Privacy in an Interactive World

Living with new media

Eras

Period	Characteristics
1960-1980	Non-discretionary Centralized systems
1980-2000	Informational self-determination*
2000-	Implicit interaction Behavioral analysis

(*) "The right of the individual to decide what information about himself should be communicated to others and under what circumstances"
(Westin, Privacy and Freedom, New York: Atheneum, 1970.)

Privacy

- Motives for privacy protection
  - empowerment: control the dissemination of information about oneself (identity theft)
  - utility: protection against nuisance (spam)
  - dignity: freedom from unsubstantiated suspicion (surveillance of public spaces)
  - regulating agent: checks and balances on power (unauthorized wiretaps)

Undermining privacy

- Trespass of presumed “personal borders”
  - natural (walls, doors,…)
  - social (confidentiality within social groups)
  - spatial/temporal (isolation of activities in different places or times)
  - ephemeral: (expectation of forgetting/disposal)
- “the potential to create an invisible and comprehensive surveillance network”
- Privacy impacted by
  - ability to monitor
  - ability to search

Privacy Preferences

- Determined by social context
- Difficult to articulate
- Wide array of techniques (surveys, focus groups, interviews, formal experiments, cases studies, diaries, participatory design, observational,…)
- Westin's survey segmentations
  - classifications
    - Fundamentalists (15-25%)
    - Pragmatists (40-60%)
    - Unconcerned (15-25%)
  - Stable over time, similar trends in different countries
  - Difficult to relate to particular preferences to demographics
  - Cautions
    - Only probes use of personal information by companies
    - Questions changed over time
- Decomposing of privacy into specific concerns
  - Collection
  - Processing (errors)
  - Control
  - Improper access

WWW and e-commerce

- Attitude survey
  - GVU (1998)
    - Most people were concerned about privacy/security in e-commerce
    - Most favored FIPS-like requirements for notification and disclosure control
  - IBM (1999)
    - Executive underestimated consumers privacy concerns
    - Educational level and technical sophistication of user associated with higher level of privacy concern\
  - Baumer (2003)
    - Respondents more likely to share personal information with known brands
    - Privacy policies etc. provided only marginal effect

New media

- New media affords new communication possibilities and new privacy concerns
- IM/SMS
  - Teens showed varying privacy behaviors (caution against assumption of standard preferences)
  - Unobtrusive nature of text messaging supports “environmental privacy” (limited interruption of the activity in the physcial space)
  - Sharing of information
    - Greater with closer acquaintances
    - Depends on purpose of disclosure
- Shared displays
  - Accidental disclosure
  - Concern is magnified by
    - Sensitivity of information
    - Relation to onlookers
    - Onlookers control of display

New media

- Media spaces
  - Physical spaces (offices, work areas) enhanced with multimedia or video recording technology
    - Videoconferencing
    - Always-on audio/video between/among locations
  - Important privacy design considerations
    - Symmetry
    - Opt-out control
    - Purposefulness: acceptance of privacy risks based on perceived value (a value proposition judgement)

New media

- Sensors, RFID
  - Concerns
    - Loss of control of collected data
    - Uncertainty of technologies utility
  - Trust (elderly interviewees regarding home-based monitoring)
    - Accept potential privacy invasion based on trust in those controlling the technology
    - Judgment of value proposition for increased safety
- Location disclosure
  - Effected more by *who* was asking more than the current location
  - Tracking/disclosure seen as more invasive than location-based configuration (e.g., ringtone volume control)
  - Concerns affected by
    - Trust in service provider
    - Oversight of regulatory agencies
  - Precision
    - “blurring” of current location less used than anticipated
    - Instead users either did not respond or provide information they believed was most useful to recipient

Smart objects

- Enabling technologies
  - low-power processors with integrated sensors and wireless communication
  - remote identification of objects
  - precise localization of objects
- Smart everyday objects
  - attached processing “introspection” capability
  - ability to respond in context-sensitive manner
  - creating “ambient intelligence” (smart without actually being intelligent)

Economic effects

- Improved inventory management
  - supply chain regulation
  - product quality monitoring
- “autonomous purchasing agents”
- “reducing information asymmetries”
  - more complete product disclosure
  - pay per use
    - utilities
    - insurance
- Risks
  - unanticipated feedback loops
  - unforeseen interrupts in supply chain
  - loss of control

Other risks

- Reliability
  - manageability of such a scale of interacting devices; continue to meet requirements?
  - predictability (unanticipated consequences?)
  - dependability in the face of service interruptions
- Delegation of control
  - content: who attests to the veracity of information conveyed by a smart object?
  - system control: will our cars drive the way the insurance company prefers?
  - accountability: who is responsible for economic or legally significant actions taken by a smart object?

Social factors

- Compatibility
  - transparency (how to check the validity of a multitude of small interactions; the micro charges of a fine-grain pay-per-use model)
  - sustainability (experiences become transient; lack of rootedness)
  - fairness (“social sorting” – reinforcing inequalities)
  - universal access (accessible to a broad cross section of society)

- Acceptability
  - feasibility/credibility (will it achieve promised goals?)
  - artifact autonomy (increased dependence on infrastructure to sustain artifact behavior)
  - health/environment (a landfill of smart objects?)
  - man-to-world relationship