

Josh Zingg
Dr. Krone
Honors 131
11 December 2006

The Adolescence of Big Brother

Radio Frequency Identification, or RFID, introduces an opportunity that is pivotal, with possibilities that may lead to progress or toward a very real ethical danger. On the one hand is the use of RFID transmitters in packaging and shipping to reduce loss, waste, and theft, as well as other convenience and tracking applications. On the other is a more sinister use: tracking, but not of freight. RFID may soon be used to track people. There are already programs in place that use implanted RFID chips to track pets and livestock. Lost pets can be identified and returned to their owners when the animals have on a chip implanted in their bodies.

Recently, Digital Angel Corporation, the pioneer in this field, has obtained a patent on a chip that can be implanted in a human via syringe. The chip monitors glucose levels and can be a great aid to diabetics, allowing for easy and painless monitoring of glucose levels in their bodies (Jones).

However, if the technology already exists to read information about animals, to track freight as it is shipped all over the world, and to implant a chip into a human, there is now a very real possibility that a tiny microchip could be injected into a human being, complete with stored information such as social security numbers, criminal record, bank information, and an RFID transmitter. This transmitter could be used to monitor the movement of a person, their purchase history, who they've been in contact with, and any number of other things. This could constitute a breach of privacy if it becomes

mandatory, and could give the government almost unlimited information about the daily dealings of its citizens, whether they like it or not.

1.1 RFID: What does it do?

Radio Frequency Identification is currently being used in many areas of the commercial and personal sector for a number of applications. RFID uses a fairly short range radio frequency to broadcast data, and there are two kinds of transmitters: active and passive. Active transmitters are always on, constantly outputting their signal. For example, a container of fragile materials could be set to broadcast an identifier so that it would trip sensors of the receiving crew before the crate arrives. Passive transmitters do not transmit a signal until they receive a corresponding signal. You can think of these as more intelligent bar codes similar to those we have on most consumer products. The advantage of RFID tags is that they do not require line of sight to identify themselves. Rather than having to directly scan a bar code, a shipping worker could simply walk past a packing crate with a sensor, transmit the signal, receive the RFID chip's response, and proceed, all without having to open any packaging at all.

1.2 How are RFID tags used now?

Often, because of the relatively new implementation and fairly high cost, RFID tracking of freight is used mostly for large bulk shipments. The chips are planted within large containers and used to track the movement of cargo. They could be used to catalogue all the cargo that passes through a particular port, or how much of a particular product ships, or where cargo is lost or stolen. Digital Angel Corp uses RFID tags implanted in pets to recover lost animals. They implant chips in livestock to monitor the movement of herds, death of animals on large ranges, and determine ownership of

particular animals. Ranchers now can have an electronic brand that instantly identifies their animals remotely. Wildlife specialists have used RFID implanted in animals to track movements of monitored species, fish migratory patterns, and other wildlife information.

1.3 What could RFID be used for in the future?

In the commercial sector, RFID is currently used mostly to track large shipments of bulk cargo. However, as the technology becomes more sophisticated and more financially viable, RFID chips could be put not just in the shipping crates, but in the products themselves. Companies could know instantly exactly how many units of a particular product they have, how many passed through a particular area, how many are on each truck, each ship, and each plane. This kind of tracking could greatly reduce waste, misallocation, and shipping error.

Additionally, since the technology exists to monitor a subject's glucose levels, it is entirely feasible that new chips could monitor other vital signs as well. This could be beneficial, detecting blood impurities, chemical imbalance, cholesterol levels, and other conditions before a problem becomes outwardly apparent, saving lives. An RFID tag could monitor the Blood Alcohol Content, preventing a driver from operating a vehicle while over the legal limit. If a record of such a chip's findings is kept over time, they could screen for drug use well after the chemicals have passed through a person's system.

Now for the more sinister aspect of advancements in RFID technology. The possibilities are legion: an RFID chip could be implanted underneath a person's skin, containing their banking information, personal identification verifiers, medical information, and anything else they, or the government, might wish. With an RFID chip in a person's hand tied directly to their bank account, they wouldn't need to carry credit

cards, or personal identification for that matter. You couldn't ever accidentally leave your wallet at home; it would be inside you. With a wave of your hand you could purchase goods and services in an instant. However, coupled with RFID tags in the products you buy, a profile could easily be built up in a database. They could record what you buy, where you buy it, how much of it you buy, how often you buy it, how often you use certain services, how often you enter certain places. For example, if RFID is used for personal identification, every time you are identified your movements could be recorded.

1.4 How would this affect my daily life?

Let's follow John Doe on a typical day throughout the not too distant future of pervasive RFID tracking. John gets up, gets ready for work, gets into his car, and heads to work. On the way he drives through a toll booth which detects his implanted RFID chip and automatically deducts the toll from his account. He arrives at work and parks, authorized to enter the parking structure by the clearance on his RFID chip; let's say he works for the government, as a clerk for the Department of Justice. He then passes through security, his chip transmitting all the authorization he needs to enter the building. He works his time, goes out to lunch at Kentucky Fried Chicken, returns to work and finishes his day. Afterwards he picks up his dry cleaning, buys some groceries, rents a romantic movie to watch with his wife, and returns home. On the way he gets pulled over by a police officer for speeding, but gets let off with a warning. He has a nice dinner with his wife – wine, steak, a baked potato, and poppy-seed cake for dessert. All his monetary transactions that day were done without having to carry cash or cards that might be stolen; he never had to present complicated forms of identification. This is all very convenient for John, and since it's common in his time, he probably thinks nothing of it.

However, now let's look what happens behind the scenes. The toll booth he passed through tracked his movements on the highway. The parking garage kept a record of exactly when he arrived. His building has an exact record of when he entered and exited the building. As a government employee his financial records are most likely under scrutiny, so his boss will know exactly what he ordered for lunch. His superiors will know he visited the dry cleaners, they will know what groceries he purchased, and what movie he rented. They will also be well aware of his traffic stop. Though he got a warning from the officer, his employer may be less forgiving. If the records of his medical-monitoring chip are kept, they will also be aware that he had alcohol in the evening and ate two meals with high fat and salt content. A particularly grim employer might make note of this and think that perhaps they should stop investing in a man at high risk for heart disease. Additionally, that poppy seed cake might skew the results of a drug use analysis (opiates are made from poppy seeds). Machines don't take into account cake consumption; they only notice what chemicals are present.

Now, this may all seem very outlandish at first glance, but consider the possibilities. His purchase history could be sold to advertising corporations to serve as involuntary market research, and he could be specifically profiled and advertising could be targeted at him. When he deviates from his ordinary routine, perhaps stopping off at a bar for a quick drink before going home, it will be noted. If he purchases anything strange, it will be noted. If he watches a movie that might be deemed objectionable, it will be noted. Virtually everything he does will be tracked and recorded. The ethical implications of this are obvious. His privacy is violated at every turn. This is all just with the limited implementation of currently viable technology. In the future, the chip in his

body could be tracked actively, not just when he makes transactions or passes through an identification checkpoint. His very movement could be monitored in real time, wherever he went. Clearly that kind of total scrutiny is more pervasive than even Orwell could have imagined. Big Brother wouldn't just be watching you; he would be a part of you.

2.1 What are the ethical issues with widespread RFID use?

First, while RFID tags are not in use in a majority of products, if they should become more pervasive, companies would be able to build a profile about you based on your purchases. Is this ethical? RFID chips are a viable technology for human implantation, but will they become mandatory as a form of identification? The Social Security program was originally, and technically still is, a voluntary system (Wolfe, 186). However, imagine all the areas in which you are required to identify yourself by your SSN: banking, credit, home ownership, getting a driver's license, and many more. While RFID chips may not be made "mandatory," they could become the de facto method of identification very easily. You may not be required to get one, but circumstances may well force you to. Is this system of passively forced national identification ethical? Additionally, with the rise in electronic banking, RFID is a technology entirely capable of moving us to a cashless society. Even now our dollars are little more than the idea of money. They are no longer notes redeemable for gold from the government. They are simply information, so what is to stop banking from eventually transitioning exclusively into the digital realm? Is that ethical?

2.2 Applying Utilitarianism

The issues brought up by RFID are complex as a rule, and each one has two sides with valid points. First, is it ethical to build a profile on a person's purchases using RFID

tags? According to the ever-popular utilitarian ethics, it is. Companies benefit from the information on purchases and may receive accurate sales information about their product in real time, as well as information to further their marketing. You certainly are not harmed in any obvious way and indeed may benefit from lower prices passed on by companies' savings on prevented loss and waste. Additionally, targeted advertising would only show you products you are likely to buy, rather than things you are uninterested in. However, the only problem is, to what extent is this violation of privacy harm in and of itself? If you resent profiles being made on your purchases, then certainly you are being wronged. Generally market surveys are done on a volunteer basis, but through RFID tags your purchases could be monitored whether you like it or not, without your knowledge.

Second, is a system of de facto required RFID tags ethical? Again it is a balance between obvious benefits and hidden harms. First off, if everyone has RFID chips implanted, say with their banking, personal information, and medical history, then ostensibly there will be much less need to carry multiple forms of identification. Think of it: rather than have to bring your entire life to the DMV, you would simply swipe your hand near a scanner. This would naturally be a great benefit. If all citizens had RFID chips, it would be much easier to track illegal immigrants and possible terrorists.

However, the potential for misuse is staggering. If all your information is contained electronically, what is to stop a government agency from simply changing the information? You could wake up one day and be unable to enter a government building or your place of business. You would be unable to prove who you were at all. You would likely have difficulty even purchasing things. Additionally, this is certainly not a foolproof identification method. A hacker could theoretically replace the information in

their chip with different identification codes, or implant a different chip entirely. As with all "foolproof" technologies and identification methods, people will always find a way around it. Hence, your security of identity is threatened without any real benefit to security. As such, the potential for harm outweighs the convenience of pervasive RFID chips.

The last issue, the transition to a society entirely based on electronic banking, presents another difficult problem. First, in order to eliminate hard currency, everyone who wanted to purchase goods or services would need an RFID chip, either implanted or in a card or fob. This is related to the above issue of de facto requirements of implantation. If that it is the only way someone can make monetary transactions, then they virtually have to get a chip. Also like above, your net worth exists entirely in the digital realm. Without a stack of bank notes to prove that you have money, (though their actual worth is dubious at best now), you will be at the mercy of bank computers. A government agency could freeze your accounts with a keystroke, or could erase them. Even a computer error or the misplacement of a decimal point could ruin you financially in an instant, and there would be no way to prove otherwise. The convenience of not having to deal with hard currency, thus eliminating physical counterfeiting, is vastly outweighed by the risks. Hackers could easily create false amounts of money to use or drain "actual" money from your accounts. A simple glitch could erase your life savings without a trace. The average person would be completely at the whim of whoever controlled the information tied to their RFID information. Clearly, there is greater potential harm than good.

3.1 Conclusion

Therefore, it is apparent that a rise in the use of RFID technology, like most great advances, has the potential both to benefit humankind and to harm our basic freedoms. Implementation of widespread RFID use could reduce waste and loss in shipping, give instant inventory information, and track sales in real time. It could make buying things as simple as waving your hand and eliminate the need to carry identification or even money. Officials could identify you at a distance and monitoring of RFID tags could detect criminals or potential terrorists. However, your privacy could be stripped away in an instant and your very existence would be put at the mercy of those with access to your information. With a string of commands and the authority to enforce them, you could become a fugitive, could be bankrupt, and could even be shown to have never existed. Additionally, the perceived benefits in identity verification could be circumvented, putting innocents at risk while not effectively stopping the guilty. Pervasive RFID tagging of human person and the transfer of identification and banking to entirely digital systems is unethical and dangerous. Regardless of the clear and present danger, RFID identification is even now being discussed in our government. It is a viable technology and ethical or not, it is likely we will see some form of implementation before the end of the decade.