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TECHNOLOGY OF THE FUTURE. CHIPS AND IMPLANTATION OF CHIPS

The 20th century was a turning point for humanity. During this short period of time, a huge number of various projects, concepts and devices have been developed. Chips were invented in 1960 by group of American scientists led by Jay Last and from that moment chips were constantly improved. Chip or integral circuit is a set of electronic components, usually transistors, that allow you to execute some logical operations. It includes a layer of semiconductor crystal on which you can record the information and store it for a long time.

The information is recorded with the help of femtosecond lasers. Flash duration of this laser is a millionth part of a billionth of a second. Short-term, but very powerful flashes create a three-dimensional nanostructured information array in crystal. Versatility and flexibility of a chip allowed to use it in various areas of our life. Besides the widespread usage of chips in various electrical devices, doctors tried to use them for treatment of people with neurological diseases and problems with musculoskeletal system e.g. people with damaged backbone, and they did it quite successfully.

For example, scientists have found that if you stimulate certain parts of the brain with an electric current, you can prevent epileptic seizures. Also, they found a way to transmit nerve impulses from brain to damaged part of musculoskeletal system. This technology allowed patient to control his body again. During last 50 years the neurobiology, science that deals with this problems, has developed greatly and may be in the future there will be no incurable neurological diseases. The only problem is that such kind of chips need a constant power supply and constant controlling of their work with the help of the computers. We can't place these components in the body due to their big size and that is why the patient remains attached to his problem and dependent on life support appliances. Nevertheless, this problem will be solved with the development of technology. Not long ago people began to implant chips not only for medical purposes. There are some information about such kinds of chips as RFID and NFC chips.

RFID or Radio Frequency Identification is a way of automatic identification of object, which provides reading and writing the information via radio signals. Any RFID system includes reader and a transponder (recording part), which is represented by RFID chip or RFID label. When a transponder enters to the radio waves coverage zone, that were sent by a reader, it sends a respond signal, and after processing of it, reader causes triggering of certain algorithm. NFC or Near Fields Communication technology has practically the same working principle, except the fact, that transponder also could be a reader. Two devices with that technology form peer-to-peer connection and you can exchange the information between them.

Another feature is that NFC technology is more secure, because data is encrypted in a special way, but you can't transmit the information for a long distance. A default RFID system can work at the distance of 20 centimeters, and transponders can be equipped with antennas, that allow to increase it to 300 meters. NFC devices must be in close proximity to each other, usually no more than a few centimeters and they don't have any antennas. RFID chips are really popular nowadays because of their universality. People use them for creating contactless credit cards and electronic badges. We can find them in some shops and airports in the form of RFID labels, which we use instead of bar codes. NFC chips are usually used for emulation of credit cards in our phones. Just like RFID labels, we can find NFC labels on various things and products as an alternative to QR codes.

If you have a device with NFC technology, you can scan this label and then read some information about thing e.g. shelf time, who is the manufacturer, product composition and etc. Implantation of such kind of chips do not influence on our health, because that chips are really small and they are covered with a layer of biologically neutral glass. The length of such implants is no more than 7 mm, and the width is no more than 5 mm. Usually they are even smaller. People implant chips because they make our life easier. For example, RFID chips are used for marking of animals. Implantation of such a small but useful device simplifies the work of veterinaries and pastoralists.

People record passport data of animals, a history of diseases and a history of vaccinations and basic information about the owner, in order to make it easier to find the missing animal. Due to the fact that information, stored on RFID chip can be changed, it works as a small database. Not long ago, people began voluntarily implant chips themselves. In 2016 about 4000 Swedes agreed to implant NFC chip and replaced all their cre-

dit cards and badges by a small device and every year the number of people who want to implant a chip increases.

Representatives of biohacking companies claim, that in the near future we will see a great breakthrough in this field of science.

People develop chips that do not need a constant power supply, and they get energy through glucose splitting. There will be ships, that could determine the state of our health. Scientists actively test robots-microchips that deliver portions of drugs directly to the digestive tract. And a list of such useful implants will be permanently widened.

Despite all the possibilities offered by the implantation of chips, this technology has a lot of opponents. In some countries and regions it is prohibited by law (for example in florida state) and there are several reasons for that. First of all, It is amoral. People do not want to turn themselves into cyborgs, stuffed with various modern gadgets. People are afraid of the fact that we can become addicted to technologies and machines and they will take us under control. Adding of GPS technology to chips can lead to total control of every person by the government. In addition, modern chips do not have any special protection from hackers. That is why no one guarantees the safety of the data you store on your implant. This problem has been demonstrated at the last hacker's conference Defcon, that took place in Las Vegas in august in 2018. With the help of special software hackers could read, copy, change and delete any information, stored on the chip. They could also infect a chip with a virus that caused software failure.

Chips are an integral part of most electrical appliances. However implantation of chips does not make any sense, because this technology is too young and it has more cons than pros, but if we find a way to get rid of them, chip implants will become an indispensable part of our life.

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HOW DO MUSIC AND WORDS INFLUENCE WATER?

Everyone knows that water is the substance without which our life is not possible. It is the most widespread substance on the Earth. All living things contain water. That's why we should learn more about this amazing liquid. Few people know, that water changes its structure under the influence of words and music.