CYBERLAWS 2010 Panel

Society Trends: Challenges of Privacy and Anonymity in the Information Society

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Trust and Privacy

What are the metrics of Trust for computer systems? (eg web services)
What are the metrics of Privacy for computer systems? (eg web services)
Does the cloud paradigm change anything?
What is privacy
Common conceptions?
Personal information
Specific concerns
Privacy at common law
Overseas initiatives
DPA 1984
Canada
What is privacy

- It is no more than a name for an attitude towards a set of abuses, very weakly, if at all, associated with each other
- ‘the right to be let alone’
- The claim of individuals, groups, or institutions to determine for themselves when, how, and to what extent information about them is communicated to others
Common conceptions?

- Intrusions on PP are now greater than ever, and increasing.
- Modern technology at least part to blame.
- Much info inaccurate, unchecked, but users regard as irrefutable.
- Anyone can get at it, whether access open or clandestine.
- Legal remedies left behind by the speed of technological change as to be useless.
Personal information

- NZ PA PI “means information about an identifiable individual; ...”
- Oz “information or an opinion (including [that] forming part of a database), whether true or not, and whether recorded in a material form or not, about an individual whose identity is apparent, or can reasonably be ascertained, from the information or opinion”
- Canada PI “means information about an identifiable individual, but does not include the name, title or business address or phone number of an employee”
Specific concerns

- Collection of information
- Linking and profiling
- Disclosure of information
- Increased storage capacity
- Unauthorised access
Privacy at common law?

- Victoria Park Racing and Recreation Grounds Co Lt v Taylor (1937) 58 CLR 479
- Tolley v J.S. Fry & Sons [1931] AC 333
- Malone v Commissioner of Police of the Metropolis (No. 2) [1979] Ch 344(UK)

Also see
- Kaye v Robertson (1991) (UK)
- Stephens v Avery (UK)
...and some more

- Tucker v News Media Ownership Ltd [1986]
- Morgan v TVNZ (High Court, Christchurch)
- Bradley v Wingnut Films Ltd (1992)
<table>
<thead>
<tr>
<th>Country</th>
<th>Title of legislation</th>
<th>Year</th>
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</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>Danish Private Registers Act also Data Protection Act</td>
<td>1978</td>
</tr>
<tr>
<td>Austria</td>
<td>Data Protection Act</td>
<td>1978</td>
</tr>
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<td>France</td>
<td>Data Processing, Data Files &amp; Personal Data Protection</td>
<td>1984</td>
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<td>Norway</td>
<td>Personal Data Registers Act</td>
<td>1987</td>
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<td>UK</td>
<td>Data Protection Act</td>
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<td>Finland</td>
<td>Personal Data File Act</td>
<td>1993</td>
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<td>Sweden</td>
<td>The Data Act</td>
<td>1993</td>
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<td>Belgium</td>
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<td>1993</td>
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<td>NZ</td>
<td>PA</td>
<td>1984</td>
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<tr>
<td>US</td>
<td>Privacy Act</td>
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</table>
Features of UK DPA 1984

- Exemptions for
  - national security
  - operations solely for the preparation of text document
  - public obligation to publish
  - domestic processing
  - unincorporated clubs (with conditions)
  - certain mailing lists
  - payroll/accounts

- Must comply with eight principles
Canada

❖ PIPEDA, an act that is designed to establish a right to the protection of personal information in certain circumstances, and billed as an act to “promote electronic commerce”.

CYBERLAWS
2010
Instruments of change

Chips
Watching
Profiling
TGI's
Email
Cryptography
Networks / Clouds / …
Trust

Images redacted
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Tonsberg, Norway
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End of privacy?

- Use of technology to invade privacy.
- Security cameras
- Gossip-Girl (mobile gossip site with push technology)
- Google object recognition
- => Face recognition
- Reasonable expectation of privacy
Privacy and Social Media

• Self produced content
  • ..is your own problem!
  • ..but..
• Content produced by others
  • ..is another problem
• What is the future of reputation, is our attitude changing..
• Is reputation becoming less important..
Privacy and Social Media

- Employers using social media
  - As part of hiring process
  - As monitoring

- Response from young person: If they won’t hire me because of my FB profile, then it’s OK. I wouldn’t work for such company anyway.

- Reputation overrated, tolerance required
Privacy and Social Media

• Recent newspaper report of insurance company using Facebook to assess ability to work..

• Need regulation to protect individuals..
Expert Panel

Digital Society Trends:
Challenges of Privacy and Anonymity in the Information Society.


The International Conference on Legal Aspects of the e-Society (CYBERLAWS 2010).

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² Westfälische Wilhelms-Universität Münster (WWU), Münster, Germany
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Apply Privacy and Anonymity to Information and Computing Systems

**Individual: Control flow and storage**

**Privacy:** Privacy is the ability and possibility of an individual / person / subject to control the flow and storage of (all) individual-related data/information regarding this individual / person / subject.

**Superior: Securing the individual's interests**

**Anonymity:** Anonymity is achieved by using and warranting anonymisation. Using the term anonymisation we understand the modification of individual- or subject-related data in such a way as drawing conclusions from those data on a definite or allocable individual or subject are and will be impossible (for any lobby).

**Target Systems and Purpose**

- **Future Information Systems (FIS):** Provide various special, interdisciplinary, integrated, and interlinked information and High End Computing resources for societal purposes (economy, science, education).
- **Future Computing Systems (FCS):** Get rid of the limitations of current computing architectures and systems for delivering compute power.
### Challenges

**Incompatibility and Oppositeness**

<table>
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<tr>
<th>Disciplines</th>
<th>Problems</th>
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<tr>
<td>Information system application</td>
<td>reduce obstacles</td>
</tr>
<tr>
<td>Computing</td>
<td>overcome limitations</td>
</tr>
<tr>
<td>Technology</td>
<td>integrate and differentiate</td>
</tr>
<tr>
<td>Usability/ergonomics</td>
<td>security and usability</td>
</tr>
<tr>
<td>User/interests</td>
<td>enable use and protect against misuse</td>
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<tr>
<td>QoS</td>
<td>service and costs</td>
</tr>
<tr>
<td>Law/legal regulations</td>
<td>integration and modularisation</td>
</tr>
<tr>
<td>Ethics</td>
<td>extend applicat. and restrict use</td>
</tr>
<tr>
<td>Implementation</td>
<td>protection and transparency</td>
</tr>
<tr>
<td>Society</td>
<td>acquire sense on trustworthiness</td>
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### Importance and Politics

#### Dimensions

<table>
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<tr>
<th>Category</th>
<th>Dimension</th>
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<tbody>
<tr>
<td>Scope</td>
<td>All of us</td>
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<tr>
<td>Political</td>
<td>Responsibility</td>
</tr>
<tr>
<td>Scientific &amp; technological</td>
<td>Maximum complexity</td>
</tr>
<tr>
<td>Legal aspects &amp; laws</td>
<td>Regulatory</td>
</tr>
<tr>
<td>Social &amp; cultural</td>
<td>Key issues</td>
</tr>
<tr>
<td>Economical</td>
<td>Market readiness</td>
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*Art is I,*  
*Science is We,*  
*Engineering is They,*  
*and it must be remembered that computer system design is all three.*

– **David J. Kuck, High Performance Computing**
Requirements for integrated and interlinked systems . . .

- enable customers, industry, and services providers to make use of distributed High End Computing (HEC) resources, even for strategic tasks,
- interdisciplinary components,
- need for a governmental-academia-industry forum,
- increase attractiveness for industry,
- lower the hurdles for international cooperations,
- financing necessary for holistic, transparent initial projects,
- suitable system integration projects,
- standardised components support,
- maximum user transparency,
- complementary means, never means one hundred percent can be reached.
Present and Future Goals

What is the essence of protecting information?

<table>
<thead>
<tr>
<th>Present</th>
<th>Future</th>
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</thead>
<tbody>
<tr>
<td>Support trust! Protect data and information!</td>
<td></td>
</tr>
<tr>
<td>Minimise threats and misuse!</td>
<td></td>
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<tr>
<td>Separate security from management &amp; administration!</td>
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<tr>
<td>Communicate: Any process needs communication!</td>
<td></td>
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<tr>
<td>Create modular technical-legal frameworks!</td>
<td></td>
</tr>
<tr>
<td>GMES/GEOSS/SEIS, GSDI/INSPIRE/GDI-DE, FDA/HIPAA, PSI/ EPSI.</td>
<td></td>
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<tr>
<td>Collaboration frameworks reducing complexity!</td>
<td></td>
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<tr>
<td>Grid-GIS house.</td>
<td></td>
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<tr>
<td>Economic integration, accounting, billing!</td>
<td></td>
</tr>
<tr>
<td>Modular distributed systems like SGAS.</td>
<td></td>
</tr>
</tbody>
</table>
### Target System Examples

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Privacy</th>
<th>Anonymity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geoscientific Information Systems</td>
<td>individual, society, intellectual</td>
<td>Individual, society</td>
</tr>
<tr>
<td>Archaeology Information Systems</td>
<td>societal</td>
<td>Society</td>
</tr>
<tr>
<td>Medical Data Information Systems</td>
<td>individual, societal</td>
<td>Individual, society</td>
</tr>
<tr>
<td>Flight and Transport Systems</td>
<td>individual, societal</td>
<td>Individual, society</td>
</tr>
<tr>
<td>Banking, Accounting, Billing Systems</td>
<td>individual, societal</td>
<td>Individual, society</td>
</tr>
<tr>
<td>Exploration IS (energy, oil&amp;gas)</td>
<td>societal</td>
<td>Society</td>
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<tr>
<td>Environmental IS (pollution)</td>
<td>individual, societal</td>
<td>Individual, society</td>
</tr>
<tr>
<td>Computing shared/distributed</td>
<td>societal, intellectual</td>
<td>Individual, society</td>
</tr>
<tr>
<td>Navigation Systems</td>
<td>individual</td>
<td>Individual</td>
</tr>
<tr>
<td>Recherche Systems, Search Engines</td>
<td>individual, societal</td>
<td>Individual</td>
</tr>
<tr>
<td>Georeferencing</td>
<td>individual, societal</td>
<td>Individual</td>
</tr>
<tr>
<td>Automation</td>
<td>individual, societal</td>
<td>Individual</td>
</tr>
<tr>
<td>Integration</td>
<td>individual, societal</td>
<td>Individual</td>
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</table>
Subject/object privacy: Protection of archaeological sites.
Example: Archaeology Information Systems and Tourism

Subject/object privacy: Protection of archaeological sites.
Target System Examples

Example: Archaeology Information Systems and Tourism

Subject/object privacy: Protection of archaeological sites.

Protect non-public location and existence-information.
Problem: Subject-related. Prevent lootings and illegal digging.
Economy: Promote education & individual tourism.
Example: Medical Data Information Systems

Individual privacy and anonymity: Protection of individual information.

<table>
<thead>
<tr>
<th>Related to:</th>
<th>ALCOHOL</th>
<th>DRUGS</th>
<th>SELF INFLECTED</th>
<th>NO</th>
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</table>

I hereby acknowledge that I HAVE RECEIVED AND UNDERSTAND THE GIVEN INSTRUCTIONS INDICATED. I understand that I may be released before all my medical problems are know or treated. will arrange for follow-up care as instructed above. I fully accept the charges above itemized.
Example: Medical Data Information Systems

Individual privacy and anonymity: Protection of individual information.

INSTRUCTIONS INDICATED. I understand that I may be released before all my medical problems are know or treated. will arrange for follow-up care as instructed above. I fully accept the charges above itemized.
Example: Medical Data Information Systems

**Individual privacy and anonymity: Protection of individual information.**

Protect individual information/categorisation.

Problem: Prevent misuse, data collection, data trade, ...

Problem: Prevent digitalisation side effects.

Economy: Enable medical support, epidemiology IS.
Example: Flight and Transport Systems

Individual privacy and anonymity: Protection individual characteristics.
Example: Flight and Transport Systems

Individual privacy and anonymity: Protection individual characteristics.

Protect individual characteristics.
Example: Banking, Accounting, Billing Systems

Individual privacy and anonymity: Physical and electronical.
Target System Examples

Example: Banking, Accounting, Billing Systems

Individual privacy and anonymity: Physical and electronical.

Protect properties and values.
Problem: Reduce barriers and protect against misuse.
Economy: Enable efficient banking at “frontend” and “backend”.
Example: Exploration and Information

Network privacy and anonymity: Protect individual & resources.
Example: Exploration and Information

Network privacy and anonymity: Protect individual & resources.

Protect customers, economy, and industry – separate networks.
Problem: Combination of individual and resources inf. (energy).
Economy: Person- and subject-related (exploration/environment).
Example: Navigation Systems

Individual privacy and anonymity: Protect individual activities, habits, ...
Individual privacy and anonymity: Real system base security and protection.

top - 12:26:46 up 2:50, 73 users, load average: 7.85, 7.26, 6.93
Tasks: 247 total, 2 running, 245 sleeping, 0 stopped, 0 zombie
Cpu0 : 0.7%us,  9.3%sy,  0.0%ni,  0.3%id, 88.7%wa,  0.0%hi,   1.0%si,  0.0%st
Cpu1 :  2.3%us,  1.7%sy,  0.0%ni,  21.2%id, 74.8%wa,  0.0%hi,   0.0%si,  0.0%st
Mem:  2061856k total, 2045280k used, 16576k free,  3016k buffers
Swap:  2104472k total,  668k used, 2103804k free, 1068024k cached

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<th>PR</th>
<th>NI</th>
<th>VIRT</th>
<th>RES</th>
<th>SHR</th>
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<th>%MEM</th>
<th>TIME+</th>
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Example: Distributed Computing Systems / High End Computing

Individual privacy and anonymity: Real system base security and protection.

Protect individual properties.
Problem: Ensure privacy for investments and data.
Economy: HW and SW support, separating data, process load . . .
Milestones for work on future information & computing systems

- **Strengthen trust with (Computer-Computer):**
  - Creation of legal base, legal frameworks
  - Collaboration frameworks, reducing complexity
  - Standardisation of suitable authentication/authorisation and encryption methods
  - Support for “trustable” computing
  - Creation of common policies, access rights, common virtual organisations
  - Industry and vendor support, strengthen interoperability, overcome technical limitations
  - Integration of Distributed Computing aspects: Grid Computing, Cloud Computing
  - Integration of High End Computing, High Performance Computing (HPC)
  - Transparency of workflows, accounting, billing, support for business applications
  - Flexible licensing
  - Open chip design, open tokens, hardware support

- **Envision wider social integration (Computer-Human):**
  - Transparency
  - Strengthen intellectual properties, combination with e-learning
  - Individual configurability
  - Technology-modular laws
  - Data security, handle sensitive data
  - Privacy on critical developments
  - Create integrated infonomics / information management

- **Uniform Future Implementations (Long-term future applications):**
  - Electronic passport, Electronic health card, . . .
  - “Back to the future security” for yesterdays methods and data
Future Work and Concluding Questions

**Present and Future Work on Basic Technological Implementations**
- Information and Computing Systems (GEXI, ZIVSMP, HLRN and others).
- Collaboration Frameworks (Grid-GIS house).
- Future Internet (Internet N.x).
- Internet of Things (RFID).
- SuperGrid & SmartGrid (Internet Technology). Energy-Sciences & Economy.

**Concluding Questions**
- Privacy and anonymity is regarded a major issue for nearly all information and computing systems. **How can different efforts be integrated?**
- Integrated systems are most complex. **How can we progress to reduce complexity for integrated systems?**
- Most information technology is international, most laws are not. **What can be the next “technical-legal” steps?**
- There are no standards for interlinking information and computing systems. **Which support/services can industry and politics provide?**
- There is no modularisation on technology and international legal base. **Which further actions can press the FIS and FCS topics ahead?**