



Identity Chips: How will they be useful to Humans considering the concerns?

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Abstract:

In the current scenario, due to the increasing demand and supply of technology, many rigorous ways of implementation have been made in the area of various industries based on those types of people who from facing the loss of memory due to old age issues or due to some sort of diseases. As the world is moving more towards robotic treatment in every type of high-end surgery. The introduction of chip implants was also been not far. **Radio Frequency Identification (RFID)** is a type of microchip implant on an integrated circuit that has been introduced for both humans and animals. It was used to track those types of people tending to lose their way while walking around so that their fellow members can be able to know currently where the particular individual is now the moment and also various characteristics of an individual can be identified. It can be used in any different sector for different purposes.

So the purpose of this research is to examine people's opinions regarding the implantation of microchips in humans. The report is limited and focuses on risks and also how can it be beneficial if the implant is done with precautionary care based on the terms of past medical history and the age group factor in various sections of the body in consideration of the concerns related we shall do detailed research on several types of implants and also speaking about the pros and cons of human implantation.

Keywords:

RFID, chips, implants on humans, microchips.

1. Introduction:

• History of RFID Technology

- 1) People want to live a simple life where every day is smooth and effortless. Nowadays, it is becoming more and more common to have microchips implanted in the body to make life easier. More than 5000 Swedes now have a microchip in their body. Microchips are also called integrated circuits. The microchip consists of four components (diodes, resistors, capacitors, and transistors). The four components are all integrated into a small disk called a microchip.
- 2) Human microchips are called radio frequency identification (RFID). You place an RFID chip under your skin that contains a lot of information and can be used for a variety of purposes. An RFID has a unique code that links them to the system. RFID is a passive type of chip. This means that it is powered when you connect it to the reader. Otherwise, the chip has no electronic power and cannot

transmit a signal. Passive chips make it difficult to track the chip. Bio-hacking, a term for body modification, is becoming more popular by the day, and more and more people are doing it. Transhumanism is the origin of bio-hacking, a philosophy that advocates improving our mental and physical characteristics.

- 3) RFID, however, was officially invented in 1983 when Charles Walton filed the first patent with the word "RFID." NFC made headlines in 2002 and has been evolving ever since. The first step toward RFID occurred during World War II when the British used the technology to detect whether aircraft were "friends or foes." Several technical problems led to the shooting down of Allied aircraft, and since then the use of RFID has been limited to the defense and military industries due to cost. Recent technological advances have made several commercial applications possible. RFID technology has been adopted by major agencies such as the U.S. Department of Defense and is now being used by other organizations and industries. Walmart is the second largest RFID adopter and has invested significant resources in application development.
- 4) A still prevalent security issue with RFID technology is that RFID readers can be easily and inexpensively built and data can be read from RFID chips without the ability to modify them. For example, someone can get the latter at a lower price by putting their RFID reader in their cheap product and uploading the data to the chip on board the expensive product.

- **What is a human implant?**

A human microchip implant ("HMI") refers to integrated circuits or RFID transponders encased in quartz glass that are implanted into the human body. Such implants (also known as subcutaneous implants) typically contain a unique identification number that can be linked to an external database that can store the user's

identification data, criminal history, medical history, medications, allergies, and contact information. British scientist Kevin Warwick was the first who experimented with his RFID implants in 1998 to open doors, turn on lights and interact with other systems in a building. Several types of human implants have been discovered which we will be studying while going further into the research involving their unique capabilities along with their risks affecting the individual depending on the factors for every implant.

2. Factors involving or affecting based on human implants:

➤ **Age Factor:** If we are studying about a chip implant for a human being the age factor will always come into the picture and in such type of situation everyone should be aware about a few concerns involved with every set of age group. Basically age is not a major risk consideration but the individual which are below the age group of 18 years cannot have such types of implants as below age children's it can be life threatening and could be illegal in several countries against the law. It is mainly focused for the age group of 18 to 30 years and also above based on the condition of their medical records which can either be clean or be fatal for their life if a implant is being done.

➤ **Privacy:** When it comes to everyone's privacy, many people see the introduction of microchips as a really bad thing because their privacy can be threatened by the risk of being constantly tracked. These small chips make it easier to obtain information about an individual and can retrieve personal information through a single scan. Today, there are privacy concerns and debates about the use of RFID microchips. Applied Digital Solutions (ADS), which was developed by Verichip, is used worldwide to determine the status of patients in hospitals to get the information much quickly. All users who have an

implant are secured with a password. It has been proven wrong that the microchips can only be read by special readers.

- **Cost:** It mentions that despite the many benefits, it is also important to see the costs associated with the introduction of RFID French fries. The price depends on various factors, such as which frequencies and which functions are needed. When it comes to devices like recordable labels, the cost is around ten pounds or even more, depending on higher frequencies. Door readers can cost around 2000 pounds each and small hand-held readers around 170 pounds

3. Types of human implants based on different areas of body:

- **Brain Implants:** Most of us never think about how the human brain works - until something goes terribly wrong. A person may lose their vision or hearing, lose their cognitive abilities due to disease or aging, or become paralyzed or damaged due to an accident or other type of trauma. Unfortunately, when impairment occurs, it is often irreversible. For centuries, scientists have pondered how to repair a broken brain. Now the idea of implanting microchips in the human head is becoming a reality. At the intersection of neuroscience, engineering and computer science, neural implants could restore function to people who have suffered from degenerative diseases, accidents, vision or hearing loss and more. Several devices that use brain-computer interfaces (BCI) are getting closer to market. Neural implants are used for deep brain stimulation, vagus nerve stimulation, and thought-controlled prostheses. X-rays of a patient shows the electrodes of a deep brain stimulator implanted in the brain. This "brain pacemaker" delivers electrical impulses to treat the motor symptoms of the disease.
- **Skin Implants:** Another main area of our body through which the whole outer body structure is the skin and there has been many aspects where a skin is being burnt or

damaged through some accidents causing a degree of burns like for e.g. 2nd degree or 3rd degree burns which can be much fatal cannot be repaired. Many doctors have tried to repair such types of tears but they can't be successful soon the individual has to suffer higher amount of skin damage. So, the idea of implantation comes into the picture as several skin implants have experimented in previous years.

- There are three types of implants associated with the skins based on the individual's consideration:
 - a) **Subdermal implants:** Subdermal implants, objects inserted under the skin, are used in medicine, e.g., for pacemakers and the contraceptive Norplant. There is also historical evidence that some tribal cultures inserted stones or metal under the skin for ritual purposes. In the early 1990s, the idea of inserting 3D artificial implants in various shapes under the skin to create a decorative look. He started with surgical steel, then moved on to Teflon, and carved silicone, and now uses injection-molded implant-grade silicone that he makes himself. Other artists have since made silicone implants with water jet cutters, but these often have undesirably sharp edges that can injure the skin. Subdermal implants are usually inserted through a hole in the skin, which is widened to insert the object and then sutured shut. Magnets and RFID transmitters have also been implanted in humans using this method.
 - b) **Transdermal implants:** Transdermal implants give the appearance of being implanted directly into the body from the outside. In reality, the implanted object is an anchor with a threaded post. The post protrudes through a hole in the skin, and the "jewelry" is screwed onto it. Transdermal implants have numerous medical applications, including chemotherapy "ports" that lead from outside the body to a vein and stay in place for the duration of cancer treatment to facilitate intravenous administration. Transdermal implants anchored in bone have been used to secure prosthetics.
 - c) **Prosthetic implants:** This type of implant is being carried out when a particular individual has been met with a major

accident causing them to lose their limbs or arms making them vulnerable to hold and walk such people tends to do this surgery by implanting prosthetic legs or arms and such type of prosthetics contain a chip beneath containing the user's information about the amount of usage making them live again in a weird way like a robotic manner but manageable enough rather than living the whole life with no legs or arms.

- **Dental Implants:** Dental implants can be a replacement tooth root. Implants provide a strong foundation for fixed (permanent) or removable dentures that mimic your natural teeth. When a tooth is lost due to injury or disease, complications such as rapid bone loss, speech problems, or altered chewing patterns can result in discomfort. Replacing a lost tooth with a dental implant can greatly improve the patient's quality of life and health. Dental implant systems consist of a dental implant body and a dental implant abutment, and may also include an abutment fixation screw. The dental implant body is surgically placed in the jawbone in place of the tooth root. The dental implant abutment is usually attached to the implant body with the abutment fixation screw and protrudes through the gum into the mouth to support the attached artificial teeth.

4. Security Concerns Related to Human Implantation:

- **Vulnerability of Data:** According to the report, there are vulnerabilities and holes in the "exposed connected infrastructure" for these implants. Some Researchers have already found a serious vulnerability and several worrisome misconfigurations in an online management platform popular with surgical teams that could allow an attacker to access sensitive data and treatment procedures. If communications are not encrypted, an attacker could disclose private information such as the IMD model or even patient medical information. This would compromise the privacy (data) of the implant wearer. It has also been shown that

the microchip can be sometimes susceptible to viruses.

- **Hacking:** RFID must be read by a specially designed reader based on regulations and standards. For a hacker to hack into an RFID chip, all they need is more power to have the ability to read and identify information. Hackers who can reach those chips can also inject malicious content that is nearly impossible to find. Talented hackers know to turn RFID chips on and off because the information changes, which can worry people because they do not think it's worth acquiring. Hackers have different goals when it comes to hacking. Some have a specific goal, such as making money, and see the financial benefits, while others just do it for fun and see it as a challenge for themselves.
- **Robbery:** Since the chip does not need to be used by its actual owner in various situations, there is a risk that thieves without knowledge of IT and hacking will use forcible methods and cut the RFID chip out of the victim. Violent methods can be misused instead of hacking because the criminals lack the competence of hacking. Things that can happen when using a microchip include fraud, harassment, or extortion in addition to robbery. People who use a chip are going to be hurt in some way if they are subject to robbery, and it does not necessarily have to be that you end up being personally hurt. They can also be harmed economically and in other ways.

5. Positive and Negative aspects of Human Micro chipping:

- **Positive Aspects:**
 - a) **You never have to worry about losing your wallet again:** RFID chips are used for several daily activities. They are in the cards we use to pay in stores, use public transportation, gain access to buildings, and check out books at the library. The problem with these plastic cards is that we can lose them or they can be stolen. With an implanted RFID chip, it is impossible to lose or steal.
 - b) **Easier Identification:** Our passports, ID cards, and driver's licenses already contain microchips, and it would take minimal

infrastructure changes at train stations, bus terminals, and airports to move from scanning passports to scanning guns. You are identified without having to do anything - except walk past a reader.

- c) **Accessibility of Medical History:** An implanted RFID chip can be used to quickly access your medical history: what antibiotics you've taken in the past, what substances you're allergic to, what medications you're taking, and any other medical information that's relevant in medical emergencies, especially if a patient is unconscious. These implants are especially useful for people suffering from diabetes, cardiovascular disease, or Alzheimer's disease. The chip itself doesn't contain the patient's entire medical history, but only a unique code or number that can be used to retrieve the information from a database.
- d) **Checks on patients, children, and criminals:** It is not uncommon for babies to be confused in hospitals, for the elderly or hospital patients to wander out of nursing facilities, or for criminals to escape from prison. Where it is mostly not uncommon for children to get lost in a crowd, run away from home, or be kidnapped. In these cases, the ability to locate individuals means peace of mind for millions of caregivers, family members, and parents. In the case of an abduction, the first four hours are the most critical, as this is usually when a murder occurs.
- o **Negative Aspects:**
- a) **Threat to Health:** There are many different digital identification systems, and we use many different cards. We have a credit card, an ID card, a health care membership card, a public transportation card, and so on. We would probably also need to implant more than one RFID chip. One potential problem with these chips is that they do not always stay in place. Sometimes they move to another location, making them difficult to find, which would be especially problematic in medical emergencies. Other risks include electrical hazards, adverse tissue reactions, infections, and incompatibility with medical equipment such as MRI machines.

- b) **Freedom of Choice:** With RFID implants, we will always have to be on our best behavior. We will no longer ride the bus for free, drive a little faster than we should, or make an excuse for why we were late for work. To better serve the public, service providers will need to have more access to more information, which may also severely limit our freedom. What if some day comes when receiving microchips becomes mandatory?
- c) **Prime targets for corrupt people:** Like most new technological developments, RFID chips are vulnerable to exploitation. Because they contain so much vital information, they can become a prime target for those with bad intentions, such as hackers. Imagine if the information on your chip was not only readable but also writable. This would mean that your data could be corrupted, erased, or copied. This means that criminals could use your data and copy or replace it with their data to change your - and their - physical identity.

6. Public Survey:

We first conducted a poll of people through Google form creator and data collection service to acquire information regarding people's awareness.

6.1. Questionnaire:

- Are you aware about the chip implants?
- Do you know about the chips that can be implanted to humans?
- What is your level of knowledge of RFID technology?
- Please rank who should control the data collected?
- Please rank how law enforcement should be able to access the data?
- Would an RFID chip can be a threat to individual's right to privacy online?
- If your RFID chips monitors your health status periodically, would you be

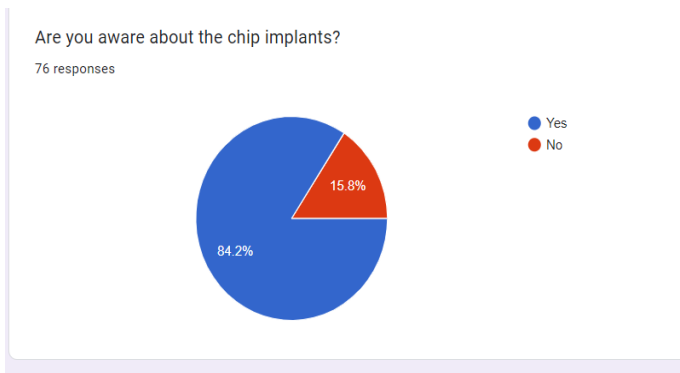
comfortable to share your medical history with the RFID provider?

- Should all RFID tags be mandatorily containing Aadhaar Card data?
- Would an RFID chip violate a person's right not to incriminate themselves?

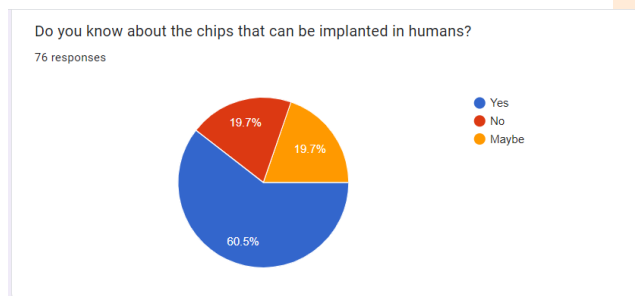
6.2. Results:

Following are the results of the poll conducted online through Google Forms.

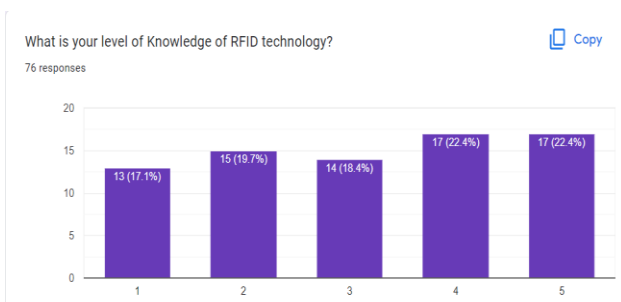
1) When asked about were they aware about the chip implants?



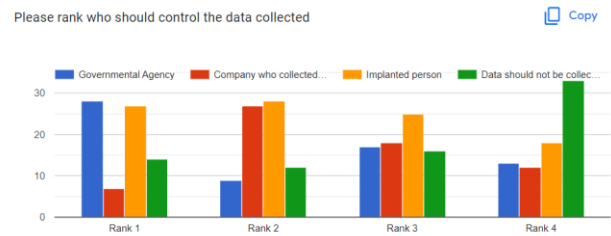
2) When asked about did they know about the chips that can be implanted to humans?



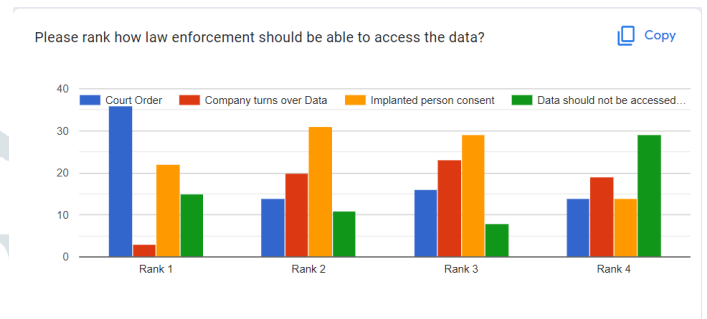
3) When they asked about they have the knowledge of RFID technology?



4) When they were asked to rank who should control the data collected?



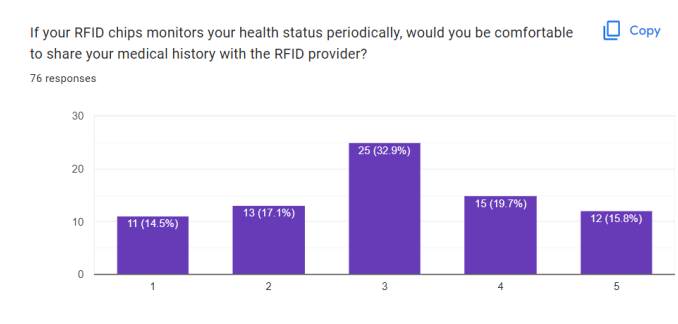
5) When they were asked to rank how law enforcement should be able to access the data?



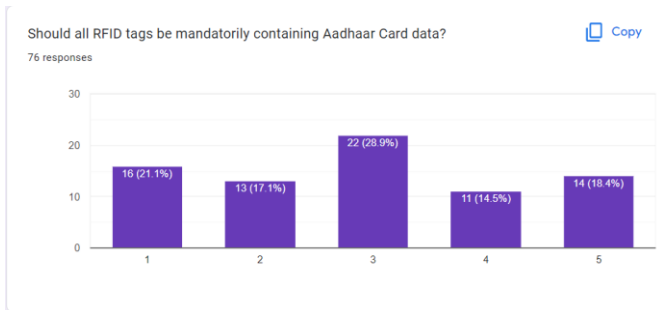
6) When asked about whether an RFID chip can be a threat to individual's right to privacy online?



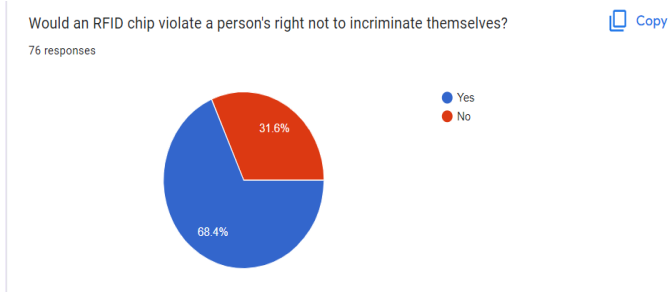
7) When asked about whether you would be comfortable to share you medical history with the RFID provider?



8) When they were asked should all RFID tags be mandatorily containing Aadhaar Card data?



9) When asked about would an RFID chip violate a person's right not to incriminate themselves?



7. Descriptive Analysis:

Descriptive statistics is a means of describing features of a data set by generating summaries about data samples.

<i>Are you aware about the chip implants?</i>	
Mean	1.16
Standard Error	0.042617
Median	1
Mode	1
Standard Deviation	0.369075
Sample Variance	0.136216
Kurtosis	1.625806
Skewness	1.892923
Range	1
Minimum	1
Maximum	2
Sum	87
Count	75
Confidence Level (95.0%)	0.084916

<i>Do you know about the chips that can be implanted in humans?</i>	
Mean	1.6
Standard Error	0.092998111
Median	1
Mode	1
Standard Deviation	0.805387266
Sample Variance	0.648648649
Kurtosis	0.901945396
Skewness	0.861067936
Range	2
Minimum	1
Maximum	3
Sum	120
Count	75
Confidence Level (95.0%)	0.185302781

<i>Would an RFID chip can be a threat to individual's right to privacy online?</i>	
Mean	2.76
Standard Error	0.151675
Median	3
Mode	3
Standard Deviation	1.313547
Sample Variance	1.725405
Kurtosis	-0.88675
Skewness	0.27546
Range	4
Minimum	1
Maximum	5
Sum	207
Count	75
Confidence Level (95.0%)	0.30222

If your RFID chips monitors your health status periodically, would you be comfortable to share your medical history with the RFID provider?

Mean	3.053333
Standard Error	0.146912
Median	3
Mode	3
Standard Deviation	1.272297
Sample Variance	1.618739
Kurtosis	-0.91128
Skewness	-0.06187
Range	4
Minimum	1
Maximum	5
Sum	229
Count	75
Confidence Level (95.0%)	0.292729

Should all RFID tags be mandatorily containing Aadhaar Card data?

Mean	2.92
Standard Error	0.160809
Median	3
Mode	3
Standard Deviation	1.392645
Sample Variance	1.939459
Kurtosis	-1.16289
Skewness	0.084728
Range	4
Minimum	1
Maximum	5
Sum	219
Count	75
Confidence Level (95.0%)	0.320418

What is your level of Knowledge of RFID technology?

Mean	3.146667
Standard Error	0.164063
Median	3
Mode	4
Standard Deviation	1.420823
Sample Variance	2.018739
Kurtosis	-1.29211
Skewness	-0.14989
Range	4
Minimum	1
Maximum	5
Sum	236
Count	75
Confidence Level (95.0%)	0.326902

Would an RFID chip violate a person's right not to incriminate themselves?

Mean	1.32
Standard Error	0.054227
Median	1
Mode	1
Standard Deviation	0.469617
Sample Variance	0.220541
Kurtosis	-1.41827
Skewness	0.787584
Range	1
Minimum	1
Maximum	2
Sum	99
Count	75
Confidence Level (95.0%)	0.108049

8. Findings:

- According to my survey, the awareness of the chip implants has been well known for most of the respondents only few individuals are unaware of it.
- About 60% of the respondents were on the positive side favoring the knowledge of knowing about any type of chip implants for humans as only few people was not having the knowledge of it.

- In the range scale of 1-5 when they were given a choice of ranking the responses were mostly a 50-50% match as either people were familiar with the technology or some were unfamiliar with the criteria and some were not even known whether its exist or not.
- Depending on the ranking scale who should control the data collected according to the priority people feel that the governmental agency has the right aspect to have control over the data collection and above that the data should be confidential and should not be shared with anyone.
- Depending on the ranking scale how law enforcement should have access over the data the priority responses were mostly with the court order should happen and along with that the implanted person should have only the access of his info.
- The importance of online privacy has been a huge concern happening in every part of the sector related to data and as though most of the respondents were on the neutral side like it can either be trusted or not.
- As the importance of Aadhaar has been significant in India and as every type of info is being linked with aadhaar most of the respondents are unsure whether it should either be linked or not.
- When asked will it violate a individual's right not to incriminate themselves most of the people like 68% of respondents were on the positive side and 32% were disagreeable with that question.
- A neutral response has been collected as most of the individuals cannot decide whether they are comfortable to share their current medical history the implant provider.

9. Conclusion:

As the advancement in the technology will be increasing day by day in the upcoming years the improvement in the chip implant will be also an asset in the upcoming future. With the detailed study above in this research we have come across some factors affecting or involving for human chip implants also pros and cons of chip implants and also the types of implants as the history of the RFID chip and it's technology has been knowledgeable to most of the individuals has been found through a

qualitative public survey and most of them are aware about the chip implants along with their use and concerns involving various factors. As the main aim of this research was to prove how it can be helpful in every possible way. The usage of chip implant in India is not yet on a major scale but in Sweden during the covid times was been used on a huge scale. So at last we will conclude that chip implants is much useful for the humans involving some risks and concerns which can't change the fact that it can be sometimes fatal for life but as in general every single surgery has own sets of risk but it should be done in a appropriate way with a proper consent of the implanted person and under a legal way as everything will always have two sides of coin. But in general as much as it can risky if the probability of success it can be a boon to each and every human who has lost hope facing a mishap can live life again as it was before.

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