

Cookies, Web Browsers, and Informed Consent Online



Informed consent provides a critical protection for privacy, and supports other human values such as autonomy and trust. In turn, technical mechanisms provide a critical component in realizing informed consent for online interactions.

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Current State of Informed Consent Online

- ❖ Currently there is a mismatch between industry practice and the public's interest in informed consent
- ❖ According to a recent report from the Federal Trade Commission, for example, 59% of sites that collect personal identifying information neither inform Internet users that they are collecting such information nor seek the user's consent
- ❖ According to a Harris poll, 88% of users want sites to garner their consent in such situations

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Research Goals

- ❖ To understand the value of informed consent carefully
- ❖ To understand how this value plays out in the context of Web browser-based interactions
- ❖ To use the methods of Value-Sensitive Design to explore what we can do proactively through design to preserve and enhance the value in our online interactions
- ❖ Funded by NSF Award IIS-9911185

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Value-Sensitive Design Methods

❖ **Conceptual Analyses**

Developed a conceptual model for informed consent that could be meaningfully applied to online contexts

❖ **Technical Analyses**

Conducted a retrospective analysis of cookie technology with respect to that conceptual model

1. Existing Implementation → Support Informed Consent
2. Model of Informed Consent → New Implementation

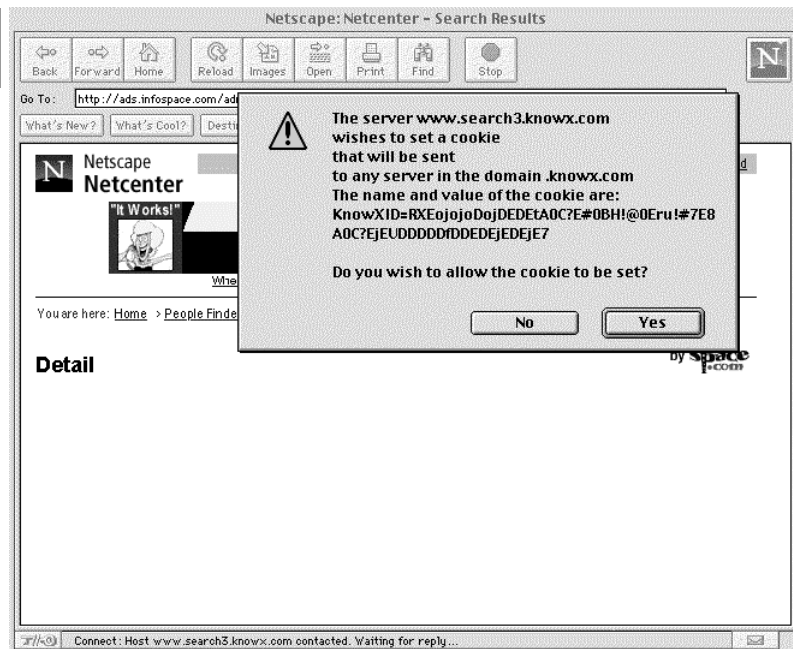
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A Bit of Background...

- ❖ Intuition for Informed Consent
- ❖ How Web Browsers and Cookies Work

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BROWSER	NETSCAPE NAVIGATOR						INTERNET EXPLORER			
	Version	1.1	2.02	3.04	4.03	4.6	6.01	3.0	4.0	5.0
Release date	4/95	3/96	8/96	6/97	5/99	1/01	8/96	8/97	3/99	
Menu levels	N/A	N/A	3	3	3	3	3*	3	3/4	
"Accept all/none"	No	No*	No	YES	YES	YES	No	YES	YES	
"Ask before accepting"	No	No	YES	YES	YES	YES	YES	YES	YES	
"Accept some/all/none"	No	No*	No	YES	YES	YES	No	No	YES	
"Don't reaccept cookies later"	No	No	No	No	No	YES	No	No	No	
Block specific domains	No	No	No	No	No	YES	No	No	No	
View cookie content fields	No	No	No	No	No	YES	No	No	No	
Delete cookies	No	No	No	No	No	YES	No	No	No	
Default setting	Accept all	Accept all	Accept all	Accept all*	Accept all	Accept all	Accept all*	Accept all*	Accept all*	

Cookies Timeline: The Beginning...

April 1995 (Netscape 1.1)

- First browser to allow cookies
- No preference settings (can't turn off cookies)
- No visibility to the user

Summer 1996 (Netscape 3.0; IE 3.0)

- Option to decline individual cookies, one by one
- No way to turn off all cookies
- Default: Accept all cookies

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Cookie Timeline: The Middle Years...

Summer 1997 (Netscape 4.0; IE 4.0)

- Can turn off cookies
- In Netscape 4.0 can accept some classes of cookies but not others
- Default: Accept all cookies

Spring 1999 (Netscape 4.6; IE 5.0)

- Virtually no changes from Netscape 4.0 to 4.6
- In IE 5.0 can accept some classes of cookies
- In IE 5.0 cookies settings are tied to security zones (only one zone tells the user the cookie setting)
- Default: Accept all cookies

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Cookie Timeline: Late Breaking ...

Winter 2001 (Netscape 6.01)

- View cookie content fields
- Delete cookies
- Block cookies for certain domains
- Remember not to “reaccept a cookie later”
- Default: Accept all cookies

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What Counts as “Informed”?

i. Disclosure

- ❖ Potential harms and risks from engaging in the activity should be made explicit.
- ❖ The purpose and benefits of engaging in the activity should be made explicit.
- ❖ When information is collected, make explicit: (a) what will be collected, (b) who will have access to it, (c) how long it will be archived, (d) what it will be used for, and (e) how the individual’s Identity will be protected.

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What Counts as Informed?

ii. Comprehension

- ❖ Refers to the individual’s accurate interpretation of *what* is being disclosed.
- ❖ Implies that the information disclosed is provided in a language and manner that is easily understood by the individual.

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What Counts as “Consent”

iii. Voluntariness

- ❖ The opportunity to consent or decline must be genuine – that is, not coerced.
- ❖ Less obvious forms of coercion can occur when there is only one reasonable way for individuals to receive certain needed services or information.

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What Counts as “Consent”?

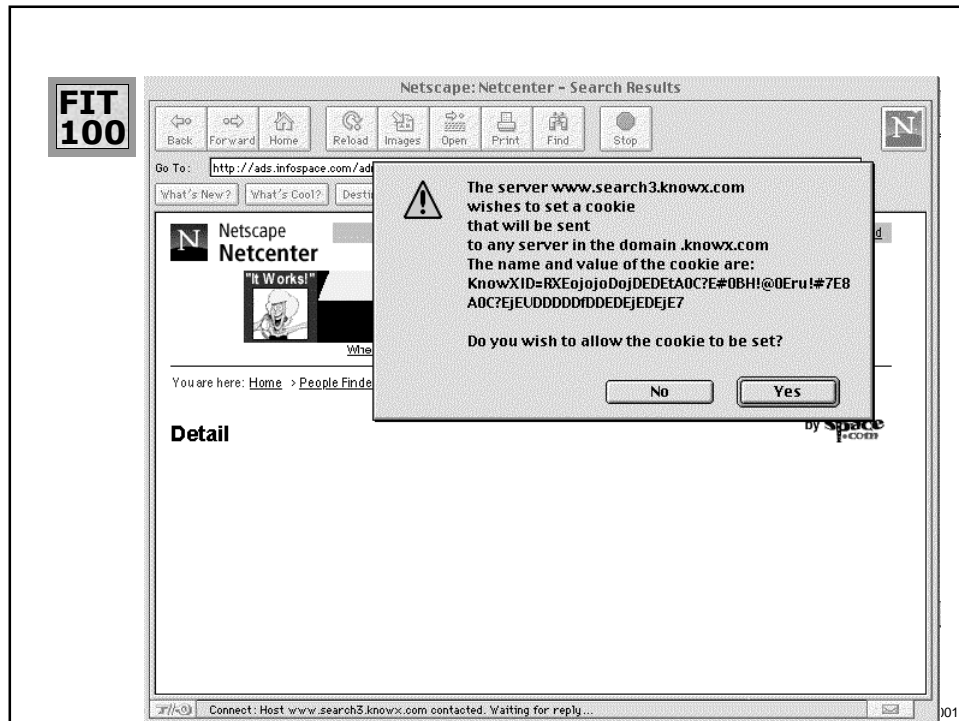
iv. Competence

- ❖ Individual possess the mental, emotional, and physical capabilities needed to be capable of giving informed consent (e.g., youth)

v. Agreement

- ❖ Reasonably clear opportunity to accept or decline to participate
- ❖ In traditional human subjects research, consent is on-going

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Persistent Problems and Remedies

- *The information disclosed about a cookie still does not adequately specify what the information will be used for or how the user might benefit or be harmed by its use.*

Remedy: Redesign the browser's cookie dialog box to include three additional fields one for stating the purpose for setting the cookie, one for a brief statement of benefits, and one for a brief statement of risks.

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Persistent Problems and Remedies

- *In order to change cookie preference settings to something other than “accept all cookies”, a user needs to traverse a minimum of three menu levels to locate the preference settings.*

Remedy: Cookie preference settings should be located in a meaningful menu hierarchy (e.g., “Privacy and Security”) and located close to the top of that hierarchy.

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Persistent Problems and Remedies

- *In Internet Explorer, the burden to decline all third party cookies still falls to the user who must decline each cookie one at a time.*

Remedy: Redesign the browser preference setting to include a comprehensibly-labeled option to decline all cookies that would be returned to third party Web sites.

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Persistent Problems and Remedies

4. *None of the browsers* provide the user with control over how long a cookie will exist on the user's machine.*

Remedy: Redesign the browser to allow users to easily delete a cookie or to change a cookie's expiration date.

**NS 6.01 now allows the user to delete a cookie.*

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Persistent Problems and Remedies

- *The default cookie setting for current browsers is "accept all cookies". Thus, the "out-of-the-box" experience for users of NS 4.6 or IE 5.0 in mid-1999 is no different than their "out-of-the-box" experience of cookies for NS 1.1 in 1995.*

Remedy: What is needed is a default that preserves informed consent without unnecessarily burdening the user with overwhelming queries. Likely, different solutions are needed for sophisticated and novice users.

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Persistent Problems and Remedies

- *No browser alerts a user to when a site wishes to use a cookie, as opposed to store a cookie.*

Remedy: ???

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Some Conclusions from Our Work

- ❖ Since 1995, the industry had made a sustained effort to realize informed consent for cookie technology.
- ❖ But there is more that should be done.
- ❖ Some remedies are difficult or no longer possible to implement because changes must occur at levels no longer within reach of the browser itself.
- ❖ This work offers a conceptual model and criteria for examining informed consent in online contexts beyond cookies.

(UW-CSE Technical Report 2000-12-3 at <http://www.cs.washington.edu/research/tr/tr-by-date.html>)

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Additional Conclusions...

Leads to two larger ideas:

- ❖ With regard to many human values, it is much easier to design proactively to protect and foster the value than to retrofit existing designs.
- ❖ To do so requires that, as a profession, we embrace a well-articulated set of human values as criteria – along with technical criteria such as reliability, correctness, and efficiency -- by which we judge the quality of the systems we design and deploy.

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A Surprise!

- ❖ During the quarter, we've alluded to computing that is:
 - ❑ Embedded in physical objects
 - ❑ Responsive to the user
 - ❑ Has sensors to "sense" the environment
 - ❑ Interacts with you by voice and gesture
- ❖ Now, I'd like to introduce you to AIBO...
 - ❑ A companion for the elderly?
 - ❑ A babysitter for a young child?
 - ❑ A new form of entertainment?

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