

# **Contextualized Communication of Privacy Practices and Personalization Benefits: Impacts on Users' Data Sharing and Purchase Behavior**

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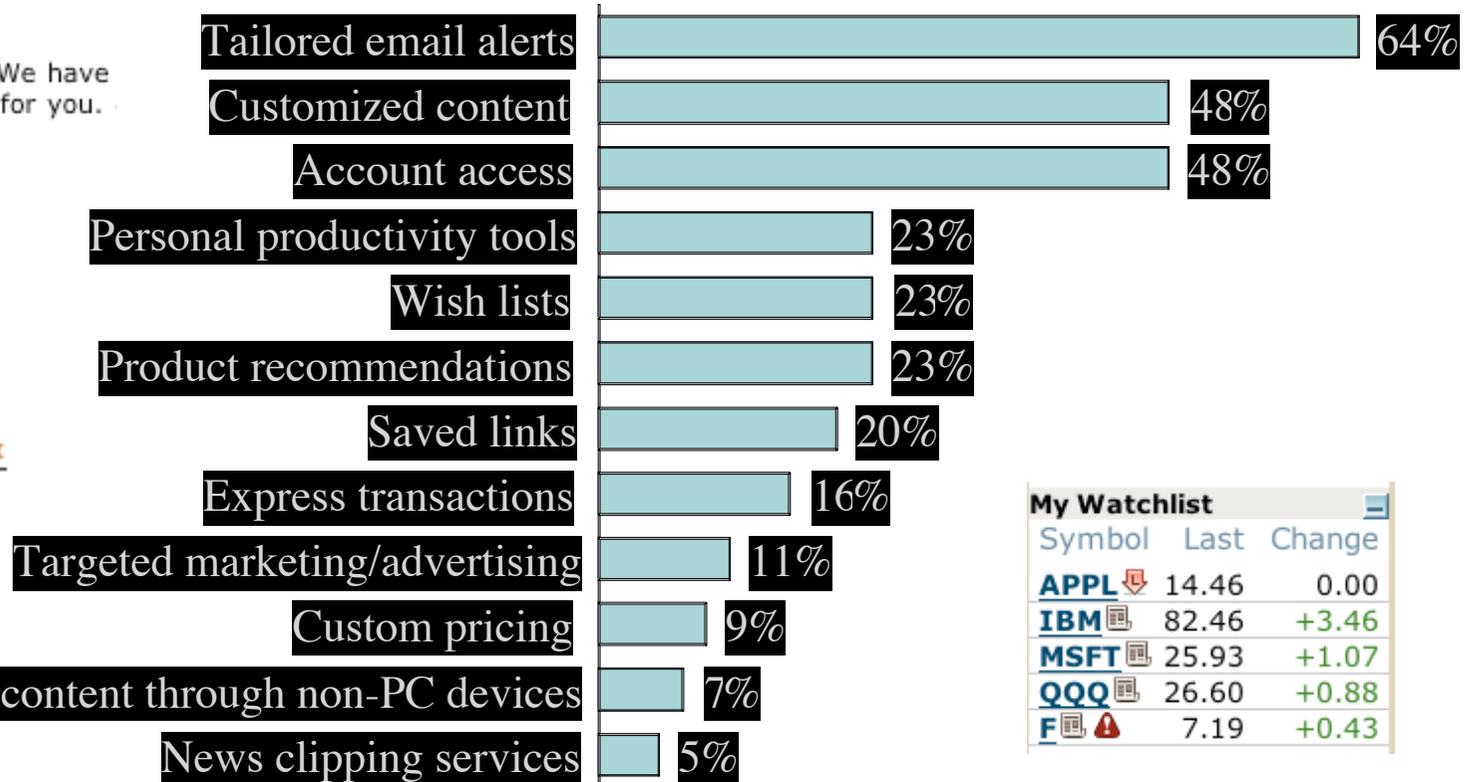


# Personalization is widespread on today's World Wide Web

Hello, Kobsa, Alfred. We have [DVD Recommendations](#) for you.



Kobsa,'s Gold Box



My Watchlist		
Symbol	Last	Change
APPL	14.46	0.00
IBM	82.46	+3.46
MSFT	25.93	+1.07
QQQ	26.60	+0.88
F	7.19	+0.43

Source: Forrester Research

Percent of 44 companies interviewed (multiple responses accepted)

# Personalization in the very near future

- Web courses that tailor their teaching strategy to each individual student
- Information and recommendations by portable devices that consider users' location and habits
- Product descriptions whose complexity is geared towards the presumed level of user expertise
- Tailored presentations that take into account the user's preferences regarding product presentation and media types (text, graphics, video)
- Recommendations that are based on recognized interests and goals of the user

# Current personalization methods (in 30 seconds)

## Data sources

- Explicit user input
- User interaction logs

## Methods

- Assignment to user groups
- Rule-based inferences
- Machine learning

# Web personalization delivers benefits for both users and web vendors

**Jupiter Communications, 1998:** Personalization at 25 consumer e-commerce sites increased the number of new customers by 47% in the first year, and revenues by 52%.

**Nielsen NetRatings, 1999:**

- Registered visitors to portal sites spend over 3 times longer at their home portal than other users, and view 3 to 4 times more pages at their portal
- E-commerce sites offering personalized services convert significantly more visitors into buyers than those that don't.

**Gartner Group, 1999:** By 2003, nearly 85 percent of global 1,000 Web sites will use some form of personalization (0.7 probability)

**Jupiter Research, 2003:**

- Personalized sites cost four times more than regular sites
- Few users indicate that personalization would make them buy more often

***Downside:*** *Personalized sites collect significantly more personal data than regular websites, and do this often in a very inconspicuous manner.*

# Many computer users are concerned about their privacy online

## Number of users who reported:

- *being extremely or very concerned about **divulging** personal information online:*  
67% (Forrester 1999), 74% (AARP 2000)
- *being (extremely) concerned about **being tracked** online:*  
77% (AARP 2000)
- ***leaving** web sites that required registration information:*  
41% (Boston Consulting 1997)
- *having entered **fake** registration information:*  
40% (GVU 1998), 27% (Boston Consulting 1997), 32% (Forrester 1999)
- *having **refrained from shopping** online due to privacy concerns, or **bought less**:*  
32% (Forrester 1999), 32%  35%  54%  : IBM 1999, 24% (AARP 2000)
- *wanting internet sites **ask for permission** to use personal data: 81% (Pew 2000)*
- *being willing to give out personal data for getting something **valuable in return**:*  
31% (GUV 1998), 30% (Forrester 99), 51% (Personalization Consortium)

Kobsa (2002), *CACM* 45(5)

# Either Personalization or Privacy?

- Personal data of computer users are indispensable for personalized interaction
  - Computer users are reluctant to give out personal data
- ☛ **Fundamental conflict between privacy and personalization?**

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**Personalization Vs. Privacy Debate Heating Up**

> > > ClickZ News

# Privacy-Enhanced Personalization

- Respect the user's privacy (and let the user know)
  - Respect privacy laws / industry privacy agreements
- Provide benefits (including optimal personalization within the given privacy constraints)
- Increase the user's understanding (don't do magic)
- ☞ Gain the user's trust
- ☞ *Then be patient, and users will incrementally come forward with personal data / permissions if their usage purpose and the ensuing benefits are clear to them.*

# Attitudes of web users regarding privacy statements

Sears, Roebuck and Co. World Wide Web Site  
Customer Information Privacy Policy

Microsoft.com Privacy Statement

## Privacy statements...

- are regarded as very important by 76% (DTI 2001)
- make 55% more comfortable providing personal information (Roy Morgan 2001, Gartner 2001)
- are claimed to be viewed by 73% ["always" by 26%] (Harris Interactive 2001)
- are effectively viewed by only 0.5% (Kohavi 2001)
- are several readability levels too difficult (Lutz 04, Jensen&Potts 04)
- are insufficient  
"in order to trust an e-Commerce company, they must feel that the company is doing more than just protecting their data – it must also be providing them with functionality and service that they value."  
(Brodie et al. 2004)

Fidelity's Commitment to Privacy

# Our counterproposal: A design pattern for personalized websites that collect user data

*Design patterns constitute descriptions of best practices based on research and application experience. They give designers guidelines for the efficient and effective design of user interfaces.*

Every personalized site that collects user data should include the following elements on every page:

## **1. Link to Global Communication of Privacy Practices** (and Personalization Benefits)

- Still necessary for legal reasons

## **2. Contextualized Local Communication of Privacy Practices and Personalization Benefits**

- Break long privacy policies into small, understandable pieces
- Relate them specifically to the current context
- Explain privacy practices but also personalization benefits

# An example webpage based on the proposed design pattern

Traditional link to a privacy statement

The screenshot shows a webpage layout with a top navigation bar, a left sidebar, and a main content area. The top navigation bar includes category tabs: BOOKS, ELECTRONICS & PHOTO, MUSIC, DVD, VIDEO, SOFTWARE, and PC & VIDEO GAMES. On the right, there are links for VIEW BASKET, WISH LIST, YOUR ACCOUNT, and HELP. The left sidebar contains sections: YOUR SELECTION (1,000,000 books), MORE TO EXPLORE (Privacy, Personalization, Our Security Guarantee, Associates, Amazon Web Services, Payments, Sell now!, Gift services, Review raffle, Amazon.de mobile), and a traditional link to a privacy statement. The main content area features a personalization message and three surveys. Callouts explain: 1) 'Explanation of personalization benefits' pointing to the 'What are your benefits?' section of the first survey. 2) 'Explanation of privacy practices' pointing to the 'What happens with your data?' section of the second survey.

BOOKS ELECTRONICS & PHOTO MUSIC DVD VIDEO SOFTWARE PC & VIDEO GAMES

VIEW BASKET | WISH LIST | YOUR ACCOUNT | HELP

**YOUR SELECTION**  
You currently have a choice of **1,000,000** books.

**MORE TO EXPLORE**

[Privacy](#)  
We protect your personal data

[Personalization](#)  
We want to give you a personal service

[Our Security Guarantee](#)  
Your security ranks first

[Associates](#)  
Earn money from your web site

[Amazon Web Services](#)  
Build websites, applications or tools using Amazon Web Services.

[Payments](#)  
Payment options with Amazon

[Sell now!](#)  
Offer items for sale. Free, fast and easy!

[Gift services](#)  
Have even more fun making presents

[Review raffle](#)  
The first reviewer may be a winner!

[Amazon.de mobile](#)  
Shop while on the go with your cell phone

You currently have a choice of 1,000,000 books. We can better tailor the selection to your needs if we receive additional information.

**We would like to use cookies to record the order in which you visit our web pages (clickstream). Do you agree with this?**

Yes  
 No  
 No answer

**What are your benefits?**  
We would like to give you an even more satisfying experience, which is optimized for your screen and your browser. If you choose not to accept cookies, you will not be able to use such important options as 1-Click® shopping and "New for You".

**What happens with your data?**  
Your personal data will remain anonymous. If you agree to accept cookies, we will be able to improve our site and to better present our products and services. We are also interested in recurring navigation patterns. You can always change your decision to accept cookies.

**Please enter your favorite author or book title:**

No answer

**What are your benefits?**  
When selecting books for you we take your favorite authors into account as well as other suitable books.

**What happens with your data?**  
These data will be stored under a pseudonym, and then aggregated and analyzed. The contents of our web pages will be adapted to you. Your data will not be shared with others.

**When buying a book, do you pay more attention to the text on the back cover or to the name of the author?**

Text on the back cover (short description)  
 Author  
 No answer

# The tested “experimental new version of an online bookstore”

Links to original privacy statement (split into privacy, security and personalization notice)

amazon.de

“Selection counter”

WUNSCHZETTEL | MEIN KONTO | HILFE

BÜCHER | ELEKTRONIK & FOTO | KÜCHE & HAUSHALT | MUSIK | DVD | VIDEO | SOFTWARE | COMPUTER & VIDEOSPIELE

**Ihre Auswahl**  
Sie haben momentan eine Auswahl von **1000000** Büchern.

Sie haben zur Zeit eine Auswahl von 1000000 Büchern. Mit weiteren Informationen können wir die Auswahl der Bücher noch besser an Ihre Bedürfnisse anpassen.

**ENTDECKEN**

**Datenschutz**  
Ihre persönlichen Daten sind bei uns geschützt

**Personalisierung**  
Wir möchten Ihnen einen persönlichen Service bieten

**Sicherheitsgarantie**  
Ihre Sicherheit steht bei uns an erster Stelle

**Partnerprogramm**  
Geld verdienen mit Ihrer Website

**Amazon Web Services**  
Erstellen Sie Websites, Applikationen oder Tools mit Amazon Web Services

**Kaufen & Zahlen**  
Zahlungsmöglichkeiten bei Amazon.de

**Jetzt verkaufen!**  
Kostenlos Artikel zum Verkauf anbieten. Schnell und einfach!

**Geschenkservice**  
So macht Schenken noch mehr Spaß

**Rezensions-Gewinnspiel**  
Wer zuerst schreibt, gewinnt!

## Wir möchten gerne Cookies zur Aufzeichnung der Reihenfolge Ihres Aufrufs unserer Internetseiten (Clickstream) speichern. Sind Sie damit einverstanden?

- ja
- nein
- keine Angabe

Contextualized short description of relevant privacy practices (taken from original privacy statement)

### Welchen Nutzen haben Sie davon?

Wir wollen Ihnen in Zukunft einen noch besseren Onlineauftritt bieten, der optimiert ist für Ihren Bildschirm und für Ihren Browser. Wenn Sie keine Cookies verwenden, sind Sie nicht in der Lage, so wichtige Features wie 1-Click@-Kaufen und "Neu für Sie" zu nutzen.

### Was geschieht mit den Daten?

Ihre persönlichen Informationen verbleiben anonym. Ihr Einverständnis, Cookies zu akzeptieren, ermöglicht uns, unsere Site zu verbessern und Produkte und Dienstleistungen besser zu präsentieren. Weiterhin sind wir daran interessiert, Ihr wiederholtes Navigationsverhalten zu analysieren. Sie können Ihre Entscheidung, Cookies zu akzeptieren, jederzeit revidieren.

## Geben Sie bitte Ihren Lieblingsautor oder Buchtitel ein:

- keine Angabe

Contextualized short description of relevant personalization benefits (derived from original privacy statement)

### Welchen Nutzen haben Sie davon?

Wir berücksichtigen bei der Auswahl Ihren Lieblingsautoren und weitere persönliche Präferenzen.

### Was geschieht mit den Daten?

Diese Information wird unter Ihrem Pseudonym gespeichert, aggregiert und analysiert. Die angezeigten Inhalte werden für Sie angepasst. Eine Weitergabe an Dritte findet nicht statt.

## Worauf achten Sie beim Buchkauf mehr: Angaben auf dem Buchrücken oder Name des Autors?

- Angaben auf dem Buchrücken (Kurzbeschreibung)
- Autor

# Version with non-contextual explanations only

Links to original privacy statement (split into privacy, security and personalization notice)

“Selection counter”

amazon.de

WUNSCHZETTEL | MEIN KONTO | HILFE

BÜCHER | ELEKTRONIK & FOTO | KÜCHE & HAUSHALT | MUSIK | DVD | VIDEO | SOFTWARE | COMPUTER & VIDEOSPIELE

## Ihre Auswahl

Sie haben momentan eine Auswahl von **1000000** Büchern.

## ENTDECKEN

### Datenschutz

Ihre persönlichen Daten sind bei uns geschützt

### Personalisierung

Wir möchten Ihnen einen persönlichen Service bieten

### Sicherheitsgarantie

Ihre Sicherheit steht bei uns an erster Stelle

### Partnerprogramm

Geld verdienen mit Ihrer Website

### Amazon Web Services

Erstellen Sie Websites, Applikationen oder Tools mit Amazon Web Services

### Kaufen & Zahlen

Zahlungsmöglichkeiten bei Amazon.de

Sie haben zur Zeit eine Auswahl von 1000000 Büchern. Mit weiteren Informationen können wir die Auswahl der Bücher noch besser an Ihre Bedürfnisse anpassen.

### Wir möchten gerne Cookies zur Aufzeichnung der Reihenfolge Ihres Aufrufs unserer Internetseiten (Clickstream) speichern. Sind Sie damit einverstanden?

- ja  
 nein  
 keine Angabe

### Geben Sie bitte Ihren Lieblingsautor oder -buchtitel ein:

keine Angabe

### Worauf achten Sie beim Buchkauf mehr: Angaben auf dem Buchrücken oder Name des Autors?

- Angaben auf dem Buchrücken (Kurzbeschreibung)  
 Autor  
 keine Angabe

zurück weiter

# Why not ask users what they like better?

- Inquiry-based empirical studies
  - Reveal aspects of users' rationale that cannot be inferred from mere observation
- Observational empirical studies
  - Reveal actual user behavior which may differ from users' stated behavior
    -  This divergence seems to be quite substantial in the case of stated privacy preferences vs. actual privacy-related behavior

# Experimental Procedures

## 1. Instructions to subjects

- “Testing experimental new version of a well-known online bookstore”
- Answering questions to allegedly obtain better book recommendations
- No obligation to answer any question, but helpful for better recommendation.
- Data that subjects entered would purportedly be available to company
- Possibility to buy one of the recommended books with a 70% discount.
- Reminder that if they buy a book, ID card and bank/credit card would be checked (subjects were instructed beforehand to bring these documents if they wish to buy)

## 2. Answering interest questions in order to “filter the selection set” (anonymous)

- 32 questions with 86/64 answer options become presented (some free-text)
- Most questions were about users’ interests (a very few were fairly sensitive)
- All “make sense” in the context of filtering books that are interesting for readers
- Answering questions decreased the “selection counter” in a systematic manner
- After nine pages of data entry, users are encouraged to review their entries, and then to view those books that purportedly match their interests

# Experimental Procedures (cont'd)

## 3. “Recommendation” of 50 books (anonymous)

- 50 predetermined and invariant books are displayed (mostly popular fiction, politics, tourism, and sex and health advisories)
- Selected based on their low price and their presumable attractiveness for students
- Prices of all books are visibly marked down by 70%, resulting in out-of-pocket expenses between €2 and €12 for a book purchase.
- Extensive information on every book available

## 4. Purchase of one book (identified)

- Subjects may purchase one book if they wish
- Those who do are asked for their names, shipping and payment data (bank account withdrawal or credit card charge).

## 5. Completing questionnaires

## 6. Verification of name, address and bank data (if book purchased)

# Subjects and experimental design

- 58 economics/business/MIS students of Humboldt University, Berlin, Germany  
(data of 6 students were eventually discarded)
- Randomly assigned to one of two system versions:
  - a) 26 used non-contextualized version (that had single links to global descriptions of privacy, personalization and security)
  - b) 26 used contextualized version (w/ additional local information on privacy practices and personalization benefits for each entry field)

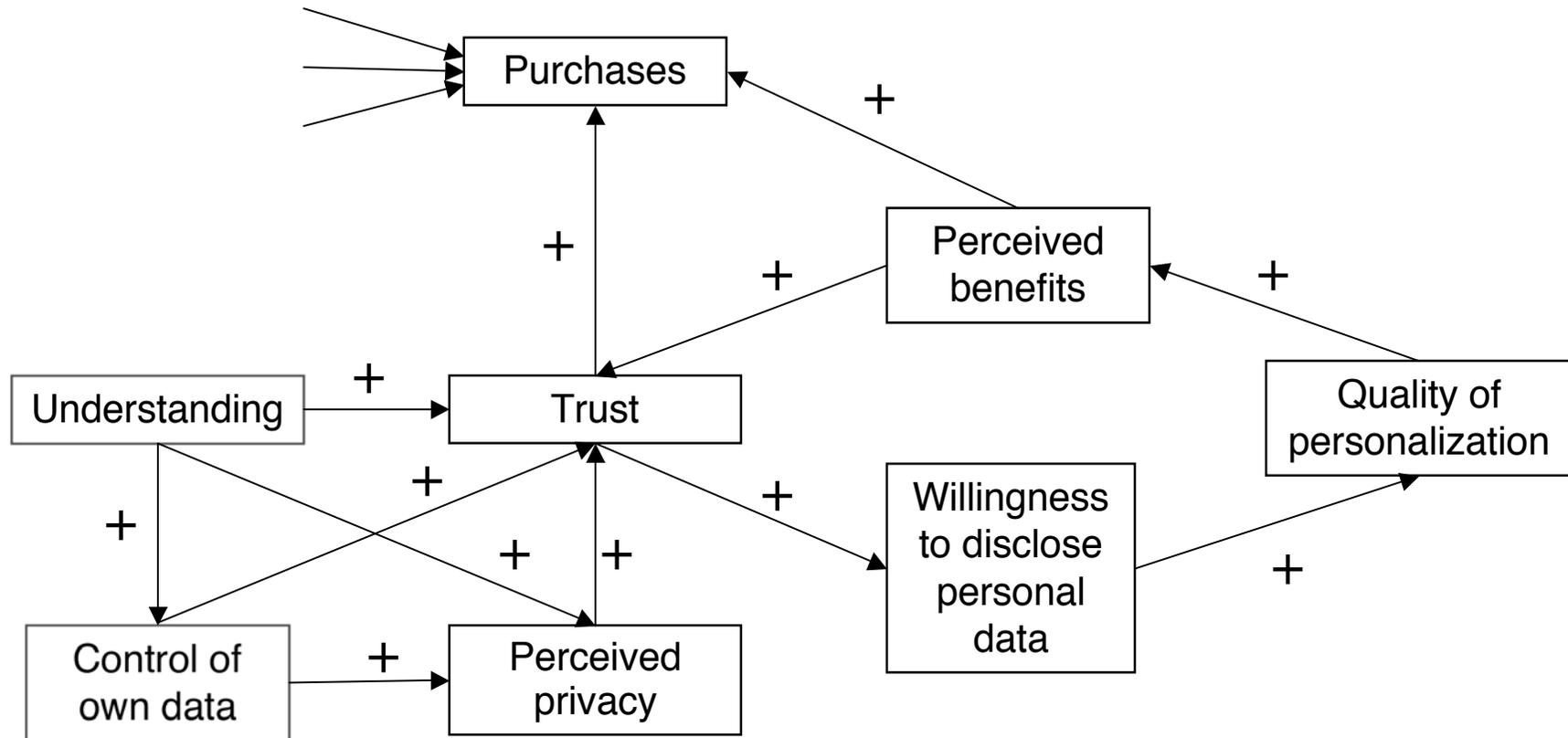
Hypothesis: users will

- be more willing to share personal data in condition (b)
- view site (b) more favorably

# Results

	w/o contextual explanations	With contextual explanations	Increase	p	
Observations	Questions answered	84%	91%	+8%	<0.001
	Answers given	56%	67%	+20%	<0.001
	Book buyers	58%	77%	+33%	0.07
Perception	“Privacy has priority”	3.34	3.95	+18%	0.01
	“Data allowed store to select better books”	2.85	3.40	+19%	0.035
	“Data is used responsibly”	3.62	3.91	+8%	0.12

# Privacy, Trust and Personalization



# Other factors to be studied

	With contextual explanations	w/o contextual explanations	Increase	p	
Observations	Questions answered	91%	84%	+8%	<0.001
	Answers given	67%	56%	+20%	<0.001
	Book buyers	77%	58%	+33%	0.07
Perception	"Privacy has priority"	3.95	3.34	+18%	0.01
	"Data allowed store to select better books"	3.40	2.85	+19%	0.035
	"Data is used responsibly"	3.91	3.62	+8%	0.12

- Site reputation
- Is privacy or benefit disclosure more important?
- Stringency of privacy practices
- Permanent visibility of contextual explanations
- References to full privacy policy

# Roadmap for Privacy-Enhanced Personalization Research

- Study the impacts of privacy laws, industry regulations and individual privacy preferences on the admissibility of personalization methods
- Provide optimal personalization while respecting privacy constraints
- Apply state-of-the-art industry practice for managing the combinatorial complexity of privacy constraints

# Forthcoming workshop



**CHI 2006 Workshop on**  
**Privacy-Enhanced**  
**Personalization**



**22-23 April 2006, Montréal, Canada**

<http://www.isr.uci.edu/PEP06>

# Alternatives to traditional privacy statements

- P3P, in combination with user clients like
  - the AT&T Privacy Bird
  - those embedded in IE 6.0, Mozilla, etc.
- Short notice + complete notice (Abrams 2001)

## **Problem**

- Disregard situational nature of privacy. Users must specify their preferences and make decisions
  - upfront, without context
  - without explanation of what data will be requested, and for what purpose
  - without explanation of the privacy impacts they should be concerned about
  - without explanation of what they miss out if they do not use a site or provide data

# Recent contextualized approaches

- Friedman et al. (2002) study contextual issues such as how to enhance users' understanding of cookie settings, *at the time when cookie-related events occur* (and in a form that is least distracting).
- Patrick & Kenny (2003) derive four HCI guidelines for effective privacy interface design from the privacy principles of the EU Data Protection Directive:

*comprehension, consciousness, control, consent.*

Since single large click-through privacy statements do not meet the spirit of the Directive, the authors propose “*just-in-time* click-through agreements” on an *as-needed* basis instead of a large, complete list of service terms.