

Lecture 12:

- (i) Anonymization;
- (ii) Privacy

CMSC 25900 / DATA 25900

Spring 2021

The University of Chicago



THE UNIVERSITY OF
CHICAGO

“...a tension that shakes a foundational belief about data privacy: Data can be either useful or perfectly anonymous but never both.” – Paul Ohm

Historical Conceptualizations of Anonymization and Personal Data

Personally Identifiable Information (**PII**)

- Also termed “**personal data**”
- 2010 NIST Special Publication 800-122 Guide to Protecting the Confidentiality of Personally Identifiable Information (PII)
- General Data Protection Regulation (GDPR)

NIST 800-122 Definitions

- “**PII** is —any information about an individual maintained by an agency, including (1) any information that **can be used to distinguish or trace an individual’s identity, such as name, social security number, date and place of birth, mother’s maiden name, or biometric records**; and (2) any other information that is **linked or linkable to an individual, such as medical, educational, financial, and employment information.**”

NIST 800-122 PII Examples

- **Name**, such as full name, maiden name, mother's maiden name, or alias
- **Personal identification number**, such as social security number (SSN), passport number, driver's license number, taxpayer identification number, patient identification number, and financial account or credit card number
- **Address information**, such as street address or email address
- **Asset information**, such as Internet Protocol (IP) or Media Access Control (MAC) address or other host-specific persistent static identifier that consistently links to a particular person or small, well-defined group of people
- **Telephone numbers**, including mobile, business, and personal numbers
- **Personal characteristics**, including photographic image (especially of face or other distinguishing characteristic), x-rays, fingerprints, or other biometric image or template data (e.g., retina scan, voice signature, facial geometry)
- **Information identifying personally owned property**, such as vehicle registration number or title number and related information
- **Information about an individual that is linked or linkable to one of the above** (e.g., date of birth, place of birth, race, religion, weight, activities, geographical indicators, employment information, medical information, education information, financial information).

NIST 800-122 Definitions

- “To **distinguish** an individual is to identify an individual. Some examples of information that could identify an individual include, but are not limited to, name, passport number, social security number, or biometric data. In contrast, a list containing only credit scores without any additional information concerning the individuals to whom they relate does not provide sufficient information to distinguish a specific individual.”
- “To **trace** an individual is to process sufficient information to make a determination about a specific aspect of an individual’s activities or status. For example, an audit log containing records of user actions could be used to trace an individual’s activities.”

NIST 800-122 Definitions

- **Linked information** is information about or related to an individual that is logically associated with other information about the individual. In contrast, linkable information is information about or related to an individual for which there is a possibility of logical association with other information about the individual. For example, if two databases contain different PII elements, then someone with access to both databases may be able to link the information from the two databases and identify individuals, as well as access additional information about or relating to the individuals. If the secondary information source is present on the same system or a closely-related system and does not have security controls that effectively segregate the information sources, then the data is considered linked. If the secondary information source is maintained more remotely, such as in an unrelated system within the organization, available in public records, or otherwise readily obtainable (e.g., internet search engine), then the data is considered linkable.

GDPR Definitions (Article 4)

- **‘personal data’** means any information relating to an identified or identifiable natural person (‘data subject’); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person;

GDPR Definitions (Article 4)

- **‘processing’** means any operation or set of operations which is performed on personal data or on sets of personal data, whether or not by automated means, such as collection, recording, organisation, structuring, storage, adaptation or alteration, retrieval, consultation, use, disclosure by transmission, dissemination or otherwise making available, alignment or combination, restriction, erasure or destruction;
- **‘restriction of processing’** means the marking of stored personal data with the aim of limiting their processing in the future;

GDPR Definitions (Article 4)

- **‘pseudonymisation’** means the processing of personal data in such a manner that the personal data can no longer be attributed to a specific data subject without the use of additional information, provided that such additional information is kept separately and is subject to technical and organisational measures to ensure that the personal data are not attributed to an identified or identifiable natural person;

Example from UChicago IRB

4. * Do you anticipate that the research data will be transferred or transported at any time?

Yes No [Clear](#)

5. * Do you plan to store data on a server or cloud service?

Yes No [Clear](#)

a. * Which server or cloud service do you plan to use?

UChicago Box

6. * Will you collect any identifiers from the research participants (including names, addresses, Social Security Numbers, email and phone contact information, etc.)?

Yes No [Clear](#)

7. * What identifying information about research participants will be linked to the data?

- Data/specimens will be directly labeled with personal identifying information
- Data/specimens will be labeled with a code that the research team can link to personal identifying information through a crosswalk to the coding system
- Data/specimens will be labeled with a code but the research team will not have access to the crosswalk that connects the codes to participant identifiers
- Data/specimens will not be labeled with any identifying information and a coding system will not be used
- Other

8. If you will be using a coding system, who will have access to the crosswalk that links participant identifiers to the data/specimens and where will you store the crosswalk?

Not applicable.

Models of Data-Release Stewardship

Scope of Releasing Data

- Release to third parties
- Release to the public
- Release to others within your organization

Models of Data-Release Stewardship

- *(Note that we just made up most terms on this page)*
- **A Release-and-Forget Model:** Try to remove PII and otherwise “deidentify” data, but then provide unrestricted access (e.g., through publicly posting a dataset)
- **A Release-Under-Conditions Model:** Try to remove PII and otherwise “deidentify” data, but then provide restricted access to them (e.g., through data processing covered under contractual obligations and an approval process) and sometimes conditions upon the processing or the release of aggregate data
- **A Managed-Processing Model:** The data steward never releases the data, but will run computation for others and provide aggregate answers

General Techniques for Anonymization

Nonanonymized Data

TABLE 1: Original (Nonanonymized) Data

Name	Race	Birth Date	Sex	ZIP Code	Complaint
Sean	Black	9/20/1965	Male	02141	Short of breath
Daniel	Black	2/14/1965	Male	02141	Chest pain
Kate	Black	10/23/1965	Female	02138	Painful eye
Marion	Black	8/24/1965	Female	02138	Wheezing
Helen	Black	11/7/1964	Female	02138	Aching joints
Reese	Black	12/1/1964	Female	02138	Chest pain
Forest	White	10/23/1964	Male	02138	Short of breath
Hilary	White	3/15/1965	Female	02139	Hypertension
Philip	White	8/13/1964	Male	02139	Aching joints
Jamie	White	5/5/1964	Male	02139	Fever
Sean	White	2/13/1967	Male	02138	Vomiting
Adrien	White	3/21/1967	Male	02138	Back pain

Suppressing Data

- **Suppression:** Deleting or omitting data

TABLE 2: Suppressing Four Identifier Fields

Race	Complaint
Black	Short of breath
Black	Chest pain
Black	Painful eye
Black	Wheezing
Black	Aching joints
Black	Chest pain
White	Short of breath
White	Hypertension
White	Aching joints
White	Fever
White	Vomiting
White	Back pain

Generalizing Data

- **Generalization:** Re-code data to be less granular

TABLE 3: Generalized

Race	Birth Year	Sex	ZIP Code*	Complaint
Black	1965	Male	021*	Short of breath
Black	1965	Male	021*	Chest pain
Black	1965	Female	021*	Painful eye
Black	1965	Female	021*	Wheezing
Black	1964	Female	021*	Aching joints
Black	1964	Female	021*	Chest pain
White	1964	Male	021*	Short of breath
White	1965	Female	021*	Hypertension
White	1964	Male	021*	Aching joints
White	1964	Male	021*	Fever
White	1967	Male	021*	Vomiting
White	1967	Male	021*	Back pain

Aggregating Data

- **Aggregation:** Release summary data rather than raw data

TABLE 4: Aggregate Statistic

Men Short of Breath	2
---------------------	---

[Broken] K-anonymity

- “A release of data is said to have the k-anonymity property if the information for each person contained in the release cannot be distinguished from at least $k - 1$ individuals whose information also appear in the release.”

[Broken] K-anonymity

Name	Age	Gender	State of domicile	Religion	Disease
Ramsha	30	Female	Tamil Nadu	Hindu	Cancer
Yadu	24	Female	Kerala	Hindu	Viral infection
Salima	28	Female	Tamil Nadu	Muslim	TB
Sunny	27	Male	Karnataka	Parsi	No illness
Joan	24	Female	Kerala	Christian	Heart-related
Bahuksana	23	Male	Karnataka	Buddhist	TB
Rambha	19	Male	Kerala	Hindu	Cancer
Kishor	29	Male	Karnataka	Hindu	Heart-related
Johnson	17	Male	Kerala	Christian	Heart-related
John	19	Male	Kerala	Christian	Viral infection

[Broken] K-anonymity

Name	Age	Gender	State of domicile	Religion	Disease
*	20 < Age ≤ 30	Female	Tamil Nadu	*	Cancer
*	20 < Age ≤ 30	Female	Kerala	*	Viral infection
*	20 < Age ≤ 30	Female	Tamil Nadu	*	TB
*	20 < Age ≤ 30	Male	Karnataka	*	No illness
*	20 < Age ≤ 30	Female	Kerala	*	Heart-related
*	20 < Age ≤ 30	Male	Karnataka	*	TB
*	Age ≤ 20	Male	Kerala	*	Cancer
*	20 < Age ≤ 30	Male	Karnataka	*	Heart-related
*	Age ≤ 20	Male	Kerala	*	Heart-related
*	Age ≤ 20	Male	Kerala	*	Viral infection

This data has 2-anonymity with respect to the attributes 'Age', 'Gender' and 'State of domicile' since for any combination of these attributes found in any row of the table there are always at least 2 rows with those exact attributes. The attributes available to an adversary are called **quasi-identifiers**. Each quasi-identifier tuple occurs in at least k records for a dataset with k -anonymity.^[14]

How Do You Find Personal Data?

- Example: Google's Cloud Data Loss Prevention (DLP) API
 - <https://cloud.google.com/dlp/docs/infotypes-reference>
- Uses heuristics to try to identify particular information types

Google Cloud DLP

InfoType	Description
ADVERTISING_ID	Identifiers used by developers to track users for <i>advertising purposes</i> . These include Google Play Advertising IDs, Amazon Advertising IDs, Apple's identifierForAdvertising (IDFA), and Apple's identifierForVendor (IDFV).
AGE	An age measured in months or years.
CREDIT_CARD_NUMBER	A <i>credit card number</i> is 12 to 19 digits long. They are used for payment transactions globally.
CREDIT_CARD_TRACK_NUMBER	A <i>credit card track number</i> is a variable length alphanumeric string. It is used to store key cardholder information.
DATE	A <i>date</i> . This infoType includes most date formats, including the names of common world holidays. Note: Not recommended for use during latency sensitive operations.
DATE_OF_BIRTH	A <i>date of birth</i> . Note: Not recommended for use during latency sensitive operations.
DOMAIN_NAME	A <i>domain name</i> as defined by the DNS standard.
EMAIL_ADDRESS	An <i>email address</i> identifies the mailbox that emails are sent to or from. The maximum length of the domain name is 255 characters, and the maximum length of the local-part is 64 characters.
ETHNIC_GROUP	A person's <i>ethnic group</i> .

Google Cloud DLP

MALE_NAME	A common <i>male name</i> . Note: Not recommended for use during latency sensitive operations.
MEDICAL_TERM	Terms that commonly refer to a person's <i>medical condition or health</i> . Note: Not recommended for use during latency sensitive operations.
ORGANIZATION_NAME	A name of a <i>chain store, business or organization</i> . Note: Not recommended for use during latency sensitive operations.
PASSPORT	A <i>passport number</i> that matches passport numbers for the following countries: Australia, Canada, China, France, Germany, Japan, Korea, Mexico, The Netherlands, Poland, Singapore, Spain, Sweden, Taiwan, United Kingdom, and the United States.
PERSON_NAME	A full <i>person name</i> , which can include first names, middle names or initials, and last names. Note: Not recommended for use during latency sensitive operations.
PHONE_NUMBER	A <i>telephone number</i> .
STREET_ADDRESS	A <i>street address</i> . Note: Not recommended for use during latency sensitive operations.
SWIFT_CODE	A <i>SWIFT code</i> is the same as a Bank Identifier Code (BIC). It's a unique identification code for a particular bank. These codes are used when transferring money between banks, particularly for international wire transfers. Banks also use the codes for exchanging other messages.
TIME	A <i>timestamp</i> of a specific time of day.
URL	A <i>Uniform Resource Locator (URL)</i> .

Google Cloud DLP

Credentials and secrets

The infoType detectors in this section detect credentials and other secret data.

InfoType	Description
AUTH_TOKEN	An <i>authentication token</i> is a machine-readable way of determining whether a particular request has been authorized for a user. This detector currently identifies tokens that comply with OAuth or Bearer authentication.
AWS_CREDENTIALS	Amazon Web Services account access keys.
AZURE_AUTH_TOKEN	Microsoft Azure certificate credentials for application authentication.
BASIC_AUTH_HEADER	A <i>basic authentication header</i> is an HTTP header used to identify a user to a server. It is part of the HTTP specification in RFC 1945, section 11.
ENCRYPTION_KEY	An <i>encryption key</i> within configuration, code, or log text.
GCP_API_KEY	<i>Google Cloud API key</i> . An encrypted string that is used when calling Google Cloud APIs that don't need to access private user data.
GCP_CREDENTIALS	<i>Google Cloud service account credentials</i> . Credentials that can be used to authenticate with Google API client libraries and service accounts.
JSON_WEB_TOKEN	<i>JSON Web Token</i> . JSON Web Token in compact form. Represents a set of claims as a JSON object that is digitally signed using JSON Web Signature.
HTTP_COOKIE	An <i>HTTP cookie</i> is a standard way of storing data on a per website basis. This detector will find headers containing these cookies.
PASSWORD	Clear text <i>passwords</i> in configs, code, and other text.

Google Cloud DLP

US_PASSPORT	A United States passport number.
US_PREPARER_TAXPAYER_IDENTIFICATION_NUMBER	A United States Preparer Taxpayer Identification Number (PTIN) is an identification number that all paid tax return preparers must use on US federal tax returns or claims for refund submitted to the US Internal Revenue Service (IRS).
US_SOCIAL_SECURITY_NUMBER	A United States Social Security number (SSN) is a 9-digit number issued to US citizens, permanent residents, and temporary residents. This detector will not match against numbers with all zeroes in any digit group (that is, 000-##-####, ###-00-####, or ###-##-0000), against numbers with 666 in the first digit group, or against numbers whose first digit is 9.
US_STATE	A United States state name.
US_TOLLFREE_PHONE_NUMBER	A US toll-free telephone number.
US_VEHICLE_IDENTIFICATION_NUMBER	A vehicle identification number (VIN) is a unique 17-digit code assigned to every on-road motor vehicle.
<h2>Uruguay</h2>	
InfoType	Description
URUGUAY_CDI_NUMBER	A Uruguayan Cédula de Identidad (CDI), or identity card, is used as the main identity document for citizens.

Google Cloud DLP

★ **Important:** Built-in infoType detectors are not a 100% accurate detection method. For example, they can't guarantee compliance with regulatory requirements. You must decide what data is sensitive and how to best protect it. Google recommends that you test your settings to make sure your configuration meets your requirements.

Global

InfoType	Description
ADVERTISING_ID	Identifiers used by developers to track users for <i>advertising purposes</i> . These include Google Play Advertising IDs, Amazon Advertising IDs, Apple's identifierForAdvertising (IDFA), and Apple's identifierForVendor (IDFV).

Can You Screw Up Data Suppression?

- Yes!

Case Study 1: ZIP Code, DOB, Sex

Massachusetts Health Data



- Mid 1990s: Group Insurance Commission (GIC)
- Upon request, GIC will release records with 100 attributes for every state employee's hospital visits
- Latanya Sweeney, "Uniqueness of Simple Demographics in the U.S. Population":
 - 87%: ZIP code + full Date of Birth + Sex is uniquely identifying
 - 53%: *City* + full Date of Birth + Sex is uniquely identifying
 - 18%: *County* + full Date of Birth + Sex is uniquely identifying
- William Weld (Governor of Massachusetts) deanonymized when Sweeney purchased voter rolls from the city of Cambridge
 - Sweeney sent the governor's records (diagnoses/prescriptions) to him

Case Study 2: AOL Search Data

AOL Search Data Release

- AOL Research released 20,000,000 search queries for 650,000 users of AOL's search engine (3 months)
- Suppressed AOL username and IP address
 - Replaced them with unique, pseudonymous identifiers



AOL Search Data Release (Aftermath)

The New York Times

A Face Is Exposed for AOL Searcher No. 4417749

By Michael Barbaro and Tom Zeller Jr.

Aug. 9, 2006



Buried in a list of 20 million Web search queries collected by AOL and recently released on the Internet is user No. 4417749. The number was assigned by the company to protect the searcher's anonymity, but it was not much of a shield.

AOL Search Data Release (Aftermath)

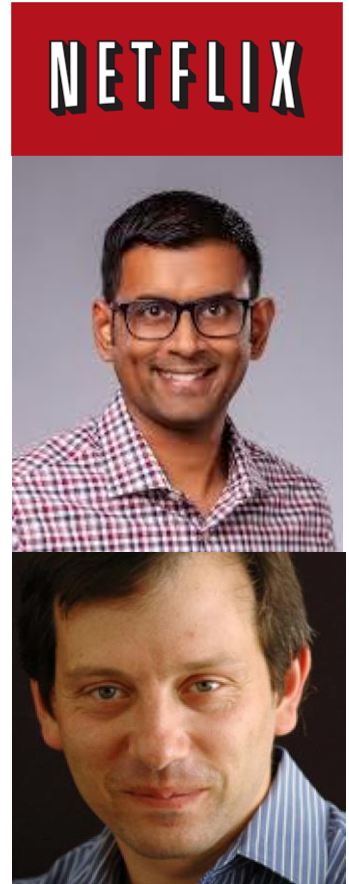
- “...User 4417749’s identity in queries such as “landscapers in Lilburn, Ga,’ several people with the last name Arnold and ‘homes sold in shadow lake subdivision gwinnett county georgia.” They quickly tracked down Thelma Arnold, a sixty-two-year-old widow from Lilburn, Georgia who acknowledged that she had authored the searches, including some mildly embarrassing queries such as “numb fingers,” “60 single men,” and “dog that urinates on everything.”



Case Study 3: Netflix Prize

Deanononymizing the Netflix Prize

- Netflix released 100,000,000 records from 500,000 users
 - December 1999 to December 2005
 - Assigned a unique pseudonymous identifier to each user
- Each record included the pseudonymous identifier, the movie watched, the rating (1-5 stars), and rating's date



Deanononymizing the Netflix Prize

- Narayanan and Shmatikov correlated with IMDb
- Ratings on IMDb are public
- Databases are not perfect subsets of each other
- What can be leaked from knowing which movies an identified user watched?



De-anonymizing the Netflix Prize

$$\text{Sim}(r_1, r_2) = \frac{\sum \text{Sim}(r_{1i}, r_{2i})}{|\text{supp}(r_1) \cup \text{supp}(r_2)|}$$

Definition 3 (De-anonymization) *An arbitrary subset \hat{D} of a database D can be (θ, ω) -de-anonymized w.r.t. auxiliary information Aux if there exists an algorithm A which, on inputs \hat{D} and $\text{Aux}(r)$ where $r \leftarrow D$*

- *If $r \in \hat{D}$, outputs r' s.t. $\Pr[\text{Sim}(r, r') \geq \theta] \geq \omega$*
- *if $r \notin \hat{D}$, outputs \perp with probability at least ω*

Deanonymizing the Netflix Prize

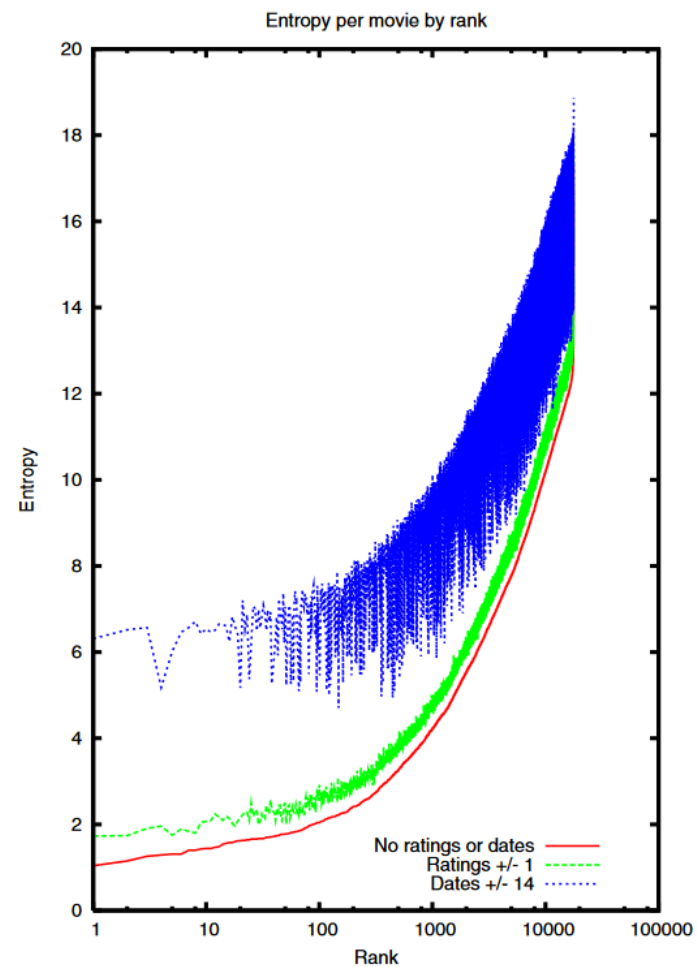


Figure 7. Entropy of movie by rank

Recap

The Surprising Success of Deanononymization

- The use of **auxiliary information**
 - Extremely hard to control
- Errors suppressing data
- Personal data showing up in unexpected places
- It's hard to reason about what is/is not identifiable
- **Thinking only about personal data / PII is not sufficient**

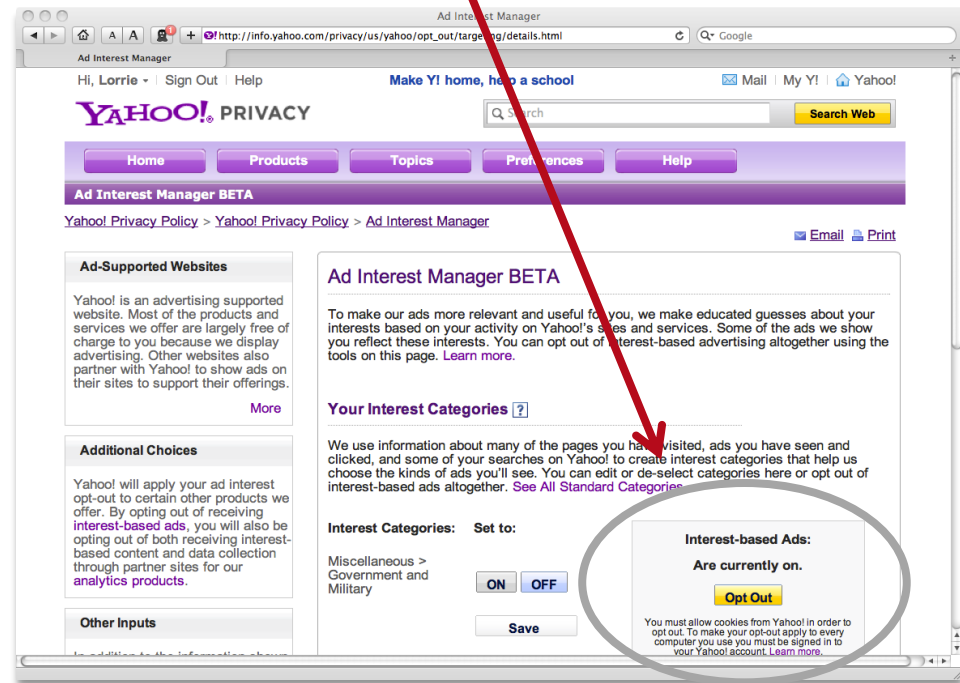
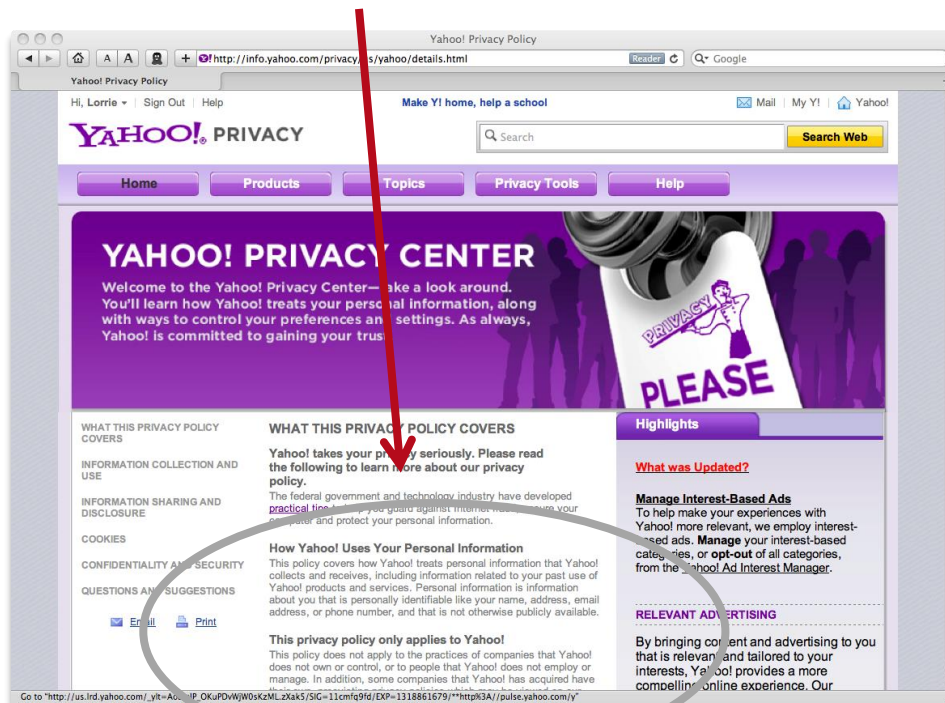
Privacy Communication

Notice and choice

Protect privacy by giving people control over their information

Notice about data collection and use

Choices about allowing their data to be collected and used in that way



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.



About Our Privacy Policy

Whenever you do something like buy one of our products, watch a information is created. Because we know your privacy is important to explain how we collect, use and protect that information. There's and the actual policy is written in an easy to understand "Frequently Asked Questions" (FAQ) format (/sites/privacy_policy/terms). We want to simplify make informed choices about your privacy, and then spend the rest of your life on products and services.

Effective July 24, 2015

A Quick Summary of Our Privacy Policy

Our Privacy Policy applies to your use of all products, services and our AT&T affiliates, such as DIRECTV, unless they have a different privacy policy. Because some apps, including some AT&T and DTW branded apps, may collect, use and protect your information in different ways, they may have their own privacy policy and terms and conditions. These apps may also offer you a choice to opt out of sharing your information with us or with our affiliates. These apps may also offer you a choice to opt out of sharing your information with us or with our affiliates.

Back to Top

Our privacy commitments

- We don't sell your Personal Information to anyone for any purpose. Period.
- We keep your Personal Information in our business records while you are a customer, or until it is no longer needed for business, tax or legal purposes.
- We will keep your information safe using encryption or other appropriate security controls.

How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.
How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.
How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.	How to find this information online: <ul style="list-style-type: none">1. Go to www.att.com/privacy2. Click on "Privacy Policy" under "About Us" in the top right corner.3. Click on "Privacy Policy" under "About Us" in the top right corner.4. Click on "Privacy Policy" under "About Us" in the top right corner.



USER PRIVACY
AGREEMENT

📍 YOUR LOCATION

ACCEPT

Sections The Washington Post

Privacy Policy

January 1

Published: January 1, 2015

The WP Company LLC ("The Washington Post") recognizes the importance of protecting your personal information, and we have prepared this policy to explain to you about our

Search Facebook

Data Policy

We give you the power to share as part of our mission to make the world more open and connected. This policy describes the personal information we collect and how it is used and shared. You can also find additional tools and information at [Privacy Basics](#).

As you review our policy, keep in mind that it applies to all of our brands, products and services that do not have a separate privacy policy or that link to this policy, which we call the "Facebook Services" or "Services."

- What kinds of information do we collect?
- How do we use this information?
- How is this information shared?
- How can I manage or delete information about me?
- How do we respond to legal requests or prevent harm?
- How our global services operate
- How will we notify you of changes to this policy?

Microsoft

Privacy & Cookies

View Privacy Statement for:

[Bing & MSN](#)
[CRM](#)
[Microsoft.com](#)
[Mobile Devices](#)
[Office](#)
[Enterprise Services](#)
[Windows Services](#)
[Xbox](#)
[Other Products](#)

Last Updated: October 2014

Microsoft.com Privacy Statement

This privacy statement applies to Microsoft.com and Microsoft websites, services and products that collect data and display these terms, as well as their offline product support services. It does not apply to Microsoft sites, services and products that do not display or link to this statement or that have their own privacy statements.

Please read the summaries below and click on "Learn More" for more details on a particular topic. You may also select from the products listed above to view that product's privacy statement. Some products, services or features mentioned in this statement may not be available in all markets. You can find more information on Microsoft's commitment to protecting your privacy at <http://www.microsoft.com/privacy>.

Cookies & Similar Technologies

Most Microsoft websites use "cookies," which are small text files stored on your device, to help operate the sites and collect information about online activity. For instance, we use cookies to store your preferences and settings; help with sign-in; provide targeted ads; combat fraud; and analyze site operations.

We also use web beacons to help deliver cookies and compile analytics. These may include web beacons from third-party service providers.

You have a variety of tools to control cookies and similar technologies, including:

- Browser controls to block and delete cookies;



SOUNDCLOUD Explore

We have updated our Privacy Policy as of 10 June 2015.

SoundCloud Privacy Policy

Welcome to SoundCloud®, a service provided by SoundCloud Limited ("SoundCloud", "we", "our", "us").

Your privacy is important to us. This Privacy Policy explains how we collect, store, use and disclose your information when you use soundcloud.com and m.soundcloud.com (together, the "Website"), our mobile and desktop apps (the "Apps") and all related sites, players, widgets, tools, apps, data, software, APIs and other services provided by SoundCloud (the "Services").

This Privacy Policy explains the following, amongst other things:

- Our principles with respect to your information and your privacy
- The information we collect about you
- How we use your information
- How we share your information
- How we use cookies and similar technology
- Your choices with respect to your information
- How to contact us regarding privacy issues

By using the Website, the Apps or any of the Services, and in particular by registering a SoundCloud® account, you are consenting to the use of your information in the manner set out in this Privacy Policy.

For your convenience, information relating to our use of cookies and similar technologies is set out in a separate [Cookies Policy](#). The Cookies Policy forms part of the Privacy Policy and whenever we refer to the Privacy Policy, we are referring to the Privacy Policy incorporating the Cookies Policy.

es, and uses your personal information as a data controller in connection with our services and websites (together "Services") according to this privacy policy.

rights, please contact us at [privacy\[at\]rovio.com](mailto:privacy[at]rovio.com) or alternatively at Rovio Finland.


on, please see "Special Note About Children's Privacy" below.

or accessing a Service You give consent to the processing, use and disclosure of your personal information. If you do not agree to this Privacy Policy, you may not use our Services.

of Services will signify your acceptance of the changes to this Privacy Policy.

but are not limited to: (i) by using Rovio's mobile apps or visiting our websites using a third party ID, such as social networking sites or gaming sites; (ii) Rovio's online stores or within the app (or "in-app purchase"); (iii) using our legal support; and (iv) otherwise through use of Rovio Services where

consumerreports.org

 **CR** Consumer Reports

Privacy Policy

Privacy Policy Highlights

Privacy Principles

Privacy Policy FAQ

Cookies

Protection of Information

Surveys

Choice/Opt Out

Like 2 Share Tweet G+1 Pin it

Choice/Opt Out

Opting out of email communications (promotional, free email newsletters, and Ratings alerts)

If you subscribe to any of our paid products or services (for example, *Consumer Reports* magazine or ConsumerReports.org), our free email newsletters (for example, those about cars, finance, drugs or safety issues) or our Ratings alerts, we may send you promotional emails about our other products and services or to ask you about your experience.

Opting out online
You can opt out of receiving these email communications from us by following the instructions provided at the bottom of each email. If you use this method, you will stop receiving only that particular type of email message.

If you are a subscriber to one of our paid products or services, you can manage your email communication preferences on your "My Account" page by clicking [here](#) (or by going to www.consumerreports.org/myaccount).


EDITION: ▼

ZDNet 🔍

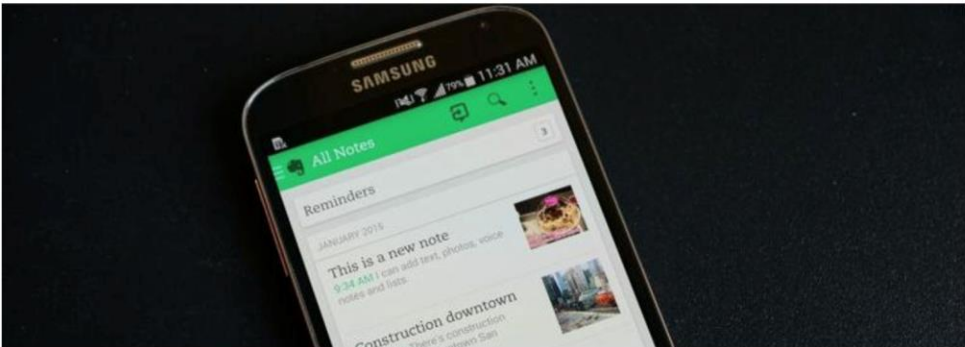
VIDEOS SMART CITY CES WINDOWS 10 CLOUD INNOVATION SECURITY MORE ▼ NEWSLETTERS ALL WRITERS 👤

Evernote's new not-so-privacy policy will let employees read your notes





The note-taking app will let humans (and not just machines) sift through your private data.

By  Zack Whittaker for [Zero Day](#) | December 14, 2016 -- 16:55 GMT (08:55 PST) | Topic: [Security](#)

🗨️ f in 🐦 ✉️



RELATED STORIES

-  Security **XSS on WebEx domains undoes previous fixes to Cisco WebEx Chrome extension**
-  Security **Expect renewed push for encryption backdoors from Trump administration**
-  Security **Breach site LeakedSource apparently raided by feds**
-  Security **Facebook adds security key and YubiKey support for 2FA**



“Only in some fantasy world do users actually read these notices and understand their implications before clicking to indicate their consent”

**REPORT TO THE PRESIDENT
BIG DATA AND PRIVACY:
A TECHNOLOGICAL
PERSPECTIVE**

Executive Office of the President
President's Council of Advisors on
Science and Technology

May 2014



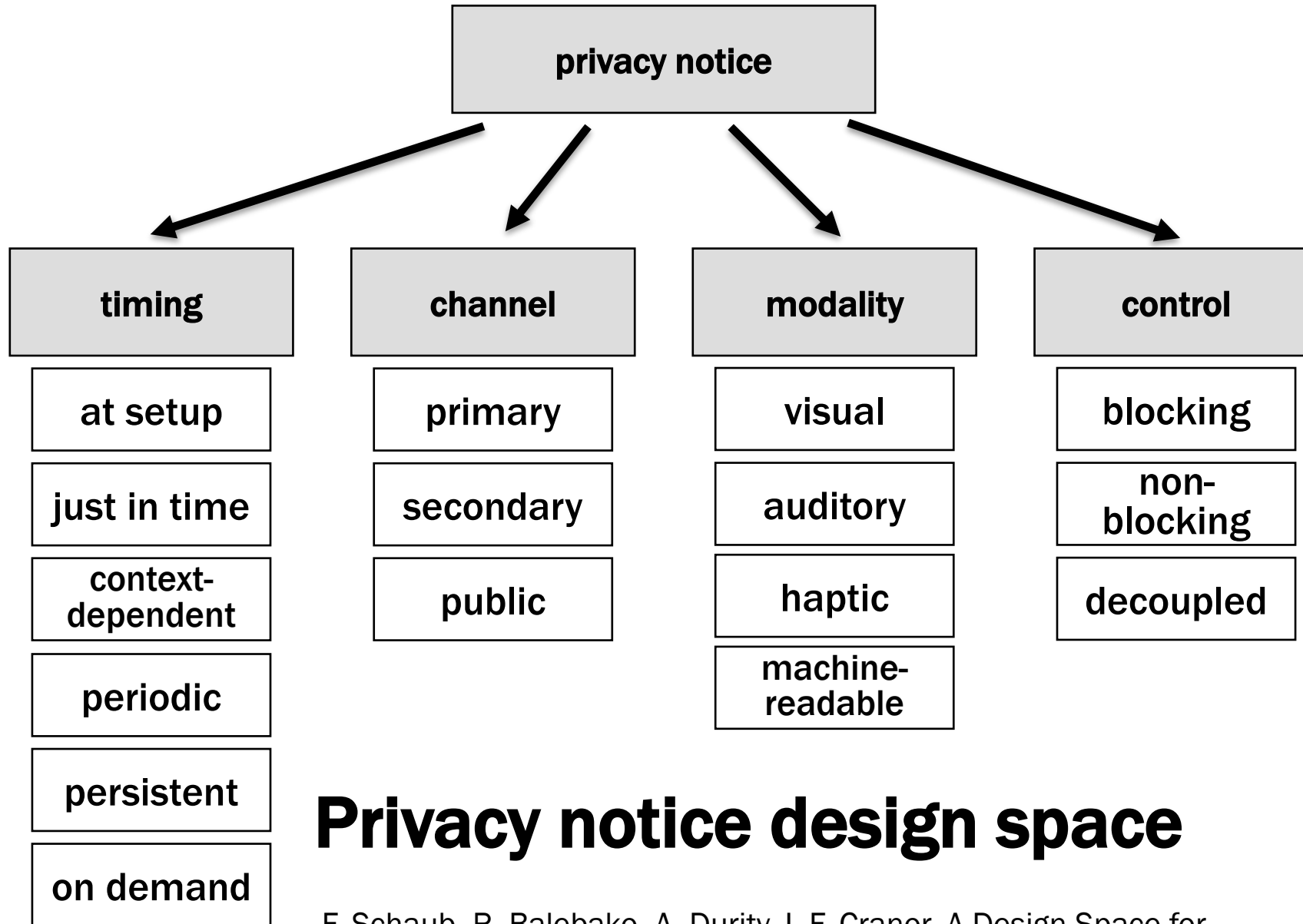
Cost of reading privacy policies

- What would happen if everyone read the privacy policy for each site they visited once per year?
- Time = 244/hours year
- Cost = \$3,534/year
- National opportunity cost for time to read policies: \$781 billion



Aleecia McDonald and Lorrie Faith Cranor. The Cost of Reading Privacy Policies. I/S:
A Journal of Law and Policy for the Information Society. 2008 Privacy Year in Review Issue.

Privacy Notice Design Space



Privacy notice design space

F. Schaub, R. Balebako, A. Durity, L.F. Cranor, A Design Space for Effective Privacy Notices, SOUPS'15

privacy notice

timing

channel

modality

control

at setup

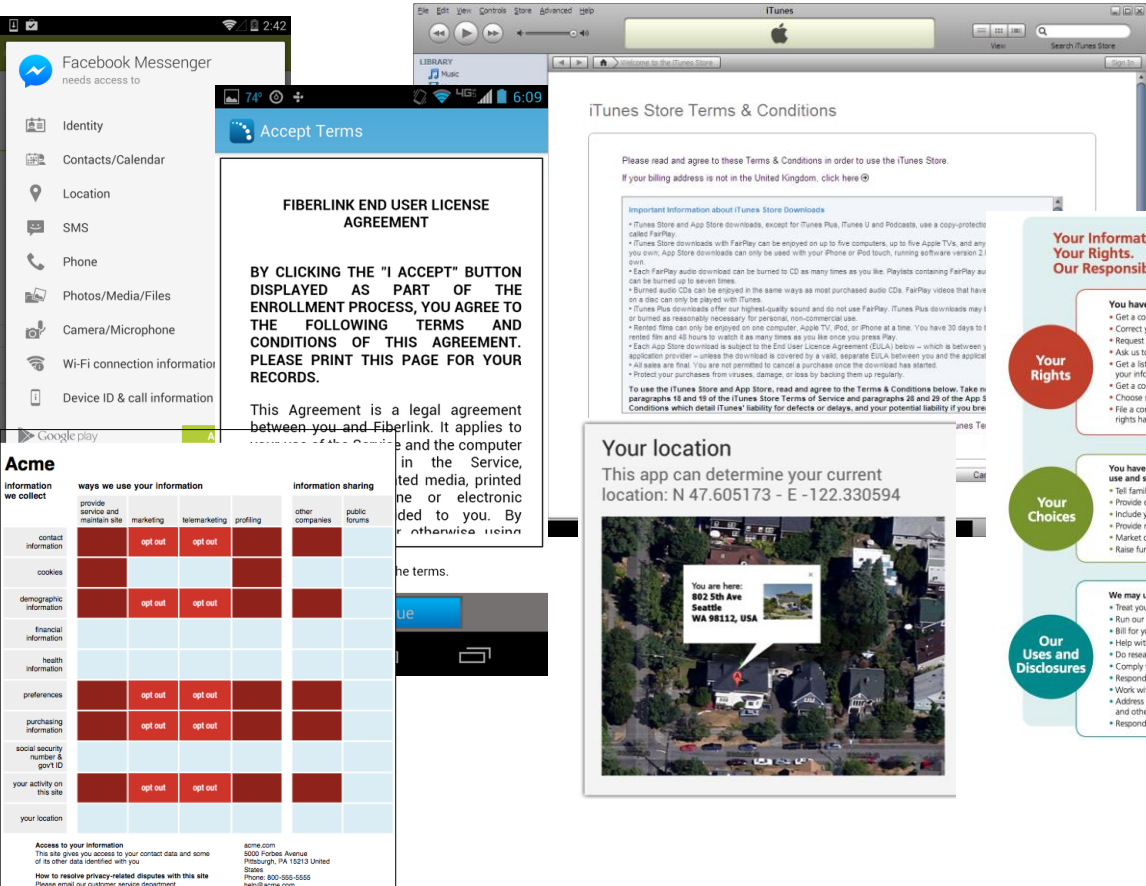
just in time

context-dependent

periodic

persistent

on demand



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 other data generated with you.
How to receive privacy-related notices with this site
Please email our customer service department.

acme.com
5000 Forbes Avenue
Pittsburgh, PA 15213 United States
Phone: 412-555-5555
help@acme.com

Your Information. Your Rights. Our Responsibilities.

This notice describes how medical information about you may be used and disclosed and how you can get access to this information. **Please review it carefully.**

You have the right to:

- Get a copy of your paper or electronic medical record
- Correct your paper or electronic medical record
- Request confidential communication
- Ask us to limit the information we share
- Get a list of those with whom we've shared your information
- Get a copy of this privacy notice
- Choose someone to act for you
- File a complaint if you believe your privacy rights have been violated

➤ See page 2 for more information on these rights and how to exercise them

You have some choices in the way that we use and share information as we:

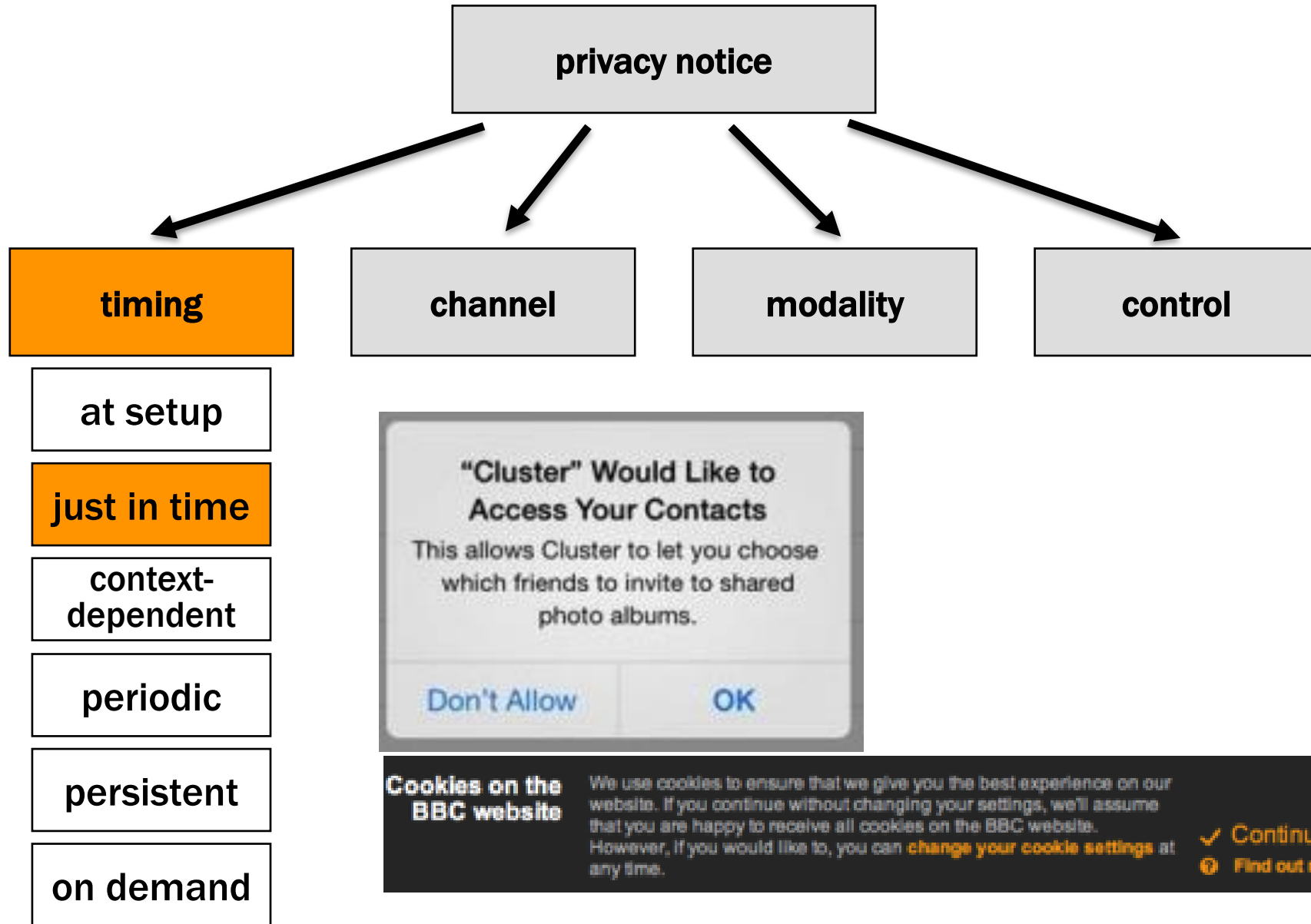
- Tell family and friends about your condition
- Provide disaster relief
- Include you in a hospital directory
- Provide mental health care
- Market our services and sell your information
- Raise funds

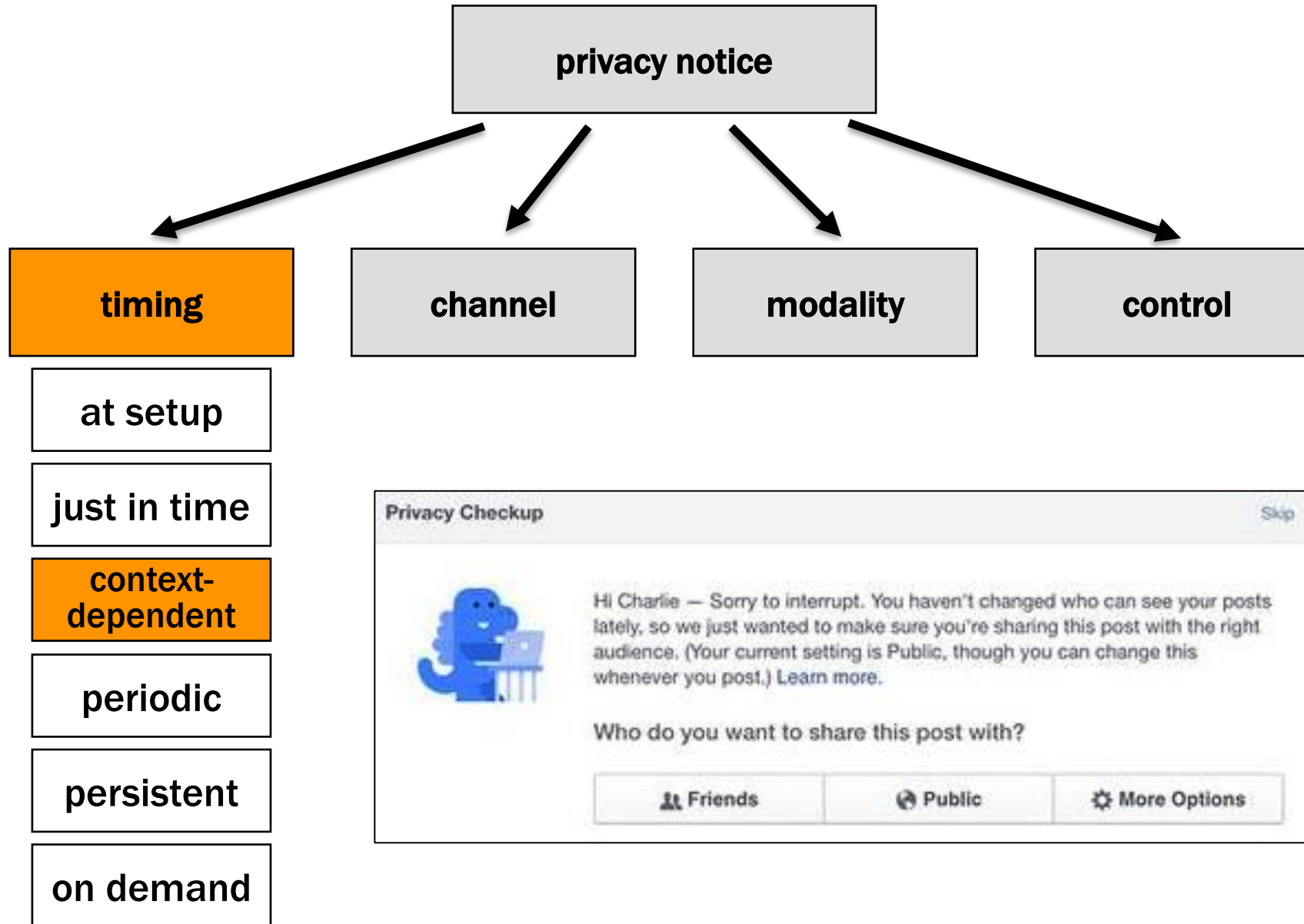
➤ See page 3 for more information on these choices and how to exercise them

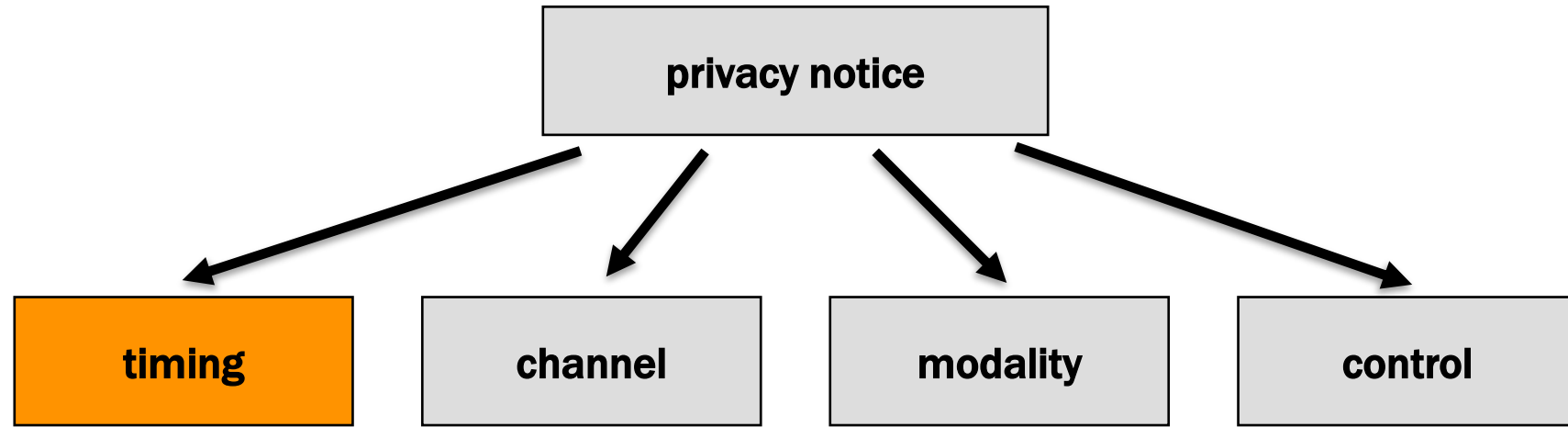
We may use and share your information as we:

- Treat you
- Run our organization
- Bill for your services
- Help with public health and safety issues
- Do research
- Comply with the law
- Respond to organ and tissue donation requests
- Work with a medical examiner or funeral director
- Address workers' compensation, law enforcement, and other government requests
- Respond to lawsuits and legal actions

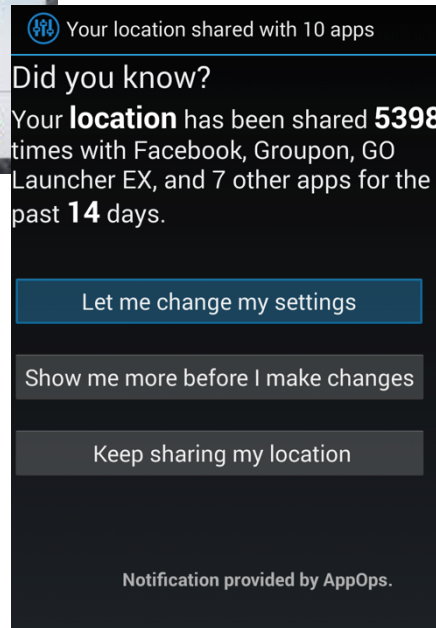
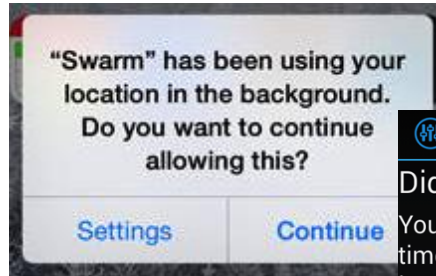
➤ See pages 3 and 4 for more information on these uses and disclosures





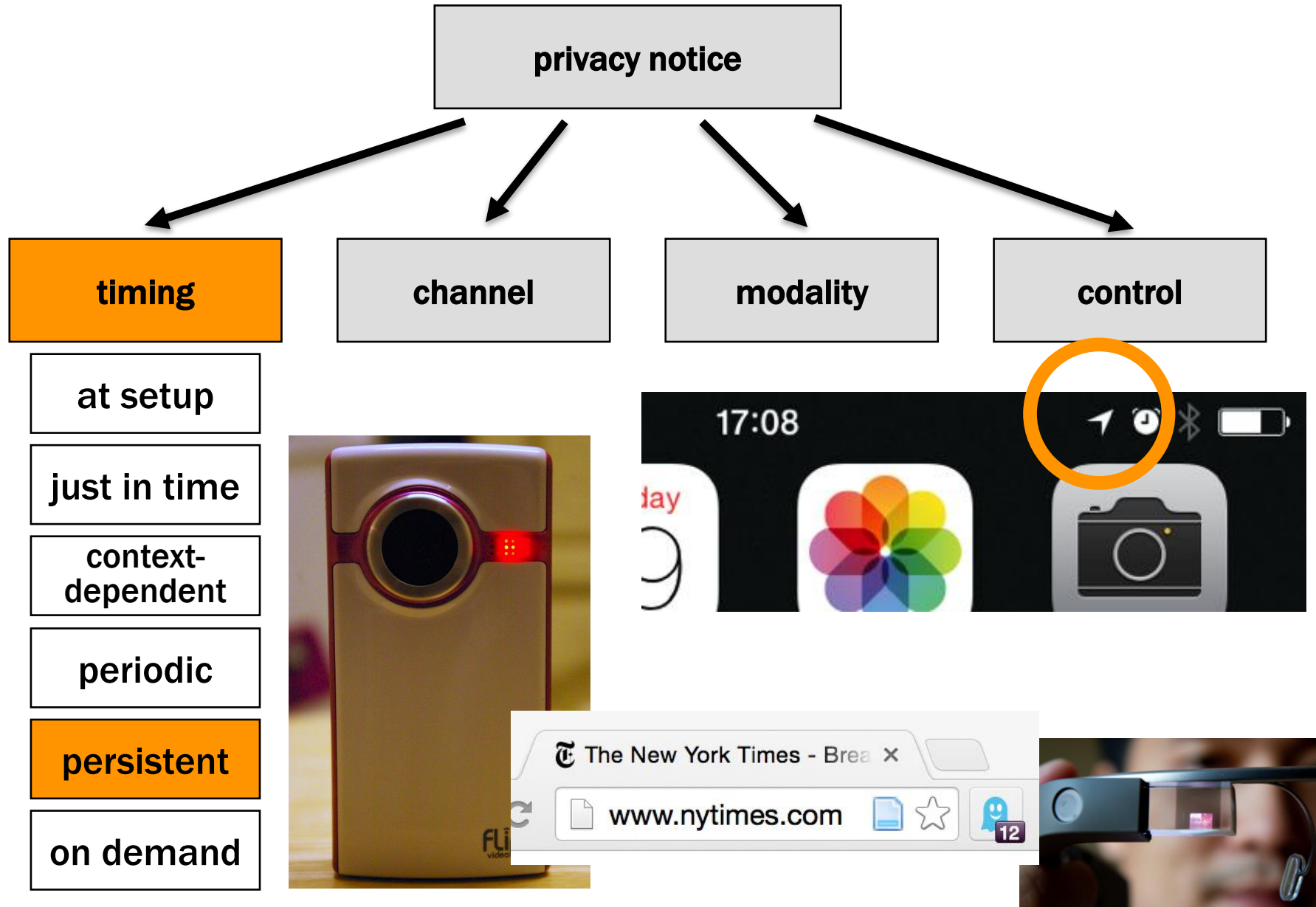


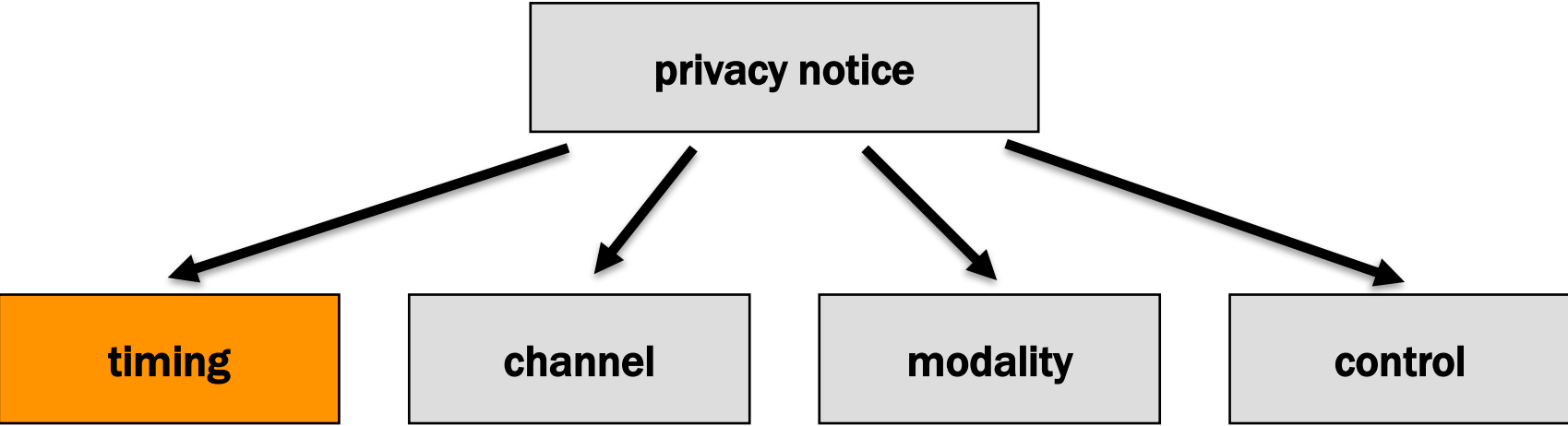
- at setup
- just in time
- context-dependent
- periodic
- persistent
- on demand



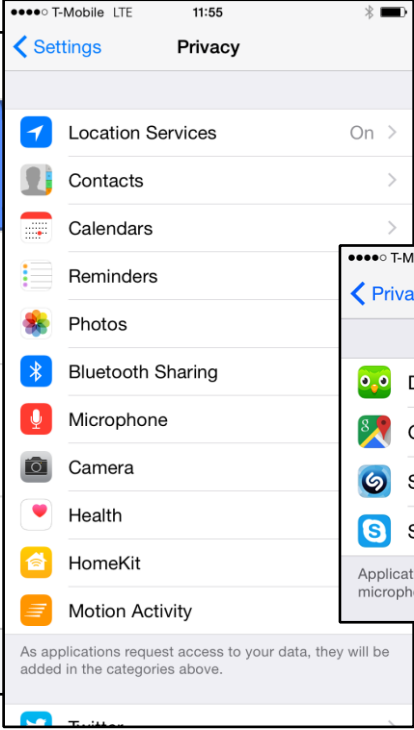
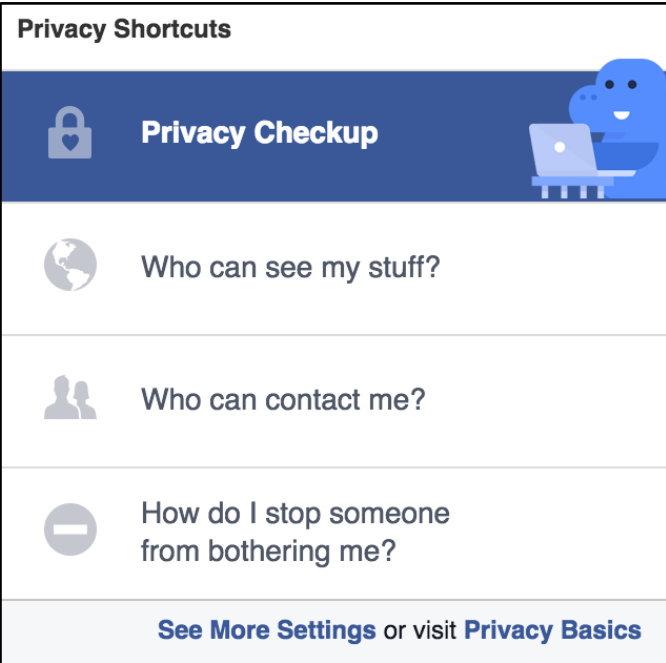
Rev. April 2015

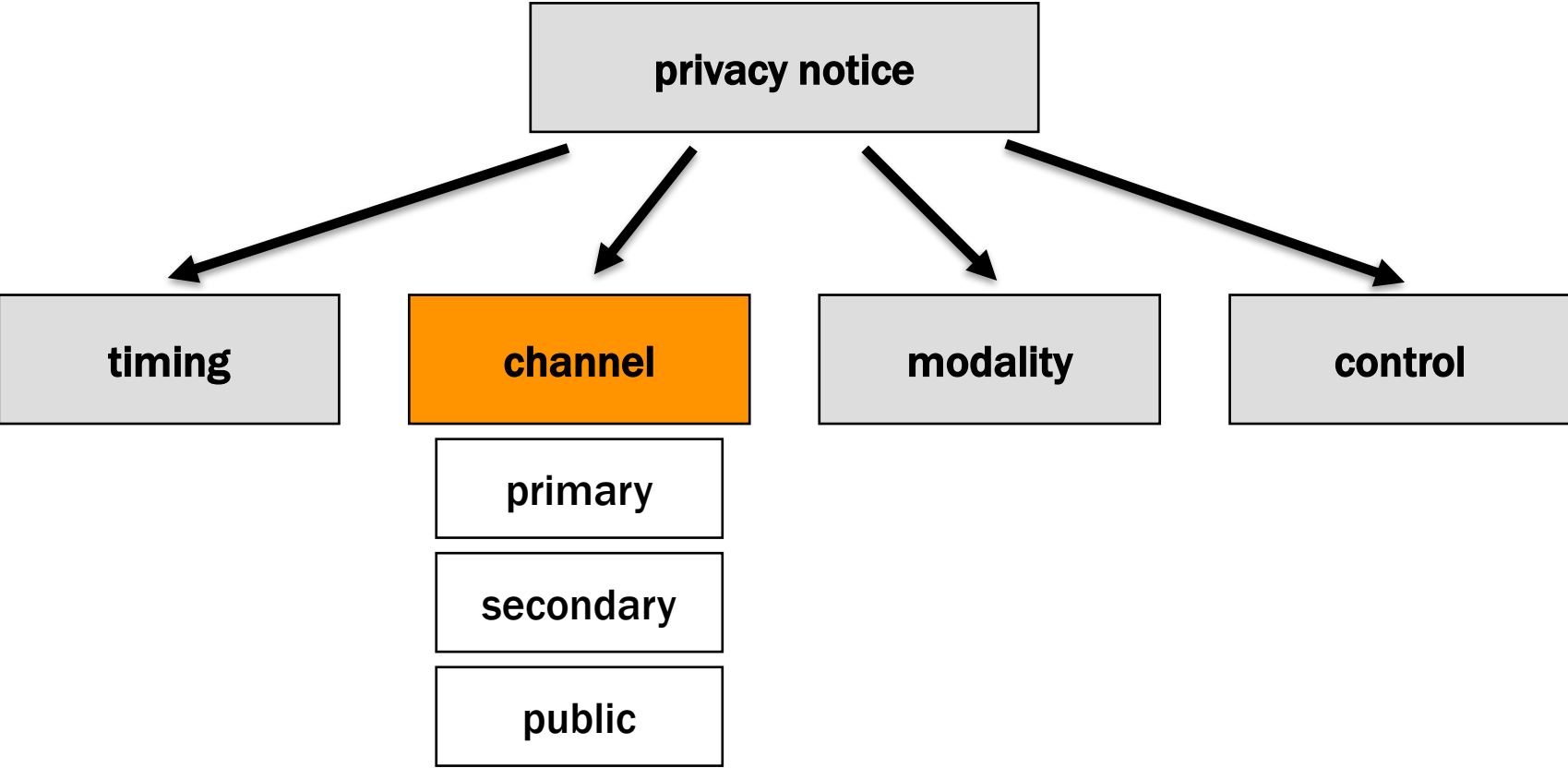
FACTS	WHAT DOES PNC DO WITH YOUR PERSONAL INFORMATION?	
Why?	Financial companies choose how they share your personal information. Federal law gives consumers the right to limit some but not all sharing. Federal law also requires us to tell you how we collect, share, and protect your personal information. 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 account transactions • Credit scores and payment history 	
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 PNC chooses to share, and whether you can limit this sharing.	
Reasons we can share your personal information	Does PNC 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	No
For joint marketing with other financial companies	Yes	Yes
For our affiliates' everyday business purposes — information about your transactions and experiences	Yes	No
For our affiliates' everyday business purposes — information about your creditworthiness	Yes	Yes
For our affiliates to market to you	Yes	Yes
For nonaffiliates to market to you	No	We don't share
To limit our sharing	<ul style="list-style-type: none"> • Call 1-800-762-2118 — our menu will prompt you through your choice(s) • Visit us online: www.PNC.com/privacy (Online Banking customers only) Please note: If you are a new customer, we can begin sharing your information 30 days from the date we sent this notice. When you are no longer our customer, we continue to share your information as described in this notice. However, you can contact us at any time to limit our sharing.	
Questions?	Call 1-800-762-2118	

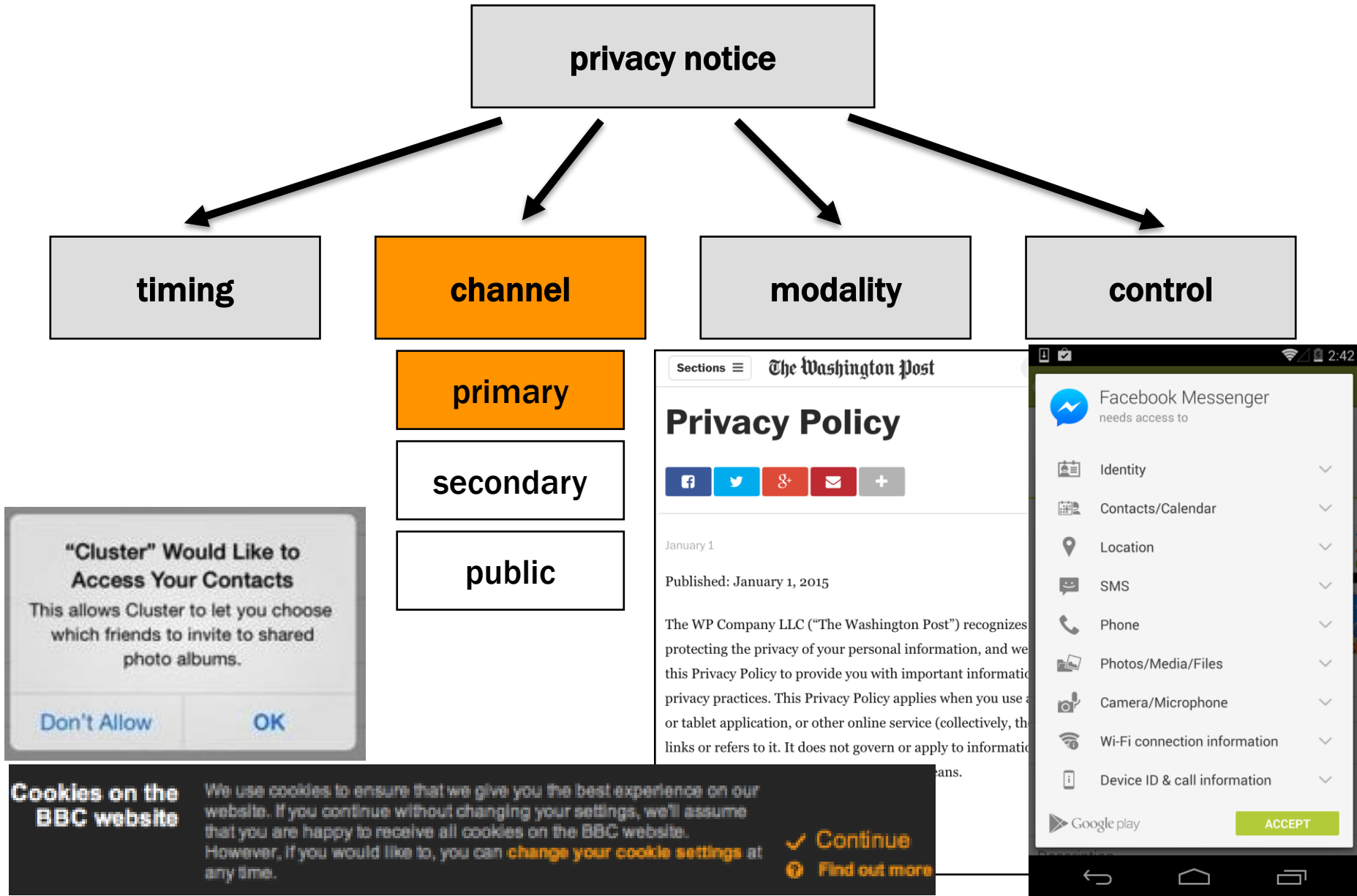




- at setup
- just in time
- context-dependent
- periodic
- persistent
- on demand







privacy notice

timing

channel

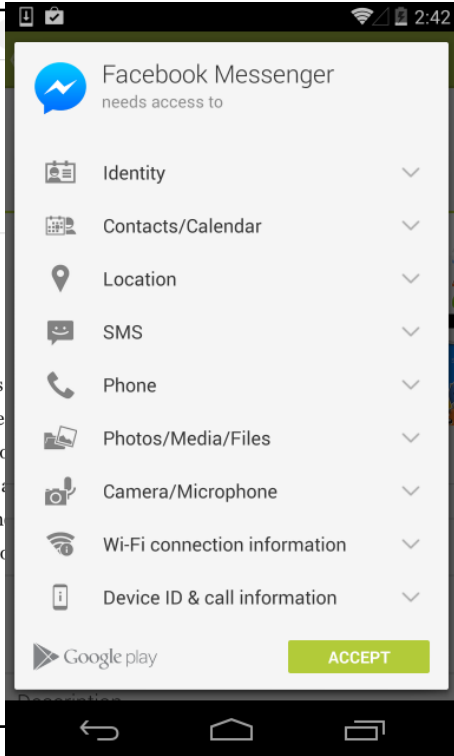
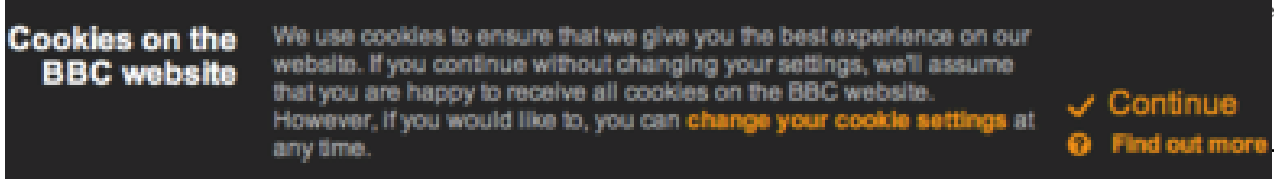
modality

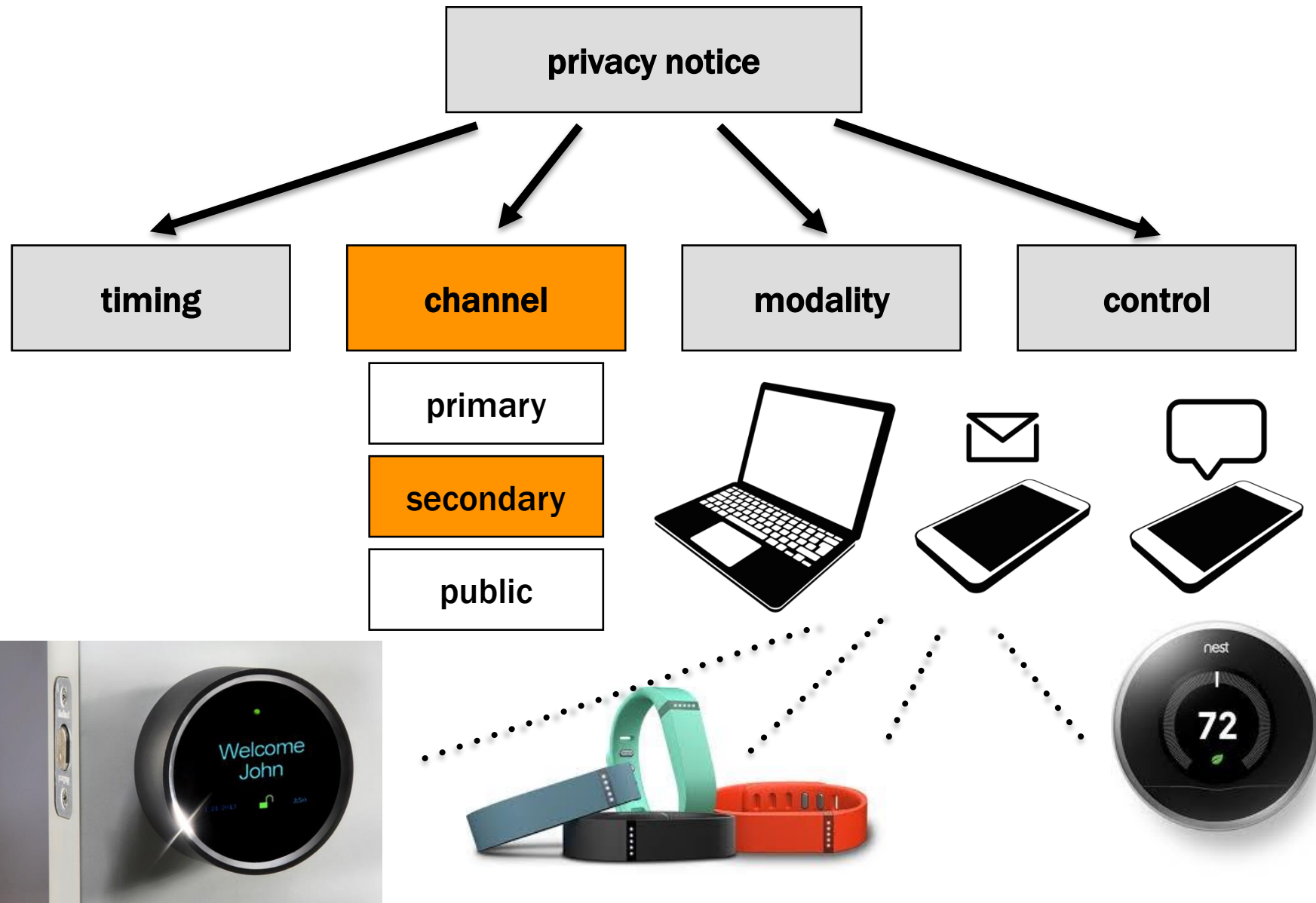
control

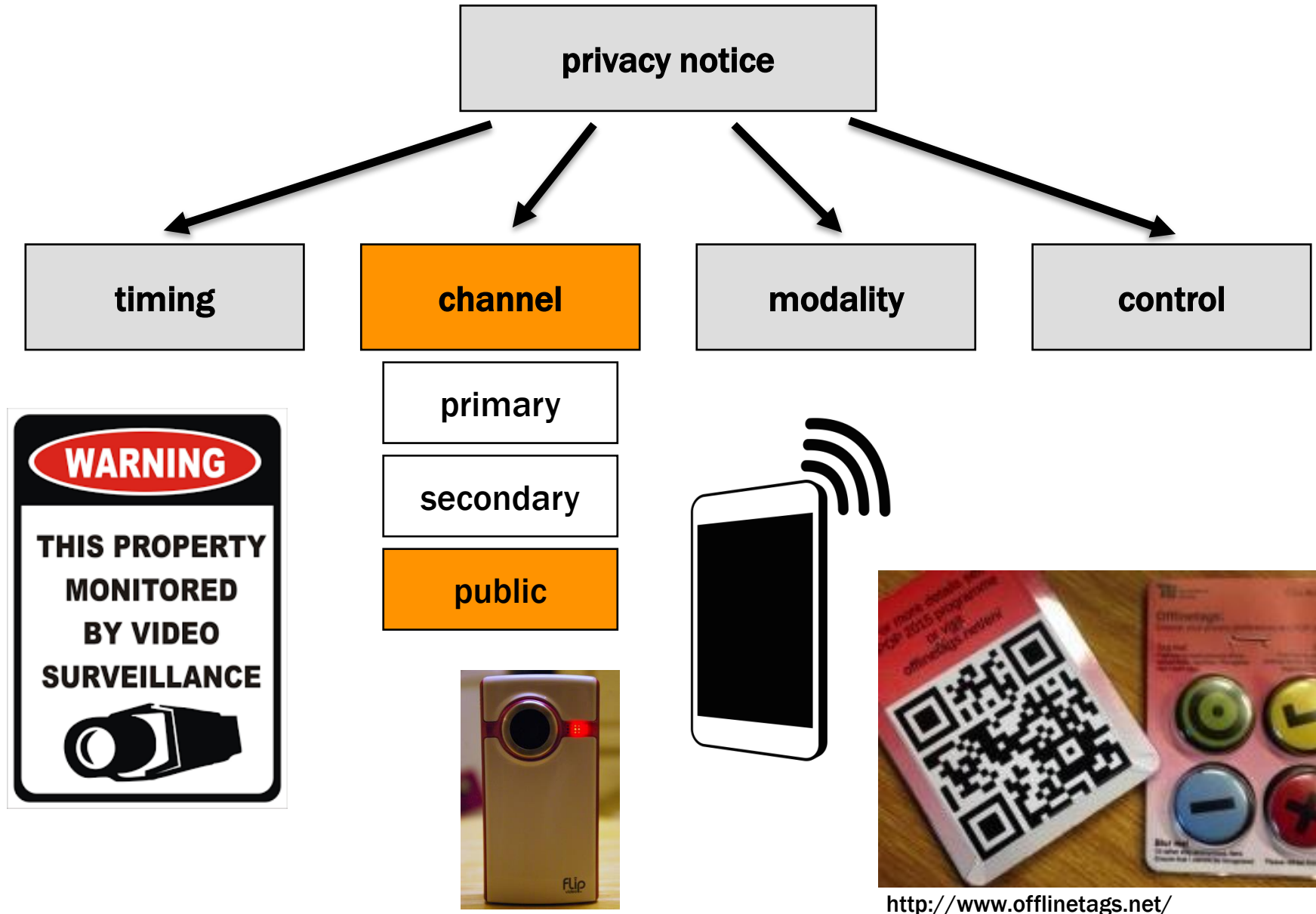
primary

secondary

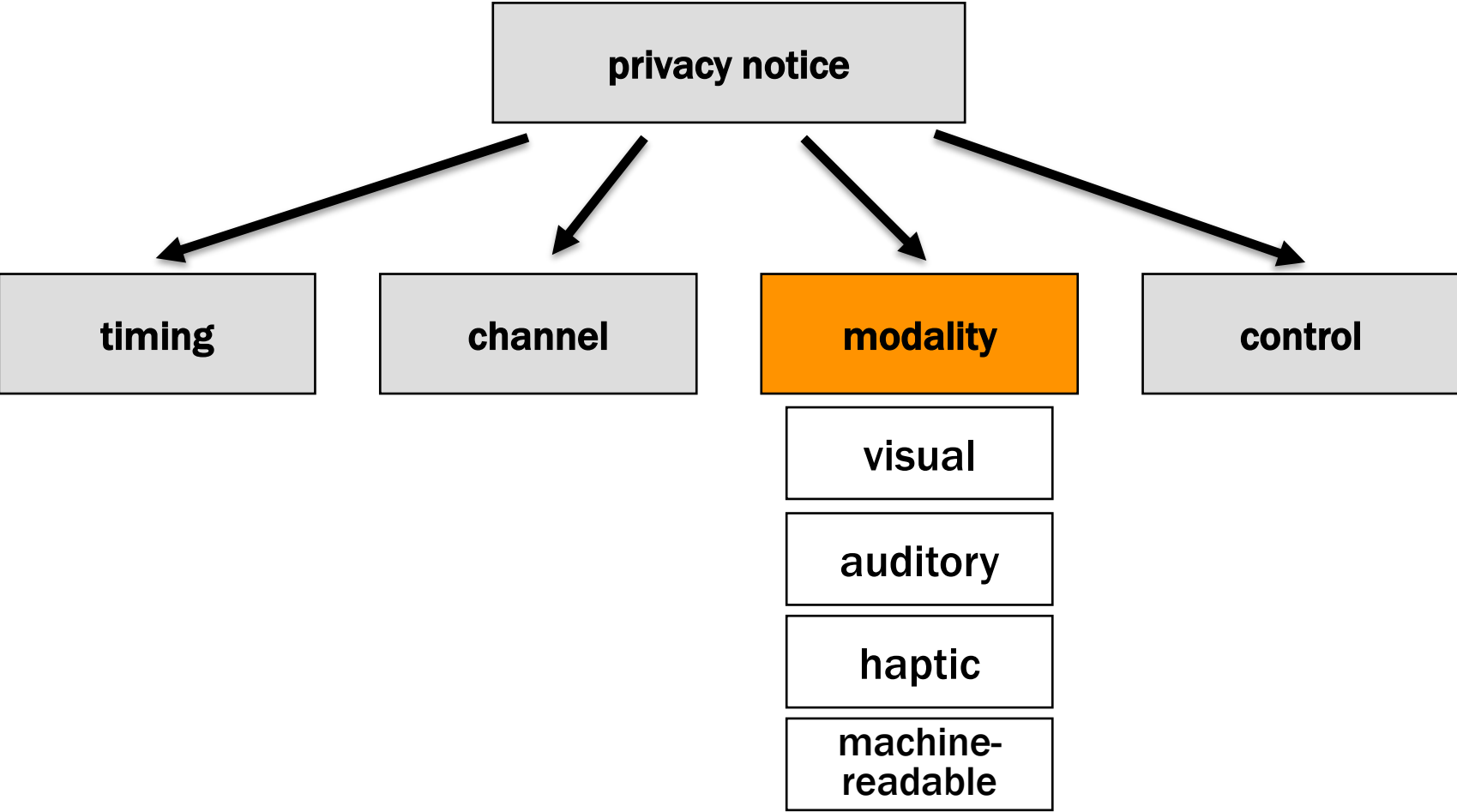
public

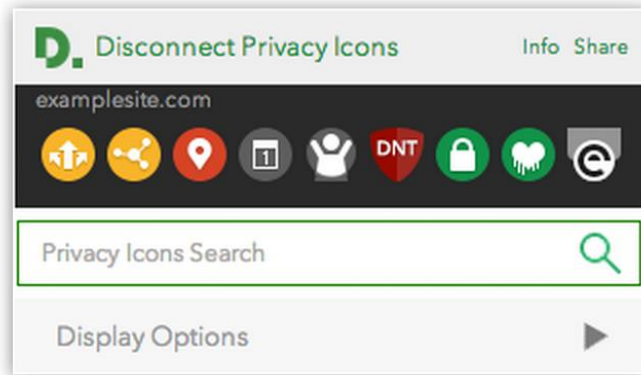
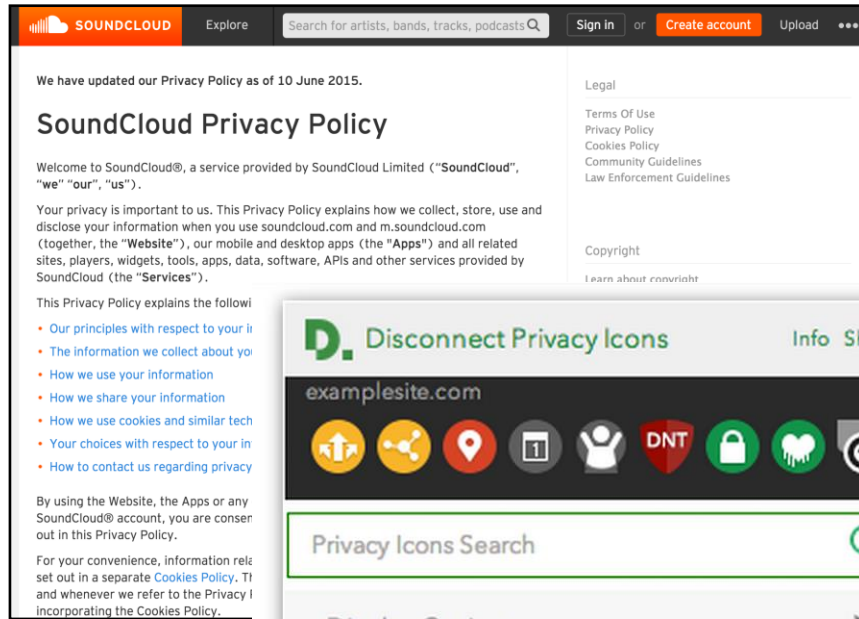
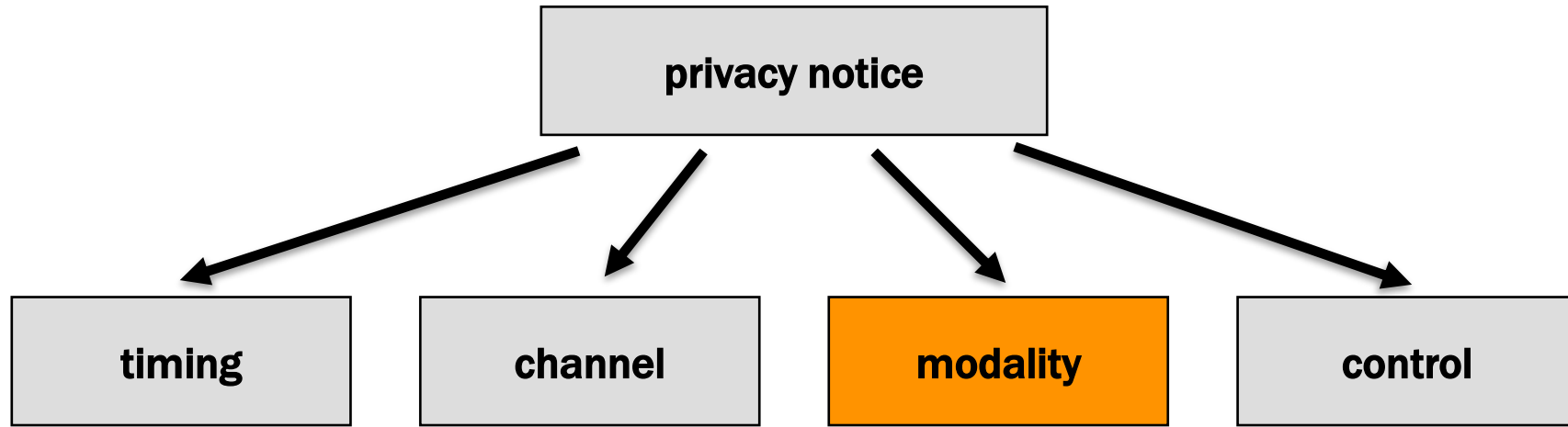






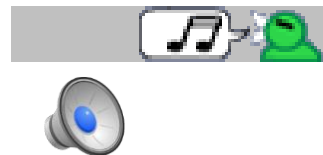
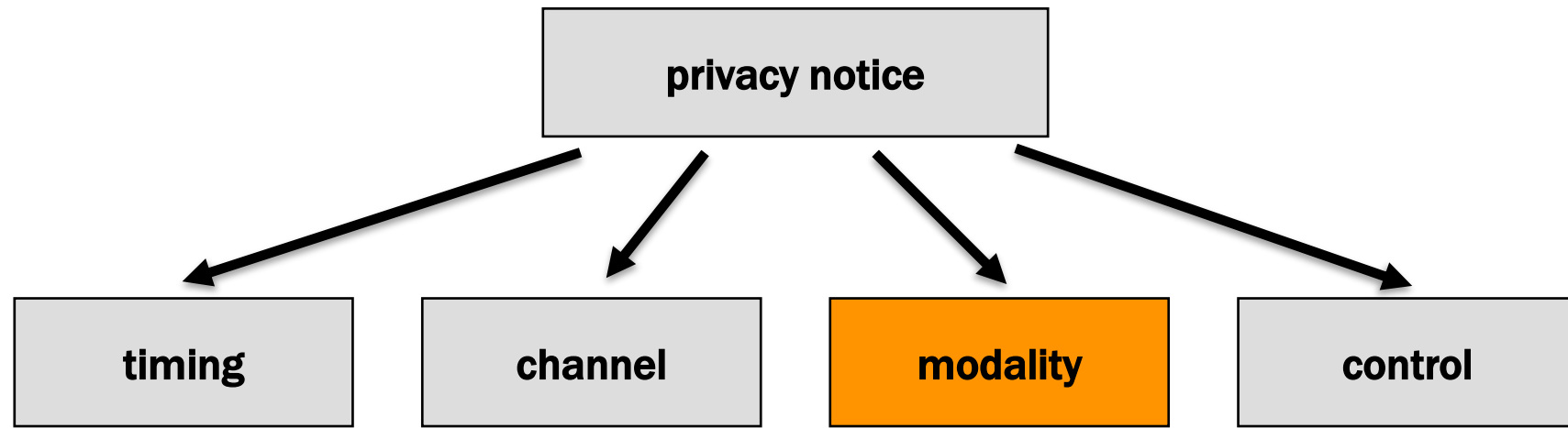
<http://www.offlinetags.net/>



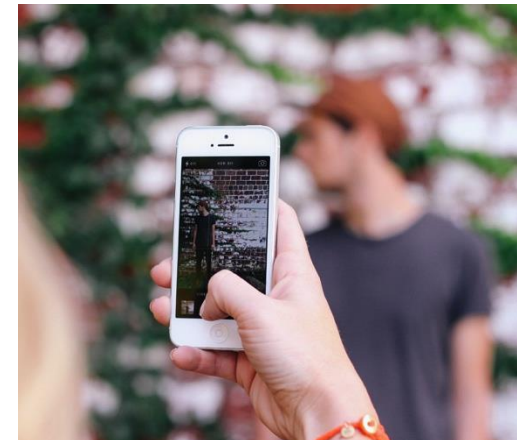


- visual
- auditory
- haptic
- machine-readable

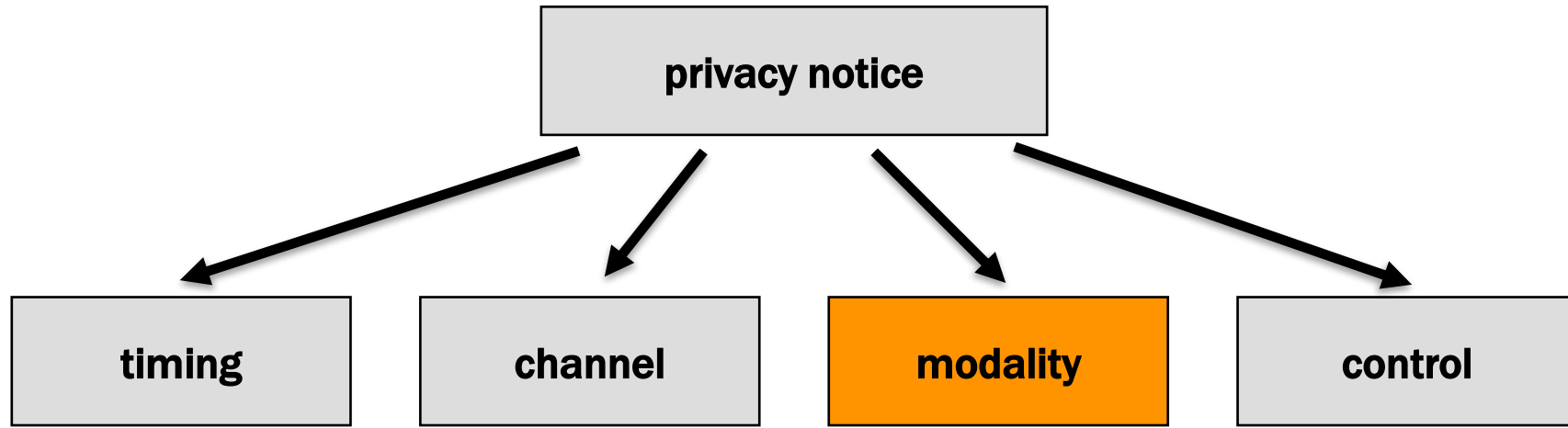




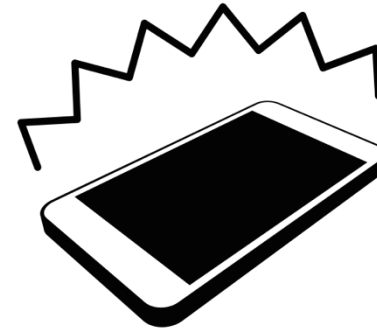
- visual
- auditory**
- haptic
- machine-readable

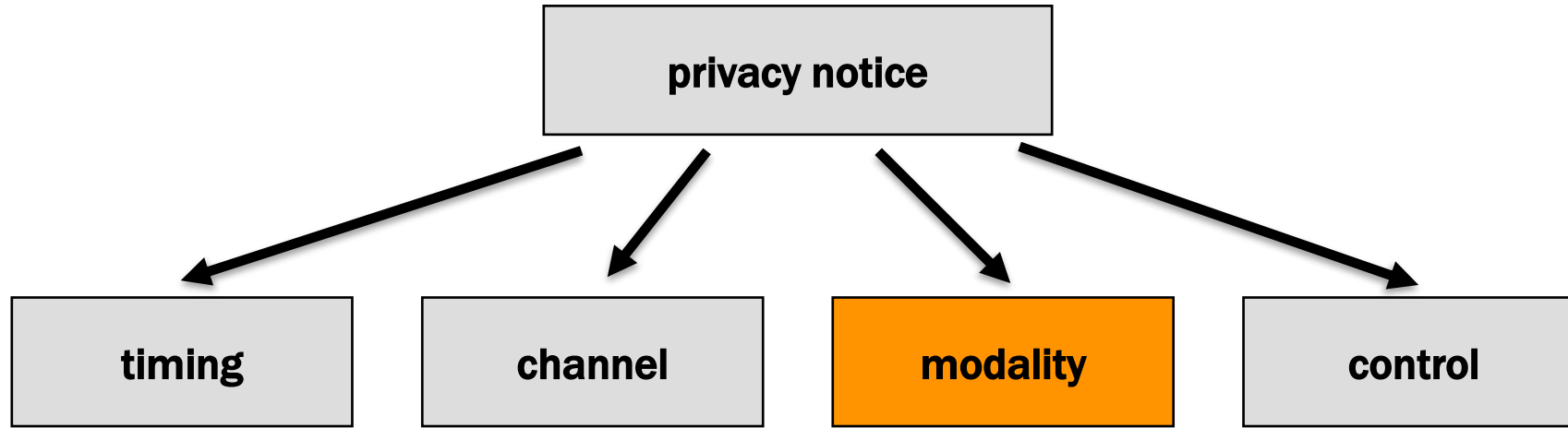


“this call will be recorded for training purposes”



- visual
- auditory
- haptic**
- machine-readable





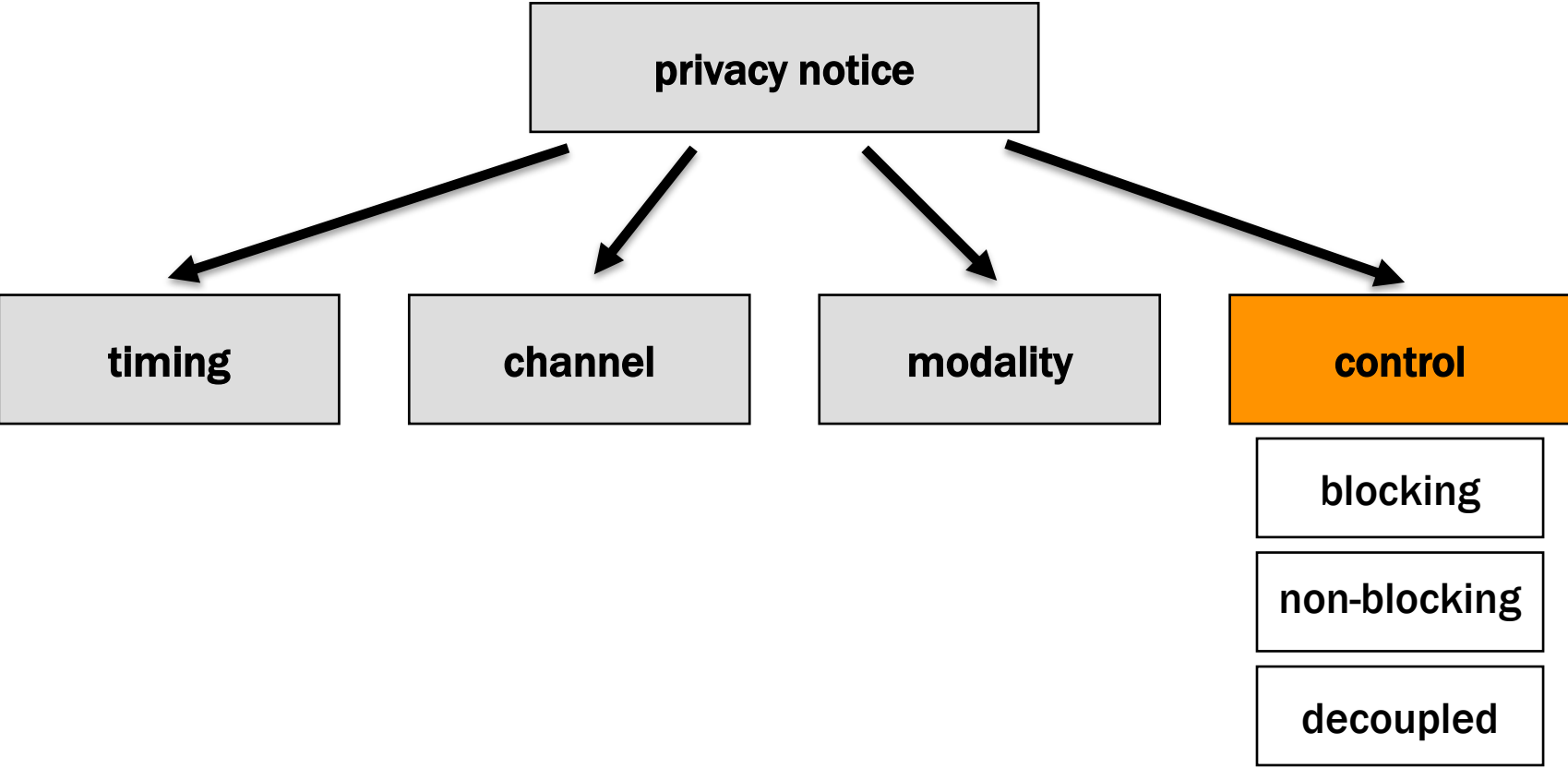
The Platform for Privacy Preferences 1.1 (P3P1.1) Specification
 W3C Working Group Note 13 November 2006

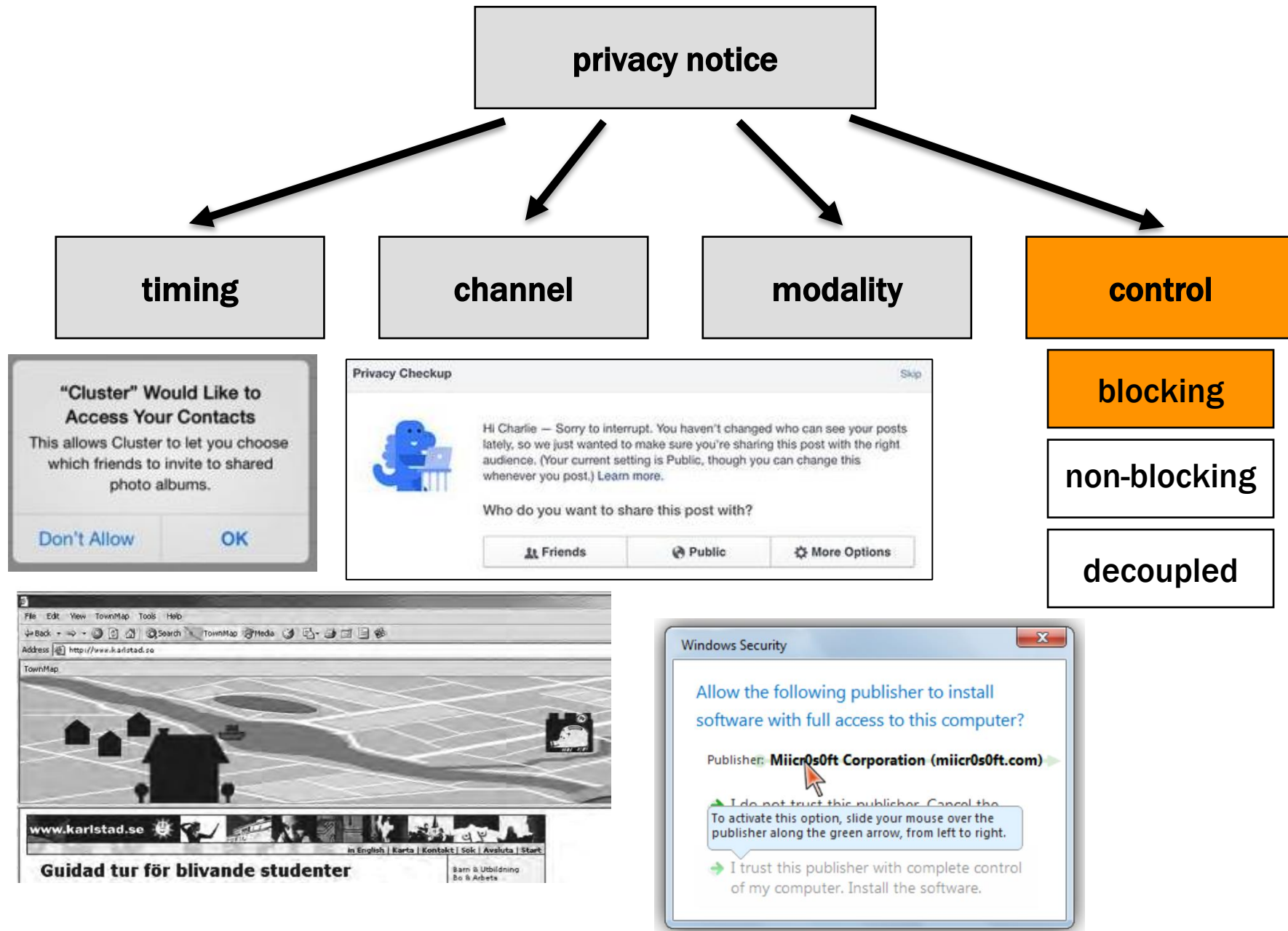


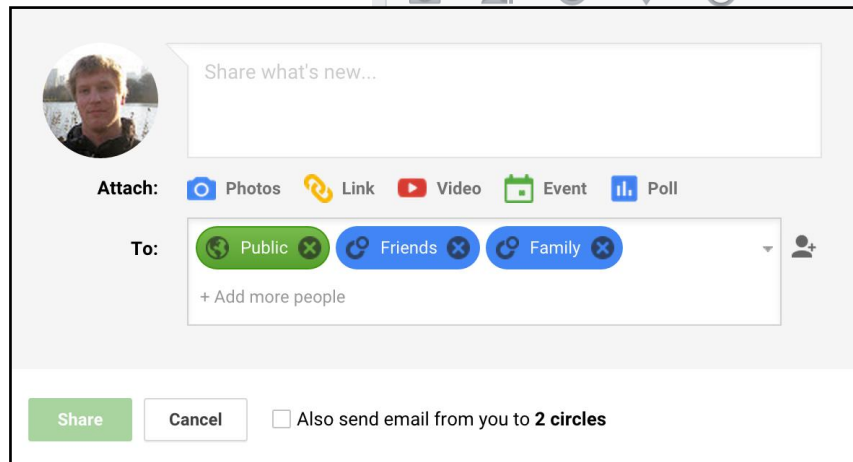
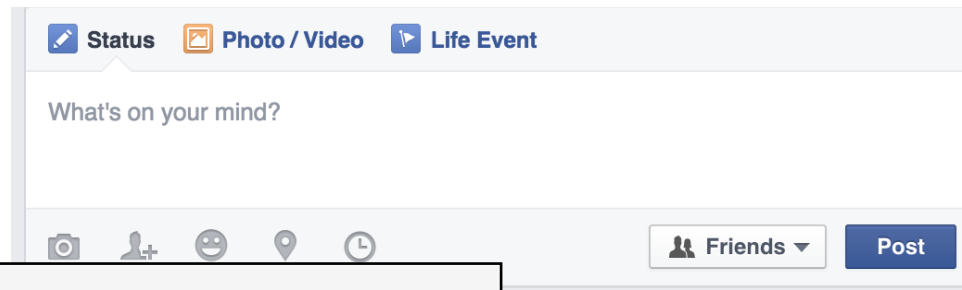
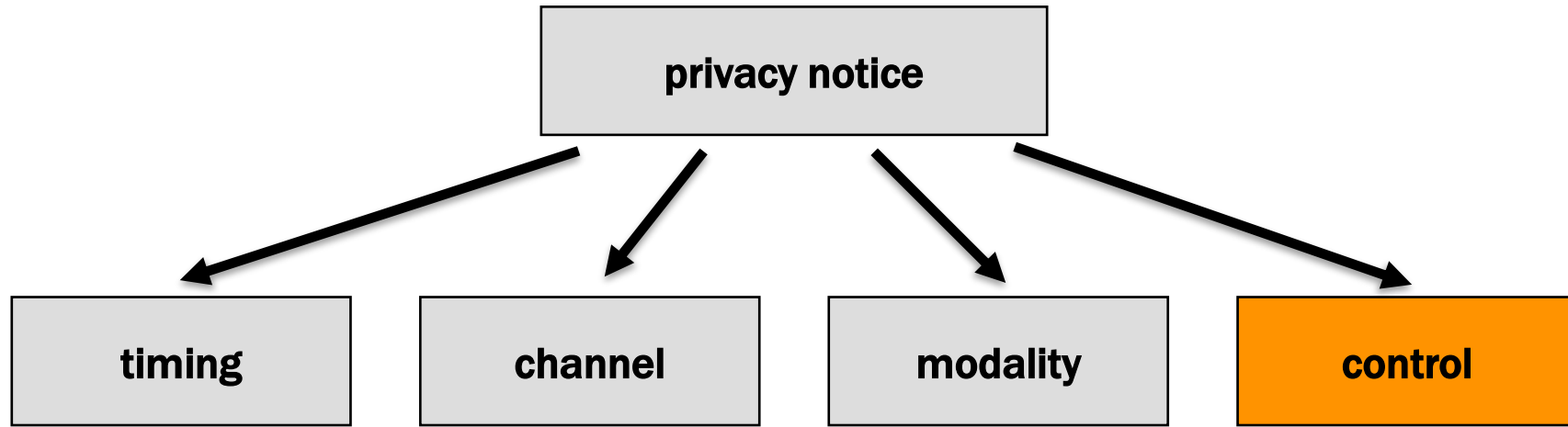
- visual
- auditory
- haptic
- machine-readable

```

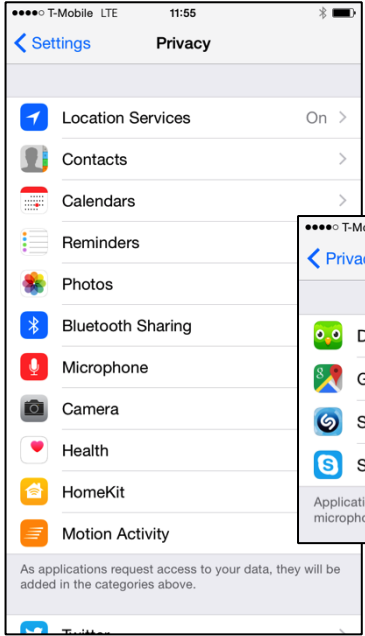
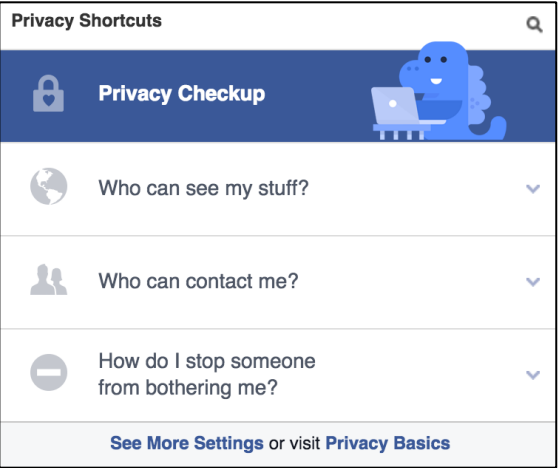
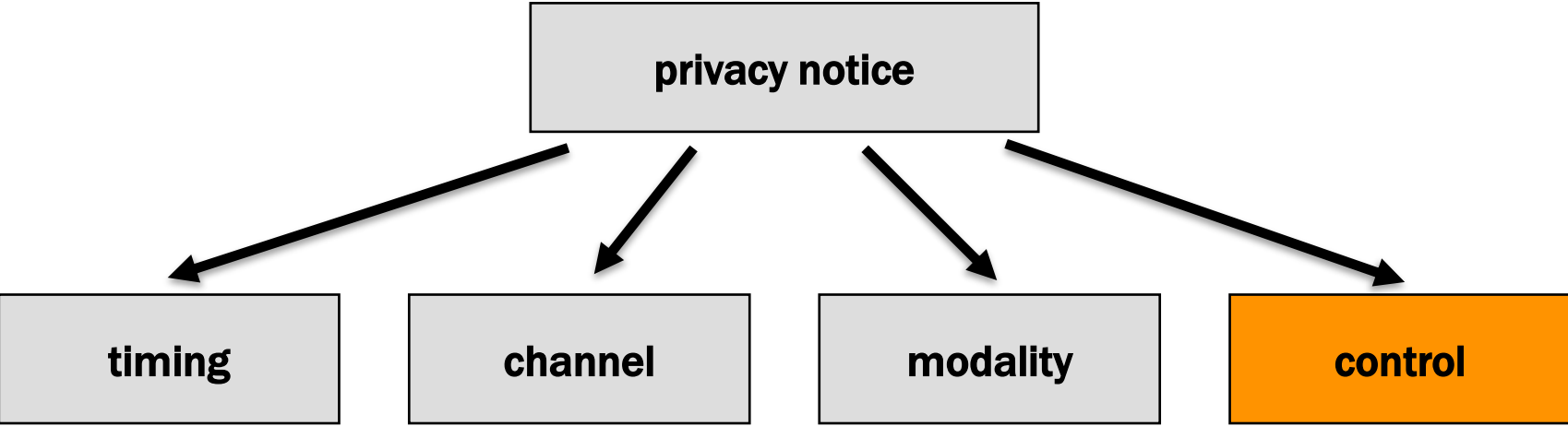
<POLICY xmlns="http://www.w3.org/2000/P3Pv1"
  entity="TheCoolCatalog, 123 Main Street, Seattle, WA 98103, USA">
  <DISPUTES-GROUP>
    <DISPUTES service="http://www.PrivacySeal.org"
      resolution-type="independent"
      description="PrivacySeal, a third-party seal provider"
      image="http://www.PrivacySeal.org/Logo.gif"/>
    </DISPUTES-GROUP>
  <DISCLOSURE discuri="http://www.CoolCatalog.com/Practices.html" access="none"/>
  <STATEMENT>
    <CONSEQUENCE-GROUP>
      <CONSEQUENCE>a site with clothes you would appreciate</CONSEQUENCE>
    </CONSEQUENCE-GROUP>
    <RECIPIENT><ours/></RECIPIENT>
    <RETENTION><indefinitely/></RETENTION>
    <PURPOSE><custom/><develop/></PURPOSE>
    <DATA-GROUP>
      <DATA name="dynamic.cookies" category="state"/>
      <DATA name="dynamic.miscdata" category="preference"/>
      <DATA name="user.gender"/>
      <DATA name="user.home." optional="yes"/>
    </DATA-GROUP>
  </STATEMENT>
  <STATEMENT>
    <RECIPIENT><ours/></RECIPIENT>
    <PURPOSE><admin/><develop/></PURPOSE>
    <RETENTION><indefinitely/></RETENTION>
    <DATA-GROUP>
      <DATA name="dynamic.clickstream.server"/>
      <DATA name="dynamic.http.useragent"/>
    </DATA-GROUP>
  </STATEMENT>
</POLICY>
  
```







- blocking
- non-blocking
- decoupled



- blocking
- non-blocking
- decoupled

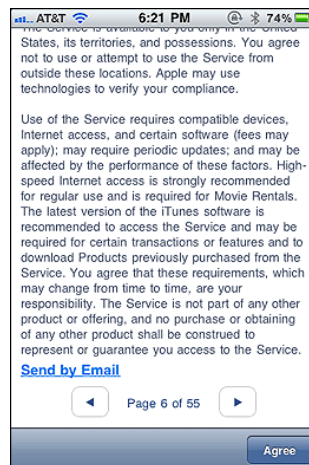
Layered examples from iOS



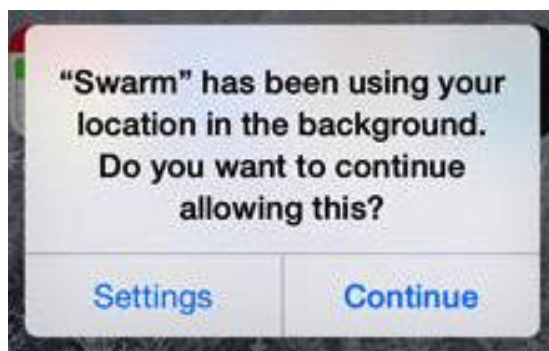
just-in-time, primary visual, blocking



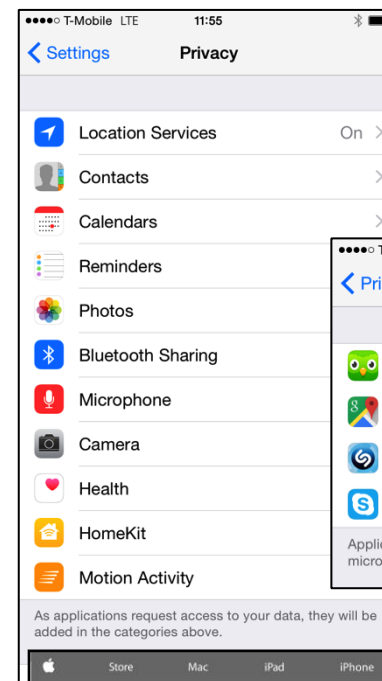
persistent, primary visual, non-blocking



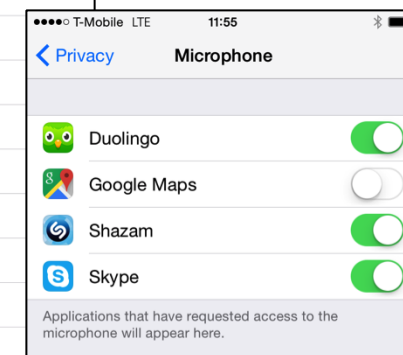
at setup, primary visual, blocking



periodic, primary visual, blocking



on demand, primary visual, decoupled

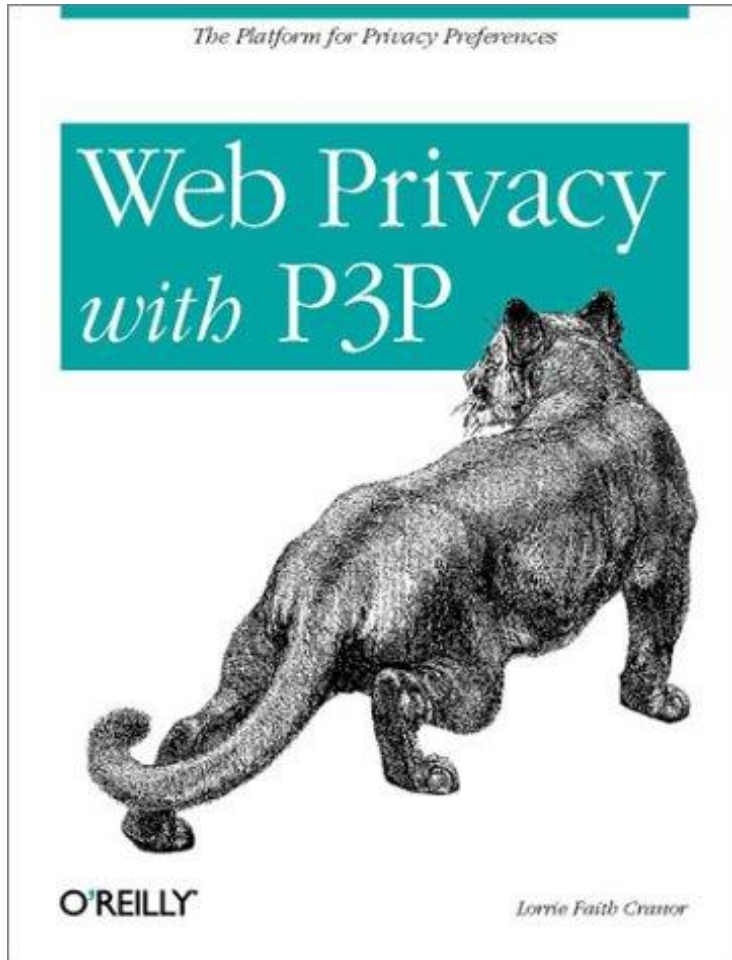


on demand, secondary visual, decoupled

Attempts at improving notice & choice

Attempt: Machine-readable privacy policies

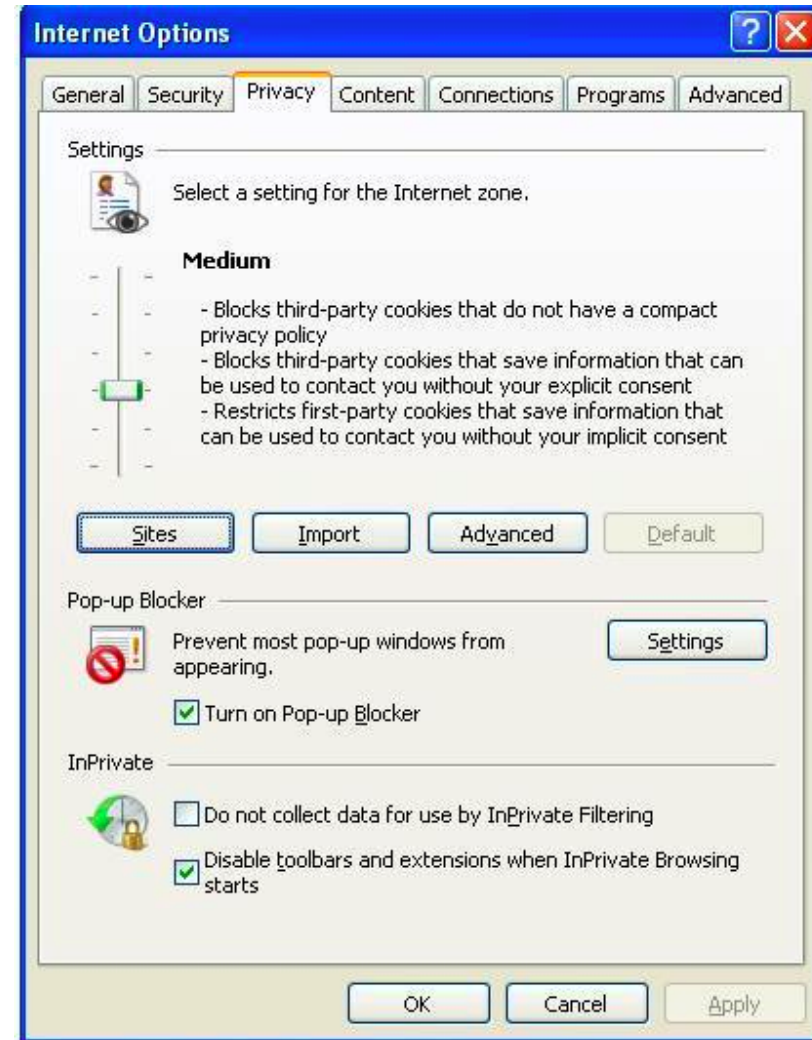
Let your computer read for you



- 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

P3P in Internet Explorer

- P3P implemented in IE 6, 7, 8, 9, 10 ...
- Default privacy setting
 - Rejects third-party cookies without a CP
 - Rejects unsatisfactory third-party cookies



**Attempt: Make your own
machine-readable privacy
policies**






Use NLP to read policies

- Usableprivacy.org
- It's a hard problem
- Annotated corpus → machine learning

Attempt: Crowdsourcing






Terms of Service; Didn't Read

SoundCloud Class B

-  You stay in control of your copyright
-  Collected personal data used for limited purposes
-  6 weeks to review changes
-  Indemnification from claims related to your content or your account
-  Personal information can be disclosed in case of business transfer or insolvency






 [More details](#)

GitHub Class B

-  You don't grant any copyright license to github
-  Changes can happen any time, sometimes without notice
-  You shall defend and indemnify GitHub
-  Your personal information is used for limited purposes
-  Your account can be suspended and your data deleted any time for any reason






 [More details](#)

Twitpic Class E

-  Twitpic takes credit for your content
-  Your content is for Twitpic and their partners
-  Reduction of legal period for cause of action
-  You indemnify Twitpic from any claim related to your content
-  Deleted images are not really deleted

 [More details](#)

Delicious Class D

-  Very broad copyright license on your content, includes right for Delicious to distribute through any media
-  No Right to leave the service
-  Only for personal and non-commercial use
-  [bad] delicious new terms 5. third party services get access to personal information
-  Your personal information are an asset for business transfers

 [More details](#)

Attempt: Standardized notices

Privacy Facts

[Redacted text block]

Privacy Facts

[Redacted text block]

Privacy Facts

[Redacted text block]

Privacy Facts

[Redacted text block]

Privacy nutrition labels

- 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. CHI 2010.





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

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

Standardized financial notices

- Gramm-Leach-Bliley Act mandated annual disclosures
- In 2009, regulators created a recommended form
 - High adoption because of safe harbor

Standardized financial notices

Rev. [insert date]

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:

- Social Security number and [income]
- [account balances] and [payment history]
- [credit history] and [credit scores]

When you are *no longer* our customer, we continue to share your information as described in this notice.

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.

Standardized financial notices

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		
Questions?	Call [phone number] or go to [website]	

Standardized financial notices

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.]

Standardized financial notices

Definitions	
Affiliates	Companies related by common ownership or control. They can be financial and nonfinancial companies. <ul style="list-style-type: none">■ <i>[affiliate information]</i>
Nonaffiliates	Companies not related by common ownership or control. They can be financial and nonfinancial companies. <ul style="list-style-type: none">■ <i>[nonaffiliate information]</i>
Joint marketing	A formal agreement between nonaffiliated financial companies that together market financial products or services to you. <ul style="list-style-type: none">■ <i>[joint marketing information]</i>
Other important information	
<i>[insert other important information]</i>	

Standardized financial notices

- Built a parser and built an online database
- Lets people compare practices
- <https://cups.cs.cmu.edu/bankprivacy>

Attempt: Improve timing

Privacy label for Android

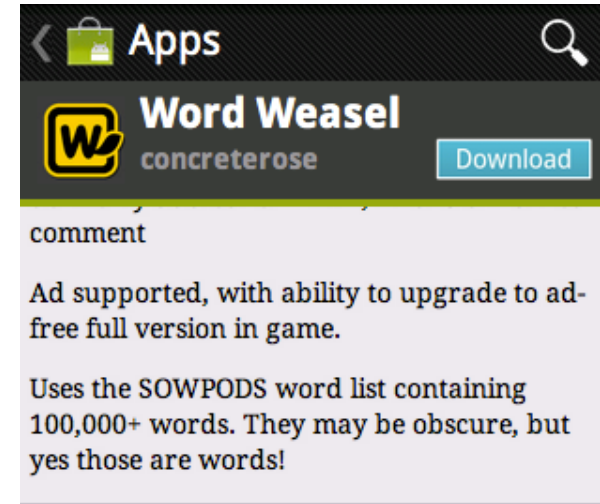


Privacy score ★★★★☆ 793
10,000+ downloads
1.9MB

DESCRIPTION

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



Privacy Facts

THIS APP COLLECTS YOUR

- Personal information
- Contacts
- Location
- Calendars
- Credit card / financial
- Diet / nutrition
- Health / medical
- Photos

THIS APP USES

- Advertising
- Analytics

REVIEWS



Attempt: Personalized privacy assistants

Personal privacy assistants



Attempt: Icons



Attempt: Standardized disclosure icons

AdChoices 



Pop in. Stand out.

Buy Now!

 **TARGET**  **P&G eStore**
by eStore Retail Services  **amazon.com**

AT&T.

The nation's
largest
4G
network.



[LEARN MORE](#)

Rethink Possible® 


4G speeds not available everywhere.

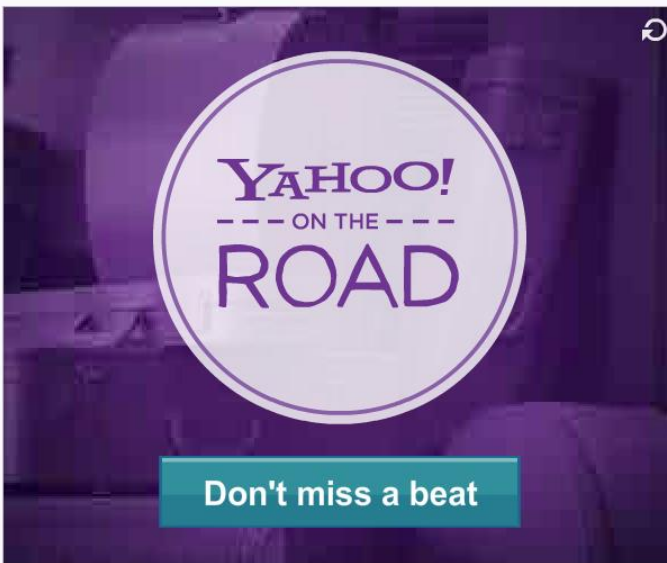
It's 1702, a decade after
The Crucible's infamous seductress
danced with the devil in Salem.

MAY 4-26, 2013

Abigail
1702

BY ROBERTO AGUIRRE-SACASA
DIRECTED BY TRACY BRIGDEN

 **CITY THEATRE** [BUY TICKETS >](#)



YAHOO!
--- ON THE ---
ROAD

[Don't miss a beat](#)

[Ad Feedback](#) AdChoices 