Transhumanism Between Human Enhancement and Technological Innovation*

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Abstract: Transhumanism introduces from its very beginning a paradigm shift about concepts like human nature, progress and human future. An overview of its ideology reveals a strong belief in the idea of human enhancement through technologically means. The theory of technological singularity, which is more or less a radicalisation of the transhumanist discourse, foresees a radical evolutionary change through artificial intelligence. The boundaries between intelligent machines and human beings will be blurred. The consequence is the upcoming of a post-biological and posthuman future when intelligent technology becomes autonomous and constantly self-improving. Considering these predictions, I will investigate here the way in which the idea of human enhancement modifies our understanding of technological innovation. I will argue that such change goes in at least two directions. On the one hand, innovation is seen as something that will inevitably lead towards intelligent machines and human enhancement. On the other hand, there is a direction such as "Singularity University," where innovation is called to pragmatically solving human challenges. Yet there is a unifying spirit which holds together the two directions and I think it is the same transhumanist *idea.*

Keywords: transhumanism, technological innovation, human enhancement, singularity

Each of your smartphones is more powerful than the fastest supercomputer in the world of 20 years ago. (Kathryn Myronuk)

If you understand the potential of these exponential technologies to transform everything from energy to education, you have different perspective on how we can solve the grand challenges of humanity. (Ray Kurzweil)

We seek to connect a humanitarian community of forward-thinking people in a global movement toward an abundant future (Singularity University, Impact report 2014).

Introduction

It is axiomatic for most of us that technological innovation implies progress and leads eventually to progress. It is well-known that the very notion of progress emerged in the early modernity, a long time before what we nowadays call technological innovation. However, right from the beginning, technological innovation was assigned with the mission of solving particular human problems,

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or at least the most pressing of them, including some natural human imperfections. This teleological mission is still present today, but we are now facing a new perception about technological progress. For the first time in history, progress is directed towards a deeper fusion between human being and machine.

The aim of my paper is to analyze the ideological structure of such concepts as transhumanism and innovation. I will make a distinction within thranshumanism itself between human enhancement and technological innovation. First I will outline the idea of innovation and human enhancement used in transhumanist tradition. This clarification will give us a better view about the crucial impact of innovation in our contemporary society. In the first part of this study I will focus on some main transhumanist ideas expressed by Max More, Hans Moravec, and Ray Kurzweil. In the second part I will argue that transhumanism introduces a revolutionary conception of innovation which is now seen disruptive *par exellence.*

Transhumanist Principles and the Possibility of Human Enhancement

Any reference regarding philosophical legacy of transhumanism goes up to the origin of modernity, when the whole perception of being in the world was changing. The autonomisation of nature and human being and the aim to find new means for ameliorating sufferance and to create a better social order are only a few general examples we can enumerate here. Transhumanism extracts its ideological vigor from these revolutionary representations of reality. Other schools of thought can be associated with transhumanism, such as utopianism, humanism, Enlightenment, positivism, or Darwinism. (In this enumeration I have a special mention for Friedrich Nietzsche. The concept of "posthuman" can be easily associated with Nietzschean term of "superhuman." It is still to be demonstrated the way in which transhumanist ideas were influenced by Nietzsche. Max More tries to give a sketch about the philosophical influences of transhumanism in: More 2010, 1-4. James Steinhoff has also found some philosophical connections between transhumanism and Marxism in: Steinhoff 2014).

It was not a coincidence the fact that "transhumanism" as a notion was invented by Julian Huxley who was biologist. He took as a premise Darwin's principle of natural selection and proposed the enlargement of this process beyond the limits of nature (J. S. Huxley 1958, 8). In a study about Darwin's idea of evolution, Huxley underlined the necessity of monitoring and measuring the evolution rate. He was referring in this context to "biological progress (Huxley 1958, 9)." If 19th century biologists were interested in the origins of species, those from the 20th century will explore new possibilities regarding human nature. For this trend to occur it was necessary a completely new idea of evolution with the specific purposes of realization these new possibilities (Huxley 1958, 10). The inherent biological limitations are applicable to the

biological evolution governed by the natural selection and not to the artificial devices. Huxley gave the examples of telescope and electronic microscope, the instruments that significantly enhanced the visual human capacities (Huxley 1958, 11). This theory of biological evolution still exerts an important influence on the most part of transhumanist theories today. Therefore, one can distinguish within the very origins of the notion of transhumanism a new concept of innovation closely related with the idea of human enhancement.

Promoters of transhumanism like Marvin Minsky, Hans Moravec or Raymond Kurzweil provided some credibility to their theories as they are established scholars in areas such as computational sciences, innovation, and artificial intelligence. Other philosophers or futurologists like Max More and Nick Bostrom endow transhumanism with intellectual and philosophical meanings.

The so-called *Transhumanist Declaration* signed in 2012 by many adherents takes two premises: (1) the inevitable and ultimate impact of science and technology in the future; and (2) the assumption of enlargement of human potentialities through overcoming limitations like ageing, "cognitive shortcomings," "limitations on human and artificial intellects, unchosen psychology, suffering, and our confinement to the planet earth (Max More and Natasha Vita-More, 54-55." The premises cover two aspects: the absolute character of technological innovation and the strong desirability of human enhancement. To put it differently, I would say that *Transhumanist Declaration* is based on two limitless processes within innovation and inside the human nature.

Max More argues not surprisingly that transhumanism is a philosophy of life, an intellectual and cultural movement, and a field of research (More 2013, 4). Thus he emphasizes the ideological complexity that stands behind the transhumanist project. Transhumanism can further be regarded as a part of secular humanism at large. One can argue that transhumanism promotes a secularized type of transcendence, its own ethical code, and no doubt it foresees an eschatological post-human time. It assumes however the possibility of creating a bright future exacerbating the theme of progress; it maintains a full trust in the power of reason and human creativity and it hopes for the improvement of human condition. When linked to human enhancement, all these principles lead to the idea that human nature has the possibility to overcome its actual limitations through technology. The novelty of transhumanism is underlined by More in the following words:

> 'Trans-human' emphasizes the way transhumanism goes well beyond humanism in both means and ends. Humanism tends to rely exclusively on educational and cultural refinement to improve human nature whereas transhumanists want to apply technology to overcome limits imposed by our biological and genetic heritage. 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. (More 2013, 4)

Transhumanist discourse is obviously directed towards the achievement of human enhancement. Therefore innovation is of great importance since it uses technology as a tool for life improvement (More 2013, 5). I will further depict the way in which this view of technological innovation is specific to transhumanism and even radicalized in some of its theories. It seems that for the first time in human thinking, innovation is called to operate simultaneous within biological and artificial bodies. In order to avoid being too general, I will exemplify my idea using a specific and representative transhumanist theory: technological singularity.

Ray Kurzweil and Technological Singularity

Those who anticipate technological singularity foresee an ultimate acceleration of the rate of progress which will lead to a definitive change of humanity, and finally to the emergence of super intelligent entities. Radical human enhancement comes with an overestimation of the role of technological innovation.

Vernor Vinge introduced the term "technological singularity" in January 1983. The concept was announcing the upcoming of intelligent machines:

> We will soon create intelligences greater than our own. When this happens, human history will have reached a kind of singularity, an intellectual transition as impenetrable as the knotted spice-time at the center of a black hole, and the world will pass far beyond our understanding. This singularity, I believe, already haunts a number of science-fiction writers. (Socrates 2012)

Vinge has developed this idea 1993 in his essay *The Coming Technological Singularity* (Vinge 1993, 2013). In the abstract of his article, Vinge formulated a firm statement: "Within thirty years, we will have the technological means to create superhuman intelligence. Shortly after, the human era will be ended (Vinge 1993)." The magnitude of this anticipated and imminent change seems comparable with the emergence of life on earth. The progress would be much faster compared with the previous evolution. Like J. Huxley, Vinge was making a parallel with the evolutionary process in biological realm. We cannot prevent the singularity since its upcoming is the inevitable extension of the humankind's capacity to adapt to the environment. To this it adds the infinite possibilities offered by technology (Vinge 1993). In Vinge's discourse, a techno-utopian optimism brings human enhancement to a different level, in the sense that we have already been placed in a post-human age. The super-human intelligence will have all the prerogatives for such a transition. In this recalibrated scale of progress, the innovative process itself will attain a certain autonomous trajectory. Transhumanist assumptions reveal a specific determinism and a rigid optimism that can be particularly seen within the theory of singularity of Hans

Moravec. He became known among the representatives of the theory of singularity after he published his book *Mind Children* (1988). He argued here that robots will evolve in a new generation of artificial species by 2030 or 2040. They will probably be successors of *homo sapiens* (Socrates 2012). In his article "The Age of Robots," published in 1993, Moravec states:

> Depending on your point of view, humanity will then have produced a worthy successor, or transcended inherited limitations and transformed itself into something quite new. No longer limited by the slow pace of human learning and even slower biological evolution, intelligent machinery will conduct its affairs on an ever faster, ever smaller scale, until coarse physical nature has been converted to fine-grained purposeful thought. (Moravec 1993)

Ray Kurzweil is probably the most famous figure to be associated with the concept of singularity. He is writer, inventor, futurist, and currently director of engineering department at Google. He wrote on topics like health, artificial intelligence, transhumanism, technological singularity, and futurism. In 1999, Kurzweil received National Medal of Technology and Innovation, the highest American award in technology. In 2001 he received Lemelson-MIT prize, the most important reward in the field of innovation. Kurzweil wrote many books, among which we mention: *The Age of Spiritual Machines* (Kurzweil 1999)*, The Singularity is Near* (Kurzweil 2005) and *How to Create a Mind: The Secret of Human Thought Revealed* (Kurzweil 2012)*.*

In *The Age of Spiritual Machines*, Kurzweil conceives the 21th century as the first in our post-biological future, a future when the definition of humankind will be reevaluated (Kurzweil 1999, 15). In *The Singularity is Near,* this future means that human life will be irreversibly changed by the astonishing rate of technological progress. Singularity will enable us to transcend our body and brain limitations and we will have full power on our destiny (Kurzweil 2005, 24). It is a matter of time until we find the optimal combination between human intelligence and computer superiority in terms of speed, accuracy, and fast access to memory. Once they are integrated in the same body, the moment will mark a tremendous leap (Kurzweil 1999, 15).

Kurzweil anticipates that by the end of the century, non-biological intelligence will be a trillion times more powerful than human intelligence. We are now in the preliminary phases of this transition, but the exponential growth will reach the curve prior to the stage of explosive increase. This will be immediately followed by the perfect vertical direction (Kurzweil 2005, 25). We see here again that the very concept of human enhancement appears to be exceeded or even outdated. Prior to the mid 21th century it will be difficult to make a distinction between human capabilities and the intelligence of machines, believes Kurzweil (Kurzweil 1999, 16).

There is one remarkable aspect which is typical not only for Kurzweil, but for most transhumanists: they have a physicist view over the biological world and a biological representation of the artificial field. Hence the big relevance of

the Darwinist theory of species I mentioned before. Singularity is ultimately the fusion of our biological existence with technology so there will be no distinction between human and machine, or between physical and virtual (Kurzweil 2005, 25). Human intelligence is considered by Kurzweil the work of billion years of evolution. The emergence of a new type of intelligence able to compete with human intelligence and to exceed it will be the most important novelty which ever shaped the history of humankind. This transformation will have deep implications in all human activities including labor, learning process, governance, war, and the way we conceive ourselves (Kurzweil 1999, 16).

În *Singularity is near*, Kurzweil enumerates the principles of singularity, among which I mention here only: 1) The rate of technological innovation doubles every ten years; 2) By the end of 2020s it will be no difference between the computational intelligence and the biological intelligence; 3) The non-biological intelligence will be able to download abilities and knowledge from other machines, eventually from humans; 4) Computers could access the whole knowledge of our civilization through the Internet; 5) Nanotechnology would be capable to make nanobots at the molecular scale. They will have multiple functions such as to invert the aging process or to create virtual realities at the level of nervous system; 6) Human ability to manifest emotions will be also dominated by machines (Kurzweil 2005, 37-40).

The issue of singularity seems rather a subject for SF movies and novels. Nevertheless it deserves the interest of scholars for multiple reasons. One of them is the new perspective on technological innovation. In which way this perspective really modifies our perception about innovation remains to be demonstrated. Innovation has necessarily an accelerate rate not only in the transhumanist worldview, but in our perception too. Yet in transhumanism and in scientific circles innovation is mostly oriented towards intelligent systems and artificial intelligence. The distinctive idea of transhumanist innovation is the autonomisation. The innovation needed for the next evolutionary steps will be generated by the machines themselves, creating an ascendant spiral. As a matter of fact, innovation will not be a human prerogative any more since the boundaries between human and machine will be indistinguishable.

I pointed so far that the merging between human enhancement and technological innovation is called to attain physical human transcendence. In the following I will offer an account of this transhumanist *idea* with regard to the changing paradigm of innovation nowadays.

Enhancement and Innovation

The contemporary innovative process is realistic and pragmatic by definition. Researchers in the area of intelligent technologies seldom make philosophical statements about changing the human nature and about a future golden age. Their top priority is to develop intelligent technologies that improve health, comfort, and security. They look more tailored to meet individuated demands

and market requirements. Yet the proliferation of intelligent artifacts, systems, and devices that are context-aware and self-adjusting is another occasion to talk again about a "paradigm change" (Rapoport and Safra 2014, 17). Such a paradigm change can be followed in different directions like for example in our new imaginary about the world, a new consciousness, a new worldview in terms of totalizing *Idea.* In this paper I refer particularly to a paradigm change in the idea of innovation. In this regard I will argue that innovation gets some transhumanist features.

I will refer first to an interesting, intriguing and unusual institution, "Singularity University." I consider that this is a relevant example for a study focused on the idea of technological innovation. Singularity University was founded in 2008 by Peter Diamondis and Ray Kurzweil. One might believe it is a futuristic institution focused on predictions and research that aims to facilitate the advent of singularity. A closer look will offer a totally different view about this "University." Situated in Silicon Valley, it is an organization having the only purpose of innovation. More precisely it is concerned with the implementation of "exponential technologies" in order to answer the big challenges of humankind like food, health, poverty, education, and environment. Innovators from all over the world are encouraged to use technologies in a way that could change the lives of billions of people. In the annual report of 2014 of "Singularity University" we find a clarification concerning exponential technologies: „Exponential technologies demonstrate continued accelerating growth of capabilities (speed, efficiency, cost-effectiveness or power), driven both by advances in the individual technologies themselves, as well as through their interplay and synergies. These technologies are seen to be generating tremendous disruption: artificial intelligence & robotics, biotechnology, nanotechnology & digital fabrication, network & computing systems and medicine & neuroscience." (Impact Report 2014)

Singularity University is interested about the impact of technologies from nine key domains: medicine, neuroscience, computational sciences, artificial intelligence, robotics, biotechnology, bioinformatics, nanotechnology, and energy. According to Nicholas Haan, the director for "Global Grand Challenges" at Singularity University since 2013, one of the key questions for those who want to join the "University" is how they can positively influence the life of a billion people in the next decade. To this purpose there are organized Global Impact Competitions (In 2014 the GIC contest was organized in 20 countries having 25 winners in total. The first competition in 2015 was in Finland. https://www.slush.org/2014/11/sigularity-uni/). When he was asked how the exponential technologies can solve the big challenges of humanity, Hann answered:

> Exponential technology creates whole new opportunities to solve humanity's grand challenges in that it becomes more digitized, democratized, demonetized, and dematerialized. Exponential trends in the performance of computing are

> mirrored in a wider range of industries: the price of decoding the human genome is plummeting, the price of solar production is plummeting, and so on. Increasingly technology is in the hands of innovators around the world – including the people who are most facing challenges. (https://www.slush.org/2014/11/sigularity-uni/)

Haan views "Singularity University" both as an institution committed to solve the big challenges of humanity, and as an opportunity to create a positive vision about a future when everyone's needs shall be satisfied and people will thrive. Kurzweil sees the "University" as an intellectual community where people share their interest for information technology and its exponential growth.

Singularity University is a laboratory of innovation. Vivek Wadhwa, vice president for innovation and research is confident that the next decade will be the most innovative from the history of humankind. Technologies advance so fast that whole industries will disappear and new ones will emerge. Nevertheless, Wadhwa declares himself realist and pragmatic. He does not take into account the convergence between humans and machines. He considers this science fiction and refers only to practical implementation of contemporary technologies that can help humanity (Rowan 2013). According to Wadhwa, the mission on the "University" is to teach leaders, CEOs, entrepreneurs and innovators about technologies situated in exponential advance. Few are aware of the fast advance in areas like robotics, AI, medicine, biotechnology, or computing, and of their potential solutions for the global challenges (http://singularityu.org/2011/12/01/singularity-university-appoints-vivek-wadhwa-vice-president-of-academics-and-innovation/).

Rob Nail, director at the Singularity University, extends the meaning of innovation. Innovation shouldn't the prerogative of inventors and researchers, but also of leaders, economists and entrepreneurs. Innovative is the one who has a visionary perspective towards the future of technology and education and who want to solve the problems of humankind.

The final question of this paper is this: what is the correspondence between the transhumanist idea of innovation and the view about innovation promoted by an institution like "Singularity University"? In my opinion the two views are complementary. Without doubt, it is no coincidence that one of the founders of this University is Ray Kurzweil, a famous transhumanist. The name of this institution remembers the most representative transhumanist theory. Exponential technologies have a central role in transhumanist views as well as in the projects of "Singularity University." Other similarities are: (1) both views share a high optimism concerning a future that will be once and for all transformed by innovation; (2) the future is bright and completely new; (3) progress is seen at an accelerate rate, growing towards an unmatched level; (4) life will be improved through the aforementioned exponential technologies.

Within the broad current of transhumanism one can notice an extreme optimism, but this is never naïve and exalted. However, the idea that change

occurs at a level that cannot be compared with any former technological revolution in the whole history is difficult to assimilate. The transhumanist *idea* comes to absolutize technology to the extent that human enhancement is even overwhelmed through innovation. Although transhumanism seems difficult to be absorbed in our imaginary, certain aspects of its spirit penetrates the way we understand innovation and human empowerment. The limits of innovation are pushed out. Innovation is called to open itself toward society and contemporary problems. Standard innovation (intelligent cities, supercomputers, spatial missions) is moved ahead by the transhumanist mentality which grants technology with a strong feeling of enhancement. In singularity state, our contemporary problems will be simply out of question. This kind of post-human status offers a serious impetus for contemporary innovation. Thus, transhumanist ideas are not turned away from concrete reality which is for them both a starting point and a source of inspiration.

Conclusion

The premises and the main concepts of transhumanism can be easily identified: human nature is the subject of innovation and transformations. Technology is seen as a continuation of human evolution. By way of consequence, a deep symbiosis between human and machine up to the emergence of post-human entities will occur. This paper made the distinction between human enhancement and technological innovation as it is designed by transhumanists. I have argued that this distinction lead to a modification of the paradigm of technological innovation.

A representative transhumanist theory, "technological singularity," exemplifies how this paradigm reaches an extreme level up to the dissolution of innovation itself. "Singularity University" was a moderate example of hybridization of innovation. On the one hand, it manages to promote a certain pragmatism concerning exponential technologies linked to solving stringent human problems. On the other hand, it maintains the transhumanist view on innovation when it emphasizes human enhancement. So, we cannot speak about two distinct and contradictory views of innovation in respect to emergent technologies. The transhumanist *spirit* permeates the one and the same concept of innovation. However, we can talk about a new paradigm of innovation. This becomes visible in the idea of human enhancement and in the artificial intelligence research. One can see transhumanism as a symptom of mutations that occurred in the representation of innovation. This current of thinking is certainly part of its age and it has the potential to interfere strongly with its context.

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