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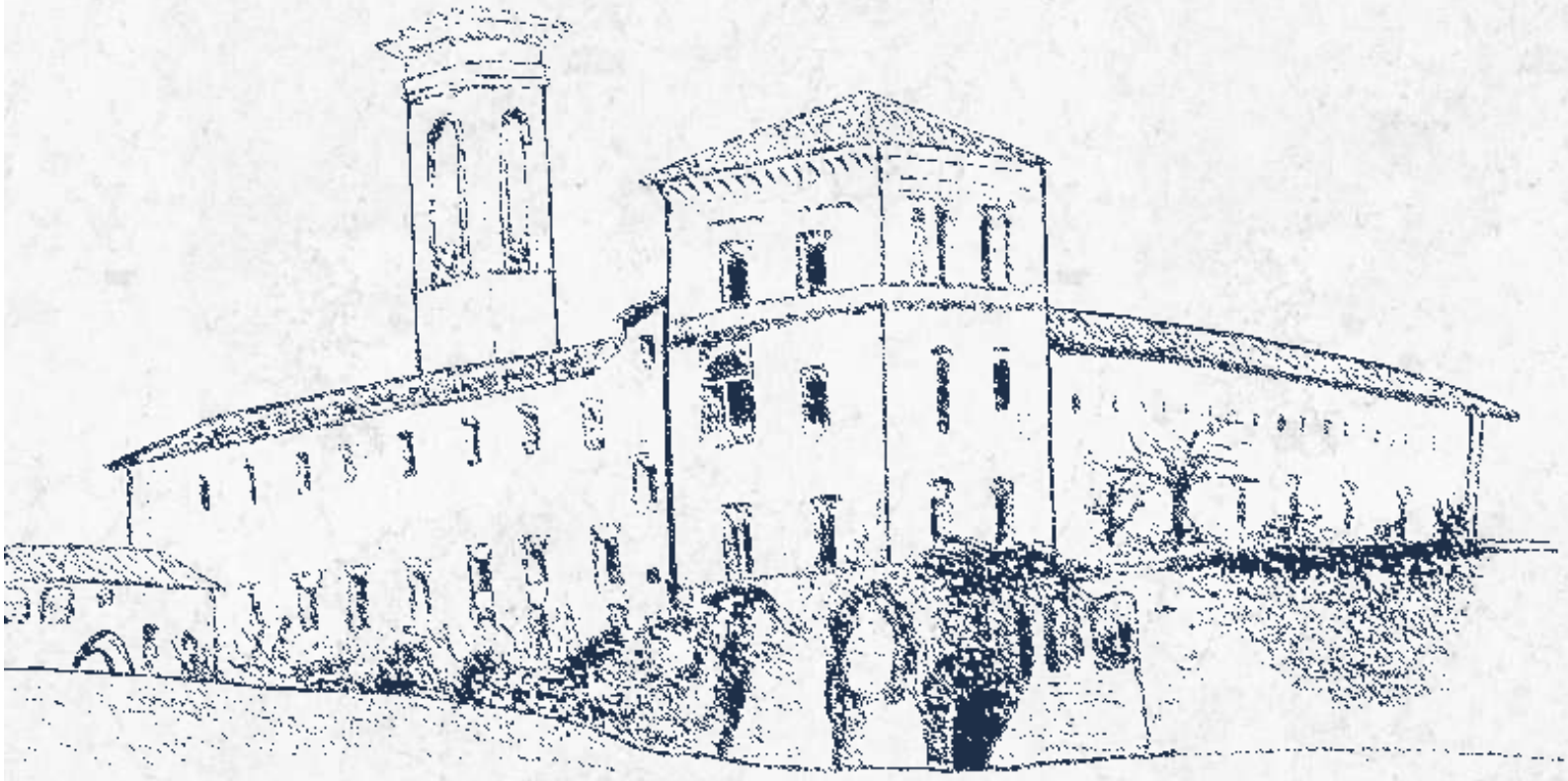

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# Cyborgs in the Workplace? Some Preliminary Considerations

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## Abstract

The paper addresses the development of cyborgization technology and the potential impact on the world of work. The first section of the paper briefly comments on the current state of cyborgization (intelligent prostheses, lenses, the use of chips, intelligent exoskeletons). In the following section, an attempt is made to initially indicate the issues that will require in-depth analysis in the context of labor law, such as the employee's right to neurological improvements and to refrain from using them, and the ownership of technological improvements in the employer-employee relationship. Finally, the paper puts forward a thesis about the impact of the COVID-19 pandemic on the acceleration of the cyborgization process.

*Keywords*: *Cyborgization; World of work; New technologies.*

## 1. Introduction

It is trivial to state that the world of work is under tremendous transformational pressure these days because of a number of mutually stimulating factors such as climate change, transcontinental migration and demographic trends. Added to this, of course, is technological change that will affect the disappearance and creation of jobs, as well as changing of the relationships between actors in the labour market (for example

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employment through online platforms). Technological change is mostly associated with such phenomena as the development of artificial intelligence or robotization of workplaces. Additionally, there is something else that can be called the project of intelligent human reconstruction or simply cyborgization.

The year 2021 marks one hundred years since the birth of Stanisław Lem, one of the greatest creators of science-fiction literature. He was also a philosopher and futurologist, reaching far into the future with his acute mind. Decades ago he predicted the appearance of virtual reality, calling it phantomatics. He also anticipated the appearance of such mundane devices like the smartphone or the 3D printer.[1]Analyzing the phenomenon of cyborgization, Lem had a remarkably clear message that in the course of this process the bond of understanding of our communication with nature will eventually be broken, "*when man, in a thousand or a million years' time, gives up his entire animal heritage, his imperfect and impermanent body, for the sake of a more perfect design, and when he turns into a being so much higher than us that it will become alien to us.*[2]. Now, there are many indications that the breaking out of human evolution from the organic realm may occur much sooner[3]. Heading in this direction means serious repercussions for all areas of the life activity of the mankind, including that relating to work.

The discussion about the cyborgization of the human body is directly related to the broader discussion about post-humanism and trans-humanism[4]. Post-humanism can be defined as an activity in which, by means of scientific, technical, or biological innovations, the human body will be improved in a way that does not exclude the human being from remaining in their current biological and symbolic framework. Technological interference is emphasized here only insofar as the idea of a human being can be maintained. Trans-humanism, on the other hand, in its intentions to improve and perfect the human condition, resigns from the essentially human in favor of post-species forms that may emerge because of technological progress[5]. Lem can also be considered a literary forerunner in these considerations, as shown by his short story: "Do You Exist, Mr. Jones?" written at the climax of the Cold War and describing

[1] S. Lem, *Summa Technologiae*, Wyd. Literackie, Kraków, 1964

[2] Ibid.: 157, translation by Joanna Zylinska.

[3] N. Harari, *Homo Deus: A Brief History of Tomorrow*, Harper, New York, 2017

[4] C. Wolfe, *What is Posthumanism?*, University of Minnesota Press, Minneapolis, 2010

[5] B. Trocha, *Transhumanizm i posthumanizm w literaturze fantastycznej w perspektywie kliszy kulturowej i futurologicznej spekulacji*, in *Rocznik Lubelski*, 2016, n. 42(2), 115- 132

the dilemmas of a racing driver, still being repaired with subsequent body prostheses after accidents[6]. One of the ardent opponents of trans-humanism is Francis Fukuyama. According to him, this vision will end with selected individuals "raised" to the level of practical immortality and the rest left in old, sickly and dying bodies[7]. In 2004 he was very explicit in his judgments, "*our good characteristics are intimately connected to our bad ones.... if we never felt jealousy, we would also never feel love. Even our mortality plays a critical function in allowing our species as a whole to survive and adapt (and transhumanists are about the last group I would like to see live forever)*". Well, let's remember that Fukuyama was wrong once before, predicting the end of history. How will it be now?

This paper does not have the ambition to deal comprehensively with either technological change, or even the phenomenon of cyborgization, or their civilizational consequences[8]. Nor will the issue of human genetic modification be the subject of our considerations, although it is the potential source of the most lasting changes in human beings (through the replicability of genetic changes in successive generations)[9]. Probably, both processes: modification of human genome and progressive cyborgization of human body/mind will occur in parallel, which may bring interesting results, but this is a topic for a separate story.

Our intention is to create an extended essay in which, moving from practical examples, we want to reflect on some aspects of the cyborgization of the working man.

## 2. A Definitional Problem: When do we Become Cyborgs?

The subject of cyborgization of the human body became a focus of scientific interest as preparations for manned space flight began. In 1960, Manfred Clynes and Nathan Kline then working for the American space

[6] S. Lem, Czy pan istnieje Mr Jones?, in *Dzienniki gwiazdowe*, Iskry, Warszawa, 1957

[7] F. Fukuyama, *Transhumanism*, in *Foreign Policy*, 2004, n.144, 42–43

[8] A comprehensive description of the possible effects of technological change on the work environment can be found, for example, in: J. M. Hirsch, *Future Work, University of Illinois Law Review*, 2020, https://www.illinoislawreview.org/wp-content/uploads/2020/06/Hirsch.pdf (accessed March 20, 2022)

[9] The most important reference at the moment in the context of genetic alterations is the new CRISPR technique, cf.
https://medicalfuturist.com/designer-babies-a-dystopian-sidetrack-of-gene-editing/ (accessed March 20, 2022)
https://www.theguardian.com/science/2019/mar/13/scientists-call-for-global-moratorium-on-crispr-gene-editing (accessed March 20, 2022)

agency NASA presented the concept of creating human-mechanical hybrids, adapted to the extremely adverse conditions that mankind would encounter during space exploration[10]. The word "cyborg," first used then, was a hybrid of the two words "cybernetics" and "organism." Clynes and Kline presented the cyborg as the realization of the transhumanist goal: a human being freed from the strictly mechanical constraints of his organism and the conditions of his environment by means of external intervention.

It was so interesting that NASA commissioned further analyses, but ultimately did not take any practical steps towards realizing this concept. Instead, it was picked up eagerly and in large numbers by science fiction writers. For example, Anne Mc Caffrey[11] created a singing spacecraft that was one big hybrid of the female gender. Frederick Pohl[12] was more modest, as he merely cyborgized the protagonist of his novel Man Plus so that he could live on Mars and colonize that planet. Over the years, writers began to place cyborgs in dystopian Earth realities, just to mention the cyberpunk heroine of William Gibson's novel Neuromancer[13], who possesses double-edged 4-cm blades that extend from under her fingernails, or Paolo Bacigalupi's biotechnologically transformed and unhappy "Windup Girl"[14].

But let us return to the real world. The word cyborg began to have its flavor - as Chris Hables Gray writes it became "*as specific, as general, as powerful, and as useless as a tool or machine*"[15]. Some scientists, wanting to free themselves from association of this phenomenon with sci-fi literature, use other terms such as: biotelemetry, teleoperators, bionics[16], but we will stick to cyborgization.

As is usually the case in science, attempts are made to categorize. For example, Kevin Warwick[17] divides devices that lead to the cyborgization of the human body into:

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[10] M.E. Clynes, N.S. Kline, *Cyborgs and Space*, in *Astronautics,*1960, n. 5(9), 26-27, 74-76

[11] A. Mc Caffrey, *The ship who sang*, Walker & Co, New York, 1969

[12] F. Pohl, *Man Plus*, Random House, New York, 1976

[13] W. Gibson, *Neuromancer*, Ace, New York, 1984

[14] P. Bacigalupi, *The Windup Girl*, Night Shade Books, San Francisco, 2009

[15] C.H. Gray, *Cyborgs Citizen: Politics in the Posthuman Age*, Routledge, Abington, 2002, p.202

[16] V. van Deventer, *Cyborg Theory and Learning*, in S. Wheeler (ed.), *Connected Minds, Emerging Cultures: Cybercultures in Online Learning*, Information Age Publishing, Charlotte, 2009, 167-183

[17] K. Warwick, *Homo Technologicus: Treat or Opportunity?,* in *Philosophies*, 2016, vol. 1, 199-208, https://www.mdpi.com/2409-9287/1/3/199 (accessed March 20, 2022)

- not integrated into the human body
- integrated into the human body but not the brain/nervous system
- integrated into the brain/nervous system for therapeutic purposes
- integrated with the brain/nervous system to achieve capabilities not found in the natural state [18]

It is easy to see, considering this classification, a very wide field for the definition of a cyborg opens up. What is more, according to some interpretations, we ourselves become cyborgs thanks to the smartphones we use. Benjamin Wittes and Jane Chong[19] quote Prof. Tim Wu of Colombia University who at a meeting at the Brooking Institution stated: "*in all those science fiction stories, there is always this thing that bolts into somebody's head or you become half robot or you have a really strong arm that throws boulders or something. But what is the difference between that and having a phone with you - sorry, a computer with you - all the time that is tracking where you are, which you are using for storing all of your personal information, your memories, your friends, your communications, that knows where you are and does all kinds of powerful things and speaks different languages? I mean, with our phones we are actually technologically enhanced creatures (...)*".

This approach can be taken quite seriously as evidenced by June 2014 U.S. Supreme Court decision (Rilly vs. California) that held that a police officer cannot search the data on a detainee's phone without a warrant. As Justice John Roberts, writing the reasoning on behalf of himself and the other justices, pointed out: *"modern cell phones ... are now such a pervasive and insistent part of daily life that the proverbial visitor from Mars might conclude they were an important feature of human anatomy"*.

We will not develop this thread further as in our opinion it only dilutes the discussion around the cyborgization of the human body. With regard to the legal battles over the recognition of a human person as a cyborg, much more fascinating is the story of artist Neil Harbisson, cited in the aforementioned report by Wittes and Chong, who attached an electronic antenna, called an "eyeborg" to his skull to enable him to overcome a severe form of color blindness. Harbisson first had to fight the British government for the right to keep this antenna on his passport photograph. Then, when Spanish policemen tried to rip that antenna out of his skull during a street riot, the question arose of whether this was an

[18] Note that the last two categories may not differ in the device itself but in the software that will be used.

[19] B. Wittes, J. Chong, *Our Cyborg Future: Law and Policy Implications*, report, Brooking Institution, 2014, https://www.brookings.edu/research/our-cyborg-future-law-and-policy-implications/ (accessed March 20, 2022)

attack on property or on the integrity of the human body. This is by no means a trivial question, and we will develop it further later in the paper.
For the purposes of our discussion, by cyborgization (alternatively, cyborgization technology) we mean the use of devices integrated into the human body that not only restore lost functions, but also support the anatomical, physiological, and informational functioning of the body. To refer to the simplest examples, according to such a definition a cyborg is a person with a pacemaker or an artificial arm controlled by thoughts [20].
In this view, devices leading to cyborgization can be most simply divided into 3 categories:

- Technologies external to the body (for example, various types of prostheses)
- Implants in the body (for example, a pacemaker)
- devices that modify brain activity, such as Google Glass[21]

## 3. Various Guises of Cyborgization

We are not competent enough to illustrate the degree of development of the technology even partially of cyborgization of human body and mind; this is not our intention. However, it seems necessary to somehow outline the field before proceeding to remarks aimed at relating these issues to the world of work.
The simplest form of cyborgization is the subcutaneous implantation of microchips designed to trigger some activity that would otherwise have to be triggered by our own manual or mental response. This type of self-cyborgization has its enthusiasts, although it is not yet a very developed social movement. For example, there are about 5000 people in the US who identify themselves as "grinders". The movement began in 1998 when Kevin Warwick, a cybernetics professor at Reading University, implanted an RFID tag in his arm so he could turn on lights with the snap of his fingers[22]. This subculture has surged in recent years as companies like Dangerous Things and Grindhouse Wetware have offered a growing number of gadgets that can sense electromagnetic fields or unlock a car without keys. Whether this will become a more common fad is hard to

[20] W. Barfield, *CyborgHumans: Our Future with Machines*, Springer, New York, 2016
[21] W. Barfield, A. Wiliams, *Cyborg and Enhancement Technology*, in *Philosophies*, 2017, vol. 2, n.1:4, https://doi.org/10.3390/philosophies2010004 (accessed March 20, 2022)
[22] Later, he began to play with his chip further. At the university's cybernetics department, automatic doors opened without a card when he wanted to pass through and his office greeted him cheerfully: Good morning professor!

judge. We can imagine an infinite number of more and less pleasant applications with mainly social, entertainment and societal purposes: tattoos that will light up in a certain color depending on the settings of other people "looking" for partners for a certain purpose or with certain characteristics (this can really change the meaning of the phrase we met by chance in a bar - it probably doesn't need to be explained). Many solutions of this type will be only a game for a long time, on the principle: if something is possible, why not try it. It's hard to imagine that someone will assemble a brain implant in order to switch on the light, without touching it, by means of thought, when they can already achieve this by giving a voice command to their smartphone. Soon, however, the implant will give enhancements that using a smartphone will not.

Professional microchipping seems to have a big future. In 2004, such a procedure was test-performed on a group of 160 high level prosecutors of Mexico to allow them automatic access to restricted areas[23]. It can be said that this concerned a closed group. However, it is now apparent that this trend is beginning to reach out openly to ordinary citizens. In Europe, several thousand Swedes are already traveling by train using an implanted microchip[24]. A real breakthrough in the popularization of this technology may be the initiative of the Polish-British start-up Walletmor, which has made available, for less than 200 euros, the world's first fully functional implant for cashless payments that works with Visa and Mastercard since 2021[25]. However, it is worth to keep in mind that this kind of "cyborgization" is still based on quite old, well known RFID technology and relies on the fact that we are accompanied by a chip placed under our own skin and not on a card in the wallet.

The possibilities offered by cyborgization have obviously caught the interest of artists, especially those who build their image through self-expression. In addition to already mentioned Harbisson, the most often pointed to artists are: Manel de Aguas-Catalan, photographer who developed "flippers" that allow him to perceive atmospheric pressure, humidity and temperature through several implants on both sides of his

[23] *B. Wittes, J. Chong, op.cit.*

[24] Euronews, *Microchips are getting under the skin of thousands in Sweden*, 2020, https://www.euronews.com/2018/05/31/microchips-are-getting-under-the-skin-of-thousands-in-sweden (accessed March 20, 2022)

[25] Notes from Poland, *World's first payment chip that can be implanted under skin launched by Polish-British startup*, 2021, https://notesfrompoland.com/2021/04/14/worlds-first-payment-chip-implanted-under-skin-launched-by-polish-british-startup/ (accessed March 20, 2022)

head; Joe Dekni - artist who developed and installed a sensory system that includes two implants in his cheekbones; Pau Prats - developer of a system that allows him to feel the level of ultraviolet radiation reaching his skin or Alex Garcia who implanted in his chest an implant that allows him to determine the level of air quality around him. The list could be very long. It is not the intention here to present the motivations that drove these people, but in any case, they can be provisionally qualified as "artistic".

Cyborgization is very often seen as an opportunity to "fix" the human body by enabling it to perform its natural functions that have not developed or have been lost, e.g., due to disease or accident. Examples include exoskeletons that allow people with spinal cord injuries to stand upright and walk. In 2012, a woman paralyzed from the waist down completed the London Marathon in such an exoskeleton. Another example is the intelligent self-learning bionic limb prostheses controlled by neural activity or electromyographic muscle signals[26]. It seems that soon such prostheses will be able to be controlled also by people who were born without limbs and therefore have no developed memory of moving them. The most popular neural prosthesis in the world is the cochlear implant. It works differently than ordinary hearing aids, which amplify sounds but are helpless when a person cannot hear them at all. A cochlear implant works differently: it converts sound into a nerve signal (an electrical impulse) that stimulates the auditory nerve. The solution is far from perfect, but it allows one to participate in conversation. At the moment, there are about 600,000 people in the world with this type of implant (including about 40,000 people who were born deaf). Around the year 2000, the first neural prosthesis of sight was implanted in a person who had lost sight 20 years earlier. The system is very simple: a digital camera worn on glasses takes pictures, these are transformed into electrical impulses, and these are sent to the visual center in the brain through a set of electrodes, which enter the brain through a socket at the back of the skull. It is true that the greatest development is around stimulating the optic nerve behind the retina and not entering the brain, but the indicated experience shows that "entering the brain" is already achievable. The quality of this vision is very poor, but at the same time this is research where new developments and their testing increase genuinely from month to month.

[26] C. Lo, *The magic touch: bringing sensory feedback to brain-controlled prosthetics*, Medical Device Network, 2020, https://www.medicaldevice-network.com/features/futureprosthetics/ (accessed March 20, 2022)

The topic of direct deep brain stimulation with implants is the most exciting, but also the most controversial. If we disregard Elon Musk's (probably unrealistic) media announcements about apes playing ping pong by their mind, this field is still at the threshold of its development. The most important practical applications of the brain-machine connection currently concern paralyzed people. It is worth to stop at this point: in 2000 Philip Kennedy with the team from Emory University in Atlanta began working with the completely paralyzed John Ray. Functional brain scans identified an area of the brain that activated when John thought about moving - amplifying this impulse allowed him to move the cursor with his thoughts, and thus tap out text and communicate with the outside world. Implants used to treat Parkinson's disease are becoming more and more common.

If one would like to find out what this kind of interference with the human brain might look like in the distant future, one should read the novel "*Nexus" by* Ramez Naam[27], one of the creators of Microsoft's flagship software programs, or his more serious, popular-science work: "*More Than Human: Embracing the Promise of Biological Enhancement"*[28]. As you can see, the title speaks for itself. As far as the here and now is concerned, we can rest assured that in the foreseeable future it will be rather impossible to apply one of the classic topoi of sci-fi literature, i.e., erasing memories existing in human minds and "adding" memories. Although, nothing can be certain. Almost 10 years ago, American scientists succeeded in "implanting" false memories into the minds of mice, by transplanting cells from the brain of one mouse into another. The experiment was validated by several teams and a herd of laboratory mice experienced memories of events they never experienced[29]. The research continues. It is worth keeping in mind that there is no indication that the human brain will behave in a fundamentally different way than the mouse brain.

This brief and subjective overview of different dimensions of cyborgization already brings us directly to the issue of cyborgization of the working man. In our opinion, cyborgization devices and processes will not appear soon as a search for answers to some challenges existing in the labour market. So far it seemed that initially the process would be the

[27] R. Naan, *Nexus*, Angry Robot, Nottingham, 2012

[28] R. Naan, *More Than Human: Embracing the Promise of Biological Enhancement,* Broadway Press, Louisville, 2005

[29] S. Ramirez et al, *Creating a False Memory in the Hippocampus*, in *Science,* 2013, vol. 26, n. 341, 387-39.

opposite. Solutions will emerge either because of scientific developments or social, artistic, or other "soft" factors. In the beginning there will be "islands" or enclaves of people who have had their bodies and neurology modified simply because it was possible and not because the job market in any sense "expected" it of them. Likely, in the longer term, it will be the other way around and the consequences of the COVID-19 pandemic will accelerate this.

## 3. Dilemmas of the Cyborgized Working Man

If Adam Smith, father of modern economics, lived in our times he would certainly wonder about the ethical consequences of the cyborgization of the working man. The currently dominant turbo-capitalist vision of civilization development does not leave much room for moral dilemmas. Therefore, it is not surprising that cyborgization is perceived by the business community primarily from the perspective of efficiency and profit rather than the integrity of the human person. We are not hiding the fact that this may obviously raise many serious doubts. It is enough to look at some aspects of cyborgization on the example of two already implemented solutions.

Cyborgization, which involves enhancing a worker's physical abilities in manufacturing or construction by using exoskeletons, seems to have the best chance of rapid development. Different versions of these are being tested in many commercial laboratories. They can be controlled: mechanically, by voice, by implant sensors or - although this is a future concept - using bioelectric signals from the central nervous system. This is not a futuristic vision, it is evidenced by the fact that Ford automotive corporation, for example, is already in its third year of introducing (for now passive) exoskeletons for the upper body in its factories around the world. Opting for this direction of cyborgization opens up opportunities not only to enhance work efficiency, but also to take advantage of previously difficult-to-tap labour resources, namely people with physical disabilities. In addition to exoskeletons, another promising technology for cyborgization of the work environment is in the testing phase, namely smart contact lenses[30]. They may have various functions useful in everyday life (e.g. controlling sugar levels in diabetics), but the most important one will be the possibility of direct visual connection with a device in order to

[30] J. Chokkattu, *The Display of the Future Might Be in Your Contact Lens*, Wired, 2020, https://www.wired.com/story/mojo-vision-smart-contact-lens/ (accessed March 20, 2022)

browse the set of information we need. Instead of impatient manipulations of the finger on the smartphone screen, it will be enough to look at it diagonally. This solution will serve all employees whose work is related to data processing. And again - the breakthrough effect will be achieved by directly connecting smart glasses to the brain, which has not yet happened, but the intentions are clear. For both applications indicated above, the target solution is the control by the brain. And this brings us to a completely different level of reference. Let's consider the implications of brain interference in the context of employment relationships.

The first issue: the ownership of implants and other mechanisms of cyborgization technology. In the classical view of subordinated labour, the answer to the question of ownership of the tools with the help of which work is performed is obvious: the owner of the tools is the employer - the organizer of labour and directly or indirectly the owner of capital. However, let us consider the situation when a device is permanently connected to the brain/nervous system of a person. Should it also be treated as an ordinary tool? What will happen when an employee equipped with an employer-funded chip/implant/device connected to the nervous system/brain ends the relationship/contract linking them to a particular employer? Just as we now expect an employee to hand in their company laptop, will we expect them to remove from their nervous system a specific ability-enhancing/capacity-creating connection along with an already acquired set of knowledge?

Secondly, what about workers who will be afraid of improvements that interfere with their brain or nervous system? Although cyborgization processes will increase efficiency at work, they will inevitably change our sense of self and the sense that our "I" and our body are one. Resistance to cyborgization may also stem from religious reasons. Will the employer of the future be able to expect an employee to submit to certain procedures? It should be noted that these procedures will consist of the use of some hardware (and it is hard to imagine an employee having no knowledge or awareness that he or she is undergoing a given procedure (except in the most dystopian vision of the future) and some software. The will and consent of an employee at the time of software change may be something completely different than at the time of hardware implementation. In the case of software, there is also the problem of its potential hacking and, what is crucial, the right to its further improvement.

It is impossible at this point to predict the stage at which body modification will occur spontaneously - it will certainly be different in different parts of the world and in different age cohorts. However, we are

interested in the second phase - the phase in which body modification will be the realization of market expectations. It is important to take into account that the processes will occur in parallel - the processes associated with the shrinking of jobs under the influence of AI development will occur independently of what is the subject of this paper - cyborgization.
Whether this second phase will occur is, of course, conditioned by a number of factors external to the subject of this paper - for example, the question of whether the influence of climate change and migration processes will not lead to a fundamental remodeling of the global order, or rather, one should say - disorder.
To sum up: it seems that the combination of the process of development of artificial intelligence resulting in increasing market polarization (disappearance of jobs requiring average level of qualifications) will be the factor which will simultaneously drive cyborgization. This will result from the fact that work will not so much become a rare good, but in order for it to bring profit to the owner of capital (and this is the model of work in a capitalist economy) it will require the "use" of an improved human.
There is another aspect - geographical. The cyborgization of the brain combined with the development of superfast data networks (thanks to quantum computers) may cause the disappearance of national borders for the world of work, unfortunately in a very ghastly formula. Building walls on the U.S.-Mexico border, or anywhere else, will lose all sense, and cross-border labour mobility will take on a whole new meaning. Anyone who has seen the movie "Sleep Dealer" from 2008 by Alex Riviera knows what we mean. The dystopian vision shows labour migrants from Latin America who no longer have to sneak across the border to a "better" world, because staying in place they connect their nervous systems to the global network and earn money by controlling machines in factories located in the USA. Such a vision of cyborgization is also possible under the conditions of the current model of capitalism.
Let us also try to return for a moment to the field of classical issues of labour law. Its basic principle is the fact that the employer-employee relationship is a relationship of due diligent action, not of result. The employee undertakes to perform his duties diligently and conscientiously. Until now it was clear that the level of work efficiency that can be expected by the employer can be related to the efficiency of work of an average group of employees with a certain level of education or professional experience. By nature, there were outstanding individuals, i.e., employees who were able to perform work tasks faster, more efficiently or more creatively. In the near future, however, we will be faced with the problem of what should be the benchmark in a situation in which some

employees will have specific augmentations, specific improvements. Is it their work efficiency that is to become the reference point for evaluating "non augmented" employees, promoting them, etc.?

And to conclude this part of the deliberations, let us consider the new context of the well-known provision of the ILO Declaration of Philadelphia. The fundamental assumption on which the labour law is based is the assumption that human work is not a commodity, which results from the fact that there is an immaterial and direct link between man (to whom we ascribe an inborn and indelible dignity) and the process of work. There is no space here to develop this thought which has its roots, among others, in Catholic social doctrine. However, we must ask the question whether the work of a cyborg is not also a commodity? After such a question is posed, thoughts go in two directions. First direction: after transformations/modifications/augmentations, will we consider that the cyborg is no longer human? There are ethical, futurological or other considerations on this topic, but it is obvious that they are still quite underdeveloped. It seems that in this area we are still relying on rather superficial considerations, and at the same time it is an area of the core of philosophical considerations - what it means to be human. Since now we are not able to say what consciousness is (which can be seen in the considerations about when an AI will become conscious), we are also not able to say anything reasonable about when a cyborg ceases to be human. This is not the path we are concerned with. The second path assumes that, in the case of an unmodified human, although it is obvious that certain costs are involved in "becoming" an employee (for example, the cost of education incurred by parents, the cost of social development, etc.), the final factor that determines the effectiveness of his work is himself. In the case of cyborgs, it may be different. Maybe not at the beginning of the cyborgization path, but when the process is more advanced. The usability of an implant or other device may in the future be a key factor in the usability of a worker. We can assume that cyborgization technologies, once they get out of the "do it yourself" and "just for fun" periods, will be expensive. At the same time, they will be technologies that ensure our well-being and allow for complete self-fulfillment[31]. It is possible that in the situation of a general decrease in the number of jobs (which is and will be due to the development of artificial intelligence and not to the development of cyborgization) in order to find work we will

[31] S. Chan, *Neural interface Technologies: Ethical and social dimension*, Royal Society, iHuman Working Group Paper, 2019, https://royalsociety.org/topics-policy/projects/ihuman-perspective/supplementary-material/ (accessed March 20, 2022)

have to gain access to expensive improvements - it is not excluded that the economic recipient of work will be the owner of rights (patents, licenses, etc.) to improvements. In that case, will we be able to treat the effect of the work of an "advanced" cyborg like any other commodity subject to the laws of supply and demand? We are probably not yet able to answer this question. Human work is subject to protection, among other reasons, because work is a source of self-fulfillment and a path of development needed for people to maintain a sense of meaning and control in life. It seems that cyborg work will also be a source of self-fulfillment and development. The difference may be that access to it may be quite different than it is now.

## 3. A Few Concluding Thoughts. Will Capitalism Bet on the Cyborgization of the Working Man?

In most projections about the future of the world of work, robotization and the development of platform work supported by artificial intelligence algorithms are presented as the main drivers of change. However, the reality may turn out to be much more complicated and surprising. This is shown in an interesting report on expectations of work by 2035 based on a survey of 1,500 respondents recruited from workers and managers in several countries of Western capitalism[32]. It also includes the first lessons learned from the COVID-19 pandemic, which are very important because they show that business leaders have come to believe that employees are more important than technology, although they intend to invest primarily in the latter. Augmentation and enhancement are to be the answer to increasing employee productivity. This is met with understanding by employee respondents. Almost half (48%) of them would be willing to have a chip implanted in their body if it would significantly improve their productivity and pay. But at the same time, a larger percentage fear that the improved performance of enhanced workers will give them a competitive advantage in the job market, and generally lead to a divided workforce (enhanced and non-enhanced). The report's message is clear. Business leaders would like to bet on augmenting human workers in the future rather than simply replacing them with robots. On the workers' side, we have a coming to terms with this prospect, while at the same time

[32] Citrix, *Work 2035. How people and technology will pioneer new ways of working*, report, https://www.citrix.com/content/dam/citrix/en_us/documents/analyst-report/work-2035.pdf (accessed March 20, 2022)

fearing that "humans with chips in their bodies to enhance their performance will have an unfair advantage in the labour market."
If these trends are confirmed by other research, it could mean that we are facing a fundamental reorientation of the perception of the future of work. The post-pandemic pressure on the part of capital for cyborgization in the sense of economic benefits will cause this phenomenon to spread much faster in advanced capitalist societies than Harari prophesied. Thus, however, the question of the dignity of human labour will become crucial, with all the emerging dilemmas such as segregation of workers versus violation of the integrity of the human person. It seems that neither academics nor trade unions representing workers and certainly not politicians are ready to search for answers.
Let's look at it more broadly. What are the fundamental challenges posed by cyborgization? What do we as humanity need to rethink? At first, someone might say, not much - what is the difference between an ape using a stick and a human with an enhanced arm or a human wearing glasses? Only the scale of the tool's efficiency. This is a completely wrong approach. Cyborgization, we reiterate, in its most perfect form involves fusing the human nervous system with a machine. This raises specific questions about the autonomy of the human cyborg, whether certain values shared by humans will be shared by cyborgs and what is the legal status of a machine connected to the human nervous system. One may look at this through Hollywood rose-colored glasses[33]- and trust, as Donna Harraway, author of The Cyborg Manifesto, does, that human cyborgs will be "*conducive to the long range survival of humans*"[34]. However, the opposite may be true. Just note that the communication of cyborgs with enhanced brains may be many times faster than that of ordinary humans. This will create huge barriers in the relationship between the two communities. We encourage you to take a look at "Gateway" by Frederick Pohl[35], where you'll find a brief description of the reactions of space pilots ripped into the devices, to see how science fiction sees the reaction of the first fully digital humans. They seemed disgusted: "O, mother, how slowly these people communicate."
Much depends on whether there is any paradigm shift in the development of our civilization. The current model of capitalist economy is based on

[33] K. Warwick, *Cyborgs morals, cyborg values, cyborg ethics*, in *Ethics and Information Technology*, 2003, vol. 5, 131-137
[34] D. Harraway, *A Manifesto for Cyborgs: Science, Technology and Socialist Feminism in the 1980*, in *Socialist Review*, 1985, vol. 80, 65-108
[35] F. Pohl, Gateway, St Martin's Press., New York, 1977

the mantra of accelerating labour efficiency. If this does not change, the working man will even be "pushed" down the path of forced cyborgization with all its consequences. It is to be expected that cyborgization introduced in such a way will entail increasing exclusion of those who will not submit to it or their growing aggression. As a result, mankind will be divided into "plebs" and cyborg culture[36]. Until democracy ends and the victors show the path to follow.

[36] K. Warwick, In the Mind of the machine, Arrow Books, London, 1998

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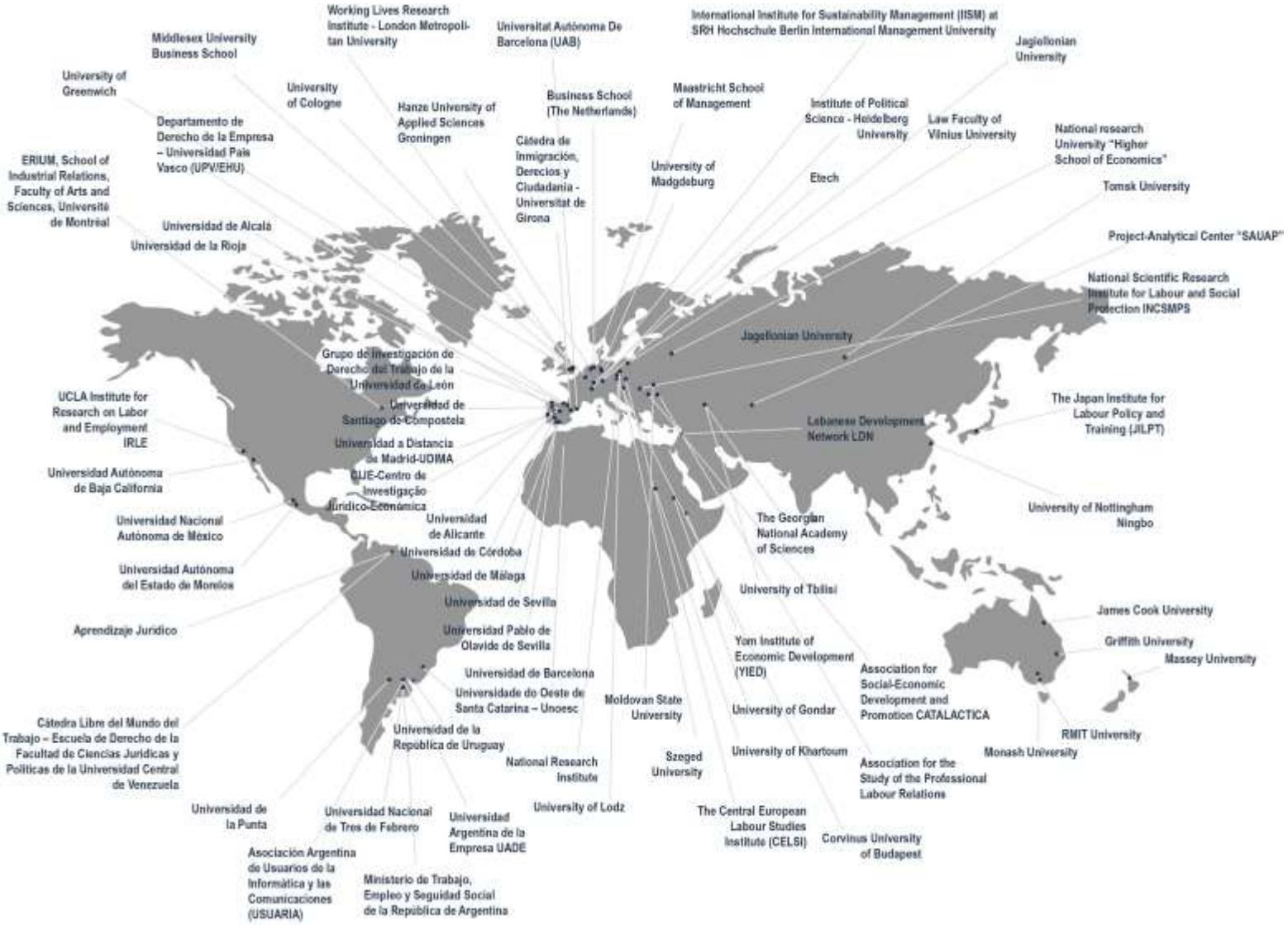

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