Go Beyond Security to Embedding Privacy by Design: *Positive-Sum, Not Zero-Sum*

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November 25, 2008

Presentation Outline

1. *The Privacy Landscape: Privacy "101"*
2. *"Privacy by Design"*
3. *Positive-Sum, NOT Zero-Sum*
4. *The Next Wave: PETs Plus or Transformative Technologies*
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The Privacy Landscape: Privacy "101"

Privacy = Freedom

What Privacy is Not

Privacy ≠ Security

Security *is*, however, vital to privacy

Privacy and Security:
The Difference

- Authentication
- Data Integrity
- Confidentiality
- Non-repudiation

Security:

Organizational control of information through information systems

- Privacy; Data Protection
- Fair Information Practices
- “Use” of Personally Identifiable Information (PII)

Information Privacy Defined

Information Privacy: Data Protection

- Freedom of choice; personal control; informational self-determination;
- Control over the collection, use and disclosure of any recorded information about an identifiable individual;
- Privacy principles embodied in "Fair Information Practices."

Fair Information Practices:
A Brief History

- OECD Guidelines on the Protection of Privacy and Transborder Flows of Personal Data (1980);
- European Union Directive on Data Protection (1995/1998);
- CSA Model Code for the Protection of Personal Information (1996);
- United States Safe Harbor Agreement (2000);
- Global Privacy Standard (2006).
  www.ipc.on.ca/images/Resources/up-gps.pdf

Global Privacy Standard

- In 2005, at the 27th International Data Protection Commissioners Conference in Montreux, Switzerland, I chaired a Working Group of Commissioners convened for the sole purpose of creating a single Global Privacy Standard (GPS);
- Globalization and converging business practices created a need to harmonize various sets of fair information practices so that businesses and technology companies could turn to a single instrument for evaluating whether their practices or systems were actually enhancing privacy;
- The GPS builds upon the strengths of existing codes containing time-honoured privacy principles and reflects an enhancement by explicitly recognizing the concept of “data minimization” under the “collection limitation” principle;
- The final version of the GPS was formally tabled and accepted in the United Kingdom, on November 3, 2006, at the 28th International Data Protection Commissioners Conference.

www.ipc.on.ca/images/Resources/up-gps.pdf

"Privacy by Design"

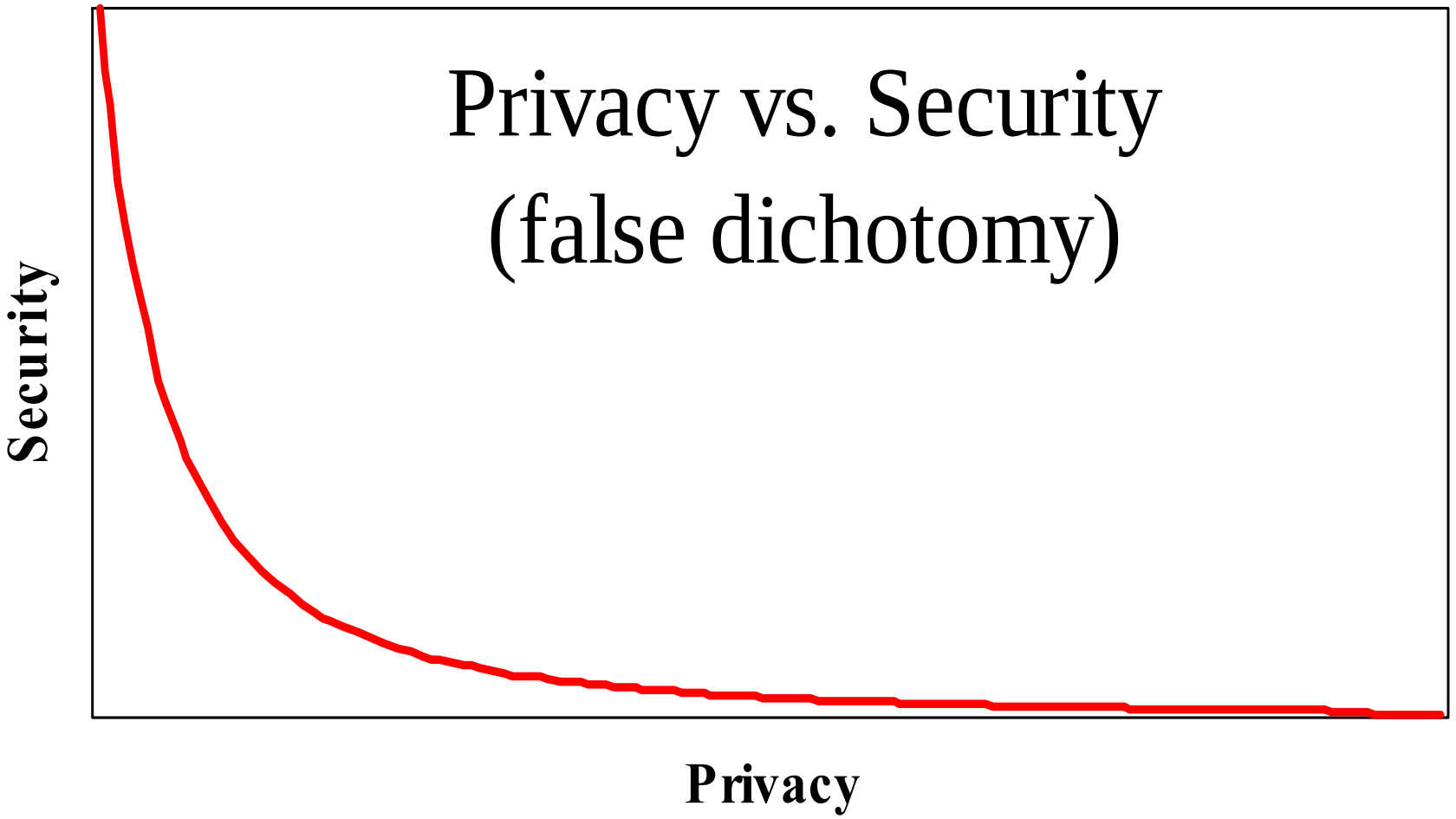
Privacy by Design: "Build It In"

- I first developed the term "Privacy by Design" in the 1990's, as a response to the growing threats to online privacy that were beginning to emerge;
- "Privacy by Design" seeks to build in privacy – up front, into the design specifications; into the architecture; embed privacy right into the technology used – ***bake it in***;
- Assess the risks to privacy: conduct a privacy impact assessment; follow up with annual privacy audits;
- Data minimization is key: minimize the routine collection and use of personally identifiable information – use encrypted or coded information whenever possible;
- Use privacy-enhancing technologies (PETs) where possible: give people maximum control over their own data.

The Future of Privacy:

Positive-Sum
NOT
Zero-Sum

Privacy OR Security:
A Zero-Sum Game



Change Your Perception of Privacy and Technology

I want you to think differently …

Change the Paradigm!

Think
"Positive-Sum"
Not Zero-Sum

Positive-Sum Paradigm

- A **Zero-Sum Paradigm** describes a concept or situation in which one party's gains are balanced by another party's losses – win/lose; either/or; enhancing security comes at the expense of privacy – the more you have of one, the less you can have of the other;
- A **Positive-Sum Paradigm** describes a situation in which *all* participants may gain together (win-win);
- To achieve a positive-sum model, privacy must be proactively built into the system, so that privacy protections are engineered directly into the technology, right from the outset;
- The effect is to minimize the unnecessary collection and use of personal data by the system, while at the same time, strengthening data security, and empowering individuals to exercise greater control;
- This can result in technologies that achieve strong security *and* privacy, delivering a "win-win" outcome.

Positive-Sum Model

Change the paradigm
from a zero-sum to
a positive-sum model:
Create a "win-win" scenario,
not an "either/or"
involving unnecessary
trade-offs

The Next Wave:
"Transformative Technologies"
(PETs Plus)

Background: Privacy-Enhancing Technologies *(PETs)*

- The IPC coined the concept and methodology recognized around the world today as *privacy-enhancing technologies* (PETs);
- In 1995, the IPC and the Dutch Data Protection Authority published the landmark study, *Privacy-Enhancing Technologies: The Path to Anonymity (Vols. I & II).*

  Vol. I - www.ipc.on.ca/index.asp?layid=86&fid1=329

  Vol. II - www.ipc.on.ca/images/Resources/anoni-v2.pdf

Privacy-Enhancing Technologies *(PETs)*

- Privacy Enhancing Technologies enlist the support of technology to **protect** privacy. They include those that empower individuals to manage their own identities and personally-identifiable information (PII) in a privacy enhancing manner – encryption plays a key role.
- These include tools or systems to:
  - anonymize and pseudonymize identities;
  - securely manage login ids and passwords and other authentication requirements;
  - restrict traceability and limit surveillance;
  - allow users to selectively disclose their PII to others and exert maximum control over their PII once disclosed.

Time For A Change…

… from PETs to PETs Plus,

or

Transformative Technologies

Transformative Technologies

Surveillance Technology + Positive-Sum Paradigm + Privacy-Enhancing Technology =

<u>Transformative Technologies</u>

Common characteristics of Transformative Technologies:

- Help minimize unnecessary disclosure, collection, retention and use of personal data;
- Empower individuals to participate in the management of their personal data;
- Enhance the security of personal data, if collected/used;
- Promote public confidence and trust in (personal) data governance structures;
- Help promote and facilitate widespread adoption of those technologies.

Biometric Encryption

IPC and Biometrics

- The IPC has been a longstanding proponent of biometric encryption technologies;
- We continue to press for strong privacy protections in the development and deployment of interoperable biometric technologies;
- Active member of the European Biometrics Forum International Biometrics Advisory Council (IBAC).

www.eubiometricforum.com/index.php?option=content&task=view&id=457

European Biometrics Forum

- The European Biometrics Forum (EBF) was launched in 2003; Member of International Biometrics Advisory Council (IBAC);
- Composed of leading biometrics and technology experts, the EBF was established to develop world-class standards, best practices and innovation in the biometrics industry to strengthen trust and confidence in the use of emerging biometric applications;
- The EBF is supported by a network of national biometric organizations, companies, universities and experts across Europe in carrying out research for the development of a roadmap for the European Biometrics industry to 2010.

www.eubiometricforum.com

Biometric Encryption (BE)*

What is Biometric Encryption?

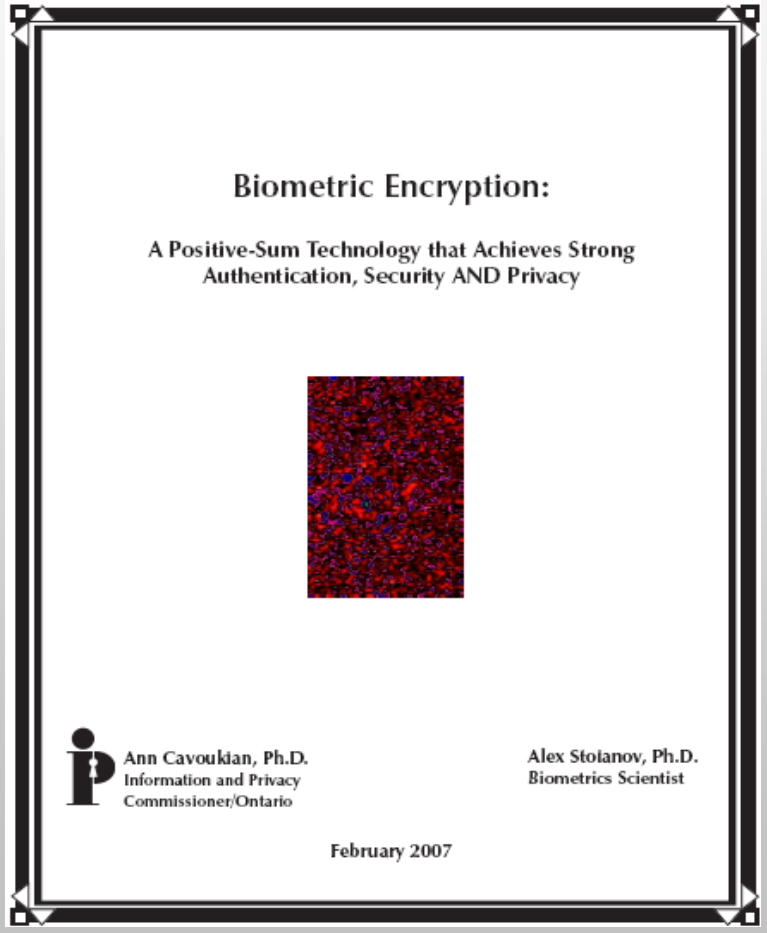
- Class of emerging “untraceable biometric” technologies that seek to transform the biometric data provided by the user;
- Special properties:
  - uniqueness
  - irreversibility

* Pioneering development by George Tomko, Ph.D. Founder of Mytec Technologies,1994.

Biometric Encryption:

A Positive-Sum Technology that Achieves Strong Authentication, Security AND Privacy

- Privacy-enhanced uses of biometrics, with a particular focus on the privacy and security advantages of BE over other uses of biometrics;
- How BE technology can help to overcome the prevailing "zero-sum" mentality by effectively transforming one's biometric to a private key.



www.ipc.on.ca/images/Resources/up-1bio_encryp.pdf

Advantages of Biometric Encryption

BE Embodies core privacy practices:

1. Data minimization: no retention of biometric images or templates, minimizing potential for unauthorized secondary uses, loss, or misuse;

2. Maximum individual control: Individuals may restrict the use of their biometric data to the purpose intended, thereby avoiding the possibility of secondary uses (function creep);

3. Improved security: authentication, communication and data security are all enhanced.

Current BE Projects

- **The Philips privID™ (Netherlands) –** is currently one of the most advanced BE technologies in operation; unlike some BE systems, the privID™ system is very fast which allows for a true one-to-many mode; it is also very secure, making it extremely difficult to crack;
- **PerSay (Israel) –** has successfully combined their own voice authentication technology with Philips' BE technology making voice biometric encryption a reality. A major telecommunications company is now exploring the possibility of deploying a voluntary voice identity verification service for its customers using this new technology;

Current BE Projects (Cont'd)

- **University of Toronto –** Professor Kostas Plataniotis and Karl Martin have developed a privacy-enhancing approach to video surveillance cameras using cryptographic techniques to secure a private object (face/image), so that it may only be viewed by designated persons, by unlocking the encrypted object with a secret key. The Toronto Transit Commission is now exploring the possibility of using this technology for their video surveillance system;
- **Ontario Lottery and Gaming Corporation** (OLG) is exploring the use of facial biometrics to assist gamblers who voluntarily choose, under the self-exclusion program, to provide photos of themselves so that they may be denied entry into casinos, at their own request, due to their gambling addictions.

Radical Pragmatism

Radical Pragmatism

Radical

Radical

(/raedikel/ adj, & n.) — adj.

2) **far-reaching … thorough.**

— Concise Oxford Dictionary, Eighth Edition, 1990.

Radical Privacy Pragmatism

Radical = far-reaching … thorough;

Pragmatism ≠ status quo;

Radical Pragmatism (in the area of privacy)
is the embodiment of a positive-sum paradigm,
involving a practical approach,
invoking the need for
Transformative Technologies;

Talk – Action = Zero

Conclusions

- We need to change the paradigm from a zero-sum game to a positive-sum model, where both privacy *and* security are built directly into various technologies;
- The use of privacy-enhancing biometrics such as Biometric Encryption will ensure that privacy is protected, while at the same time, delivering strong security – a true win/win scenario – positive-sum, all the way;
- "Radical pragmatism" reflects an effort to embed privacy protective measures, such as privacy by design, into existing technologies and business practices, in a positive-sum manner;
- Change the paradigm and you think differently: Make it privacy AND security, not the mutually exclusive "either/or."

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