: First, this is not the complete list of statements considered, it is only a small excerpt, trying to take into account the most important ones. Furthermore, it is important to note that it was not only the statements that contributed to the derivation of the transhumanist narrative. The theoretical part can also be classified as a central element for the derivation of the narratives.*

1. Reductive view of humans, human institutions, and biological organisms
  - (a) "Too many of our preferences reflect nasty behaviours and states of mind that were genetically adaptive in the ancestral environment. Instead, wouldn't it be better if we rewrote our own corrupt code [60]?"
  - (b) "There are no inherent barriers to our being able to reverse engineer the operating principles of human intelligence and replicate these capabilities in the more powerful computational substrates [...] [44]."
  - (c) "Our human intelligence is based on computational processes that we are learning to understand [44]."
  - (d) "Death is a malfunction of the human experience [38]."
  - (e) "Humans are handicapped by our biology. We operate tens of thousands of years behind evolution with our inherited instincts,

which means our behaviour is not suited to its current environment [39].”

## 2. Aggrandized view on technology

- (a) ”Within thirty years, we will have the technological means to create superhuman intelligence. Shortly after, the human era will be ended [79].”
- (b) ”If human beings are infinitely malleable, if culture and most determinatively, biotechnology can overwhelm nature in shaping basic human drives and preferences [...] then clearly no particular set of political and economic institutions, and certainly no liberal democratic ones, can ever be said to be, in Kojève’s phrase ‘completely satisfying’. [...] The ultimate implication of this is that biotechnology will be able to accomplish what the radical ideologies of the past, with their unbelievably crude techniques, were unable to accomplish: to bring about a new type of human being [25].”
- (c) ”One cubic inch of nanotube circuitry, once fully developed, would be up to one hundred million times more powerful than the human brain [44].”
- (d) ”Let an ultraintelligent machine be defined as a machine that can far surpass all the intellectual activities of any man however clever. Since the design of machines is one of these intellectual activities, an ultraintelligent machine could design even better machines; there would then unquestionably be an “intelligence explosion,” and the intelligence of man would be left far behind [9].”
- (e) ”Posthumans will be innately smarter than us, not just in the narrow autistic sense of intelligence measured by contemporary IQ tests, but also a more empathetic intelligence. To use a non-scientific term, our descendants will be ”wiser” than contemporary humans [61].”

## 3. Enhancement imperative

- (a) The human species can, if it wishes, transcend itself - not just sporadically, an individual here in one way, an individual there in another way, but in its entirety, as humanity. We need a name for this new belief. Perhaps transhumanism will serve: man remaining man, but transcending himself, by realizing new possibilities of and for his human nature [37].”

- (b) "By the end of this decade, computers will disappear as distinct physical objects, with displays built in our eyeglasses, and electronics woven in our clothing, providing full-immersion visual virtual reality [44]."
- (c) "Suffering of any kind will be biologically impossible. Our descendants will lead lives of genetically pre-programmed bliss whose worst lows surpass today's peak experiences. A thousand years hence, the heritable hedonic set-point of ordinary waking life will have been ratcheted upwards so that everyday existence feels sublime [61]."
- (d) "Transhumanists regard human nature not as an end in itself, not as perfect, and not as having any claim on our allegiance. Rather, it is just one point along an evolutionary pathway and we can learn to reshape our own nature in ways we deem desirable and valuable. By thoughtfully, carefully and yet boldly applying technology to ourselves, we can become something no longer accurately described as human –we can become posthuman [54]."
- (e) "By the late twentieth century, our time, a mythic time, we are all chimeras, theorized and fabricated hybrids of machine and organism; in short, we are cyborgs [32]."

#### 4. Inevitability

- (a) "I believe in transhumanism: once there are enough people who can truly say that, the human species will be on the threshold of a new kind of existence, as different from ours as ours is from that of Peking man. It will at last be consciously fulfilling its real destiny [36]."
- (b) "Once artificial intelligence reaches human level, there will be a positive feedback loop that will give the development a further boost. AIs would help constructing better AIs, which in turn would help building better AIs, and so forth [5]."
- (c) "We do not have to regard ourselves as slaves to inevitable technological progress when that progress does not serve to human ends. True freedom means the freedom of political communities to protect the values they hold most dear, and it is that freedom that we need to exercise with regard to the biotechnology revolution today [24]."
- (d) "Our sole responsibility is to produce something smarter than we are; any problems beyond that are not ours to solve [44]."

- (e) "The bold code of the transhumanist will rise. That's an inevitable, undeniable fact. It's embedded in the undemocratic nature of technology and our own teleological evolutionary advancement. It is the future [38]."

What exactly the transhumanist narratives are and how they were applied in the qualitative content analysis will be described in detail in the chapters *3.10.3 Category building and codebook* and *3.10.4 Coding Process*.

In summary, transhumanism is a multi-layered ideology that goes far back into the past. Transhumanism has been massively influenced by philosophical, but also religious aspects for many years. Whereas the contemporary definition of transhumanism can be strongly derived from today's technology. Indisputably, however, the ideas of transhumanism about humans prove to be extremely flawed and negative. The question arises as to how we deal with the fact that technological progress offers us both opportunities and, as we can see, challenges for society as a whole.

### 3 Research Methodology

The following chapter describes the qualitative method used for data collection and data evaluation with regard to the investigation of the research question:

*Are popular science media buying into the transhumanist narrative?*

For the collection and evaluation of data by means of qualitative methods to meet a quality standard, the path of knowledge production must be intersubjectively comprehensible. The method used must therefore be described as precisely as possible. Thus, in this chapter, not only is the method described, but the research path is presented in a comprehensible way.

In this thesis, a qualitative content analysis was conducted for the book *Homo Deus* by Yuval Noah Harari and the *ARTE* documentary *iHuman* by Tonje Hessen Schei. In the following, content analysis as a method will be introduced and examined in more detail. It has its origins in communication science, but is now carried out in various disciplines and on the basis of different objects of investigation.

#### 3.1 Definition and history of content analysis

Since the term content analysis leaves many different possibilities of its use open, there are also many different definitions.

Früh defines content analysis as an "empirical method for the systematic, intersubjectively comprehensible description of content-related and formal characteristics of communications [23]." He refers to Berelson's preceding definition: "Content Analysis is a research technique for the objective, systematic, and quantitative description of the manifest content of communication [4]."

Similarly, Atteslander defines the term content analysis based on Berelson's definition: "Content analysis is a method of data collection for uncovering social facts, in which statements are made about the context of its creation, about the intention of the sender and/or on the social situation by analyzing a given content (e.g. text, picture, film) [2]." In doing so, he does not deviate significantly from Früh's definition.

Content analysis can be assigned to empirical social research. Atteslander defines this as "the systematic recording and interpretation of social facts [2]." Brosius writes on the subject of empirical research: "To proceed empirically means to gather experience about reality, to systematize it, and to

apply this systematization to the subject area of communication science. In doing so, the procedure is documented in such a way that it is intersubjectively comprehensible and thus can in principle be repeated by others [12].” This means that empirical research always proceeds systematically and objectively. This leads to high transparency of the research process.

The object of content analysis is considered to be communication processes, i.e., ”all communication content, insofar as it can be manifested in some way, i.e., mapped as text [50].” Accordingly, the goal is to describe social reality with the help of data collected from the communication process. In doing so, the entire reality can never be considered; a delimited section must always be defined. Consequently, content analysis is theory-accompanying. This means that statements on a specific and delimited question or hypothesis (or a combination of several hypotheses on one topic) are analyzed. Content analysis thus has a ”selection and classification interest [23].”

Content analysis is a systematic approach. It functions according to fixed rules that make the analysis comprehensible and verifiable.

Content analyses can deal with textual but also with visual or auditory material [80].

However, the term content analysis does not always cover only the pure analysis of the content of the research material but can also include formal features. These can be, for example, the style, the length of the sentences, or the frequent use of certain word genres [17].

Alongside interviewing and observation, content analysis is seen as a third independent instrument for recording social reality. Diekmann describes three main advantages of content analysis over the other two methods:

1. Relation to the past: Content analysis also makes it possible to examine material produced in the past.
2. Social change Social change: With content analysis, social changes, especially changes in social values, can be researched.
3. Non-reactivity: With exceptions, content analysis refers to non-reactive data material [17].

When defining content analysis, it should also be noted that a distinction is often made between quantitative and qualitative content analysis. According to Volpers, in research, the term content analysis is usually understood to mean quantitative standardized content analysis [80]. And Mayring also explicitly distinguishes between qualitative and quantitative content analysis [49]. According to Früh, however, a content analysis usually consists of a combination of quantitative and qualitative analysis. He rejects a separation:

”At least with regard to content analysis, a strict contrasting of qualitative and quantitative approaches is even theoretically as well as practically pointless [23].” Früh argues that the answer to a question in empirical social science always deals with a problem that is a ”qualitative issue”. Thus, in content analysis, qualitative analysis always builds on the quantitative collection of data. In this thesis too, in addition to the qualitative content analysis, quantitative data will be collected (coding process), from which corresponding statistical conclusions will then be drawn.

Considering the presented definitions of content analysis, the following general definition can be derived:

**(Qualitative) Content Analysis.** The term content analysis covers various approaches to the study of texts, communication processes, or other materials. Basically, characteristics of communication are to be described systematically and in an intersubjectively comprehensible way. Content analysis is particularly useful for social science questions. Written texts are suitable as material. These can be newspaper articles, legal documents, or protocols, but also transcribed interviews or television reports. Qualitative content analysis is a procedure that moves between the methodological traditions of standardized (quantitative) and reconstructive (qualitative) social research. It refers to different theoretical traditions. At the heart of the procedure is the development of a coding and category system in which the meaning of the text is expressed. This is the core of the resulting interpretation. The categories are developed according to predetermined rules in mutual reference to theory and material. Then, the data is interpreted with the help of these categories and assessed based on content-analytical quality criteria.

In his paper on qualitative content analysis, Kuckartz describes how qualitative content analysis differs from one another in the context of international methodological discussions: ”Qualitative content analysis is extremely popular, especially in German-speaking countries, and described in detail in relevant literature (Kuckartz 2018; Mayring 2015; Schreier 2012, 2014; Stammann, Janssen & Schreier 2016), whereas qualitative content analysis is still relatively unknown in the English methodological literature. While publications (Bengtsson 2016; Elo et al. 2014; Graneheim & Lundman 2004; Hsieh & Shannon 2005) exist alongside Schreiner’s (2012) textbook, qualitative content analysis is virtually ignored in handbooks (e.g., Denzin & Lincoln 2018) and the survey literature (e.g., Creswell & Poth 2018) [42].” Further, Kuckartz notes: ”Other methods of analysis for qualitative data are described in the English-language research literature. For example, forms

of analysis similar to content structuring content analysis, but with a much more qualitative focus, are frequently found (Creswell 2016) [42].”

For the following thesis, the textbook *Qualitative Inquiry & Research Design* by Creswell and Poth [13] and *Coding Manual for Qualitative Researchers* by Saldana [64] were particularly relevant.

### 3.2 Forms of content analysis

According to Diekmann, there are three forms of content analysis: Frequency analysis, contingency analysis, and evaluation analysis [17].

Frequency analysis is probably the most common form of content analysis performed. As the name implies, frequencies are analyzed here, i.e., how often certain words, expressions, phrases, topics, or terms occur in a previously determined unit of analysis. Faulstich summarizes: ”Frequency analysis is used to determine the simple frequency of a category [18].” Frequency analysis often serves as a basis for further investigations. It can be used for the actual analysis of the content and the analysis of formal properties. Here, not only the analysis of texts is possible, but also films or pictures can be the subject of frequency analysis [17].

Frequency analysis provides the starting point for the second type of content analysis, contingency analysis. Here, the focus is on association structures within the material to be analyzed. This means that the associations of terms or topics are analyzed here. However, this type of analysis cannot make any statements about the evaluation that occurs in the associations [17].

About the evaluation of objects or events, statements can be made with the help of the evaluation analysis. Accordingly, it can be determined whether the sender expresses himself negatively or positively about a certain fact. Valuation analysis is a highly complex procedure that is very time-consuming, lengthy, and costly, especially when dealing with large amounts of text [17].

In this thesis, primarily frequency analysis and, to some extent, evaluation analysis were applied. Since frequency analysis determines an indicator of the frequency and thus importance of certain categories that appear in the research materials, and intensity analysis additionally makes it possible not only to uncover evaluation trends, but also to record how strongly the material shows a positive or negative tendency, these two forms of content analysis were chosen to answer the research question of this thesis.



### 3.3 Quality criteria

In content analysis, as in all empirical methods, three quality criteria must be met as far as possible: objectivity, reliability, and validity.

The degree of objectivity of research depends on the person who uses the measuring instruments. Thus, maximum objectivity would be achieved if two researchers independently apply the measurement instruments and obtain exactly the same results. Diekmann distinguishes between implementation objectivity and evaluation objectivity [17]. While evaluation objectivity is at a maximum with quantitative methods, problems can arise with the implementation objectivity of conventional content analysis. The instructions for the coders to act may be interpreted differently under certain circumstances (e.g., due to a different understanding of the language) [30].

Reliability is a stronger quality criterion than objectivity. It is the reliability of a measuring instrument. This means that reliability is "a measure of the reproducibility of measurement results" [17]. Accordingly, the methodological procedure must be described unambiguously and applied correctly [30]. This is another advantage of computer-assisted content analysis. It grants a very high degree of reliability since the results of coding are always the same with the same investigation arrangement if they are accomplished by a computer.

The third quality criterion is validity. Objectivity and reliability alone do not guarantee the validity of an examination [17]. What is of interest here is whether what is measured is what is intended to be measured. This criterion is thus closely linked to the theses on which the analysis is based. Accordingly, if a measurement instrument is valid, the theoretical constructs constructed in the theses must be adequately captured, and all essential aspects must be observed. In the case of computer-assisted content analysis, the category scheme must therefore be checked for validity [30].

### 3.4 Criticism of the method

Many researchers criticize quantitative content analysis as being devoid of content. They believe that purely quantitative surveys say nothing about real facts. In contrast, qualitative methods are often accused of not being objective, representative, and thus arbitrary [2]. Furthermore, it is considered problematic that, especially in qualitative content analysis, there is "sometimes a lack of clarity about the concrete procedure and areas of application of the method [51]." According to Klingemann, "the decisive weakness of content analysis is that it has not produced a secure body of measurement instruments that could describe social reality in a standardized and valid

way [40].” However, he sees potential for this in computer-assisted content analysis.

Although there are criticisms of content analysis, it was chosen as the method for this thesis. As explained in the previous chapters, content analysis is very well suited for the research material of this thesis, i.e., popular science media.

### **3.5 Computer Assisted Qualitative Data Analysis (CAQ-DAS)**

The use of software programs for the analysis of qualitative data is widespread today. Qualitative data in the form of text, but also images or video, are largely analyzed with the help of specially developed software. In this context - since the mid-1990s and going back to Lee and Fielding [28] - the term ”Computer Assisted Qualitative Data Analysis,” or CAQDAS for short, or the use of QDA software (Qualitative Data Analysis) is used.

The use of software as an integral part of data analysis leads to easier organization and structuring of the analysis process, especially with larger data sets. However, the programs cannot take over the interpretative thinking work from the researchers [41].

Other advantages of using QDA software include the possibility of processing different types of data and linking them with each other using multimedia, as well as improved documentation and increased transparency. In addition, another advantage is that the software usually allows simultaneous or parallel processing of data sets and thus supports teamwork.

QDA software is also intended to serve as a method in this thesis and will therefore be examined in more detail below.

### **3.6 Theory and history of computer-assisted content analysis**

In contrast to conventional content analysis, in which specially trained coders identify the characteristics of the objects of study and assign them to categories, CAQDAS uses computer programs for this purpose. This lends itself to the use of computer programs since the effort involved in manual coding is very high [86].

CAQDAS goes back to the program ”The General Inquirer,” developed under the direction of Philip J. Stone, which was introduced in the early 1960s [74].

In computer-assisted content analysis, a system of categories is created in which a content-analytic dictionary is used to form lists of words that define the respective categories. This is referred to as a dictionary-based approach. Depending on the research question, existing dictionaries can be used, or, as is more often the case, an own dictionary can be created [17]. The latter will also be done in this thesis.

In CAQDAS, frequency analysis is currently the most common type of analysis.

As already described in the chapter before, a high degree of objectivity and reliability is given in CAQDAS, because computers work with exact instructions (logarithms), which offer no room for interpretation. The underlying dictionary is intersubjectively comprehensible, which ensures objectivity [30]. Once the dictionary is created, the computer always codes in the same way. Thus, reliability is also assured. Validity, however, also requires a closer look at computer-assisted content analysis. Götz formulates the most important questions regarding the validity of a CAQDAS: "Does the dictionary represent an adequate translation of the category schema behind it? Is the category schema itself valid?" [30]. The distinctive feature of the CAQDAS is that it does not even determine the validity of the measurement instrument. Rather, validity can be increased step by step during the process, e.g., with the help of the previously mentioned testing mechanisms. The focus here is on improving the dictionary through its constant testing [30].

Faulstich mentions as a major advantage of CAQDAS that the step of coding is taken over by a computer program. Thus, one of the two most important sources of error in content analysis (besides the creation of the category system) is circumvented [18].

Today, there is a wealth of QDA software available, both for a fee and free of charge, the latter often as open source. They offer a wealth of features that go far beyond pure text analysis. The best-known software packages, which are used in particular for category-oriented procedures, include *MAXQDA*, *NVivo*, and *ATLAS.ti*. Since the latter program is used in this thesis, it will be briefly introduced in the following.

### **3.7 *ATLAS.ti***

*ATLAS.ti* is a powerful program for qualitative analysis of large amounts of text, graphic, audio, and video data. It is a paid product of *ATLAS.ti Scientific Software Development GmbH*. A first prototype of *ATLAS.ti* was developed at the Technical University of Berlin as part of the *ATLAS* project between 1989-1992. A first commercial version of *ATLAS.ti* was then released

in 1993. Meanwhile, *ATLAS.ti* is available on various platforms, including Windows, Mac, Web, Android, and iOS. The most recent version is *ATLAS.ti 9* [22]. For this thesis, a free student version (version 8.4.3 for *Windows* and *Mac*) was used for all participants, which provides unrestricted access to all functions of the program.

### **3.8 *Homo Deus* as an object of research**

In a first instance, the world bestseller *Homo Deus* by Israeli historian Yuval Noah Harari was analysed. For *Homo Deus*, Harari received the German business book award 2017 for the best business book of the year.

The book was chosen primarily for its obvious popularity. *Homo Deus* has sold millions of copies and is cited worldwide.

Harari attempts to predict our future in the age of artificial intelligence and digitization based on human history in *Homo Deus*. In doing so, he refers to possible future scenarios of how our lives might change in the coming decades or centuries. The basis for this are the overarching developments, especially the technological progress of recent times.

### **3.9 *iHuman* as an object of research**

In a second instance, the *ARTE* documentary *iHuman* by Norwegian director Tonje Hessen Schei was analysed.

As a public service broadcaster aired in German and French and subtitled in four other languages, *ARTE* covers a relatively wide audience in the media landscape. Numerous *ARTE* productions and co-productions have also won major international awards. *ARTE's* soundness and prominence were the main reasons why the *ARTE* documentary *iHuman* was chosen as research material.

The documentary *iHuman* accompanies AI experts as they predict new technologies and future scenarios. In the process, they not only radically change the outside world, but also the way people see themselves. *iHuman* reports on a supposedly near future in which power belongs to the machines.

### **3.10 Conducting the content analysis**

In the following, the execution of the content analysis with the present research material will be described in detail. For this purpose, it is first useful to take a look at Figure 2, the *data analysis spiral* developed by Creswell and Poth on the activities of a content analysis [13]. The spiral describes the individual activities of a "classical" content analysis and served in this thesis as



Figure 2: Data analysis spiral as illustrated in [13]

a guide for the execution of the content analysis. However, as Huberman and Miles appropriately formulated, data analysis is a procedure that must be iteratively tailored, revised, and choreographed in a repeated manner [52]. In this thesis, too, the process presented was modified and rearranged according to the needs of the analysis.

### 3.10.1 Managing and organizing data

For the analysis, the book *Homo Deus* was acquired as an epaper (PDF, English, 433 pages) from an epaper library, downloaded and transferred to *ATLAS.ti* as a new project. The project was given the title:

"*MT21\_TranshumanistNarrative\_HomoDeus\_11934067\_v1-0*".

Unlike *Homo Deus*, *iHuman* is an audiovisual documentary, for this reason it first had to be converted into a written form suitable for analysis. Therefore, *iHuman* was downloaded from the *ARTE* database using an online video downloader tool and cached as a video file (MP4, German, 01:36:29). In a next step, *iHuman* was transcribed manually without the aid of transcription software (appendix ??). The reason for this was the fact that *iHuman* is dubbed in German, but the original language (English) can be heard in many parts of the documentary, which would have made an automatic transcription almost impossible. The finished transcript (DOCX, German, 18 pages) was converted into a PDF file and then transferred to *ATLAS.ti* as a new project. The project was given the title:

"*MT21\_TranshumanistNarrative\_iHuman\_11934067\_v1-0*". *iHuman* was deliberately transcribed in the original synchronization (German) broadcasted by *ARTE* and uploaded as a project in *ATLAS.ti*. A subsequent translation

into English was deliberately omitted, since all researchers were German speakers.

Since both projects are only a single PDF file, it was not necessary to create additional document groups in *ATLAS.ti* for reasons of clarity.

All other configurations that had to be made in *ATLAS.ti* for analysis purposes are described in the chapter *3.10.3 Category building and codebook*.

### **3.10.2 Data familiarization**

Before the analysis process could start, enough time was planned to get acquainted with the research material. Coding on the screen can be nerve-racking, especially with such large amounts of data. For this purpose, *Homo Deus* (hardcover, German, 16th edition, 576 pages) was organized and read through in advance. Reading the material before coding helps to see the big picture, as the book can be read in one flow, whereas coding with a CAQDAS is rather the opposite, due to the constant stop and go nature of its process.

For the same purpose, *iHuman* was also viewed twice in full length before coding. Because coding also took into account aspects related to the tonality/dramaturg of the statements, it was especially important to not only read *iHuman* as a transcript but also to watch it in its original version as a documentary. This was the only way to ensure that these details were coded correctly.

### **3.10.3 Category building and codebook**

At this point it is important to mention that the premise of this thesis and the analysis carried out with it, was inspired by a previous thesis carried out by a fellow student. Already in this first thesis a content analysis was conducted for the two research subjects presented, but in a much simpler and qualitatively less sound form. However, on the basis of this earlier analysis, it was possible to elaborate and develop the analysis for this thesis. Furthermore, the used categories and codebook served as inspiration, but were then adapted and optimized during the compilation process. Generally, it can be stated that the present thesis has been significantly extended and improved compared to the previous thesis and differs enormously especially in quality and execution.

The category system, the codebook and the actual "coding" form the core and the central procedure within the framework of a qualitative content analysis. The codebook as a research tool is used to identify characteristics from text, image or sound units, which are then assigned to the defined categories

with the help of codes. These codes represent keywords derived from the theoretical part of this thesis. The codebook is made up of several components: It must contain the categories against which the research material is to be processed. In addition, concrete instructions for the coding process are given, for example important information for the understanding of categories and their characteristics. Since transparency in the form of intersubjective comprehensibility is always required in research, the codebook must also be formulated in a detailed and comprehensible manner. After all, not only the coders, but also other researchers should be able to get a complete picture of the research design on its basis. When used repeatedly, the codebook should ensure that researchers get the same results using the same study material (ensuring reliability). Therefore, an extremely clear and unambiguous definition of the categories is necessary [13, 48, 42].

Another prerequisite for the development of a "good" category system is the so-called discriminatory power. Categories should represent unambiguous, delimitable spaces for text contents. In this context, great attention must be paid to the discriminatory power between the categories. Adherence to the discriminatory power allows a text content to be assigned to only one category (provided that no other rules have been defined per category). If there is ambiguity regarding the assignment of a text passage to a category or the text passage can be assigned to two or more categories, then the discriminatory power between the categories is lacking. If in this case no correction is made to ensure sufficient discriminatory power with an appropriate specification, multiple assignments of text passages will occur in the subsequent coding process. This leads to consequences in the interpretation of the results, especially if an evaluation is to take place subsequently [13, 48, 42].

In a further step, coding rules are defined. These rules provide coders with the necessary orientation framework that facilitates the assignment of text passages. The coding rules are intended to help especially with problems of delimitation of content or thematically related categories. Here the coders receive information about when and under which conditions text passages are to be assigned to a certain category and when to another category [13, 48, 42].

In order to create a category system that is as accurate as possible and meets the requirements, there are two approaches: theory-guided and empirically-guided category formation. Usually a combination of both is used. In theory-guided category formation, the research objects are initially disregarded and the categories are formed from the research question. This is also referred to as deductive category formation [42]. In this thesis, deductive category formation was mainly used. The basis for this was the already existing category system from the previous thesis and the theory part of this thesis.

In empirical category building, the categories derived from theory are to be differentiated and supplemented more precisely in an empirical way with the help of the examined texts, if necessary [30]. This is a so-called inductive procedure, i.e. from the material [42]. With the help of this procedure, some of the categories in this thesis were iteratively refined and improved during the coding process.

Based on the theory-guided and the empirically-guided category formation and the compliance with all prerequisites and requirements, the following category system was created:

### Rules

1. Selection of text passages
  - (a) Artificial intelligence and related technologies (current and future)
  - (b) Analogies and comparisons of technologies with living organisms
  - (c) Influences of technologies on society and individuals
  - (d) Generally, it is necessary to select each text passage to which one of the presented codes (table 2 - 6) is applicable
2. Marking of text passages
  - (a) Do not mark half sentences, only whole sentences
  - (b) Do not tear sentences completely out of context, but mark them along so that the sentences make sense and can be understood
  - (c) Generally, less is more, markings should be kept as long as necessary and as short as possible

### Categories and codes

The *lean coding* approach recommended by Creswell and Poth [13] was selected for the creation of the categories and codes. This involved starting with a shorter list of codes, which was then expanded as needed. As mentioned earlier, this thesis is inspired by a previous thesis, thus the first version of the codebook consisted of a priori codes, which were expanded accordingly. A particular challenge was the fact that the same codes would be used for both research materials, so an appropriately sophisticated category and code structure had to be developed that could be applied to both *Homo Deus* and *iHuman*. For the analysis conducted in this thesis, it was determined that a selected text passage could be assigned to multiple categories since



several constructs can be addressed in a single text passage. It is important to mention that this multiple selection is limited exclusively to the categories and does not refer to the individual codes within the categories. Therefore, despite multiple selection of the categories, the above-mentioned discriminatory power of the individual codes is guaranteed. After several weeks of rework and adjustments to the code book and a first coding trial run, a total of 4 categories and 28 codes (table 2 - 6) were defined. For the sake of clarity, 4 category groups with the same labeling were created in *ATLAS.ti* and filled with the corresponding codes. Furthermore, the 4 categories were marked with different colors to make it easier to keep track during the coding process. The categories and codes are explained in more detail below.

## Technology

- Category:** Technology  
**Usage:** Does the selected text mention a specific technology?  
**Application:** Several codes can be applied per selected text.  
**Obligation:** Not mandatory, only applies if applicable.

Category: Technology	
Name	Code
Algorithm	<i>&lt;tech_algorithm&gt;</i>
Robot	<i>&lt;tech_robot&gt;</i>
Bot	<i>&lt;tech_bot&gt;</i>
Artificial Intelligence	<i>&lt;tech_AI&gt;</i>
Artificial Narrow Intelligence	<i>&lt;tech_ANI&gt;</i>
Artificial General Intelligence	<i>&lt;tech_AGI&gt;</i>
Machine Learning	<i>&lt;tech_ML&gt;</i>
Neural Network	<i>&lt;tech_NN&gt;</i>
Deep Learning	<i>&lt;tech_DL&gt;</i>

Table 2: Category: Technology

*Artificial General Intelligence* is understood as the achievement of human-like intelligence.

The other technologies are not discussed further in this part of the thesis; detailed definitions and when to apply the codes can be found in the codebook (appendix ??).

## Concept

<b>Category:</b>	Concept
<b>Usage:</b>	Does the selected text mention a specific concept or idea?
<b>Application:</b>	Several codes can be applied per selected text.
<b>Obligation:</b>	Not mandatory, only applies if applicable.

Category: Concept	
Name	Code
Automation	<i>&lt;con_automation&gt;</i>
Intelligence	<i>&lt;con_intelligence&gt;</i>
Creativity	<i>&lt;con_creativity&gt;</i>
Autonomy	<i>&lt;con_autonomy&gt;</i>
Singularity	<i>&lt;con_singularity&gt;</i>
Cyber attack	<i>&lt;con_cyberattack&gt;</i>
Cyber war	<i>&lt;con_cyberwar&gt;</i>
Analogies/Comparisons	<i>&lt;con_analogies&gt;</i>
Impact on society and individuals	<i>&lt;con_impact&gt;</i>

Table 3: Category: Concept

*Automation* describes the replacement of manual labor by machines, i.e. "machinization".

The code *intelligence* is used interchangeably with human and technical intelligence and is used when the author describes one of them.

*Singularity* refers to the infinite, unpredictable self-improvement of artificial intelligence.

As the name suggests, *Analogies and Comparisons* is about analogies and comparisons made in relation to humans, with no limits on how they are formulated. A simple example of this is the use of the word *upgrade* in reference to humans, which suggests that humans can be upgraded like computers.

The other concepts are not discussed further in this part of the thesis; detailed definitions and when to apply the codes can be found in the codebook (appendix ??).

### Narrative support (group A)

- Category:** Narrative support (group A)  
**Usage:** Can a support of the transhumanist narrative be identified in the selected text?  
**Application:** Several codes can be applied per selected text.  
**Obligation:** Not mandatory, only applies if applicable.

Category: Narrative support (group A)	
Name	Code
Reductive view of humans, human institutions and biological organism	<i>&lt;nar_A_reductive&gt;</i>
Aggrandized view on technology	<i>&lt;nar_A_aggrandized&gt;</i>
Enhancement imperative	<i>&lt;nar_A_enhancement&gt;</i>
Inevitability	<i>&lt;nar_A_inevitability&gt;</i>

Table 4: Category: Narrative support (group A)

Since Narrative Support (Group A, as well as Group B) is in many ways a category that presupposes some prior knowledge on the topic of transhumanism, the individual codes will be explained in more detail below, showing when they come into play. As mentioned earlier, the following transhumanist narratives are based on the literature review conducted and the knowledge gained about the various aspects of transhumanism as a result.

**Reductive.** This code is about the general reductive, deficient, but also condescending attitude and view towards humans, human-created institutions and ideas like democracies, and other biological organisms like animals. The only additional requirement is that the code must be related to technology, but this can also be of biotechnological nature. This code is to be used when one or more of the following statements are mentioned in the selected text:

- Humans are (biochemical) algorithms, processors, data networks, etc.
- Humans have deficits compared to machines
- Intuition and emotional intelligence are flawed
- Biology can be replicated (reverse engineered)
- Humans can fully define themselves and thus be masters of their own creation

- The human body is a container that nurtures the mind/brain
- The human mind is composed of electromagnetic impulses and chemical substrates (i.e., it can be replicated, uploaded, or upgraded)

**Aggrandized.** This code is about the general attitude and view that machines are better than humans. There is a glorifying view of technology that highly instrumentalizes technology and portrays it as something supernatural. However, it is important that the statement does not reduce humans in any way, in which case the reductive code would be applied. This code is to be used if one or more of the following statements are mentioned in the selected text:

- Machines are predictable and therefore better than humans
- Technology is godlike, superhuman, magic, a next (better) species

**Enhancement.** This code is about the general attitude and view that humans have a moral obligation to develop, improve and optimize themselves. This view is by no means limited to physical development, but also mental aspects. An example of this is the cyborg - half human, half robot. This code is to be used when one or more of the following statements are mentioned in the selected text:

- Imperative (moral obligation) to human enhancement
- Advocacy of invasive measures for physical and mental enhancement

**Inevitability.** This code is about the general attitude and view that humans will soon be replaced by technological progress and become superfluous. The statements suggest a certain inevitability towards this scenario. Often there is reference to AGI, which achieves or surpasses human-like abilities and thus gains the upper hand. This code is to be used when one or more of the following statements are mentioned in the selected text:

- The human species will be replaced
- AI will achieve human-like capabilities
- Inevitable evolutionary step
- Imperative of progress

## Narrative support (group B)

- Category:** Narrative support (group B)  
**Usage:** Is the narrative neutrally reported or is it supported/rejected by the author?  
**Application:** Only one code can be applied per selected text, but only if one or more codes from group A have already been used, otherwise this code remains unused.  
**Obligation:** Mandatory, this code must be selected if and only if one or more code from the category *Narrative support (group A)* has already been applied.

Category: Narrative support (group B)	
Name	Code
Supported	<i>&lt;nar_B_supported&gt;</i>
Rejected	<i>&lt;nar_B_rejected&gt;</i>
Neutral	<i>&lt;nar_B_neutral&gt;</i>

Table 5: Category: Narrative support (group B)

When selecting this code, it is important to consider the author's point of view. How does the author describe the narrative? Is it only mentioned or can the author's support or rejection be read out? In this regard, special attention must be paid to the wording and context of the statements, only in this way can the most accurate assumption be made. If the author quotes the narrative from other sources or makes a corresponding remark, it is not the author's own statement. In this case the narrative is only mentioned. If, however, the author describes a narrative without naming any sources (e.g. from the first-person perspective and thus as his own), it could be a matter of support or rejection. This, in turn, can be determined on the basis of the context.

## Attitude interpretation

- Category:** Attitude interpretation  
**Usage:** What is the tonality of the selected text?  
**Application:** Only one code can be applied per selected text.  
**Obligation:** Mandatory, code must be selected.

Category: Attitude interpretation	
Name	Code
Optimistic	<i>&lt;att_optimistic&gt;</i>
Pessimistic	<i>&lt;att_pessimistic&gt;</i>
Neutral	<i>&lt;att_neutral&gt;</i>

Table 6: Category: Attitude interpretation

This code deals exclusively with the tonality of the statement. Intuitively, a statement can be classified as positive/optimistic or negative/pessimistic. In addition, trigger words such as promising, hopeful, confident, favorable, encouraging, success, etc. for positive or regrettable, doubtful, gloomy, harm, dangerous, risk, etc. for negative can describe the tonality accordingly. If neither a positive nor a negative tonality is identifiable, the statement is classified as neutral.

### **Narrative subcategories**

In order to further understand and more accurately categorize the transhumanist narratives in the analysis, additional subcategories were created for the four main narratives. In this way, a more conclusive analysis could be ensured. In doing so, the subcategories had to be adapted to the respective research material. Nevertheless, there were overlaps due to the similarity of the narratives. As with the four main narratives, the subcategories are also derived from the literature review conducted and the theory section of this thesis. The following lists show the defined subcategories for the corresponding narratives of the two research materials:

### **Homo Deus**

1. Reductive view of humans
  - (a) Humans, human-created institutions, and biological organisms are biochemical algorithms, data-processing systems, or data networks
  - (b) Humans and other biological organisms have deficits compared to machines
  - (c) Human biology can be reverse engineered
  - (d) Human-created forms of government, institutions, or general societal structures are sub-optimal
  - (e) Human decisions are not based on free will and are therefore determined or random

2. Aggrandized view on technology
  - (a) Technology is better than humans and biological organisms
  - (b) Technology will create superhumans
  - (c) Technology will help humans become god-like/immortal
  - (d) Humans will hand over authority and responsibility to machines
  - (e) Technology will become all-knowing
3. Enhancement imperative
  - (a) Human enhancement will expand people's physical and mental capabilities
  - (b) Human enhancement will create a new species
  - (c) Human enhancement will be imperative
  - (d) Human enhancement will create a class of useless, inferior humans
  - (e) Human enhancement will prevent illness
  - (f) Human enhancement will bring new risks
  - (g) Human enhancement will prevent death
4. Inevitability
  - (a) Technological progress is inevitable and cannot be stopped
  - (b) Technological progress will surpass human intelligence/skills and make them obsolete
  - (c) Technological progress will bring the end of humanity
  - (d) Technological progress will deprive humans of their free will
  - (e) Humans will relinquish/lose their control over technology

## **iHuman**

Because the Narrative *Enhancement Imperative* was not coded once in *iHuman*, a corresponding subcategorization was unnecessary.

1. Reductive view of humans
  - (a) Humans, human-created institutions, and biological organisms are biochemical algorithms, data-processing systems, or data networks
  - (b) Humans and other biological organisms have deficits compared to machines

- (c) Human biology can be reverse engineered
2. Aggrandized view on technology
    - (a) Technology is better than humans and biological organisms
    - (b) Technology will create something that will be far better and more significant than humans
    - (c) Technology will break free from human control
  3. Inevitability
    - (a) Technological progress is inevitable and cannot be stopped
    - (b) Technological progress will surpass human intelligence/skills and make them obsolete
    - (c) Technological progress will bring risks with it
    - (d) Technological progress requires a rethink in society
    - (e) Humans will relinquish/lose their control over technology

#### 3.10.4 Coding process

Coding for this thesis was carried out over a period of 13 weeks. Even before coding, a category system and a corresponding codebook (appendix ??) were developed, which was then repeatedly adapted, expanded and optimized in the course of the coding process. Ultimately, it was the coding itself that brought out the strengths and weaknesses of the category system developed. The coding team consisted of a total of four persons, two of whom dealt exclusively with either *iHuman* or *Homo Deus*. The remaining two coders co-coded both research materials. Before coding, the developed category system was reviewed in detail with all participants to clarify any questions or ambiguities. In addition, all coders were reminded that the category system presented was not a fixed scheme set in stone, but was open to adjustments and suggestions for improvement. Thus, in the first weeks of the coding process, a trial coding took place in order to test the developed category system and the coding manual and to adapt them if necessary. For this purpose, the preface (pages 9-72) of *Homo Deus* was used. The conducted trial coding was able to reveal many important aspects that had been overlooked during the development of the initial coding system and improve the coding system accordingly. For example, some of the codes and categories were only superficially or inaccurately described, which caused confusion among the coders, which were specified more precisely during the trial coding. Some codes were



even classified in the wrong category and had to be moved accordingly. In addition, the trial coding improved the actual coding process by optimizing the use of *ATLAS.ti* with markers, comments, and color categories, adjusting the coding times, and scheduling sufficient breaks for the upcoming coding sessions.

Because this thesis is a computer-assisted qualitative content analysis, which was conducted with *ATLAS.ti*, all participants were thoroughly trained and familiarized with the software in advance. In order to make the amount of coding material more manageable during the main coding process, the research subjects were divided roughly into three equal parts. Conveniently, *Homo Deus* is already divided into three main parts: First part (pages 73-150), second part (pages 151-269), and third part (pages 270-379). *iHuman* was divided as follows: First part (pages 1-6), second part (pages 7-12), and third part (pages 13-18). An approximate coding time of three weeks was allotted for each coding part, which also included the associated evaluation. In order to obtain independent and thus more significant results, the coding process of each coding part deliberately took place without consultation with the other participants and was coded separately.

After the first coding part of the two research materials was completed, matching sessions were organized within the participants, in which the coefficient of agreement according to Holsti [46] was calculated. The reason why the Holsti reliability coefficient was chosen was because of the possibility of multiple selection of some categories and codes. This method is based on the logic of pairwise comparison. All the coders' measurements are compared with each other in pairs in order to then determine the proportions compared to the totality:

$$r_H = \frac{3 \times N_{\check{U}}}{N_A + N_B + N_C}$$

Where  $r_H$  represents Holsti's reliability coefficient,  $N_{\check{U}}$  represents the number of matches between coder A, B, and C.  $N_A$  represents the number of codings of coder A,  $N_B$  represents the number of codings of coder B, and  $N_C$  represents the number of codings of coder C. The determined value is a number between 0 (no reliability) and 1 (perfect reliability). From a reliability value of at least 0.80 (80%), agreement is considered satisfactory and sufficient quality is considered to exist [46]. *ATLAS.ti* facilitates the performance of a reliability test because the software can calculate all pairwise comparisons and the corresponding average value fully automatically at the click of a button. The minimum requirement is 30 to 50 codings per cat-

egory. However, because more codes per category (Technology: 148 codes, Concept: 288 codes, Narrative support: 501 codes, Attitude interpretation: 283 codes) were used in this thesis, a higher reliability was guaranteed. In the respective comparisons, all coded text passages were discussed, argued and finally adjusted in the group until the desired inter-rater reliability of at least 80% was achieved. This process was repeated identically for the other two coding parts of the two research materials.

In order to further understand transhumanist narratives and to better support the analysis in the categorization of the narratives, subcategories for the respective narratives were defined in a final step after coding all research materials, which then had to be applied in the same manner (division of the research materials into three equal parts) for both research materials. The focus was exclusively on the narratives. Since this part of the coding was not carried out by several coders, it was not taken into account for the calculation of the reliability coefficient.

## 4 Results

The following charts show the results of the computer-assisted qualitative content analysis. The analysis performed is based on the coding manual presented in chapter 3.10.3 *Category building and codebook*. A total of 286 text passages were coded in *Homo Deus* and 100 in *iHuman*. While the absolute frequency (n) indicates how often a particular event occurs, the relative frequency describes how large the absolute frequency is as a proportion of the total number of trials. Thus, relative frequency can be used as an estimate of probability when the total number of trials is sufficiently large, which was the case in this analysis. All results are presented in relative (percentage) numbers. All charts were created using Microsoft Excel.

### 4.1 Category: Technology

This chapter presents the relative number of technologies discussed in the coded text passages.

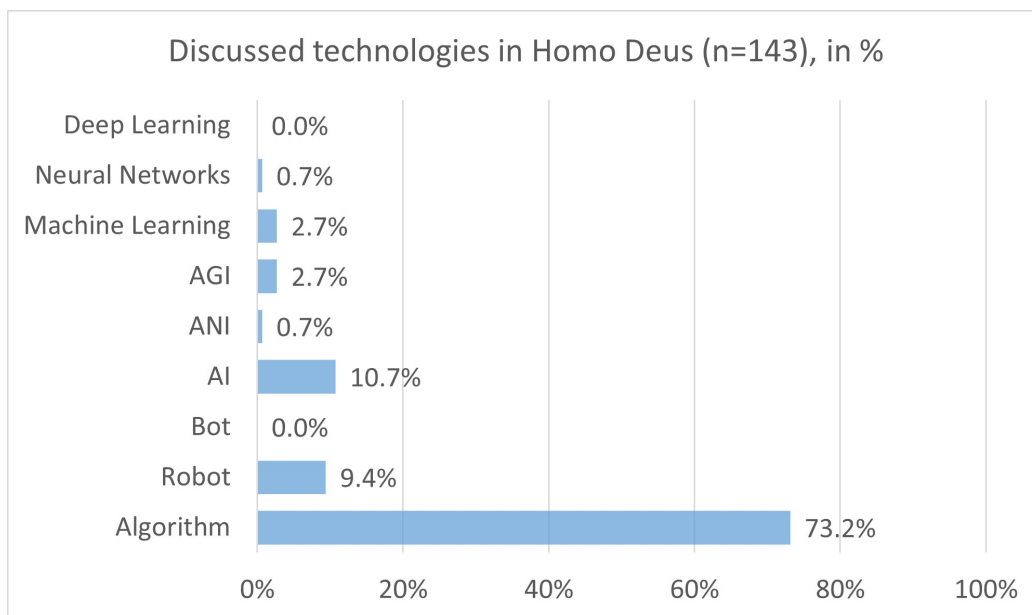


Figure 3: Discussed technologies in Homo Deus

In *Homo Deus*, the technology category was applied collectively in 143 different text passages, with a total of 149 codes of the category coded. It can be clearly seen that *Homo Deus* focuses primarily on algorithms in the area of technology.

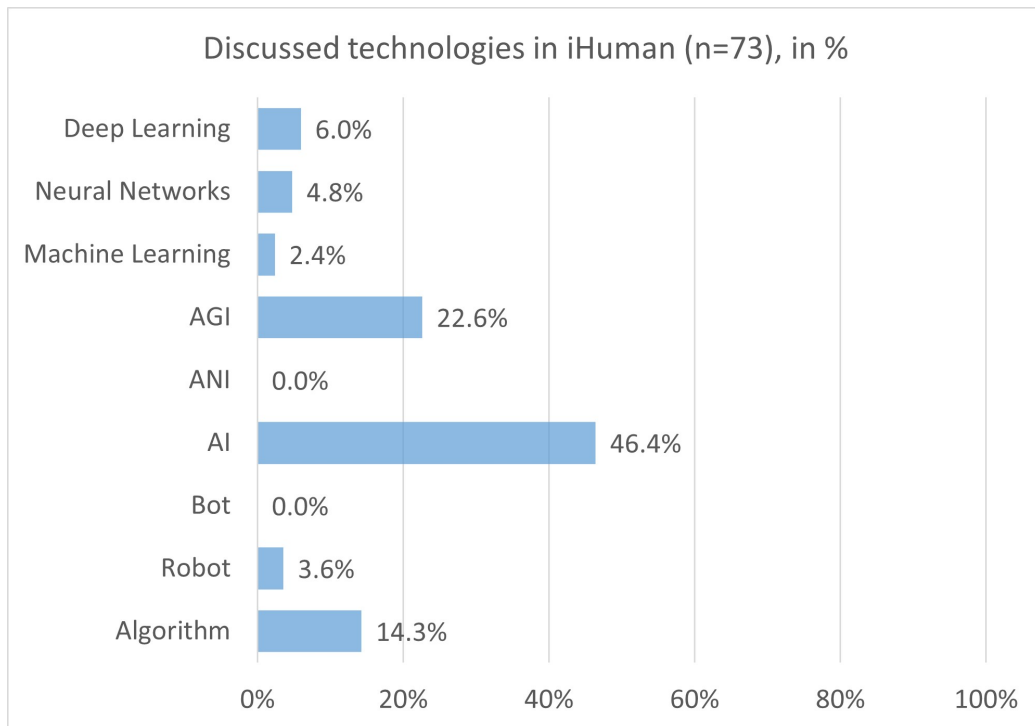


Figure 4: Discussed technologies in iHuman

In *iHuman*, the technology category was applied collectively in 73 different text passages, with a total of 84 codes of the category coded. Technologically, *iHuman* focuses primarily on artificial intelligence and the development of artificial general intelligence.

## 4.2 Category: Concept

This chapter presents the relative number of concepts and ideas discussed in the coded text passages.

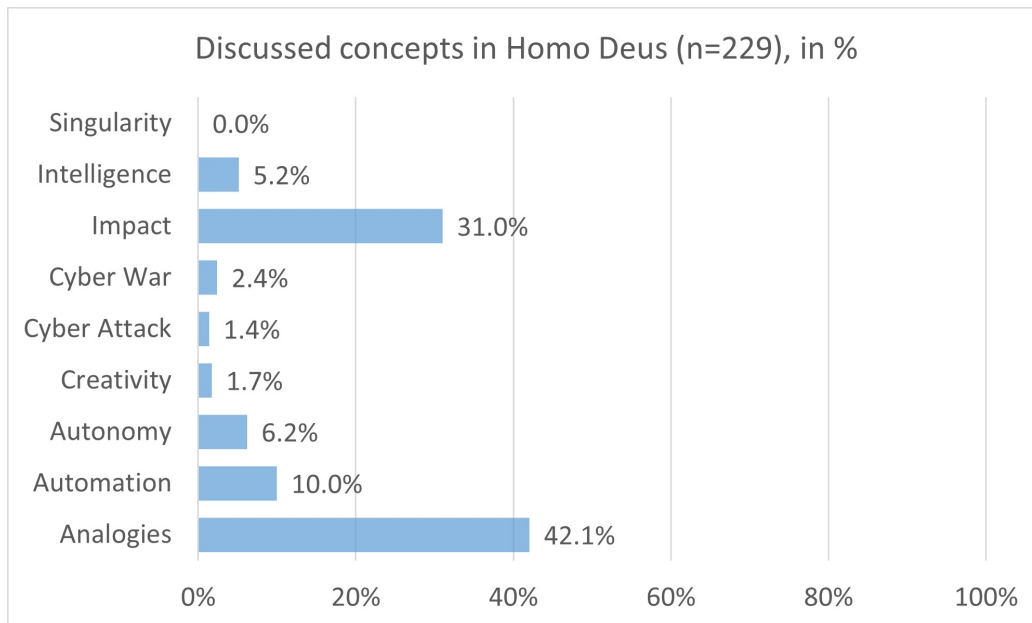


Figure 5: Discussed concepts in Homo Deus

In *Homo Deus*, the concept category was applied collectively in 229 different text passages, with a total of 290 codes of the category coded. Analogies between humans and other living organisms with biochemical algorithms and processes as well as what impact this development will have on humanity are among the most frequently discussed concepts in *Homo Deus*. To illustrate this, some of the coded passages are listed below:

#### 1. Impact

- (a) "What will happen to the job market once artificial intelligence outperforms humans in most cognitive tasks? What will be the political impact of a massive new class of economically useless people? What will happen to relationships, families and pension funds when nanotechnology and regenerative medicine turn eighty into the new fifty? What will happen to human society when biotechnology enables us to have designer babies, and to open unprecedented gaps between rich and poor?" *p. 261*
- (b) "In order to gain immortality, bliss and divine powers of creation, we need to process immense amounts of data, far beyond the capacity of the human brain. So the algorithms will do it for us. Yet once authority shifts from humans to algorithms, the humanist projects may become irrelevant." *p. 376*

(c) "However, once technology enables us to re-engineer human minds, Homo sapiens will disappear, human history will come to an end and a completely new kind of process will begin, which people like you and me cannot comprehend." *p. 50*

## 2. Analogies

(a) "In order to preserve the collective myths and organise mass cooperation, the early farmers relied on the data-processing abilities of the human brain, which were strictly limited." *p. 153*

(b) "Agriculture speeded demographic growth, so the number of human processors rose sharply. Simultaneously, agriculture enabled many more people to live together in the same place, thereby generating dense local networks that contained an unprecedented number of processors." *p. 363*

(c) "The algorithms controlling vending machines work through mechanical gears and electric circuits. The algorithms controlling humans work through sensations, emotions and thoughts. And exactly the same kind of algorithms control pigs, baboons, otters and chickens." *p. 87*

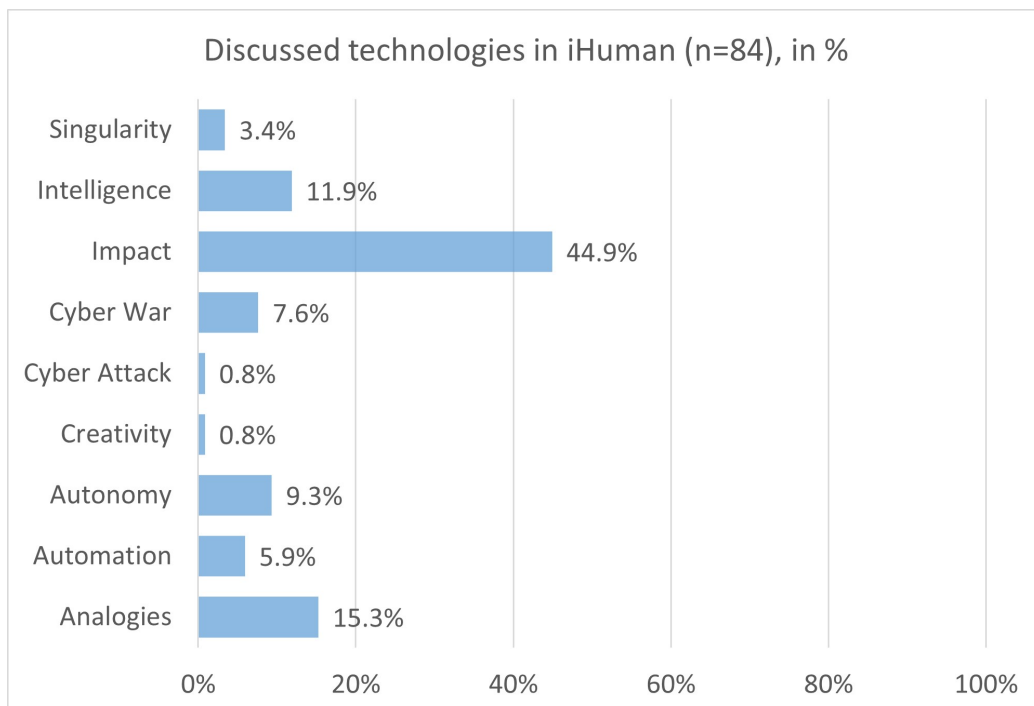


Figure 6: Discussed concepts in iHuman

In *iHuman*, the concept category was applied collectively in 84 different text passages, with a total of 118 codes of the category coded. Conceptually, *iHuman* also focuses mainly on the potential impact of technological progress. To illustrate this, some of the coded passages are listed below:

#### 1. Impact

- (a) "AGI kann per Definition alle Jobs besser machen als wir. Wer sagt, es wird immer Arbeit geben, wo Menschen besser machen als Maschinen, verschliesst die Augen vor der Wissenschaft und behauptet, dass es nie technologische Singularität geben wird."
- (b) "Ich glaube das Problem mit Fake News wird hundert Millionen Mal schlimmer, Cyberattacken werden extremer, es wird komplett automatisierte KI-Waffen geben. Wir glauben, dass KI das Potenzial hat eine endlose, stabile Diktatur zu schaffen."
- (c) "In naher Zukunft wird die gesamte Geschichte der Menschheit in einer riesigen Ansammlung miteinander verbundener Datenbanken von Gesichtern, Genomen, Verhaltensweisen und Gefühlen bestehen. [...] Auf Grundlage all dieser Daten sind die Algorithmen in der Lage unser Verhalten extrem genau zu beeinflussen und zu verändern, wie wir denken und in der Zukunft wahrscheinlich auch wie wir fühlen."

### 4.3 Category: Narrative Support

This chapter presents the relative perspectives of the author and the documentary that were perceived in the coded text passages.

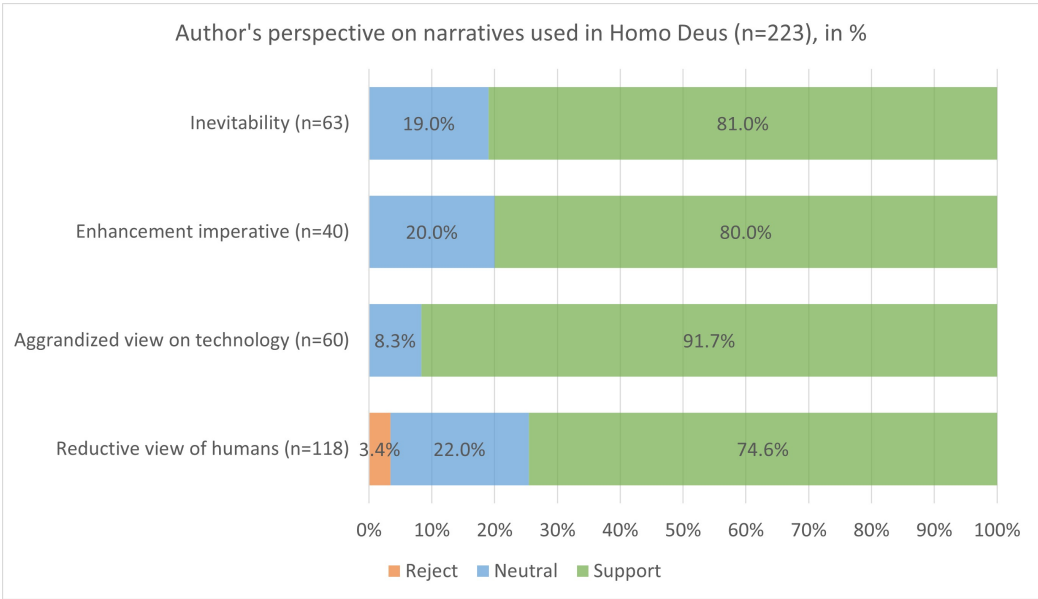


Figure 7: Author's perspective on narratives used in Homo Deus

In *Homo Deus*, transhumanist narratives could be detected in 223 (78%) of the collectively coded text passages (n=286). It can be clearly seen that the author rejects the transhumanist narratives in the fewest cases. With over 90%, aggrandized view on technology has a particularly high support.

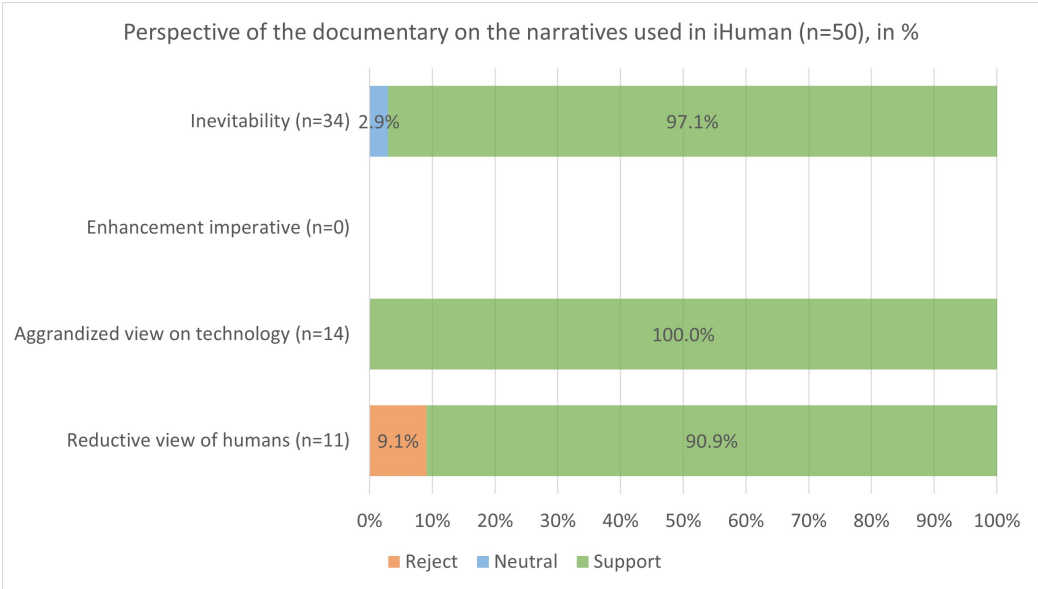


Figure 8: Perspective of the documentary on the narratives used in iHuman



In *iHuman*, transhumanist narratives could be detected in 50 (50%) of the collectively coded text passages (n=100). In *iHuman*, support for transhumanist narratives is even more pronounced. Overall, transhumanist narratives are neither hardly rejected in *iHuman*, nor are they presented in a neutral way.

## 4.4 Narrative subcategories

This chapter gives a more detailed reflection of how each narrative and its corresponding subcategories were used.

### 4.4.1 Reductive view of humans

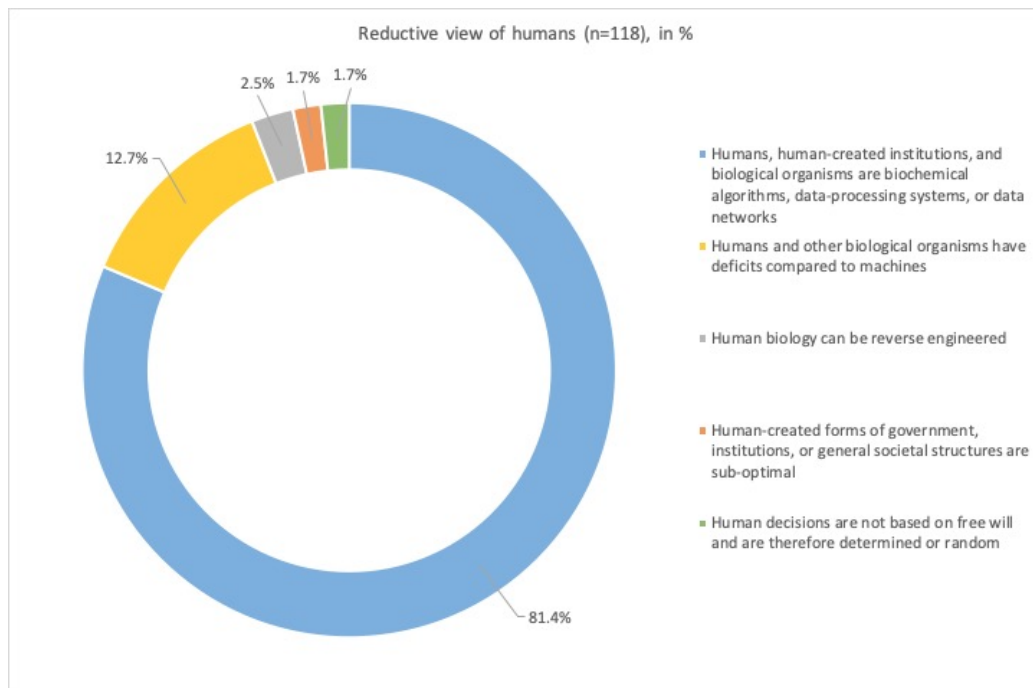


Figure 9: Reductive view of humans in *Homo Deus*

Of all the transhumanist narratives in *Homo Deus* (n=223), *reductive view of humans* was by far the most frequently used (n=118). In over 80% of cases, the author uses with absolute majority the subcategory *Humans, human-created institutions, and biological organisms are biochemical algorithms, data-processing systems, or data networks*. To illustrate this, some of the coded passages are listed below:

1. Humans, human-created institutions, and biological organisms are biochemical algorithms, data-processing systems, or data networks
  - (a) "From a dataist perspective, we may interpret the entire human species as a single data-processing system, with individual humans serving as its chips." *p. 361*
  - (b) "[...] for the last 70,000 years or so, human experiences have been the most efficient data-processing algorithms in the universe, hence there was good reason to sanctify them. However, we may soon reach a point when these algorithms will be superseded, and even become a burden." *p. 75*
  - (c) "After Darwin, biologists began explaining that feelings are complex algorithms honed by evolution to help animals make the right decisions." *p. 373*

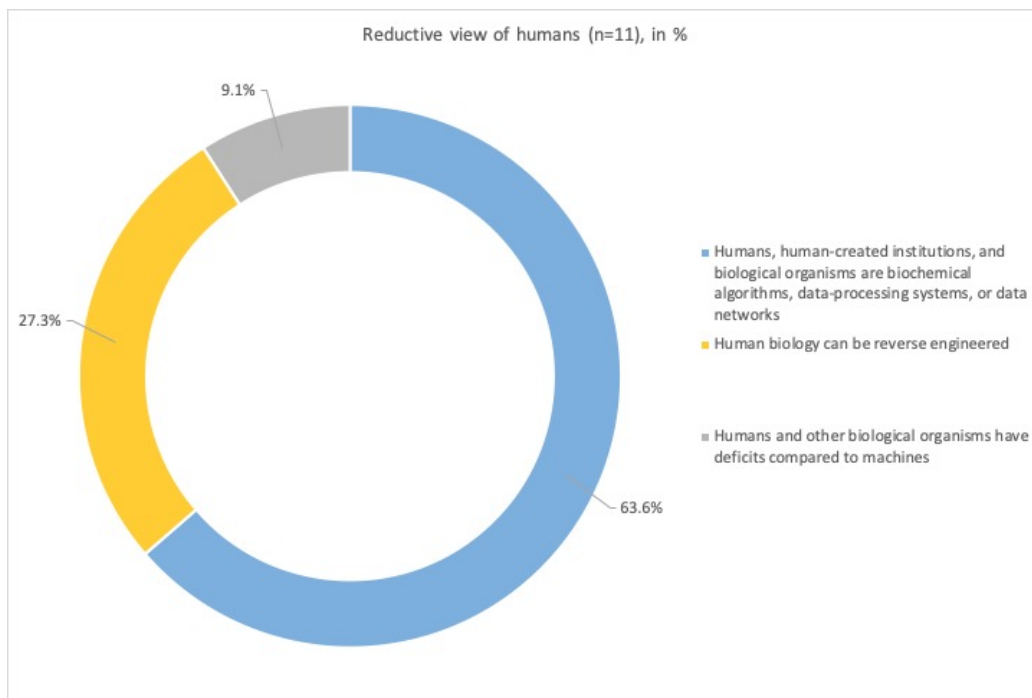


Figure 10: Reductive view of humans in *iHuman*

With  $n=11$  applications, *reductive view of humans* forms the smallest narrative in *iHuman*. Similar to *Homo Deus*, humans in *iHuman* are in most cases (over 60%) represented as biochemical algorithms and/or as data

processing systems. To illustrate this, some of the coded passages are listed below:

1. Humans, human-created institutions, and biological organisms are biochemical algorithms, data-processing systems, or data networks
  - (a) "Wir alle bestehen aus Daten. Was wir tun, wie wir sprechen, wie wir lieben, was wir jeden Tag machen."
  - (b) "Viele Leute glauben, dass Intelligenz etwas geheimnisvolles sei, das nur in einem biologischen Organismus wie uns existieren kann, aber bei Intelligenz geht es um Informationsverarbeitung. Es ist egal ob die Intelligenz von Kohlenstoffatomen in Zellen und Gehirnen entsteht in Menschen oder in Siliziumatomen und Computern."

#### 4.4.2 Aggrandized view on technology

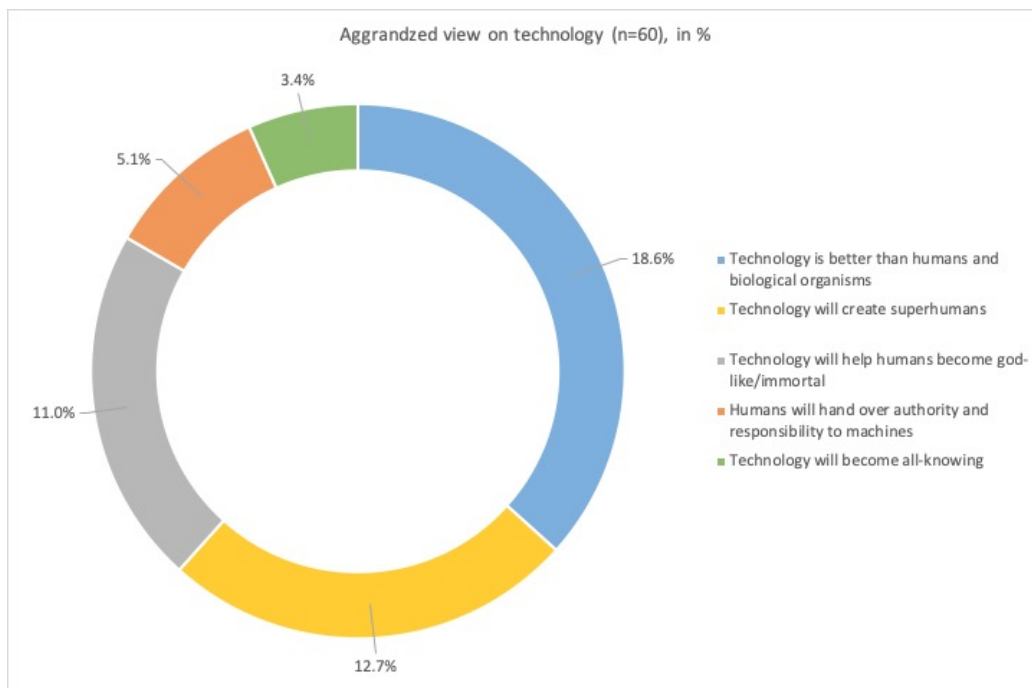


Figure 11: Aggrandized view on technology in Homo Deus

In almost 20% of his statements, the author finds that technology is better than humans and other biological organisms. In addition, in almost half of

the statements, the author suggests that technology will succeed in making humans godlike and immortal, thus transcending them to superhumans. To illustrate this, some of the coded passages are listed below:

1. Technology is better than humans and biological organisms
  - (a) "Moreover, with the rise of machine learning and artificial neural networks, more and more algorithms evolve independently, improving themselves and learning from their own mistakes. They analyse astronomical amounts of data, which no human can possibly encompass, and learn to recognise patterns and adopt strategies that escape the human mind. The seed algorithm may initially be developed by humans, but as it grows, it follows its own path, going where no human has gone before – and where no human can follow." *p. 375*
2. Technology will create superhumans
  - (a) "This idea is an updated variant on the old dreams of evolutionary humanism, which already a century ago called for the creation of superhumans. However, whereas Hitler and his ilk planned to create superhumans by means of selective breeding and ethnic cleansing, twenty-first-century techno-humanism hopes to reach the goal far more peacefully, with the help of genetic engineering, nanotechnology and brain–computer interfaces." *p. 336*
3. Technology will help humans become god-like/immortal
  - (a) "And having raised humanity above the beastly level of survival struggles, we will now aim to upgrade humans into gods, and turn Homo sapiens into Homo deus." *p. 27*

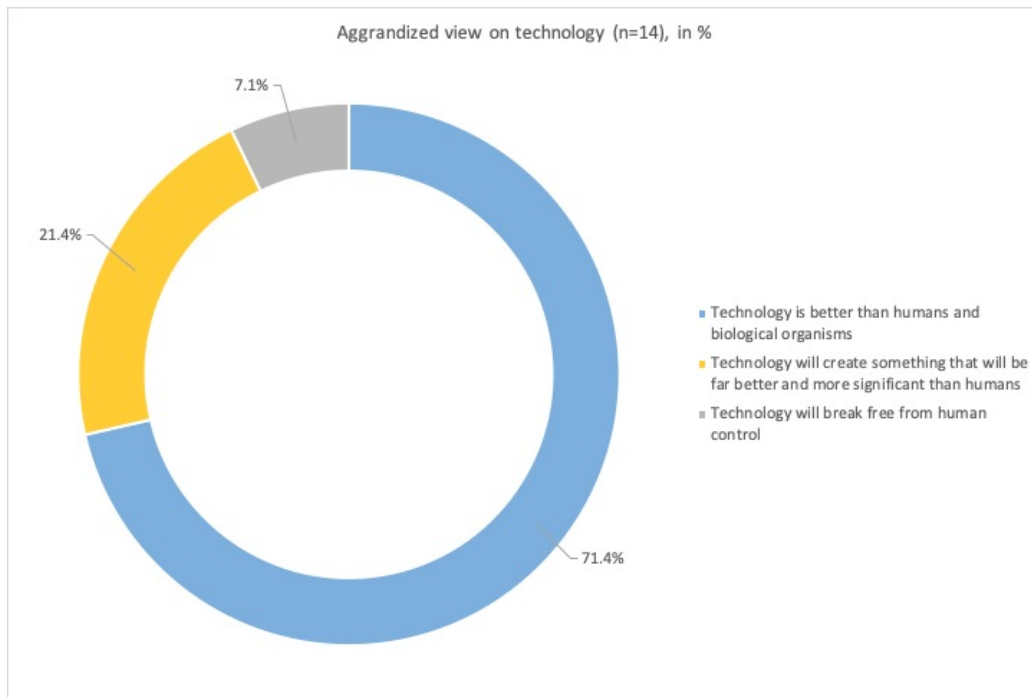


Figure 12: Aggrandized view on technology in *iHuman*

The evaluation of the analysis of the *Aggrandized view on technology* clearly shows that *iHuman*, is also a documentary which in over 70% of the coded cases is convinced that technology is fundamentally better than humans and other living organisms and will eventually succeed in creating something that will be much better and more significant than humans. To illustrate this, some of the coded passages are listed below:

1. Technology is better than humans and biological organisms
  - (a) "Schon die allerersten AGIs werden extrem viel leistungsfähiger sein als Menschen. Menschen werden für die meisten Aufgaben nicht mehr ökonomisch sinnvoll sein. Warum sollte man einen Menschen einstellen, wenn es einen Computer hat, der das viel besser und viel billiger machen kann."
2. Technology will create something that will be far better and more significant than humans
  - (a) "Wissenschaftlern wird schon seit längerem vorgeworfen Gott zu spielen, aber jetzt ist uns allen bewusst, dass wir etwas schaffen, dass sehr anders ist als alles was wir bisher geschaffen haben."

- (b) "Unser Verständnis von KI ist noch sehr eng gefasst. Seit Beginn der KI-Forschung war aber der heilige Gral eine KI zu schaffen, die alles besser kann als wir selbst. Im Prinzip bauen wir einen Gott. Es wird das Leben, wie wir es kennen, revolutionieren."

#### 4.4.3 Enhancement imperative

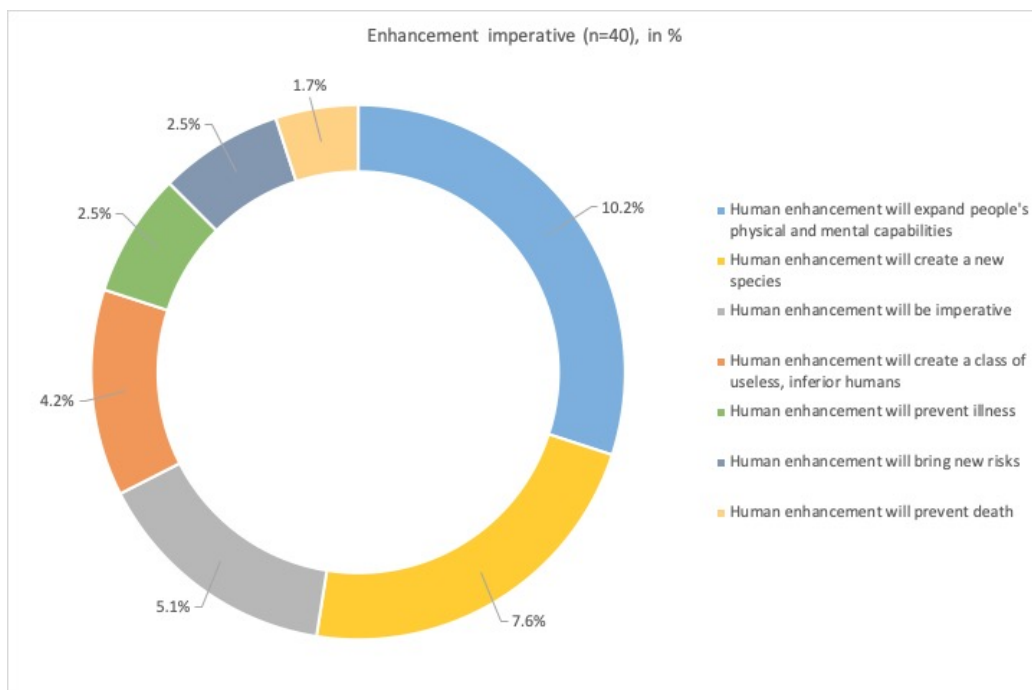


Figure 13: Enhancement imperative in Homo Deus

*Enhancement imperative* was used least frequently of all narratives (n=40). Generally, the author holds the assumption that human enhancement will improve humans both physically and psychologically and thus develop them into a new species. To illustrate this, some of the coded passages are listed below:

1. Human enhancement will expand people's physical and mental capabilities

- (a) "Cyborg engineering will go a step further, merging the organic body with non-organic devices such as bionic hands, artificial eyes, or millions of nano-robots that will navigate our bloodstream, diagnose problems and repair damage. Such a cyborg could enjoy abilities far beyond those of any organic body." p. 48

## 2. Human enhancement will create a new species

- (a) "Bioengineering is not going to wait patiently for natural selection to work its magic. Instead, bioengineers will take the old Sapiens body, and intentionally rewrite its genetic code, rewire its brain circuits, alter its biochemical balance, and even grow entirely new limbs. They will thereby create new godlings, who might be as different from us Sapiens as we are different from Homo erectus."
- (b) "In pursuit of health, happiness and power, humans will gradually change first one of their features and then another, and another, until they will no longer be human." *p. 48*

### 4.4.4 Inevitability

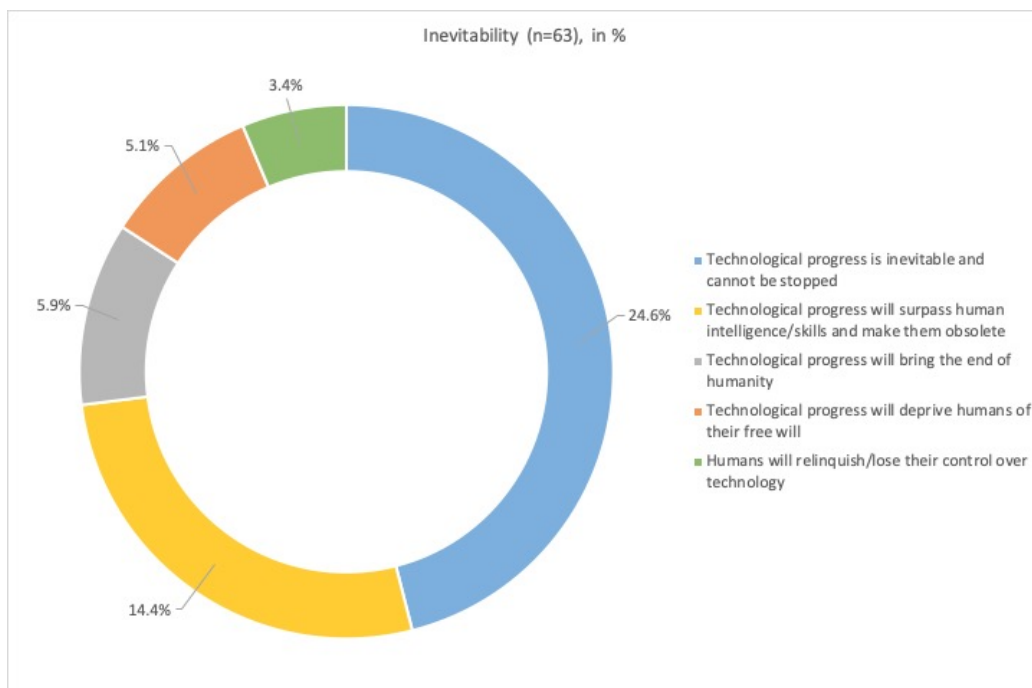


Figure 14: Inevitability in *Homo Deus*

With  $n=63$  coded text passages, *inevitability* is among the second most frequently used narrative in *Homo Deus*. The analysis makes it clear that for the author technological progress is an unstoppable reality and that humans will sooner or later be replaced by technology and thus become superfluous. To illustrate this, some of the coded passages are listed below:

1. Technological progress is inevitable and cannot be stopped
  - (a) "Eventually, we may reach a point when it will be impossible to disconnect from this all-knowing network even for a moment. Disconnection will mean death." *p. 329*
  - (b) "[...] we are on the brink of a momentous revolution. Humans are in danger of losing their value, because intelligence is decoupling from consciousness." *p. 299*
  
2. Technological progress will surpass human intelligence/skills and make them obsolete
  - (a) "When genetic engineering and artificial intelligence reveal their full potential, liberalism, democracy and free markets might become as obsolete as flint knives, tape cassettes, Islam and communism." *p. 268*

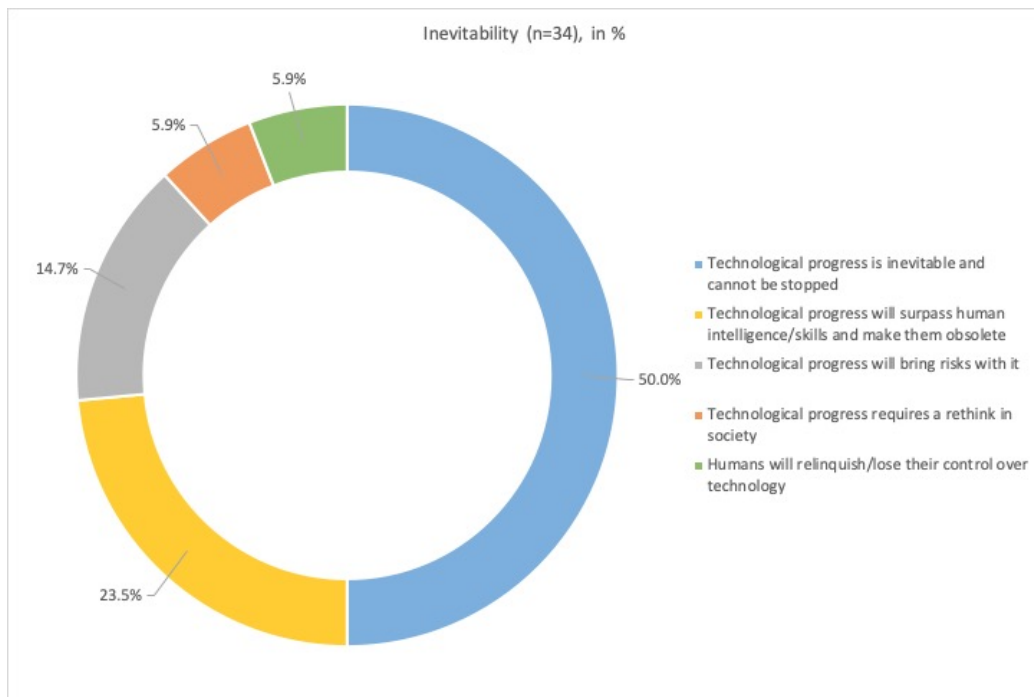


Figure 15: Inevitability in iHuman

With  $n=34$  applications, *inevitability* represents the absolute majority of the coded narratives in *iHuman*. As with *Homo Deus*, *iHuman's* attitude



toward technological progress is characterized by a commitment to the inevitable evolutionary step of humans and the imperative of progress. To illustrate this, some of the coded passages are listed below:

1. Technological progress is inevitable and cannot be stopped
  - (a) "[...] Feuer hat wie KI die Eigenschaft, dass sie sich ohne menschliches Zutun zu einem Flächenbrand ausbreiten kann, aber die Vorteile überwiegen die Nachteile so sehr, dass wir diese Entwicklung nicht aufhalten werden."
  - (b) "In naher Zukunft wird die gesamte Geschichte der Menschheit in einer riesigen Ansammlung miteinander verbundener Datenbanken von Gesichtern, Genomen, Verhaltensweisen und Gefühlen bestehen. [...]"
2. Technological progress will surpass human intelligence/skills and make them obsolete
  - (a) "Wenn wir eines Tages Artificial General Intelligence haben, dann kann KI per Definition auch die Arbeit von KI-Programmen verbessern und das bedeutet, dass im weiteren Prozess KI nicht mehr von den menschlichen Programmierern, sondern von KI dominiert wird. Rekursive, sich selbst verbessernde KI lässt menschliche Intelligenz weit hinter sich und schafft eine Superintelligenz. Das wäre die letzte Erfindung, die wir jemals machen müssten, denn sie kann selbst alles weitere viel schneller erfinden als wir."

## 4.5 Attitude interpretation

This chapter presents the general presentation and tonality of the coded text passages.

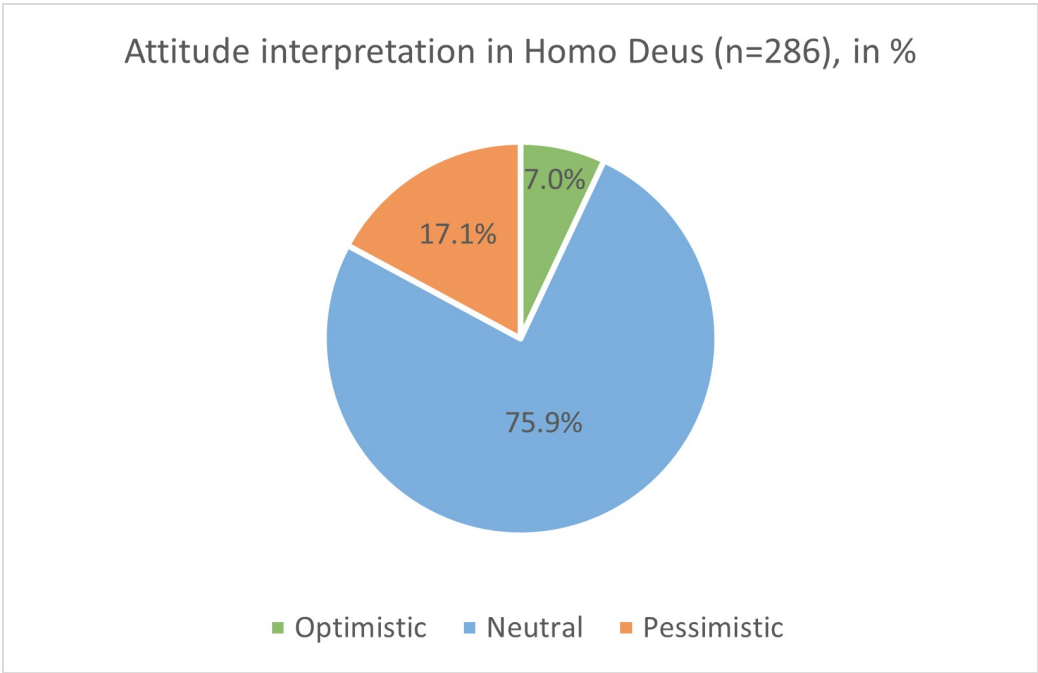


Figure 16: Attitude interpretation in Homo Deus

In terms of attitude and tonality, *Homo Deus* is predominantly neutral with over 75% of all analyzed text segments (n=286). Nevertheless, there is also a considerable pessimistic share. All in all, an optimistic interpretation of the statements is kept within limits. The following bar chart shows the author’s attitude towards the coded narratives:

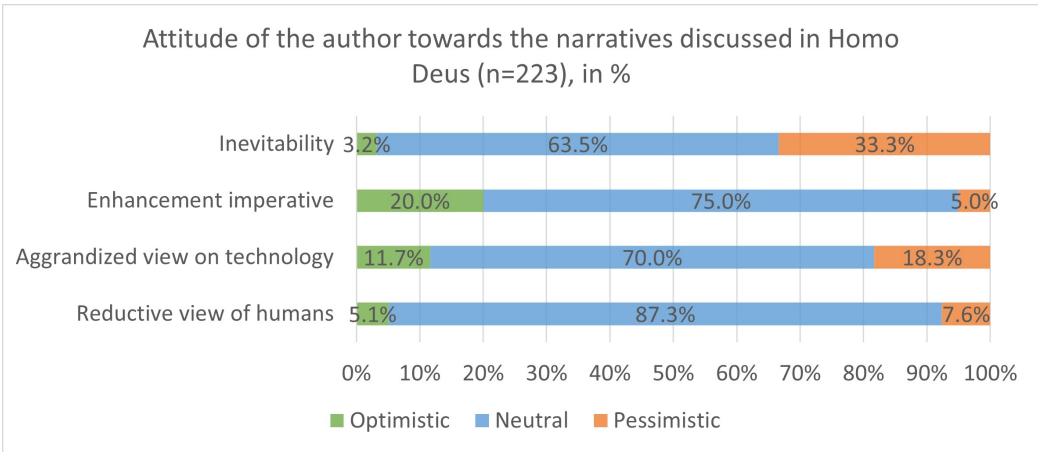


Figure 17: Author’s attitude towards coded narratives in Homo Deus

With more than 30%, inevitability has the largest pessimistic share of all narratives. With an average of 74%, a large part of the statements are presented neutrally.

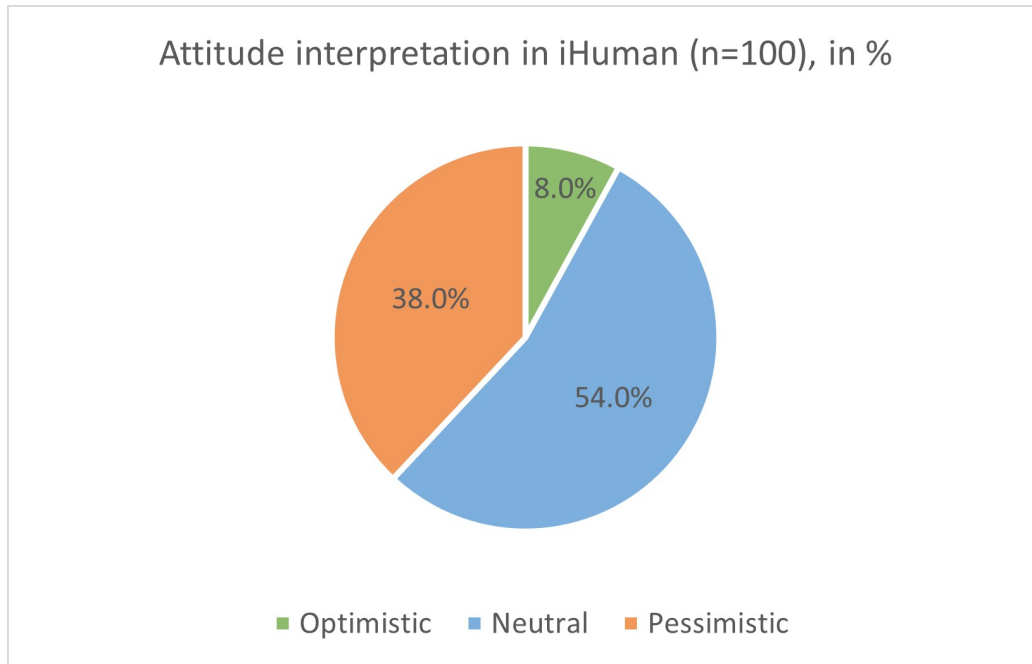


Figure 18: Attitude interpretation in iHuman

Although more than half of the statements are presented neutrally, the analysis makes it clear that *iHuman* is nevertheless a very pessimistically oriented medium. Similar to *Homo Deus*, only the fewest statements can be classified as optimistic. The following bar chart shows the attitude towards the coded narratives:

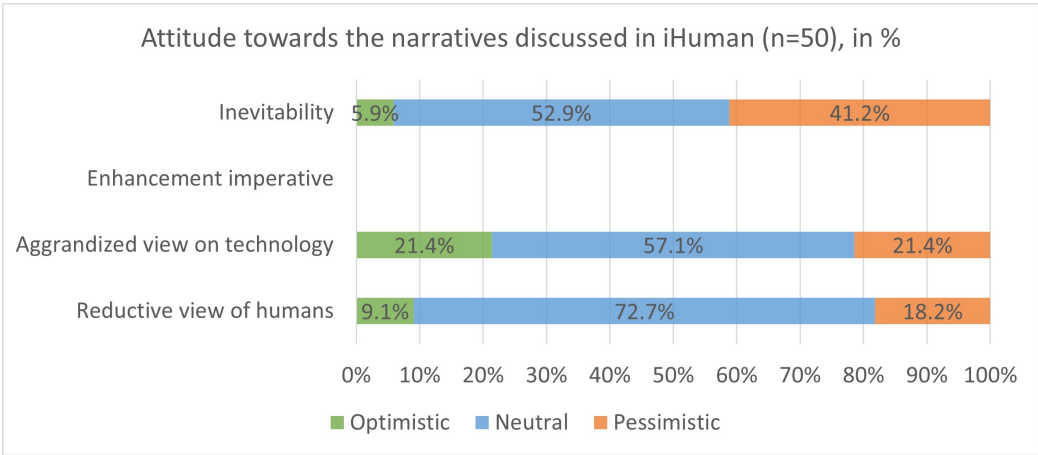


Figure 19: Attitude towards coded narratives in iHuman

As in *Homo Deus*, inevitability in particular is the most pessimistic of the coded narratives in *iHuman*.

## 5 Discussion

The following section interprets the previously presented results to answer the research question:

*Are popular science media buying into the transhumanist narrative?*

The research question was unmistakably confirmed in the analysis and can be answered with a resounding *yes* for both research materials used. In total, 223 transhumanist narratives were identified in *Homo Deus* and 50 in *iHuman*. In relative numbers, this accounts for 78% of the total coded text passages in *Homo Deus* and 50% in *iHuman*. Thus, the narratives compose a considerable part of the overall coding. In addition, of the 223 transhumanist narratives in *Homo Deus*, over 80% of the cases are supported by the author, in *iHuman* it is nearly 97% of the total cases.

In summary, the general tone in both research materials is kept neutral. Nevertheless, *iHuman* paints a significantly more pessimistic picture in a direct comparison. While *iHuman* discusses more specific technologies than *Homo Deus*, neither goes into technical detail or provides evidence-based sources. Conceptually, *Homo Deus* makes a strong effort to draw analogies between humans and machines. Whereas *iHuman* focuses primarily on the influences of individuals and society. Both sources rarely reject or challenge the transhumanist narratives. Especially *iHuman* shows a strong support of the narratives. In this regard, the inevitability of technological takeover is the most prevalent narrative in *iHuman*. In *Homo Deus*, it is the reductive view of humans, which is often expressed in analogies. Basically, strong support for the narratives evident in *Homo Deus* as well as *iHuman* does not imply optimism about the propositions.

The vision of the future in *Homo Deus* paints a humanity that has considerable power at the beginning of the third millennium through biotechnology and information technology. Given human development to date and the steady progress in technology and science, Harari concludes that humanity's next goals will be immortality and divinity. Furthermore, Harari argues that humans will finally realize their ancient desire to reach beyond themselves and unleash their own autonomy. Even though Harari does not use the term transhumanism once, there is no doubt that the coded passages address transhumanist ideas. The amount of transhumanist statements clearly show that transhumanism is polarized in *Homo Deus*.

With a good dose of drama, *iHuman* describes a future scene of humanity controlled and ultimately taken over by artificial intelligence. The relationship between humans and machines is compared to ours with animals - while we do not hate them, we often ruthlessly enslave them for our own ends. In *iHuman*, Tonje Hessen Schei gives a lot of room to such disturbing and alarming opinions. Especially since the majority of the interviewed experts are well-known figures of the transhumanist scene. Thus, *iHuman* has a strong transhumanist character for this reason alone. The only problem is: *iHuman* neither asks counter-questions, nor does the documentary properly classify information, but relies on arbitrary snippets of information, which all seem somehow threatening.

From these results it can be concluded that popular science media, or at least the research materials analyzed for this thesis, buy into the transhumanist narratives and bring the ideas of the transhumanist agenda to the world without any rebuttal or questioning them.

Furthermore, the analysis of the transhumanist narratives revealed some key thematic and structural commonalities, which should help to better understand the nature of transhumanist narratives:

1. The narratives open up a space of imagination or possibility in which social future scenarios are reflected upon. Many of these futures are based on the technical and digital innovation potentials of the present, which have become established in the fictional future scenarios and fundamentally determine social processes. Technical innovations in robotics and the all-encompassing presence of artificially intelligent systems lead to gigantic economic monopolies that control people via digital technologies. Society adopts this logic by also implementing evaluation systems in social life that assign socio-economic value to the individual.
2. The narratives establish gloomy futures under the sign of a world dominated by AI and robotics. It is striking that, on the one hand, progressive utopias of creation, immortality, or self-optimization are linked to the topic of AI, but on the other hand, they are mostly anti-utopias in which not only the technical innovative power is questioned. At the end, there is often an attempt at limitation or even withdrawal. In social terms, technical progress often proves to be a threat to humanistic social values.
3. Narratives that tell of the creation of artificial intelligence or transhumans often contain biblical-religious or mythological references. For

example, narratives are about the first human or acts of creation. Artificial intelligence or the interconnection between humans and machines, for example, sometimes even appear as projections of salvation. Biblical or mythological references usually position the narratives in a historical-cultural context. In doing so, they problematize the technical act of creation as a narcissistic act of ethical and moral violation of boundaries, which in many narratives threatens to destabilize both human beings and society.

4. Although artificial intelligence is usually constructed to resemble humans, they are initially placed in opposition to “real” humans. Starting from this basic constellation, they address attempts at drawing boundaries between what is considered human and what is considered non-human. The question of what distinguishes humans from machines is defined in very different attributes such as consciousness, mortality, emotions, ability to develop, creativity or freedom.
5. In the narratives, the “stranger” represented by machines is often a projection for social concepts such as ethics, morality, love, sexuality, gender or law. In dealing with artificial beings classified as non-human, it becomes apparent how society deals with machines in the narratives. Artificial intelligence and machines are either excluded as representations of the stranger or they are integrated, with society ascribing to them their role within the prevailing structures of order and power. Similarly, the counterpart is also sufficiently addressed in the narratives, namely the interaction of machines with humans.

## 6 Conclusion and further research

The research question "Are popular science media buying into the transhumanist narrative?" posed at the beginning of this thesis could be confirmed with the data collected during the qualitative content analysis. The preliminary analysis in the theoretical part of this work, which had to be carried out in order to be able to deal with such a technologically but also philosophically complex topic altogether, and the analysis actually carried out, have shown quite clearly that there is a multitude of transhumanist narratives in popular science media, which have passed over into everyday knowledge and shape the cultural negotiations and conceptions of artificial intelligence and the technology associated with it.

Packed with a good portion of dramaturgy and other theatrical elements, *iHuman* wants to draw our attention to the impending crisis between humans and machines. While technology companies blindly believe in AI and claim that AI can tackle global catastrophes like hunger or war, others see the development of AI and a general artificial intelligence as the last invention of humankind and at the same time as the downfall of humanity. In her documentary, Tonje Hessen Schei addresses the unjust concentration of power in the AI industry, which is neither regulated by state authorities nor offers any form of transparency. In true opportunistic fashion, one future horror scenario after another is thrown at the viewer, leaving no stone unturned. Be it facial recognition software in public spaces, privacy abusing governments like China, US election toppling organizations like Cambridge Analytica or philosophical questions about the nature of human beings. However, these findings come as no surprise at all, as most of the experts interviewed are familiar faces from the transhumanist scene. The question remains, however, why a renowned broadcaster like *ARTE* would even offer a voice to such a fear-mongering documentary littered with transhumanist narratives in the first place.

This insight is not quite so self-evident in *Homo Deus*. One might think that the work of a serious historian would hardly come into contact with transhumanist narratives, but after the analysis a completely different picture emerged. *Homo Deus* is not so much "a brief history of tomorrow," but in fact a popular science book brimming with anti-humanist prejudices, with the degradation of humans underlined by the core elements of transhumanist narratives. In his remarks on the supposedly imminent technological future that awaits us, Harari does not shy away from drawing on existing studies, without, however, discussing them in detail. By equating human intelligence



with artificial intelligence, Harari repeats the widely held view that artificial intelligence has reached and already surpassed human capabilities. The only problem is that he does not provide an evidence-based argument for this. One possible reason why Harari inflates the future of artificial intelligence to immeasurable proportions and, one might almost say, decorates it with his own wants and needs, could be related to his understanding of human consciousness, whereby he is firmly convinced that all the feelings and emotions a human being can feel are nothing more than biochemical algorithms resulting from evolution. Harari takes this thought even further and applies his logic to all other living beings and asserts that the processing of biochemical algorithms takes place completely unconsciously, according to which animals also have no instincts and emotionally only function like algorithms. This is an argument that not only abuses and disregards contemporary science, but also one that represents one of the core elements of transhumanist ideology, namely the perverse reduction of humans to mindless matter. Even though Harari cleverly gets himself out of the line of fire in his statements by appropriately referencing the transhumanist narratives, Harari nonetheless reduces and degrades humans to predetermined, data-processing beings because he makes no effort whatsoever to use counterarguments or to scientifically substantiate the narratives. Instead, he calls the idea of the rationally thinking human being, who possesses a free will and can determine his life completely freely, as a naive and arrogant illusion, which is very questionable for an author/historian with his reach, but unfortunately also dangerous.

While many influential visionaries argue that transhumanist goals such as significant life extension or even the elimination of death are desirable and therefore spare no expense to achieve them, transhumanism is perceived by critics as a serious threat that could potentially render humanity irrelevant. In their manifesto [21], ethicists describe transhumanism as a dangerous ideology and see the future scenarios pursued by transhumanists as not serving the good of humanity because they convey an image of the human being that fundamentally misunderstands what it means to be human.

Whether and to what extent we ultimately submit to or resist the seemingly predetermined transhumanist future is our personal decision but also our responsibility. Only if we understand the reasons for this ideology, we can also understand why resisting it requires a societal change. It should not be the goal to extend or even replace humans by artificial intelligence and human enhancement, rather we should use these achievements to make our present but above all future world more human. Unfortunately, Harari as well as Schei, at least in this respect, have not fulfilled their responsibility towards our society.

For the results of this thesis, the aim was to achieve the highest possible degree of representativeness. However, it should be noted that the number of media analyzed was relatively small. In order to achieve even better and more representative results, it would make sense to conduct further studies that evaluate more popular science literature on the one hand and other media such as newspapers, online offerings or magazines on the other. In addition, it would be interesting to include other categories in an analysis besides those included in this thesis. Methodically, a qualitative content analysis was conducted in this thesis. Thus, it would also be interesting to look at the adoption of transhumanist narratives in popular science media using a different method. Since qualitative content analysis cannot provide information about valuations contained in the coded text passages, it might be useful to look at the research material using a hermeneutic method. One conceivable way of doing this would be to conduct an advanced discourse analysis.

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