17 – Usability of privacy policies and the dimensions of privacy notice

Carnegie Mellon University CyLab

institute for SOFTWARE RESEARCH

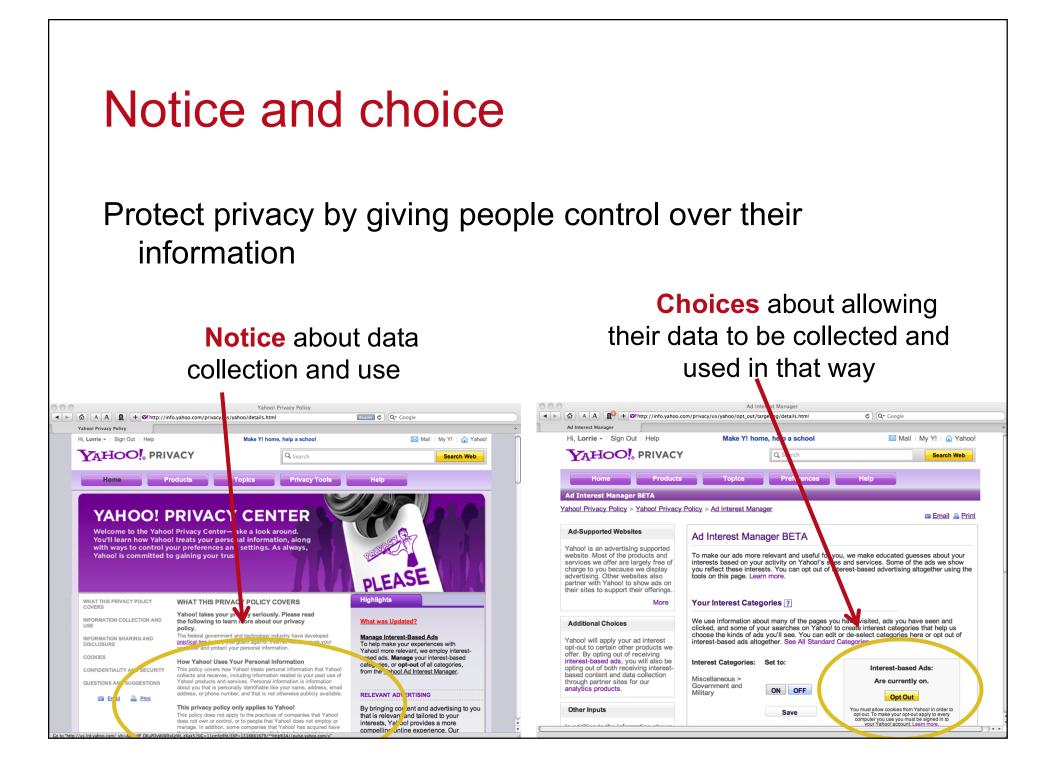
Engineering & Public Policy



Lujo Bauer, Nicolas Christin, and Abby Marsh

March 16, 2016

05-436 / 05-836 / 08-534 / 08-734 / 19-534 / 19-734 Usable Privacy and Security



Nobody wants to read privacy policies

"the notice-and-choice model, as implemented, has led to long, incomprehensible privacy policies that consumers typically do not read, let alone understand"

 Protecting Consumer Privacy in an Era of Rapid Change. Preliminary FTC Staff Report. December 2010.



Nobody wants to read privacy policies

- Research needed to develop:
 - concise formats for showing policies
 - tools for alerting users of policy mismatches
 - integrated with normal functionality (e.g., web search)
 - tools to extract information from human-readable policy

Towards a privacy "nutrition label"

- Standardized format
 - People learn where to find answers
 - Facilitates policy comparisons
- Standardized language
 - People learn terminology
- Brief
 - People find info quickly
- Linked to extended view
 - Get more details if needed

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	Potassium 180mg	5%	11%	
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	Soluble Fiber 2g			
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	Vitamin A	0%	6%	
	Vitamin C	35%	35%	
	Calcium	2%	15%	
	Iron	10%	10%	
	Vitamin E	8%	8%	
	Thiamin	10%	15%	
	Riboflavin	4%	10%	
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	Amount per Serving	
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	vendors follow Good Manufacturing Pri	aC+

Our vendors follow Good Manufacturing Practices to segregate ingredients to avoid cross contact with allergens. Made on shared equipment with milk, tree nuts & soy. Facility processes eggs & peanuts.

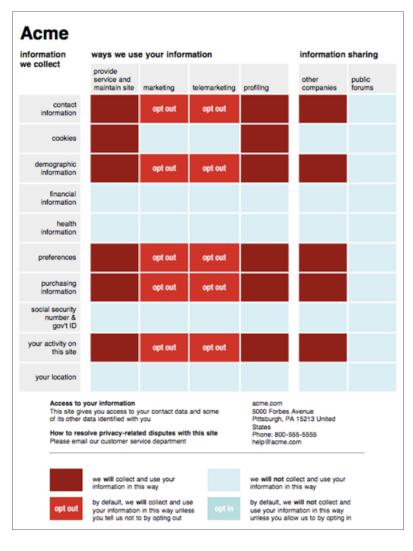
Dist. & Sold Exclusively By: Trader Joe's, Monrovia, CA 91016

Certified Organic by Juality Assurance International (OA

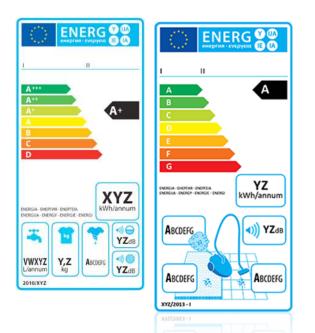


Iterative design process

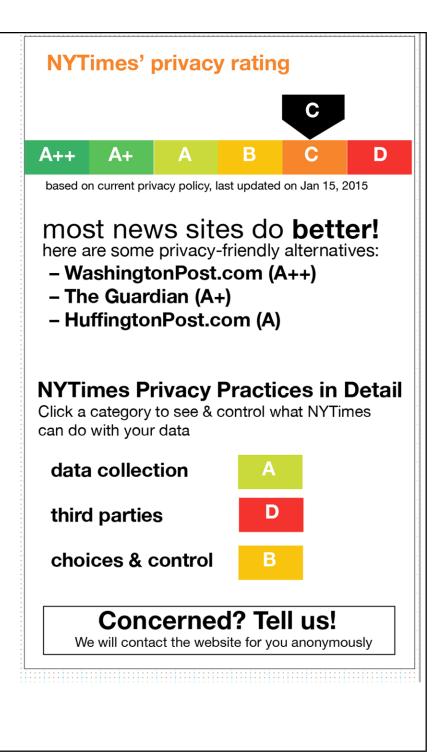
- Series of studies
 - Focus groups
 - Lab studies
 - Online studies
- Metrics
 - Reading-comprehension (accuracy)
 - Time to find information
 - Ease of policy comparison
 - Subjective opinions, ease, fun, trust
- P.G. Kelley, J. Bresee, L.F. Cranor, and R.W. Reeder. A "Nutrition Label" for Privacy. SOUPS 2009.
- P.G. Kelley, L.J. Cesca, J. Bresee, and L.F. Cranor. Standardizing Privacy Notices: An Online Study of the Nutrition Label Approach. CHI2010.

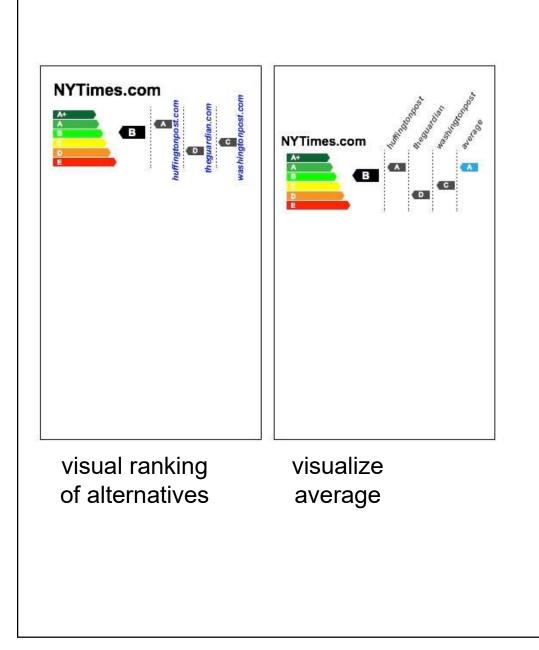


- rate website on scale
- give specific alternatives
- inspired by energy labels



From CMU's Usable Privacy Policies Project. N. Sadeh, A. Acquisti, T. Breaux, L. Cranor, ...





Privacy label for Android



Like word games? Like weasels? This is the game for you. Word Weasel is a fast word game where you find as many words as you can from 9 letters in 50 seconds. Compete with everyone else playing at the same time, a new game starts every minute!

"The most fun you can have on your own with 9 random letters. Brilliantly simple, devilishly addictive." --Kim, Android Market comment



comment

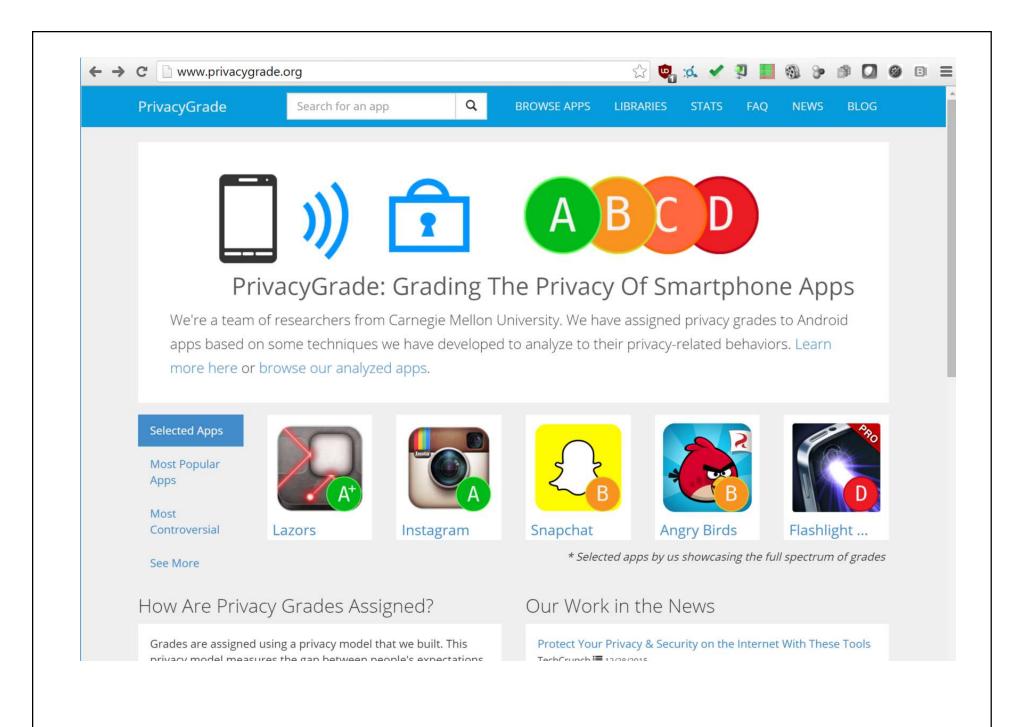
Ad supported, with ability to upgrade to adfree full version in game.

Uses the SOWPODS word list containing 100,000+ words. They may be obscure, but ves those are words!

Privacy Facts

THIS APP COLLECTS YOUR Personal information Credit card / financial Contacts Diet / nutrition ✓ Location Health / medical □ Calendars D Photos THIS APP USES ✓ Analytics Advertising REVIEWS

Average	5 stars	534
4.6	4 stars	210
4.0	3 stars	37
*****	2 stars	5
793	1 star	7



http://www.azarask.in/blog/post/privacy-icons/

2010



Privacy Icons

Your Data is Used Only for the Intended Use



Your data is never bartered or sold.



Your Data May be Used for Purposes You Do Not Intend



Your data may be bartered or sold.



Your data is never given to advertisers.



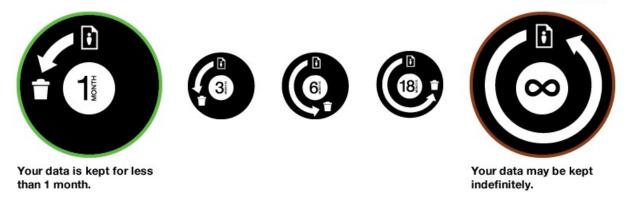
Site gives your data to advertisers.



Data is given to law enforcement only when legal process is followed.



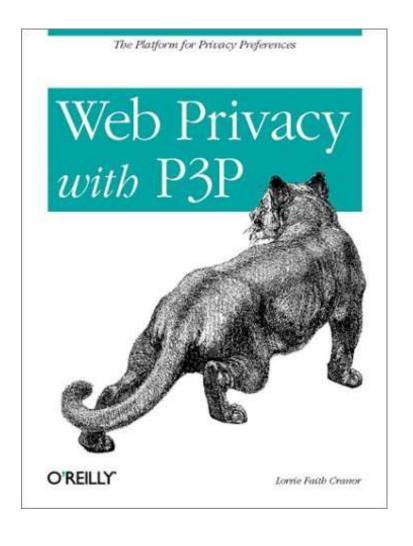
Data may be given to law enforcement even when legal process is not followed.



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Smartphone App Privacy Icon Study Conducted for LifeLock, Inc. by Cranor et al., 2013

Let your computer read for you

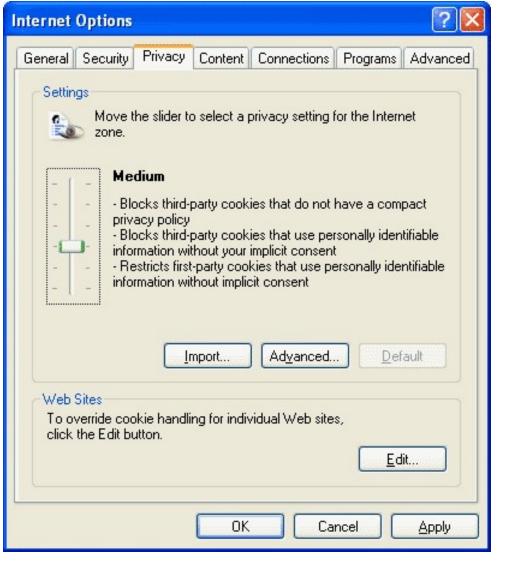


- Platform for Privacy Preferences (P3P)
- W3C specification for XML privacy policies
 - Proposed 1996
 - Adopted 2002
- Optional P3P compact policy HTTP headers to accompany cookies
- Lacks incentives for adoption

What's in a P3P policy?

- Name and contact information for site
- The kind of access provided
- Mechanisms for resolving privacy disputes
- The kinds of data collected
- How collected data is used, and whether individuals can opt-in or opt-out of any of these uses
- Whether/when data may be shared and whether there is opt-in or opt-out
- Data retention policy

P3P in IE6

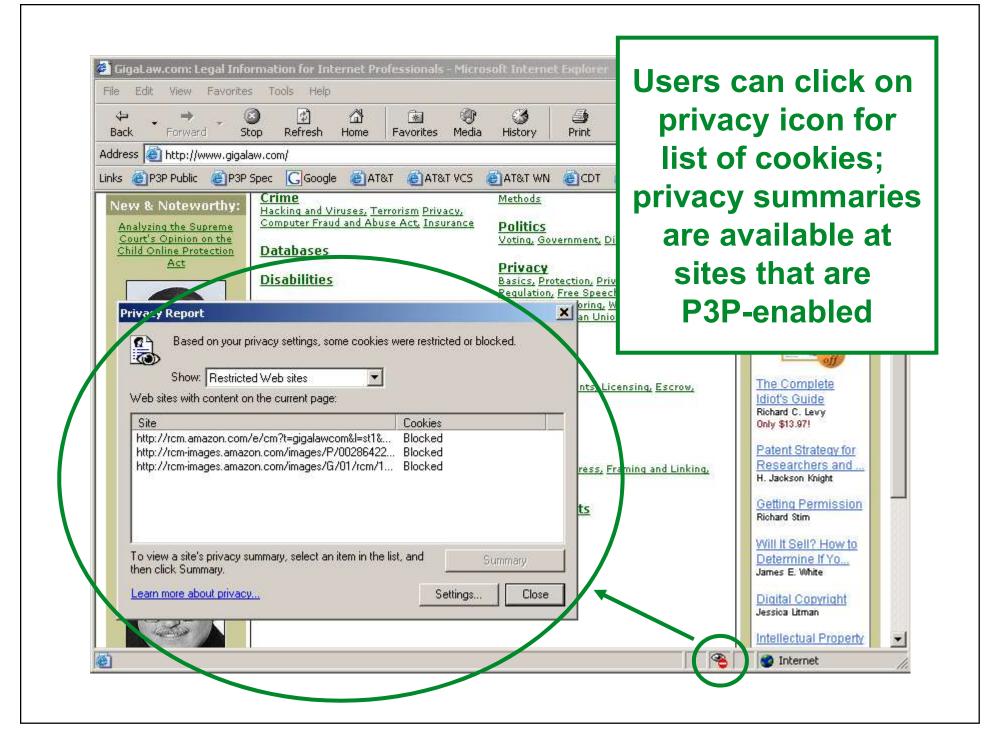


Automatic processing of compact policies only; third-party cookies without compact policies blocked by default



Privacy icon on status bar indicates that a cookie has been blocked – pop-up appears the first time the privacy icon appears







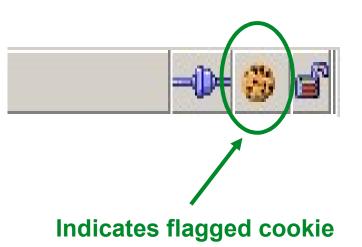
Privacy summary report is generated automatically from full P3P policy

🔮 Privacy Policy × Privacy Summary for: Microsoft Corporation To read this Web site's complete privacy policy, click here. Privacy Certificate: Register a dispute Site statement 1 What kind of information does this Web site collect? Information that allows an individual to be contacted or located in the physical world, such as a telephone number or a postal address. Information that allows an individual to be contacted or located on the Internet. such as an e-mail address. Often, this information is independent of the How should cookies from "microsoft.com" be handled? 0K Compare cookies' Privacy Policy to my settings. Cancel C Always allow this site to use cookies. C Never allow this site to use cookies.

P3P in Netscape 7

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Preview version similar to IE6, focusing, on cookies; cookies without compact policies (both first-party and third-party) are "flagged" rather than blocked by default



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ar.atwola.com	badsc	
ar.atwola.com	badsc	
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Domain:	.cnnaudience.com	
Path:	I	
Server Secure:	no	
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Users can view English translation of (part of) compact policy in Cookie Manager

P3P Privacy Policy Summary	
P3P Privacy Policy Summary	
Privacy Policy For Walt Disney Internet Group	
o see the full human readable policy, click <u>here</u> .	
o see the opt-in/opt-out instructions for this web site, click <u>here</u> .	
Privacy Policy Summary	
his web site has the following statements in its P3P privacy policy:	
Site Statement 1	
<u>Site Statement 2</u>	
Site Statement 1	
This web site collects information about:	
 The computer system that you are using to access the internet. 	
 Your likes and dislikes. 	
 Purchases you make online. 	
• Your behavior on the web site such as queries to a search engine.	
\bullet Specific content that you have provided to the site such as the text of	f an e-mail.
The information that you supply to this web site may be used for:	
• Provide technical support of the web site and its computer system.	
• Contact you by some means other than by telephone to promote a p	product or service.
- You will be given an opportunity to opt-in to having your infor	mation used for this
purpose.	
 Complete the activity for which it was specifically provided 	

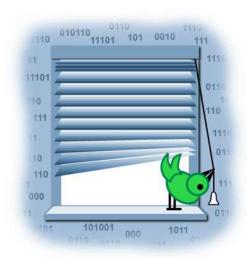
A policy summary can be generated automatically from full P3P policy

AT&T Privacy Bird

- Free download of beta from http://privacybird.com/
- "Browser helper object" for IE 5.01/5.5/6.0
- Reads P3P policies at all P3P-enabled sites automatically



- Clicking on bird icon gives more information
- Current version is information only no cookie blocking



Chirping bird is privacy indicator

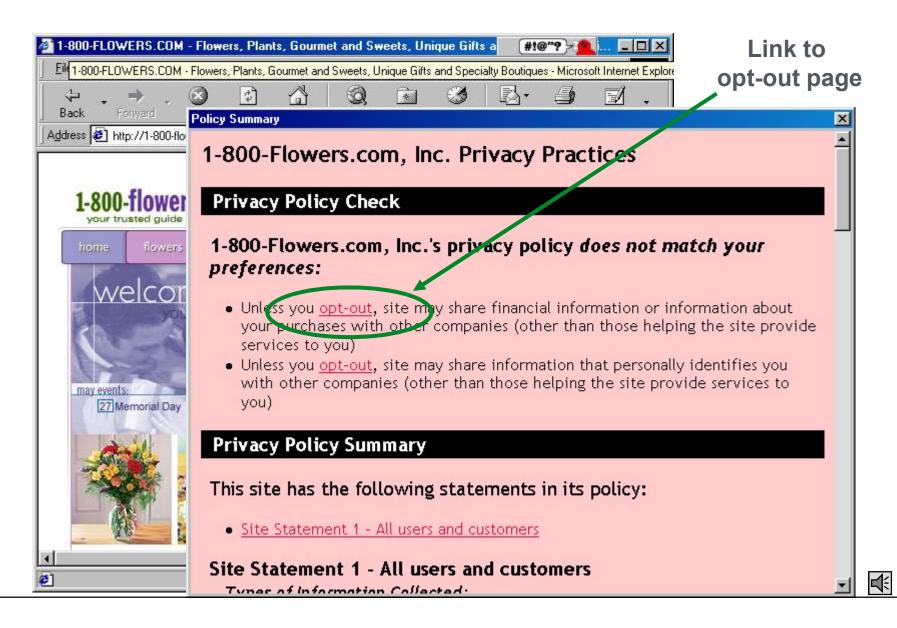
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Click on the bird for more info

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Shane Zachary	Privacy Policy Check	
Share Zachary	Shane Cranor's Home Page's privacy policy matches your preferences.	
	Privacy Policy Summary	
	This site has the following statements in its policy:	
	<u>Site Statement 1</u>	
	Site Statement 1	
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Shane's Photo Album	 HTTP protocol information Click-stream information 	
• <u>Shane's First Year</u>	How your information will be used:	
Shane's Latest Photo	 Research and development To complete the activity for which the data was provided Web site and system administration 	
Shane attended Mom's Ch		
The next day Shane help:	Who will use your information:	
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Privacy policy summary - mismatch



Expand/collapse added in beta 1.2



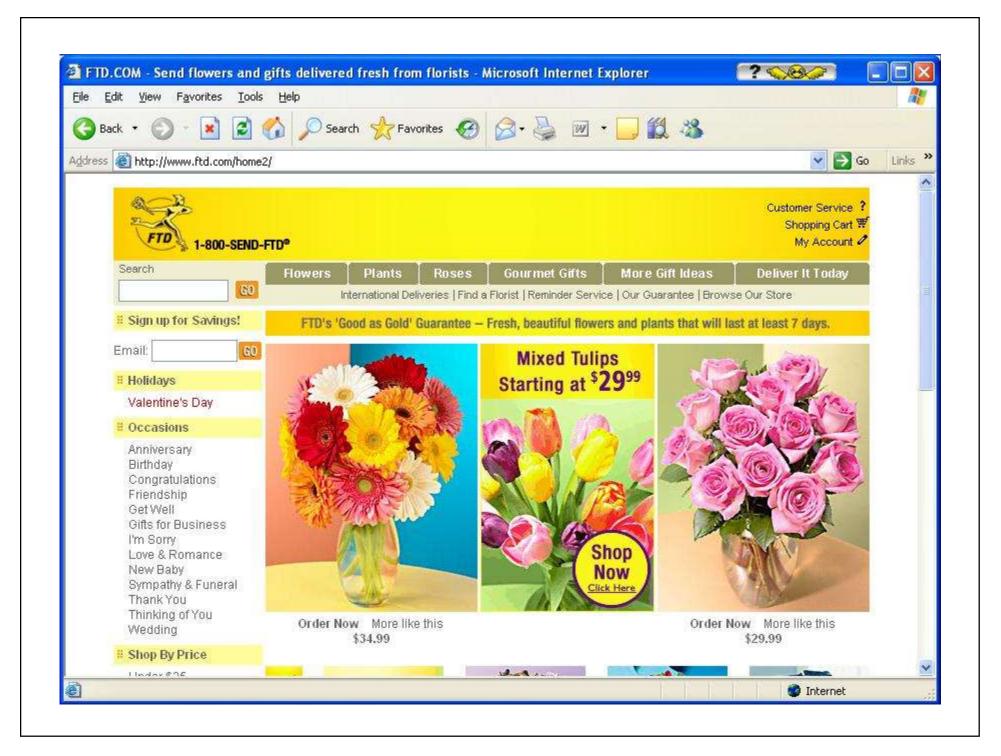
Bird checks policies for embedded content

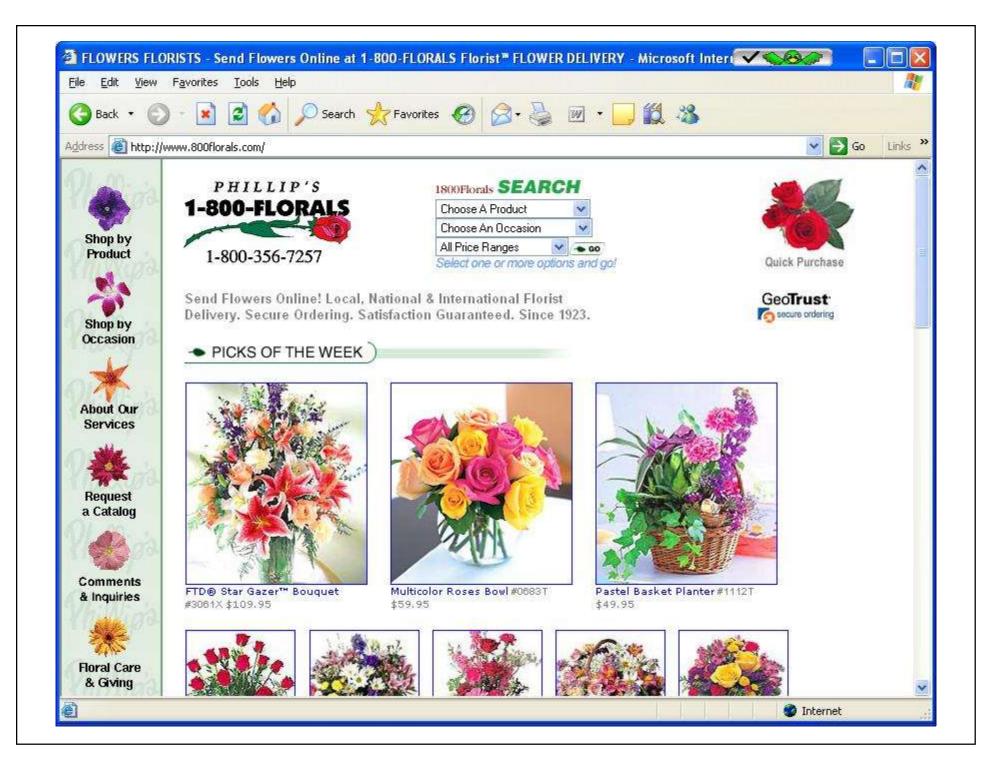
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Privacy Bird icons



Example: Sending flowers





Privacy Finder

- Prototype developed at AT&T Labs, improved and deployed by CUPS
- Uses Google or Yahoo! API to retrieve search results
- Checks each result for P3P policy
- Evaluates P3P policy against user's preferences
- Reorders search results
- Composes search result page with privacy annotations next to each P3P-enabled result
- Users can retrieve "Privacy Report" similar to Privacy Bird policy summary

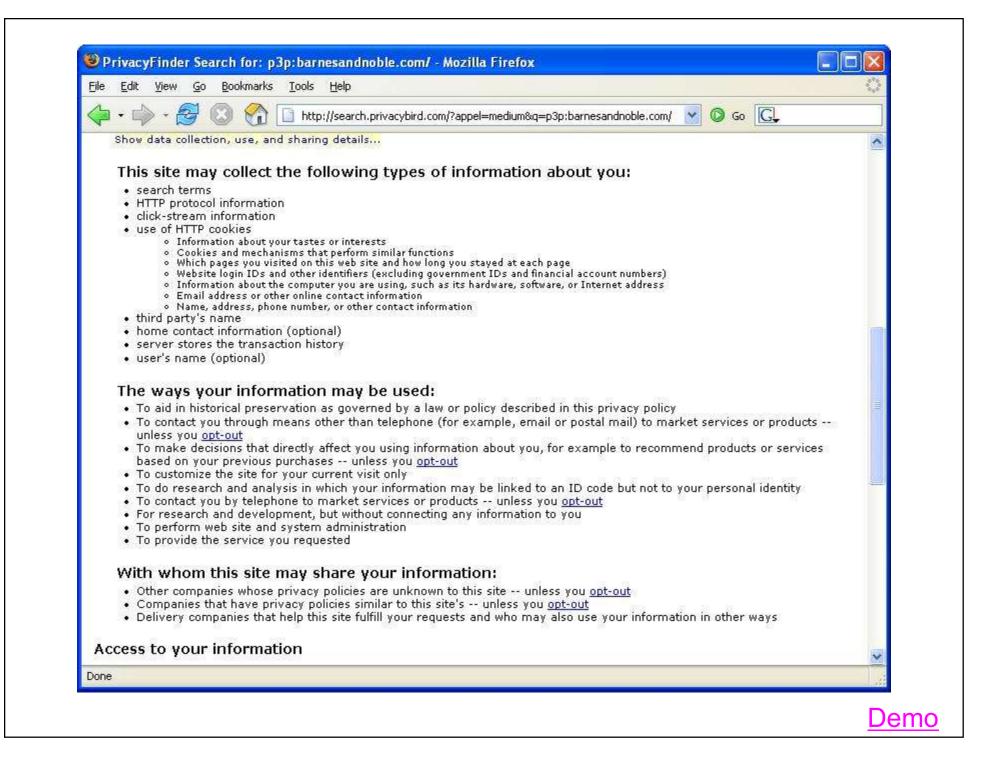
Condition 3: Privacy Information



Duracell AA batteries 8-pack

Search

Duracell Alkaline Battery, AA, 8/PK Duracell Coppertop Alkaline AA Batteries Long-life alkaline batteries provide the best, longest power source. Recommended for use in smoke alarms, flashlights, lanterns, calculators, pagers, cameras, recorders, radios, CD players www.ocvsoftware.com/c/product.html?record@56119 \$14.45 (w/shipping) 0000 ou wat to Duracell AA8 DURACELL - Alkaline Batteries Value Packs Check Mapped Duracell AA8 DURACELL Alkaline Battery Value Packs ... discountofficeitems.zoovy.com/product/DURMN15RT12Z + Privacy Policy 11111 \$14.60 (w/shipping) Duracell Alkaline Battery Value Packs CURATE Duracell AA8 DURACELL Alkaline Battery Value Packs DURACELL AA ALKALINE BATTERY - 8 PACK Privacy Report Cardboard card for peg hook 8 pack Specifications Weight 0.45 lbs Length 4.5 inches Width 3.75 inches ALC: N Height 1 inches Manufactures Web site www.duracel... www.instawares.com/Coppertop-Alkaline-Lithium-Bat... - Privacy Policy \$14.80 (w/shipping) 0000 Duracell Coppertop Alkaline AA Batteries INCOME. Phary Report Long-life alkaline batteries provide the best, longest power source. Recommended for use in smoke alarms, flashlights, lanterns, calculators, pagers, cameras, recorders, radios, CD players, medical equipment, toys 111 and electronic games. Dependable after seven years of storage. www.officequarters.com/product.onp/item/DUR-MN150388... - Privacy Policy \$15.14 (w/shipping)



No P3P syntax checking in IE

- IE accepts P3P policies containing bogus tokens or missing required tokens
- Example of valid compact policy: CAO DSP COR CURa ADMa DEVa OUR IND PHY ONL UNI COM NAV INT DEM PRE
- Examples of invalid policies accepted by IE: amazon.com AMZN



Facebook does not have a P3P policy. Learn why here: http://fb.me/p3p

P. Leon, L. Cranor, A. McDonald, and R. McGuire. Token Attempt: The Misrepresentation of Website Privacy Policies through the Misuse of P3P Compact Policy Tokens. WPES 2010.

IEBlog	Windows Int	ternet Explorer Engineering Team Blog [
MSDN Blogs > IEBlog > Google Bypassing User Privacy	Settings	Languages
Google Bypassing User P	rivacy	English
Settings	3 - 20	Français
Settings		Deutsch
Published Monday, February 20, 2012 1:31 PM	152 comments	Português (Brasil)
When the IE team heard that Google had bypassed user	privacy settings on Safari.	한국어
we asked ourselves a simple question: is Google circum	and a second state of the second s	日本語
preferences of Internet Explorer users too? We've discov	and the state of the second	简体中文
Google is employing similar methods to get around the	default privacy	Duccuui

Google

Microsoft uses a "self-declaration" protocol (known as "P3P") dating from 2002 It is well known – including by Microsoft – that it is impractical to comply with Microsoft's request while providing modern web functionality.

Alternatives to machine-readable policies...

- Extract information from human-readable policies through:
 - Natural language processing
 - Crowdsourcing

Crowdsourcing privacy policy extractions

- Not your typical crowdsourcing task
- Challenges
 - obtain high quality annotations
 - with manageable cost
 - from non-expert crowd workers
 - from complex policy documents

Privacy policy annotation tool

Search this policy	٩	
t	ime.com	Answer the following questions
Sports Illustrated		Click here to view the instructions again
PRIVACY POLICY		
Table of Contents		Question:
		Does the policy state that the website might collect
The Information We Collect		contact information about its users?
How We Use the Information		Select sentence from policy and click Remove last selection
Privacy Options		
Your California Privacy Rights: Notice to California Customers		Your personally identifiable information may be required to
Collection of Information by Third-Party Sites and Sponsors		engage in these activities as well as to receive products and
Cookies		services that you may have requested.
Our Commitment to Securit	A MARKET AND ALCO ALCON	
Accessing, Correcting, and Retention of Personal Inforr	Deleting Your Personal Information	No - the policy explicitly states that the website will not collect
Special Note for Parents		contact information.
Changes to this Privacy Policy		Yes - the policy explicitly states that the website might collect contact information.
How to Contact Us		
Safe Harbor Privacy Policy	4	
, , ,		 Unclear - the policy does not explicitly state whether the website might collect contact information or not, but the selected
European Union Privacy Inf	ormation	sentences could mean that contact information might be
For citizens of member countries of the European Union, and		collected.
Switzerland, Norway, Lichtenstein, Iceland, Australia, and New Zealand		
		Not applicable - this question is not addressed by this policy.
Canada Privacy Information		Next
This is the Privacy Policy wh	nich applies to you if you live outside the	
European Union, Switzerland, Norway, Lichtenstein, Iceland, Australia,		Your Progress
New Zealand, and Canada.		Jump directly to question -

Interpretation of privacy policies

 Comparative annotation study with privacy policy experts, skilled annotators, AMT Crowdworkers on 6 privacy policies

Result Highlights

- Data collection relatively easy to identify
- Data sharing practices more difficult
- Even experts do not always agree
- Finer nuances difficult to extract
- Policy language too ambiguous

Reidenberg et al., *Disagreeable Privacy Policies: Mismatches between Meaning and Users' Understanding,* Berkeley Technology Law Journal (to appear), available on SSRN



PRIVACY

FXPFRT

Nobody wants to read privacy policies

- Research needed to develop:
 - concise formats for showing policies
 - tools for alerting users of policy mismatches
 - integrated with normal functionality (e.g., web search)
 - tools to extract information from human-readable policy