Social Impacts of RFID Biotech Chips: Social Incorporation, Human Interactions, Socioeconomic Impacts, Personal Finance Influences

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Abstract

The incorporation of RFID Biotechnology chips into society is expected to bring unprecedented social effects. Because the full incorporation of RFID chips on a mass scale has yet to occur at the time of writing this research paper, there is a lack of sources that outline its exact social impacts. Hence, in this research paper, the study revolves primarily around case-studies of past social impacts from technological advancements. Examples of such advancements in this paper include scissors, touch-screen smartphones, and GPS trackers. This paper points out similarities between varying technology and predicts the potential social impacts that society will face when RFID Biotechnology chips are incorporated into society on a mass scale.

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I. Introduction

The key function of RFID Biotech Chips is to make social life within our community much easier. While RFID Biotech Chips are believed to serve its function well, there are numerous effects it may have on society that must be considered prior to mass incorporation into society. First off, it's important to note how RFID Biotechnology Chips will be incorporated into society.

II. RFID Biotechnology Chip's "Invisible" Incorporation into Society

The term invisible technologies is defined as "A way to think about invisible technologies is that they are the set of infrastructure, tools and tech that have become indistinguishable from your daily life."[1] These technologies are often indistinguishable from normal tools we have in life. A good example would be scissors. At one point in time, scissors were considered cutting-edge technology. However, it has adapted into our society "invisibly" and it's part of our daily lives now. Incorporation of invisible technologies is best described in the research paper *Making Technology Invisible in the Developing World*:

> "Besides physical forms such as newspapers, books and magazines, the air around us is crammed with signals carrying information that we can access and use almost without thought on our smartphones and other devices. Information, and the technologies that

[1] Senion, "Invisible technology, best technology" Blog Post from 9th March 2019

allow us to access it, are so convenient that we scarcely think about them. They are mostly invisible to our conscious mind."[2]

John Sculley, an executive officer at Apple, once mentioned during an interview that Steve Jobs would say that "technology can either be beautiful … or technology should be invisible, which means simplifying."[3] Technology companies such as Apple have already worked to incorporate technologies into our lives invisibly. Drawing parallels from technology that was introduced historically and how companies have worked to incorporate them into our society as invisible as possible, it is likely that the same will be done for RFID chips. RFID Chips will likely evolve to an extent where humans no longer perceive it as "technology" but instead as a necessary tool for daily life.

III. RFID's Social Impact on Human Interactions

Historically, human interaction has taken place mostly during the day. This is seen clearly by comparing road traffic during the day and during the night. As shown in the following graph:

[2] Marsden, Gary and Cutrell, Ed and Nanavati, Amit and Jones, Matt and Rajput, Nitendra (2012) *Making Technology Invisible in the Developing World*, IEEE Computer, 82-85.
[3] Rudd, To Avoid Extinction, Insurers Need to 'Disappear", Cognizant (18th January 2018)

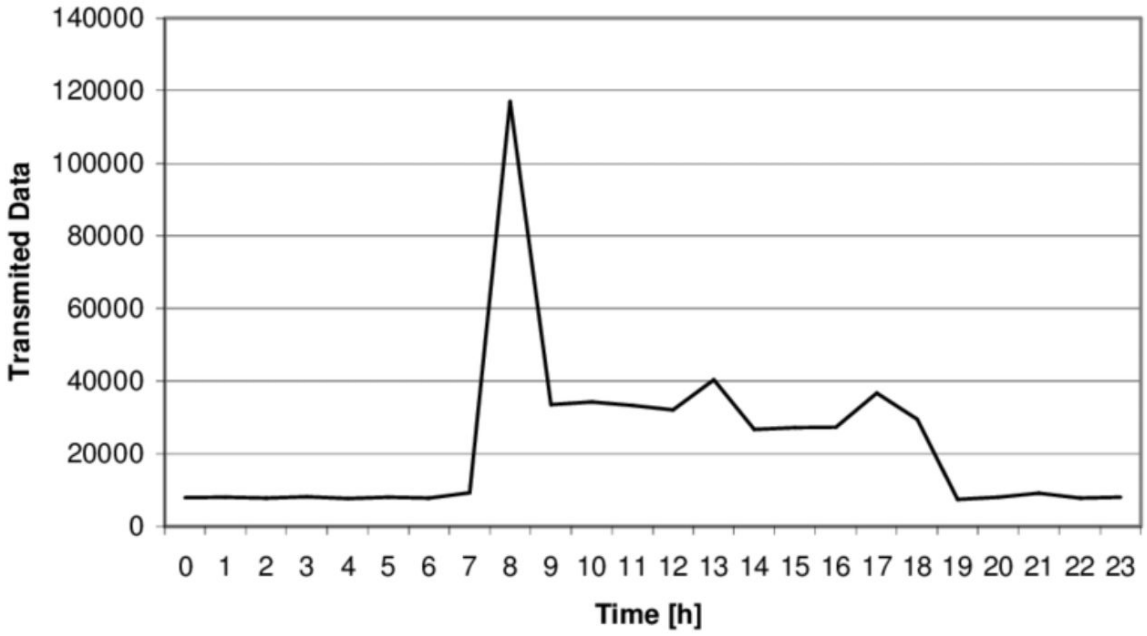

Figure 1 [4]

During the time of the day with daylight, which is about 7 A.M. to 6 P.M., there is much more road traffic than the time without daylight, which includes about 7 P.M. to 6 A.M. The correlation between road traffic and human interaction is that when there is heavy road traffic, it can be assumed that people are moving around and interacting with each other. When there is low road traffic, people are most likely indoors and not interacting with other humans. However, this is believed to change. As mentioned in 2014 study:

> "Always connected to the Internet through a Smartphone provides a great instrument for individuals for constant communication resulting in great safety for children attending schools or going outside. The classic mobile phones provided this facility for a long time

[4] Mohan, Consumer Behaviour towards Smartphone Industry in the Indian Market, (Published 2014)

> but the Smartphone's utilizing the same and providing additional convenient capabilities to communicate with children and know their whereabouts anytime."

Although the previous study was done on smartphones, it is also applicable to RFID chips as there is one key purpose they both serve: location tracking. Because RFID chips can serve the same purpose of Smartphones in tracking users down, children will become safer as there will be a tracking system that allows guardians to know their whereabouts. This is believed to move back the traffic time into later times. While the road traffic correlates heavily to work, it also heavily correlates with safety. If safety becomes a smaller factor in return time, it is likely that the road traffic will expand deeper into the night. But moving aside from children, it's important to look at how elders will react and adapt to the chips.

> "Furthermore, this research shows that, by the year 2020 more than 1000 million people over 60 years age will be living on this planet [33]. Keeping this in mind and looking into the capabilities of Smartphone, it is apparent that in such a situation Smartphone will play an important role in the integration process of people with special needs and elderly age. Smartphone's are capable to give this group of people the opportunity to live more independently. The more they can do by themselves, the better they will feel and enjoy life. Impact of Smartphone's on Society 223 Smartphone features like, text to speech, GPS and social Websites are some examples, which can help this group of people to easily remain integrated with society. Using these services and many more features, the target group of people can easily communicate their needs, seek assistance from others and remain connected to society"[5]

[5] Cotter, Just a Number: An International Legal Analysis on Age Discrimination (Published: 2008) pg112

For elders, RFID Biotech Chips may provide a way in which they can remain connected to society. Again, while the evidence covers the concept of Smartphones, it is believed that RFID Chips may be able to serve a similar purpose as smartphones. Those chips can provide information about the elders and give them key access to communication. Conclusively, elders will have a chance to interact with fellow humans utilizing the technology, making life much more enjoyable. Social distancing is a topic that has become a prime idea due to the COVID-19 pandemic of 2019 and 2020 (at the time of this writing).

The final effect on human interaction that this paper will discuss is social distancing. The concept of social distancing has been and remains essential. Infectious diseases kill over 17 million people annually across the globe. The impact of these infectious, contagious diseases are seen clearly in an article published by the World Health Organization:

> "Nearly 50,000 men, women and children are dying every day from infectious diseases; many of these diseases could be prevented or cured for as little as a single dollar per head, the World Health Organization says in The World Health Report 1996, published today."[6]

One of the main reasons why these diseases spread is due to direct human interactions. Direct human interaction allows for the transfer of bacteria and viruses. This is mentioned in an article by the Mayo Clinic:

[6] World Health Organization, Press Release, Date of publication unknown

> "Infectious diseases commonly spread through the direct transfer of bacteria, viruses or other germs from one person to another. This can happen when an individual with the bacterium or virus touches, kisses, or coughs or sneezes on someone who isn't infected."[7]

Social distancing immediately seems like an option as distancing from sick individuals can allow one to remain free of the virus. This is made easier by the fact that there is one symptom that is quite common in numerous diseases: fever. According to Medlineplus, "A fever is a body temperature that is higher than normal."[8] Normally, individuals cannot see with the human eye whether another individual has fever. However, RFID chips have the ability to change all that.

RFID Chips have the ability to obtain the user's temperature and it also has the ability to send electromagnetic waves to transmit information. The ability of RFID chips to record temperature is allowed by its sensors, and according to Universal RFID,

> "In all applications, the data can be logged and alarms set when temperatures fall outside a specified range. The precision and placement of the RFID sensor tags on a range of materials generates quality data at unprecedented scale."[9]

If an RFID chip records the user's temperature, and realizes that the user clearly has fever, it will be able to send off transmissions to other nearby RFID users and inform them that there is someone with fever nearby.

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[7] Mayoclinic Staff, "Infectious Diseases," Mayoclinic, July 17 2019
[8] Medlineplus Staff, "Fever," Medlineplus Website, July 17 2020
[9] Universal RFID by Metalcraft, "How Passive RFID Temperature Sensors Work," Unknown date of publication

IV. RFID Chips on Socioeconomic Class Distinction

Since the beginning of human history, technology has affected class distinction. Those with better technology were ranked higher up on the social class while those using older technology were ranked lower.

> "The benefits and opportunities created by technology and digitization are unequally distributed toward those who are already wealthier due to factors such as better access to technology and better technical education, causing an overall intensification of socioeconomic stratification."[10]

This is seen evident in clothing as it is a much more obvious system to rank people upon. Those showing off designer clothing are much more likely to be looked highly upon while those wearing cheap clothing aren't as highly looked upon. It is likely RFID chips will have the same effect on society as clothing. Clothing was originally introduced for functional reasons. It could be used for body protection and help individuals keep warm. However, according to "Clothing and People - A Social Signal Processing Perspective," clothing has evolved to be much more.

> "In our society and century, clothing is not anymore used only as a means for body protection … clothing brings a clear communicative message in terms of social signals, influencing the impression and behaviour of others towards a person." [11]

[10] Bontrager, Effects of Technology on Socioeconomic Stratification, (Published: 2018)
[11] M. Aghaei, F. Parezzan, M. Dimiccoli, P. Radeva and M. Cristani, "Clothing and People - A Social Signal Processing Perspective," IEEE *2017* page 532-537

Clothing has offered a way to rank social class. Those wearing expensive designer clothing will be hailed for being rich while those wearing cheap garments will be treated poorly. This is essential because RFID Chips may serve the same purpose. For example, if two people go to a restaurant and one pays with their hand while the other has to take out cash from their wallet, it will be obvious who has a RFID chip and who doesn't. Although they are cheap, RFID chips cost thousands to implement into a human. Those with a higher socioeconomic standing will be able to afford it while those with a lower status won't be. This will be similar to taking out an old flip phone in front of someone with the newest smartphone.

Another problem that comes to mind is the use of RFID chips by the governments to purposely create class distinction. For example, China already has a "point system" that they use to rank individuals based on a variety of different factors. Here is an excerpt of the review of this system by Business Insider:

> "China has started ranking citizens with a creepy 'social credit' system — here's what you can do wrong, and the embarrassing, demeaning ways they can punish you. China plans to rank all its citizens based on their "social credit" by 2020. People can be rewarded or punished according to their scores."[12]

By utilizing GPS tracking, the governments can keep track of the user's common locations and overlap this with the socio-economic geography. If the user usually stays within areas where the socio-economic class is high and interacts with other users with high points, it can be presumed that the user has a relatively high class. If the user seems to reside in a poor area and interacts

[12] Alexandra Ma, "China has started ranking citizens with a creepy 'social credit' system — here's what you can do wrong, and the embarrassing, demeaning ways they can punish you," Business Insider, October 30th 2018

with other poor people, the government will be able to presume that the user is in a lower socio-economic class. While there are definitely numerous problems and exceptions to this utilization, it is definite that governments will have the power to pull off building a system such as this in the near future using the technology well.

V. Effects of RFID on the Concept of Money

One of RFID Biotech Chip's primary functions will be to incorporate a credit card system inside a human. While this may increase convenience, there are significant problems involved. As stated in *Credit Cards: Use and Consumer Attitudes* by Durkin,

> "Nevertheless, concerns persist about whether consumers fully understand the costs and implications of using credit cards and whether credit cards have encouraged widespread overindebtedness"[13]

When credit cards were first introduced in the 1950s, it brought financial convenience. The new technology was supposed to help people manage their money better. However, credit cards have created an unforeseen crisis with debt as the previous evidence claims. As stated in the same research study:

> "From modest origins in the 1950s as a convenient way for the relatively well-to-do to settle restaurant and department store purchases without carrying cash, credit cards have become a ubiquitous financial product held by households in all economic strata. Since the late 1960s, much federal legislation has been enacted to ensure that consumers have

[13] Durkin, Credit Cards: Use and Consumer Attitudes. 1970-2000, (Published 2000), pages 623-634

> the protections and information they need to use this widely available form of open-end credit wisely. Nevertheless, concerns persist about whether consumers fully understand the costs and implications of using credit cards and whether credit cards have encouraged widespread overindebtedness"[14]

There are two main problems with credit cards. First, because credit card users cannot see with their eyes the amount of money that's being spent, they unconsciously spend more than they can afford. Second, people lack the education and knowledge on how to properly use this new technology. Continuation of these two problems has led to incredible credit card debt. According to CNBC's news article, *American debt is set to hit $4 trillion—here's why one expert isn't worried*, credit card debt has surpassed one trillion dollars. Here is an excerpt:

> "In the first nine months of 2018, Americans had a cumulative $3.93 trillion in debt, excluding mortgages, with $1 trillion of that from credit cards and $2.93 trillion from other sources such as student loans and auto loans."[15]

Credit cards brought high debts to its users and it brought light to an important idea: increased ease of spending leads to higher debts. It is likely that RFID chips will do the same. Because these biotechnology chips will be placed inside humans, paying for goods will become even more convenient. This convenience will ultimately result in more spending, leading to higher debts.

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[14] Durkin, Credit Cards: Use and Consumer Attitudes. 1970-2000, (Published 2000), pages 623-634

[15] Leonhardt, American debt is set to hit $4 trillion - here's why one expert isn't worried, cnbc.com (Published: Nov 30, 2018)