

CSC 495.002 – Lecture 12

Usable Privacy: Privacy Policies and Notices

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PREVIOUSLY ON USABLE PRIVACY

Decision Making and Warnings

- Human decision making
- Bounded rationality
- Privacy engineering: Warnings and nudges

Problem Definition

- What is the problem with privacy policies? Nobody reads them
- What if we actually read them? What would be the cost?
- If every Internet user read privacy policies for each site they visited, it would cost \$781 billion per year
- Problem: How can we make privacy policies easier to understand?

McDonald and Cranor. The cost of reading privacy policies. Technology Policy Research Conference, 2008

Potential Solution

The image compares two versions of a Nutrition Facts label. The left label is the standard format, and the right label is a proposed 'usability' format with larger text and more prominent information. The right label has several changes highlighted with red circles and text annotations:

- Servings:** '8 servings per container' is circled in red, with the annotation 'Servings larger, bolder type'.
- Calories:** '230' is circled in red, with the annotation 'Calories larger type'.
- Added Sugars:** 'Added Sugars 0g' is circled in red, with the annotation 'Added sugars added'.
- Potassium:** 'Potassium 235mg' is circled in red, with the annotation 'Actual amounts added'.
- Other annotations:** '12%' is circled in red, and 'Vitamin D 2mcg' is circled in red.

Text annotations on the right side of the image describe the changes:

- Serving sizes updated**
- Daily Values % comes first**
- Nutrients required changed**
- Footnote updated**
- Added sugars added**
- Actual amounts added**

SOURCE: U.S. FOOD AND DRUG ADMINISTRATION | FOODBUSINESSNEWS.NET
FEBRUARY 27, 2014

Standardizing Privacy Notices

- Research question: Do standardized policy presentations have positive effects on accuracy and speed of information finding?
- Compare five policy formats
- Traditional:
 - Full text policy
 - Layered (high level summary)
- Standardized:
 - Standardized table
 - Standardized short table
 - Standardized short text

Kelley et al. Standardizing Privacy Notices: An Online Study of the Nutrition Label Approach. Conference on Human Factors in Computing Systems, pages 1573–1582, 2010

Standardized Tables

Acme

information we collect	ways we use your information				information sharing	
	provide service and maintain site	marketing	telemarketing	profiling	other companies	public forums
contact information		opt out	opt out			
cookies						
demographic information		opt out	opt out			
financial information						
health information						
preferences		opt out	opt out			
purchasing information		opt out	opt out			
social security number & gov't ID						
your activity on this site		opt out	opt out			
your location						

Access to your information
This site gives you access to your contact data and some of its other data identified with you

How to resolve privacy-related disputes with this site
Please email our customer service department

acme.com
5000 Forbes Avenue
Pittsburgh, PA 15213 United States
Phone: 800-555-5555
help@acme.com

Acme

information we collect	ways we use your information				information sharing	
	provide service and maintain site	marketing	telemarketing	profiling	other companies	public forums
contact information		opt out	opt out			
cookies						
demographic information		opt out	opt out			
preferences		opt out	opt out			
purchasing information		opt out	opt out			
your activity on this site		opt out	opt out			

Information not collected or used by this site: social security number & government ID, financial, health, location.

Access to your information
This site gives you access to your contact data and some of its other data identified with you

acme.com
5000 Forbes Avenue
Pittsburgh, PA 15213 United States
Phone: 800-555-5555
help@acme.com

How to resolve privacy-related disputes with this site
Please email our customer service department

opt out we will collect and use your information in this way
by default, we will collect and use your information in this way unless you tell us not to by opting out

opt in we will not collect and use your information in this way
by default, we will not collect and use your information in this way unless you allow us to by opting in

Standardized Text

Acme

Acme will collect your contact information. They will use this information for providing you service and maintaining the site and profiling. They will also use this information for marketing and telemarketing unless you opt out. They will share this information with other companies unless you opt out. They will share this information on public forums if you opt in.

Acme will collect your activity on this site, demographic information, your health information, and cookie information. They will use this information for providing you service and maintaining the site and profiling. They will also use this information for marketing and telemarketing unless you opt out. They will not share this information.

Acme will collect your preferences and your purchase information. They will use this information for providing you service and maintaining the site and profiling. They will also use this information for marketing and telemarketing unless you opt out. They will share this information on public forums if you opt in.

Information not collected or used by this site:
financial, SSN or government ID, and location.

Access to your information
This site gives you access to your contact data and some of its other data identified with you

How to resolve privacy-related disputes with this site
Please email our customer service department

acme.com
5000 Forbes Avenue
Pittsburgh, PA 15213 United States
Phone: 800-555-5555
help@acme.com

Methodology

- Deploy survey on Amazon Mechanical Turk
- Use privacy policies from
 - Microsoft
 - IBM
 - Target
 - Disney
- Anonymized company names
- A series of tasks
 - Simple: Can be answered by looking at a single row or column
 - Complex: Requires some interaction between data use and sharing
 - Comparison: Compare two policies

Word Counts

	Pol. 1	Pol 2.	Pol 3.	Pol 4.
Full Policy Text	2127	6257	4399	2912
Std. Short Text	175	127	108	90
Layered Text			409	800

Survey Tasks & Results

	#	Question	Answer	Std. Table	Std. Short Table	Std. Short Text	Full Policy Text	Layered Text
Simple Tasks	Group A	1	Does the policy allow Acme to collect information about which pages you visited on this web site?	Yes	82.35	86.25	91.57	80.23
	Group B			Yes	87.21	85.06	89.53	92.11
	Group A	2	Acme might want to use your information to improve their website. Does this policy allow them to use your information to do so?	Yes	79.41	77.50	83.13	82.56
	Group B			Yes	76.74	77.01	86.05	89.47
	Group A	3	Does the policy allow Acme to collect information about your current location?	No	48.04	23.75	43.37	18.60
	Group B			No	46.51	24.14	53.49	3.95
Group A	4	Based on the policy will Acme register their secure certificate with VeriSign or some other company?	The policy does not say	88.23	81.25	84.34	52.33	
Group B			The policy does not say	79.07	82.76	87.21	43.42	30.77
Group A	5	Based on the policy may Acme store cookies on your computer?	Yes	89.22	92.50	73.49	91.86	
Group B			Yes	89.53	80.46	87.21	96.05	88.46
Group A	6	Does the policy allow Acme to collect information about your medical conditions, drug prescriptions, or family health history?	Yes	84.31	76.25	69.88	48.84	
Group B			No	73.25	58.62	81.40	28.95	33.33
Complex Tasks	Group A	7	Does the policy allow Acme to share some of your information on public bulletin boards?	Only if I allow them to	75.50	76.25	59.04	15.12
	Group B			No	61.63	57.47	65.12	25.00
	Group A	8	Does the policy allow Acme to share your home phone number with other companies?	Yes, unless I tell them not to	62.75	68.75	67.47	36.05
	Group B			Yes	68.60	60.92	20.43	14.47
	Group A	9	Does the policy allow Acme to use your buying history to design custom functionality targeted at you?	Yes	53.92	58.75	53.01	62.79
	Group B			Yes	50.00	58.62	69.77	64.47
Group A	10	Does the policy allow Acme to share your cookie information with other companies?	No	69.61	67.50	50.60	16.28	
Group B			No	79.07	71.26	74.42	26.32	44.87
Group A	11	Will Acme contact you with advertisements?	Yes, unless I tell them not to	54.90	61.25	55.42	38.37	
Group B			Yes, unless I tell them not to	44.19	49.43	51.16	14.47	39.74
Group A	12	Does Acme give you control regarding their sharing of your personal data?	Yes	70.59	68.75	73.49	66.28	
Group B			No	56.98	44.83	37.21	31.58	24.36
Comparison Tasks	Group A	14	Does either company give you options with regards to cookies?	Only with Acme	58.82	52.50	45.78	33.72
	Group B			Only with Bell	63.95	48.28	19.76	15.79
	Group A	15	Does either company collect sensitive information (such as banking or medical records)?	Acme	64.71	47.50	53.01	20.93
Group B	Neither company			73.26	63.22	80.23	52.63	53.85
Group A	16	By default, Acme can collect information about your age and gender in order to market to you by email, but the Bell Group cannot.	True	59.80	61.25	34.94	19.77	
Group B			False, both can	56.98	74.71	77.91	46.05	24.36

Effective Privacy Notices

A Design Space for Effective Privacy Notices

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ABSTRACT

Notifying users about a system's data practices is supposed to enable users to make informed privacy decisions. Yet, current notice and choice mechanisms, such as privacy policies, are often ineffective because they are neither usable nor useful, and are therefore ignored by users. Constrained interfaces on mobile devices, wearables, and smart home devices connected in an Internet of Things exacerbate the issue. Much research has studied usability issues of privacy notices and many proposals for more usable privacy notices exist. Yet, there is little guidance for designers and developers on the design aspects that can impact the effectiveness of privacy notices. In this paper, we make multiple contributions to remedy this issue. We survey the existing literature on privacy notices and identify challenges, requirements, and best practices for privacy notice design. Further, we map out the design space for privacy notices by identifying relevant dimensions. This provides a taxonomy and consistent terminology of notice approaches to foster understanding and reasoning about notice options available in the context of specific systems. Our systemization of knowledge and the developed design space can help designers, developers, and researchers identify notice and choice requirements and develop a comprehensive notice concept for their system that addresses the needs of different audiences and considers the system's limitations and opportunities for providing notice.

website, or linked to from mobile app stores or mobile apps, to signs posted in public places to inform about CCTV cameras in operation. Even an LED indicating that a camera or microphone is active and recording constitutes a privacy notice, albeit one with limited information about the data practices associated with the recording. Providing notice about data practices is an essential aspect of data protection frameworks and regulation around the world [57]. While transparency has been emphasized as an important practice for decades, existing privacy notices often fail to help users make informed choices. They can be lengthy or overly complex, discouraging users from reading them.

Smartphones and mobile apps introduce additional privacy issues as they support recording of sensor and behavioral information that enables inference of behavior patterns and profiling of users. Yet, comparatively smaller screens and other device restrictions constrain how users can be given notice about and control over data practices.

The increasing adoption of wearable devices, such as smart watches or fitness trackers, as well as smart home devices, such as smart thermostats, connected light bulbs, or smart meters, represents a trend towards smaller devices that are even more constrained in terms of interaction capabilities, but are also highly connected with each other and the cloud. While providing notice and choice is still considered essential in the "Internet of Things" (IoT) [48, 74], finding appropriate and usable notice and choice mechanisms can be challenging.

Schaub et al. A Design Space for Effective Privacy Notices. Symposium On Usable Privacy and Security (SOUPS), 2015

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Usable Privacy: Privacy Policies and Notices

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Motivation

- Purpose: Make users aware of data practices involving personal information
- Privacy notice: Public announcement of data practices regarding
 - Collection
 - Usage
 - Sharing
- Different forms
 - Privacy policy posted on a website
 - Signs posted in public places (CCTV cameras)
 - LED indicating that a camera or microphone is recording
 - Shutter sound

Goal

- Embed privacy notices and choice options into system design
- With minimal disruption to regular flow
- Provide transparency for users

Exercise: Roles of Privacy Notices

- For companies:
 - Demonstrate legal compliance
 - Build customer trust
- For regulators:
 - Investigate and enforce regulatory compliance
 - Treat violation as unfair or deceptive trade practice

Challenges

- Notice complexity: 244 hours annually to read all policies for websites visited
- Lack of choices: Informative, but not actionable
“Warning: CCTV in use”
- Notice fatigue: Often shown at inopportune times, conflict with user’s main task
- Decoupled notices: For example, a fitness tracking device

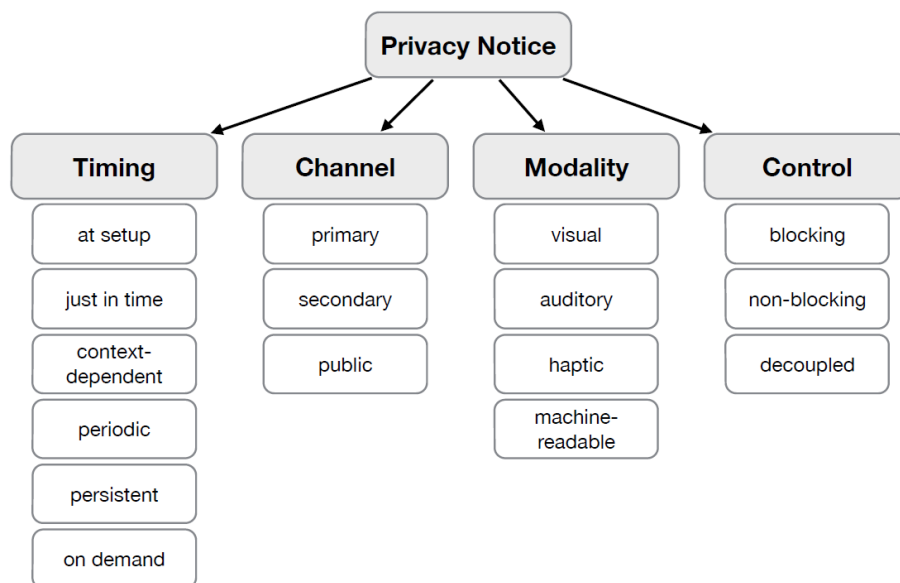
Audiences

- Which data practices affect which audience
- Let’s think about Google Glass
- Primary user: Person who wears it
- Secondary users: Friends, family members
- Incidental users: Bystanders

Layered and Contextualized Notices

- Multi-layered policies
- Notices shown at different times
- With respect to the context and user's expectations

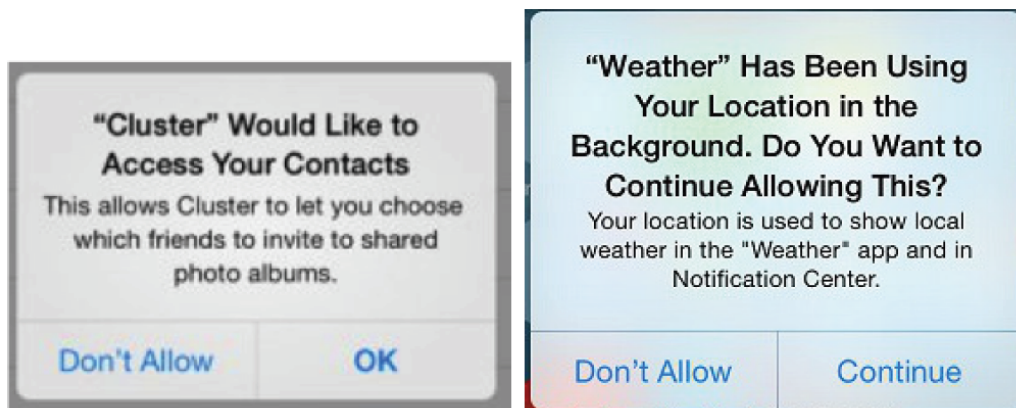
Design Space



Timing

- At setup: When used for the first time (part of installation)
- Just in time: When a data practice is active
- Context-dependent: Nudges to prevent oversharing
- Periodic: Frequency determined based on sensitivity of data
- Persistent: Unobtrusive visual notice
- On demand: User can request

Just in Time and Periodic: iOS



Context-dependent: Facebook Privacy Checkup



Channel

- Primary: Provided on the same platform or device
- Secondary: Limited primary channels, e.g., wearables, smart home devices
- Public: For incidental users, e.g., signs for video surveillance

Modality

- Complement user's activity: For example, use audio while driving
- Visual: Text, images, icons
- Auditory: Spoken words or sounds
- Haptic: Combine sound and vibration to notify about data sharing

Control

- Opt-in: User must explicitly agree to a data practice
- Opt-out: User may request to stop a specific practice
- Blocking: Requires user to make a choice
- Non-blocking: Without forcing user interaction, e.g., use same settings as previous post
- Decoupled: Privacy dashboards to control privacy settings across multiple services

Websites and Social Media

- Provide notices on demand (Timing)
- Post privacy policy on the website or app (Channel)
- Largely visual, specifically text (Modality)
- Controls are decoupled from the notice (Control)

Exercise: Smartphone Permissions

- When asks for permissions during installation: At setup
- When user sees the list of permissions: Blocking
- When an app update changes requested permissions: Periodic

Evaluation of Standardized Privacy Notices

A Large-Scale Evaluation of U.S. Financial Institutions' Standardized Privacy Notices

LORRIE FAITH CRANOR, PEDRO GIOVANNI LEON, and BLASE UR,
Carnegie Mellon University

Financial institutions in the United States are required by the Gramm-Leach-Bliley Act to provide annual privacy notices. In 2009, eight federal agencies jointly released a model privacy form for these disclosures. While the use of this model privacy form is not required, it has been widely adopted. We automatically evaluated 6,191 U.S. financial institutions' privacy notices posted on the World Wide Web. We found large variance in stated practices, even among institutions of the same type. While thousands of financial institutions share personal information without providing the opportunity for consumers to opt out, some institutions' practices are more privacy protective. Regression analyses show that large institutions and those headquartered in the northeastern region share consumers' personal information at higher rates than all other institutions. Furthermore, our analysis helped us uncover institutions that do not let consumers limit data sharing when legally required to do so, as well as institutions making self-contradictory statements. We discuss implications for privacy in the financial industry, issues with the design and use of the model privacy form on the World Wide Web, and future directions for standardized privacy notice.

Cranor et al. A Large-Scale Evaluation of U.S. Financial Institutions' Standardized Privacy Notices. ACM Transactions on the Web, 10(3):17:1–17:33, 2016

Limitations of Usability of Privacy Policies

- Studies show that consumers will pay a premium price to make purchases from more privacy-protective businesses
- However, numerous issues negatively impact usability of privacy policies
- Generally requires two years of college education to comprehend
- Typically unavailable in a user's language (unlike the website itself)
- Require hundreds of hours a year to read them all

Goal

- Difficult to compare privacy policies
 - Even among financial institutions with identical practices
 - Even for regulators, e.g., Federal Trade Commission, National Credit Union Administration

- Standardize the way financial institutions provide privacy disclosures

- Develop a “Model Privacy Form”

Model Privacy Form: Facts

FACTS	WHAT DOES [NAME OF FINANCIAL INSTITUTION] DO WITH YOUR PERSONAL INFORMATION?	
Why?	Financial companies choose how they share your personal information. Federal law gives consumers the right to limit some but not all sharing. Federal law also requires us to tell you how we collect, share, and protect your personal information. Please read this notice carefully to understand what we do.	
What?	The types of personal information we collect and share depend on the product or service you have with us. This information can include: <ul style="list-style-type: none"> ■ Social Security number and [income] ■ [account balances] and [payment history] ■ [credit history] and [credit scores] 	
How?	All financial companies need to share customers' personal information to run their everyday business. In the section below, we list the reasons financial companies can share their customers' personal information; the reasons [name of financial institution] chooses to share; and whether you can limit this sharing.	
	Reasons we can share your personal information	Does [name of financial institution] share? Can you limit this sharing?
	For our everyday business purposes —such as to process your transactions, maintain your account(s), respond to court orders and legal investigations, or report to credit bureaus	
	For our marketing purposes —to offer our products and services to you	
	For joint marketing with other financial companies	
	For our affiliates' everyday business purposes —information about your transactions and experiences	
	For our affiliates' everyday business purposes —information about your creditworthiness	
	For our affiliates to market to you	
	For nonaffiliates to market to you	

Model Privacy Form: Details

Page 2	
Who we are	
Who is providing this notice?	[insert]
What we do	
How does [name of financial institution] protect my personal information?	To protect your personal information from unauthorized access and use, we use security measures that comply with federal law. These measures include computer safeguards and secured files and buildings. [insert]
How does [name of financial institution] collect my personal information?	We collect your personal information, for example, when you <ul style="list-style-type: none"> ■ [open an account] or [deposit money] ■ [pay your bills] or [apply for a loan] ■ [use your credit or debit card] [We also collect your personal information from other companies.] OR [We also collect your personal information from others, such as credit bureaus, affiliates, or other companies.]
Why can't I limit all sharing?	Federal law gives you the right to limit only <ul style="list-style-type: none"> ■ sharing for affiliates' everyday business purposes—information about your creditworthiness ■ affiliates from using your information to market to you ■ sharing for nonaffiliates to market to you State laws and individual companies may give you additional rights to limit sharing. [See below for more on your rights under state law.]
What happens when I limit sharing for an account I hold jointly with someone else?	[Your choices will apply to everyone on your account.] OR [Your choices will apply to everyone on your account—unless you tell us otherwise.]

Opt-out Form

Mail-in Form

Leave Blank OR
 [If you have a joint account, your choice(s) will apply to everyone on your account unless you mark below.]

Apply my choices only to me]

Mark any/all you want to limit:

- Do not share information about my creditworthiness with your affiliates for their everyday business purposes.
- Do not allow your affiliates to use my personal information to market to me.
- Do not share my personal information with nonaffiliates to market their products and services to me.

Name		Mail to:
Address		[Name of Financial Institution]
City, State, Zip		[Address1]
[Account #]		[Address2]
		[City], [ST] [ZIP]

Methodology

- Obtain list of financial institutions
- Determine institution's web domain
- Retrieve standardized policies
- Parse standardized policies
- Analysis

Sharing Practices

Practice	Number of Institutions	Percentage of Total
Affiliates		
Shares with affiliates	1,726	28%
Does not share	1,543	25%
No affiliates	2,632	43%
Blank	237	4%
Nonaffiliates		
Shares with nonaffiliates	730	12%
Does not share	4,038	66%
No nonaffiliates	1,085	18%
Blank	285	5%
Joint Marketing		
Jointly markets	2,575	42%
Does not jointly market	3,356	55%
Blank	207	3%

Sharing Purposes

Reason for Sharing Personal Information	Does Not Share		Offers Opt-Out		No Opt-Out		(Missing)	
For our everyday business purposes – such as to process your transactions, maintain your account(s), respond to court orders and legal investigations, or report to credit bureaus	45	0.7%	9	0.1%	6,016	97.2%	108	1.7%
For our marketing purposes – to offer our products and services to you	1,808	29.2%	410	6.6%	3,832	61.9%	127	2.1%
For joint marketing with other financial companies	3,434	55.5%	563	9.1%	2,044	33.0%	124	2.0%
For our affiliates' everyday business purposes – information about your transactions and experiences	4,492	72.6%	158	2.6%	1,331	21.5%	189	3.1%
For our affiliates' everyday business purposes – information about your creditworthiness [<i>Opt-out mandatory when sharing</i>]	5,317	85.9%	572	9.2%	80	1.3%	189	3.1%
For our affiliates to market to you [<i>Opt-out mandatory when sharing; row may be omitted in certain cases</i>]	1,682	27.2%	715	11.5%	21	0.3%	3,754	60.6%
For nonaffiliates to market to you [<i>Opt-out mandatory when sharing</i>]	5,459	88.2%	455	7.3%	31	0.5%	204	3.3%

Opt-out Mechanisms

Opt-Out Mechanism(s)	# Institutions Providing This Mechanism	% Of the Total # of Institutions Offering Opt-Outs
Only phone	391	30.8%
Phone and website	265	20.9%
Only postal mail	217	17.1%
Phone and postal mail	153	12.0%
Three or more mechanisms	152	12.0%
Phone and email	46	3.6%
Postal mail and website	25	2.0%
Only website	17	1.3%
Only email	2	0.2%
Postal mail and email	1	0.1%
Website and email	1	0.1%

Contradictions

Reasons we can share your personal information	Does Bendena State Bank/Bank of Highland share?	Can you limit this sharing?
For our everyday business purposes- such as to process your transactions, maintain your account(s), respond to court orders and legal investigations, or report to credit bureaus	Yes	No
For our marketing purposes- to offer our products and services to you	Yes	We don't share

Bank Privacy Interface

BANK PRIVACY Search | For Banks | About

We've collected 6,326 banks' privacy notices. See how your bank stacks up...

Look up a bank

...or find banks in your ZIP code...
Enter ZIP code

...or search for a privacy-protective bank.

Specialization: ANY | Privacy practice: Opt-in marketing: ANY, Joint marketing: ANY

The following 7 banks have headquarters or branch locations in 15219:

Institution	Headquarters	This institution's privacy practices						
		Everyday business	Our marketing	Joint marketing	Affiliates' trans...	Affiliates' credit...	Affiliates' marketing	Nonaffiliates' marketing
Tristate Capital Bank	Pittsburgh, PA	Shares	Opt-out	Doesn't share	Opt-out	Doesn't share	(Missing)	Doesn't share
Allegheny Valley Bank of Pittsburgh	Pittsburgh, PA	Shares	Shares	Doesn't share	Shares	Doesn't share	Doesn't share	Doesn't share
City Co. Credit Union	Pittsburgh, PA	Shares	Shares	Shares	Opt-out	Doesn't share	(Missing)	Doesn't share
PNC Bank National Association	Wilmington, DE	Shares	Shares	Opt-out	Shares	Opt-out	Opt-out	Doesn't share
Citizens Bank of Pennsylvania	Philadelphia, PA	Shares	Shares	Shares	Shares	Opt-out	Opt-out	Doesn't share
Fifth Third Bank	Cincinnati, OH	Shares	Shares	Shares	Shares	Opt-out	Opt-out	Doesn't share
First Commonwealth Bank	Indiana, PA	Shares	Shares	Shares	Shares	Opt-out	Opt-out	Doesn't share

Exercise: Privacy Helper

- Select an app category
Video sharing, Driving, Dating
Health/Fitness, Chat, Kids, Shopping
Events, Education, Entertainment
- Summarize the privacy practices relevant to the app category in a short table
 - What would be the columns?
 - Only share vs not share? Or, another scale?
 - What should a good app do? Balance functionality and privacy (match with user preferences)

Disagreeable Privacy Policies

DISAGREEABLE PRIVACY POLICIES: MISMATCHES BETWEEN MEANING AND USERS' UNDERSTANDING†

*Joel R. Reidenberg, Travis Breaux, Lorrie Faith Cranor,
Brian French, Amanda Grannis, James T. Graves, Fei Liu,
Aleecia McDonald, Thomas B. Norton, Roban Ramanath,
N. Cameron Russell, Norman Sadeh and Florian Schaub†**

ABSTRACT

Privacy policies are verbose, difficult to understand, take too long to read, and may be the least-read items on most websites even as users express growing concerns about information collection practices. For all their faults, though, privacy policies remain the single most important source of information for users to attempt to learn how companies collect, use, and share data. Likewise, these policies form the basis for the self-regulatory notice and choice framework that is designed and promoted as a replacement for regulation. The underlying value and legitimacy of notice and choice depends, however, on the ability of users to understand privacy policies.

This paper investigates the differences in interpretation among expert, knowledgeable, and typical users and explores whether these groups can understand the practices described in privacy policies at a level sufficient to support rational decision-making. This paper seeks

Research Objectives

- Better inform users about data use purposes
- Give them choice: Consent, opt-out

Survey Tool

The screenshot shows a survey tool interface. On the left, there is a search bar labeled "Search this policy" and a list of links for "time.com" privacy policy sections, including "Sports Illustrated PRIVACY POLICY", "Table of Contents", "The Information We Collect", "How We Use the Information", "Privacy Options", "Your California Privacy Rights: Notice to California Customers", "Collection of Information by Third-Party Sites and Sponsors", "Cookies", "Our Commitment to Security", "Accessing, Correcting, and Deleting Your Personal Information", "Retention of Personal Information", "Special Note for Parents", "Changes to this Privacy Policy", "How to Contact Us", "Safe Harbor Privacy Policy", "European Union Privacy Information", "For citizens of member countries of the European Union, and Switzerland, Norway, Lichtenstein, Iceland, Australia, and New Zealand", and "Canada Privacy Information". Below the links, it states: "This is the Privacy Policy which applies to you if you live outside the European Union, Switzerland, Norway, Lichtenstein, Iceland, Australia, New Zealand, and Canada."

On the right, the survey tool asks the question: "Does the policy state that the website might collect contact information about its users?". Below the question are two buttons: "Select sentence from policy and click" and "Remove last selection". A text box contains the selected sentence: "Your personally identifiable information may be required to engage in these activities as well as to receive products and services that you may have requested." Below the text box are four radio button options: "No - the policy explicitly states that the website will not collect contact information.", "Yes - the policy explicitly states that the website might collect contact information.", "Unclear - the policy does not explicitly state whether the website might collect contact information or not, but the selected sentences could mean that contact information might be collected.", and "Not applicable - this question is not addressed by this policy." There is a "Next" button and a "Your Progress" indicator.

Study Details

- Participant groups
 - Typical users (e.g., crowd workers)
 - Knowledgeable users: Graduate students with a background in law, public policy, or computer science
 - Privacy policy experts

- Privacy policy dataset
 - News websites: ABC News, Washington Post, Weather Underground
 - Shopping websites: Barnes and Noble, Lowe's, Overstock

Intra-Group Agreement: Data Collection

Level of Agreement on the Same Answer (Median Across All Policies)	Collect Contact	Collect Financial	Collect Location	Collect Health
Experts				
All choices	100 %	87.5 %	100 %	50 %
Answer Choice 1	n/a	n/a	n/a	n/a
Answer Choice 2	100 %	100 %	100 %	n/a
Answer Choice 3-4	n/a	75 %	n/a	100 %
Knowledgeable Users				
Using All Answers	100 %	100 %	70 %	80 %
Answer Choice 1	n/a	n/a	n/a	n/a
Answer Choice 2	100 %	100 %	90 %	n/a
Answer Choice 3-4	n/a	90 %	100 %	100 %
Crowd Workers				
Using All Answers	90 %	50 %	90 %	70 %
Answer Choice 1	n/a	n/a	n/a	n/a
Answer Choice 2	90 %	100 %	90 %	n/a
Answer Choice 3-4	n/a	60 %	n/a	100 %

Intra-Group Agreement: Data Sharing

Level of Agreement on the Same Answer (Median Across All Policies)	Share Contact	Share Financial	Share Location	Share Health
Experts				
All Choices	75 %	62.5 %	62.5 %	50 %
Answer Choice 1	n/a	n/a	n/a	n/a
Answer Choice 2-4	87.5 %	87.5 %	75 %	n/a
Answer Choice 5-6	n/a	n/a	75 %	75 %
Knowledgeable Users				
All Choices	60 %	50 %	60 %	80 %
Answer Choice 1				
Answer Choice 2-4	80 %	80 %	100 %	n/a
Answer Choice 5-6	60 %	60 %	100 %	100 %
Crowd Workers				
All Choices	60 %	60 %	40 %	80 %
Answer Choice 1	n/a	n/a	n/a	n/a
Answer Choice 2-4	100 %	60 %	60 %	n/a
Answer Choice 5-6	n/a	100 %	70 %	100 %

Intra-Group Agreement: Data Deletion

	Level of Agreement on the Same Answer (Median Across All Policies)
Experts	
All Choices	75 %
Answer Choice 1	n/a
Answer Choice 2-3	100 %
Answer Choice 4-5	n/a
Knowledgeable Users	
Using All Answers	60 %
Answer Choice 1	n/a
Answer Choice 2-3	100 %
Answer Choice 4-5	n/a
Crowd Workers	
Using All Answers	50 %
Answer Choice 1	n/a
Answer Choice 2-3	100 %
Answer Choice 4-5	n/a

Inter-Group Agreement: Data Sharing

	Sharing Contact	Sharing Financial	Sharing Location	Sharing Health
Experts Selecting Mode Answer Choice (Median Across All Policies)	87.5 %	87.5 %	75 %	75 %
Knowledgeable Users Selecting Experts' Mode Answer Choice (Median Across All Policies)	80 %	50 %	60 %	100 %
Crowd Workers Selecting Experts' Mode Answer (Median Across All Policies)	100 %	40 %	60 %	100 %

Difficulty of Annotating Policies

Policy	Experts (avg. ease)	Knowledgeable users (avg. ease)	Crowd workers (avg. ease)
Overstock	3.00	3.40	3.00
Lowe's	3.00	3.00	1.80
Barnes and Noble	2.25	2.60	2.40
ABC News	3.50	3.60	3.00
Weather Underground	2.50	3.20	2.80
Washington Post	3.00	3.60	2.20

Implications

- Challenges with annotating text
 - Experts inadvertently focus on irrelevant material
 - Multiple parts of text correspond to answers to a specific question
- Findings reinforce the fact that privacy policies
 - Too ambiguous to be meaningful
 - Need to clarify specific data practices, especially regarding data sharing
 - Need to use better language for the public (non-experts)
- Crowdsourcing might be a potential solution for semi-automated extraction