Change the Paradigm:
Transformative Technologies for Privacy

Ann Cavoukian, Ph.D.
Information and Privacy Commissioner
Ontario, Canada

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Privacy = Freedom

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."

Global Privacy Standard

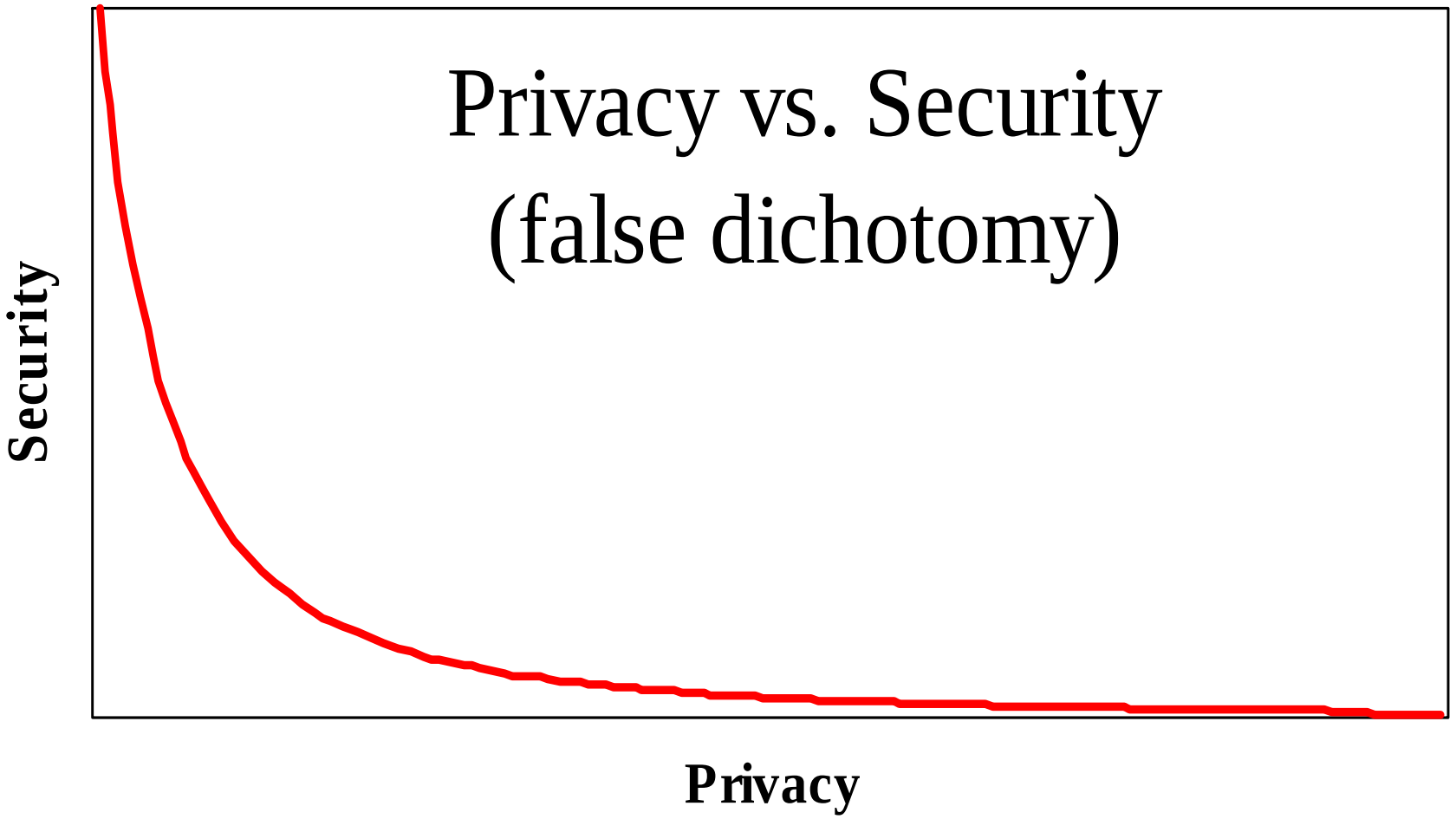
- In 2005, at the 27th International Data Protection Commissioners Conference in Montreux, Switzerland, I chaired a Working Group of Commissioners convened for the sole purpose of creating a single Global Privacy Standard (GPS);
- Globalization and converging business practices created a need to harmonize 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

If Privacy is to Survive, Things Have to Change

Positive-Sum
NOT
Zero-Sum

Privacy OR Security:
A Zero-Sum Game



We Need to

Change

The Paradigm

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 often comes at the expense of privacy – the more you have of one, the less you have of the other;
- A **Positive-Sum Paradigm**, in contrast, 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 a minimization of 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

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.

Privacy-Enhancing Technologies *(PETs)*

- The IPC developed 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).***

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

From PETs to Trans Tech

The Next Wave: Transformative Technologies

Transformative Technologies *(PETs Plus)*

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

<u>Transformative Technology</u>

Common characteristics of Transformative Technologies:

- Minimize the unnecessary collection, disclosure, use and retention of personal data;
- Empower individuals to participate in the management of their own personal data;
- Enhance the security of personal data, if collected/used;
- Promote public confidence and trust in personal data governance structures;
- Promote/facilitate the commercialization and adoption of these technologies.

Biometrics Transformed: 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

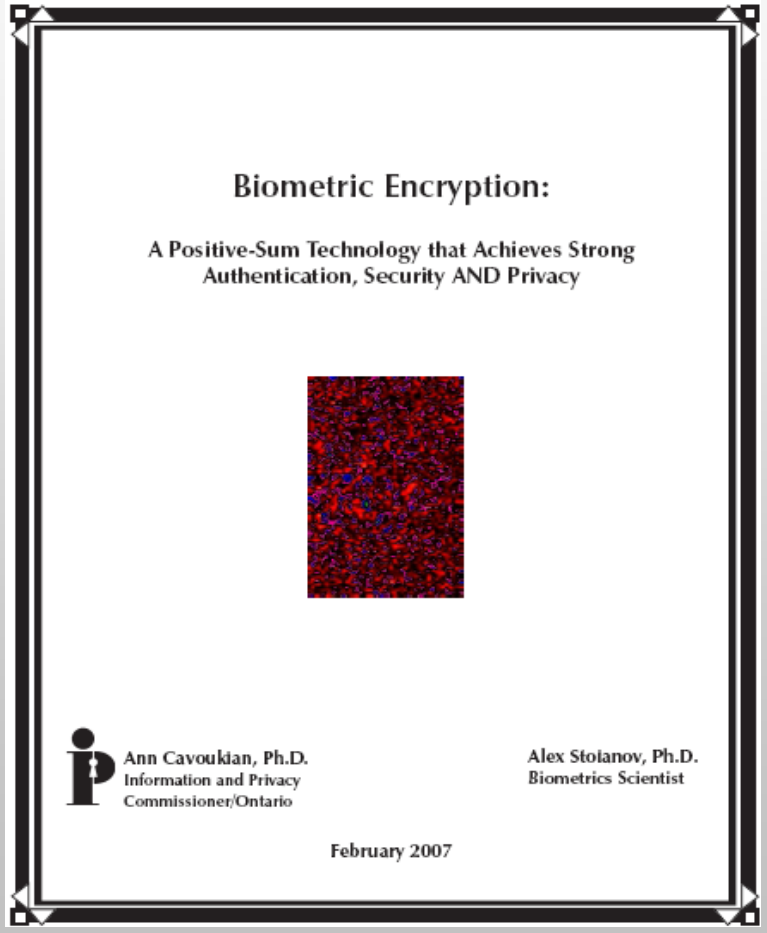
- The European Biometrics Forum (EBF) was launched in 2003; Member of International Biometrics Advisory Council (IBAC);
- Composed of leading biometrics and technology experts, the EBF was established to develop world-class standards, best practices and innovation in the biometrics industry to strengthen 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:

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

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.

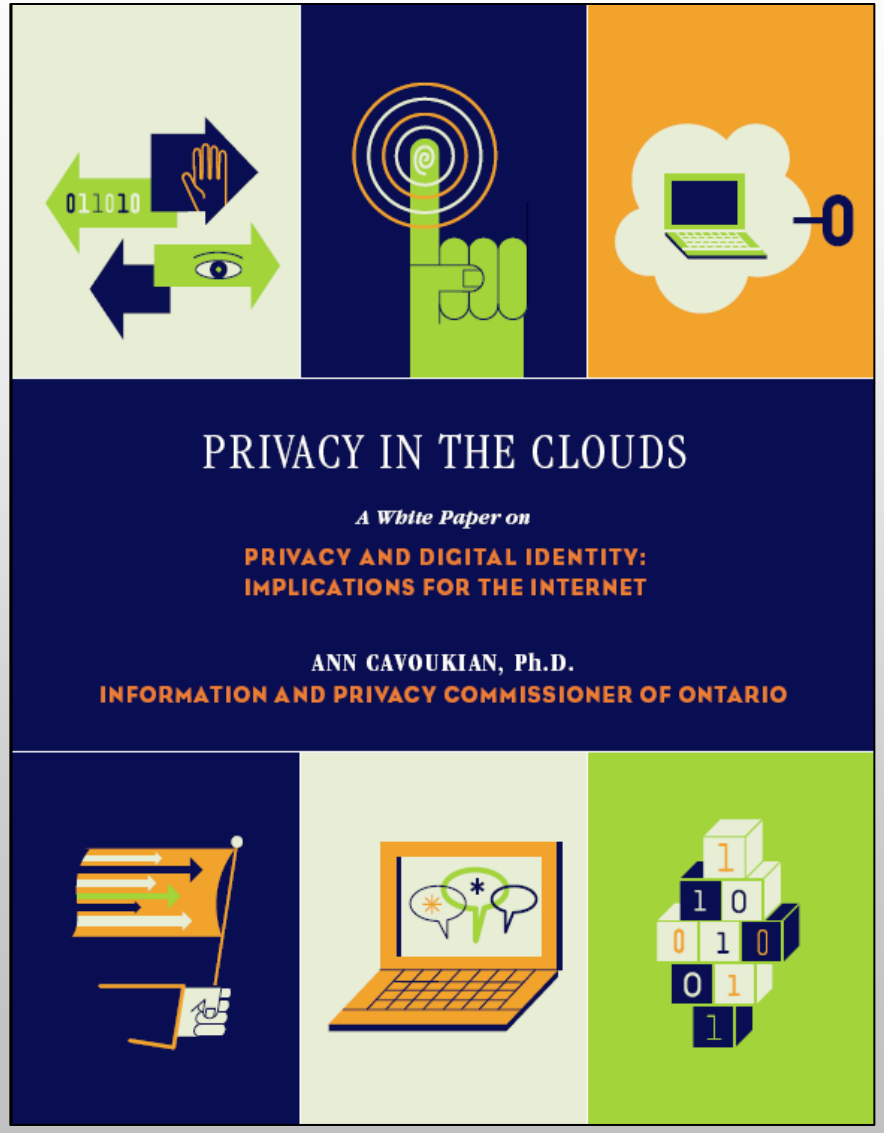
Biometric Encryption

- Biometric encryption is a process that securely binds a PIN or a cryptographic key with a biometric, so that neither the key nor the biometric can be retrieved. The key is recreated only if the correct live biometric sample (a finger or iris) is presented on verification;
- In biometric encryption, you can use the biometric to encrypt a PIN or a password for numerous applications, such as access to computers or bank machines. The PIN can be 100s of digits in length since you don't need to remember it;
- Most important, the only item that has to be stored in a database is the biometrically encrypted PIN or password, not the biometric template, so privacy is preserved.

Privacy in the Clouds

Clouds Building Blocks:

1. Open source and proprietary identity software based on open standards;
2. Federated identity;
3. Multiple and partial identities;
4. Data-centred policies;
5. Audit tools;



www.ipc.on.ca/images/Resources%5Cprivacyintheclouds.pdf

Conclusions

- We need to change the paradigm away from a zero-sum game to a positive-sum model where both privacy and security are built directly into 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 practices, in a positive-sum paradigm;
- Work with us to change the paradigm and think differently: We need both privacy AND security, not "either/or."

How to Contact Us

Ann Cavoukian, Ph.D.
Information & Privacy Commissioner of Ontario
2 Bloor Street East, Suite 1400
Toronto, Ontario, Canada
M4W 1A8

Phone: (416) 326-3948 / 1-800-387-0073
Web: www.ipc.on.ca
E-mail: info@ipc.on.ca