

# ● HUMAN ENHANCEMENT TECHNOLOGIES: DEMYSTIFYING THE LEGAL AND ETHICAL ISSUES



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## **Abstract**

*The right to bodily autonomy implicit under right to life and personal liberty as enshrined under Article 21 of the Constitution may also be interpreted to include the right to modify or improve one's body. The use of RFID technology that provides for microchipping in individuals have been in existence for quite a while. While some consider the technology to be beneficial, the others are of the opinion that the practice is unsafe, invasive and inhumane. However, the issue arises when such unbridled right is used by individuals in enhancing their existing capabilities in a manner which would give them definitive advantage over other non-enhanced human beings, resulting in class divides and structural inequalities.*

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## **Key words**

*Human enhancement technologies, right to bodily modifications, brain-machine interface, RFID technology, brain chip implants*

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## **Introduction**

The rapid advancement in science and technology, has transformed our lives in numerous ways. We are living in an era where gadgets have become an indispensable part of our lives. From mathematical calculations to electronic dictionaries to GPS navigation to e- payments, these days we are very much dependent on technology. These technological innovations have not only changed our lives for the better; but has also turned into extensions of our body. But then, what if these external aids that augment our lives could be merged with the human body? Would that make individuals less of a normal human being? From manufacturing assistive devices that are designed to aid the people in their day-to-day activities to developing technologies that collaborate people with artificial intelligence, there has been a gradual shift in the approaches towards improving the quality of life.

With a view to integrating humans with technologies, emerged the concept of 'trans humanism'. The idea of trans humanism' was devised by Julian Huxley, who explained the philosophy as improvising the human condition by the use of emerging technologies, surpassing the traditional limitations of human body<sup>1</sup>. The scope of trans

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<sup>1</sup>Huxley J., Transhumanism, 8 Journal of Humanistic Psychology, 73-76 (1968), doi:10.1177 /002216786800800107

humanism extends to not only mitigation of diseases, illness or restoration of normal bodily functions, otherwise incapacitated by accident or injury, but also to the process of augmenting the existing intellectual and emotional capabilities in humans with the view of transforming them into super intelligent beings. According to trans humanists, with the responsible use of the emerging technologies we can eventually remold the human beings to enhanced versions of themselves<sup>2</sup>. The vision therefore is to make use of the technology into achieving a greater degree of control over our lives, augment the human productivity and thereby create an opportunity to live longer.

When technology enhances the human performance beyond the realms of what is regarded as 'normal' for human beings, the question arises as to whether an 'enhanced human' or a 'trans human' should be regarded as a human being? Whether 'trans humanism' should be trivialized as mere bodily modifications? If technology enables humans to enhance the bodily functions, and become augmented beings, should it be restricted? If the restrictions are placed, would it tantamount to infringement of right to bodily autonomy, a subset of right to life and personal liberty? If restrictions are not placed, would it be a threat to humanity? Though these are individual choices which are to be made, it has a huge bearing on the society as a whole and could in fact change the way we live. Human microchip implantation and brain machine interface are two such emerging human enhancement technologies which have gained popularity in the recent times. Though these are promising technological innovations, it holds the potential for misuse, especially if left unchecked. Thus, understanding the future implications it is extremely important to frame a robust regulatory regime that focuses on balancing the risk of misuse of human enhancement technologies with a desire not to stifle the breakthrough innovations.

## Human Microchip Implantation

The origin of RFID technology can be traced to World War II where it was used to detect and warn the citizens of the approaching allied airplanes<sup>3</sup>. Consequently, with the exploration of potential application of the technology in various fields, the RFID systems became widely used in electronic tolling systems, smart ID cards, tracking of individual goods, merchandise as well as pets and other animals<sup>4</sup>. Thus, an otherwise cumbersome process of bulk reading, data transfer, inventory management, tracking and identification of lost petsetc had become much easier with the use of RFID technology.

Gradually the application of RFID technology in humans gained considerable

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<sup>2</sup>Grant AS, Will Human Potential Carry Us Beyond Human? A Humanistic Inquiry into Transhumanism, *Journal of Humanistic Psychology* (2019), doi:10.1177/0022167819832385

<sup>3</sup>Dario A. Rodriguez, Chipping in at Work: Privacy Concerns Related to the Use of Body Microchip ("RFID") Implants in the Employer-Employee Context, 104 *Iowa L. Rev.* 1581 (2019), available at <https://ilr.law.uiowa.edu/print/volume-104-issue-3/chipping-in-at-work-privacy-concerns-related-to-the-use-of-body-microchip-rfid-implants-in-the-employeremployee-context/>, last accessed on June 30, 2021.

<sup>4</sup>Elaine M. Ramesh, Time enough? Consequences of Human Microchip Implantation, 8 *Risk: Health, Safety & Environment*, 373 (1997), available at [https://heinonline-org.gnlu.remotlog.com/HOL/Page?public=true&handle=hein:journals/risk&div=36&start\\_page=373&collection=journals&set\\_as\\_cursor=0&men\\_tab=srchresults](https://heinonline-org.gnlu.remotlog.com/HOL/Page?public=true&handle=hein:journals/risk&div=36&start_page=373&collection=journals&set_as_cursor=0&men_tab=srchresults), last accessed on May 29, 2021.



popularity. The first successful human microchip implantation was performed in 1998 on Mr. Kevin Warwick, a professor of cybernetics, who had inserted the chip on his arm so as to track his movements within the University by means of a computer<sup>5</sup>. Over the years, the significant developments paved way for the manufacture of Gen2 Compatible RFID chips with better specification and features. The implantable RFID chips which are in commercial use today are about the size of a grain and are designed to hold all relevant information such as identity, details regarding health, payment, security clearances etc of the concerned individual. There have been mixed responses in relation to the use of RFID technology in humans. While some consider the technology as a boon to the society, the others are of the opinion that the use of technology is extremely invasive and in the long run would pose a threat to the health of the individual.

### **a. The Meow-Meow Case**

In 2017, the courts for the very first time witnessed the issues pertaining to the right of the individuals to modify their own body when a biohacker in Australia, Mr. Meow inserted a travel chip into his hand so that he could travel hassle free without having to carry and swipe the card every time he boarded a train<sup>6</sup>. In a legal action against Mr. Meow for travelling without a valid ticket, the biohacker submitted that by swiping the chip implanted onto his wrist, he had technically paid for the journey and that by inserting the microchip in his hand, he had merely exercised his freedom of enhancing the functionality of his body which can be attributed to right to bodily integrity protected under the right to life of the individuals<sup>7</sup>. The transport authorities contended that there was a violation of the terms and conditions in the card's use as cutting the chips in the card and implanting the same in the body amounted to tampering. Indicating as to how the law of the day ought to have been followed, Mr. Meow was fined and directed to pay \$220 along with legal costs for not being able to show a valid ticket at the time of inspection. In an appeal by Mr. Meow, the District Court directed that the conviction be set aside and upheld the legal costs.

The case highlights the inadequacy in the law to keep pace with the technological advancements and raises questions on the aspects of bodily integrity and the legality of bodily modifications. Though many condemned the extreme choices made by Mr. Meow, it is predicted that taking into account the utility of the RFID technology, many more individuals would voluntarily come forward wanting to get themselves chipped. From locking and unlocking the doors to authorizing payments to storing relevant personal data, the microchips inserted in the individuals have a lot to offer and it is interesting to observe how over the years the mind set of the society has changed into accepting these technologies for the sake of convenience.

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<sup>5</sup>Ajay Kumar S. et al., Microchip Insertion in Human beings - A New Identification Tool, 5 International Journal of Current Research and Review, 52 (2013), available at [https://www.ijcrr.com/article\\_html.php?did=1000&issueno=0](https://www.ijcrr.com/article_html.php?did=1000&issueno=0), last accessed on June 25, 2021

<sup>6</sup>Paul Gregoire, Australia's First Cyborg Rights Case: An Interview with Biohacker Meow-Meow, available at [https://www.sydney\\_criminallawyers.com.au/blog/australias-first-cyborg-rights-case-an-interview-with-biohacker-meow-meow/](https://www.sydney_criminallawyers.com.au/blog/australias-first-cyborg-rights-case-an-interview-with-biohacker-meow-meow/), last accessed on June 22, 2021.

<sup>7</sup>Galloway, Kate, The COVID Cyborg: Protecting Data Status, 45 Alternative Law Journal, 162-67 (2020), <https://doi.org/10.1177/1037969X20930431>.

## b. Microchipping the Workforce

In the recent times, embracing the new world of emerging technologies, many global companies and organizations have started considering the prospects of microchipping their employees. The chips inserted in the employees can reveal real time information such as the time spent by the employee in the office, the duration of break, the amount spent at the cafeteria etc<sup>8</sup>. The organizations claim that the RFID technology could be the biggest boon as it ensures the effective monitoring of employees which contributes to their increased productivity at work. Countries like Sweden have readily accepted the human-technology interface and have already inserted microchips in thousands of its citizens<sup>9</sup>. Despite the promising benefits, there are numerous concerns relating to the long-term risks and uncertainties that these implants can have on the health, privacy and safety of the individuals<sup>10</sup>.

Additionally, there have also been instances where the organizations have imposed microchipping as a condition of employment, resulting in situations where the employees are pressurized into either voluntarily/involuntarily accepting the chip implants<sup>11</sup>. Right to life shall be interpreted to be inclusive of the right of individuals to refuse any bodily implants. In view of this, as many as seven states which includes New Hampshire, Oklahoma, Maryland, Wisconsin, California, Utah and North Dakota have already passed legislations prohibiting mandatory microchipping in humans<sup>12</sup> and a few more states are in the process of adopting similar legislations. In the increasing context of employee surveillance, enhanced productivity and convenience, it is crucial to not only consider the implications of microchipping but also to safeguard the individual rights from the newly sanctioned technological advancements.

With an escalation in the number of human microchip implantation globally, it is only a matter of time when the courts in India will have to deal with issues of similar nature. Right to life and personal liberty guaranteed under Article 21 of the Indian Constitution incorporates the right to bodily autonomy which includes the right of citizens to make voluntary choices with respect to one's body, be it in relation to sexual activity, procreation, medical care, body designing or other forms of bodily modifications such as sex-reassignment surgery, cosmetic surgery etc. Though voluntary microchip implantation could be interpreted as one such form of bodily modification which can be

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<sup>8</sup>Joshua Z. Wasbin, Examining the Legality of Employee Microchipping Under the Lens of the Transhumanistic Proactionary Principle, 11 Wash. U. Jur. Rev. 401 (2019), available at: [https://openscholarship.wustl.edu/law\\_jurisprudence/vol11/iss2/10](https://openscholarship.wustl.edu/law_jurisprudence/vol11/iss2/10), last accessed on June 17, 2021

<sup>9</sup>Orlowski, Eric J W., Evolution, Revolution and the New Man: An Ethnographic Investigation into Microchipping, Human Augmentation and Building New Futures, 32 Etnofoor, 77-92 (2020), available at <https://www.jstor.org/stable/26924851>, last accessed on June 24, 2021

<sup>10</sup>Suder S., Erikson M., Microchipping Employees: Unlawful Monitoring Practice or a New Trend in the Workplace? In: Ebers M., Cantero Gamito M. (eds) Algorithmic Governance and Governance of Algorithms. Data Science, Machine Intelligence, and Law, Springer, Cham, [https://doi.org/10.1007/978-3-030-50559-2\\_4](https://doi.org/10.1007/978-3-030-50559-2_4)

<sup>11</sup>Ibid

<sup>12</sup>States Just Saying No to Employee Microchipping, available at <https://www.lexisnexis.com/en-us/products/state-net/news/2020/03/13/states-just-saying-no.page#:~:text=Laws%20passed%20in%20California%2C%20Maryland,any%20person%2C%20not%20just%20employees>, last accessed on June 19, 2021



brought under the ambit of Article 21; it is to be noted that involuntary or rather forced microchipping falls outside the purview of right to bodily integrity. The rise in human microchipping also calls our attention to the potential dark side of the technological innovation which includes the risk of data theft, malicious access, data manipulation and infringement of privacy. In the wake of potential misuse of the RFID technology; especially in relation to forced microchipping, it is extremely important to frame appropriate laws and guidelines that not only regulate the process of microchipping but also ensure the safety of the individuals opting to get themselves chipped. Additionally, it is also essential to educate the citizens about the pros and cons in microchipping so that citizens can make an informed choice regarding the same.

### **Brain-Machine Interface**

Brain machine interface, also known as the neural interface is a promising technological innovation that measures the activities of the brain and provides for a communication pathway which supplements, enhances or restores the natural output, thereby improving the quality of life<sup>13</sup>. By detecting the brain signals and transmitting them to digital devices, diagnosis of diseases becomes easier which in turn makes prevention, rehabilitation and restoration of affected individuals, a possibility. The research community is of the opinion that this is a powerful technology which can not only enable people affected by disease, illness or otherwise incapacitated, to perform their normal bodily functions but also improve the cognitive performances in humans.

Recently, in a study conducted by BrainGate, (a team of professional experts dealing with developing Brain-MachineInterface (BMI) technologies) the use of BMI in a clinical trial participant was demonstrated. With the help of BMI, the participant who had been suffering from cervical spinal cord injury was able to type words on the computer by merely picturizing the hand motions involved while writing each of the alphabets<sup>14</sup>. It was observed that the 65-year-old clinical trial participant could type close to 90 characters per minute, which happens to be more than the previous record speed of 40 characters per minute. The research team is of the opinion that with the use of the system, a person could type sentences at a rate similar to that of a person of the same age, typing on a smartphone. This has by far been one of the fastest and accurate techniques of decoding the handwriting by way of BMI and BrainGate is confident that over the years it will be in a position to develop useful human enhancement technologies that can permanently restore people's ability to communicate especially in cases where they have been incapacitated by illness or injury.

Likewise, Neuralink, the company founded by Mr. Elon Musk is into developing a chip that can connect the human brain to a digital device such as a phone or a computer. This chip which is proposed to be placed in a portion of the skull mandates the involvement of robotic surgeons who can perform the entire process with clear precision, thereby negating any element of human error. Since the chip can be connected wirelessly on a

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<sup>13</sup>Sarah N. Abdulkader, et al., *Brain Computer Interfacing: Applications and Challenges*, 16 *Egyptian Informatics Journal*, 215-230 (2015), <https://doi.org/10.1016/j.eij.2015.06.002>.

<sup>14</sup>Willett, F.R., Avansino, D.T., Hochberg, L.R. et al., *High-performance brain-to-text communication via handwriting*, *Nature* 593, 249-254 (2021), <https://doi.org/10.1038/s41586-021-03506-2>.

digital device, monitoring as well as communication becomes a lot easier<sup>15</sup>. In August 2020, Neuralink showcased to the entire world the functionality of the implant in pigs. In the live demo, three pigs were shown—one, which did not have any implant, the other, which had the implant and the third which previously used to have the implant. Clarifying how the implants posed zero adverse effects on the health of the pigs, Musk demonstrated how the real-time information from the brain cells could in fact be captured<sup>16</sup>. It was also explained as to how by virtue of the chip implant, the pigs could be trained to perform activities such as walking on the treadmills etc. Musk further revealed that pigs were chosen for the trial because their skull structure and the dura membrane were comparable to that of the humans<sup>17</sup>. Being granted the breakthrough device designation by the FDA, Neuralink is all set to start with the human trials this year<sup>18</sup>.

Though the technology promises to cure medical issues such as paralysis, dementia, alzheimers, parkinson's, acute depression etc, there have been debates on how the process could emerge as the biggest threat to humanity<sup>19</sup>. The studies have established that BMIs could potentially be used to augment the human capacities, enabling an individual to connect to the internet, download new skills, store or upload data from and to a computer and thereby become an enhanced version of oneself or rather a 'smart human'<sup>20</sup>. However, the scientists as well as the human right activists have raised their apprehensions on the misuse of BMIs especially in cases where it would be used for the purpose of human enhancement. Taking into consideration the right of bodily autonomy guaranteed to the individuals, it would be difficult to define and restrict the use of brain-machine interface to certain specific cases. It would also be extremely difficult to categorize the individuals based on the purpose with which they have undergone the bodily implants. With the prospect of becoming enhanced humans, more people are likely to opt for BMIs, which would further necessitate the implementation of different mechanisms to evaluate and assess these individuals. Unless such definite mechanisms evolve, there is also a risk where enhanced and non-enhanced individuals are compared with one another to the disadvantage of the latter. The research studies and clinical trials undertaken over past few years reveal that BMI is an extremely probable future technology. Therefore, it is crucial to devise appropriate laws and regulations that can

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<sup>15</sup>Fourmeret, É. et al., *The Hybridization of the Human with Brain Implants: The Neuralink Project*, 29 *Cambridge Q. Healthcare Ethics* 668 (2020), doi:10.1017/S0963180120000419.

<sup>16</sup>Reuters, *Elon Musk's Neuralink puts computer chips in animal brains*, *The Hindu* (August 29, 2020), available at <https://www.thehindu.com/sci-tech/science/elon-musks-neuralink-puts-computer-chips-in-animal-brains/article32471569.ece>, last accessed on June 17, 2021.

<sup>17</sup>Julia Carrie Wong, *Neuralink: Elon Musk unveils pig he claims has computer implant in brain*, *The Guardian* (August 28, 2021), available at <https://www.theguardian.com/technology/2020/aug/28/neuralink-elon-musk-pig-computer-implant>, last accessed on June 9, 2021.

<sup>18</sup>*Ibid.*

<sup>19</sup>Burwell et al, *Ethical Aspects of Brain Computer Interfaces: A Scoping Review*, 18 *BMC Medical Ethics* (2017), doi: 10.1186/s12910-017-0220-y.

<sup>20</sup>Ellen M. McGee, *Becoming Borg to Become Immortal: Regulating Brain Implant Technologies*, 16 *Cambridge Q. Healthcare Ethics* 291 (2007), available at <https://heinonline-org.gnlu.remotlog.com/HOL/P?h=hein:journals/cqhe16&i=297>, last accessed on June 15, 2021.



mitigate the deleterious effects of the technology, before it becomes widely used.

## Conclusion

Today, people are compelled to transform themselves either out of a medical necessity or mandatory condition of employment or merely owing to an aspiration to augment the existing human capabilities so as to be enhanced individuals who are at a greater advantage in comparison to others. The scientific and technological advancements are already changing our perception towards human machine interface and is with time turning into a reality. As far as the implantations in humans are concerned, it may not be easy to distinguish implants made for therapeutic purpose from those made with an object of enhancement. For example, if a learning disorder such as dyslexia in a child can be resolved by means of a BMI, it would be difficult to determine whether it qualifies as an implant for therapeutic purpose or an enhancement; given the fact that dyslexia is not a disease but rather a condition a person is born with and often runs in families. Likewise, if a person suffers from dyscalculia, a learning disability in Maths or atelophobia, the fear of making mistakes or even athazagoraphobia, the fear of forgetting or being forgotten, by merely implanting a chip in their body which can store all the relevant data, should that be considered as a therapy or a form of human enhancement? In order to explain what qualifies as a human enhancement, it is primarily important to define what it means to be a 'normal human being'. Both human rights and fundamental rights are inherent rights that are guaranteed to every 'human being' or rather a 'person' or a citizen. If the right to bodily integrity allows a person to transform their body so as to become an enhanced human, can such individuals still come under the purview of a 'person'? According to Salmond, "So far as legal theory is concerned, a person is any being whom the law regards as capable of rights and duties"<sup>21</sup>. Even if the terminology 'person' is given a broader interpretation so as to include humans as well as trans humans, by virtue of the principle of justice, equity and good conscience, it would be unjust and unreasonable to consider an enhanced and non-enhanced individual on an equal footing. On the other hand, giving a narrow interpretation so as to exclude an enhanced human from the purview of a 'person' would mean that any individual who undergoes bodily modifications, be it for a therapeutic purpose or enhancement, ceases to be a 'person' and therefore does not enjoy any of the basic rights. All these raise a host of legal and ethical issues that requires careful consideration.

In the present times when both scientific and technological developments are advancing at a breakneck pace, it becomes really difficult to ascertain how much of technology is 'too much of technology' so as to be labelled as a 'threat to humanity'. The scientists who oppose the human enhancement technologies are of the opinion that these emerging technologies would open the door to injustice and societal harm; whereas, the supporters are of the view that these are tools to improve the human condition and give us new options to make our lives better<sup>22</sup>. In the current AI driven world, where humanoid robots have been granted citizenship<sup>23</sup>; the development and

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<sup>21</sup>Valerie Kerruish, *Jurisprudence as Ideology*, Taylor & Francis, 2005

<sup>22</sup>Steve Clarke et al., *The Ethics of Human Enhancement: Understanding the Debate*, Oxford University Press, 2016.

use of human enhancement technologies are certainly foreseeable. In the larger public interest, it is therefore essential to assess the potential risks and vulnerabilities in human enhancement technologies and further address the same through proactive laws that strike a balance between the emerging innovations and fundamental rights of the citizens.

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<sup>23</sup>Cleve R. Wootson Jr., Saudi Arabia, which denies women equal rights, makes a robot a citizen, *The Washington Post* (October 29, 2017), available at <https://www.washingtonpost.com/news/innovations/wp/2017/10/29/saudi-arabia-which-denies-women-equal-rights-makes-a-robot-a-citizen/>, last accessed on June 27, 2021.