Transdisciplinary approach to the Emerging CHallenges of NOvel technologies: Lifeworld and Imaginaries in Foresight and Ethics (TECHNOLIFE)

TECHNOLIFE deliverable D4.3

Social imaginaries and ethical issues in deliberative process on Body and Mind Enhancement

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Introduction

This deliverable reports on the analysis of a virtual forum discussing body and mind enhancement. The forum was facilitated by KerTechno (see D3.1)[1], and invitations were extended to a number of individuals and groups who are considered stakeholders of one or another kind: experts, administrators, relevant occupations, interest groups, and more (see D2.0)[2]. Discussions were kick-started with a short provocative film, drawing on a scoping exercise attempting to capture the "hot topics" engendered by body and mind enhancement technologies. The scoping paper (D1.3)[3] identifies an increasing preoccupation with issues of immortality and a juxtaposition of a world of bodies with virtual existence and identities. On the one hand, we have novel biosocieties organised around emerging biomedical identities, specific diseases, and so on. On the other hand, we have online gaming and the use of large-scale registries to govern populations. These trends can be found in the science fiction literature such as the *Neuromancer* (Gibson, 1984), in academic analysis (e.g. Hayles, 1999), and in regulatory discourse on data and privacy protection. D1.3 also explores scenarios, depicting efforts of overcoming imperfections, ailments, shortcomings and finitude. They disclose a future world of more capable, healthier and longer lasting bodies and minds, even *super-soldiers* and *super-intelligence* (see e.g. Roco and Bainbridge, 2002). Science fiction has for a long time played a major role in cultivating such visions where body and mind enhancement is speculated on, but also tried and tested as indicated by recent developments in the use of implants or by latest advances in bionics and reconstructive surgery.

Particular complications arise against the emergence of transhumanism (e.g. Bostrom, 2005). Techno-scientific utopias, such as Ray Kurzweil's notion of *Singularity*, scenarios of leaving the body behind for virtual existence in cyberspace, and new body cultures that fetishise modification (tattoo, fitness, fashion, implants and cosmetic surgery), are all ethically and substantively challenging. For example, the virtual existence of a person is a digital "placeholder", perfection is an unstable category, and whether or not quality of life can be improved upon remains an empirical matter. Many existing enhancement technologies are experimental with uncertain and unpredictable results. And, apart from potential physical complications, there are issues regarding changes in emotion, personality and identity, and a risk of deep disappointment. Furthermore, legal ramifications need to be established around decisions of which persons have access to state-of-the-art technologies for enhanced capabilities.

Together, these questions draw attention to the manner in which benefits, risks and burden are communicated among experts, policy-makers, interest and patient groups, and other relevant stakeholders. In other words, perfection, immortality, power, body/health economies, personal, occupational and organisational challenges, should be further examined in public debates and KerTechno was positioned as an instrument to attempt such an exploration. The forum on digital globes was designed to hone in on three focus issues for discussion and debate:

> 1) The final words of the movie are: "to me, **normal is a state of perfection**." What do you think about this?
>
> 2) **Freedom of choice and social difference**: If some people can afford to choose their bodies and minds, how could that change society?
>
> 3) **Forever young**: Can new technologies make us live and stay beautiful longer, or even forever? Will humanity turn into super-humans or cyborgs? What do you think about this?

Our methodological approach to the forum, the aims of our analysis and a summary of the many disparate findings, are elaborated in the D4.0 introductory report.[4]

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1   http://neicts.lancs.ac.uk/pdf/Technolife-D3-1-DocumentationOfKerDST.pdf
2   http://neicts.lancs.ac.uk/pdf/Technolife-D2-TheoreticalFramework.pdf
3   http://neicts.lancs.ac.uk/pdf/Technolife-D1-3-Scoping-Body.pdf
4   http://neicts.lancs.ac.uk/pdf/Technolife-D4-Introduction.pdf

1. Identifying actors' assumptions

In this section we describe the short film intended to kick-start forum discussions on body and mind enhancement. We will address its composition and use as a method, and we ask to what extent, if any, the contributions can be said to be guided or influenced by the world-making this film accomplishes as an imaginary. In particular, we draw particular attention to the use of the term "perfection". First it is anchored in historical references to various body fashions up until the present day. Thereafter, perfection is anchored in explicit references to norms of being happy, healthy, beautiful and forever young—a promise of total freedom—the freedom of movement, morphology and choice being the key message in the consumer marking of perfection. Finally, the film anchors "perfection" in Nazi politics of racial superiority which indicates there may be serious ethical problems in achieving superior bodies and minds.

We explore some of the interpretive and imaginative registers of perception and reaction to the film. These registers are anchored in: 1) the ways in which the film confirms to participants unrealistic and paradoxical depictions of "perfection". Perfection as such is not a commodity and enhancements are typically not about "perfection". Rather, they can be seen as options for improvement in one or another form; 2) the ways in which the film confirms to participants the inevitability of human enhancement, and the importance of preparing for greater life expectancy and a changing spectrum of human appearances and/or capabilities.

Narration in voice, image and sound

The film opens with a statement about the human body (0.09-0.19). A narrator speaks on top of a sonar image of a live foetus, claiming that the body is incomplete, but can be modified. *Your own natural capacities can be enhanced*. Here the narrator comes into view, a Nordic looking male wearing a lab coat. He is seemingly a representative of enhancement services—is physically situated in an open-plan space, bathed in icy blue light with live monitors and touch screen access to virtual objects and images. He continues, claiming that [*w*]*hat we do is not new* and, on top of a collage of still images, he refers to historical body fashions such as longer necks, thinner waists, smaller feet, a perfect lining of teeth, tattooing, piercing, etc. Then he comes back into view with images floating on a monitor behind him, concluding that [*h*]*umans have a natural desire for perfection. Who will settle for normal when you can be perfect?* (0.25-0.54).

At this juncture the narrator proceeds to tell the viewer that we can erase from our lives everything we do not like, we can shop for beauty products and medicine (0.55-1.14). Then he asks if you are *tired of being tired, of forgetting, of being down,* claiming that new technologies are on the market for those who want to be energetic, happy and young all the time. *We offer you implants and prosthesis* to remove or transform undesirable body features and to correct congenital defects. Bionics will also improve athlete bodies. We will have total freedom of movement, morphology and choice (1.15-1.51). In the following sequence of scenes, the narrator proceeds to explain that *we have the technology to go beyond any limitation*—technology convergence will potentially make *any physical and psychological enhancement* possible. You choose your model and you tell *us how you want to be*. (1.57-2.16).

This narrator is presented as a persuasive salesman. He is very much in the frame throughout the duration of the film and he speaks with authority about enhancement procedures and products *we* have—that *we* are awaiting *you* to make your choices about *how you want to be*. We see momentarily a stereotyped female beauty (0.55-0.57), then a trolley moving through a supermarket and a scene showing pills manufacture, all of these indicating that enhancement options are already for sale (1.05-1.17). We see the narrator come in and out of view with

monitors in the background (or a head shot of him), as he touches screens to flip between images/scenes while he speaks to the viewer. We see close-up views of visuals on monitors, e.g., a business woman/mother holding hands with a child, a tummy with surgery markings, a close-up view of facial surgery, a prosthesis model/animation, brain scan images, a computer model of a grid on which a head or a full body is animated, and more.

What is perhaps most striking about the film pertains to the dominant icy blue colour spectrum which gives the visuals an appearance of objective authoritative quality, however, it is unclear if the icy blue supports depictions of a techno-scientific reality or a science fiction. Indeed, we observe responses to the film in which participants see confirmation of the inevitability of modification and/or enhancement, but we also see how they are pushed to think about the ways in which the technologies are portrayed. The music track is suggestive of a comforting certainty. The musical score opens with a soft and cheerful piano melody in the foreground, as well as other keyboard melodies on a rhythmic background with a gentle base line and synthetic chords that begin to accentuate a dramatic build-up and dramatic shifts from one scene to another. Then at 2.17 there is a radical shift in the music score, to a more volatile tonal flow of strings and bells when the film also shifts to black and white scenes from the 1936 Olympics. The visuals show athletes in action, parades and audiences, while the voice of the narrator tells the viewer about [s]*uperior bodies and minds*, without pain or limits (2.17-2.30). Scenes from the 1936 Olympics continue on a background monitor (2.31-2.36) while the narrator comes back into view, then the image of the live foetus again, then the narrator finally, claiming that people *think they are complete* and normal, but *we* offer the happy, healthy, beautiful and forever young because, *to me, normal is a state of perfection*. (2.37-2.53).

Critiquing "perfection"

The final words of the film, "to me, normal is a state of perfection", are posed as a focus topic for participants to reflect on. We observe how participants take for granted that others know - more or less - what is meant by "perfect" and "normal". The point of reference is how, in the film, the former stands for *completeness* of happy, healthy, beautiful and forever young, while "normal" stands for the *incomplete*, except when the narrator elevates "normal" to a "state of perfection" in the last scene. We also observe how participants challenge the uses of these terms, seeing them as subjective qualifiers, potentially void of all concrete meaning. Actually, the characteristics of "perfection" and "normal" are never specified with much clarity in the forum. Common conceptions of what is perfect, appear to indicate just about anything above and beyond average human characteristics, although, it is unclear exactly above and beyond what. Is it the person's health, a mental capacity, or some other specific attribute? Simple indicators of "more" or "better" can also lead to confusing conclusions. For example, one participant states that, if everyone was perfect, humanity would slide into total boredom and unhappiness. The implicit assumption, it appears, is that everyone will be pretty much the same in being happy, healthy, beautiful and forever young, or there will be nothing to entertain us in the absence of common "flaws". In response to this proposition, another participant offers the counterargument that bored and unhappy humans would be imperfect by definition.

In light of this and similar confusions about what "perfection" can stand for, it should not come as much of a surprise that the uses of "perfection" and "normal" in the film are perceived of as paradoxical and misleading by a number of participants. "Perfection" is described as a bad or ill-thought out concept. For example, offering "perfection" for sale is a lie if there will always be "more perfect" individuals among the "perfect". The relationship between perfect and normal also finds expression with reference to the claims of the narrator.

Fragment: **D4.3.1**

```
 1  Andrea
 2  I, too, found the concept of "perfection" misleading in the video […]  As others
 3  have asked, "what is 'perfection'?" I'd actually rather like to be normal some
 4  days, I'm well below average height, it would be nice to not have my feet dangle
 5  off an average-sized chair.
 6
 7  However, even if I got my extra few inches… others would seek to be taller
 8  still. I see this in Second life, actually, where so many avatars are at nearly
 9  maxed out dimensions. I've had to make mine taller than I'd like just to remain
10  proportional with my friends. "Keeping up with the Joneses" as it were.
```

According to Andrea, the term "perfection" is misleading, the meaning unclear. But she appears to take for granted that "normal" means "average". The way she puts it, "I'd actually rather like to be normal […] I'm well below average height" (lines 3-4). In relation to perfect then, normal is something entirely different. Normal is *not* a state of perfection as the narrator in the film claims to see it. Nevertheless, normal is to Andrea a preferred state, at least "some days". She also invites the assumption that seeking "more" can be aimed at normality and not just perfection. She would like the extra inches to be normal. Then she reflects on how others would desire to be taller still in order to exceed the normal. The reference Andrea provides to Second Life is noteworthy in this respect. As she describes it, many players maximise the size of their avatars so others have to increase the size of theirs, whether they like it or not, "just to remain proportional […] "Keeping up with the Joneses" as it were" (lines 9-10). The implication is that we always find new points of reference for subjective qualifiers like "normal" and "perfection". In the latter case, as one participant puts it, "[t]he quest for perfection is always flawed and endless":

Fragment: **D4.3.2**

```
 1  Anthony
 2  It [the quest for perfection] is like the quest for wealth. No much how much
 3  wealth people have, it is never enough.
 4  No matter how perfect one is, it is never perfect enough.
```

According to Anthony, the term "perfection" refers squarely to untenable targets, "never enough". People never have enough of what they are after. Perfection "is never perfect enough" (line 4). On the account of such an extreme formulation, "never", one could ask if "normal" is ever normal enough. No participant asks that question directly, although, reactions to the use of the term "perfection" may invite the speculation. Indeed, other participants express similar concerns to Anthony, about the use of the term "perfection" and in one instance assimilating "natural" and "normal".

Fragment: **D4.3.3**

```
 1  Amber
 2  This video seems to me an extremely ; heavy-handed method of presenting the
 3  concept of mind/body enhancement. Rather than present the potential for
 4  enhancing the "natural" ;aspects of the human being, the video uses terms like
 5  "perfection" ;as if it were possible to somehow reach an ultimate goal of
 6  body/mind potentials. This is enhancement technology as imagined by marketing
 7  professionals or politicians;
```

Amber is very clear that she finds it "an extremely ; heavy-handed method" (line 2) to use the term ""perfection" ;as if it were possible to somehow reach an ultimate goal of body/mind potentials" (lines 5-6). According to Amber, this is how "marketing professionals or politicians" (lines 6-7) imagine enhancement but the video could instead "present the potential for enhancing the "natural" ;aspects of the human" (lines 3-4). In other words, rather than pushing an ideology of "perfection", we could be discussing more realistically the potential to enhance what humans "naturally" have, indicating that "natural" is analogous to ordinary or normal. The very existence of "perfect" and the quest for it, is further contested in relation to the question of how technologies can be useful, by juxtaposing *realistic* and *unrealistic* depictions:

*Fragment: **D4.3.4***

```
1  Anna
2  What is great in this world is that nothing is perfect. I really do not like
3  this search for PERFECTION and especially the promises of the movie that are not
4  true and will only get people still more suspicious about technologies. I thing
5  that technologies can however be very useful and should be developed to HELP
6  people. For example I had an eye operation and I feel great without glasses or
7  contact lenses.
```

Anna takes for granted the extreme notion of perfect as an ideal and, on the basis of that, she denounces the search for something that, to her, does not exist. To Anna, "nothing is perfect" in this world (line 2). The she raises concerns about "the promises of the movie that are not true" (lines 3-4) and provide a false depiction of technological potentials. As Anna puts it, technologies "should be developed to HELP people" (lines 5-6), like they have helped her eyesight. We observe other remarks of similar orientations but also questions in response such as, "[w]hy do you believe that humans cannot perfect themselves, or at the very least seek their own version of perfection?". These responses are less concerned with the uncertainties associated with the term "perfection", i.e., what perfection can possibly stand for, than signalling a disposition toward the overall objective of perfecting or improving oneself.

What we observe here are a number of uncertainties associated with the uses of the terms "perfection" and "normal". Uncertainties are identified by participants in relation to the narration in the film, as well as in each other's contributions. Andrea (D4.3.1) would rather be normal than perfect, but the quest for "more" encourages others to "keep up" so what counts as normal changes over time. Anthony (D4.3.2) takes for granted the extreme notion of perfection (the ideal) which renders it an untenable objective, finding expression only in "endless" and "flawed" quests. Amber (D4.3.3) contests the very existence of what "perfection" could possibly stand for and objects to the search for it, and Anna (D4.3.4) suggests that the technologies in the film are subject to doubt and the focus of development should be to help people. One can argue that these uncertainties surrounding "perfection" are anchored in ordinary logics of specifying what terms for ideals like "perfection" and "normal" can actually stand for, namely, how they elude specification. As one participant argues, to say that normal is a state of perfection is so subjective that it is as good as meaningless. But the "heavy-handed method", as Amber puts it, of suggesting that perfection is our ultimate goal, also warrants a fearful response. As one participant put it, "[t]he film shows a path which can be dangerous if not directed in the right way", and another participant stated, "I found the video showing scary developments. I would not want to live in such a world and I do not believe in human perfection".

As we will explore in the section on addressing the focus topics, participants continue to critique the uses of "normal" and "perfect". They fit these critiques in with macro-propositions

which already begin to take shape in direct response to the film, e.g., *perfection is untenable, an endless and flawed quest, and a lie to exploit consumer behaviours to market it*. Participants also discuss questions of equality, justice and freedom and, thereby, they draw attention to a range of potential controversies. For example, they discuss freedom and choice versus conformity, i.e., whether enhancement technologies will coexist with social pressures (even coercion) to conform to particular body and mind types, rather than incentives to create a much greater variety of innovative and unique body and mind characteristics than currently exist. They address issues of haves and have-nots, whether society will change or existing social textures only sharpen. They also ask if good and bad qualities can ever be equally or justly (re)distributed.

A tenable objective ?

Paradoxical, misleading or illogical uses of concepts like perfection and normal, do not deter participants from positioning body and mind enhancement as plausible, inevitable, even desirable. The film is deemed to show `"the very possible future"`. It is a `"perfect video witch shows the way only thinking about technology gets us"`.

The following contribution provides a reasonable cross section of the responses to the film that strongly indicate an optimistic disposition regarding the plausibility (and feasibility) of modification and enhancement:

*Fragment: **D4.3.5***

```
 1  Bernard
 2  The movie film clip is good and quite realistic I think for the near and coming
 3  future.
 4
 5  The movie is not provocating me but I think it will be quite natural in the
 6  future.
 7
 8  Basically it is a matter of 'life quality' for the individual. So if this means
 9  to modify your body or brain this is ok with mee as long as it is 100%
10  voluntarilly and not done under pressure from somebody else wether an individual
11  or a state or system or something else.
12
13  So if this leads to modified face or body or replacement of faulty parts like
14  knees or heart or kidney or something else this is ok with me. I think this is
15  up to the individual person to decide. Human 'spare part' replacement will be
16  quite natural in the future and probably a prerequisite for people getting older
17  and older.
```

The first thing to notice is the unquestioned faith in the potential of the technologies represented in the film, `"good and quite realistc"` (line 2), and `"will be quite natural in the future"` (line 5). Bernard then argues that matters of "life quality" for the individual provide the justifications for modifying bodies and brains. `"[I]f this means to modify your body or brain this is ok"` (lines 7-8), or `"if this leads to modified face or body or replacement of faulty parts like knees or heart or kidney or something else this is ok"` (lines 12-13). But Bernard issues a warning. Participation in such procedures should be a hundred percent voluntary, not `"under pressure from somebody else"`, individual, state or a system (lines 8-10).

According to Bernard's response to the film, it will be up to individuals to decide if they seek modification or "spare parts" to improve their lives and chances of longevity. Other participants respond to the film similarly to Bernard, with remarks about enhancements of abilities and the role of organ replacements. As one participant puts it, `"I believe that enhancement of human`

abilities and specially replacing organs that malfunction is a great contribution to improving human life". Indeed, the question of technology in service to life quality and life expectancy is a common first reaction to the film. Consider the following exchange:

Fragment: **D4.3.6**

```
 1  Bridget
 2  The movie raises good questions on how much technology should go to change the
 3  daily life of citizens of the world.
 4  Today 100.000 people will die of diseases related to old age.
 5  Today we know that technological developments will almost certainly make it
 6  possible for human beings to live really longer and in better health than ever
 7  before.
 8  We are living in a fast evolving world. If we give a priority to rejuvenation
 9  for older people, nanotechnologies in the field of medicine, …, we could go a
10  lot faster to improve life expectancy.
11
12  Brendon
13  Agreed… I do not only see this as very beneficial for the people who are (likely
14  to) suffer(ing) from age-related diseases and thus are deprived of their
15  capabilities, opportunities, plans, wishes, quality of life and may not be able
16  to transport their experience to other people, but also as a benefit for society
17  at large.
```

Bridget begins with a series of statements. Good questions are raised in the film about `"how much technology should go to change […] daily life"` (lines 2-3), so-and-so many people die everyday `"of diseases related to old age"` (line 4), and developments will `"make it possible for human beings to live really longer and in better health"` (lines 5-6). One assertion she is making on the basis of these "facts" is that `"we could go a lot faster to improve life expectancy"` (lines 9-10). Brendon agrees with Bridget in that he also sees `"this as very beneficial for the people who are (likely to) suffer(ing) from age-related diseases"` (lines 13-14). Then he adds that he considers these developments `"also as a benefit for society at large"` (lines 16-17).

We can infer from these remarks that body and mind enhancements are placed on a continuum with ongoing advancements in medical technology. There are questions raised about how far technological developments can go but also if they can progress faster than they already do. There is a taken-for-granted assumption that individuals (as in anybody) will have the freedom and choice to sign up for available treatments or enhancements. Bridget asks how far the technologies should go to change people's lives but there is no evidence that she draws a line to establish a principled differentiation between treatment and enhancement, nor to establish that some individuals are deprived of choices. Brendon sees body and mind enhancements as beneficial to people suffering from age-related diseases, as if enhancement options were the natural progression in the management of ageing but he does not account for health inequalities. Bernard (D4.3.4) names "spare part" replacements *and* modification of bodies and brains even-handedly as available means to improve the life quality of individuals.

Issues surrounding the question of how the boundaries are drawn between treatment and enhancement, are well known in academic circles ([D1.3](#)). It is therefore of significant notice when participants see enhancement technologies as plausible or inevitable, and in ways that only indirectly draw attention to the question of how we distinguish between treatment and enhancement, i.e., they side-step the question. But in doing that, they also draw attention away from the substantive challenges of treatment and, consequently, enhancement. As medical sociologists have shown (e.g. Pescosolido et al, 2011), treatments are frequently experimental, partial and fragmented with uncertain and unpredictable results. They come with contractual

complexities in operations, involving bodies, persons, spaces and distinct complexes of equipment—operations that are prone to deep disappointments. In that respect, enhancements on a continuum with treatment, pose particularly challenging questions in stark contrast to the optimism we observe in response to the film and in the forum more generally. That said, participants challenge some of the social semiotics represented in the film, for example, the competitive market economy, consumer and product exploitation which is presented as the ultimate means to make enhancements available. Consider this exchange:

*Fragment: **D4.3.7***

```
 1  Beth
 2  What strikes me the most about the video is the underlying paranoia about these
 3  kind of technologies and what they offer. […] Most of the technologies cited in
 4  the video came out of necessities; such as diseases, injuries or infections that
 5  our body cannot handle and which render us something less than what we have
 6  started with. […]
 7  On the other hand, the video presents this technologies more in the vein of
 8  "next ipad" or "next miracle vegetable" context and from a pure market economy
 9  mindset. Although, I must admit, this is a legitimate concern; in my opinion it
10  focuses on the wrong aspect of these technologies. This will be about
11  fundamental change, not just improvement. […]
12  Body enhancements will have the capability provide people with the means to
13  become the person they want to be for prolonged periods of time. I think it
14  would be a mistake to see these developments only in the area of
15  "Product/customer exploitation" realm.
16
17  Boris
18  Coming from a European country the "underlying paranoia" that you refer to is
19  not a mere side-effect of technological development and speed […] the question
20  is not merely one of the intentions of individual researchers or technology
21  providers; it is about the cumulative effects of their efforts […] what will be
22  the outcomes of enhancements on a broad scale, as taking place largely inside a
23  competitive market economy […]
24
25  On the other hand, I appreciate the need for dealing with bodily enhencements
26  piecemeal and to also evaluate developments in a more pragmatic manner, as many
27  of the developments within the human sciences and beyond are of course
28  impossible to stop.
29
30  Beth
31  …I heard from a representative of a really big pharma company these words "But,
32  there are only 10.000 people who have this disease, why should we bother to cure
33  it?" […] This executive I [now] quoted was obviously after an industrialized
34  cure; something that can be mass-manufactured and will return huge dividends.
35  And if the body enhancements will ever take shape of mass-produced products; all
36  your concerns will be realized and the enhancements will be just a new mean of
37  class division in the societies. […] if the enhancements would be more
38  "personalized" then the grip of the market economy would be less tight and
39  people can use the enhancements in a way that would fit their desires. […]
40
41  Hence, in my opinion, the regulations must focus on to keep the enhancements
42  from becoming social necessities, so that persons wouldn't be forced to have
43  enhancements for their daily lifes (a product/market point of view dictates the
44  necessity).
```

Beth challenges what she refers to as an "underlying paranoia about these kind of technologies and what they offer" (lines 2-3). She relates this reading of the film to her observation that the technologies are represented "in the vain of "next ipad" or "next miracle vegetable"" (lines 7-8). Beth's complaint is that the film "focuses on the wrong aspect of these technologies" (lines 9-10). "[I]t would be a mistake to see these

developments only in the area of [… market] exploitation" (lines 13-15).

According to Beth, the enhancement technologies represented in the film, "came out of necessities" (line 4), i.e., to help us cope with and survive diseases, injuries or infections. Again, enhancement technologies are on a continuum with previous developments. However, she further states that body enhancements "will be about fundamental change" (line 10), of providing "people with the means to become the person they want to be for prolonged periods of time" (lines 12-13), thus implying that future developments have disruptive potential.

In a response to Beth, Boris seeks to clarify that there is a question of cumulative efforts and their effects, i.e., the "underlying paranoia" concerns "the outcomes of enhancements on a broad scale, as taking place largely inside a competitive market economy" (lines 21-23). As Boris puts it, the "paranoia" is more than expression of common assumptions about "technological development and speed", (line 19), or worries about "the intentions of individual researchers or techniology providers" who make enhancement options available (line 20). But Boris also appreciates the need for pragmatic and piecemeal evaluations of, seemingly, inevitable developments. In a follow-up, Beth replies to Boris with further clarification of what she means by "mistake to see […] only [… market] exploitation", i.e., a mistake in the way the film represents "facts" on how the technologies are obtainable. According to Beth, industrialised cures "can be mass-manufactured and will return huge dividends" (line 34). But she argues that we do not want to see body enhancements "take shape of mass-produced products [… I]f the enhancements would be more "personalized" then the grip of the market economy would be less tight and people can use the enhancements in a way that would fit their desires" (lines 35-39). In other words, Beth's opinion is that mass marketing will make certain fears come true, such as enhancements becoming social necessities in the way "a product/market point of view dictates" (line 43). This is indeed her reason for making the case that enhancement objectives can be obtainable as personalized options which, in her view, should have been part of the film's projection.

We observe not only views that correspond with the core message of the film, that enhancement options are inevitable and will be offered within a market/consumerist economy. We observe how strongly the consumerist take on technology development is critiqued ("next ipad", "next miracle vegetable", also, "[d]efinitely not a development that should be left to the market alone!"). So we already see a potential controversy in the ways in which consumerism and mass-market exploitation is juxtaposed with personalized service development. This juxtaposition also raises questions about freedom and choice versus social coercion to seek ideally enhanced bodies and minds as participants continue their discussion and debate in the forum. Therefore, it is noteworthy that many of the first responses to the film are enthusiastic in expressing how "research to slow the consequences of old age should become a top priority starting from today" or how "[g]overnment should […] intervene to hasten progress, and to make sure that as many people as possible benefit from new technologies". For example, in dealing with ageing-related conditions, one would actually expect the development of mass-marketable products. But participants are not necessarily sure that we can predict the future or outline the ways in which enhancement objectives are obtainable:

*Fragment: **D4.3.8***

```
1  Bryan
2  I bet the video was intended to be controversial, but the truth will be even
3  more far out […]
```

```
 4   Frankly, I find the idea of enhancing a healthy body to be repugnant, but the
 5   potential to restore cellular damage with nanotechnology to be absolutely
 6   amazing. There will be a steep cost for virtual immortality, and most people
 7   will not be willing (or able) to pay for it.
```

Bryan is convinced that `"the video was intended to be controversial, but the truth will be even more far out"` (lines 2-3). What will be "far out" about enhancement technologies in the future is not exactly clear, but he states his opinion that enhancing a healthy body is repugnant while nanotechnology promises to do amazing things, restoring cellular damage. The question of "virtual" immortality is also captured by Bryan in terms of `"steep cost"` (line 6), for which people are possibly not willing or able to pay. In other words, how obtainable enhancement options really are, is cast by Bryan in terms of questioning the enhancement of healthy bodies, praising the extent to which damage could be repaired, and pointing out the price that would be paid for prolonged life, even "virtual" immortality. Although one can imagine other terms for capturing the question of whether enhancement options are truly obtainable, Bryan's contribution sheds light on some of the controversies the film introduces, i.e., other than those associated with mass-market exploitation or the concept of "perfection": Why seek improvement if one is healthy? To what extent can damage be repaired? Who has access to the new technologies, who can pay for them, and who is willing?

Finally, the very question of whether or not we need an ethical discussion and debate about enhancement technologies, is preceded by the simple assumption that these technologies are indeed inevitable:

Fragment: ***D4.3.9***

```
 1   Ben
 2   Attempting to make this a discussion about ethics or morals is pointless at
 3   best, counter-productive at worst. Better to ask how best to integrate these
 4   technologies into our collective cultures. Plan for the possibilities, cultivate
 5   a sense of ethics and morality (and common sense!) in all day-to-day dealings,
 6   and let the future unfold as it always does - whether you like it or not.
 7
 8   Bart
 9   I completely agree with that statement: "Better to ask […]". I just have one
10   simple question: ;what is your concept of ethics, if it does not deal with these
11   issues? I think this should be seen as a goal: expanding "cultivation" in the
12   sense you talk about, to also encompass most fields of science, technology and
13   engineering education, practice and policy making. Then the need for "ethics",
14   at least the way it is propagated today, would more or less disappear.
```

Ben wants to ask how to `"integrate these technologies"` (lines 3-4), `"plan for the possibilities"` (line 4), and `"cultivate a sense of ethics and morality […] in all day-to-day dealings"` (lines 4-5). In other words, Ben's opinion appears to be that we should let the future unfold as long as we prepare, plan and cultivate, whether or not we come to like that future. Bart agrees here with Ben, but asks him what his `"concept of ethics [is], if it does not deal with these issues"` (lines 10-11), i.e., preparation, planning and cultivation. Bart singles out "cultivation" as particularly important. He argues that cultivating a sense of ethics and morality should `"encompass most fields of science, technology and engineering education, practice and policy making"` (lines 12-13). In Bart's view, such cultivation will make "ordinary professional ethics" redundant, however, that is not the same as saying, as Ben does, that discussion about ethics or morals is `"pointless at best, counter-productive at worst"` (lines 2-3).

A controversial film?

If the film `"was intended to be controversial"`, as Bryan puts it (D4.3.8, line 2), one has to ask how exactly it is controversial with reference to the direct responses we observe. For example, we observe on overwhelming optimism and a positive disposition regarding the potential of body and mind enhancement. `"I think it will be quite natural"` (D4.3.5, line 5), `"technological developments will almost certainly make it possible for human beings to live really longer and in better health"` (D4.3.6, lines 5-6). In other words, `"very beneficial for […] people [… and] for society at large"` (D4.3.6, lines 13 and 16-17). A significant incentive here is improved life quality and life expectancy with "spare part" replacements and modifications of the body, including the brain. The narrator in the film offers [*t*]*otal freedom, freedom of movement, freedom of morphology, freedom of choice*. According to contributors who indicate they feel that people should have those freedoms, the freedoms appear to be conceived of as possession or "right". It is noteworthy in this respect how the substantive challenges to common treatments typically signal lack of freedom and choice in light of physical / material complications, often followed by disappointment and frustration. Justification for treatment (or enhancement) on the basis of improved life-quality needs matching against the contractual complexity, and questions are inevitably raised about the voluntariness of subjects and others involved. That said, it remains obscure over time, as we observe with respect to the focus questions, if participants' imaginaries on future bodies and minds are science fiction or deemed to be of techno-scientific credibility.

Direct evidence, showing that the film raises alarm among participants, centres on three issue clusters. The first cluster concerns the uses of the term "perfection" and, by proxy, the terms "normal" and "natural". Participants either latch onto these terms uncritically or they are very sceptical and find `"the concept of "perfection" misleading"` (D4.3.1, line 2). The quest for perfection `"is like the quest for wealth […] it is never enough"` (D4.3.2, lines 2-3), and the term is used `"as if it were possible to somehow reach an ultimate goal"` (D4.3.3, lines 5-6). The second cluster concerns critiques of consumer/mass-market exploitation. Beth is particularly opposed to representations of enhancement technologies as if they were new gadgets for mass consumption. Although, it might be perfectly reasonable to expect new technologies to develop in a market democracy, the juxtaposition of mass-marketable enhancement products versus personalized products and services, indicates that there are different ways in which the new developments could go forward. Finally, the third is a cluster of questions of why we might want these developments, who has access to them, who can pay or who is willing to pay.

Taken together, these immediate responses to the film set the tone for further discussion and debate that addresses more directly the suggested focus topics on *perfection*, *freedom of choice* and the question of *humans becoming cyborgs*. For example, discussing the quest for perfection has already foregrounded issues of social and ethical relevance, with reference to social-cultural versus objective "perfection". Normative indicators of perfection such as happy, healthy and beautiful are also subject to doubt and some confusion. The topic of having freedom to choose one's body and mind is also hinting at social pressures to conform to certain body and mind types, as opposed to the possibility that enhancement will bring about new and unexpected configurations of humans. One could argue that the reference in the film to the Nazi agenda of "perfect" bodies and minds, without pain or limits, would encourage discussion along those lines of conformity versus choice, however the only direct response to that scene called the comparison with current discourse on body and mind enhancement ridiculous. But we see a macro-proposition emerge, telling us that, *body and mind enhancement is inevitable and will create previously unknown varieties so we should prepare for a widening range of human capabilities*.

Finally, between Ben and Bart (D4.3.9) still another proposition emerges, telling us that, *the future will unfold in ways we may or may not like, but if we cultivate a sense of ethics and morality, "professional ethics" will be redundant.*

In the next section we shall examine how these topics take shape over time as participants attend to the focus topics of the forum and work those topics to clarify macro-propositions on the kinds of lifeworlds that are incredible, impossible or doable and desirable.

2. Addressing the topics: Issues of ethical and social relevance taking shape

As we have already indicated, the focus topics inspired extensive discussions on matters of seeking "perfection" or improvement more generally in a consumer/market democracy, of the existing social strata and how that might change or be further entrenched, what kind of social-cultural trends we can expect and what lies ahead for humanity if enhancements becomes widely available and attractive. In the following we summarize the results of discussion and debate of the focus topics.

1) *The final words of the movie are: "**To me, normal is a state of perfection**." What do you think about this?*

Reflecting on the statement that normal is a state of perfection inspires a lively discussion and debate. Participants continue to discuss the uncertainties associated with "perfection"—objective perfection or socially-culturally defined perfection, in particular, what the implications of the latter could be. It appears glaringly obvious to some of our participants that an "objective" measure does not exist which can only fuel the imagination on what the subjective qualifiers of "perfect" or "normal" can actually stand for. Is "perfection" really so subjective as to lose all real meaning? In attempt to answer that question, participants discuss what "beautiful", "happy" and "strong" can really mean to people when these are subjective qualities. For example, does one need to feel unhappy or weak to appreciate being happy or strong. Similarly, they ask what beauty can stand for if no one is ugly. Participants were not of one voice on these matters but these and similar considerations draw attention to the possibility that enhancements will result in high degree of conformity to certain body and mind types. As we become aware of in the forum, this speculation correlates with what we commonly assume about the consumer-driven society we already live in, i.e., all its pressures to conform to stereotypes. But, it is noteworthy as well who participants objection to this assumption. They believe that many people will not want the same for themselves as everyone else. In other words, a consumer-driven society also produces pressures to be special, unique and innovative which here is juxtaposed with pressures to conform —foregrounding the view that there are always (and always be) "counter cultures".

As these discussions on perfection and desire for improvement progress, we notice how participants touch on questions of haves and have-nots, visions of scarcity and post-scarcity, and the role of capitalism in creating the need (greed) and strive for perfection, superiority, and so on. One view we observe is that crafting dystopian scenarios of haves and have-nots are artificially generated moral conversations, utilising new technologies to discuss ethics along economic class lines and in ways that seek to guarantee moral outrage at the ruling class. But some of our participants are deeply concerned about enhancement technologies progressing under the dominant socio-economic and political conditions in Western countries where the ruling classes cannot be trusted. One participant also suggests that perhaps we are seeking to overcome body and mind imperfections which are merely the symptoms of imperfect situations, namely, the radical product/consumer agendas of contemporary societies. But these discussions also point out the unequal and unfair distributions of good and bad qualities already, i.e., neither *nature* nor

nurture are equal and fair, and the question is raised, whether we maintain these differences by striving for a state of perfection. In other words, the world is already unfair and enhancements can possibly turn that around, keep it much the same or exacerbate it.

2) ***Freedom of choice and social difference****: If some people can afford to choose their bodies and minds, how could that change society?*

We observe a significant tension between the idea of having freedom to choose an enhancement or being under social pressure to do so. This tension sheds light on participants' views on how the freedom of choosing ones body and mind could possibly change society. For example, social pressures can potentially result in less and less freedom to choose. Participants also point out that conditions in the environment will call for enhancements whether or not those conditions are physical, virtual or primarily social. For example, how can we traverse particular kinds of terrains more easily, how are we able to use objects more effectively? The comparison with Second Life contributes significantly to this line of reasoning in the forum. One view is that enhancements are simply about widening ones capabilities, exceeding the unchosen natural limitations to thinking, experiencing, physiology, etc., however, the options should preferably not be "one-size-fits-all", whichever upgrade one has in mind. As one participant puts it, that could be dangerous in case of a digital or biological attack.

Participants also begin to differentiate between therapy and enhancement in their discussions on freedom of choice. They raise the issue of sickness and death as naturally integral and essential to our existence, and one participant asks explicitly why we push these factors as far away as possible from our lives. This and similar sentiments draw attention to questions of "naturalness" of the variety of experiences and existential ills we are ordinarily faced with. As some participants emphasise, we might have misconceived of our ideas about perfecting imperfections like susceptibility to a range of common diseases which in fact are the consequence of environmental/societal problems. Such imperfections would go away if everyone had clean air and water, enough space, naturally cultivated foods, access to basic medicine, and so on. However, chances are that we choose enhancements that cannot change our societies, only deepen already entrenched societal and environmental problems. This is perhaps most starkly illustrated in the view that is useless to deliberate the "goodness" of supreme health and enhanced intelligence because these are self-evidently good and the choices *should* be accessible to everybody. As some of our participant point out, accessibility to *everyone* is not the kind of world we live in.

As these discussions develop further, they draw attention to common Western drugs and procedures both for therapy and enhancement. We observe comments from those who live in parts of the world where the taken-for-granted options in the West are either unknown or not accessible. These discussions also draw attention to divisions, manifested in the social isolation of certain groups, e.g., the wealthy in their beauty bubble. We observe a lively debate on the question whether enhancement will only be for the rich, and to what extent we will see the trickle down effect. One view is that the enhancement of some does not make others obsolete, no more than giving one office worker a computer will make all other office workers obsolete. Eventually all of them will have computers to work with. Another view concerns the ethics of doctors and those who develop the technologies. Is "good health" first priority, are there minimum safety requirements, could the detriments be greater than the benefits, and how young is too young for enhancement?

Finally, we observe the sentiment that a freedom to choose ones body and mind will need to overcome intolerances, expand our perceptions or ideals of beauty, and embrace diversity. This

sentiment foregrounds the relationship between diversity and tolerance vs. homogeneity and intolerance. In this respect, participants express their view that regulation needs to focus on keeping enhancements from becoming a social necessity in the form of a product/market push. The distribution of benefits would be inherently flawed, for example, prolonging life would only increase the power in the hands of those who already have access to the benefits of prolonged life, although the argument goes, advancements will improve the health of all, prevent untimely deaths everywhere, and so on. But, then again, given the presumed need to develop, perfect and adopt enhancement technologies, having the wealthy leading the way may not be such a bad deal, i.e., if they can take the fall-out.

3) **Forever young**: *Can new technologies make us live and stay beautiful longer, or even forever? Will humanity turn into super-humans or cyborgs? What do you think about this?*

The question of whether living longer and staying beautiful will lead to super-humans or cyborgs, affords a number of speculations. First we observe that participants consider the question of "normal" as gradually changing its meaning to connote, living as one pleases and looking which ever way one chooses. In other words, "normal" will assume "variety", possibly transcending conventional notions of beauty or perfection. Whether the future holds biological or digital varieties in store is left by participants as an open question. They engage in deliberations on the possibility of developing digital personalities and going viral, of a future of regenerative medicine, molecular-scale tools, and the possibility of integrating artificial systems into the body. One view we observe is that enhancement technologies are considered to be like any other assistive technologies. The boundaries of what counts as invasive are blurred or different technologies sit on a continuum, say, from eye glasses, to contact lenses, to laser corrective surgery, to the bionic eye. Here we see again how enhancement is placed on a continuum with treatment, however, participants do not agree here. Another view is that distinctly invasive measures are disruptive in the sense that we will most certainly see permanent irreversible alterations of humans and our socio-technical systems. The question is asked if we can be in control of such radical alterations, but also why not to take our destiny into our own hands to go with it.

A substantial development in this discussions pertains to arguments which are highly critical of the dominant socio-economic and political conditions. Technological advancements are currently a proprietary business but the core of this critique seems to spur the idea that advancements will ultimately enable utopian conditions—a world in which there is no scarcity and only minimal if any cost of obtaining tools/devices or basic necessities. The model for this utopia is primarily the success of open-source software, the changing computing capacity-price ratio over the years and the spread of mobile, smart, and personal computing to all corners of the world. Computing is also the reference point for a faith in a future of converging nano, bio, information and cognitive technologies, involving nano factories, self-replicating mechanisms and more. One of the consequences of this computing comparison is the perception that biotechnology will shift from generalised mass-marketable products, a way from big corporate enterprise, toward personalised technologies, open-to-all recipes in a highly participation-based model, similar to how the open-source communities work. Biotechnology will not need ivory towers but passionate individuals who can both learn and contribute, for example, to bio-informatics, genomic and proteomics. We could reach a society of naturally evolving experts in everything—a future of automated virtual tools for lay persons to design organisms or a future where tasks currently done in big laboratories, can be accomplished by 2-3 graduate students. Such a development would counter the current "competitive edge" aspect of enhancement technologies. But another implication of this comparison, for the future of human bodies and

minds, is that computing is on the brink of being internalised completely into our practices. It will eventually transcend all previous distinctions of groups and create an oracle which will be intelligent in its own right. One enhancement is to be super-connected, another to be filled with cutting edge smart body and/or brain implants, still another to be "uploaded" into the super-connected system.

Although the pressure to go for enhancement is opposed by the argument that human and other biological systems could already be optimised, participants discuss the desire for immortality as an innate survival instinct. We will find new ways of pushing the envelope and no ethical values opposing such advancements are valid <u>and</u>, at the same time, big enough. Constant change is inevitable, however, through trial and error with some unintended consequences. But, as one participant argues, this is what all developments face and how progress is expressed. Finally, participants suggest that we could have "natural" and "altered" sport realms. An "anything goes" category could do anything in order to create über-athletes—an arms race for the ultimate spectacle. The boundaries are already blurred in the "normal" category of fiddling with hormones and expert tuning of athlete bodies, and ethics consistently take the back-seat to commerce and entertainment. The final verdict is that super humans and cyborgs will simply happen as the technologies become safe, the only uncertainty still whether we are actually ready for them.

Ethics of body and mind enhancements

As we point out in the introduction to this report, the scoping exercise identifies preoccupation with immortality and a convergence of the virtual, mental and physical. We learn that science fiction has played a major role in cultivating visions of body and mind enhancements while recent developments in the use of implants and advances in bionics give some idea of what the implications might be of using some such technologies to enhance humans rather than help them manage difficult physical or mental conditions. We also learn that techno-scientific utopias that fetishise modifications or leaving the body behind for virtual existence in cyberspace, give us some idea of what we expect, hope or fear the future might look like.

Techno-scientific realities, science fiction and techno-scientific utopias are not well distinguished in the forum and this obscurity draws the main line of what we observe, i.e., idealistic imaginaries whether or not our participants are optimistic, sceptical or fearful about body and mind enhancements. One can argue, with good reason, that imaginaries are just that. There are no limits to what can be conceived of and depicted as a socio-technical imaginary because an imaginary lacks the friction of actual socio-technicalities. For example, there is consistent lack of association with the complexities of entering any kind of substantial medial treatment and being the *body-in-treatment*—the pain, the side-effects, delays in recovery, long-term effects, and the possibility of *never being the same again* and, consequently, one's life never the same again either. Becoming an "other" in this respect, does not represent the kind of imagined modifications our participants discuss and debate.

What we also observe is how the forum is almost exclusively concentrated on enhancements as such, in the sense that modifications of bodies which would normally <u>not</u> be categorised as human enhancement, are omitted from the discussion. One can argue that the social semiotics of the film persistently draw the attention away from *modification-as-experience*, while pushing the agenda of enhancements for practical purposes of being *happy*, *healthy*, *beautiful* and *forever young*, and the stereotyped manifestations of those qualities. We argue that this is indeed a shortcoming, in particular, considering the lengths to which participants express their sentiments toward dominant socio-economic conditions. Namely, a considerable development of our economy, in spite of the latest turmoil, turns on the emergence of an experience economy which

is an area of significant market expansion, i.e., to market *new experiences* through personalised services and products. For example, it would be a legitimate question to ask to what extent body modification artists can take their craft, installing "smart" objects into people's bodies, how popular such practices could become and what the implications of that might be.

Apart from these shortcomings, we observe how thinking about the future of humans, cast in terms of body and mind enhancement, serves as a screen upon which we collectively project depictions of ourselves as individuals, our place in the world and relationship with each other and with progress, for better or worse, where our societies are headed, and so on. Participants produced a number of projections of this order in communicating the quest for perfection (including super- bodies and super-intelligence), the inevitability of progress through exponential growth in techno-scientific advancement, the role and viability of the dominant socio-economic system, and the journey ahead toward a new world order. We already observe this in responses to the film which produce propositions:

- *Perfection is untenable, an endless and flawed quest, and a lie to exploit consumer behaviours to market it.*

- *Body and mind enhancement is inevitable and will create previously unknown varieties so we should prepare for a widening range of human capabilities.*

- *The future will unfold in ways we may or may not like, but if we cultivate a sense of ethics and morality, "professional ethics" will be redundant.*

We further observe the emergence of propositions such as:

- *People will not want the same for themselves as everyone else. They want to be unique and innovative.*

- *Enhancements should never be one-size-fits-all in case of a biological or digital attack*

- *It is useless to debate the "goodness" of supreme health and enhanced intelligence. These qualities are self-evidently good.*

- *Neither nature nor nurture are fair in their distribution of qualities. Enhancements can turn that around, keep it much the same or exacerbate it.*

We observe many more propositions with which participants position themselves in the discussions they have. There are progressives and luddites but, overall, participants produce a range of projections of how the betterment of ourselves or the world at large, can be improved with technology: enjoying life, understanding the world, helping humanity progress, and so on. Serious and tragic consequences are made clear as well to some extent. What perhaps stands out however, is the projection of a the new world order, manifested in the emergence of an open-source biotechnology. These utopian conditions depict a world of no scarcity and only minimal cost of tools/devices or basic necessities—a future of converging nano, bio, information and cognitive technologies, involving nano factories, self-replicating mechanisms and computing that transcends all previous obstacles so we can be super-connected, filled with cutting edge smart body and/or brain implants, or "uploaded" into a super-connected system.

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