

**Radiofrequency
identification technology
(RFID):
is there reason to mistrust it?**

Analytical Document

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FOREWORD

The Commission d'accès à l'information is releasing an analysis of radiofrequency identification technology (RFID), with the aim of presenting its concepts and highlighting the various issues it poses regarding protection of personal information and privacy.

The purpose of this analysis is to shed first light on this technology and favour initial reflection on its collective and individual implications.

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INTRODUCTION

RFID technology has several applications and will be increasingly present in everyday life. The foreseeable outlets of this powerful and revolutionary technology could have repercussions for everyone. Businesses have a keen interest in this technology because of its operational efficiency and reduction of the proposed costs. However, it gives rise to concern about protection of personal information and individual privacy. This document offers some points for reflection on this subject.

1. Definition of RFID Technology

Radio Frequency Identification (RFID) technology is based on the use of an electronic chip linked to a miniature antenna. This technology generally appears in a form about the size of a grain of rice or a tag.

RFID technology generally operates passively, without its own energy, awaiting activation by radio frequencies transmitted by transmitter-receivers (RFID readers) and using the energy from the radio signal received to reflect and respond to it. This passive RFID technology has a maximum range of about ten metres, while active RFID technology, which has an internal battery, has a greater range depending on the reader used.

The RFID tags currently tested will probably replace the existing bar codes¹. In fact, ever since the prices of RFID tags and readers have fallen, the economic viability of their dissemination is increasing. Their storage and their interactive communication capacity make them much more powerful than bar codes. In addition, an RFID tag provides a unique identifier for each product equipped with it, while bar codes are identical for all copies of the same product.

RFID technology operates without human intervention and is easily usable without being noticed.

2. Applications of RFID Technology

Recent studies² show that suppliers of RFID technology will spend nearly US\$800 million in 2006 and US\$1.3 billion in 2008 on hardware, software and services. These amounts will be invested in a multitude of applications, some examples of which are presented in the following sections.

¹ Le Devoir, September 8, 2003, B-7.

² Source: IDC, www.idc.com

In 2005, an initial investment of about \$1.7 million Canadian was injected into the creation of a Canadian RFID Centre to enable the industry to better understand, experiment with and try the latest RFID technology. This Centre is located in Markham (Ontario).³

The commercial field

RFID tags can be used to allow contactless payment at points of sale; for example, articles with RFID technology are read automatically at the store exit for payment and to prevent fraud⁴.

They can serve to create “smart shelves” in stores for better supply chain management and to facilitate shelf stocking.

Washable RFID tags can be incorporated into clothing (wearable computing) to prevent or detect infringement of specific trademarks and prove a product’s authenticity (<http://www.spsychips.com/press-releases/checkpoint-photos.html>).

In one Barcelona discotheque, RFID technology allows users to pay for their drinks without taking out their wallets⁵.

Wal-Mart will require its suppliers to convert to RFID technology with the aim of improving inventory control and reducing costs.

The Canadian Cattle Identification Agency (CCIA)⁶ recommends that all calves born in or after 2005 be controlled by RFID technology.

The health-care field

The pharmaceutical industry sees an advantage in adopting this technology, particularly for management of returns, contraindications, and product diversion and counterfeiting. For example, the US Food and Drug Administration (FDA) has launched a program to fight drug counterfeiting based on the use of RFID technology in packaging.

On October 13, 2004, the Applied Digital company announced that the FDA had approved a surgical implant (VeriChip RFID device) for certain medical applications (<http://www.rfidconcerns.com>).

³ <http://www.canadianrfidcentre.ca>

⁴ Des étiquettes trop bavardes?, section technologie, revue Protégez-vous, October 2004.

⁵ Le Soleil, July 20, 2004, B-1, B-2.

⁶ The Canadian Cattle Identification Agency, www.canadaid.com

The Bearing Point company also presents an application in the health-care field (http://www.bearingpoint.com/portal/site/bearingpoint/menuitem.7e4bc0defa952a30357b6910826106a0/channel/published/executive%20insights/generic/PS_foglifter_3045abc).

The transportation field

Travel documents, such as passports and visas, could be RFID equipped. The U.S. Government is seeking the introduction of the “e-passport”, which will use RFID technology (<http://www.aclu.org/passports>).

The Virginia State Legislature is planning to adopt a resolution to integrate an RFID chip into driver’s licenses (<http://www.aclu.org/Privacy/Privacy.cfm?ID=16658&c=39>).

In the aviation sector, the two giants Boeing and Airbus are aiming to adopt RFID technology (<http://www.rfidjournal.com>).

The Intermec company presents the NEXUS solution for control of vehicles at the Canada-U.S. border (http://www.intermec.com/eprise/main/Intermec/content/Products/Products_ListFamily?Category=RFID).

3. *Fears Raised by RFID Technology*

RFID technology is not new. For example, it is currently used in security cards allowing access to certain buildings. However, its deployment in a great many applications unbeknownst to the public raises apprehensions, especially since the rapid evolution of nanotechnology promises generalization of microchips invisible to the naked eye. Although the chips generally contain information on a product (format, colour, manufacturing date, etc.) rather than on an individual, there are still potential risks of impairment of individual rights. This is because individuals have no control over RFID technology, particularly regarding the following points:

- The presence of RFID technology in products is not identified;
- No standard or policy exists concerning the use of RFID technology;
- Remote data capture is automatic, without warning or confirmation. There is no possibility of stopping communication or providing consent to use;
- It is impossible to detect whether an RFID tag remains active after purchase. Thus, it potentially can be read (traced) without its user’s knowledge, by other individuals or bodies, at the risk of infringing the bearer’s privacy.

RFID technology provides an operational improvement for businesses (e.g., inventory control, anti-theft control, reduction of operating costs). However, the characteristics of this technology allow deployment that may have numerous implications for privacy, particularly when the data contained in a chip can be associated with nominative information. For example, a store can use an RFID tag with a unique number (EPC code) for a product and link this number to the buyer's name when payment is made by credit card. This information can be stored to establish consumer habits and brand preferences, on the same basis as the loyalty cards that currently exist. This use of RFID chips is comparable to the use of cookies when surfing the Internet and thus could have similar impacts.

It is also appropriate to consider whether the incorporation of RFID chips containing personal information into the driver's permit or passport could increase the risks of identity theft.

4. Reactions of the Personal Information and Privacy Protection Bodies

The introduction of the new RFID technology has generated reactions from several personal information and privacy protection bodies around the world. Appended are references to a number of bodies, which have stated their position on this issue, along with their Internet addresses. Here, for example, are the assessments by certain bodies, whose reactions range from mobilization to taking a position, particularly by adopting resolutions:

- In the United States, Consumers Against Supermarket Privacy Invasion and Numbering (CASPIAN) denounces the development of chips introduced into products, which can be used to trace individuals;
- In France, the Commission nationale de l'informatique et des libertés (CNIL) considers that RFID technology is becoming a major economic issue, particularly in applications related to distribution and transportation. Because of their massive dissemination, the individual nature of the identifiers of each marked object, their invisibility and the risks of individual profiling, the CNIL considers RFID tags to be personal identifiers within the meaning of the *Information Technology and Freedoms Act*;
- At the International Conference of Data Protection and Privacy Commissioners, held in Sydney in September 2003, RFID technology was the subject of a resolution concerning the necessity to account for data protection principles when RFID technology is linked to personal information. All the fundamental principles of data protection and privacy legislation must be observed in the design, implementation and use of RFID technology, particularly concerning the evaluation of alternatives, the exercise of clear and transparent collection, compliance with purposes, retention and destruction of data and media.

5. Impact of RFID Technology Regarding the Principles of Personal Information Protection

A study of the various reactions of personal information and privacy protection bodies and an analysis of how RFID technology works in relation to the principles of personal information protection reveal certain findings or concerns that merit special attention. To the extent that a private enterprise or a public body collects, holds or uses personal information associated with an RFID technology, or communicates it to third persons, the following considerations or questions should be examined:

Responsibility for personal information

Must the users of RFID technology publish their policy, standards and practices concerning the implementation of this technology and the systems supporting them, as well as the existence of a database, if applicable?

Must a person in charge of protection of personal information be designated, if applicable?

Must this responsibility be taken into account starting from the design phase of a system using RFID technology?

Purpose

When personal information is concerned, must the users of RFID technology indicate the purpose for which this knowledge is used (e.g., for inventory control)?

Must the explanations be recorded in pamphlets, posters or other materials and accessible to individuals?

Moreover, if applicable, must the reasons why the users of the RFID technology intend to collect and use personal information be explicit?

Limit on collection

Is the personal information collected necessary to the enterprise or the public body and is it collected from the person concerned?

Can the service offered with the assistance of the RFID technology be performed without collecting personal information?

Does the individual have an option or options to refuse the RFID technology without being penalized?

Informing the public

The public has the right to know what products are identified with RFID technology and the technical specifications used. It would be appropriate to provide a clear, precise and easily understandable indication of the products identified with RFID technology, in non-technical and vulgarized language. In addition, the complaints process must be indicated clearly.

Limiting access to personal information

If personal information is collected, what means are used to limit access only to authorized persons?

Communication

If personal information is communicated to third persons, what means is used to obtain the individual's consent in advance?

Quality

What mechanisms are put in place so that personal information is maintained up to date, accurate and complete, so that it only serves the purposes for which it was collected?

Security

Security raises several questions, particularly:

What physical, technological and administrative security measures must be put in place to protect personal information?

How is the integrity of the information protected?

Can the information be read by any RFID reader?

Is encryption of the information required?

Right of access and rectification

What mechanism for consultation and correction of information must be applied to allow each individual concerned to exercise his rights?

Retention and destruction

It is necessary to create a database when implementing RFID technology?

If this is the case, must the personal information retention period be established and must personal information be destroyed irreversibly when the object for which it has been collected is accomplished?

From the time that the RFID tags are in the possession of individuals, the technology should allow the establishment of mechanisms for permanent deactivation or destruction of these RFID tags at no charge.

CONCLUSION

The introduction of this new technology raises several reactions by organizations defending human rights and freedoms. Strictly from the personal information protection perspective, this technology raises questions for which there is currently no complete answer. Consequently, this situation should induce the individuals concerned to be vigilant regarding new risks for the protection of their personal information and privacy.

The Commission d'accès à l'information is watchfully monitoring the introduction of this technology, on the basis of the *Act respecting access to documents held by public bodies and the protection of personal information* and the *Act respecting the protection of personal information in the private sector*. This document offers some points for reflection and eventually could lead to the establishment of standards or rules of use.

APPENDIX

Bodies which have stated their position on RFID

- Conférence internationale des commissaires à la protection des données et à la vie privée (Sydney, septembre 2003)
<http://www.privacyconference2003.org/commissioners.asp>
- La Commission nationale de l'informatique et des libertés (CNIL), en France
<http://www.cnil.fr/index.php?id=1063>
- Le Bureau du commissaire à l'information et à la protection de la vie privée de l'Ontario. Document d'analyse sur la technologie RFID : *Tag, you're it : Privacy implication of radio frequency identification (RFID) technology*, Ann Cavoukian, Ph. D., Commissioner, February 2004
http://www.ipc.on.ca/scripts/index.asp?action=31&P_ID=15007&N_ID=1&PT_ID=11351&U_ID=0
Guidelines for Using RFID Tags in Ontario Public Libraries” (June 2004),
<http://www.ipc.on.ca/docs/rfid-lib.pdf>
- Commissaire à l'information et à la protection de la vie privée de l'Alberta
News Release: *Commissioner urges businesses to consider privacy obligations before implementing RFID technology* (5 April 2004),
http://www.oipc.ab.ca/ims/client/upload/RFID_NewsRelease_Mar2004.pdf
- L'Association CASPIAN (Consumer Against Supermarket Privacy Invasion and Numbering)
<http://www.spsychips.com> et <http://www.nocards.org/rfid/rfidbill.shtml>
- L'Association EPIC (Electronic Privacy Information Center)
<http://www.epic.org/privacy/rfid>
- Consumer Privacy and Civil Liberties Organisations
<http://www.privacyrights.org/ar/RFIDposition.htm>
- L'American Civil Liberties Union
<http://www.aclu.org/privacy/spying/15306res20050404.html>

- Commission Européenne, Groupe article 29 sur la protection des données Directive 95\46\EC, document de travail sur la protection des données concernant la technologie RFID, 19 janvier 2005, WP 105.
http://europa.eu.int/comm/justice_home/fsj/privacy/docs/wpdocs/2005/wp105_fr.pdf
 - Commissariat à la protection de la vie privée du Canada.
Teresa Scassa, Theodore Chiasson, Michael Deturbide & Anne Uteck, “An Analysis of Legal and Technological Privacy Implications of Radio Frequency Identification Technologies - A Report to the Office of the Privacy Commissioner of Canada, under the 2004-05 Contributions Program” (28 April 2005), [http://www.library.dal.ca/law/Guides/FacultyPubs/Scassa/RFIDs_Report2\(Single\).pdf](http://www.library.dal.ca/law/Guides/FacultyPubs/Scassa/RFIDs_Report2(Single).pdf)
- Colin Bennett & Lori Crowe, “Location-based Services and the Surveillance of Mobility: An Analysis of Privacy Risks in Canada - A Report to the Office of the Privacy Commissioner of Canada, under the 2004-05 Contributions Program” (June 2005), <http://web.uvic.ca/polisci/bennett/pdf/lbsfinal.pdf>