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Ethical Issues of Human Chip Implantation Technology

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ABSTRACT
With the development of human chip implantation technology, there are also outstanding ethical issues. This paper is based on Epicenter's case of implanting chips for employees and makes an ethical analysis of human chip implantation by using rule utilitarianism. The ethical issues related to this technology are chip security, privacy security and user's physical safety. There are three recommendations: first, try to use wearable devices instead of implanted chips; second, strengthen the access rights of chips to protect the data in chips; finally, people can use only one chip instead of the chips that need to be replaced.

Keywords: *Human Chip Implantation, Artificial Intelligence, ethical issues, rule utilitarianism*

1. INTRODUTION

With the rapid development of human chip implantation technology, people pay more and more attention to its application prospect. The practical application of this technology corresponds with the development trend of artificial intelligence development, and can bring a lot of convenience for human's life in the future. But in the process of continuous progress, this technology is also faced with unavoidable ethical problems.

According to CNBC, Epicenter of Stockholm, Sweden, has implemented human chip for its employees, and the small implants use Near Field Communication technology (NFC). Employees can voluntarily choose whether to implant microchips in their own hands. As of July 2017, about 150 of Epicenter's more than 2000 employees have accepted the company's chip implantation. The chip was implanted in less than a minute by a semi painless injection into the recipient's hand, and it was about the size of a rice. Mesterton, co-founder and CEO of Epicenter, said the biggest benefit of chip implantation for employees is convenience. Because the chip implanted into the human body can replace many things, just like the master key and the universal identity card. The employees, who are implanted with the chip, do not need to use other auxiliary items in the face of unlocking, swiping the card to pay and operating the printer and other situations, they only need to use the chip implanted in their hands to solve the problem. At the same time, communication data can be stored in the chip, and calls can be made through smart phones. In addition, this chip can also conduct more accurate supervision on the behavior of employees. Libberton, a microbiologist at Karolinska college in Sweden, points out that this chip can collect all the personal behavior information of employees, such as health data, whereabouts, working hours, working frequency, and even when they go to the toilet [1].

When Epicenter company promoted the human chip implantation technology to the whole company, this behavior greatly improved the influence of the technology in practice and effectively promoted the specific application of the technology in reality. Many people think that this technology is the future trend, human chip represents the perfect combination of human and machine with the continuous progress of artificial intelligence. However, the development prospect of this technology is optimistic, at the same time, its own ethical problems are also very prominent.

2. ANALYSIS

Implantable chips are challenging social moral standards. First, because the implantable device can be accessed through the network, it will cause personal information and behavior to be monitored by the Internet, so personal information is in an unsafe state [2]. Secondly, when the personal information of the user implanted with the chip is in an unregulated state, the abuse of this information will certainly lead to a morally unacceptable situation. At the same time, the European ethics group proposed that the application of ICT implants in non-

medical situations will threaten the security of human society [3].

3. RECOMMENDATIONS

The use of human chip in many companies has brought a lot of convenience to employees and employers, such as entering the company, paying money, using printers and so on, which employees only need to scan the chip in their body to get permission. At the same time, the implanted chip can record the action track, working hours and health status of employees, which can make it more convenient for employers to manage their employees. However, there are many problems in the use of human chip, such as the security of chip, employee privacy and health issues. For these problems, the author puts forward the following recommendations.

3.1. Wearable devices are better than implantable devices.

As an anti-terrorism security tool, implantable chip is the most appropriate method to monitor criminals in prison. For example, there are some data show that implantable chips can effectively monitor criminals. Therefore, data can be used to analyze which criminals have the tendency to be released from prison [4]. Whereas implantable chip can help parents to track their children in case they lose them [5].

However, according to CNBC, the implanted chip uses near-field communication (NFC) technology [1], which means that the reader can recognize and activate the human chip from a few centimeters away. It is this technology that employees can access the company's devices. But the hidden danger of this technology is that employees who implant chips may scan their own chips without knowing it. For example, if other people use the card reader and get close to the employee who has implanted the chip, they may successfully read the employee's chip, so as to copy the chip and steal the employee's access rights. If employees use wearable devices, this situation may be avoided, because employees can hide the wearable devices, such as in their coats, which can make it difficult for others to find. In addition, the embedded chip is active, because it will be activated as long as it is close to the card reader chip, and the wearable device can activate the device when the employees have their own will by setting the activation operation, such as button or remote control, so as to avoid the device being read maliciously. Although wearable devices may have the risk of loss and theft, compared with embedded chips, wearable devices can detect device loss faster and replace it more easily.

What's more, human chip technology not only involves the application of computer technology, but also involves the field of biology. One of the most important issues is how to guarantee that the chip will not have a negative impact on the human body. When the human chip needs to interact with the nervous system of the human body, if the chip collapses, whether human life will be threatened through the impact on the nervous system. Besides, when human chip technology develops to be able to connect to the Internet, there is a possibility that hackers can threaten human life by implanting viruses into human chips. Therefore, the use of wearable devices instead of implanted chips can reduce the harm to human health.

3.2. To strengthen the access rights to chips or devices.

Human chip technology has the risk of personal information data leakage. Epicenter allows employees to implant microchips that can record a large amount of personal data and track the location of employees. Unlike wearable device, unless employees remove chips inside the body, they cannot delete all personal data stored in the chips at will. If it is a wearable device, employees can process part of the data by themselves and have the ability to control part of the data. Once the chip is implanted into the human body, the individual is completely in a passive position and completely loses the ability to process personal information data, and gives all the right to process information to other people who have access rights of human chips. If the software or device reading the chip is vulnerable, or attacked by hackers, then the data information of the employees may be used maliciously.

When employees use the body chip, the company collects personal information of employees, including their location and health status, which can help company managers better understand the trend of employees to facilitate their management. However, the data leakage and privacy problems caused by this technology are inevitable. The company should try its best to reduce the probability of these problems, strengthen the access to chips or devices, so that employees' information can be protected better in the company.

3.3. People use only one personal chip.

Employee chip implantation involves another problem, that is, if an employee leaves his current company, what should he do with the chip in his body? It is obvious that when employees leave the company, the chip implanted in the employees' body must be invalid. There are two ways to disable the chip. One is to take the chip out of the human body, the other is to leave the chip in the body, and then the company destroys the chip program or cancels the chip scanning function. Through the first method, it can be seen that if employees change their workplaces frequently, it means that employees need to implant and take out different chips many times to obtain the access rights of different companies. It is

painful for employees to perform multiple chip implantation operations, and there is no guarantee that it will affect the health of employees. For the second way, the consequences of this way may make employees have multiple different chips.

At the same time, many studies have proved that radiation can have an impact on human health [6]. However, according to the radiation frequency range after chip activation, there is not enough research to prove that this range will have an impact on human health [4]. In addition, there is research has shown that the energy provided by the drug products is not enough to cause chemical changes with the implanted chip [7]. Therefore, there is not enough evidence to show the impact of chip implantation on human health, but the potential threat of chip implantation cannot be ignored.

In order to reduce the possibility of multiple chip implantation and removal and avoid multiple chips in the body of employees, the best solution is to have only one personal chip, and then achieve multiple access rights of one chip by upgrading the chip or registering in different places.

4. JUSTIFICATION

Whether it is ethical for companies to implant microchips into their employees, we can use rule utilitarianism to analyze. For rule utilitarianism, we need to analyze the rule represented by a certain action, and analyze the consequences after the rule is universalized. If the consequences of this rule can maximize happiness, then it is moral [8].

The rule of human chip in the company's application scenario is that the company requires its employees to implant human chip, and the company has the right to access the data of employee's chip, such as employee's location, health status and action track. If this rule is universalized, in other words, all companies require their employees to implant their chips. First, calculate the benefits of this technology. For companies, this technology can help companies better manage their employees. For example, human chips record employees' working hours, action tracks and visited devices, which can help the company record how long employees work every day and monitor whether employees are working seriously during working hours. At the same time, personal chips can collect and analyze the health data of employees. When employees need sick leave, the company can know the severity of the disease in time. Human chip brings better management to the company, which can maximize the work efficiency of employees and bring the greatest benefits to the company. For calculating this benefit, we assume it worth 70 units. For employees, the implanted chip brings a lot of convenience to them. For example, employees do not need to bring keys or remember passwords. They just need to raise their hands to scan the reader to unlock the company's door or gain access to the company's devices. At the same time, one of the functions of the chip is to track the health status of employees which can provide timely health advice for employees (+50 units). On the other hand, the potential threat of human chip cannot be ignored. The collection of employee data through body chips, including tracking employee location and monitoring health data, poses a threat to employee privacy (-40 units). At the same time, because the microchip needs to be implanted into the human body, it means that this technology involves not only computer science, but also biological science. These two problems will not only question whether the chip program is safe, but also question whether the chip material is safe in the human body. No matter what kind of vulnerability is, implanted chip may threaten people's lives (-80 units). In addition, human chips may be stolen or attacked by hackers, which threatens the interests of the company (-40 units).

So, calculate the overall impact of this rule: 70 + 50 - 40 – 80 – 40 = -40 units. It can be seen from this analysis that the consequences of this rule will cause more serious negative effects, so it is not ethical for companies to let employees implant chips.

5. CONCLUSION

At present, the Human chip implantation technology continues to develop, and many regions have practiced this technology in reality, but at the same time, this technology also faces many ethical dilemmas. When we use the ethical framework of rule utilitarianism to analyze, the negative impact of this technology is greater than the positive impact. If this technology has been widely implemented in the future, how to deal with the ethical problems brought by this technology needs to be seriously considered. My suggestions are; first, try to use wearable devices instead of implanted chips; second, strengthen the access rights of chips to protect the data in chips; finally, people can use only one chip instead of the chips that need to be replaced.

In conclusion, the implanted chip technology is the trend of the development of technology in the future, but the moral problems brought by this technology cannot be ignored. Therefore, people should pay more attention to the use of this technology to see whether it is irreplaceable.

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