

RFID: Small Package, Big Problem

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Introduction

In his book 1984, George Orwell presents a world run by corporations where personal freedoms are severely limited and every move that a person makes is closely scrutinized. It is a world of paranoia and doubt, where everyone is watched and no one is truly free. As Americans, we have been privileged to possess more freedom than any other nation on Earth, so we tend to believe that an Orwellian, “big brother”-based society could never grab hold in our nation. Unfortunately, this is not exactly the case. Our society is a delicate balance of rights and limits, public information and private lives. Without privacy, this pillar of American society crumbles to the ground. There is a new technology present in our lives, that if used incorrectly, could ruthlessly weaken the fabric of our belief systems and reduce this nation to a trembling mass of nervous wrecks.

Radio Frequency Identification (RFID), like any new revolution technology, has many disadvantages and dangers. As with all things, there are good uses which can greatly aid society, and there are immoral uses which greatly threaten our current way of life. In this paper, I aim to inform you of current issues surrounding RFID privacy and security, and offer my opinions on the subjects. This paper is in no way a summary of RFID technology, nor is it intended to sway you in a particular direction. General RFID information is easily found on the internet, and for a more general look at possible privacy issues, please see my previous paper on the subject.

Secret Testing

When you are at the supermarket, happily weaving through the aisles, buying your goods, do you ever think about who is watching you? If you have never thought

about this question, it can be quite disturbing to think about. In many grocery outlets, there are often cameras located throughout the store, and in some older establishments, there are even two-way mirrors which allow executive staff a view from high above the floor. Well, with the introduction of RFID tags, which allow manufacturers and distributors to track where and when products are purchased, there are new ways to monitor shoppers.

As RFID tags become more prominent on the packaging of goods, it is important to preserve the individual's right to privacy. Unfortunately, even as RFID tags are being tested, these rights are being broken.

As was reported earlier this year on the Electronic Privacy Information Center (EPIC) website:

Wal-Mart and Procter & Gamble recently admitted to secret RFID testing of consumers who interacted with Lipfinity brand lipstick in an Oklahoma Wal-Mart store earlier this year. Triggered by a RFID tracking device imbedded in the lipstick packaging, consumers were videotaped when they had contact with the product. The revelation contradicts repeated assurances by Wal-Mart that it was not conducting such tests on consumers.¹

This is clearly a slap in the face to personal privacy as well as commonsense. I cannot comprehend why Wal-Mart would not simply inform consumers of the new tags, and I really do not understand why consumers needed to be videotaped when they were handling the product. The purpose of RFID tags is to transmit and store information electronically, which to me means that you no longer need to videotape the product. One could merely wait until they paid for the product and then connected the purchase to their credit card, which would then more precisely provide their identification.

Regrettably, this is not the first time that such a practice has been adopted. Recently, Tesco, a large supermarket chain in England, "reportedly photographed

customers removing Gillette razors from the shelves.”² This is another example of a large company—actually two companies in this case—not respecting the privacy of the individual. This case actually prompted a consumer response in which a consumer privacy group called for a boycott of all Gillette products, but this accomplished almost nothing. While Gillette claims that they had no intention of using the photographs for anything other than internal testing, there is no way that they can guarantee the information would not be used improperly in the future. It only takes one disgruntled employee to cause problems in many people’s lives.



Figure 1 - Image of Gillette's RFID packaging³

These issues lead me to wonder whether or not there is value in this technology as it is applied to consumer products which outweigh its dangers. For one, it is practically impossible for a consumer to know if there is an RFID tag implanted in the packaging of one of their purchases. RFID tags are tiny electronic circuits, and only those trained to

find them have any real chance. I believe that there need to be strict guidelines passed that require the labeling of all RFID tagged products informing consumers of the presence of the tag.



Figure 2 - Gillette's Spy Shelf (Note the camera under the shelf)⁴

Tracking Issues

Another application of RFID technology that is becoming a hotbed of controversy is in the area tagging clothing. In this scenario, RFID tags are embedded in clothing, which allows the monitoring of inventory both in the warehouse and on the store floor. Most retailers who plan to use this technology merely wish to streamline inventory flow and control which in turn will improve turnover and help prevent product shortages or backlogs.

One of the first companies to announce the implementation of these RFID product tracking tags was Benetton, a major European clothing retailer. “The chips will help the Italian clothing manufacturer cut costs by eliminating the need for workers to take inventory by manually scanning individual items of clothing. It will also protect the

garments against theft, analysts say.”⁵ On paper this is a revolutionary idea that could easily revamp the way that retailing is accomplished. However, there are a couple of serious questions that need to be addressed before this technology can be unleashed on the masses.



Figure 3 - Benetton's RFID tags and clothing tags⁶

The first major concern with RFID tagging clothing is the personal privacy issues that arise. How many people really want to be able to be tracked when they walk around their town? How many people want personalized advertising displayed on store fronts when they walk into the store where they purchased the sweater that they are wearing? “Privacy advocates fear that consumers will be bombarded with intrusive advertising since a history of customers' purchases and their identities would be linked with the tag even after they leave the store.”⁷ Soon, everything that you see when you go shopping will be tailored directly to you, and all of the information used to communicate to you will be located in the tag of your jeans or t-shirt. While some people may find this a relief since they no longer have to slog through ads that they do not care for, I find this a

little frightening. I am not so sure that I will feel comfortable with a company knowing my buying habits and storing that information in my clothing.

Another concern about clothing—or any retail good for that matter—is the fact that the consumer must trust that the company implementing the RFID tags is doing so for the right reasons. Retailers claim that the tags will be used to help improve inventory control and theft prevention, but they could easily use the technology for much more. Many people fear that companies will begin to secretly keep tabs on customers without notifying them of the intrusion.

Richard Smith, an Internet privacy and security consultant said he is eerily reminded of a scene from the movie *Minority Report*, when Tom Cruise enters a department store and is welcomed by a billboard ad. But instead of scanning his eyeballs as was done in *Minority Report*, his Benetton shirt would be scanned to identify him.

"It's extremely intrusive," Smith said of Benetton's proposed RFID system. "The surveillance network would be initially built to sell clothes in the store but could be used for this other stuff. You don't need to build anything new for that."⁸

In our world of corporate greed and scandal, how can anyone be sure that a company is not spying on them or using information illegally or immorally? The only way that I see to regulate the use of RFID tags in retail situations is to implement stiff fines and other punishments if a company is caught using the tags improperly, and regular inspections of the systems and the data gathered by the tags. Even with these safeguards in place, there is still a high likelihood that if a company chose to secretly misuse data, they would not be caught for many years, if ever.

Government Takes

You may now be asking yourself, "If RFID technology has such great benefits, but at the same time, so many dangers, is it regulated in some way by the government?"

What is the governments' take on this technology?". Well, it seems that the government has welcomed in RFID technology with welcome arms, especially where the Department of Defense (DoD) is concerned.

The United States DoD is one of the largest, if not the largest spending entities in the country. The DoD spends hundreds of billions of dollars every year on everything from weapons and vehicles, to food and clothing. If you can think of a good, chances are the DoD buys them sometime during the year. This being the case, the DoD has tremendous sway over many of the retail and commercial markets in America, and when they want something changed, it typically changes quickly. As reported on the EPIC website:

The DoD plans to require RFID tags on all products purchased by 2005 in order to "improve [the Department's] business functions and facilitate all aspects of the DoD supply chain," according to the Department. The DoD plans to use the Electronic Product Code (EPC) technology which is under development by the Uniform Code Council. This move is predicted to hasten the deployment of RFID tags and lower the cost by increasing visibility and demand for the technology. However, while the producers of the tags expect a huge financial benefit, the cost of the implementing the technology will fall on suppliers, who will likely then transfer the cost to consumers.⁹

This means that not only will RFID tags get a deployment boost, but the looming danger of RFID misuse is quickly approaching. While the DoD and several other government entities are welcoming the coming RFID revolution, there are a few examples of governing bodies who are not as sure about the effects of RFID technology.

One such government entity is the California State Senate. In August, California's Senate Subcommittee on New Technology held a special hearing to determine whether RFID tags in consumer products violates an individual's right to privacy. The committee, like most people who are informed on the topic of RFID, fear

that the uses of RFID tracking of goods could move past simple inventory control into something more malicious. "Eventually the unique radio frequency [of an RFID tag] could be attached to a personal identity...At that time, it becomes personally identifiable information. The tracking and surveillance capabilities are very real and potentially very harmful."¹⁰ While it may seem like a state government could have little effect on the nationwide or even worldwide deployment of RFID technology, it is reassuring that some groups are truly concerned with the dangers ahead.

I think that in the coming months and years we are going to be hearing a lot more about RFID in the news, especially in regards to legislation and regulations. I am confident that California's exploration of the issues will set a good example for other states and even the national government. If I am wrong, then the events of the next few years are going to be interesting, and there will be a lot of legislation passed after the fact. I only hope that the pressing issues surrounding RFID can be brought to lawmakers attention before problems begin to get out of hand.

Protecting Privacy

To the average consumer, the trials and tribulations of RFID technology may seem like a problem for huge conglomerates and government entities. However, there are ways for the individual to help plot the course of RFID in the future. There are numerous groups and public agencies whose purpose is to help protect the rights of citizens, and some are even targeted directly at RFID and similar technologies. These groups are actively trying to inform the public and at the same time influence government involvement in the future.

One such group is Consumers Against Supermarket Privacy Invasion and Numbering (CASPIAN). This group was originally started to help fight supermarket loyalty or frequent shopper cards which many supermarket chains implement. Recently, however, they have taken up the fight against the improper use of RFID technology against consumers. CASPIAN has even written and proposed legislation to help protect consumers from RFID misuse. In the “RFID Right to Know Act of 2003”, CASPIAN calls for the government to “require that commodities containing radio frequency identification tags bear labels stating that fact, to protect consumer privacy, and for other purposes.”¹¹ The full text of the proposed legislation is available at <http://www.nocards.org/rfid/rfidbill.shtml> For the most part, this legislation calls for amendments to laws protecting food, alcohol, packaging, and numerous other consumer products. It aims to make it illegal for producers to omit labels informing consumers of tagged goods. I think that this is an excellent start, and although I do not know how far reaching this proposed legislation is, I feel confident that if it fails, there will be more robust laws to back it up. I am glad that groups exist to look out for the individual consumer.

Other means to protect yourself from RFID tag misuse are numerous. Some are simple, such as informing yourself about current event surrounding the technology and being aware of what you are buying. Others are extreme, such as carrying around “blocker tags” which confuse RFID tag readers and boycotting companies who implement RFID tags in their products or packaging. These measures seem a little too hasty, because soon, it will be almost impossible to boycott all of the RFID products. If you did, you probably would not be able to purchase any of the goods that you required

to survive. Personally, I think that the first strategy is the best. There is no reason to let RFID technology scare you. If you simply stay informed and aware of what is happening, then you should be prepared for whatever the future brings.

Conclusion

Judging by the wealth of news stories beginning to appear in the papers and on the internet, RFID is becoming a hot bed for excitement and controversy. This emerging technology promises sweeping changes in many areas of life, from business to transportation. However, it also appears that RFID has the potential to create a type of pervasive commerce, one in which business can track consumer behaviors down to which type of toothpaste or mayonnaise a person prefers. I do not feel that RFID is an evil technology, nor is it something which should be feared. My only concern is that proper measures be taken and the technology be improved so that consumer privacy is maintained. Properly implemented, RFID can strengthen this great country, but if handled incorrectly, we could be reduced to a nation ruled by paranoia and distrust. I have faith that the case will be the former.

¹ Electronic Privacy Information Center, [EPIC RFID Privacy Page](http://www.epic.org/privacy/rfid/), 12 November 2003, <<http://www.epic.org/privacy/rfid/>> (6 December 2003)

² Caroline Humer, [Radio Tags Face Technical Hurdles, Deadlines](http://story.news.yahoo.com/news?tmpl=story&cid=581&ncid=581&e=3&u=/nm/20031102/tc_nm/bizretail_tags_dc), 03 November 2003, <http://story.news.yahoo.com/news?tmpl=story&cid=581&ncid=581&e=3&u=/nm/20031102/tc_nm/bizretail_tags_dc> (03 November 2003)

³ <http://www.boycottgillette.com/spychips.html>

⁴ <http://www.boycottgillette.com/spychips.html>

⁵ Elisa Batista, [Wired News: What Your Clothes Say About You](http://www.wired.com/news/wireless/0,1382,58006,00.html), 12 March 2003, <<http://www.wired.com/news/wireless/0,1382,58006,00.html>> (7 December 2003)

⁶ <http://www.wired.com/news/wireless/0,1382,58006,00.html>

⁷ Elisa Batista, [Wired News: What Your Clothes Say About You](http://www.wired.com/news/wireless/0,1382,58006,00.html), 12 March 2003, <<http://www.wired.com/news/wireless/0,1382,58006,00.html>> (7 December 2003)

⁸ Elisa Batista, [Wired News: What Your Clothes Say About You](http://www.wired.com/news/wireless/0,1382,58006,00.html), 12 March 2003, <<http://www.wired.com/news/wireless/0,1382,58006,00.html>> (7 December 2003)

⁹ Electronic Privacy Information Center, EPIC RFID Privacy Page, 13 October 2003,
<<http://www.epic.org/privacy/rfid/>> (6 December 2003)

¹⁰ Susan Kuchinskas, California Scrutinizes RFID Privacy, 15 August 2003,
<<http://siliconvalley.internet.com/news/article.php/3064511>> (6 December 2003)

¹¹ CASPIAN, RFID Right to Know Act of 2003, Date Unknown,
<<http://www.nocards.org/rfid/rfidbill.shtml>> (7 December 2003)