

HEAD IN THE DIGITAL SAND:

**How the Obama
Administration's
NTIA-led
Multistakeholder
Effort Doesn't Deliver
its Promised Privacy
Bill of Rights**

Jeff Chester

Center for Digital Democracy

August 2013

Executive Summary

The recent “multistakeholder” meetings convened by the National Telecommunications and Information Agency (NTIA) to develop “enforceable codes of conduct” in connection with the Obama Administration’s proposed “Privacy Bill of Rights” were flawed from the outset. While the Administration had an opportunity to advance the privacy and consumer protection interests of the American public, it failed to engage in the serious scrutiny and leadership these issues require. Missing almost entirely from the more than yearlong discussion was the impact that current digital marketing, mobile, and app-related business models have on the capability of a consumer to make meaningful privacy choices.

In order to address how best to ensure transparency for mobile app-related privacy choices, it was necessary to examine the full range of data collected by mobile apps, the interactive marketing techniques and formats used, their relationship to the increasingly cross-platform digital marketing system, and especially the impact of these practices on sensitive personal data (e.g., health and financial information) and vulnerable users (e.g., youth). The NTIA-led proceeding, unfortunately, failed on all counts.

This proceeding was bereft of information that surely industry stakeholders knew about—including contemporary mobile app data-collection practices; significant industry research examining the inter-relationships between consumers and mobile services; and actual app-related “sensitive data” applications involving finance, health, youth, seniors, and race/ethnicity. Industry also knew that addressing privacy problems focused on just

one application and platform would fail to identify the most effective ways to protect privacy in an era when users are increasingly tracked across a range of devices and are influenced by a well-designed, integrated digital marketing system. The leading and most knowledgeable mobile app gatekeepers—Apple, Google, Facebook, and Amazon—did not provide insights about their own activities. The NTIA should also have ensured that the academic literature on digital privacy, and what we know about the ability of consumers to make reasonable choices, informed the group’s work.

That the NTIA, which views itself as an expert agency on telecommunications for the White House, didn’t understand that mobile apps are merely one part of an integrated set of real-time consumer data collection and targeting services, involving an array of platforms, applications, and techniques that are leveraged to exploit the social and geo-locational behaviors of users, suggests that it cannot be relied upon to facilitate a meaningful process on privacy. Dominated by industry lobbyists, the Administration’s reliance on the stakeholder process to deliver meaningful safeguards to consumers is ill conceived. A disjointed, piecemeal, and uninformed initiative to protect the digital privacy of Americans is simply unacceptable. The Administration’s stakeholder framework to protect privacy is in need of serious reform.

The White House should not try to replace much-needed public policy with an inadequate, lobbyist-dependent series of convenings. It should release its long-overdue proposed privacy legislation, so the public can understand precisely how it would like its “Bill of Rights” implemented. If the Administration wants to continue stakeholder meetings, it should replace the NTIA with the Federal Trade Commission, which is much better equipped to serve as a fair and well-informed facilitator of what could be useful and revealing conversations between industry and consumer groups. It is now time, in short, for the White House to stand up for the privacy rights of all Americans.

Frustrated by the lack of candor on the part of industry stakeholders and the inability of the NTIA to pursue an objective analysis of the state of mobile app data collection, CDD began its own inquiry into the mobile app marketplace. The report addresses 12 areas that are either problematic app industry practices or issues that required stakeholder scrutiny. They include mobile industry research initiatives; app monetization practices; mobile app “discoverability” techniques; mobile measurement techniques; real-time surveillance; cross-platform tracking and device identification; lack of candor by industry standards groups; mobile marketing’s use of data for targeting; mobile real-time bidding & targeting; apps and sensitive data; the impact of mobile design on consumers; and issues raised by mobile tablets.



Introduction

In February 2012, the Obama Administration released its “blueprint for privacy in the information age,” proposing a “Consumer Privacy Bill of Rights.” President Obama said “Never has privacy been more important than today, in the age of the Internet, the World Wide Web and smart phones.” Among the proposed “Rights” included “Individual Control: a right to exercise control over what personal data companies collect from them and

how they use it; “Focused Collection: a right to reasonable limits on the personal data that companies collect and retain;” and “Transparency: a right to easily understandable and accessible information about privacy and security practices.” The Administration’s “Consumer Data Privacy in a Networked World” plan called on Congress to pass legislation enacting its proposal. It also announced that it would launch a “multistakeholder” initiative “to

produce enforceable codes of conduct that implement the Consumer Privacy Bill of Rights.” The codes were to “lead to privacy solutions that consumers can easily use and understand.” The Administration envisioned the development of multiple codes, explaining that “[a] single code of conduct for a given market or business context will provide consumers with more consistent privacy protection that is common today”¹

The Department of Commerce’s National Telecommunications and Information Agency (NTIA) was designated to convene multistakeholder meetings to develop the codes. The Administration urged Internet companies, trade organizations, privacy advocates, consumer groups, academics and others to work with the NTIA. The first NTIA stakeholder meeting took place on 12 July 2012, and a proposed “Short Form Notice Code of Conduct to Promote Transparency in Mobile App Practices was voted on 25 July 2013.”²

This initial effort to develop a code of conduct that reflects the Bill of Rights framework raises fundamental questions about the commitment of the Obama Administration to protect privacy. As this report documents, the yearlong NTIA stakeholder process failed to engage in the serious scrutiny and analysis required to protect consumer privacy in the contemporary digital-data-collection era. It avoided addressing the impact that current digital marketing business models have on the capability of a consumer to make meaningful privacy choices, including when using mobile devices or “apps. The NTIA has not demonstrated the necessary leadership or expertise to ensure that consumers can soon expect to be in control over their data, including sensitive information related to the finances and health. Dominated by industry lobbyists, the Administration’s reliance on the stakeholder process to deliver meaningful safeguards to consumers was ill-conceived.

The Federal Trade Commission (FTC) should launch a new inquiry into mobile application data practices, and propose safeguards for consumers. The European Union should also be forewarned that despite public commitments from the Administration on how consumer privacy is protected, the U.S. is still far behind in developing effective data protection rules. The White House should conduct a review of the NTIA to assess whether it is capable of advancing the proposed Privacy Bill of Rights initiative. As this report will explain, we believe the FTC—an independent agency with significant privacy expertise—should be the lead federal entity developing new consumer protection rules for the digital marketplace.

It was the NTIA that choose “mobile app transparency” from the many opportunities to advanced consumer protection that the White House’s Privacy Bill of Rights potentially provided. The decision by the NTIA to narrowly focus its work on implementing the White House principles dovetailed with the deregulatory agenda of the mobile data collection industry.³

For the Center for Digital Democracy (CDD), a fundamental issue from the start was that in order to address how best to ensure transparency for mobile app-related privacy choices, it was necessary to understand the range of app data collected, the interactive marketing techniques and formats used, their relationship to the increasingly cross-platform digital marketing system, and, especially, the impact data collected from apps have on sensitive information areas. The app industry is part of a highly structured, maturing, and sophisticated mobile and digital monetization and marketing infrastructure, with pre-existing and expanding consumer-targeting techniques, abundant industry-funded research, self-regulatory policies, and influential corporate players.

The NTIA proceeding was bereft of information that surely industry stakeholders knew about—including contemporary mobile app data-collection practices; ongoing mobile industry standards groups; significant industry research examining the inter-relationships

between consumers and mobile services; and actual app-related “sensitive data” practices involving finance, health, youth, seniors, and ethnicity. Industry also knew that addressing privacy problems focused on just one application and platform would fail to identify the most effective ways to protect privacy in an era when users are increasingly tracked across a range of devices and are influenced by a well-designed, integrated digital marketing system. The leading and some of most knowledgeable mobile app gatekeepers—Apple, Google, Facebook, and Amazon—did not provide insights about their own activities. The NTIA should also have ensured that the academic literature on digital privacy, and what we know about the ability of consumers to make reasonable choices, informed the group’s work.⁴

The NTIA’s position that it is merely a facilitator in helping to develop a consensus among stakeholders—and thus could not insist that information on app marketplace structures, techniques, and their implications be made a central

focus for review, illustrates that agency’s institutional constraints in playing a privacy leadership role on behalf of the public.

CDD has previously raised concerns about mobile privacy. In 2009 CDD and US PIRG filed a complaint with the Federal Trade Commission asking for an investigation into unfair and deceptive mobile marketing activities. Since that filing we have closely followed industry practices, with their growing ability to harness hyper-local data collection, to “auction” off mobile users for real-time targeting through ad exchanges, and to deploy a standardized set of unique mobile advertising formats. In our view, placing a label on what might be collected, which was the focus of the NTIA “transparency” effort, was a flawed approach. What was needed was an inventory and analysis of current mobile and mobile app-related data gathering practices, such as the role of so-called app “discoverability,” where data-rich profiles can be used to influence how individuals may learn of or interact with an app.

With gaming the most popular form of app, how would interest in a game affect a user's privacy choices? What, and how, should a consumer be told about the practice of app and other casual game developers to closely monitor users' spending behavior in real time, changing the game to maximize revenue?⁵ Consumers should be told before downloading an app that they are going to be labeled by developers, such as a "minnow, dolphin or whale" depending on their in-app spending behaviors.⁶

Numerous other questions about how well-known app-business practices affect consumer privacy should have been discussed. These concern the impact on initial privacy decisions of the common app business practice of initially offering a "freemium" app that is specifically designed to become one involving a range of paid transactions. Similarly, what is known about privacy decision-making when the referral for an app may come from a friend, but is actually part of a well-developed "viral" social-media marketing

strategy? More than 40 million U.S. smartphone users were expected to use mobile coupons this year. How do incentives, such as discounts and mobile coupons, influence consumers? How does video, especially on a mobile device, impact a user's app decision-making? What is the array of metrics, such as "lifetime value" or "K-factor," used by the app industry to measure and evaluate a consumer and what should we know about their implications? There was not even a review of the basic way individuals learn about apps, including the role of download rank, store reviews, media coverage, ads, and word-of-mouth information. Another omission was the failure to address the implications of app-related research commissioned by online companies. We would have learned that consumers are "addicted to apps," which serve "as a digital extension of [our] physical selves."⁷ No consideration was given either to the implications of long-established digital data collection practices involving engagement and personalization, as reflected in the recent work of the IAB.⁸

Apps from K Street:

The NTIA's process fundamentally relies on the willingness of lobbyists representing the data collection industry—and which make up the vast majority of participating stakeholders—to propose or endorse policies that would potentially harm their own business practices. It is foolish, at best, to rely on an initiative to protect consumers where lobbyists must be willing to publicly acknowledge that their clients' or industry's existing data collection practices raise serious privacy and consumer protection concerns. It would have been against the economic interests of the online industry's fundamental business model to limit what are ever-growing data gathering capabilities. Given the role that trade associations play as stakeholders—and their well-known opposition to legislation or regulation that would actually enable consumers to control their online information—conflict of interest was rife. The role of the Department of Commerce, which oversees the NTIA, also raises questions about conflicts, given its focus on expanding opportunities for business—including for U.S. technology companies.⁹

Need-to-Know Not Addressed

Early on, CDD led the call by the NGOs for a series of briefings on the state of the mobile and data collection system, to help bring everyone up to date and potentially on equal footing. While four background briefings were ultimately held, including one organized by CDD, these informational sessions merely scratched the surface of mobile and app industry practices and online consumer behaviors and expectations. CDD's briefing brought independent outside experts to discuss critical concerns, and also examined the mobile research done by industry.¹⁰ But instead of engaging with the substantive questions raised by scholars Lorrie Cranor, Joseph Turow, and Alessandro Acquisti, or exploring the implications of user expectations examined in Google and the Mobile Marketing Association mobile research, the industry—eager to move on a framework without regard to an assessment of actual developments and consumer experiences in the app marketplace—didn't support an ongoing discussion.¹¹ Consumer and privacy

advocates, with very limited resources and a desire not to be seen as encouraging delay, dropped their demands for further information. Ultimately, the NTIA process was like having a surgeon operate on a patient without initially conducting a thorough examination.

Frustrated by the lack of candor on the part of industry stakeholders and the inability of the NTIA to pursue an objective analysis of the state of mobile app data collection, CDD began its own inquiry of the mobile app marketplace. This report is intended to add to the record information that should have been identified and addressed months ago. It serves as a warning to consumers, policymakers, and regulators—in both the U.S. and EU—that the Administration's stakeholder framework developed to protect privacy is inadequate and in need of serious reform. A disjointed, piecemeal and uninformed initiative to protect the digital privacy of Americans should not be acceptable.

The App Landscape

Apps are a part of a robust and growing mobile, geo-location-focused and cross-platform data-collection system. Mobile advertising expenditures are climbing dramatically, with an estimated \$4.1 billion spent in 2012 (an increase of 178 percent over the previous year). eMarketer predicts that in 2013, \$7.29 billion will be spent for mobile ads, including on tablets, and by 2017 will generate more than \$27 billion (nearly half of all spending on digital ads).¹² Consumers increasingly spend time with apps, “with 14% and 29% of our mobile time spent on them, on phones and tablets respectively.”¹³ A recent report by Appnation says that the U.S. app economy was worth nearly \$60 billion this year (2013) and predicts growth to \$151 billion by 2017. Games involving apps and mobile devices are an important sector of the industry, with U.S. revenues expected to triple to \$3 billion by 2016. The sale of virtual goods via mobile is on the rise as well. Illustrating how apps have become a part of the everyday consumer experience, time spent with “price comparison apps” in December 2012 grew 247 percent year-over-previous-year, according to app analytics provider Flurry.¹⁴

Head in the Digital Sand

Why did the NTIA ignore the abundance of resources available on the mobile and mobile app marketplace to help it foster a framework to advance mobile privacy? We can't answer that question, but only illustrate that it could have turned to numerous sources from industry, trade groups, online publications, academia, and financial filings. The NTIA could have examined public documents at the Securities and Exchange Commission to gain insight into the realities that confront mobile app consumers. For example, last January mobile marketer Millennial Media filed an S-1 with the SEC explaining that its business, which included helping companies "acquire users for their apps and gain insight about their users," incorporated

sophisticated targeting capabilities and the opportunity to deliver interactive and engaging ad experiences to consumers on their mobile connected devices... . Our proprietary technology and data platform, known as MYDAS™, determines in real-time which ad to deliver, as well as to whom and when...In September 2012, our platform reached ... approximately 150 million unique users in the United States alone. ... Mobile devices are inherently personal in nature, facilitate anytime-anywhere access to their users, allow for engaging app-enabled experiences and offer location-targeting capabilities Each time an app makes a request to receive an ad, the MYDAS platform performs several tasks automatically and in real-time, including identifying unique users; targeting ads based on user interest, behavior and location; delivering those ads to millions of users through tens of thousands of apps We have developed more than 600 audience categories to which advertisers can target their ads.¹⁵

Millennial's SEC filing reflects well-established data-profiling and targeting capabilities on mobile platforms, including for apps.

*This paper will highlight some of the **key issues** that the NTIA should have addressed:*

ISSUE **one**

ASSESSING MOBILE INDUSTRY RESEARCH INITIATIVES THAT IMPACT CONSUMERS AND THEIR PRIVACY CHOICES

Over the last several years, a significant body of industry-sponsored research has documented the unique relationship an individual has with their mobile device. These studies, many conducted by the leading companies and associations working in the mobile marketplace, provide critical insights on user expectations and behaviors.¹⁶ Google especially has engaged in a wide-ranging series of research, market-conduct, and case studies related to the mobile environment. (Google, of course, has

significant ownership of mobile and app marketing services).¹⁷ A 2011 Google study, "The Mobile Movement," designed to "[g]ain a deep understanding of smartphone user behavior," which included the role such phones play in accessing apps, identified that these devices were already "embedded into daily life," an "always on companion" used while "consuming other media." The deeply personal relationships that mobile devices have with us was underscored by the finding that some 43 percent of

those surveyed (in December 2010) were willing to “give up” beer if needed to keep their smartphone access to the Internet (and 36 percent of users similarly were willing to forgo chocolate if necessary). Mobile has already transformed “everyday shopping behavior,” explains Google, including nearly a quarter of the research respondents who have bought products through an app. Relevant as well was the finding that mobile user behavior was influenced by a range of services and experiences, including “word of mouth,” online and mobile advertising, in-store experiences, and by other media.¹⁸

Google turned to anthropological research in October 2012 for another study, “The Meaning of Mobile,” which was designed to answer the following question: “We can’t live without apps, maps, and email on the go, but what we don’t know is why. Why does the ringing of mobile phones trigger the same brain waves as love, for example? And why do we feel them vibrating even when they’re missing? What do these devices mean to us that they make us lovesick?” An anthropologist interviewed

“dozens of ordinary mobile device owners and observe them as they interacted with their smartphones.” The study found that “[o]ur mobile devices help us fully actualize our best self, or what we call the Quicksilver Self; they engage us to create a shared culture, the New Tribalism; and they help us to make sense of the physical world around us, an act we describe as Placemaking. Understanding the deeper levels at which individuals, customers, are finding meaning in mobile will enable marketers to put this powerful medium to its best use.”¹⁹ Viacom/MTV’s research analyzed the “Life Cycle” of apps, where interviewees admitted being “addicted” to using them. Yahoo, Microsoft, the Mobile Marketing Association, and many others have also conducted or published studies.²⁰

The research suggests that mobile devices are viewed as extensions of ourselves, raising fundamental questions of how apps and other mobile communications influence our privacy decision-making. The stakeholder group failed to confront this fundamental question.

ISSUE **two**

THE FAILURE TO IDENTIFY AND ANALYZE MOBILE APP MONETIZATION PRACTICES

One of the most critical areas for the stakeholders to have reviewed, under a consumer protection lens, is the relationship of app business models to privacy decision-making. Consumers should be told how their data—and cash—could be impacted by downloading an app. Prominently displayed on the Applications Developer Alliance’s website is the term “Monetization,” along with a new tool designed to help its members use such techniques as “behavioral tracking,” “In-app Purchasing,” “Personalization,” and “Geolocation Targeting” to boost their

revenue-generating capabilities. A paper written for the Alliance’s app developer members discusses issues related to monetization, how apps are marketed to users, and the role of app stores. Yet these relevant concerns were not part of the stakeholder deliberations. App users face, explains the Alliance, the “Seven Types of Monetization” strategies.” They include such practices as “Free-to-Play”: “The idea behind in-app purchases is to let consumers sample enough of the product to want more. Developers can offer multiple upgrade options for each app and

continually add buying opportunities.”²¹ In-app advertising is also a major force in this market. The Alliance recommends that app developers leverage “analytics and [use] A/B testing to gauge the stickiness of specific ads ... [as] key elements of successful ad strategies. Developers also can drive users to their apps, and thus the revenue-generating ads, with push notifications.”²²

For example, several members of the Alliance employ monetization strategies that should have been part of a broad discussion. LeadBolt enables developers to “fully monetize through the app usage cycle,” including enabling “immediate monetization upon install. Excitement about the app is at its peak and the user is most receptive to ads.”²³ Another Alliance member relies on selling the location of app users as a source of app revenue generation. Placed Affiliate promises developers they can “start turning location into monthly revenue (used for ‘market research purposes’).”²⁴ PaeDae says its

network has “[o]ver 150,000 developers” and works with some of the most popular games and apps on mobile and Facebook. Its monetization approach illustrates the real-time surveillance by many apps, and the kind of app dynamics that required review.²⁵

Tracking social interactions is another model used by Alliance member eDealya and its subsidiary Appayable. They “analyze the device’s social profiles to provide our data partners with roughly 50 unique attributes per user—associated with a device ID.”²⁶ eDealya’s “Brand Engagement” solution “gets to know your fans and followers through their social interactions, filters out irrelevant chatter, and analyzes potential business triggers that present an engagement opportunity for your brand.” One can

define engagement triggers such as: events, desires, buying intentions, and interests their fans and followers are sharing on social media. Our algorithms

spot, identify and filter the activities and information your fans and followers share. Spotting these intentions and engagement opportunities is done based on complex sets of pre-defined lexical templates, which are optimized

based on continuously generated social data. ... These attributes allow our clients to micro-segment their user bases and provide each user or segment with the most relevant content or a personalized experience.²⁷

Apsalar, in its “Five Engagement Metrics” publication, discusses how to foster user “loyalty” for Apps:

- **Offering** a loyalty program, allowing users to accumulate points each time they return to the app, which they can then redeem for rewards
- **Launching** special limited-time promotion codes or discounts
- **Continue expanding** your app with new levels or features
- **Employing** the use of social sharing to encourage interactivity
- **Experimenting** with push notifications or email to prompt users to engage with the app more frequently
- **Using** funnel conversion and cohort retention analysis to understand where and when your users drop off in activity in the app, and experiment with the user experience to reduce this.²⁸

Other monetization strategies for apps abound, including offering an app for free in exchange for watching branded content. Tapjoy’s business model enables developers to have their apps serve

as “virtual rewards” when a consumer agrees to view “personalized ads.”²⁹ Companies such as Applicasa, in their videos, urge developers not to let users be mindless, non-paying “Zombies” but

to use Applicasa’s virtual store services to drive in-app purchases. Applicasa’s data gathering enables developers to target users with “a wide range of variables,” including “the highest amount spent in one transaction, current balance of virtual currency, preferred time of play, levels completed, [and] achievements.” It also says that developers can “drop a few lines of code”—or “events”—into their apps to trigger a promotion when users reach a milestone such as a goal or score. Promotions can include such things as deals (e.g., daily discounts or two-for-ones), announcements (i.e., push notifications to give users updates on events or new releases), or rewards of virtual goods or currency.³⁰

Urban Airship’s approach also pushes marketing messages to users, taking advantage of what it says is the “always-

there, always-on nature of mobile devices that gives real-time access to user behaviors, preferences and location profiles.” It provides a “rich push composer” that enables consumers to be targeted for in-app push messages.³¹

The breadth of app monetization strategies and relationships is extensive, but not “rocket science,” explains Burstly. Its “Skyrocket” “app monetization solution” works with more than 50 data partners, and uses segmentation strategies to create “different experiences for different users.” It enables developers to “run individual offers as banners and interstitials” and an ad-supported “mediated offerwall.”³² As we will discuss later, gaming developers also provide us with a glimpse into the sophisticated methods used to secure monetization

ISSUE three

THE ROLE OF THE MOBILE APP “DISCOVERABILITY” SYSTEM DESIGNED TO ACQUIRE NEW USERS

The app industry has developed a very robust method using data profiling to target users and convince them to download an app. Known as “discoverability,” this was one of the most important issues overlooked by the NTIA. “The race to get apps in front of people has turned ad installs into a lucrative market,” explained Ad Exchanger, “with the top 40% of iOS and Android app developers” using Facebook’s mobile app install ad product alone. Install ads can be “granular in terms of rich targets and different profiles ... [to]

target specific users based on their age, interests, the brands they like, [and] where they are in the U.S”³³

While it may have served the industry participants to deliberately ignore the apparatus their industry has constructed to influence user decision-making for apps, for CDD it showed a lack of serious commitment to look closely at what actually is happening in the marketplace. The industry understands how a user learns—or “discovers”—an app, and has consequently developed a set of

strategies to take advantage of where users congregate and how they behave. In 2013, apps were promoted and advertised using the 100-plus mobile ad networks; “app discovery platforms”; via other apps that permit so-called “cross-selling”; by “incentivized ad networks” that provide incentives, including rewards, to promote app downloading; through search engines; and through social media, such as Twitter and Facebook, that rely on “user invites and other social app discovery platforms.” Users inviting their friends and app discovery based on social elements, explained mobile app measurement and tracking company AppsFlyer, were the most effective marketing techniques.³⁴

Facebook’s “mobile app install ad unit” is considered “the most effective social driver of high quality users at large volumes.” Given the intense public debate on Facebook’s focus on mobile, one would have imagined it would have sparked the interest of the NTIA or stakeholders. But no such luck, despite the social networking giant’s extensive mobile measurement partners, and its various options for

developers to “measure the performance of Facebook ads driving mobile app installs” Facebook works with an array of mobile measurement and app tracking providers, including Ad-X, Adeven, Adways, Apsalar, HasOffers, Kontagent, Localytics, and Swrve, that help developers identify such metrics as “lifetime value” and “downstream conversions.” Despite the robust system of mobile app analytics involving the millions of Americans using Facebook, the NTIA looked the other way. If it had the interest of American online users in mind, it would have learned that Facebook partner Ad-X tracks “all media sources that deliver an app down” and also measures “any in-app conversion events a client wishes,” including “sale, sales value or registration.” Adeven tracks “revenue per user, time to first purchase, revenue per event.” Apsalar enables Facebook app developers to “analyze user behaviors and remarket [retarget] to their best users to increase customer lifetime value,” while Hasoffers’ “MobileAppTracking allows you to easily see revenue per install.”³⁵

Apsalar (“data is in our DNA”) urges the use of behavioral targeting to engage in user acquisition for apps, including the use of “targeting parameters” involving “demographics, income, geo (location), interests, and more.” Claiming it delivers “only high quality mobile users,” Apsalar says it relies on “1st party behavioral data on over 700 Million mobile users to help marketers more effectively reach profitable and engaged users with both audience

targeting of specific personas and through lookalike targeting of prospective users that share similar behavioral qualities as the marketer’s best users.” It can “target users that play games, make in-app purchases and have high engagement indexes,” as well as use “lookalike” techniques to “build a targeted user profile that match the behaviors of your best LTV! (lifetime value).”³⁶

Another developer, Xyo, harnesses the role of social media experience to promote apps to both individuals and their network of friends. It explains that

With just one click our “Apps for Me” feature taps into your Facebook profile to provide you with a list of app recommendations based on your real life interests. It’s the equivalent of a waiter magically guessing your favorite foods and drinks We do “Apps for Me” not only for you, but also for your entire Facebook network. The outcome is search results that include the app interests of your friends. On the Xyo platform, you can view the app interests of your closest friends and send them personalized

App measurement and marketer Flurry, relying on data it “gathers from 1 billion mobile users per month ... uses advanced targeting to find the right users for your app and keep them coming back.” Flurry also offers 20 “Personas” that are

targetable segments of consumers with shared interests based on their usage across hundreds of thousands of apps. One can be identified as an “In-app purchaser, value shopper, hardcore gamer, social influencer, LGBT, High Net-Worth

Individual,” etc. It provides age and language targeting, including to 13-17 year olds. (The use of such targeting labels should have been deliberated during the NTIA proceeding.)³⁸

Fiksu also illustrates how discoverability for potential app users can involve a set of distinct data points. Its platform “includes ... over 80 billion app user conversion events (installs, launches, in-app purchases, game levels, and other conversion events) each attributed to a media source. This data helps identify

media sources known to deliver the types of users your business needs.”³⁹ Like many others in digital marketing, Fiksu uses the data collected to optimize how a consumer can be better targeted in the future. Nor were the implications of the use of data management platforms involving a host of third-party data to track and target users when they engage with apps discussed, such as Bluekai’s ability to “[a]ctivate audience segments across BlueKai’s huge digital ecosystem and mobile partners to target your audience across mobile web and in-app.”⁴⁰

ISSUE **four**

THE IMPACT OF MOBILE MEASUREMENT METHODOLOGIES ON CONSUMER PRIVACY

In digital media, the use of measurement tools and the targeting of users are integrated. App companies track “events” to determine how well a user is helping achieve goals related to monetization.⁴¹ The methods and techniques in mobile and mobile app metrics continue to grow, with industry observers noting that 2013 was the “Year of Mobile Measurement.” Yet there was no discussion on the numerous ways users are tracked, measured, assessed, and subsequently treated when they interact with the app-connected environment. The Application Developers

Alliance Business & Revenue Working Group white paper, “Monetization: Picking the Path to App Profitability,” includes a recommendation that “developers use analytics tools like Distimo, Flurry and Xyologic to see which app stores perform best for them and where their target audiences shop.”⁴² As the Alliance explains to its members (but not to the NTIA stakeholder group), apps should use a range of “metrics” about users to help them “ace your monetization strategy,” including identifying a consumer’s “lifetime value.” These metrics include

“Acquisition: You need to know how much revenue one user brings on average ...”; “Engagement: how compelled your users are to come back during the same day or week ... [and] the average session length.” Another metric the Alliance paper recommends is the identification of a user’s “K-factor,” or “Virality.” It explains that the “K-factor represents the average number of additional users each user introduces to the app A good way to increase your app’s vitality is to integrate it with social media channels such as Facebook and Twitter.”⁴³

The Alliance’s paper recommended the use of “multiple analytics tools” and referred its readers to the MobyAffiliates website. That site, which contains an abundance of information on the mobile app system, includes a 2012 “Guide to Mobile Analytics.” Numerous measurement companies well known to be involved in the app industry are cited—yet the techniques of collection and assessing users went undiscussed by the NTIA and stakeholders.⁴⁴ Also overlooked was the

impact and controversies related to app “unique identifiers.” Despite the significant role played by Google’s Android UDID and Apple’s Identifier for Advertisers in terms of data collection, one would have imagined that these pervasive practices were not even invented yet! Apple’s concerns about the implications of accepting UDID-based apps for its store, which were made public in 2012, should have at least triggered a debate by stakeholders.⁴⁵

Through a range of analytic functions, companies can better understand the conditions to target users for the most effective promotion of apps. Google, for example, has an extensive app discoverability analytical system. Mobile app analytics provide insights into “the geographic location and languages spoken by visitors, in-app purchase totals, the number of screens seen per visit, and the order in which visitors move through these screens,” as well as their interactions with “special content, like video.” One can learn, via Google, “how often your app

is downloaded and installed, and how successful certain marketing campaigns are in attracting visitors ... the people using your app —where they are, how often and long they use an app ... [and] track in detail the ways users interact with your app. Find out which screens are viewed in a typical visit, or set up Event Tracking to analyze custom actions, like button clicks and video plays.” It would have been a fascinating discussion if the NTIA had pressed Google to tell stakeholders

what it informs app developers, marketers, and advertisers—that app developers can identify business goals and ecommerce objectives to “track the detailed ways visitors interact,” including “discrete actions like a minimum session duration or completing a certain level in a game; in-app purchase data, including product or service sales, total revenue, and revenue per transaction, [and] the average number of visits it takes to complete a transaction.”⁴⁶

ISSUE **five**

REAL-TIME SURVEILLANCE

One of the most serious privacy concerns CDD discovered was what appears to be routine close surveillance of gaming app consumers. Real-time monitoring and assessment of consumers' in-app behaviors, and the resulting changes to their content in order to maximize profits, require an immediate investigation by the FTC and state attorneys-general.

PlayFirst, the app developer of the popular "Diner Dash" and "SpongeBob Diner Dash" series, focuses on gathering real-

time user actions to increase monetization. PlayFirst identifies users by their spending habits, including labeling them as minnows, dolphins, or whales (which spend "43 times more than minnows," explained CEO Marco DeMiroz to developers, with 16 or more in-app purchases). They "analyze and monitor and manage user behaviors to increase in-app spending" on a "24 by 7" basis. A/B and multivariate testing are also conducted to make sure players are primed to make purchases. When users reach "key conversion points," such as game levels

4 or 7, they are prompted to “convert” (spend money). “Viralty, monetization and retention” are built into the core game design.⁴⁷

The data gathered by gaming company Playnomics permits “predictive player targeting” by watching “every move” game users make (“our algorithmic targeting engine continuously buckets players every second of day ...”), including on mobile devices. “Every player is evaluated, scored and segmented based on their in-game behavior.” ... [T]hat level of granularity allows you to find attributes about customer behavior ... that help uncover motivations that can become monetization opportunities.” “Sub-scores” are created for users, determining, for example, “how loyal each player is [and] what their future spend patterns could be Then we put the power of the scores to work” Players are sent “push notifications” tied to their behaviors. Meanwhile there is ongoing player-level testing designed to “migrate players through funnels and activate compulsion loops.”⁴⁸

Playnomics explains that its engagement scores are “like a high fidelity credit score for gamers, designed to quantify performance across every stage in a player’s life cycle ...,” with scores for “attention, loyalty and intensity.” This surveillance is used, for example, to drive “revenue from ... whale spenders ... [and] identify the low value or nonspenders in your game”⁴⁹

Bees & Pollen is a “predictive personalization” platform for games and apps that “uses advanced predictive algorithms to detect complex, non-trivial correlations between conversion patterns and users’ DNA signatures, thus enabling it to automatically serve each user a personalized best-fit game options, in real-time.” It analyzes over 100 user attributes, including activity on Facebook, spending behaviors, marital status, and location. All this information is used by developers to “personalize any Element in your game,” including optimizing features involving “payment pages, incentives, call-to-action messages, look-and-feel, game-flow.” Its Sense6 product for casino games enables

developers to “predict players choice” and offer more personalized content designed to prevent “leaving money on the table ...” The company explains that “We believe ‘gold’ can be mined from the abundant heaps of social and transactional user data available in apps (like games, social apps and ecommerce). Our algorithms leverage both social and behavioural (CRM) data, in addition to current session data to make intelligent prediction on-the-fly to match each user’s predicted preferences

and adjust their path and experience. By improving each user’s experience with more relevant content our customers benefit because their users stay longer, spend more, return sooner, and invite more friends, resulting in an uplift of all key metrics (KPIs) of Monetization, Virality, Retention and Engagement, meaning more money and extended reach for our customers.”⁵⁰

Kontagent also provides app developers with real-time insights of users. “kSuite DataMine makes it possible to answer questions such as:

- **What** last three actions did users take before they uninstalled or failed to return?
- **What** last five behaviors did users exhibit before purchasing virtual goods?
- **What** are the purchase habits of my highest-value gamers or users?
- **Who** are my most viral users, and how can I use that information to attract more of them?
- **What** unusual spending patterns or other behaviors signal the presence of fraud or other anomalies?⁵¹

While gaming apps provide a glimpse into the ongoing—and unconscionable—monitoring of users, the range of methods used by “social casinos” and other online

gambling apps requires scrutiny by policymakers. The role of app games was not subject to a discussion by the NTIA.⁵²

ISSUE **SIX**

CROSS-PLATFORM DEVICE IDENTIFICATION AND USER FINGERPRINTING

Advances in device identification technologies increasingly enable the tracking of users across multiple devices. Developments in mobile device identification models (using so-called fingerprinting) are leading to the expansion of profiling and “lookalike modeling” (where a user is identified for targeting according to parameters collected and analyzed based on the behavior of other similar users), including across devices.

As Ad Monsters recently explained about the implications of device identification,

“Never before has digital tracking become so personal, and never before has the argument for consumer privacy controls been so compelling.”⁵³ Device recognition on mobile devices is helping marketers and developers scrutinize the “path that led a consumer to take an action” and the capabilities to both target and retarget users.

The cross-platform tracking of users also reveals that focusing solely on one platform, such as mobile, is insufficient when addressing Internet privacy. A

user who decides to forgo an app on their mobile device can be relentlessly pursued and retargeted elsewhere online. For example, Drawbridge “developed a statistical algorithm to match users’ cookies with their devices. Using our algorithm, we are able to match, within levels of confidence, the device ids belonging to a person represented by a cookie in the browser and vice versa. We run our algorithm daily to match device ids in our mobile advertising network with the desktop cookies we receive from our partners and build a database storing the device ids and the cookies associated with them We have accumulated cookies that are matched to over 500 million devices in our current database”⁵⁴ Drawbridge explains its “TrustE certified matching technology also offers user mapping across apps and browsers, and across identification formats. Users who click on the ad can be ‘deep linked’ into the app (i.e., the application is opened directly into the product purchase page), and can therefore have a seamless experience that takes advantage of the initial application download.”⁵⁵ It targets

ads “both in-app and in mobile web—towards users that fulfill any combination of criteria set by the marketer (e.g., ‘has turned off alerts, has not made first purchase, loves sales on household décor’).”⁵⁶

Other companies are also engaged in cross-platform targeting. AdBrain explains it “creates a single customer profile by modelling billions of rich desktop, mobile and tablet data sets using advanced data science and machine-learning algorithms.”⁵⁷ MdotM’s “cross-device retargeting technology enables advertisers to reach users as they navigate from one device to another.”⁵⁸ Companies such as Kochava provide fingerprinting capabilities that help app developers and others “track even the untrackable.” It explains that “When no device identifiers are provided by a publisher or network, Kochava automatically engages its fingerprinting system By using a variety of algorithms which incorporate geo-location, carrier information as well as device information, we can match clicks to installs with an ~85% accuracy rating.”⁵⁹

A wide and growing set of data variables connected to individual consumers is gathered and made actionable for the app-targeting industry. Applift, for example, explains, that when a user clicks on an ad, its “system creates a unique device fingerprint” that includes a “transaction ID.” In milliseconds, the user “gets instantly redirected to the Apple AppStore, Google Play Store or any other destination page you have chosen to install your mobile game. As soon as the user opens your app on his device, the user’s fingerprint will be

compared to the “click fingerprint” on our servers. In case both fingerprints match we record a successful conversion and attribute it to its respective traffic source.”⁶⁰

When a myriad of integrated data sets, including app device ID’s, are used in real-time that have analyzed users behavior, and target when a user may be most vulnerable (or target using different platforms in a coordinated manner), there should be actionable implications.

ISSUE seven

MOBILE INDUSTRY GROUPS AND LACK OF CANDOR

Despite the highly structured work of the mobile marketing industry to advance its data collection capabilities, industry representatives were silent on what their companies actually do, and on the issues and future objectives they are working to address. Although the Mobile Marketing Association has separate committees addressing “Mobile Applications, Mobile Analytics, Data Targeting Standards, Mobile Video, Mobile Ad Coupon and Privacy,” its work was not presented to the NTIA. For example, its Mobile App

committee is “examining Mobile Apps as a media channel that needs to be optimized in the following areas: relevancy, distribution, monetization, development and marketing.” In 2012 this committee formed task forces addressing the first three areas, and the results of their efforts were delivered at the MMA Forum in New York on June 14, 2012. Nearly three-dozen companies that represent a wide range of mobile interests and expertise comprise the Mobile App committee, including AT&T, Google, Turner, Pandora, and Fiksu.⁶¹ The Interactive Advertising Bureau’s “Center for

Mobile Excellence,” established in 2010 to foster research and education (and which includes Google, Facebook, Microsoft, Verizon, and others on its own board) similarly failed to provide stakeholders with its considerable resources on practices that impact privacy.⁶² Both the Digital Advertising Alliance and Network Advertising Initiatives engaged in mobile app and privacy-related work and released relevant documents during this first NTIA stakeholder proceeding. But the implications of what they did were not discussed.⁶³

Despite the role of the Application Developers Alliance (Alliance) working with three NGOs on what became the principal short form code, the NTIA group actually heard very little about the data collection practices its members engage in. Although the Alliance has key working groups on issues central to protecting app privacy, such as on “Mobile Payments, Health and Medical Apps, and Emerging Technologies and Research,” these specific issues were not explored by the NTIA. Nor was information presented by the Alliance on the crucial role of mobile lead generation, where a user’s data can be gathered and sold to others (often for financially related purposes).⁶⁴

ISSUE **eight**

THE RELATIONSHIP OF THE MOBILE MARKETING SYSTEM TO CONSUMERS AND ITS IMPACT ON PRIVACY

Understanding the data driven-marketing framework targeting consumers with mobile-related services is a fundamental ingredient to developing strategies that empower user privacy. A review of the mobile advertising formats for apps would have been important to better understand the dynamic relationship that has been constructed by marketers between users, their location and other data, and techniques designed to promote industry goals of “immersion” and “engagement.” Yet nowhere did the NTIA and industry ever discuss longstanding techniques

designed to foster consumer action and behavior, such as click or tap to call, click to email, or the use of rich media and other formats established by mobile marketing trade groups. For example, music service Pandora enables mobile marketers to use “Tap to Video, Drag and Drop and Tap to App, Tap to Email, Tap to iTunes,” while Airpush relies on eight mobile ad types, such as “AppWall, Dialog, Push, Banner and Video.”⁶⁵ There are “Dynamic In-Application Ads” (“Ads that can be dynamically changed ... to the same or different users”) and “Event Based

Ads” (“Ads that are generated as a result of an event in the application, typically triggered by a User’s interaction ...”).⁶⁶ A whole new set of mobile marketing formats, known as the “Rising Stars,” has been researched and approved by the IAB, with names like “filmstrip, slider, adhesion banner, and push.” As comScore explained in announcing the “winners” of the IAB mobile ad contest, “Consumers interact on smartphones and tablets with a series of swipes, taps, scrolls and flips that go well beyond the basic click that we’re used to focusing on with other digital screens.”⁶⁷

The use of mobile behavioral targeting was also ignored. Apsalar touts its behavioral and audience targeting prowess, explaining that it has “accumulated over 350MM unique user profiles and hundreds of billions of user events from the most in-depth behavioral analytics available” Its “mobile app ecosystem” targeting involves “complex mathematical procedures involving Principal Component Analysis (PCA), logistic regression and

other statistical models run over massive 1st party behavioral and other data sets.”⁶⁸ Mobile ad and app marketing company Nexage integrates “demographic, location, device ID and psychographic data, including age, gender, marital status, children, income, education, occupation, latitude and longitude, zip code, Neustar AdAdvisor Targets and Nielsen PRIZM clusters” for real-time targeting.⁶⁹

The mobile marketing industry has also developed a series of policies, guidelines, and “best practices” on mobile commerce, many of which should have been reviewed for their impact on consumer privacy. For example, since 2008 the Mobile Marketing Association (MMA) has had a “Global Code of Conduct.”⁷⁰ MMA published a 165-page “U.S. Consumer Best Practices Report” in 2011. Its Mobile Advertising Guidelines “establish a common and basic set of standards ... [to] accelerate market development and ensure consumer acceptance.” There is also a specification that covers a variety of “Mobile Application Advertising Unit

Definitions” for apps, and identifies types of apps that should have required analysis and appropriate safeguards.⁷¹ The lack of a thorough review by the NTIA of the

relevant industry codes, frameworks, and mobile app data collection standards illustrates the lack of rigor it applied to the proceedings.

ISSUE **nine**

THE ROLE OF MOBILE REAL-TIME BIDDING (RTB) AND ITS IMPLICATIONS WAS TOTALLY IGNORED, DESPITE ITS ROLE SUPPORTING APP MONETIZATION STRATEGIES

An expansion of the programmatic exchange system featuring the automated buying and selling of online users in real time, mobile real-time bidding (RTB) has been a feature for several years. There is an infrastructure of data profiling and targeting services used for mobile RTB, including the use of first- and third-party data to target users. As Open X and AdTruth explain, mobile “RTB-level performance means the ability to apply audience intelligence to billions of impressions at millisecond speeds,

gather data that can be used to improve campaign performance, deliver the fullest range of creative execution and provide real ROI for mobile marketers.”⁷² Among the companies providing mobile app RTB services are Mobclix (“more app, less crap”), MoPub (“the largest RTB exchange for mobile apps,”), and Nexage.⁷³

AdTheorent’s “real time learning machine” reflects the current capabilities of Big Data RTB power to drive mobile and app marketing. It analyzes the “audience

profile of each potential ad impression in real time. We then enrich the profile with additional first party and third party demographic, behavioral, psychographic, environmental, sentiment, keyword and other contextual insight.” AdTheorent’s Apptivation mobile ad unit can then drive “in-app activity by detecting instantly whether a specified brand or social app is loaded on a user’s mobile device, and then launching the app, even taking the user directly to a branded page. If the app is not yet installed, Apptivation directs the user to an alternate destination, such as the appropriate app store or another mobile page.”⁷⁴

Mobile RTB company Jumtap handles “2 Billion RTB Requests Per Day,” and “supports its audience targeting through partnerships with more than 20 third-party data providers,” including Acxiom, datalogix, PlacelQ, Bluekai, and AppNexus. That company’s “audience profile store” features “100 million unique, data-rich profiles, of which more than 44 million can be reached across various screens—online and mobile.”⁷⁵ Its “app

promotion” targeting power is used to reach users with financial apps and drive consumers into fast food restaurants. Jumtap is being acquired by mobile ad company Millennial Media, which boasts they have more than “450 million user profiles” used for ad targeting.⁷⁶

Companies are focused on “leveraging billions of rich mobile, tablet and desktop data sets to create a single customer view for intelligent real-time audience buying.”⁷⁷ In a recent app-related mobile RTB patent application, mobile marketing company Fiksu illustrates how inferences (which they call “embodiments”) are made about the characteristics of users, who can then be subjected to real-time targeting.⁷⁸ Device recognition methodologies are being combined with RTB, leading to frightening privacy prospects.⁷⁹

The use of real-time and “cross-platform” data-enabled targeting raises questions concerning the impact such techniques have on the ability of a user to make meaningful privacy choices.

ISSUE **ten**

NO STAKEHOLDER EXAMINATION OF THE ACTUAL IMPACT OF APPS IN SENSITIVE DATA CATEGORIES, INCLUDING FINANCIAL, HEALTH, YOUTH, AND ETHNICITY/RACE

Stakeholders as a group failed to examine the collection and use of information by apps in some of the most important areas affecting the public. The actual practices of apps targeting multicultural users, teens, and financial and health consumers went unexplored. Yet the Administration's privacy blueprint highlighted the critical importance of protecting sensitive data, noting that "Unauthorized disclosure of sensitive information can violate individual rights, cause injury or discrimination based

on sensitive personal attributes, lead to actions taken in response to misleading or inaccurate information, and contribute to costly and potentially life-disrupting identity theft."⁸⁰

The NTIA had the opportunity to press stakeholders to ensure vulnerable or at-risk users, and such personally critical issues related to health and finances, were the subject of inquiry, discussion, and proposed safeguards. But industry stakeholders, for the most part, didn't

want to address these issues, given that they might trigger a much-needed but uncomfortable spotlight on what they really do.

In a multicultural society like the U.S., it is disturbing that issues related to the use of ethnic or racial data were not addressed. It is well known that Hispanics and African Americans are in the forefront of using mobile devices and applications. Both Hispanics and African Americans, according to eMarketer, are more inclined to download an app than whites. These groups are targeted in distinctive ways, including through the use of mobile-connected social media applications. Racial and ethnic data are often used to target multicultural users, who have little knowledge—let alone control—of whether they approve the use of such data (which are often combined with financial, location, and other information). U.S. Hispanics were said to spend \$500 million on mobile apps last year. The NTIA should also have insisted that stakeholders address how apps are targeted to primarily Spanish-

speaking consumers. This issue should be the focus of an FTC inquiry.⁸¹

Adolescents are leading app users, yet stakeholders failed to address their critical privacy needs. Stakeholders did not want to examine the impact of age on a user's ability to make app-related privacy choices (whether kids or seniors). Despite an abundance of developmental and market research available that demonstrated the need for teen safeguards—and an urging in the White House privacy framework that young people required special consideration—the NTIA proceedings conveniently ignored them. The failure to address adolescents illustrates why the reliance on a stakeholder approach cannot be used to protect privacy. Industry representatives are fearful that if sensitive data issues are fully explored, they may spur policymakers to enact new privacy rules (extending what CDD and its colleagues were able to achieve protecting children 12 and under in the Children's Online Privacy Protection Act).⁸²

The data used by financial and health apps can have a direct impact on an individual. The NTIA should have asked the industry stakeholders to provide it with representative examples of apps in these sensitive data categories to better understand their operations and implications. For example, payday loan and debit card companies that generate high fees from financially vulnerable consumers are using mobile apps. So, too, are lead-generation companies, which gather and sell user data, often for financial products. Mobile payment services have expanded their use of apps, raising serious questions of privacy and consumer protection. The data collected and shared by shopping apps, similarly, deserves attention. The emergence of so-

called mobile wallets, backed by Google and others, is another growing financial app category that should have been reviewed.

There is also an explosion of health apps, addressing distinct concerns related to diet, stress, women's health, chronic conditions, mental health, smoking, and the like. The Privacy Rights Clearinghouse recently analyzed 43 health and fitness apps, finding that they "pose a number of privacy risks."⁸³ Understanding the potential uses for health information, and how it may be used to discriminate against or target a consumer with unfair products and services, should have had a high priority for the NTIA. Unfortunately, it was not.⁸⁴

ISSUE eleven

THE ROLE OF MOBILE DESIGN IN CONSUMER PRIVACY

In designing any code or developing privacy safeguards, it is critical to deconstruct how mobile applications are created to begin with. When consumers interact with mobile services, including apps, they likely face an environment that has been purposefully designed and tested to engage their behavior. Through such common industry practices as multivariate testing and eye tracking, the devices, platforms, and applications are honed for user ease and acceptance—raising issues about how consumers recognize and can process privacy concerns on

mobile devices. Mobile marketers and others, for example, have long and openly discussed their ability to use design and related marketing applications (such as “engagement”-oriented “rich media”) to elicit the responses and behaviors desired by the developer or the marketer. While there was some interest in analyzing the proposed code, there wasn’t a commitment to understand in the first place how mobile services and applications are tested and what that means when developing new approaches to empowering consumer decision-making.⁸⁵

ISSUE twelve

1621 Connecticut Ave.
NW, Suite 550
Washington, DC 20009

DemocraticMedia.org
DigitalAds.org

THE NEED TO ADDRESS THE DISTINCT USER ISSUES RAISED BY TABLETS

No distinctions were offered by the NTIA and industry stakeholders concerning the differences raised by various mobile platforms, especially the mobile phone and tablet. Yet as industry certainly recognizes from its own extensive research, the tablet offers a unique environment. VivaKi, for

example, has been conducting research—backed by major advertisers—to identify new digital formats since 2011. Its research on tablets, which also started in 2011, involved 20 million consumers through “field trials” and other venues, and included leading online ad industry

The Proposed Code

research organizations and such brand advertisers as Bank of America, Best Buy, the Coca-Cola Company, General Mills, and Procter & Gamble. In its report—not a secret to anyone in the mobile industry—the impact of tablets was described: “The U.S. is now home to 70 million tablet users, marking the tablet as the fastest-growing innovation ever. The rate at which consumers have adopted tablets dwarfs the pace of all the innovations of the last century—the television, the automobile, the smartphone.” As the report notes, “50 Billion Apps” have been downloaded by tablet users, with 1.3 million apps available for that platform, with extensive “multiplatform” behavior (e.g., “96% of tablet users shop while in their bedroom”). Understanding what the industry itself has learned about tablets would have been useful: “By combining the mobility of a smartphone with capabilities and user experiences that mirror those of TV and traditional PCs, tablets have defined their own brand of mobility—one that spans all dayparts, creating even greater opportunities for advertisers to connect with consumers throughout the day and night.”⁸⁶ How the leading mobile platforms may distinctly influence privacy considerations was ignored.

The “Short-Form Notice Code of Conduct presented to the stakeholder group by the Application Developers Alliance, ACLU, Consumer Action, and World Privacy Forum is supposed to “provide consumers enhanced transparency about the data collection and sharing practices of apps that consumers use.” It is based on a premise that by providing “information about application practices in a consistent way ... consumers [can] compare and contrast data practices of apps. These short notices seek to enhance consumer trust in app information practices” Although voluntary, the code would require those who adopt it to provide a wide range of information on what data are collected (biometrics, contacts, location, etc.) and shared (with ad networks, government agencies, other apps, etc.). It permits a range of data-

related activities to be “exempt” from the notice requirements, including when the information is used to “maintain, improve or analyze the functioning of the app, cap the frequency of advertising, [or] perform network communications.” It “encourages but does not require presentation of a short form notice prior to installation or use of the application.” Authors of the code said they hoped the consistent provision of information on what apps collect or share would create the digital equivalent of a nutrition label found on many consumer food products.⁸⁷

The code was hailed by NTIA chief Lawrence Strickling, who called it “a seminal milestone in the efforts to enhance consumer privacy on mobile devices.”⁸⁸ The ACLU, one of the code’s drafters, was more temperate, calling it a “modest but important step forward for consumer privacy.”⁸⁹ It will now be subject to testing by some industry groups.

However, as this report suggests, the ways by which the code was developed was flawed. There was an assumption—despite the evidence available—that consumers can make rational and responsible decisions about their privacy by seeing key words and phrases about a particular application or issue. This approach was embraced despite the overwhelming evidence about the interconnected and data-driven operations of the digital targeting system and its ability to influence consumer expectations and behavior.

Recommendations

The White House should not try to replace much-needed public policy with an inadequate, lobbyist-dependent series of convenings. It should release its long-overdue proposed privacy legislation, so the public can understand precisely how it would like its “Bill of Rights” implemented. We hope its bill will empower the FTC to conduct the necessary rulemakings to place consumers actually in charge of their data. The Consumer Financial Protection Bureau (CFPB) should also be urged to issue rules that protect online financial privacy.

The Administration should acknowledge that the NTIA-led stakeholder initiative is incapable of developing privacy safeguards for consumers and citizens. Data-collection industry-dominated groups have no self-interest to meaningfully disclose—let alone propose effective regulation—about practices that require redress. With many of the same stakeholder companies working against proposed European Union and U.S. regulations to strengthen consumer privacy protection, it’s naive to believe they suddenly could rise above their own institutional and industry priorities.

The White House appears to believe that just because industry can come together on technical standards, it can also do so on what is a politically contentious issue—privacy. If it wants to see how another similar stakeholder effort addressing privacy is failing, it should examine the more than two-year old struggle of the Worldwide Web Consortium to develop a “do-not-track” technical standard. As with the NTIA proceedings, data collection companies comprise the majority of participants in that undertaking as well.

If the Administration wants to continue stakeholder meetings, it should replace the NTIA with the FTC. The commission can better serve as a fair and well-informed facilitator to help direct what could be useful conversations between industry and consumer groups. If it convenes stakeholder

advisors, the FTC should first prepare a report that outlines contemporary data collection and business practices and their impact on privacy. Such research—which brings into view how information is collected from individuals in the “360-degree” targeting environment—should form the baseline of future work. The FTC should issue its own set of recommendations on industry best practices and make the appropriate recommendations to Congress.

Deliberations should also not flitter from issue to issue. For example, it is rumored that the NTIA (and some stakeholders) want to address “facial recognition” next. How one can justify abruptly abandoning much-needed work on the mobile platform to address this issue is unfathomable.⁹⁰

We hope this report also serves as a wake-call for the White House. The current controversies about the NSA reveal the pervasive and powerful nature of the data collection system that has been unleashed. American technological innovation has fostered a far-reaching digital targeting machine that is able to stealthily “shadow” us wherever we go and whatever we do. It is able to analyze—and even predict—our behaviors—all in a lightning flash. Data about us are melded together in an instant, used to generate “stories” and “experiences” that engage our deep interest. Through the collection of location and social media information, our unique geographic behaviors and how we interact with our friends and communities have become just another Big Data point for online targeting.

A voluntary effort primarily composed of people working to expand, without constraint, the capabilities of the digital marketing industry should not be the Obama Administration’s vehicle to address privacy. What we need are fundamental rights that correct the balance over how individuals control their data in the 21st Century. It is not, as one company cited earlier said, “rocket science.” Online marketers and others want to collect all the data they can about us—that’s been the basis for e-commerce since the Web became commercial. Legislation and

regulation should reasonably limit how and what information can be collected—especially in those areas that deeply affect an individual’s ability to protect the interests of themselves and their families. It’s time for the White House to stand up for the privacy rights of Americans.

The Center for Digital Democracy is a leading consumer advocacy organization committed to protecting the digital and privacy rights of all consumers.

202.986.2220 www.democraticmedia.org

1 The reliance on multistakeholder agreements were based on the Administration's belief that they can offer the "flexibility, speed, and decentralization necessary to address Internet policy challenges" and that "they can produce solutions in a more timely fashion than regulatory processes and treaty-based organizations." White House, "Consumer Data Privacy in a Networked World: A Framework for Protecting Privacy and Promoting Innovation in the Global Digital Economy," Feb. 2012, p. 31, <https://www.whitehouse.gov/sites/default/files/privacy-final.pdf> (viewed 17 Aug. 2013). This framework was adopted from the Internet technical standard's process, which, the Administration explained, "function[s] on the basis of consensus and [is] amenable to the participation of individuals and groups with limited resources. These characteristics lend legitimacy to the groups and their solutions, which in turn can encourage rapid and effective implementation." "Consumer Data Privacy in a Networked World," p. 23.

2 National Telecommunications and Information Agency, "Short Form Notice Code of Conduct to Promote Transparency in Mobile App Practices," draft, 17 June 2013, http://www.ntia.doc.gov/files/ntia/publications/july_17_code_draft.pdf (viewed 17 Aug. 2013). The code has varying degrees of support, from industry and advocates, and some participants plan to conduct user testing. National Telecommunications and Information Administration, "A Homework Assignment for Privacy Stakeholders," 1 Aug. 2012, <http://www.ntia.doc.gov/blog/2012/homework-assignment-privacy-stakeholders> (viewed 23 Aug. 2013). The "Consumer Privacy Bill of Rights," explained the Administration's paper, sets "forth individual rights and corresponding obligations of companies in connection with personal data. These consumer rights are based on U.S.-developed and globally recognized Fair Information Practice Principles (FIPPs)" Other Rights include "Respect for Context, Security, Access and Accuracy, and Accountability."

3 The Future of Privacy Forum, a group backed by many mobile data-focused collection companies, including Google, Jumptap, InMobi, AT&T, Verizon, and Facebook, urged the NTIA in April 2012 to designate "mobile apps as a first area of focus" for the stakeholder process. The goal was made clear in an op-ed written by the Forum's co-founders: "App Developers, Not Regulators are Best Suited to Solve Privacy Problems." Future of Privacy Forum, "FPF Asks NTIA to Focus on 'App Privacy,'" <http://www.futureofprivacy.org/2012/04/02/fpf-asks-ntia-to-focus-on-app-privacy-2/> (viewed 24 Aug. 2013).

4 Given their vast investment and knowledge of the app market, the lack of effective participation by the app gatekeepers is another illustration of how the NTIA effort is riddled with problems. There is also a wealth of information available on the app market, something that appeared not to interest the NTIA and most stakeholders. See, for example, Apple, "About the Guidelines for Creating Great Mac Apps," Mac Developer Library, 23 July 2012, <http://developer.apple.com/library/mac/documentation/UserExperience/Conceptual/AppleHIGuidelines/Intro/Intro.html>; AdMob, "Build a Great App Business with AdMob," <http://www.google.com/ads/admob/>; Google, "Mobile Ads," Google Think Insights, <http://www.google.com/think/products/mobile-ads.html>; Amazon, "App Engagement Reports," <https://developer.amazon.com/welcome.html>; Amazon, "Web App Resources Overview," <https://developer.amazon.com/sdk/webapps.html> w/video; Facebook, "Games on Facebook Overview," Facebook Developers, <https://developers.facebook.com/docs/guides/canvas/>; Fiksu, "Fiksu Resources," <http://www.fiksu.com/resources>; Amazon, "Amazon Mobile Ads API," <https://developer.amazon.com/sdk/mobileads.html>; Google, "Campaign Measurement—Android SDK," Google Developers, <https://developers.google.com/analytics/devguides/collection/android/v2/campaigns#google-play-campaigns>; Fiksu, "The Fiksu Blog," <http://www.fiksu.com/>

blog/facebook%E2%80%99s-mobile-app-install-ads-drove-spike-app-downloads-may; Amazon, "Amazon In-App Purchasing API," <https://developer.amazon.com/sdk/in-app-purchasing.html> (all viewed 17 Aug. 2013).

5 Center for Digital Democracy, "Complaint and Request for Inquiry and Injunctive Relief Concerning Unfair and Deceptive Mobile Marketing Practices," 18 Jan. 2009, http://www.centerfordigitaldemocracy.org/current_projects/privacy/analysis/mobile_marketing; eMarketer, "Time Spent With Mobile Apps Rivals TV," 11 Dec. 2012, <http://www.emarketer.com/Article/Time-Spent-With-Mobile-Apps-Rivals-TV/1009533> (both viewed 20 Aug. 2013).

6 Brian Anthony Thornton, "Stellar Stories—With Marco Demiroz of PlayFirst," Gamesauce, 2 Nov. 2012, <http://gamesauce.org/news/2012/11/02/stellar-stories-with-marco-demiroz-of-playfirst/> (viewed 23 Aug. 2013).

7 eMarketer, "Digital Coupons, Mobile Give Cheapskates Staying Power," 29 Apr. 2013, <http://www.emarketer.com/Article/Digital-Coupons-Mobile-Give-Cheapskates-Staying-Power/1009847>; "MTV Research Finds Mobile App 'Addiction' Stronger Than Coffee, Soda Addiction," Mobile Marketing Watch, 8 June 2011, <http://www.mobilemarketingwatch.com/mtv-research-finds-mobile-app-addiction-stronger-than-coffee-soda-addiction-16080/>; eMarketer, 1 Aug. 2013, "US Time Spent on Mobile to Overtake Desktop," <http://www.emarketer.com/Article/US-Time-Spent-on-Mobile-Overtake-Desktop/1010095>; Google Mobile Ads, "The Full Value of Mobile—Extra Anchovies and the Moon," YouTube, 26 Mar. 2013, <http://www.youtube.com/watch?v=eKS5-KuGAls>; Google, "Full Value of Mobile," <http://www.fvm.withgoogle.com/fvm/en/d/#>; "MTV Networks' Mobile Apps Study Reveals the Life Cycle of an App: From Discovered to Discarded," PR Newswire, 7 June 2011, <http://www.prnewswire.com/news-releases/mtv-networks-mobile-apps-study-reveals-the-life-cycle-of-an-app-from-discovered-to-discarded-123348433.html> (all viewed 20 Aug. 2013).

8 Interactive Advertising Bureau, "IAB Digital Ad Engagement Whitepaper: An Industry Overview and Reconceptualization," <http://www.iab.net/adengagement> (viewed 23 Aug. 2013).

9 U.S. Department of Commerce, "About the Department of Commerce," <http://www.commerce.gov/about-department-commerce> (viewed 20 Aug. 2013).

10 National Telecommunications and Information Administration, "Privacy Multistakeholder Process: November 13, 2012 Telephone Briefing," <http://www.ntia.doc.gov/other-publication/2012/privacy-multistakeholder-process-november-13-2012-telephone-briefing> (viewed 17 Aug. 2013).

11 Jules Polonetsky of the Future of Privacy Forum admitted in one briefing that the mobile app system was interconnected to the broad data collection apparatus already established by industry. NTIA, "Privacy Multistakeholder Process: November 13, 2012 Telephone Briefing."

12 Mark Walsh, "VivaKi Rolls Out New Tablet Ad Units," Online Media Daily, 3 Apr. 2013, <http://www.mediapost.com/publications/article/197250/vivaki-rolls-out-new-tablet-ad-units.html#axzz2bUBqsEwO> (viewed 17 Aug. 2013); eMarketer, "US Ad Spending: Mid-2013 Forecast and Comparative Estimates," 31 July 2013 personal copy.

13 eMarketer, "US Time Spent on Mobile to Overtake Desktop," 1 Aug. 2013, <http://www.emarketer.com/Article/US-Time-Spent-on-Mobile-Overtake-Desktop/1010095> (viewed 17 Aug. 2013).

- 14 Kim-Mai Cutler, "Time Spent In Retailers' Mobile Apps Grows More Than Five-Fold In A Year, Flurry Finds," Tech Crunch, 25 Jan. 2013, <http://techcrunch.com/2013/01/25/mobile-shopping-apps/>; eMarketer, "Gaming for Marketers—Let the Mobile Games Begin," Dec. 2012, <http://www.slideshare.net/AleixRisco/emarketer-gaming-for-marketers-let-the-mobile-games-begin>; eMarketer, "US Gamers Race to Mobile," 14 Dec. 2012, <http://www.emarketer.com/Article/US-Gamers-Race-Mobile/1009543> (all viewed 22 Aug. 2013).
- 15 Millennial Media, "Form S-1, Registration Statement Under the Securities Act of 1933," 5 Jan. 2012, <http://www.sec.gov/Archives/edgar/data/1372375/000104746912000042/a2206760zs-1.htm> (viewed 18 Aug. 2013).
- 16 As digital market researcher Millward Brown wrote in its 2012 report "Mobile devices are indispensable and increasingly central to our lives." MillwardBrown, "AdReaction 2012: Mobile Presents Marketers Globally with an Unprecedented Opportunity to Engage with Consumers," Changing Channels 70|20|10, http://www.millwardbrown.com/Sites/Changing_Channels/AdReaction.aspx (viewed 18 Aug. 2013).
- 17 Google, "Mobile," Google Think Insights, <http://www.google.com/think/ad-types/mobile.html> (viewed 18 Aug. 2013).
- 18 Google, "The Mobile Movement," Google Think Insights, Apr. 2011, <http://www.google.com/think/research-studies/the-mobile-movement.html> (viewed 18 Aug. 2013).
- 19 Jesse Haines and Abigail Posner, "Mobile and ... Anthropology?" Google Mobile Ads Blog, 2 Oct 2012, <http://googlemobileads.blogspot.com/2012/10/mobile-and-anthropology.html>. Google research has also demonstrated the potential of its "app promotion solutions," such as its "Conversion Optimizer," to deliver a "150% improvement in [the] App download rate for mobile social gaming service GREE." Google, "GREE Uses the Conversion Optimizer in Google AdWords to Maximize ROI Across the AdWords Network," Google Think Insights, Oct 2012, <http://www.google.com/think/case-studies/gree-uses-the-conversion-optimizer-in-google-adwords.html> (both viewed 18 Aug. 2013).
- 20 "MTV Research Finds Mobile App 'Addiction' Stronger Than Coffee, Soda Addiction," Mobile Marketing Watch, 8 June 2011, <http://www.mobilemarketingwatch.com/mtv-research-finds-mobile-app-addiction-stronger-than-coffee-soda-addiction-16080/> (viewed 23 Aug. 2013). The same study also highlighted the impact gaming and entertainment-oriented apps have on how users perceive the value of the app. See also Yahoo, "Mobile Modes," Aug. 2011, <http://advertising.yahoo.com/article/mobile-modes.html>; Microsoft, "Advertising: Understanding How Mobile Factors into the Consumer Journey," <http://advertising.microsoft.com/en-us/cl/457/mobile-research-report>; James Gurd, "M-commerce Innovation Briefing," Econsultancy, Nov. 2011, <http://econsultancy.com/us/reports/m-commerce-innovation-briefing>; Mobile Marketing Association, "MMAF New York 2012—Speaker Presentations," 11-14 June 2012, <http://www.mmaglobal.com/events/forums/newyork2012/presentations> (all viewed 18 Aug. 2013); "MTV Networks' Mobile Apps Study Reveals the Life Cycle of an App: From Discovered to Discarded." Despite the MMA's support for the International Journal of Mobile Marketing, the range of insights on the impact of mobile practices was not presented. Of relevance, for example, would have been such articles as Melody Adhami, "Using Neuromarketing to Discover How We Really Feel About Apps," International Journal of Mobile Marketing 8, n. 1 (Summer 2013), http://www.mmaglobal.com/international_journal_mobile_marketing_vol8_no1 (purchase required).
- 21 "Monetization: Picking The Path To App Profitability," p. 7.

- 22 "Monetization: Picking The Path To App Profitability," p. 11.
- 23 LeadBolt, "Monetize," <http://www.leadbolt.com/developers.php> (viewed 20 Aug. 2013).
- 24 Placed, "Monetize You App with Placed Affiliate," <http://www.placed.com/publisher-solutions/placed-affiliate> (viewed 19 Aug. 2013).
- 25 PaeDae explains its process in the following manner:
- (1) Interact: A consumer is engaged with an app
 - (2) Achieve: The consumer reaches a moment of success such as leveling up or completing an app achievement
 - (3) Reward: The app presents the consumer with an advertising unit – that looks and feels like a reward
 - (4) Action: The consumer then enters their email to receive the reward
 - (5) PaeDae is personalized and targeted. Our proprietary tools allow you to reach your ideal customer by giving them prizes that will entice them. Your ad is not disruptive; in fact, users are playing the game/app longer in order to receive a prize. This generates significant engagement rates.
- PaeDae, "Advertisers," <http://paedae.com/advertisers> (viewed 19 Aug. 2013)
- 26 Appayable, "Monetize," <https://www.appayable.com/monetize/> (viewed 19 Aug. 2013).
- 27 eDealya analyzes the relevant data collected and scores each intention so that a qualified decision can be made as to whether this is a valid intention to be targeted. This analysis is based on machine learning and advanced natural language algorithms that, together with proprietary statistical optimization techniques, allow you to filter out the exact intentions your brand can answer. eDealya determines the static and dynamic attributes of individual fans and presents engagement opportunities for the brand to join the conversation. ... eDealya's easy to use social persona API provides a comprehensive profile for each of your users in real-time. Using the individual's Twitter handle, we provide a detailed profile of over 50 attributes which range from age and gender, to hobbies, interests, and lifestyle habits. eDealya, "Leverage Social Data," <https://www.e-dealya.com/advertisers/>; eDealya, "Target Mobile Inventory by Leveraging Social Signals ...," <https://www.e-dealya.com/wp-content/uploads/2013/07/eDealya-One-Page-v4.32.pdf> (viewed 20 Aug. 2013). Also not discussed by the stakeholders was the routine use of app-related dashboards that enable marketers to watch us. See, for example, Tapstream, <https://tapstream.com/> (viewed 22 Aug. 2013).
- 28 Apsalar, "5 Engagement Metrics You Need To Track For Your Mobile Apps."
- 29 Tapjoy, "How Tapjoy Works for Mobile Developers—the Tapjoy Mobile Value Exchange," YouTube, 10 Apr. 2013, http://www.youtube.com/watch?v=Lg2t5pldVO8&feature=youtube_gdata_player; Tapjoy, <http://info.tapjoy.com/> (both viewed 22 Aug. 2013).
- 30 Kongregate Developers, "Maximizing Monetization—Casual Connect SF 2013," 1 Aug. 2013, <http://developers.kongregate.com/blog/maximizing-monetization-casual-connect-sf-2013>; Tzvi Kopetz, "Applicasa's Mobile Game Management Platform," YouTube, 27 Sept. 2012, <http://www.youtube.com/watch?v=Oy7iHC8mVds#t=32>; Applicasa, "Mobile Game Management Platform," <http://www.applicasa.com/#Press1> (all viewed 23 Aug. 2013).
- 31 Urban Airship, "Audience Segmentation," <http://urbanairship.com/products/audience-segmentation>; Urban Airship, "Mobile App Engagement," <http://urbanairship.com/products/mobile-app-engagement#push-messages> (both viewed 22 Aug. 2013).

- 32 SkyRocket, "Mediation," <http://www.skyrocketapp.com/features#mediation>; SkyRocket, "Supported 3rd-Party Networks," <http://www.skyrocketapp.com/networks>; FlightPath, "Analytics in Action," <https://testflightapp.com/flightpath/>; SkyRocket, "Rewards," <http://www.skyrocketapp.com/features#rewards> (all viewed 24 Aug. 2013).
- 33 Judith Aquino, "Facebook Mobile App Install Ads Capture Revenue, Drive Installs," Ad Exchanger, 2 July 2013, <http://www.adexchanger.com/mobile/facebook-mobile-app-install-ads-capture-revenue-drive-installs/> (viewed 22 Aug. 2013).
- 34 Oren Kaniel, "AppsFlyer Q1 2013 Mobile App Discovery Report," AppsFlyer, 1 May 2013, "<http://www.appsflyer.com/d4vp6l7yis-appsflyer-q1-2013-mobile-app-discovery-report/>" (viewed 22 Aug. 2013).
- 35 Facebook, "Mobile Measurement Partners," Facebook Developers, <https://developers.facebook.com/preferredmarketingdevelopers/mobile/measurement/>; Mobile App Tracking, <http://www.mobileapptracking.com/>; Mobile App Tracking, "Resources for MobileAppTracking," <http://www.mobileapptracking.com/resources/> (both viewed 22 Aug. 2013); Aquino, "Facebook Mobile App Install Ads Capture Revenue, Drive Installs."
- 36 Kaniel, "AppsFlyer Q1 2013 Mobile App Discovery Report"; Peter Farago, "App Engagement: The Matrix Reloaded," Flurry Blog, 22 Oct. 2012, <http://blog.flurry.com/bid/90743/App-Engagement-The-Matrix-Reloaded>; Apsalar, "Data is in our DNA ... and in our Products," <http://apsalar.com/why-apsalar/big-data-lab/>; Apsalar, "Acquire the Right Users, Anytime, Anywhere," <https://apsalar.com/products/apengage/audience-targeting/>; Apsalar, "Apsalar's Demand-Side Platform Available and Out of Beta," Apsalar Blog, July 2013, <http://apsalar.com/blog/2013/07/apsalar-mobile-dsp/> (all viewed 22 Aug. 2013).
- 37 Xyo, "About Ayo," <http://xyo.net/about> (viewed 19 Aug. 2013).
- 38 Flurry, "Build a Better App Audience," <http://www.flurry.com/appCircle-a.html>; Flurry, "Maximize Your Marketing ROI, Completely Free," <http://www.flurry.com/flurry-user-acquisition-analytics.html>; Flurry, "Segment Audiences by Real Interests," <http://www.flurry.com/flurry-personas.html> (all viewed 22 Aug. 2013).
- 39 Fiksu, "Fiksu Mobile App Marketing Platform: How It Works," <http://www.fiksu.com/products/how-it-works>; Fiksu, "Fiksu Mobile App Marketing Platform: Marketing Performance, Business Results," <http://www.fiksu.com/products/overview> (both viewed 22 Aug. 2013).
- 40 BlueKai, "The Data Activation System," http://www.bluekai.com/marketers.php#mobile_data_management_platform (viewed 22 Aug. 2013).
- 41 Apsalar tracks and scores user behavior to generate what they call an "Engagement Index":
 Monetization: Are users making in app purchases and what percentage of my users actually make them?
 Event: In-app purchase (+ attribute SKU # & price)
 Answer: Track the "in-app purchase" event over time and use a cohort analysis to see what percentage of users make a purchase and how much revenue, ARPU & ARPPU is generated from that cohort This is a great way to see if you are getting more people to make purchases on a month-to-month basis.
 Apsalar, "5 Engagement Metrics You Need To Track For Your Mobile Apps," <http://info.apsalar.com/5-engagement-metrics-you-should-track.html?Leadsource=Ebook&leadsourcedetail=resources> (purchased required).

42 "Monetization: Picking The Path To App Profitability," p. 6.

43 "Monetization: Picking The Path To App Profitability," p. 15. Kontagent, another company measuring apps, also highlights the role of "Virality" in understanding a consumer's behavior so developers can "maximize customer lifetime value (LTV)." Explaining that the derivation of the K-factor comes from "epidemiology" and now is used to assess "the rate at which viral messages spread across social networks through viral channels and prompt action [P]eer-to-peer or application-to-peer communication can spread like a virus, and the k-factor, or 'influence score' of your customers is the most important indicator of how well you've incorporated viral mechanics into the clickstream of your application" App measurement tools can also track when a user installs an app and measures subsequent "post-install events," including "in-app purchases" and "level-ups," and identifies whether a user should be labeled as "loyal." Chantal Tode, "Walgreens Tests Closed-loop Mobile Coupons Delivered via PRIMP App," *Mobile Commerce Daily*, 29 July 2013, <http://www.mobilecommercedaily.com/walgreens-tests-closed-loop-mobile-coupons-delivered-via-primp-app> (viewed 20 Aug. 2013). Mobile apps marketing platform company AppsFlyer helps "app developers, brands and agencies to measure and optimize their entire mobile customer acquisition funnel," in real-time. It tracks and analyzes such metrics as "organic installs, paid installs, user funnel, loyal users identification, viral effect, burst/blitz campaign insights; conversion rates, in-app events, ad agency access." Joe Laszlo, "The Year of Mobile ... Measurement," *ClickZ*, 26 Oct. 2012, <http://www.clickz.com/clickz/column/2220087/the-year-of-mobile-measurement>; "Monetization: Picking The Path To App Profitability"; LeadBolt, "Monetize," http://www.leadbolt.com/developers_units.php; Placed, "Monetize Your App with Placed Affiliate"; Alex Pappas, "Best Practices for Monetizing Mobile Applications," *mMedia*, 9 Aug. 2012, <https://support.mmedia.com/entries/21815671-Best-Practices-for-Monetizing-Mobile-Applications>; PaeDae, "Advertisers"; eDealya, "Brand Engagements," <https://www.e-dealya.com/brand-engagements/>; eDealya, "Leverage Social Data," <https://www.e-dealya.com/advertisers/>; Appayable, "Monetize," <https://www.appayable.com/monetize/>. For another example of an Alliance member app data dashboard, see TapGage, "Monetize," <http://www.tapgage.com/monetize.php>. Engagement was ignored, despite its central role with apps and the overall and related data targeting system. For a discussion on how the app industry views engagement, see Mike Hines, "Announcing App Engagement Reports—Free App Usage Metrics that Require No Integration," *Amazon*, 24 May 2013, <https://developer.amazon.com/post/TxPBOGWMIKVVNM/Announcing-App-Engagement-Reports-Free-App-Usage-Metrics-that-Require-No-Integra.html>; Google, "Mobile App Engagement," <https://support.google.com/analytics/answer/2568878?hl=en>; Apsalar, "Creating a Mobile Analytics Event Strategy to Measure User Engagement," 5 Oct. 2012, <http://support.apsalar.com/customer/portal/articles/771973>; Apsalar, "Engagement Index," 21 Nov. 2012, <http://support.apsalar.com/customer/portal/articles/717517> (all viewed 19 Aug. 2013); Apsalar, "5 Engagement Metrics You Need To Track For Your Mobile Apps."

44 MobyAffiliates, "Mobile App Marketing Guide," 2012, <http://www.slideshare.net/mobyaffiliates/mobile-app-marketing-guide> (viewed 20 Aug. 2013).

45 Apple, "Using Identifiers in Your Apps," 21 Mar. 2013, <https://developer.apple.com/news/?id=3212013a>; "Apple reportedly rejecting apps that access UDIDs," *Apple Insider*, 24 Mar. 2012, http://appleinsider.com/articles/12/03/25/apple_begins_blanket_rejections_of_apps_that_access_udids; Mobile App Tracking, "Best Practices for Tracking App-to-App Installs," http://media.mobileapptracking.com/docs/MAT-App_to_App_tracking.pdf; Mobile App Tracking, "Resources for MobileAppTracking," <http://www.mobileapptracking.com/resources/> (all viewed 22 Aug. 2013).

46 Google, "Mobile App Acquisitions," *Google Analytics*, <https://support.google.com/analytics/answer/2568794?hl=en>; Google, "About Google Mobile App Analytics," *Google Analytics*, <https://support.google.com/analytics/answer/2568794?hl=en>.

google.com/analytics/answer/2568871?hl=en&ref_topic=2568641; Google, "Mobile App Analytics," Google Analytics, <http://www.google.com/analytics/features/mobile-app-analytics.html> (all viewed 22 Aug. 2013).

47 Yulia Vakhrusheva, "Mobile Game Monetization: Separating Myth from Reality | Marco DeMIROZ," Casual Connect, 21 Aug. 2012, <http://casualconnect.org/lectures/mobile/mobile-game-monetization-separating-myth-from-reality-marco-demiroz/>; Brian Anthony Thornton, "Stellar Stories—With Marco Demiroz of PlayFirst," Gamesauce, 2 Nov. 2012, <http://gamesauce.org/news/2012/11/02/stellar-stories-with-marco-demiroz-of-playfirst/> (both viewed 24 Aug. 2013).

48 Playnomics, "Q1 Playnomics Quarterly Report," 22 May 2013, <http://www.playnomics.com/q1-playnomics-quarterly-report/> (viewed 24 Aug. 2013).

49 Playnomics, "What Is PlayRM?" <http://www.playnomics.com/choose-playrm/>; Playnomics, "PlayRM Plans&Pricing," <http://www.playnomics.com/plans/>; Playnomics, "PlayRMRevenue," <http://www.playnomics.com/revenue/>; Playnomics, "PlayScience," <http://www.playnomics.com/playscience/>; Playnomics, "PlayRM Behavioral Push," <http://www.playnomics.com/behavioral-push/>; Playnomics, "Playnomics PlayRM Overview," Vimeo, <http://vimeo.com/59418389>; Playnomics, "Player Engagement Study for Q1 2013 Released by Playnomics," 23 May 2013, <http://www.playnomics.com/wp-content/uploads/2013/05/Playnomics-Q1-2013-Engagement-Report-Press-Release.pdf> (all viewed 24 Aug. 2013). Playnomics provides "In-app marketing" services, such as Smart + Segmented Cross-Promotion + 3rd Party Advertising. Playnomics, "PlayRM Predictive CRM Platform Goes Mobile," 19 Feb. 2013, <http://www.playnomics.com/playrm-predictive-crm-platform-goes-mobile-2/>; Playnomics, "Privacy Platform Policy," <http://www.playnomics.com/platformpolicy/>; "Emerging Trends: The Real Impact of Adaptive Marketing and Predictive Analytics," YouTube, 20 Aug. 2013, <http://www.youtube.com/watch?v=nnwPn8Ou6Wo>. The Application Developers Alliance noted the work of Playnomics last February. "Playnomics Launches PlayRM Monetization and Analytics for Mobile," 15 Feb. 2013, <http://devsbuild.it/resources/type/article/playnomics-launches-playrm-monetization-and-analytics-mobile> (all viewed 24 Aug. 2013).

50 Bees and Pollen, "Bees and Pollen Personalization Platform," <http://www.beesandpollen.com/TheProduct.aspx>; Bees and Pollen, "Sense6—Social Casino Games Personalization Solution," <http://www.beesandpollen.com/sense6.aspx>; Bees and Pollen, "About Us," <http://www.beesandpollen.com/About.aspx>. A paper by GamesAnalytics on "The Science of Listening" urges developers to "analyse player performance in real-time, using advanced data mining and predictive modeling to segment and act on various different player behaviours simultaneously." GamesAnalytics, "Case Studies and Whitepapers," <http://www.gamesanalytics.com/case-studies-whitepaper.html> (all viewed 24 Aug. 2013).

51 Kontagent, "Kontagent's New kSuite DataMine Changes Social/Mobile Analytics Game for App Developers," 4 Apr. 2012, <http://www.kontagent.com/company/press-releases/kontagents-new-ksuite-datamine-changes-social-mobile-analytics-game-for-app-developers/#sthash.hollyJMp.dpuf> (viewed 24 Aug. 2013).

52 Bees and Pollen, "How to Monetize Casino Social Games?" SlideShare, 1 May 2013, <http://www.slideshare.net/udibarone/how-to-monetize-casino-social-games> (viewed 24 Aug. 2013).

53 Amy Rosenberg, "ID Is Key: Unlocking Mobile Tracking & Cross-Device Measurement, Part 1," The Makegood, 13 Aug. 2013, <http://www.the-makegood.com/2013/08/13/id-is-key-unlocking-mobile-tracking-cross-device-measurement-part-1/> (viewed 24 Aug. 2013).

- 54 Drawbridge, "Drawbridge Blog," <http://blog.drawbrid.ge/> (viewed 24 Aug. 2013).
- 55 "Drawbridge Adds Mobile-to-Mobile Retargeting to Cross Device Retargeting Suite," PRWeb, 25 July 2013, <http://www.prweb.com/releases/2013/7/prweb10966587.htm> (viewed 24 Aug. 2013).
- 56 "Drawbridge Adds Mobile-to-Mobile Retargeting to Cross Device Retargeting Suite."
- 57 Adbrain, "'The Adbrains' Assemble and Secure \$1.5 Million In Seed Funding,'" 16 July 2013, http://www.adbrain.com/adbrain_funding.html (viewed 24 Aug. 2013).
- 58 MdotM, "Cross-device Retargeting," <http://mdotm.com/advertisers/retargeting/> (viewed 24 Aug. 2013).
- 59 Kochava, "Attribution Control," <https://kochava.com/> (viewed 24 Aug. 2013).
- 60 Applift, "Tracking Technologies," <http://www.applift.com/resources/tracking>; Gavin Dunaway, "ID Is Key: Unlocking Mobile Tracking & Cross-Device Measurement, Part 2," AdMonsters, 3 Aug. 2013, <http://www.admonsters.com/blog/id-key-unlocking-mobile-tracking-cross-device-measurement-part-2>; OpenX and AdTruth, "When Device Recognition and Programmatic Buying Intersect," July 2013, http://www.openx.com/insights/whitepaper_download_thank_you?file=When_Device_Recognition_and_Programmatic_Buying_Intersect. See also, for example, leading online retargeter Criteo's purchase of mobile app-related tracking company Ad-X. Criteo, "Criteo Announces Acquisition of AD-X Tracking," 15 July 2013, <http://www.criteo.com/en/adx-tracking>; "Drawbridge Adds Mobile-to-Mobile Retargeting to Cross Device Retargeting Suite," PRWeb, 25 July 2013, <http://www.prweb.com/releases/2013/7/prweb10966587.htm>; Drawbridge, "Drawbridge Blog," <http://blog.drawbrid.ge/>; David Murphy, "Drawbridge Launches Mobile-to-mobile Retargeting," Mobile Marketing, July 2013, <http://www.mobilemarketingmagazine.com/content/drawbridge-launches-mobile-mobile-retargeting>; Drawbridge, "Mobile To Mobile Retargeting," <http://doc.drawbrid.ge/#65,66,126>; AdTruth, "Human Demand Partners with AdTruth to Enhance Mobile Audience Targeting," 22 May 2013, <http://www.adtruth.com/buzz/announcements/human-demand-partners-adtruth-enhance-mobile-audience-targeting>; "Human Demand Looks to Change Mobile App Marketing with New Privacy Compliant Re-Engagement and Retargeting Platform," PRWeb, 27 June 2013, <http://www.prweb.com/releases/2013/6/prweb10868918.htm>; "The Adbrains Assemble and Secure \$1.5 Million in Seed Funding," GoMo News, 17 July 2013, <http://www.gomonews.com/the-adbrains-assemble-and-secure-1-5-million-in-seed-funding/>; MdotM, "Cross-device Retargeting," <http://mdotm.com/advertisers/retargeting/>; Kochava, <https://kochava.com/> (all viewed 23 Aug. 2013).
- 61 Mobile Marketing Association, "MMA Committees," <http://www.mmaglobal.com/member-center/committees> (viewed 18 Aug. 2013); "MMAF New York 2012—Speaker Presentations." Its committee on privacy is co-chaired by Acxiom and Chapell Associates.
- 62 Perhaps this shouldn't come as a surprise, since the Center says that one of its goals is to "Fend Off Adverse Regulation." Interactive Advertising Bureau, "Mobile Marketing Center of Excellence: Growing Mobile for Everyone," <http://www.iab.net/mobilecenter>; Interactive Advertising Bureau, "Tap into Mobile," <http://www.iab.net/mobilecenter/tapintomobile>; Interactive Advertising Bureau, "IAB Launches Mobile Marketing Center of Excellence," 9 Dec. 2010, http://www.iab.net/about_the_iab/recent_press_releases/press_release_archive/press_release/pr-120910. The IAB mobile center (<http://www.iab.net/mobilecenter>) has released (including for public comment) a range of documents related to the consumer mobile experience, such as "Mobile Rich-Media Ad Interface Definitions," <http://www.iab.net/mraid>, and "Mobile's Role in a Consumer's Media Day: Smartphones and Tablets Enable Seamless Digital Lives," http://www.iab.net/guidelines/508676/mobile_

guidance/mobileusage, both in 2012. Interactive Advertising Bureau, "IAB Releases Final Version of MRAID 2.0 to Drive the Mobile Advertising Ecosystem to Scale," 27 Sept. 2012, http://www.iab.net/about_the_iab/recent_press_releases/press_release_archive/press_release/pr-092712; Mobile Acquisition Transparency Alliance," <http://openmata.org/> (both viewed 22 Aug. 2013).

63 "Network Advertising Initiative Releases Mobile Application Code," 24 July 2013, <http://www.marketwire.com/press-release/network-advertising-initiative-releases-mobile-application-code-1814195.htm>; Digital Advertising Alliance, "DAA In the News," <http://www.aboutads.info/news> (all viewed 17 Aug. 2013).

64 The Alliance features the work of one its mobile lead generation members on its site. (While the three NGOs working with the Alliance may have, on their own, independently gathered information on mobile financial and health services, such data were never presented to the group.) Application Developers Alliance, "SF Monetization Workshop: Picking the Path to APP Profitability," <http://devsbuild.it/resources/type/article/sf-monetization-workshop-picking-path-app-profitability>; Application Developers Alliance, "Monetization: Picking The Path To App Profitability," July 2013, <http://devsbuild.it/files/Monetization%20White%20Paper.pdf>; Application Developers Alliance, "Compare Strategies," <http://devsbuild.it/monetize>; Application Developers Alliance, "Working Groups," <http://appdevelopersalliance.org/working-groups>; Application Developers Alliance, "Application Developers Alliance Launches Mobile Payments Working Group," 8 Nov. 2012, <http://appdevelopersalliance.org/news/2012-11-08-MobilePayments>; Application Developers Alliance, "Application Developers Alliance Launches Health and Medical Apps Working Group," 6 Dec. 2012, <http://appdevelopersalliance.org/news/2012-12-06-HealthandMedical>; Application Developers Alliance, "DoublePositive Online Marketing," <http://devsbuild.it/resources/type/serviceproduct/doublepositive-online-marketing> (all viewed 18 Aug. 2013).

65 Pandora, "Radio Rampant," <http://pandoraadops.drivhq.com/media-kit-media/PandoraMobileWhitePaper.pdf>; Airpush, "Billions of Impressions," <http://www.airpush.com/#adformats> (both viewed 23 Aug. 2013).

66 Mobile Marketing Association, "Mobile Application Advertising Measurement Guidelines," <http://www.mmaglobal.com/mobile-apps-ad-guidelines> (both viewed 18 Aug. 2013).

67 Interactive Advertising Bureau, "Mobile Rising Stars Added to IAB Standard Ad Unit Portfolio, to Propel Brand Advertising in Mobile to Scale," 10 June 2013, http://www.iab.net/about_the_iab/recent_press_releases/press_release_archive/press_release/pr-061013_mobilerisingstarsstudy (viewed 22 Aug. 2013).

68 Apsalar, "Rethink Your Mobile App Advertising: 4 Ways to Boost Your ROI," <http://info.apsalar.com/ebook-4-ways-to-boost-ROI-download.html?alild=455844>; Apsalar, "Acquire the Right Users, Anytime, Anywhere," <http://apsalar.com/products/apengage/audience-targeting/> (both viewed 18 Aug. 2013).

69 Nexage, "Targetable Audience," <http://www.nexage.com/nexage-exchange/targetable-audience>. Other mobile app data related techniques were overlooked despite their implications for any privacy framework. Localytics promises to "deliver rich and actionable messages" to targeted consumers while they are engaged with an app. And Swrve, an in-app marketing platform, "enables monetization managers to tune mobile app and game experience and talk to players directly in order to maximize in-game revenues." Adways Interactive, "Party Track: An Introduction," YouTube, 7 Apr. 2013, <http://www.youtube.com/watch?v=gN-aYYcy5os#at=30> (viewed 18 Aug. 2013). CDD urged the NTIA group to review the apps that won the MMA's Smarties awards in 2012, in order to gain a better real-world take on what actually is done. There wasn't interest to address how

apps actually impact consumers. Mobile Marketing Association, "The Smarties 2012 Winners Gallery," <http://www.mmaglobal.com/smartiesgallery2012/> (all viewed 22 Aug. 2013).

70 Mobile Marketing Association, "Code of Conduct," <http://www.mmaglobal.com/policies/code-of-conduct> (viewed 18 Aug. 2013).

71 Mobile Marketing Association, "Consumer Best Practices Guideline," <http://www.mmaglobal.com/policies/consumer-best-practices>; Mobile Marketing Association, "Mobile Advertising Guidelines," <http://www.mmaglobal.com/node/1846> (both viewed 18 Aug. 2013).

72 OpenX and AdTruth, "When Device Recognition and Programmatic Buying Intersect," July 2013, http://www.openx.com/insights/whitepaper_download_thank_you?file=When_Device_Recognition_and_Programmatic_Buying_Intersect (viewed 24 Aug. 2013).

73 Mobclix, "Developers," <http://www.mobclix.com/developers.html>; MoPub, <http://www.mopub.com/>; Nexage, "Game and App Developers," <http://www.nexage.com/publishers-and-developers/game-and-app-developers> (all viewed 24 Aug. 2013).

74 "Millennial Media Signs Definitive Agreement to Acquire Jumptap," 13 Aug. 2013, <http://investors.millennialmedia.com/phoenix.zhtml?c=238412&p=irol-newsArticle&ID=1847324&highlight=>; Jumptap, "Vertical Industry Focus," <http://www.jumtap.com/advertisers/vertical-industries/>; Jumptap, "App Promotion," <http://www.jumtap.com/developers/app-promotion/>; Christina Feeney, "Jumtap Partners with AppNexus and Launches First Unified Audience Exchange," 17 July 2013, <http://www.jumtap.com/home-page-news/jumtap-partners-with-appnexus-and-launches-first-unified-audience-exchange/>; "Millennial Media Reports 2013 Second Quarter Results," 13 Aug. 2013, <http://investors.millennialmedia.com/phoenix.zhtml?c=238412&p=irol-newsArticle&ID=1847334&highlight=>; Millennial Media, "Overview: Corporate Profile," <http://investors.millennialmedia.com/phoenix.zhtml?c=238412&p=irol-irhome>; BlueKai, "Jumtap and BlueKai Partner to Break New Ground in Mobile Audience Targeting," 27 Nov. 2012, https://www.bluekai.com/newsandmedia_pressreleases_20121127.php; Kimberly Maul, "Q1 Update: Mobile RTB Expands With Tablets, Rich Media And Location," Ad Exchanger, 9 May 2013, <http://www.adexchanger.com/mobile/q1-update-mobile-rtb-expands-with-tablets-rich-media-and-location/>; "As Budget Flows Into Mobile, Rubicon's Paul Gubbins Discusses How The Mobile Revenue Gap For Publishers Might Be Bridged," ExchangeWire, 25 July 2013, <http://www.exchangewire.com/blog/2013/07/25/as-budget-flows-into-mobile-rubicons-paul-gubbins-discusses-how-the-mobile-revenue-gap-might-be-bridged/>; "The Big Mobile Ad Push: What are the Implications of the Criteo Acquisition of In-App Targeting Specialist, AD-X?" ExchangeWire, 18 July 2013, <http://www.exchangewire.com/blog/2013/07/18/the-big-mobile-ad-push-what-are-the-implications-of-the-criteo-acquisition-of-in-app-targeting-specialist-ad-x/>; Fiksu, "Real-time Bidding Optimization Through Utilization of Mobile Characteristics," United States Patent Application Publication, 1 Aug. 2013, <https://docs.google.com/viewer?url=patentimages.storage.googleapis.com/pdfs/US20130198011.pdf>; AdTheorent, "Real Time Learning Machine," <http://www.adtheorent.com/real-time-learning-machine>; AdTheorent, "Aptivation: Intelligent Ad Units," <http://www.adtheorent.com/apptivation> (all viewed 24 Aug. 2013).

75 "Millennial Media Signs Definitive Agreement to Acquire Jumptap."

76 "Millennial Media Signs Definitive Agreement to Acquire Jumptap."

77 "The Big Mobile Ad Push: What are the Implications of the Criteo Acquisition of In-App Targeting Specialist, AD-X?"

78 "Real-time Bidding Optimization Through Utilization of Mobile Characteristics."

79 OpenX and AdTruth, "When Device Recognition and Programmatic Buying Intersect," July 2013, http://www.openx.com/insights/whitepaper_download_thank_you?file=When_Device_Recognition_and_Programmatic_Buying_Intersect (viewed 24 Aug. 2013).

80 "Consumer Data Privacy in a Networked World," p. 6.

81 "Terra's Third comScore Digital Study Shows Hispanics' Purchasing Funnel Fueled by Mobile and Social Engagement," 25 July 2012, <http://www.terra.com/advertise/in-the-news108.htm>; eMarketer, "Hispanics to Spend \$500 Million on Mobile Apps in 2012," 30 Apr. 2012, <http://www.emarketer.com/Article/Hispanics-Spend-500-Million-on-Mobile-Apps-2012/1009010>; eMarketer, "Black Consumers Active, Engaged on Mobile," 24 Apr. 2012, <http://www.emarketer.com/Article/Black-Consumers-Active-Engaged-on-Mobile/1008994>; Ki Mae Heussner, "Google Study Sees African-Americans More Responsive to Digital Marketing," Adweek, 18 Sept. 2011, <http://www.adweek.com/news/advertising-branding/google-study-sees-african-americans-more-responsive-digital-marketing-1349>; Center for Digital Democracy, "Digital Target Marketing to African Americans, Hispanics and Asian Americans: A New Report," <http://www.centerfordigitaldemocracy.org/digital-target-marketing-african-americans-hispanics-and-asian-americans-new-report> all viewed 24 Aug. 2013). eMarketer, "Black Consumers and Mobile: Digital Lives Lived in Motion," Apr. 2012 (personal copy).

82 See, for example, Center for Digital Democracy: "Interactive Food & Beverage Marketing: Reports," <http://digitalads.org/reports.php> (viewed 24 Aug. 2013).

83 Privacy Rights Clearinghouse, "Privacy Rights Clearinghouse Releases Study: Mobile Health and Fitness Apps: What Are the Privacy Risks?" 15 July 2013, <https://www.privacyrights.org/mobile-medical-apps-privacy-alert> (viewed 24 Aug. 2013)

84 They could have, for example, looked at apps that have won industry awards. "Appy Awards 2013," MediaPost, <http://www.mediapost.com/appyawards/winners/>; Internet Advertising Competition, "The Best Mobile Application Internet Advertising Awards!" http://www.iacaward.org/iac/winners_detail.asp?yr=all&award_level=best&medium=Mobile%20Application; Hunt Mobile Ads, "Targeting," <http://www.huntmads.com/targeting>; "Cash Advance Payday Loans," Google Play, <https://play.google.com/store/apps/details?id=com.ww365DayLoan&hl=en>; "Momentum Visa," iTunes Preview, <https://itunes.apple.com/us/app/momentum-visa/id499968493>; Chantal Tode, "Mobile's Role in Lead Generation Grows as Conversions Blow Past 25pc," Mobile Marketer, 26 Apr. 2013, <http://www.mobilemarketer.com/cms/news/content/15228.html>; Paypal, "Mobile Payments and Mobile Apps," <https://www.paypal.com/webapps/mpp/mobile-apps>; "Google Wallet," Google Play, <https://play.google.com/store/apps/details?id=com.google.android.apps.walletfc&hl=en>; (all viewed 24 Aug. 2013); Mobile Health News, "An Analysis of Consumer Health Apps for Apple's iPhone 2012," <http://mobihealthnews.com/research/an-analysis-of-consumer-health-apps-for-apples-iphone-2012/> (personal copy).

85 The findings of well-known scholars, such as Alessandro Acquisti, that had been presented to the group were ignored. See, for example, Alessandro Acquisti, "Research," <http://www.heinz.cmu.edu/~acquisti/research.htm>. See also "An Intro to Mobile Usability Testing," The Usability Blog, 13 June 2013, <http://usability.com/2013/06/an-intro-to-mobile-usability-testing/>; Tobii, "Tobii Mobile Device Testing Solution," <http://www.tobii.com/en/eye-tracking-research/global/products/solutions/mobile-device-testing/>; Nielsen Norman Group, "iPad App and Website Usability," <http://www.nngroup.com/reports/ipad-app-and-website-usability/>; Google, "Eye Tracking Study Comparing Mobile and Desktop," Google Think Insights, July 2011, <http://www.google>.

com/think/research-studies/eye-tracking-study-comparing-mobile-and-desktop.html; Velti, Forrester, and Mobile Marketing Association, "Present & Future of Mobile Marketing," 3 Dec. 2012, <http://marketingmob.blogspot.com/2012/12/the-present-future-of-mobile-marketing.html>; John McDermott, "Marketers' Approach to Mobile is (Still) Flawed," *Ad Age*, 20 Nov. 2012, <http://adage.com/article/digital/marketers-approach-mobile-flawed/238386/>; Chantal Tode, "IAB Calls for More Interactive Rich Media Ads in Latest MRAID Guidelines," *Mobile Marketer*, 11 July 2012, <http://www.mobilemarketer.com/cms/news/advertising/13277.html>; Interactive Advertising Bureau, "Mobile Rich-Media Ad Interface Definitions," <http://www.iab.net/mraid> (all viewed 19 Aug. 2013).

86 Walsh, "VivaKi Rolls Out New Tablet Ad Units." The Pool's report on tablets is available as an App. Melcher Media, "The Pool: The Tablet Lane," *iTunes Preview*, 24 May 2013, <https://itunes.apple.com/us/app/the-pool-the-tablet-lane/id622760381?mt=8>. For more background on The Pool, see VivaKi, "The Pool," <http://www.risingtidecoop.com/research> (both viewed 19 Aug. 2013).

87 National Telecommunications and Information Administration, "Short Form Notice Code of Conduct to Promote Transparency in Mobile App Practices," 25 July 2013, http://www.ntia.doc.gov/files/ntia/publications/july_25_code_draft.pdf; National Telecommunications and Information Administration, "Privacy Multistakeholder Process: Mobile Application Transparency," 25 July 2013, <http://www.ntia.doc.gov/other-publication/2013/privacy-multistakeholder-process-mobile-application-transparency> (both viewed 24 Aug. 2013).

88 National Telecommunications and Information Administration, "Assistant Secretary Strickling Statement on Privacy Multistakeholder Process," 25 July 2013, <http://www.ntia.doc.gov/press-release/2013/assistant-secretary-strickling-statement-privacy-multistakeholder-process> (viewed 24 Aug. 2013).

89 American Civil Liberties Union, "Mobile App Code of Conduct an Important Step Forward," 25 July 2013, <https://www.aclu.org/technology-and-liberty/mobile-app-code-conduct-important-step-forward> (viewed 24 Aug. 2013).

90 NTIA, "Privacy Multistakeholder Process: Mobile Application Transparency"; Worldwide Web Consortium, "Tracking Protection Working Group," <http://www.w3.org/2011/tracking-protection/>; NetChoice, "NTIA Praises Mobile Privacy 'Milestone' While Stakeholders Debate Code of Conduct's Finality," <http://netchoice.org/press/press-about-netchoice/ntia-praises-mobile-privacy-milestone-while-stakeholders-debate-code-of-conducts-finality/> (all viewed 24 Aug. 2013).