Environmental Scan of Digital Media Convergence Trends: Disruptive Innovation, Regulatory Opportunities and Challenges

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CRTC Foreword:

The CRTC undertakes a range of research initiatives in support of its mandate, including from independent researchers. These researchers' views should not be construed as those of the Commission.

This report presents a snapshot of issues of relevance to policy-makers stemming from communications trends affecting consumers of digital media. It was commissioned from Professor Sidneyeve Matrix, who teaches mass communications and marketing at Queen's University.

Disclaimer

This report was commissioned by the Canadian Radio-television and Telecommunications Commission ("CRTC" or "Commission") in August 2011. It is designed to be exploratory rather than prescriptive. While the report does raise issues that may have public policy consequences, the purpose of this report is not to offer guidance on public policy response. Instead, it provides a trend overview of segments in a market that changes very rapidly.

While the author has made every effort to ensure that the information is current and accurate at the time of writing, significant changes may be occurring or have occurred in some areas by the time of publication. This report reflects the research and views of the author, and should not be construed as representing any views of the Commission.

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Executive Summary

This environmental scan identifies issues arising from a range of key social and technological digital trends that are gaining traction in the converged media marketplace. It provides concise and critical background information concerning the issues and consequences surrounding a series of convergent digital media use trends that are impacting Canadian citizens' choices and their everyday patterns of connectivity, consumption, and communication. From a comprehensive search of the popular literature and news coverage on convergence and digital media we identify issues of relevance to public policy makers stemming from seven digital media use trends including: cloud computing; social music; smart television; new mobilities; geolocation; data portability; and behavioral tracking.

In each case, in order to identify a range of possible adaptive interventions and measures appropriate to encourage innovation and secure consumer protections in a convergent digital media culture, this scan compares selected regulatory approaches and challenges in jurisdictions including Canada, the US, EU, UK, Korea, South Africa, Germany, Australia, China and elsewhere. These cases are briefly summarized and thoroughly documented in the list of works cited. As a result this scan identifies policy implications, regulatory innovations, and legislative interventions related to convergent media trends, including:

- increasing transparency in communications from telecoms to consumers
- placing caps on charges/fees and billing practices
- establishing command regulations with penalties attached
- mandating simplified and fair contracts and privacy agreements
- educating consumers to make informed choices
- designing harmonized approaches to consumer redress
- protecting the privacy of children and minors
- social policies designed to close digital divides
- legislation to ensure consumer data protection and enforce security rules
- regulations for reporting data breaches of consumer information
- licensing for new transmission models and content rights

This range of regulatory approaches and policies in Canada and other jurisdictions includes some measures that are principles-based and others that are more prescriptive. Not all of these initiatives will be appropriate for any one country. What emerges from this scan is a collection of controversies, challenges, opportunities and innovations, loosely joined by their relation to digital media convergence and the development of adaptive regulatory measures. Each of these initiatives arises from or responds to the quickly changing conditions of converged media cultures and shorter life-cycles of technological innovation-

--and are thus useful to consider as part of a bigger picture of the impact of digital media convergence on individuals, companies and organizations, and societies writ large.[1]

This report focuses on emergent modes of digital technology use among consumers, and relies heavily on mainstream and online news reportage and commentary to draw outlines around the issues at stake and highlight the corresponding implications. To the extent they were available, reports and white papers, academic articles and trade publications were consulted, but there are many opportunities identified herein where additional research is required to fully understand the impact of these convergent media trends on Canadian consumers and citizens. This scan serves to identify some of those opportunities for future inquiry and analysis.

A recurrent theme in this scan, oft mentioned by regulators, industry analysts, government officials, telecom and network spokespersons, and consumers, concerns the need to develop agile regulatory policies that are flexible enough to respond to the rapid pace of change in manufacturing and adoption of convergent media content and consumer electronics. The precise shape of these adaptive policies in Canada and elsewhere is fodder for ongoing debate. What stakeholders seem in agreement about however, is that technological convergence has provoked a control crisis in the media, broadcasting, advertising, legislative and regulatory circles. This scan surveys diverse perspectives on and responses to this productive disruption, largely focused on the opportunities for innovation that result from convergent media cultures.

[1] On the shorter life-cycles of technological innovation and services and their implications for regulators, see Michael Latzer. (2009) Convergence Revisited: Toward a Modified Pattern of Communications Governance. Convergence Vol 15(4): 411–426.

Method and Scope of this Report

This environmental scan was prepared through desktop research. It reviews academic journal articles, reports, white papers, market research and industry forecasts, and online, freely-available public sources such as regulator and government websites, newspapers, and industry blogs. The focus is narrowed to primarily post-2010 publications and resources in English. Additional information about how these sources were identified is provided in Appendix 2.

This report scans a wide range of issues and does not include in-depth backgrounds of each these cases and trends---since the goal of this report is to identify a series of pressing emergent issues in the converged media landscape, each of them being worthy of further focused study and analysis. In many cases only references to relevant detailed discussions are provided. A comprehensive list of works cited is included in the appendices. Charts and graphs that are included are from publicly available sources and are appropriately cited.

Similarly, this report does not include any extended discussion of broadband penetration, text-messaging, over-the-top television transmission, or email services and concerns regarding SPAM, since these convergent and digital media products and services have been the subjects of recent studies elsewhere.

About the Author

Sidneyeve Matrix (PhD) researches social and mobile digital technology trends. She teaches mass communications and marketing courses at Queen's University and Rutgers, and works as a public speaker and communications consultant at MatrixMediaFX.

Acknowledgements

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Introduction

> "Digitalization in general and the internet in particular are changing the cost structures in the communication sector, enabling and demanding new business models and thereby profoundly changing the competitive conditions in convergent mediamatics markets." ~ Michael Latzer[2]

The aim of this research is to indicate the implications that arise from convergent media trends from both a consumer and regulator's perspective. It seeks to point out potential threats, complications, confusions and market failures regarding digital media convergences that could have (or are already having) a negative impact on users. To this end the scan incorporates insights and case studies identified in mainstream news media coverage of digital convergence, and from academic papers and publicly available resources such as industry market research, reports, and white papers.

The scan also highlights what is emerging as a set of new regulatory imperatives and models for what is being described as adaptive regulation appropriate to the age of convergent media. By looking into what regulatory bodies in other specific jurisdictions are doing concerning technological convergence, this report identifies some opportunities for legislation and regulatory intervention. In most cases, these measures are based on an integrated approach that emphasizes industry self-regulation and soft measures designed to encourage and support innovation in converged digital media technologies and services and to inform and protect users.

From a comprehensive search of the popular literature and news coverage on convergence and digital media we identify issues of relevance to regulators stemming from seven digital media use trends including: cloud computing; social music; smart television; new mobilities; geolocation; data portability; and behavioral tracking.

In each case, in order to identify a range of possible adaptive interventions and measures appropriate to encourage innovation and secure consumer protections in a convergent digital media culture, this scan compares selected regulatory approaches and challenges in jurisdictions including Canada, the US, EU, UK, Korea, South Africa, Germany, Australia, China and elsewhere.[3] These cases are briefly summarized and thoroughly documented in

[2] Michael Latzer. (2009) Convergence Revisited: Toward a Modified Pattern of Communications Governance. Convergence, Vol 15(4): 411–426.

[3] For a list of the regulatory bodies, offices, and agencies referred to in this document see appendix 1.

the list of works cited. As a result this scan identifies policy implications, regulatory innovations, and legislative interventions related to convergent media trends, including:

- increasing transparency in communications from telecoms to consumers
- placing caps on charges/fees and billing practices
- command regulations with penalties attached
- mandating simplified and fair contracts and privacy agreements
- educating consumers to make informed choices, including privacy nudges
- designing harmonized approaches to consumer redress
- protecting the privacy of children and minors
- social policies designed to close digital divides
- legislative steps to ensure consumer data protection and enforce security rules
- regulations for reporting data breeches of consumer information
- licensing for new transmission models (cloud, streaming, in-app) and content rights

In the process of analyzing these issues and trends, this environmental scan outlines ways that government authorities, including the CRTC, could address or respond to convergent media issues with progressive measures that encourage innovation. Looking forward, the report concludes with suggestions for monitoring developments connected with these trends, to stay abreast of emerging regulatory issues in the interim between environmental scans.

Convergence and Disruptive Innovation

> "The constructs for communications and media that worked 20 years ago no longer fit present day circumstances, let alone the next 20 years." ~ Chris Chapman, ACMA Chairman[4]

The first theme that connects these trends and issues is a discourse concerning the disruptive effects of the social web and associated convergent digital media services on the traditional broadcasting, communications, and media markets and industries. Converged regulator the Australian Communications and Media Authority goes so far as describing the situation as "broken concepts or under significant pressure from the effects of convergence and the deeper change of digitalisation."[5] This disruption is largely viewed as positive by the telecommunications industry, and met with cautious optimism by consumer protection advocates. Disruptive convergence is described as an opportunity for

[4] ACMA, 'Broken concepts' – regulation from pre-internet times. 29 August 2011 Online: http://www.acma.gov.au/WEB/STANDARD/pc=PC_410128
[5] (Ibid)

technical and market innovation, yet it comes with a set of risks related to privacy and transparency.

This discourse also has an impact for regulators. Those regulatory bodies with a mandate to encourage convergence (such as for example South Africa[6], the EU, and Korea), are effectively driving social, economic, legislative, and technological disruption, and are thus encouraging cultural innovation. A recurrent theme in this scan, oft mentioned by regulators, industry analysts, government officials, telecom and network spokespersons, and consumers, concerns the need to develop agile regulatory policies that are flexible enough to adapt and respond to the rapid pace of change in manufacturing and adoption of convergent media content and consumer electronics.

Control Crisis

> "Connectivity is now a core part of any consumer device and network-delivered content is increasingly becoming the lifeblood of these devices." ~Michael Wolf, GigaOM[7]

The second theme that runs through this scan is a discourse about a communications crisis and convergent media. Stakeholders across jurisdictions seem in agreement that technological convergence has provoked a control crisis in the media, broadcasting, advertising, legislative and regulatory circles. There are widespread social and economic impacts from this veritable flood of connected devices into the consumer electronics marketplace in the last five years. From gaming consoles and connected televisions, automobiles and home appliances, to the more conventional connected devices like laptops, tablets, e-readers and smartphones, these digital communication gadgets are reconfiguring homes, values, and lifestyles, as they actively shape consumers' everyday media use patterns and preferences.

More to the point, and relevant for regulators, is that these convergent digital devices and the services bundled with them provide new choices for consumers. They also usher in new business models and content distribution/transmission models. The result according to communications theorists and regulatory experts is a "control crisis" in the communications industry and marketplace coupled with a fragmentation of standards.

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[6] Indra de Lanerolle, (2011) Convergence and regulation in South Africa: in search of a new public interest paradigm. info, 13 (3) pp.47 - 63

[7] Michael Wolf. GigaOM July 25, 2011 Quarterly WrapUps. Online: http://pro.gigaom.com/2011/07/connected-consumer-q2-digital-music-meets-the-cloud-e-book-growth-explodes

Converged and Adaptive Positive Regulation

> "As convergence continues to blur, and even erase, the boundaries between several technologically distinct sectors, sector-specific regulations may become, at best, anachronistic and, at worst, irrelevant." ~ Andy Banerjee and Christian Dippon[8]

> "Policymakers must embrace the challenge of developing greater regulatory resilience; that is, to create regulatory structures and policies that are more adaptive to the complexity and the increasing pace of technological innovation and ensuing economic and social change." ~ Barbara A. Cherry[9]

Around the globe countries are facing the challenge of how to develop relevant, resilient, and fully adequate regulatory frameworks for the convergent future. As of 2011, several jurisdictions have integrated their media and communications laws into a converged legislative framework, including the European Union (EU) and its member states of the United Kingdom (UK), Finland, Sweden and Italy; South Africa, Malaysia, and Korea. Japan and Taiwan are engaged in legislative change that will increase convergence. Converged regulators already exist in a third of all countries in the Organization for Economic Co-operation and Development, and yet, "there is no single road to the convergent regulatory institution reform; it proceeds at a different pace in different countries, as each country needs to establish its own priorities based on its own circumstances," concluded a 2011 report of Korea's converged regulation model.[10]

In fact, even in countries with converged legislation combining telecommunications, media and the Internet into one regulatory framework (such as the UK and EU), there is only a partial integration of media and communications regulation, because the content/carriage distinction remains largely intact. According to research published this year by the Australian Communications and Media Authority (the ACMA), even in converged legislative frameworks that adopt an industry-agnostic approach to carriage regulation, at this point in the evolution of converged regulatory models, when it comes to content, sector-specific media regulatory measures still generally apply. [11] This is the conclusion reached in a report

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[8] Banerjee, A. and Dippon, C.M. (2006), ''Communications regulation and policy under convergence: advancing the state of the debate'', paper presented at the International Telecommunications Society 16th Biennial Conference, Beijing, June 12-16, available at: www.nera.com/extImage/PUB_ RegulationUnderConvergence_COM994.pdf Cited in de Lanrtolle

[9] Cherry, B. (2008), ''Institutional governance for essential industries under complexity: providing resilience within the rule of law'', CommLaw Conspectus, Vol. 17, pp. 1-31.

[10] Daeho Kim. New regulatory institution for the convergence of broadcasting and telecommunications: A Korean case. Government Information Quarterly 28 (2011) 155–163

[11] Australian Communications and Media Authority, Converged legislative frameworks—International approaches occasional paper. July 2011. Online: http://engage.acma.gov.au/wp-content/uploads/2011/07/converged_legislative_frameworks_paper.pdf

by OPTA, the Netherlands' independent telecommunications regulator, which compared the US, the UK and Korea's regulatory responses to convergence.[12]

The rapid pace of technological, economic, and social change in the digital telecommunications and media industries makes it difficult to develop effective public policies with staying power.[13] The solution it seems, is to pursue adaptive regulation and policymaking measures, ''devised not to be optimal for a best estimate future, but robust across a range of plausible futures," and flexible enough to ''respond to changes over time and make explicit provision for learning." [14] To that end, this environmental scan identifies a range of adaptive regulatory approaches and policies currently under review in other jurisdictions, some principles-based, others prescriptive, not all of which will be appropriate for any one country, but all of which respond to the quickly changing conditions of converged media cultures and shorter life-cycles of technological innovation.[15]

[12] C. Van Oranje, J. Cave et als. Responding to Convergence: Different approaches for Telecommunication regulator. Dutch Independent Telecommunications and Post Regulator. white paper .September 2008. Online: http://www.opta.nl/download/convergence/convergence-rand.pdf cited in ACMA 2011 report on Converged legislative frameworks Online: http://engage.acma.gov.au/wp-content/uploads/2011/07/converged_legislative_frameworks_paper.pdf

[13] Stanford Levin and Stephen Schmidt. Telecommunications after competition: challenges, institutions, regulation. Info. Vol. 12 No. 2 2010, pp. 28-4

[14] The theory of adaptive regulation is explored in Levin and Schmidt, Telecommunications after competition: challenges, institutions, regulation. Info. 12(2) 2010, pp. 28-40; Cherry (2008), Institutional governance for essential industries under complexity: providing resilience within the rule of law, Communication Law Conspectus, Vol. 17, pp. 1-31; Jull and Schmidt (2009), Preventing harm in telecommunications regulation: a new matrix of principles and rules within the ex ante versus ex post debate, Canadian Business Law Journal, Vol. 47; Ayres and Braithwaite (1992), Responsive Regulation: Transcending the Deregulation Debate, Oxford University Press, New York, NY; Walker, Rahman and Cave (2001), Adaptive policies, policy analysis, and policy-making, European Journal of Operational Research, Vol. 128, pp. 282-9; Lawrence Cunningham (2007), A prescription to retire the rhetoric of Principles-based systems in corporate law, securities regulation, and accounting, Vanderbilt Law Review 60: 1411–1493; and Julia Black, (2008) Forms and paradoxes of principles-based regulation. Capital Markets Law Journal 3: 425–457.

[15] On the shorter life cycles of technological innovation and services and their implications for regulators, see Michael Latzer. Convergence Revisited: Toward a Modified Pattern of Communications Governance. Convergence Vol 15(4): 411–426 2009.

Cloud Computing

> "Just as cloud computing has become more common, so too have data caps that make them less useful."~ Aalok Mehta[16]

Trend Overview

Although most web users rely on cloud computing services every day, new market research shows that less than a quarter of consumers are familiar with the term "cloud computing."[17] However that is about to change when Apple launches its iCloud service later this year, propelling the word into popular discourse through saturation advertising. Apple's iCloud is a collection of media storage, sync, backup and playback services, is new for 2011. It is first and foremost a sync and backup service, similar to Dropbox, and not necessarily intended to be a streaming-media site like the new Google Music and Amazon Cloud Drive (Figure 1) and Cloud Player (currently restricted to US consumers) technologies.

Cloud-based music and media consumption, purchase, management and storage is catching on with consumers and will become mainstream in the next year as cloud storage services from megabrands Amazon and Google compete with Apple's. The popularity of mobile media consumption makes the convenience factors of cloud-storage a major factor in consumer adoption decisions. Likewise, as more of our lives and memories are digitized in images, video, sound, and text, the security of cloud backups seems to be a responsible route to protecting oneself against local device failure. However one of the major impediments to consumer uptake of cloud computing is bandwidth caps and the threat of resulting sky high overuse charges.[18]

As ZDnet's James Kendrick observed about the iCloud service, "the synchronization as described by Apple is very prolific," enabling IMac and iOS users to access documents, apps, music, photos, contacts, calendars and preferences across devices in near-real time. "Such access is a nice thing," Kendrick continues, "but it requires the constant movement

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[16] Aalok Mehta, Data Caps Could Cut Artists off from the Cloud. National Alliance for Media Art and Culture. 26 July 2010. Online: http://namac.org/node/25824

[17] The NPD Group Inc., Consumers Don't Know What 'Cloud Computing' Is, Even Though They Use it All The Time. Aug 09, 2011 http://www.darkreading.com/cloud-security/167901092/security/news/231300455/consumers-don-8217-t-know-what-cloud-computing-is-even-though-they-use-it-all-the-time.html

[18] Joel Hruska. Bandwidth Caps Threaten Future of Cloud Computing. June 20, 2011 Online: http://hothardware.com/News/Bandwidth-Caps-Threaten-Future-of-Cloud-Computing/

of data around the user's personal cloud. This has the potential to eat up the mobile data caps in place on iPhones and 3G iPads."[19]

Figure 1: Amazon Cloud Drive

[19] James Kendrick, iCloud synchronization to push data caps to the limit. June 6, 2011 Online: http://www.zdnet.com/blog/mobile-news/icloud-synchronization-to-push-data-caps-to-the-limit/2765

Bandwidth Caps

> "I suspect many people are going to be surprised by this in the coming years, especially as the cloud continues to become more and more a part of our lives." ~Andre Vrignaud, cut off from the web for a year by his ISP Comcast after hitting bandwidth cap[20]

Early adopters of cloud services are experiencing widespread issues concerning hitting bandwidth caps when backing up multimedia data, images, and video files. At a moment when many users think that bandwidth should be getting less expensive, not more, data caps are a controversial issue.[19] For example, in those households that routinely watch Netflix HD streaming movies, game on Xbox Live or Playstation Network, and listen to Pandora's internet-streamed music radio, then diligently backup their multimedia files nightly with a synching service such as Carbonite, MobileMe, or CloudDrive, there is a real danger of hitting data plan caps and facing strict penalties (including being banned for a year[21]) and step fees for exceeding "acceptable use" policy limits. When AT&T in the U.S. instituted a bandwidth cap on previously unlimited data plans earlier this year, pushback was swift. Although AT&T maintained that "on average, only two percent of customers will be affected by the data cap," in fact critics argued that, "watching Netflix movies or TV for two hours per night for 30 days would more than triple the average data use and take customers more than a third of the way to the data cap."[22]

As mobile technology services develop, and new applications for smartphones, eReaders and tablets emerge on the market, there will be more risk that consumers will exceed mobile data caps. Handheld video conferencing via Google Hangouts, Facebook Video Chat or Skype Video chat, is a heavy-bandwidth activity. Likewise, as more streaming video services come online, connected commuters and many young people will watch more video on their mobile phones---using up data plans rapidly.[23] Mobility using netbooks and laptops is also increasingly assuming cloud computing service connections, since many machines (such as for example the Google Chromebook) are not equipped with hard drives or traditional operating system. The consequence is that this hardware design

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[20] Dean Takahash. Who will pick up paying customer that Comcast dropped because of high data usage? Could Beat.com July 29, 2011 Online http://venturebeat.com/2011/07/29/who-will-pick-up-paying-customer-that-comcast-dropped-because-of-high-data-usage/
[21] After exceeding his 250 GB limit twice, U.S. telecom Comcast cut off broadband access to client Andre Vrignaud and banned him from internet access at home for a year. The story received international media attention. For example see Dean Takahashi, Ibid.
[22] Kevin Fogarty Protests over low AT&T data caps, high penalties for violating them. May 09, 2011 http://www.itworld.com/internet/163117/protests-over-low-att-data-caps-high-penalties-violating-them
[23] Patrick Martin, What Data Caps Mean for the Mobile Revolution July 13, 2011 Online: http://www.fool.com/investing/general/2011/07/13/what-data-caps-mean-for-the-mobile-revolution.aspx

necessitates that consumers connect to the cloud to access software, store and retrieve personal files.[24]

It is not just consumption but also creation of new media content that is at stake in the coming cloud computing/bandwidth cap conundrum. In an article published by the National Alliance for Media Arts and Culture (NAMAC) entitled, "Data Caps Could Cut Artists off from the Cloud," Aalok Mehta argued that cloud services and bandwidth caps could be especially damaging and risky for filmmakers, musicians and photographers, "as improving technology and decreasing storage costs have led to larger and larger file sizes."[25]

[24] David Pogue, Excited About the Cloud? Get Ready for Capped Data Plans. The New York Times. June 16, 2011 Online: http://pogue.blogs.nytimes.com/2011/06/16/excited-about-the-cloud-get-ready-for-capped-data-plans/
[25] Aalok Mehta, Data Caps Could Cut Artists off from the Cloud. 26 Jul 2011. National Alliance for Media Arts and Culture Online: http://namac.org/node/25824

Public Policy Implications

From these complications concerning the rise of cloud computing in a digital culture of bandwidth capping, arise questions about whether internet service providers should be allowed to cut households and small businesses or organizations off from the web because of overuse, or if internet connectivity is an essential utility or service, like water, electricity, or the telephone.[26] There is a lively debate about the exceptionalism of online services in terms of society, culture, commerce, and from a policy perspective, which is outside the scope of this environmental scan. However more immediately, critics point to the need for increased clarity in disclosure from telecoms regarding set limits, and more transparency around their subscribers' usage details and patterns, so that users can access data of their own media use habits. Although many service providers do have a bandwidth monitor for customers to gauge their vicinity to data caps, there is room for additional consumer education regarding data management plans, so that subscribers can make informed choices about backups, streaming, and the like.

Improved clarity in communications from telecoms to consumers would help, as users complain of standard scripts read by customer service agents who cannot answer questions, or form letters announcing cutoffs and missing information about pathways for consumer redress. Put differently, "bandwidth hogging" consumers should receive a more appropriate response than a canned notification that they've hit the cap---one that lets them know what to do next and how to avoid repeat offenses and getting banned from the web altogether.

Cloud Privacy

"We would never be able to use a US-based provider of cloud services, even if the data is stored in a data centre in the EU," said an attendee at closed-door meetings of European IT chiefs in Germany and Switzerland organized by Financial Times in 2011.[27] This is due to conflicts between the Patriot Act (which mandates that any data housed, stored or processed by a company that is U.S. based or is wholly owned by a U.S. company must

[26] Janet Davison, Offline: What's keeping 20% of Canadian homes unwired. CBC News. May 30, 2011 Online: http://www.cbc.ca/news/technology/story/2011/05/30/f-home-internet-access-barriers.html
[27] Paul Taylor Privacy concerns slow cloud adoption. Financial Times. August 2, 2011 Online: http://www.ft.com/cms/s/0/c970e6ee-bc7e-11e0-adac-00144feabdc0.html#ixzz1XMIotVJb

make it available for inspection by U.S. authorities) and the European Data Protection Directive (which requires companies to inform users when they disclose personal information).

Moreover, it is widely remarked that cloud storage and data privacy regulations are creating new markets for security and auditing professionals, as businesses and organizations seeking to meet security and compliance policies turn to the cloud. This is also an opportunity for regionally-specific, local cloud-based service providers to have an advantage over multinational conglomerates.[28] But first, more public understanding must occur so that users who are introduced to the concept of cloud based media management and storage are made aware of the privacy policies and protection laws that bind U.S. companies like Google, Apple and Amazon.

Cloud Security

In the spring of 2011, the cloud computing Amazon Web Services experienced a widespread outage that disrupted major social web destinations and many small-medium online businesses across North America. In the aftermath of this outage, which forced many businesses offline for days, discussion focused on cloud insurance for enterprise clients[29] and the ability of networks to protect sensitive data.[30]

As cloud computing becomes more popular for enterprise clients, there is an opportunity for regulators and policy makers to intervene with measures designed to boost consumer data protection and security, while encouraging what many view as a green technology initiative.[31] As well, public policy could mandate standards for communicating risk, redress, and procedures for managing in the event of a data breach or service outage. Moreover, it is worth nothing that consumers are asking many questions of each other on blogs, forums, and social networks about data encryption and cloud computing, but the level of technological literacy required to translate how to protect data through encryption exceeds that of most mainstream users.

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[28] Ibid.
[29] Andy Dornan Should Your Enterprise Buy Cloud Insurance? InformationWeek June 29, 2011 Online: http://www.informationweek.com/news/cloud-computing/software/231000719
[30] Lucas Roh. Outages in the Cloud: A Learning Experience. July 28th, 2011 Online: http://www.datacenterknowledge.com/archives/2011/07/28/outages-in-the-cloud-a-learning-experience/
[31] Ian Grayson Green computing wins admirers as operators invest in energy efficiency. The Australian. August 23, 2011 Online: http://www.theaustralian.com.au/australian-it/cloud-computing/green-computing-wins-admirers-as-operators-invest-in-energy-efficiency/story-fn8lu7wm-1226116893774

Connected Devices and the Cloud

> "Gartner predicts that by 2016 consumers will demand Web-centric data connectivity in their cars, which will lead to new consumer experiences and address sustainability, digital convergence and mobility trends. The key success factor underpinning all of this is the cloud." ~ Michael Kogeler, Forbes[32]

As more household appliances, consumer electronics, and even automobiles become connected objects, the range of convergence regulation expands exponentially (Figure 2).

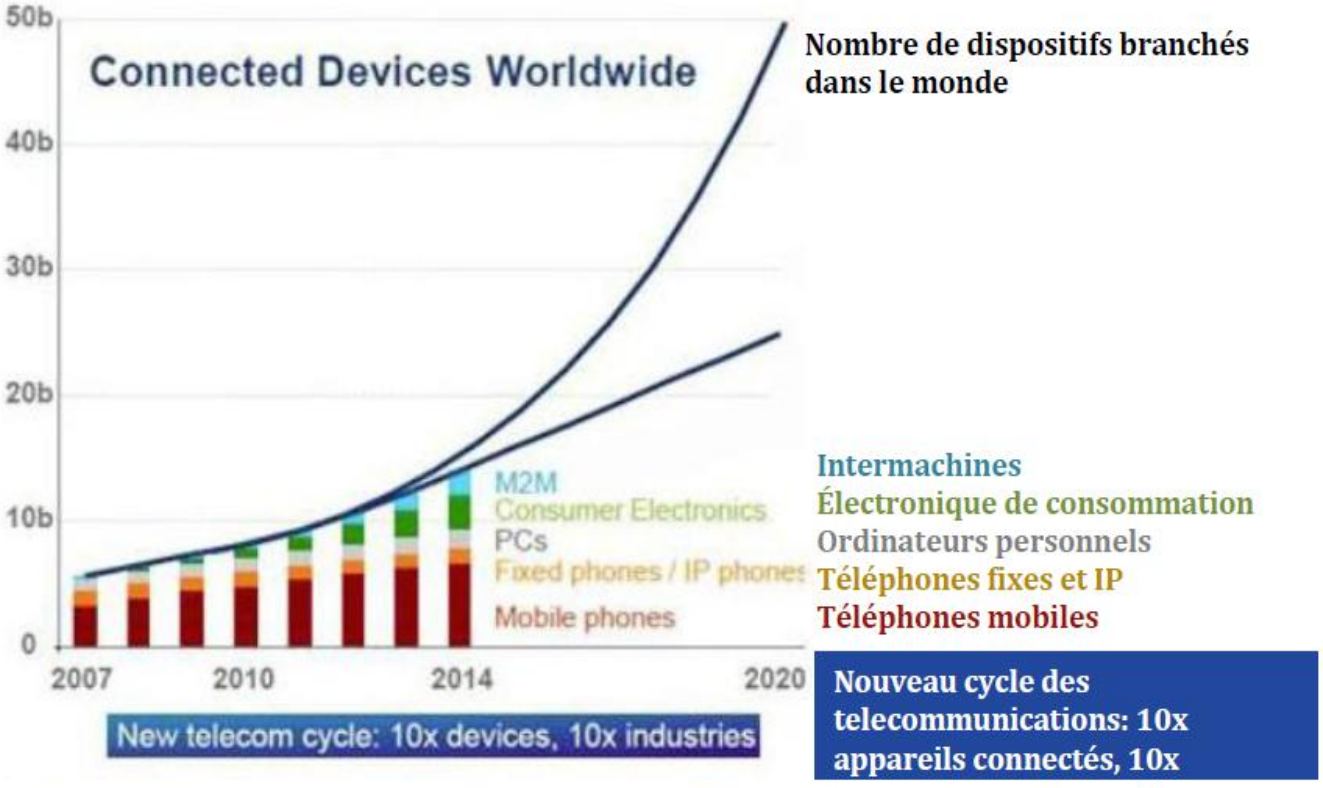

Figure 2: Rise of connected devices.
Source: Ericsson White Paper: More Than 50 Billion Connected Devices. February 2011

Figure 2: Augmentation du nombre de dispositifs branches.
Source : Étude d'Ericsson : Plus de 50 milliards de dispositifs branchés, février 2011.

[32] Michael Kogeler, Forecast For The Auto Industry: Dense Cloud Coverage. Forbes. 26 August 2011. Online: http://www.forbes.com/sites/ciocentral/2011/08/26/forecast-for-the-auto-industry-dense-cloud-coverage/

For example, cloud computing in cars is connected to personalized media use and customized transmission of branded entertainment (exclusive web radio stations). In a trend known as "The Internet of Things," more devices are being connected to the cloud, which introduces a wave of new security and privacy concerns.[33]

Although eBook readers, Wi-Fi photo frames, trackers for kids and pets, remote medical care monitors, game consoles, and cars may seem very far outside the range of concerns for regulators, as these appliances and objects join the "smart grid" and launch branded publishing and broadcasting services, there is a unique opportunity for innovative measures to adapt existing telecommunications policies and consumer protections to this emerging cultural reality.[34]

Connected Devices and Digital Divides

The range of connected objects delivering a stream of digital media content to consumers raises concerns about accessibility and digital divides. Across jurisdictions, regulators are seeking ways to ensure that new digital audiovisual media is accessible for persons with disabilities. In Canada, ensuring the accessibility of digital broadcast media is a key item in the CRTC's Broadcasting Accessibility Fund, which is "working to ensure 100% accessibility of all digital broadcasting platforms by 2020."[35]

In a convergent media culture, it is not just television and internet services that present barriers to information access, but also the content and the hardware of apps, tablets, eReaders and connected TVs that need to be made available to all users. Truly inclusive technological convergence would allow the distribution of any media content over any channel, in any format, to any device---for all users. To make smart devices more accessible to consumers and audiences who are hearing impaired, iOS apps like "Subtitles" allow users to access captions for movies in several languages.[36] Sony's television caption glasses superimpose subtitles onto television programming.[37] Likewise, there is an app that adds captions to the hugely popular TED talks, to make those videos more accessible to a

[33] Laurie Lamberth, The Internet of Things, Anywhere, Anytime, Anything. GigaOM connected consumer report. July 2010. Online: http://pro.gigaom.com/2010/07/report-the-internet-of-things-anywhere-anytime-anything/
[34] Katie Fehrenbacher, Google PowerMeter Moving Closer to Smart Appliances. GigaOM Mar. 24, 2010 Online: http://gigaom.com/cleantech/google-powermeter-moving-closer-to-smart-appliances/
[35] E-Access Bulletin, Global Centre for ICT in Parliament. Canadian Broadcasting Regulator Backs Access Fund. 21/04/2011 Online: http://www.ictparliament.org/node/3450
[36] For more information about the Subtitles app, see http://itunes.apple.com/gb/app/subtitles/id358913522?mt=8
[37] Nellie Day, Glasses Superimpose Subtitles onto Movie Screens for Hearing Impaired. ElderGadget. August 25, 2011. http://www.eldergadget.com/glasses-superimpose-subtitles-onto-movie-screens-for-hearing-impaired/

diverse audience.[38] For the vision impaired, Braille concept smartphones and other wearable technology such as the Thimble optical scanner from The University of Washington are interactive prototypes that could expand accessibility by design.[39]

In the U.S., The National Federation of the Blind is seeking to raise awareness of the access barriers that exist when universities adopt electronic textbooks and eBook readers and apps or tablet programs.[40] Closely related, after California State University issued a report warning universities not to adopt Google enterprise products due to accessibility concerns, Google announced improved accessibility features in Google Docs, Sites and Calendar.[41] Soon after, Google's Technical Program Manager for Accessibility Engineering announced that their multiuser video chat application Hangout, was being field tested with users of American Sign Language (ASL) in order to make the service more accessible to deaf and hearing impaired users.[42]

[38] The TED caption app is available for iOS devices: http://itunes.apple.com/us/app/ted-sub-ted-talks-subtitles/id412403556?mt=8
[39] Wearable Tech for the Visually Impaired. December 17, 2010. http://www.fashioningtech.com/profiles/blogs/wearable-tech-for-the-visually Also see Concept Smartphone Could Bring Sight to Visually Impaired may 13, 2011. http://gigaom.com/mobile/braille-smartphone-concept
[40] Marc Perry. Penn State Accused of Discriminating Against Blind Students. Chronicle of Higher Ed. November 12, 2010. Online: http://chronicle.com/blogs/wiredcampus/penn-state-accused-of-discriminating-against-blind-students/28154
[41] Google takes much needed steps towards accessible documents. Media Access Australia. 15 September 2011 Online: http://mediaaccess.org.au/latest_news/general/google-takes-much-needed-steps-towards-accessible-documents
[42] Janko Roettgers, Next up for Google Plus Hangouts: Sign language support. GigaOM. July 11, 2011. Online: http://gigaom.com/video/google-hangouts-asl-support/

Social Music

Trend Overview

We are currently experiencing the evolution of digital music and the web, in the form of new social playlist services and online lockers to store digital music in the clouds. This is a huge industry with myriad developments in digital media convergence, and warrants a full-length report, so in this section of the scan only selected issues will be reviewed, namely, a focus on some recent social and mobile developments and issues in the digital music space, with an eye on policy implications.

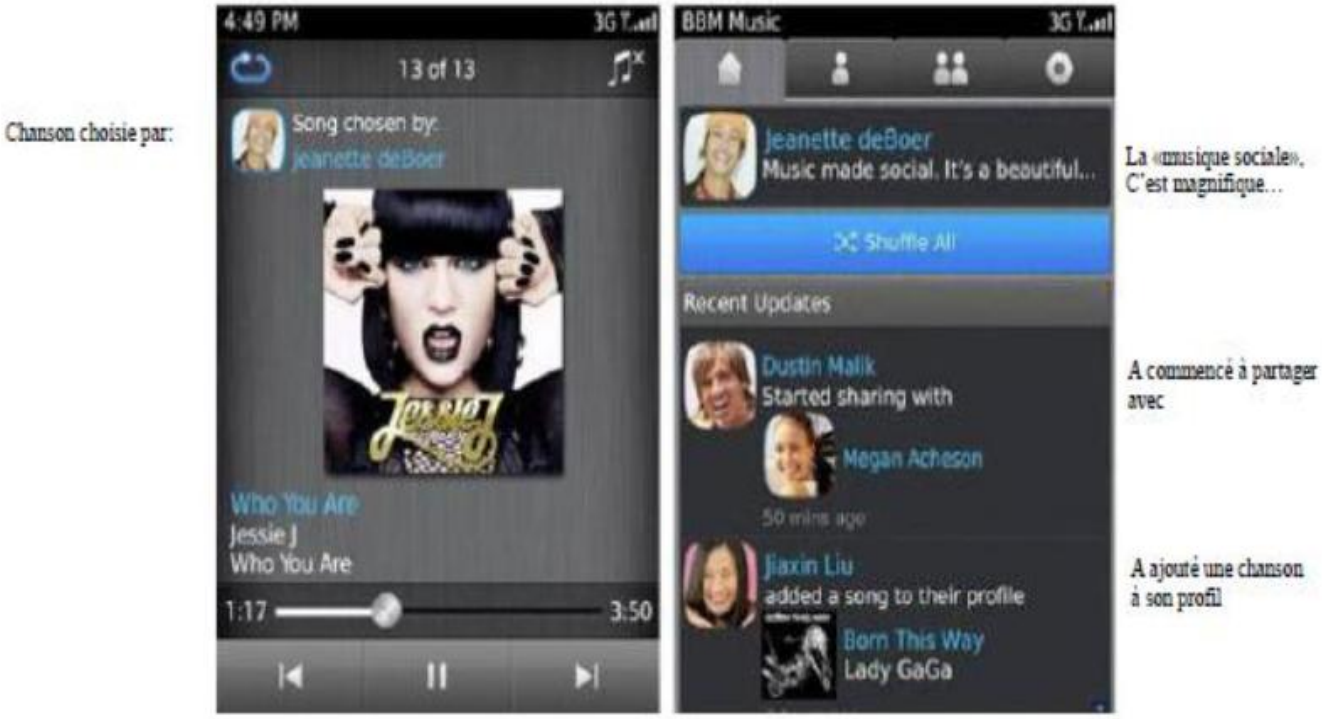

Figure 3: Listes de lecture : BBM Music par RIM, lancé en septembre 2011

Figure 3: Social Playlists: BBM Music by RIM, launched September 2011

RIM's BlackBerry BBM Music service (Figure 3)[43] is just the latest in a trend of new social music developments, including Google Music Beta, Turntable.fm, Spotify, Rhapsody, and Amazon Cloud Music. For a monthly fee, these services allow listeners to configure custom

[43] Ethan Smith, RIM Develops Music Service for Phones. The Wall Street Journal. August 19, 2011 Online: http://online.wsj.com/article/SB10001424053111903596904576516783052998262.html

playlists, rate, review, and share them with friends via social networks. In the process they are ushering in an era of new music transmission models that present an opportunity for regulators to reconsider traditional music broadcasting and licensing rules in light of convergent digital culture trends.

Social playlists are increasingly multimedia by nature, combining audio and video material. YouTube paved the way for this, becoming a key mode in the online consumption of popular music for a generation of young people growing up immediately after the post-Napster years.[44] In fact, when a recent Nielsen global survey of 26,644 online consumers across 53 countries investigated the most popular forms of digital music consumption was the "watch" habit with 57 percent of respondents having watched music videos on computers in the last three months. (Figure 4)[45]

Figure 4: Watching music trend. Source: Nielson "Music, Money & Mobile: A Global Report", February 2011

Figure 4 : Regard sur la tendance en musique. Source : Nielson « Music, Money & Mobile : A Global Report » février 2011

[44] Nielsen Media Company. Music, Money & Mobile: A Global Music Outlook. April 8, 2011. Online: http://www.scribd.com/doc/63930216/Midem-Nielsen-Music-Digital-Music-Consumption-Digital-Music-Access
[45] Ibid.

As illegal file sharing rates steadily drop, and second-generation post-Napster P2P sites are shut down, social music sharing trends rise. As the NDP Group recently reported, between 2007 and the end of 2010, the average number of music files downloaded from P2P networks such as Limewire also dropped from 35 tracks per person to 18 tracks.[46] In the summer of 2011 YouTube announced it will begin paying licensing fees and royalties, in a move that many saw as an acknowledgment of YouTube's role as a key music broadcast mechanism -- a next gen digital jukebox, as it were. Notable here is the inability for consumers to purchase music directly from YouTube. The integration of iTunes purchase links on YouTube video pages has led to increased sales for some artists, but for the most part this trend is about streaming, with consumers programming playlists and playing music through a browser or app.

Online lockers such as Amazon Cloud Player allow U.S. consumers to store up to 5GB of music online for free---this includes music files not purchased through Amazon, some of which may have been obtained illegally.[47] Similarly, Turntable.fm launched in beta in 2011 and quickly attracted 150,000 users who can select and stream in their personal listening "rooms" (lockers). Pressure from labels has caused this startup to cut back on its service area, no longer accepting international members (outside the US). What's new here is that music labels have historically been compensated for streaming music services, prompting analysts to observe that, "as digital music continues shifting to the cloud, labels will likely need to adjust their mindsets [and business models] around local vs. cloud-based storage."[48]

Music apps

> "Just as video gave music a new direction with the advent of MTV in the early 90s, the interactive, visual and social possibilities of new technologies and devices could foster new artist innovations." ~ Andrew Harris, Sydney Morning Herald[49]

Popular musicians are always seeking new ways to connect more directly with their fans, and thus socialized digital apps are a natural next step for innovators across the genres.

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[46] According to NPD Group only 9% of Americans still get music from peer-to-peer networks in 2011, that's down from 44% in 2010. See "With Limewire Shuttered, Peer-to-Peer Music File Sharing Declines Precipitously" March 23, 2011 Online: http://www.npd.com/press/releases/press_110323.html

[47] This is similar to Grooveshark, a cloud based social music service that allows users to upload music to the site, even if they don't have the legal rights to it, building a collection that is available on demand to anyone with a computer and an Internet connection. Grooveshark is currently being sued for copyright infringement. Also see Michael Fox Digital music meets the cloud; Connected Consumer Q2 GigaOM July 2011

[48] Michael Wolf, Digital music meets the cloud; Connected Consumer Q2 GigaOM July 2011

[49] Andrew Harris Music's new frontier. Sydney Morning Herald. August 6, 2011 Online: http://www.smh.com.au/national/musics-new-frontier-20110805-1ifat.html#ixzz1XNLeF8Au

For example, for her latest release, Biophilia, Icelandic artist Bjork chose an interactive smartphone app format.[50]

Similarly, Kristin Hersh, solo artist and founding member of alternative rock band Throwing Muses, opted for a multimedia app for the iPad, iPhone and iPod Touch. In an interview with The Sydney Morning Herald the musician confirmed that "Since the app release we've sold more apps than album downloads," adding "although numbers are still coming in, we've sold a couple of thousand already."(Ibid)

In August 2011 Ustream, a company that broadcasts live video to the web and smartphones, entered a partnership with U.S. startup Mobile Roadie, a company that produces mobile apps.[51] The deal sets up a system to connect fans to each other and to the musicians and their content, via a collection of thoroughly socially-integrated, multimedia, location-aware, mobile-commerce-enabled, live video broadcasting apps for Android and iOS. The livestreaming in-app content will be available by paid monthly subscription. Also in 2011, pop culture magazine VICE in partnership with Dell and Intel launched a website called Noisey, self-described as a social media "video-driven music discovery platform," featuring canned visual content and live performances by indie bands.[52] Music industry critics and experts compared Noisey to MTV and concluded that the former is the kind of service MTV would make if the network "cared about music" instead of reality television shows, "like The Hills, Teen Mom, and I Used to Be Fat." (Ibid)

These innovative technological moves effectively sidestep conventional broadcasting models for both audio and video productions, circumvent national content rules, and reserve control over revenue, publication and distribution to the label. The manufacture of apps, mobile social networking platforms, and web video channels, are not only examples of convergent music trends, but also demonstrate the trend of brands (including celebrities and public figures) becoming broadcasters and publishers in their own right.

[50] Chris Chang-Yen Phillips Björk's new app album pushes interactive boundaries. CBC News. Aug 11, 2011 Online: http://www.cbc.ca/news/arts/story/2011/08/05/f-bjork-app-album.html
[51] Stuart Dredge, Ustream cans its Live Mobilizer app in favour of Mobile Roadie deal. August 23, 2011 Online: http://www.mobile-ent.biz/news/read/ustream-cans-its-live-mobilizer-app-in-favour-of-mobile-roadie-deal/015263
[52] Noisey.com: If MTV Cared About Music, They'd Have Made This http://thestir.cafemom.com/technology/118112/noisey_com_if_mtv_cared

Public Policy Implications

Since young people are the most voracious consumers of digital music,[53] downloading tracks (and now apps) from their favorite groups, the policies pertaining to in-app privacy and restrictions on advertising to children and collecting information from minors (mentioned later in this scan, in the section on kids, smartphones, and mobile apps) can also be applied to the topic of new modes of digital music production, distribution, and consumption.

As new business models for convergent music delivery continue to emerge, there is a need for licensing for these new transmission models (cloud, streaming, in-app) and guidelines for content rights. This will require determining whether streaming of music content from an online locker constitutes a "public performance" that should require both licensing fees and royalties to be paid to the studios, in order to avoid violating copyright.

For although several lawsuits have ruled in favor of the artists and labels, several have gone the other way. In the summer of 2010 ZapTunes free music download company was shut down after numerous Digital Millennium Copyright Act (DMCA) complaints and lawsuits brought against it by a music labels.[54] However just one summer later, in August 2011, a U.S. Judge ruled in favor of a digital music startup called MP3tunes which allowed customers to shared stored music files in online lockers.[55] Clearly some standardization is in order, to clarify the regulatory playing field for consumers, artists, labels, and entrepreneurs alike. So what are other jurisdictions doing in the digital music convergence space?

In the UK

Ofcom is currently preparing to implement the Digital Economy Act's mass notification system.[56] This is essentially a mass mailing to those identified as sharing music, films and other content unlawfully through file-sharing networks.

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[53] For more on the generational differences of digital music consumption see The Ypulse Report — Technology, January 2011 Online: http://research.ypulse.com/the-ypulse-report-%E2%80%94%C2%A0technology/ and/or Pew Internet and American Life Project, Generations Online 2010 report, online: http://pewresearch.org/pubs/1831/generations-online-2010

[54] Robert Tidwell Zaptunes Shuts Down – Free MP3 Music Downloads Get Zapped Oct 26, 2010 Online: http://www.newsjunkyjournal.com/zaptunes-shuts-down-free-mp3-music-downloads-get-zapped/253630/

[55] Ben Sisario, Court Ruling Could Hurt Cloud-Based Music Services. The New York Times. August 22, 2011. Online: http://mediadecoder.blogs.nytimes.com/2011/08/22/court-ruling-could-hurt-cloud-based-music-services/

[56] Department for Culture, Media and Sport. Ofcom to review aspects of Digital Economy Act. 1 February 2011. Online http://www.culture.gov.uk/news/media_releases/7756.aspx

Earlier this year Ofcom was asked to review another section of the Digital Economy Act, one that would see ISPs blocking access to sites found to be hosting copyright-infringing content, including music and video files.[57] In August the regulator advised the government that it should scrap the site blocking proposal and instead take the opportunity to engage in some innovative overhauling of existing copyright laws.[58]

As a result, policymakers in the UK will design a digital exchange where licenses for copyright works may be bought and sold. In these two examples, the UK regulator is engaged in outreach and education designed in response the aforementioned "control crisis in the communications sector" by both encouraging information fluency, and participating in the design of new adaptive policies for convergent media.

In Australia

The Communications and Media Authority (ACMA) views existing regulations concerning music as "broken concepts" ---including the now outdated notion that music can be controlled by how it is delivered. A good example of this disconnect is how the National Classification Scheme handles music videos:

> Music videos are subject to different forms of classification depending upon the means by which they are distributed. If released on DVD or similar recorded form, a music video is technically a film and is subject to classification under the National Classification Scheme. Music videos broadcast on television, however, are instead subject to industry codes of practice under the Broadcasting Services Act 1992.[59]

However, when a video is distributed online or in a free smartphone app, which set of regulations and classifications apply? There are additional layers of confusion regarding the lack of a classification displayed at the commencement of highly sexualized music video programming on Saturday mornings when minors are likely to be watching TV. And, in the context of recorded versus online music, it is worth noting that Australia's AMRA labeling codes do not apply to online music stores. As a result,

> Frustration is growing, in many areas, in relation to the increasing amount of music being downloaded from iTunes and similar services," representatives from Media Standards Australia told the ACMA, "No alerts are provided, however, where offensive lyrics are

[57] Ofcom asked to review site-blocking clause in Digital Economy Act February 2nd, 2011. Online: http://musically.com/blog/2011/02/02/ofcom-asked-to-review-site-blocking-clause-in-digital-economy-act/
[58] Adrian Croft UK shakes up copyright laws, scraps plan to block websites. Reuters. Aug 3, 2011 Online: http://www.reuters.com/article/2011/08/03/us-britain-copyright-idUSTRE7723DQ20110803
[59] Senate Legal and Constitutional Affairs References Committee Report. http://www.aph.gov.au/senate/committee/legcon_ctte/classification_board/report/c09.htm

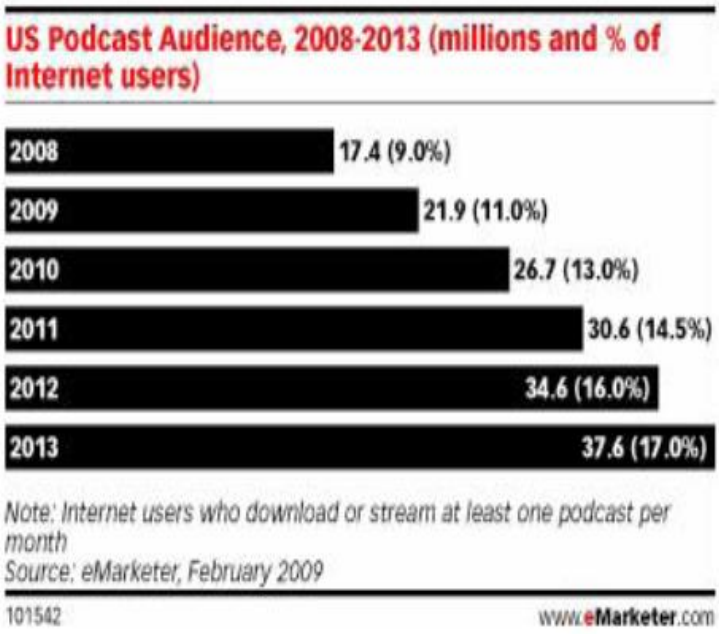
involved, and this needs to be urgently addressed. Parents are now giving out alerts among their own networks, but the whole issue is still difficult for them to police in their own homes. (Ibid)

The cumulative effect of these myriad gaps in regulation and classification of now convergent media, coupled with a confusing complaint mechanism, have resulted in a steady stream of questions and submissions for the ACMA.

In the U.S.

The American judicial system is debating whether on-demand distribution of podcast and vodcast web content constitutes broadcasting, and if it falls within the purview of the Federal Communications Commission (FCC). This is just one of the questions media producers, regulators and legislators are asking as podcast audiences and producers grow exponentially (Figure 5).

Public s'adonnant à la baladodiffusion, 2008-2013 (en millions et % d'utilisateurs Internet)



Note : Utilisateurs Internet qui ont téléchargé ou écouté en continu au moins un fichier balado par mois.
Source : eMarketer, février 2009

Figure 5: Public s'adonnent à la baladodiffusion aux É-U.
Source : eMarketer

Figure 5: Podcast audiences US. Source: eMarketer

In related discussions about using music in podcast production, U.S. legal experts are warning media creators about the differences between public performance rights for non-interactive versus downloadable, on-demand content. It turns out that in fact webcast content is not covered by most royalties and licenses because it falls under interactive media, and because it involves the reproduction and redistribution (not just performance) of the music track.[60]

There is such a wide range of issues at stake in the digitalization of music, with the technologies and services changing so quickly, and "with more music available than ever from an unprecedented number of sources" the conditions necessitate a dynamic approach to regulation. [61] Ideally, adaptive polices surrounding social music would "respond to changes over time and make explicit provision for learning."[62]

[60] David Oxenford, Beware - Music Use in Podcasts, Downloads and On-Demand Streams are Not Covered By Your SoundExchange Royalties. Broadcast Law Blog. July 21, 2011 Online: http://www.broadcastlawblog.com/2011/07/articles/music-rights/beware-music-use-in-podcasts-downloads-and-ondemand-streams-are-not-covered-by-your-soundexchange-royalties/
[61] Nielsen Media Company. Music, Money & Mobile: A Global Music Outlook. April 8, 2011. Online: http://www.scribd.com/doc/63930216/Midem-Nielsen-Music-Digital-Music-Consumption-Digital-Music-Access
[62] Walker, W.E., Rahman, S.A. and Cave, J. (2001), "Adaptive policies, policy analysis, and policy-making", European Journal of Operational Research, Vol. 128, pp. 282-9.

Smart Television

> "If you think about the traditional telephone and the smartphones we all have today, I believe that TV will see as dramatic a reinvention as the telephone. In 2011, we just watch TV that was prescribed, but TV is changing fast and people will choose to watch what's relevant to them. TV's reinvention has already begun." ~BK Yoon, President of Samsung Displays[63]

Trend Overview

Considering that the CRTC just finished a detailed report[64] on convergence and television broadcasting, this scan will have a limited focus on smart iHDTV apps, and mobile television and video consumption: television content on connected devices.

Connected televisions enable viewers to consume internet content on their HDTVs, and to stream programming from Netflix and other over-the-top next gen television content providers. There is a race among manufacturers (Google, Apple, LG) to develop a link between traditional TV and the Internet, so that audiences can seamlessly shift between watching streaming video on UStream, Hulu, and YouTube as well as traditional programming on connected TVs.

But what truly makes a TV experience smart is apps and customizable browser extensions. "Consumers want more than what traditional cable and satellite companies offer," observes journalist Vito Pilieci in The Ottawa Citizen, "They want video on-demand, Internet-based podcasts, instant news feeds and access to items stored on their home network -- and they want all of that on their TV."[65] For example, Ottawa based Espial Group Inc. produces a programmable web browser to make television sets "smarter" by accessing information and entertainment content directly from the web. However in order to get truly smart TV analysts suggest thinking beyond the browser, to interactive apps that "allow consumers to do more than simply integrate with a TV browser to connect to the web."[66]

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[63] John Kennedy, Samsung's BK Yoon: smart TV revolution to dominate to 2020. Digital Life, July 01,.2011. Online: http://www.siliconrepublic.com/digital-life/item/19852-samsungs-bk-yoon-smart-tv cited in Michael Wolf, How TV OEMs Got Smart by Watching the Mobile Industry, GigaOM Jan. 14, 2011 Online: http://gigaom.com/video/tv-oems-got-smart/

[64] CRTC, Navigating Convergence II: Charting Canadian Communications Change and Regulatory Implications, Convergence Policy, Policy Development and Research August 2011 Online: http://www.crtc.gc.ca/eng/publications/reports/rp1108.htm#t47

[65] Vito Pilieci, Web browser of Ottawa firm can be built into TV and programmed to give video on demand, The Ottawa Citizen August 23, 2011. Online: http://www.ottawacitizen.com/technology/Espial+tunes+demand+smarter+televisions/5296905/story.html

[66] Michael Wolf, Quarterly WrapUps. GigaOM July 25, 2011 Online: http://pro.gigaom.com/2011/07/connected-consumer-q2-digital-music-meets-the-cloud-e-book-growth-explodes

TV Appified and Mobilized

> "Using remote-based interactive TV is more intrusive. We're all sitting there on our couches with our iPads, iPhones and Android devices anyway." ~ Evan Krauss, Shazam Entertainment[67]

Even in our 3-screen culture, it is the television screen that is the most widely watched one, according to Nielsen research. Across global markets 30% of households have an HDTV.[68] North America leads in ownership, with the U.S. at number 4 and Canada at number 6. Currently 20.5 million North American households already have Internet-ready TVs with integrated TV apps, which represent approximately 22% of households.[69] That figure is forecasted to grow by an average 36% over the next five years.[70] In the UK a third (32%) of homes now claim to have access to HDTV channels in their living room.[71] And even with multiple viewing options, the living room is still the most relevant/popular place for in-home media consumption in the connected digital home. However that is changing, as television viewing gets more mobile each year (Figure 6).

Traditionally a "lean back" media experience, as TV gets appified and mobile it is becoming more "lean forward" interactive media engagement. Audience research by the video site Vevo, which is co-owned by the major music labels and powered by YouTube, showed that half of their users are 13 to 24 years old, and that most of its mobile views come in the evening and the afternoon. Moreover, 85 million of its three billion video streams came from mobile platforms in May 2011, an increase of 20% from the previous month, and up 365% from January 2011.[72]

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[67] Todd Spangler, Interactive TV Moves to Second Screen, New Mobile-Device 'Tags' Link TV Ads, Shows to Online Content. Multichannel News, July 18, 2011. Online: http://www.multichannel.com/article/471110-Interactive_TV_Moves_to_Second_Screen.php

[68] OfCom International Communications Market Report 2010 Online:http://stakeholders.ofcom.org.uk/binaries/research/cmr/753567/icmr/ICMR_2010.pdf

[69] PRWeb. Over 60% of Connected TV Households Use TV Apps at Least Once per Week, Says In-Stat. July 26, 2011 Online: http://www.prweb.com/releases/In-Stat/TV-App/prweb8667375.htm

[70] Wayne Friedman, Internet-Connected TV To Grow 36% By 2016. Media Daily News. July 26, 2011, Online: http://www.mediapost.com/publications/?fa=Articles.showArticle&art_aid=154727 Also see Jim O'Neill, Research: Connected TV will be consumers' portal to the Web by 2015. August 10, 2011 Online: http://www.fierceonlinevideo.com/story/research-connected-tv-will-be-consumers-portal-web-2015/2011-08-10

[71] Ofcom Communications Market Report August 2011. Online: http://stakeholders.ofcom.org.uk/binaries/research/cmr/cmr11/UK_CMR_2011_FINAL.pdf

[72] All Things Digital. For Vevo's Music Video Viewers, "Mobile" Might Mean "In Bed" July 26, 2011. Online: http://allthingsd.com/20110726/for-vevos-music-video-viewers-mobile-might-mean-in-bed/?mod=googlenews

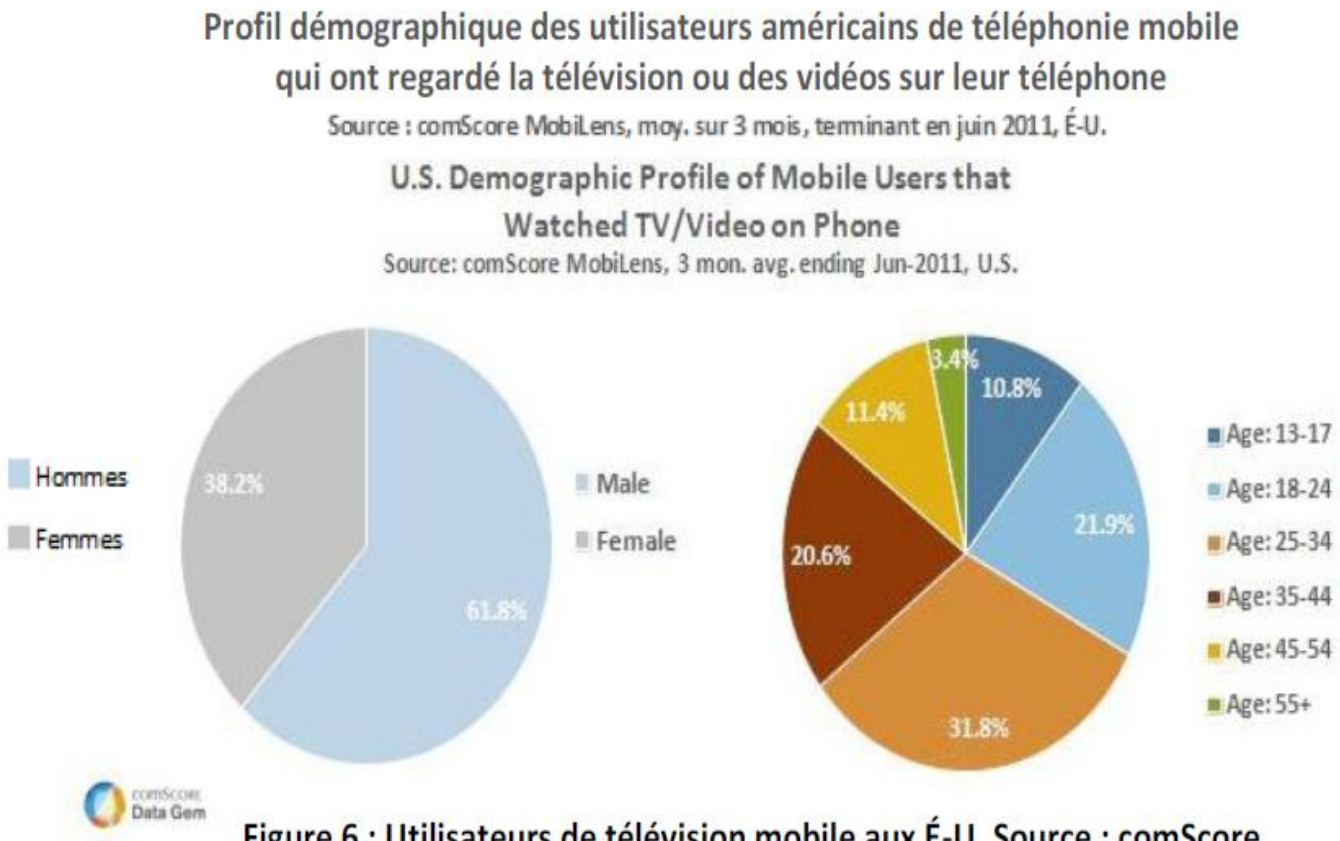

Figure 6 : Utilisateurs de télévision mobile aux É-U. Source : comScore.

Figure 6: Mobile TV audience in US. Source: comScore

Mobile television apps can enable new TV functionalities such as search and social media integration. They also promote content discovery and enable targeted advertising. From a regulatory standpoint, the implications of smart TV on marketing, information gathering, and data mining, are worth noting.

According to industry analysts at GigaOM, "a rapidly growing number of connected devices will soon disrupt what we think of as TV advertising, by combining TV-sized reach with all the interactivity, targeting and analytics advertisers have come to expect from web video ads." (Figure 7)[73] The consequences of this development for childrens' programming are worth further consideration, as audience information is collected across a range of consumer electronic formats from iTVs to game consoles, television apps and smartphones.

[73] Ryan Lawler How connected devices will disrupt the TV ad market. Jul. 14, 2011. Online: http://gigaom.com/video/connected-tv-ad-market/

Nombre de téléchargements d'applications TV pour TVHD (en millions)

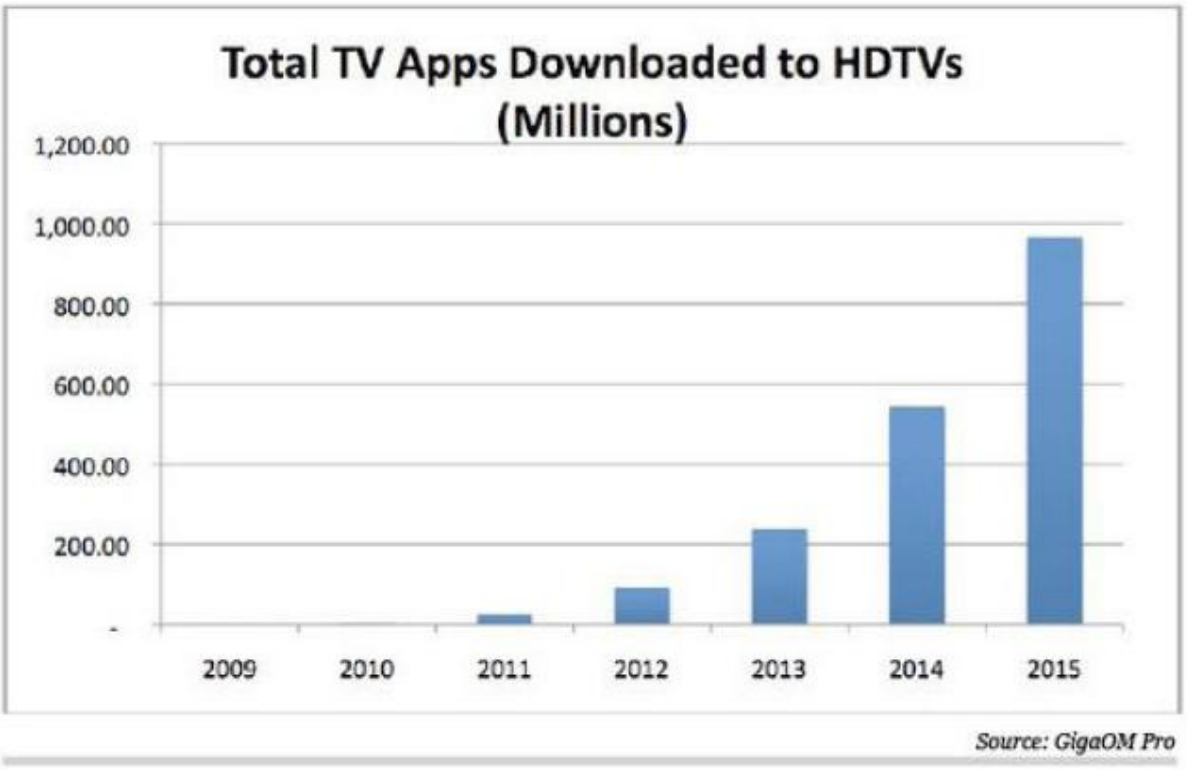

Figure 7: TV app download forecast. Source: GigaOM 2011

Figure 7: Prévisions relatives au téléchargement d'applications TV. Souce : gigaOM 2011

An enormous collection of optimized video on-demand apps for tablets, from the CBC and CTV ones aforementioned in this scan, to apps by trusted legacy brands such as ABC, and the BBC, alongside Comcast, Dish Network, DirecTV, and Comcast XfinityTV apps, all of which are making the iPad a preferred second screen for watching TV shows.[74] These apps sit alongside hundreds of lesser-known apps by startups, some of which violate the terms of network distribution agreements for television content. As a result, there are plenty of heated legal battles going on regarding content rights, causing some apps to wait on permission for iPad streaming.

For example, Viacom has been engaged in a legal fight with Time Warner Cable over its channels being available for live streaming on the iPad. Viacom is also legally challenging the Cablevision iPad streaming TV app for the same reasons.[75] Similarly, Time Warner

[74] iacom goes after Cablevision over iPad streaming By Ryan Lawler Jun. 23, 2011 Online: http://gigaom.com/video/viacom-cablevision-ipad-lawsuit/
[75] Ryan Lawler Apr. 2, 2011 Cablevision's iPad App: 300 Live Channels, 2,000 VOD Titles

Cable spent the summer of 2011 in a legal battle with Discovery, Fox and Viacom. In short, cable networks claim that apps allowing audiences to view their TV content on new handheld devices not covered as part of their existing distribution agreements.[76] In its defense, Cablevision argues that delivering content to an iPad is not substantively different from distributing it via the hard drive in a set-top PVR box, or streaming from a cloud sever. In its press release, Cablevision argues that the application "turns the iPad into an additional television" to deliver all the same content that is available on other screens in the house.[77]

Public Policy Implications

There is an obvious regulatory opportunity here to create new licensing models to meet emerging modes of television retransmission, including cloud, streaming, and in-app distribution models. As well, regulators and policy makers are engaged in realigning converged content rights. For example, a recent report by The University of New South Wales' researchers investigated the impact of the horizontal movement of content "between radio and television to podcasts and YouTube, to mobiles and tablet devices" and suggested a number of adaptive policies and initiatives for media content regulation in a quickly evolving convergent media ecosystem.[78]

In the U.S.

Over the past year the FCC has been investigating what is called the AllVid proposal designed specifically driving the design of TV apps that meet standardized guidelines. According to FCC Chairman Julius Genachowski this initiative is intended to allow the regulator to "take steps to spur innovation in and around the TV platform." In addition, the AllVid initiative would act as an intermediary between home theater gear and pay-TV services, "giv[ing] consumers greater choice of video equipment for pay TV and over-the-top (OTT) video services by allowing consumer electronics OEMs (and, by extension, Google) to mix and match pay TV and OTT services and present them side-by-side in a unified interface."[79]

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http://gigaom.com/video/cablevision-ipad-app/

[76] Ibid.

[77] Michael Wolf. Why Big Cable Fears AllVid — and Why It Shouldn't. GigaOM. Feb. 11, 2011 http://gigaom.com/video/why-big-cable-fears-allvid-and-why-it-shouldnt/ Also see Matthew Lasar, Goodbye CableCARD, hello "AllVid" ArsTechnica April 22, 2102. Online: http://arstechnica.com/tech-policy/news/2010/04/fcc-goodbye-cablecard-hello-allvid.ars

[78] Kate Crawford, Catharine Lumby, The adaptive moment: a fresh approach to convergent media in Australia. May 2011. Online: http://apo.org.au/research/adaptive-moment-fresh-approach-convergent-media-australia

[79] Ibid.

In the UK

OfCom will begin regulating a new participation TV platform called App:Play, which "allows broadcasters, publishers and content owners to reach an increasingly fragmented audience" with full social network integration.[80] Introduced in 2011, this app enables broadcasters to deliver real-time or pre-recorded media content to smartphones and tablets, and let users pay for access to this programming using Facebook credits or credit cards---from within the app.[81] Advertising via App:Play promises to drive additional revenue for networks, contributing to the trend of "t-commerce" (television commerce). This revenue generation model makes sense, especially in a country with an appetite for participatory reality television shows---which earned £43 million in 2010 from television voting.[82]

[80] Press Release. Marketing News: App:Play launches first social & mobile Participation TV platform for global broadcasters & publishers. Marketing News UK. May 19, 2011 Online: http://www.marketinguk.co.uk/Marketing/AppPlay-launches-first-social--mobile-Participation-TV-platform-for-global-broadcasters--publishers.asp

[81] App:Play launches first social & mobile Participation TV platform for global broadcasters & publishers. May 19, 2011 Online: http://fixed-mobile-convergence.tmcnet.com/news/2011/05/19/5521964.htm

[82] See 2011 report by PhonepayPlus "Emerging Trends in the UK Premium Rate eServices Market" Reviewed online: http://www.vodprofessional.com/features/cast-your-vote-the-tv-way/#.Tn-7XU9mkg8

Mobilities: The App Revolution

> "These devices are not really phones---they are miniature computers." ~ U.S. Senator Jay Rockefeller, Chair of Senate Commerce Subcommittee[83]

Trend Overview

A 2011 Pew Research Center report[84] found that 83% of adults own a mobile phone of some kind, 42% of those are smartphones -- that is double what Nielsen research company found a year before, when just 21% of survey participants had smartphones.[85] In the UK 27% of adults own a smartphone, and 6 out of ten of those consumers bought it in the last year. No surprise then that the volume of data transferred over the UK's mobile networks has increased by 67% in the last twelve months, according to Ofcom research.[86]

More smartphones means more mobile web browsing, more app downloads, and more geolocation use. In fact Pew found that 87% of smartphone owners access the mobile web at least once daily. That paves the way for more mobile video consumption, which will condition consumers to want and watch more mobile TV programming on their handheld devices.

Estimates are that 43% of smartphone users have downloaded an app -- 47% in the UK.[87] According to Flurry's 2011 data, the average iOS device owner will download 83 apps in 2011 vs. 51 in 2010, a 61% increase year over year (Figure 8).[88]

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[83] Eric Engleman, Adam Satariano, Bloomberg News, Senate panel weighs smart-phone privacy concerns, San Francisco Chronicle. May 20, 2011 Online: http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2011/05/19/BU9L1JIBRT.DTL
[84] Aaron Smith, Pew Internet. Smartphone Adoption and Usage Jul 11, 2011. Online: http://pewinternet.org/Reports/2011/Smartphones.aspx
[85] Roger Entner, Nielsen Wire. Smartphones to Overtake Feature Phones in U.S. by 2011. March 26, 2010. Online: http://blog.nielsen.com/nielsenwire/consumer/smartphones-to-overtake-feature-phones-in-u-s-by-2011/
[86] Ofcom Communications Market Report: UK. August 2011. Online: http://stakeholders.ofcom.org.uk/binaries/research/cmr/cmr11/UK_CMR_2011_FINAL.pdf
[87] Pew Rise of the 'Apps Culture' September 14, 2010. Online: http://pewinternet.org/Reports/2010/The-Rise-of-Apps-Culture.aspx
[88] Philip Elmer-DeWitt, Apple users buying 61% more apps, paying 14% more per app. CNN. July 11, 2011. Online: http://tech.fortune.cnn.com/2011/07/11/apple-users-buying-61-more-apps-paying-14-more-per-app/

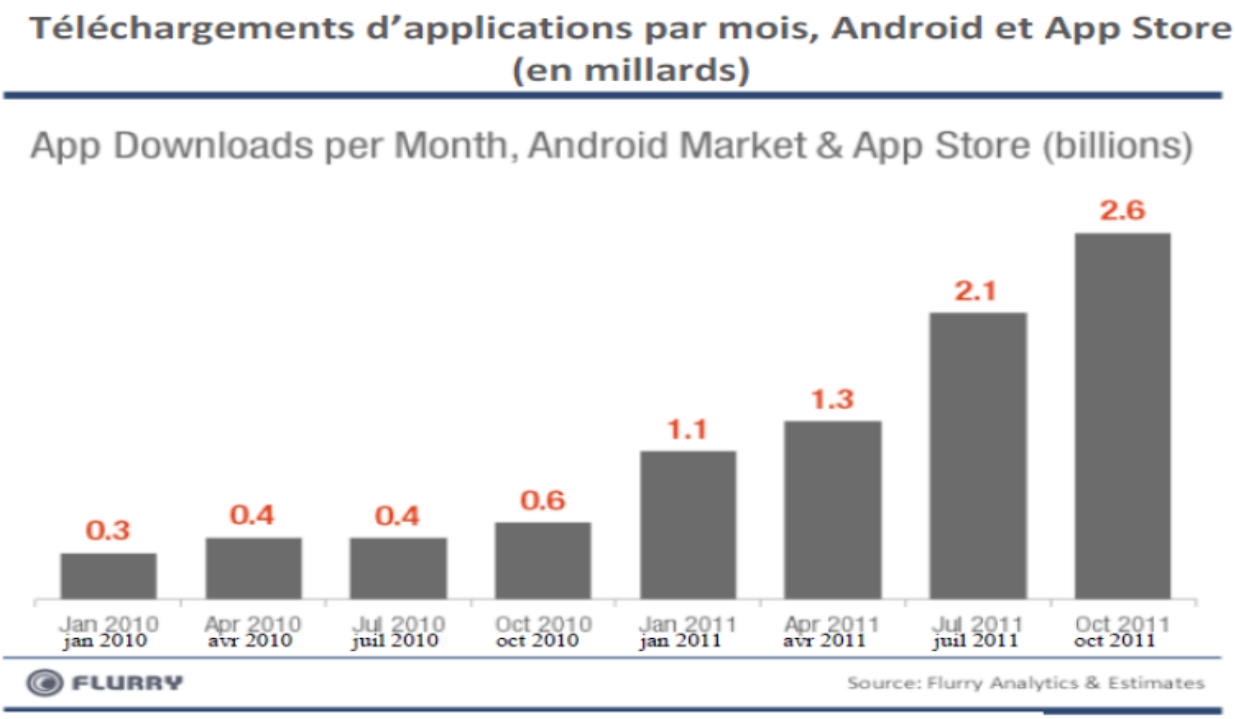

Figure 8: App downloads escalate. Source: Flurry, 2011.

Figure 8: Montée en fleche du téléchargement d'applications. Source : Flurry, 2011

Apps are actually more compelling than the mobile web for users. For example, according to Pew, the average Android consumer in the U.S. spends just under 1 hour a day interacting with their phone, and of that time, two-thirds is spent on mobile apps and one-third is spent on the mobile web (Figure 9).

% of adult cell phone users who do each of the following on their phone...

% des utilisateurs adultes de cellulaires qui font les activités suivantes sur leur téléphone...

Take a picture	76%	Prendre une photo
Send or receive text messages	72	Envoyer ou recevoir des messages textes
Access the internet	38	Accéder à Internet
Play a game	34	Jouer à un jeu
Send or receive email	34	Envoyer ou recevoir des courriels
Record a video	34	Enregistrer une vidéo
Play music	33	Écouter de la musique
Send or receive instant messages	30	Envoyer ou recevoir des messages instantanés
Use an app	**29**	Utiliser une application

Source: Pew Research Center's Internet & American Life Project, April 29-May 30, 2010 Tracking Survey. N=1,917 adult cell phone users.

Source: Centre de recherche Pew : « Internet & American Life Project » 29 avril - 30 mai 2010. Sondage. N=1 917 utilisateurs adultes de cellulaires.

Figure 9: Mobile Phone Usage. Source: Pew 2010

Figure 9 : Utilisation du téléphone mobile. Source : Pew 2010

Although most of the apps are free and Apple only earns 1% of its revenue from the iTunes App Store, CNN financial analyst Philip Elmer-DeWitt rightly observes that "without the App Store, Apple wouldn't be able to sell iPhones and iPads as fast as it can make them."[89] Through downloading and installing apps consumer can customize their smartphones, increasing the value of the device for entertainment (games), communication (social networks), information (weather and news apps), and productivity (calendar, expense tracking, word processing).

Convergent Apps

This proliferation of mobile apps indicates a variety of new transmission methods and business models for publishing and broadcasting Canadian media content. Likewise, the presence of apps by trusted legacy brands conditions consumers to use mobile data plans habitually. This impacts their everyday media use in-home and while on the go, and it has implications for advertisers, content licensing, and the volume of bandwidth-heavy multimedia content creates consequences for communication infrastructures.

Here is a very small sample of Canadian broadcasting/media apps that have been ranked highest at the iTunes Canada App Store. The descriptions are taken from iTunes.

Radio Canada Sports
Description: Hockey, football, soccer, F1, tennis and skiing results are now available in one convenient location – the Radio-Canada Sports App. Personalize your application by selecting your teams, your sports, and your favourite players, and create alerts to stay informed of the latest sports scores. (Loose translation)

CBC Radio
Description: Listen to your favourite CBC Radio programs on your iPhone / iPod Touch. Enjoy live streams and more than 60 of CBC's most popular programs on-demand. Browse archived episodes and create a favourites list so you can go straight to the programs you love. As well, you can find the local frequency for your favorite CBC Radio broadcast channel, set a sleep timer, or browse CBC.ca while you listen.

[89] Ibid.

Sirius XM Radio Canada App
Description: Now you can listen to all the programming you love from SIRIUS Canada on your iPhone and iPod touch. Hear exclusive music with dedicated artist channels, live performances, and music covering every genre – all 100% commercial-free! Tune into one of the many talk and entertainment channels with radio's biggest personalities including Martha Stewart. Talk politics on P.O.T.U.S., health care on Doctor Radio, or stay informed with world-class news from our partners like CNN, BBC, NPR and CBC

CHUM Radio iPhone app
Listen to 34 radio stations in sixteen of Canada's largest markets.

Corus iPhone app
Listen to 52 radio stations across Canada including 102.1 the Edge, Q107, CKOI, 98,5 FM, 630 CHED, CJOB 68 and Country 105.

Rogers Digital Media iPhone app
Listen to 52 radio stations across the country. Restricted to Rogers Wireless subscribers.

CBC TV App
Description: Enjoy full-length episodes with new episodes updated automatically. The hottest CBC programs including Heartland, Dragons' Den, Republic of Doyle, Best Recipes Ever, Little Mosque on the Prairie, Rick Mercer Report and more are available right at your fingertips, for free and on-demand with the CBC TV App for iPad. Whether you missed an episode of your favourite series or want to catch it again, the CBC TV App has you covered – whenever you want and wherever you are.

NFB Films for iPad
Description: As featured in a nation-wide marketing campaign by Apple, the NFB Films app allows you to watch over 1000 movies - documentaries, animations and feature films - free on your iPad.

Food Network Canada Recipes
Description: Get your next great meal idea on the go with Food Network Canada. Find thousands of recipes, share recipes with friends, save your favourites, create grocery lists and watch how-to video tips from Food Network chefs.

CTV News
Get the latest breaking news from around the world, across Canada and in your city.

GlobalTV App
Watch full-length episodes and clips for all your favourite Global shows like House, Survivor, Hawaii Five-0 and more!

CityTV Video
Catch all of the great Citytv shows FREE on your iPad including Modern Family, Biggest Loser, Cougar Town, 30 Rock and more. Missed an episode? Citytv has you covered with full episodes and a long list of video extras including clips, interviews, webisodes and more.

Weather Eye by The Weather Network App
Description: WeatherEye provides FREE detailed current, hourly, short and long term weather information with severe weather alerts and Satellite / Radar maps. Users can submit photos to The Weather Network for display on TV and online.

National Post Mobile; Globe and Mail Mobile; Montreal Gazette, Toronto Star Mobile, CBC News App (plus many other urban and provincial newspapers). Included in this scan because all are multimedia apps delivering live stream of content updated throughout the day, including significant amount of podcast and video content. Socially integrated with Facebook, Twitter, Foursquare and the like.

The purpose of providing this app roundup is to visualize the migration and extension of traditional broadcast and media channels and organizations onto mobile devices (smartphones and tablets). Clearly there is a regulatory opportunity here for the CRTC to get out in front of these convergent developments.

Kids and Apps

"Children are using these services more and more, opening themselves up to more information disclosures. And there's more and more mobile services directed to children, as well." ~ Andrew Serwin, lawyer and child-safety advocate, cited in USA Today[90]

[90] Byron Acohido, Apps, social networks pose new threat to kids. USA TODAY September 6, 2011. Online: http://www.usatoday.com/money/media/story/2011-09-06/Apps-social-networks-pose-new-threat-to-kids/50287992/1

As the number of games and books for young smartphone, iPod Touch, and tablet users increases, there is a growing sensitivity to apps designed for kids, and regulators are beginning to design policies, guidelines, legislation and strategies to guide third party developers, at least in the US. In August 2011 The U.S. Federal Trade Commission fined Broken Thumbs Apps, a maker of apps for kids $50,000 (later settled for $30,000) for violating the Children's Online Privacy Protection Act by illegally collecting email address information from children younger than 13. In the case, which was the first time that COPPA has been used against an app, the FTC indicated that the same rules apply on websites and mobile apps, where protecting children is concerned.[91] To that end, in the summer of 2011 the FTC fined Playdom (A division of Disney) $3 million for operating online game sites for kid that illegally collected and exposed personal information from over 800,000 children -- in violation of COPPA regulations.[92] This past spring, US legislators introduced the "Do Not Track Kids Act of 2011," part of a proposed amendment to the Children's Online Privacy Protection Act (COPPA). As part of this bill, mobile devices and software (apps) would be prohibited from collecting, storing, or transmitting unique identifiers such as IP addresses or geolocation data from minors.[93]

Currently, the FTC "has a number of investigations ongoing in the mobile space, including apps aimed at children [...] looking for good enforcement targets in this space," said David Vladeck, director of the FTC's bureau of consumer protection.[94] It may be instructive to investigate the new self-regulatory measures and guidelines recently adopted by alcohol brands advertising on social networking sites, designed to encourage socially responsible messaging and restrict access to prevent entry by minors.

Currently the FCC is investigating Apple after a number of very young children managed to wrack up enormous bills for unauthorized and unsupervised e-commerce and mobile (in-app) purchases. When the Washington Post reported[95] on grade school mobile shoppers, one who inadvertently spent $1,400 on virtual clothes to dress up her iPad Smurfs' Village game characters, another who spent $150 for a bucket of stars and snowflakes to decorate her Tap Zoo safari, parents and public interest groups took note. What came to light in the backlash that followed this media attention is that Apple allows for a 15 minute purchasing period after an initial buy-in, during which time there is no

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[91] Joe Mullin, FTC Busts App Maker For Collecting Kids' E-mail Addresses. Aug 15, 2011. Online: http://paidcontent.org/article/419-ftc-busts-app-maker-for-collecting-kids-e-mail-addresses/

[92] Joe Mullin, Playdom Settles FTC Charges It Mishandled Childrens' Private Info May 12, 2011. Online: http://paidcontent.org/article/419-playdom-settles-ftc-charges-it-mishandled-childrens-private-info/

[93] Craig Hoffman Mobile App and Geolocation Data Roundup May 25, 2011 Online: http://www.dataprivacymonitor.com/mobile-privacy/mobile-app-and-geolocation-data-roundup/

[94] Eric Engleman and Adam Satariano, Bloomberg. Lawmakers Aim Mobile Privacy Push at Apple, Google, Facebook. May 19, 2011 Online: http://www.businessweek.com/news/2011-05-19/lawmakers-aim-mobile-privacy-push-at-apple-google-facebook.html

[95] Cecilia Kang In-app purchases in iPad, iPhone, iPod kids' games touch off parental firestorm. The Washington Post. February 8, 2011 Online: http://www.washingtonpost.com/wp-dyn/content/article/2011/02/07/AR2011020706073_2.html?sid=ST2011020706437

password prompt. As the Washington Post reported, this was enough of a window of opportunity to allow two excited and digitally skilled youngsters to spend $52 on extra special fish for their Dolphin Play game. (Ibid.)

In response to the first signs of a major crackdown on apps targeting kids, some web and mobile app developers have designed popups and disclaimers to clearly warn users about real world costs associated with online and mobile gameplay and related activities. As the FCC progresses in its investigation of Apple (iTunes) and Google (Android) app store policies, there is an opportunity for concurrent local interventions and regulatory management that seeks to establish a consistent approach to ensuring children's privacy is protected-by-design, courtesy of guidelines and conditions for software programmers and mobile developers.[96] At the same time, this is an opportunity to develop a transparent and harmonized approach to consumer redress for the next Canadian family whose toddler buys hundreds of dollars worth of pixelated pets.

Relevance to Policy Makers

> "Currently, it is not common practice to include a privacy policy when a user first launches or downloads a mobile app---but it should be." ~ Isaac Mosquera, mobile app developer[97]

Beyond safeguards for children (and parents) connected to mobile commerce, there are several other important issues arising from these trends in the proliferation of smartphone apps that have relevance for regulators. Chief among them is the concept of mobile privacy and mobile data security. With more mobile phone use, concerns about mobile privacy proliferate. In 2011 Nielsen public opinion polling confirmed that more than half of mobile phone users confess to having some privacy concerns related to their mobile apps.[98] Even when information is collected from consumers on an opt-in basis, if the terms of service are difficult to read and understand, then it is not easy for users to make truly good and informed choices. "Everybody complains that no one reads privacy policies and that privacy policies are too long and too difficult," observed said Jim Brock, a software

[96] Alysa Hutnik, Why Your App Must Comply With Child Privacy Regulations. 18 August 2011 Huffington Post. Onlne: http://mashable.com/2011/08/18/app-children-privacy-ftc/
[97] Isaac Mosquera, Why mobile apps need to have privacy policies. VentureBeat. August 27, 2011 Online: http://venturebeat.com/2011/08/27/why-mobile-apps-need-to-have-privacy-policies
[98] Audrey Watters Nielsen: U.S. Smartphone Users Concerned About Privacy and Location Data. ReadWriteWeb April 21, 2011 Online: http://www.readwriteweb.com/archives/nielsen_us_smartphone_users_concerned_about_privac.php

designer interviewed by The New York Times.[99] If the terms of service are not optimized for small screens "the policies can become almost useless to the average consumer," concludes Times reporter Tanzina Vega (Ibid).

In addition, the security of mobile data itself is a concern, especially considering how much personal information users store in their mobile devices. Smartphones are widely regarded as the most personal of all digital devices, and public opinion polls show that for many consumers, it would be more detrimental to their well-being to lose their phone than their wallet.[100] This may be a moot point as trends point toward the development of near field communications technology and mobile payments, such that the mobile phone is fast becoming a swipe-to-pay digital wallet.[101]

This concentration of sensitive information is compounded as users download more apps, since many of them prompt users to enter even more sensitive financial and identifying information, usually including passwords, account numbers, location, addresses and phone numbers, access to other social networking accounts, birth or maiden names, pet's names, and/or access to their list of friends.

According to Bloomberg BusinessWeek, U.S. lawmakers are considering legislation aimed at protecting consumers' online privacy, they believe the app market needs to be regulated to prevent inappropriate sharing of user data. "The mobile marketplace is so new and technology is moving so quickly that many consumers do not understand the privacy implications of their actions," said US Senator Jay Rockefeller, who chairs the US Senate Commerce Committee[87]

To address the risks associated with this information density, and to make apps more transparent to downloaders, in the U.S. there is a proposed set of standardized in-app icons to make clear what is being collected, stored, and shared, when, and with who (Figure 10).

[99] Tanzina Vega, Industry Tries to Streamline Privacy Policies for Mobile Users. The New York Times. August 14, 2011. Online: http://www.nytimes.com/2011/08/15/business/media/industry-tinkers-to-create-privacy-tools-for-mobile-devices.html
[100] Garnet Roach Third of Brits would rather lose their wallet than their phone. 22/08/2011 Online: http://www.mobilechoices.co.uk/news/third-of-brits-would-rather-lose-their-wallet-than-their-phone-220811.html Also see Lexton Snol. 40% Would Rather Lose Wallet Than Mobile Phone. June 12, 2009 Online: http://www.cio.com/article/494931/40_Would_Rather_Lose_Wallet_Than_Mobile_Phone
[101] For more information see Amy Lee, Visa's Digital Wallet For Phones, Online Buying Aims To Simplify Mobile Pay. Huffington Post. May 11, 2011 Online: http://www.huffingtonpost.com/2011/05/11/visas-digital-wallet-mobile-pay_n_860789.html

Figure 10: Prototype of universally mobile privacy icons
Source: Mozilla Firefox (Aza Raskin)

Figure 10 : Modèles d'icônes de confidentialité universels destines à la téléphonie mobile
Source : Mozilla Firefox (Aza Raskin)

The Google Android Marketplace (app store) already does this, but Apple's iTunes App store does not. Having a set of universal privacy icons for use across the web and in apps would make it more clear to users exactly which permissions are being sought in order to operate an app.[102] Although it is outside the scope of this report, it remains to be seen how Canada's Personal Information Protection and Electronic Documents Act can be addresses the emergent concerns about privacy and mobile apps.

[102] For more see: https://wiki.mozilla.org/Talk:Drumbeat/Challenges/Privacy_Icons

Wi-fi Hotspots and "Evil Twins"

Trend Overview

With many smartphones set to automatically seek out wi-fi hotspots, the threat of what is called "evil twins," or fake hotspots, looms large. Evil twins are designed to steal private data including logins, passwords and account numbers. Any urban centre with numerous wi-fi hotspots is a hotbed of cybercrime, including identity theft according to Norton's Symantec Security.[103] In Canada, Burlington is the number 1 city for this type of crime, whereas Norton ranked Toronto at number 8.[104] "The spread of mobile phones that automatically log on to wi-fi hotspots is a gift to fraudsters," writes journalist Neil Tweedie, because it allows them to easily capture information from devices in the vicinity without the owner having a clue.[105] Security experts warn that wi-fi evil twin hotspots run by fraudsters are indistinguishable from genuine connections, such as for instance, those provided to clients by cafes, airports, train stations and hotels.[106]

Earlier this year investigative journalists from The Guardian newspaper teamed up with white hat hackers in the St. Pancras International train station in London and in tests conducted with volunteers painlessly and quickly gathered usernames, passwords and messages from phones using wi-fi in public places.[107] The investigative reporters concluded that BT, the UK's biggest provider of "Openzone" wireless connections in public spaces, is putting consumers at a considerable risk for identity theft, fraud, and other cybercrimes.

But unsecured networks are not the only problem the Guardian reporters uncovered. After setting up an evil twin hotspot using £49 of hardware and some free software, passersby were invited to "pay" for internet access with a credit card, and to accept terms and conditions which clearly stated "you agree we can do anything we like with your credit card details and personal logins." In spite of this, several participants entered their financial details, which the newspaper promptly deleted after the experiment. (Ibid.)

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[103] The Norton Top 10 Riskiest Online Cities Report Reveals Who's Most Vulnerable to Cybercrime March 22, 2010 Boston.com Online: http://finance.boston.com/boston/news/read?GUID=12390350&Symbol=SYMC
[104] Debra Black. Study says Burlington is Canada's riskiest online city Mar 22 2010. The Toronto Star. Online: http://www.thestar.com/news/gta/article/783266--burlington?bn=1
[105] Neil Tweedie. Just how easy is it to hack into your life? 25 Jun 2011 The Telegraph. Online: http://www.telegraph.co.uk/finance/newsbysector/mediatechnologyandtelecoms/digital-media/8597757/Just-how-easy-is-it-to-hack-into-your-life.html
[106] Ruth Lythe Security experts warn of dangers of surfing the web in public 12th July 2011Online: http://www.thisismoney.co.uk/money/news/article-2014015/Security-experts-warn-dangers-surfing-web-public.html#ixzz1XI7W9icY
[107] Charles Arthur and Steve Boggan, Wi-Fi security flaw for smartphones puts your credit cards at risk The Guardian. Monday 25 April 2011 Online: http://www.guardian.co.uk/technology/2011/apr/25/wifi-security-flaw-smartphones-risk

Relevance to Policy Makers

The Guardian's wi-fi experiment points to the need for consumer education, and a more transparent way to communicate terms of service (which are customarily so confusing and long that many users do not read them). There are other opportunities for positive regulation in this area of wi-fi authenticity. For example, authentication standards could be created within the wi-fi access market---similar to the Verisign keys that we see on websites, to assure users that the wireless network is legitimate.[108] From a different perspective, it is worth nothing that in the U.S., the Food and Drug Administration (FDA) regulates wi-fi on converged networks in medical facilities, in order to safeguard sensitive patient information. In this management model, for those cases where an IT infrastructure handles both medical device and communication data, the FDA has mandated the designation of a risk management facilitator to monitor the security of the network.[109]

In what was widely regarded as a negative and restrictive move, earlier this year China passed regulations requiring cafes, bars, bookstores, and hotels to install $3,000 of wi-fi monitoring software. Although described by Chinese officials as a measure to increase securing on wireless networks, critics suggested the government's decision was in fact "just an effort to control the flow of information."[110]

[108] Beware of Fake and Free WiFi Hotspots. April 27, 2011 Online: http://www.nomadz.net/2011/04/beware-of-fake-and-free-wifi-hotspots/2013

[109] Lucas Mearian FDA eyes regulation of wireless networks at clinics, hospitals. January 10, 2011. computerworld. Online: http://www.computerworld.com/s/article/9203761/

[110] Andrew Jacobs China Steps Up Web Monitoring, Driving Many Wi-Fi Users Away
The New York Times. July 25, 2011 Online: http://www.nytimes.com/2011/07/26/world/asia/26china.html?_r=3

Connected Travel

Trend Overview

Data from the tourism industry shows that more consumers are accessing lodging and transformation information while on the go. Travelocity has seen a 400-500% annual increase in clients accessing their site's services via mobile phones and tablets.[111] Likewise, Expedia (which owns Hotels.com, TripAdvisor and HotWire) reports mobile site usage indicated that most bookings are for same-stay or next-stay services---evidence of mobile commerce trends by travelers already on-the-go. Expedia's smartphone apps are downloaded an average of 36 times per minute.[112]

Although many smartphone owners eagerly download free travel apps, it's the international roaming and mobile data use charges they get slapped with upon arriving home that ruins the novelty of handheld use for many connected travelers. Accustomed to ubiquitous connectivity, when traveling mobile surfers are uninformed about roaming rates or app data usage fees the resulting surprise billings are so astronomical they warrant mainstream media attention.[113] This points to the need for public education about out-of-country mobile data use, more transparency with billing, and perhaps even caps on the fees network operators can charge.

"Bill Shock": Regulatory Opportunities

Certainly the high cost of mobile international data use is a concern for many countries and regulatory bodies. In some instances, price caps have been put in place. The EU did this on both the retail and the wholesale markets, in order to encourage mobile media use by setting reasonable pricing.[114] Likewise, the Arab regulatory network is working on a similar solution to cover the Arab region. (Ibid)

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[111] Jeff Hasen The Latest Plethora of Mobile Data Means What? iMedia Connection. August 22nd, 2011 Online: http://blogs.imediaconnection.com/blog/2011/08/22/the-latest-plethora-of-mobile-data-means-what/
[112] John Cook, Expedia's mobile app downloads soar as revenue tops $1 billion July 28, 2011 GeekWire. Online http://www.geekwire.com/2011/expedias-mobile-app-usage-soars-company-tops-1b-revenue
[113] Howard Solomon Samsung Canada learns to avoid $100,000 wireless bill shock. 24 Aug 2011. Network World Canada. Online: http://www.itworldcanada.com/news/samsung-canada-learns-to-avoid-wireless-bill-shock/143808 See also: LORI RACKL Beware of 'bill shock' when in roam with iPhone, smartphone. July 27, 2011. Chicago Sun-Times. Online: http://heraldnews.suntimes.com/business/6633523-420/beware-of-bill-shock-when-in-roam-with-iphone-smartphone.html
[114] Morten Falch, Anders Henten and Reza Tadayoni, International roaming: is there a need for EU-regulation beyond 2010? Info. Vol. 11 No. 4 2009, pp. 19-33,

In an effort to encourage mobile media use by travelers, earlier this year China Mobile Communications Corp., the country's biggest wireless carrier, cut international roaming fees by as much as 80 percent---voluntarily and without pressure from regulators.[115] This move was calculated to increase network in response to increased competition from rival operators, and result in "long-term profitability" according to the press release. Similarly, in Canada Rogers implemented a one-rate roaming plan for North American travelers in 2010 such that consumers could enjoy more cost certainty, and Telus reduced its international roaming voice and data rates by up to 60 percent in the summer of 2011.[116]

In 2010 the U.S Sen. Tom Udall introduced the Cell Phone Bill Shock Act, which was similar to recommendations proposed by the U.S. Federal Communications Commission in October 2010. That requires require cellphone companies to inform customers when they have used 80% of their voice minutes, text messages or data use.[117] The FCC published a white paper in 2010, in which it stated that the consumer bureau had received 764 complaints on bill shock during the first six months of the year, and projected to receive upward of 1,500 complains about mobile roaming data overcharges and bill shock complaints in 2010.[118]

To assist mobile travelers "in avoiding situations in which users incur a several-thousand-dollar bill when returning from foreign travel," the U.S. Organization for Economic Co-operation and Development recently completed a comparative report. The OECD compared mobile roaming data usage plans from 34 countries in Europe, Asia and North America. Results showed that North American mobile travelers pay the highest rates for data across the globe, with Canadians at the very top of the list (average fee of $24.61 per 1MB of data) and Americans in second place ($22.06/MB).[119] For comparison, the lowest international roaming rates on average were for travelers from Greece, Iceland and Luxembourg ($4/1MB).

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[115] China Mobile Reduces Roaming Fees by Up to 80% to Boost Usage. Online: http://www.bloomberg.com/news/2011-08-01/china-mobile-cuts-international-roaming-fees-from-today.html

[116] John Connors. Rogers One Rate roaming plans "shatter people's perception" February 23, 2010 Mobile Syrup. Online: http://mobilesyrup.com/2010/02/23/rogers-new-one-rate-roaming-plans-shatter-peoples-perception-of-wireless-data-roaming/ Also see Gordon Hamilton, Telus roaming rates cut in bid to end 'bill shock' Vancouver Sun June 14, 2011 Online: http://www.vancouversun.com/business/Telus+roaming+rates+bill+shock/4942116/story.html

[117] As of Fall 2011 this bill has not been passed. Hayley Tsukayama Sen. Udall reintroduces measure to curb cellphone 'bill shock'. The Washington Post. 04/05/2011 Online: http://www.washingtonpost.com/blogs/post-tech/post/sen-udall-reintroduces-measure-to-curb-cellphone-bill-shock/2011/04/05/AFfOyVkC_blog.html

[118] Cecilia Kang, FCC votes to explore cellphone bill-shock proposal. The Washington Post. October 14, 2010. Online: http://voices.washingtonpost.com/posttech/2010/10/fcc_votes_to_explore_cell_phon.html

[119] Hayley Tsukayama Economic group urges rules to cut international bill shock. The Washington Post. 06/08/2011 Online: http://www.washingtonpost.com/blogs/post-tech/post/economic-group-pushes-rule-to-cut-international-bill-shock/2011/06/08/AGpUNvLH_blog.html

Geolocation

> "Devices are collecting data about us and potentially sharing it with others. This is the future. We have to figure out how to deal with it."~ Tim O'Reilly[120]

Trend Overview

Location is widely considered to be at the centre of mobile technology innovation--- "a fundamental enabler of new mobile services."[121] Adding a layer of geodata to a mobile app, website, marketing campaign or social network enhances digital experiences and shapes the flow of information.

While fewer than 5% of mobile phone owners are members of geosocial networks like Gowalla and Foursquare, a far greater percentage of smartphone users opt-in to Groupon's daily local deals and utilize Google Maps. In order to provide georelevant data in real-time, both Groupon and Google Latitude collect and store users' personal data including their location. A 2010 study by JiWire, which analyzes audiences through wi-fi hotspots, found that 89% of users said they would turn to location based services over the holiday shopping season to find store locations, get product descriptions and reviews, check product inventory at local stores, and to access deals and promotions.[122] "Phones know where you are, and they need to for many of the services we offer," said Mike Nelson, a Google spokesman.[123]

In a scandal earlier this year dubbed "locationgate" it was revealed that Apple's iPhones were also recording, storing and transmitting GPS data to Apple (albeit anonymized and encrypted).[124] In response, Korea's regulator immediately levied a fine against Apple for tracking users without making them aware of it.[125] As locationgate unfolded, Google and

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[120] Cited in Nick Bilton. Tracking File Found in iPhones April 20, 2011 New York Times. Online: http://www.nytimes.com/2011/04/21/business/21data.html
[121] Phil Hendrix, Location: The Epicenter of Mobile Innovation. GigaOM. February 9, 2010. Online: http://pro.gigaom.com/2010/02/location-the-epicenter-of-mobile-innovation/
[122] Brian Quinton ,Local Mobile Ads Drive Mobile Shopping: JiWire Study Feb 14, 2011 Online: http://chiefmarketer.com/mobile/news/lcoal-mobile-ads-drive-shopping-0214/
[123] Miguel Helft, Google Says It Collects Location Data on Phones for Location Services. New York Times. April 22, 2011 Online: http://bits.blogs.nytimes.com/2011/04/22/google-says-it-collects-location-data-on-phones-for-location-services/
[124] For more information about the locationgate controversy, see Brian X. Chen, iPhone Tracks Your Every Move, and There's a Map for That, Wired. April 20, 2011 Online: http://www.wired.com/gadgetlab/2011/04/iphone-tracks/
[125] Korean regulator fines Apple $2,800 over iPhone location tracking controversy Online: http://2dayblog.com/2011/08/04/korean-regulator-fines-apple-2800-over-iphone-location-tracking-controversy/

Microsoft both took measures to restrict their own practices of wi-fi geolocational and position tracking.[126]

As geosocially-connected online networking and mobile couponing gains momentum, concerns about location privacy will escalate as well. While some marketing experts like Tim O'Reilly think location tracking is inevitable, politicians are more concerned, for example, U.S. Congressman Joe Barton has commented that,

> It is vitally important that businesses with online models keep the protection of consumers' data at the top of their list and leave no room for assumptions. Everyone involved in the online industry should take responsibility and be held accountable for the use of consumer data.[127]

In the summer of 2011, two more Do Not Track type bills were introduced in U.S. Congress, including The Location Privacy Protection Act of 2011, specifically designed to prevent the abuse of location data collected by electronic devices. "I think it's great that GPS and tracking technology exists," said Congressman Jason Chaffetz, who drafted the second bill, the Geolocation Privacy and Surveillance Act (GPS), however "what isn't great is the idea that this technology can be used to track somebody without their knowledge."[128]

The practice of tracking and tracing geodata without permission or the ability to opt-out obviously doesn't sit well with most consumers. In 2011, The Nielsen Company's public opinion polling found that more than half of those consumers who download apps to their smartphones are concerned about sharing personal information.[129] "Despite the growing popularity of check-in services in the U.S.," Nielsen analysts observed, "there are still many who are reticent to share information about their geographic location." (Ibid.) However this does not mean they are not willing to trade personal information for promotions, deals, and other mobile marketing offers. Membership on Foursquare geosocial networking skyrocketed after the platform was popularized as not just a game, but a mobile couponing site (Figure 11). Public opinion polls show that upwards the majority of smartphone-wielding consumers are interested in receiving mobile coupons. A survey by eMarketer in 2011 indicated that one in five adult mobile consumers will redeem a mobile coupon---that's an increase of 118% year over year. (Ibid.)

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[126] Peter Bright, Microsoft locks down Wi-Fi geolocation service after privacy concerns, arstechnica Online: http://arstechnica.com/microsoft/news/2011/08/microsoft-locks-down-wi-fi-location-service-after-privacy-concerns.ars
[127] Chloe Albanesius, Groupon Talks Privacy, Always-On Location Tracking. PC Magazine. August 19, 2011. Online: http://www.pcmag.com/article2/0,2817,2391391,00.asp
[128] Josh Smith, Congress to Device Makers: Don't Track Me, Bro. June 15, 2011. The National Journal. Online: http://www.nationaljournal.com/daily/congress-to-device-makers-don-t-track-me-bro-20110615
[129] Privacy Please! U.S. Smartphone App Users Concerned with Privacy When it Comes to Location. April 21, 2011 Online: http://blog.nielsen.com/nielsenwire/online_mobile/privacy-please-u-s-smartphone-app-users-concerned-with-privacy-when-it-comes-to-location/

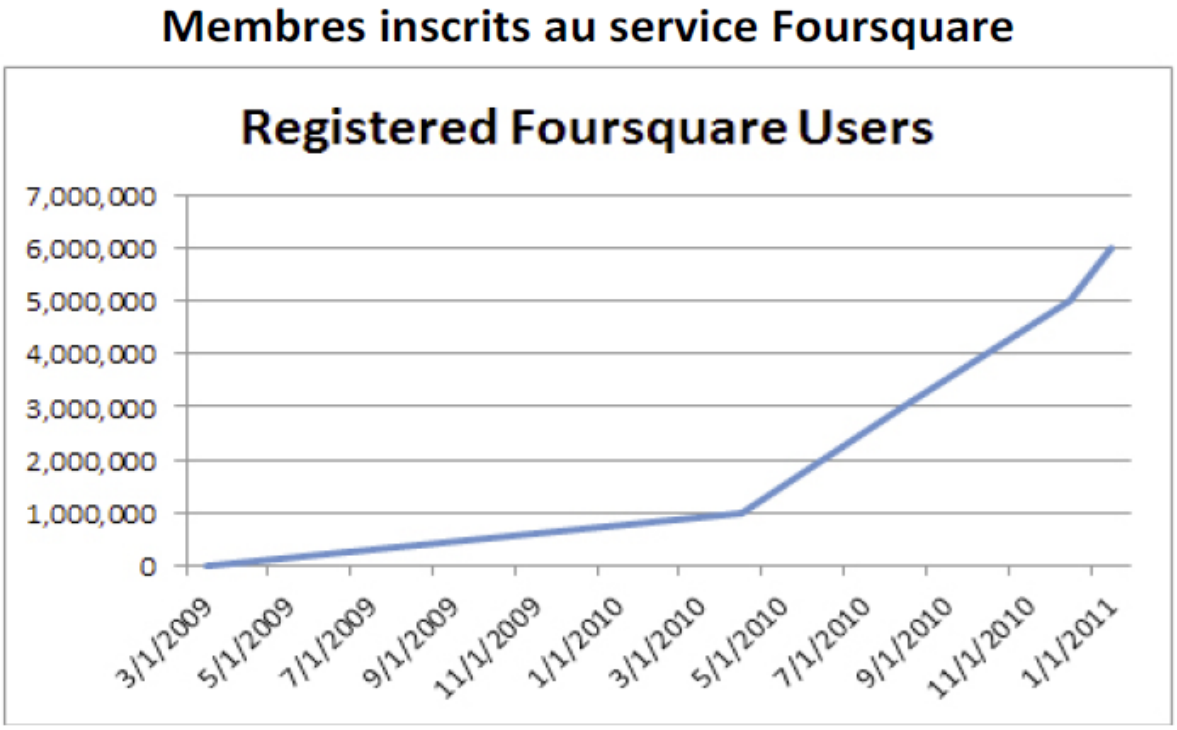

Figure 11: Popularity of geosocial networking.
Source: New York Observer, 2011

Figure 11 : Popularité du réseautage géosocial.
Source : New York Observer, 2011

Relevance to Policy Makers

Smartphones, apps and geosociality are all new technologies, concepts and services for the mainstream market. This is an opportunity for what The New York Times called a dynamic and adaptive "rules and tools" regulatory approach, combining policy and penalties with soft measures. "Getting this balance right is critical to the future of the Web, to foster innovation and economic growth," said Daniel J. Weitzner, a senior policy official at the National Telecommunications and Information Administration of the Commerce Department.[130]

It is worth noting that collecting geodata is not illegal, but at stake is whether the practice is explicitly stated in the terms of service and user agreements from Apple and other device and software manufacturers. "Apple constantly changes their privacy policy, and it's questionable whether most users are aware this is happening," Christina Gagnier, a lawyer

[130] Daniel J. Weitzner cited in Steve Lohr, Redrawing the Route to Online Privacy The New York Times. February 27, 2010 Online: http://www.nytimes.com/2010/02/28/technology/internet/28unbox.html

specializing in privacy and copyright, told The New York Times. Apple has an obligation to its customers to allow them to opt out of being tracked, said Ian Glazer of Gartner Research. "There is no way to really turn this tracking off," Glazer said, "It needs to be visually obvious, or in the settings, to see that this is happening on your phone."[131] To that end, the universal icon designs for in-app permissions and privacy settings (introduced earlier in this report) would be useful.

There's a need for increasingly simplified and fair contracts and privacy agreements between on-the-go users and location-based services. As it now stands, terms of service are rarely read, are often confusing and can't hope to capture the complexity of modern data-handling practices," privacy experts say.[132] Educating mobile consumers to make informed choices about disclosing personal info and geodata could involve sending what researchers at Carnegie Mellon University called "privacy nudges." These nags could take innumerable forms, including designing software that pushes real-time reminders on-screen, to notify users that "the information you're about to send has privacy implications." (Ibid.)

[131] Nick Bilton, Tracking File Found in iPhones, The New York Times. April 20, 2011. Online: http://www.nytimes.com/2011/04/21/business/21data.html
[132] Steve Lohr, Redrawing the Route to Online Privacy. The New York Times. February 27, 2010. Online: http://www.nytimes.com/2010/02/28/technology/internet/28unbox.html

Data Portability

> "Nine out of 10 Americans want the right to force websites and advertising companies to delete all stored information about them. And for U.S. digital natives the figure is 84%." ~ Viktor Mayer-Schönberger, author of Delete: The Virtue of Forgetting in the Digital Age

Trend Overview

At the heart of the digital portability issue is a question: should users have ultimate control over their profiles, photos, and personal data posted online, such that they can delete their online presence? If so, historically Facebook has not been in compliance, as it is well-known for making it difficult for members to remove data (such as photographs), export their information (including friend list), backup or delete their online profile altogether. In 2010 Facebook enabled data backup and export, that is if users can find the correct page to do so, buried as it is in the labyrinth of privacy and profile configuration options on that site.

So too is Google well known for making personal data management and liberation extremely difficult. In 2010 within two weeks of unveiling the Google Buzz social network app the company faced complaints from Electronic Privacy Information Center (EPIC) and The Office of the Privacy Commissioner of Canada, concerning how it was handling individual users' privacy.[133] Google pulled the plug on Buzz a year after launching it because of user pushback regarding personal data security and due to a lack of mainstream adoption.

Google is currently in court fighting the data liberation battle on another front. The company has faced numerous lawsuits regarding removal of personal information and deleting stored Google Street View photographs, in Germany, Switzerland, the UK, and Czech Republic. In August 2011 Spain ordered Google to stop indexing information about 90 citizens who filed formal complaints with its Data Protection Agency. In 2010 Canada was ranked as number 13 on a list of countries that made requests for Google to remove

[133] Matt Hartley, Privacy Commissioner's office looking into Google Buzz privacy concerns. National Post. February 17, 2010 Online: http://network.nationalpost.com/np/blogs/fpposted/archive/2010/02/17/fp-tech-desk-privacy-commissioner-s-office-looking-into-google-buzz-privacy-concerns.aspx#ixzz1XJvKYnkj

information about individuals.[134] According to Google's 2011 Transparency Report, Brazil had the highest number of content removal requests (260 in total) between July and December 2010, and South Korea, Libya, Germany and India were also very high on the list. (Ibid)

Perhaps in response to these numerous complaints about user rights over personal information, Google just launched a new app called "Takeout" for the new social network Google+, making it easy for users to download a local copy of their data. Significantly Takeout does not allow consumers freedom to access, change, delete or block their data from public view or Google search engine results. However it is a step in the direction of developing open data portability standards in which users would have the ability to export, import, and backup their data on-demand.

Conventionally linked to issues of control over personal information, the topic of data portability and liberation is growing in importance as a tool for online impression management.

> "Seventy percent of U.S. recruiters report that they have rejected candidates because of information found online, like photos and discussion-board conversations and membership in controversial groups." ~Jeffrey Rosen, The New York Times[135]

As hiring and selection committees, law enforcement, and ordinary people curious about their friends and romantic partners, turn to web search tools to investigate others' online identity, "poster's regret" and concerns about being able to bury traces of one's digital past loom large (Figure 12).

[134] Beatrice Fantoni, Canada 13th among countries asking Google to remove online content. The Ottawa Citizen. July 8, 2011 Online: http://www.ottawacitizen.com/technology/Canada+13th+among+countries+asking+Google+remove+online+content/5074508/story.html

[135] Jeffrey Rosen, The Web Means the End of Forgetting. The New York Times. July 21, 2010. Online: http://www.nytimes.com/2010/07/25/magazine/25privacy-t2.html

Figure 12 : Regrets éprouvés par ceux qui ont affiché des propos personnels et nécessité d'un bouton d'effacement.
Source : Retrevo 2011

Figure 12: Poster's regret and the need for an eraser button.
Source: Retrevo 2011

Regulatory Opportunities

"I cannot accept that individuals have no say over their data once it has been launched into cyberspace." ~Viviane Reding, Justice Commissioner, European Union[136]

"Web companies should develop tools that make it easier for young people -- or their parents -- to completely opt out and delete this information." ~ Common Sense Media[137]

[136] Cited in Suzanne Daley, On Its Own, Europe Backs Web Privacy Fights. The New York Times. August 9, 2011. Online: http://www.nytimes.com/2011/08/10/world/europe/10spain.html
[137] Cited in Adam Thierer, The Right to Be Forgotten: Erasing Our Past on the Internet. Forbes. April 17, 2011. Online: http://www.forbes.com/sites/adamthierer/2011/04/17/erasing-our-past-on-the-internet/

This year, like the US, the European Union will also debate recently introduced privacy protection rules regarding consumer rights, but unlike the U.S. the emphasis is not on preventing collection of private data so much as it is about the right for individuals to delete their personal information from the web.[138] Analysts described the EU move as an effort to secure the ability for individuals to be "forgotten" online. This regulation would place the onus on data controllers to prove they need to keep the collected data, and would strengthen individuals' right to have information deleted.[139] In effect this would accomplish what Reding called "privacy by default." (Ibid) The EU information privacy proposals go even further however, allowing for new penalties including financial sanctions and the ability for consumer rights groups to sue Facebook or Google for violations of data protection and portability standards.

Back in North America, a bill was introduced in 2011 by U.S. Senators John Kerry and John McCain that would mandate "data minimization" by website operators, and could provide an opening for broader regulation.[140] When lawmakers and regulators design policies like these to help ensure that web users have the right to liberate their data from a website or digital archive, the news is received very positively by consumers and consumer rights advocates.[141]

In fact, a recent study by University of California researchers found that 88% of web users want to have access to information stored about them online, with the option to remove it---and the percentage in favor of data liberation options was constant from the youngest (teens and twenty-somethings) to the oldest users (over 65) surveyed.[142] Similarly, public opinion polling by the European Union uncovered similar sentiments. In fact 75% of Europeans surveyed expressed concern about web companies using their personal data, and they "wanted the right to delete personal data at any time." Moreover 90% of respondents wanted the EU to take action on the data liberation and online privacy issue.[143]

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[138] Suzanne Daley, On Its Own, Europe Backs Web Privacy Fights. The New York Times. August 9, 2011. Online: http://www.nytimes.com/2011/08/10/world/europe/10spain.html
[139] John Oates, Police, Google and Facebook warned on data protection. The Register. 17th March 2011 Online: http://www.theregister.co.uk/2011/03/17/data_protection_facebook/
[140] Adam Thierer, The Right to Be Forgotten: Erasing Our Past on the Internet. Forbes. April 17, 2011. Online: http://www.forbes.com/sites/adamthierer/2011/04/17/erasing-our-past-on-the-internet/
[141] See for example, Natasha Singer, Just Give Me the Right to Be Forgotten. The New York Times. August 20, 2011. Online: http://www.nytimes.com/2011/08/21/business/in-personal-data-a-fight-for-the-right-to-be-forgotten.html
[142] Study cited in Jeffrey Rosen, The Web Means the End of Forgetting. New York Times. July 21, 2010. Online: http://www.nytimes.com/2010/07/25/magazine/25privacy-t2.html
[143] Suzanne Daley, On Its Own, Europe Backs Web Privacy Fights. The New York Times. August 9, 2011. Online: http://www.nytimes.com/2011/08/10/world/europe/10spain.html

The option to create some kind of Internet "Eraser Button"[144] or similar tool enabling users to declare "reputation bankruptcy," and effectively to wipe their online reputation slates clean and start over, receives widespread approval from users, but two thumbs down from brands and web companies.[145] As a counterpoint however, in the U.S. some oppositional voices have suggested that data liberation measures like the eraser button concept would likely conflict with freedom of speech rights and press freedoms. In the absence of an eraser button, U.S. legislators are engaged in creating consumer data protection and security rules including harmonizing regulations for reporting data breeches of consumer information, such as the events at Sony and Epilson in 2011 when hundreds of thousands of client files containing personal and financial information were publicly exposed by hackers. Data portability and data protection are complimentary regulatory measures.

Because of the connection between personal information portability and online reputation management, it is worth noting that the FCC is currently involved in mandating rules for educating children about responsible social media and web use including cyber-bullying. The 2010 death of Rutgers University student Tyler Clementi, who committed suicide after his roommate live-streamed a webcam showing his sexual involvement with another male, was just one in a string of teen suicides in response to taunting on MySpace and Facebook. A wave of media and public pressure on government to intervene in the cyber-bullying trend resulted in the FCC using its regulations in line with the Protecting Children in the 21st Century Act to order all schools receiving funds from the E-rate program, which subsidizes school Internet access, to address cyber-bullying.[146] At the same time (2010) in order to extend its education agenda the FCC also funded a pilot program for the development of mobile learning devices--to encourage young people to acquire digital and social media literacy skills (Ibid.)

Relatedly, in terms of soft(er) measures and social policies, in the EU *The Safer Internet Programme* contains a variety of "privacy nudges" designed to prompt people to think twice before sharing sensitive photos or information in the first place.[147] This is similar in theme and tone to the research being carried out at Carnegie Mellon previously reviewed in this document in the section on geolocation.

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[144] Adam Thierer, The Right to Be Forgotten: Erasing Our Past on the Internet. Forbes. April 17, 2011. Online: http://www.forbes.com/sites/adamthierer/2011/04/17/erasing-our-past-on-the-internet/

[145] Jeffrey Rosen, The Web Means the End of Forgetting. New York Times. July 21, 2010. Online: http://www.nytimes.com/2010/07/25/magazine/25privacy-t2.html

[146] Jasmin Melvin, Regulator taking on cyberbullying in schools. Oct 29, 2010 Reuters. Online: http://www.reuters.com/article/2010/10/29/us-fcc-schools-internet-idUSTRE69S33T20101029

[147] For more information on The Safer Internet Programme see http://ec.europa.eu/information_society/activities/sip/index_en.htm

Behavioral Tracking

Trend Overview

As the many varieties of Do Not Track bills from the U.S. (reviewed previously in this scan) make clear, practices of data tracking and information storage by media, broadcasting and telecommunications companies can operate as consumer surveillance techniques. For example, facial recognition technologies such as those used by Google Maps and Facebook are on the radar of regulators in several jurisdictions. For example, in the UK the Information Commissioner's Office and in Germany, the Hamburg's Data Protection Authority (DPA) requested that Facebook disable its automatic photo-tagging software, called "suggested automated tagging" because the practice amounts to unauthorized collection of data on individuals.[148] If Facebook did not comply, under German law the regulator could levy a fine of up to 300,000 Euros ($429,000). Soon after, Google settled with the DPA, through negotiating a 13-point administration agreement that met the regulators' concerns over how the company retains data and how thoroughly it obscures people's faces.[149]

In 2010 Google "apologized to privacy officials around the world,"[150] and faced financial penalties after it collected private data from unencrypted Wi-Fi routers as part of its Google Street View project. That project was later discontinued after complaints from Privacy Commissioners in Spain and Canada. It was reported that Spain's Data Protection Agency planned to fine Google between €60,000 and €600,000 ($84,000 and $840,000) per offense.[151] However earlier this year when a German woman launched a civil lawsuit against Google, claiming their photos of her and her home were a violation of her privacy, she lost her case.[152] The German court rejected her concerns, on account of the facts that Street View image collection is not illegal, and Google allows people to request that images of their properties be blacked out. This is just one example of many cases around

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[148] Kevin J. O'Brien, Germany Investigating Facebook Tagging Feature, The New York Times. 3 August 2010 Online: http://www.nytimes.com/2011/08/04/technology/germany-investigates-facebook-tagging.html Also see Maija Palmer, Hamberg rejects Facebook Facial Recognition. Financial Times August 2, 2011. Online: http://www.ft.com/intl/cms/s/0/14007238-bd29-11e0-9d5d-00144feabdc0.html#axzz1Tz3H8IrD Also see: Facebook facial recognition tool probed by UK regulator over 'obvious' privacy issues. Daily Mail. 10 June 201. Online: http://www.dailymail.co.uk/sciencetech/article-2002071/Facebook-facial-recognition-probed-UK-regulator-obvious-privacy-issues.html#ixzz1XNWeNu9n

[149] Jeremy Kirk, Berlin court rules Street View doesn't invade privacy. PC World. 23 March, 2011 Online: http://www.pcworld.idg.com.au/article/380627/berlin_court_rules_street_view_doesn_t_invade_privacy

[150] Kevin J. O'Brien, Germany Investigating Facebook Tagging Feature, The New York Times. 3 August 2010 Online: http://www.nytimes.com/2011/08/04/technology/germany-investigates-facebook-tagging.html

[151] Danny Goodwin , Google Stops Street View Data Collection After Canada, Spain Complaints October 20, 2010 Online: http://searchenginewatch.com/article/2050490/Google-Stops-Street-View-Data-Collection-After-Canada-Spain-Complaints

[152] Jeremy Kirk, Google Street View photos are legal, Berlin court rules German woman claimed Google's photo collection violated her privacy. 23 March 2011 Online: http://news.techworld.com/security/3266652/google-street-view-photos-are-legal-berlin-court-rules/

the world where Google has been accused of violating privacy through its photo capturing practices.

From a regulators' point of view, enforcing consumer data protection and security rules is part of the solution, but so too are rules that mandate simplified and fair contracts and privacy agreements, and ensuring that companies to give users a way to opt-out of data tracking measures---as Google did in the case of the Street View project. Getting permission and giving users an "out" are two issues at the heart of the controversy brewing around two U.S. web companies, Flixtser and KissMetrics.

Supercookies and History Stealing

In the case of KissMetrics, research revealed in 2011 that files were being installed on visitors' computers by websites they visited, and those files were capable of re-creating users' profiles, even after people deleted all regular cookies. This, according to researchers at Stanford University and University of California at Berkeley, whose investigation gained international headlines, the attention of the FCC, and inspired class action lawsuits. Thus the term "supercookie" was used in news reportage. Immediately a class action suit was launched, and many of KissMetrics' clients (including Hulu and MSN) said this tracking was inadvertent and they were not aware that KissMetrics was collecting this data from their visitors.[153]

In the case of Flixster, at issue was the practice of history-stealing. Flixster loaded files onto users' computers to peek at people's Web-browsing histories "to see if they previously had visited any of more than 1,500 websites, including ones dealing with fertility problems, menopause and credit repair" said Stanford researcher Jonathan Mayer in The Wall Street Journal.[154]

[153] Jennifer Valentino-DeVries Kissmetrics 'Supercookie' Code Seen on Hundreds of Sites. August 22, 2011, The Wall Street Journal. Online: http://blogs.wsj.com/digits/2011/08/22/supercookie-code-seen-on-hundreds-of-sites/
[154] Cited in Julia Angwin. Latest in Web Tracking: Stealthy 'Supercookies' Wall Street Journal. 18 August 2011. Online: http://online.wsj.com/article/SB10001424053111903480904576508382675931492.html#ixzz1VSzhsXuI

Regulatory Opportunities

Overly aggressive data tracking techniques result in "these breaches of privacy that can have real consequences for real people" to borrow phrasing from U.S. Senator Al Franken, chairman of a new Senate Judiciary subcommittee on privacy and technology.[155] Franken was discussing the case of Sony Pictures Entertainment, which when hacked in 2011 exposed personal information from 77 million customers, including 12,700 credit and debit card numbers (Ibid). Franken's comment can be applied to the consumer surveillance issue as well, since the cases of Flixster and KissMetrics bring to light the need for better security and data protection rules.

Online tracking and data mining is legal, but what is required is greater transparency and the ability to hold companies accountable for data breaches. In the US, Senators John Kerry and John McCain have introduced the Commercial Privacy Bill of Rights Act of 2011, would require companies to adopt specific security rules if they decided to store people's private information (Ibid). More aggressive measures could involve punishing companies when customers' data is exposed through hacking, and fining them when consumers' identifying and financial information is mishandled by partner companies, including advertising agencies and mobile app developers.

[155] Cited in Nick Billton, New Questions as Sony Is Hacked Again. The New York Times. June 8, 2011. Online: http://bits.blogs.nytimes.com/2011/06/08/new-questions-as-sony-is-hacked-again/

Conclusion

> "The traditional reasons for general regulation in telecommunication have mostly become obsolete." ~ M. Geppert, on German Telecommunications Reform[156]

Looking Ahead: Responsive Regulations, Visions and Strategies

Digital media convergence has changed the regulatory process, mandates, and climate in Canada and other jurisdictions. The vertical integration of telecommunications networks, media content services and broadcasters has caught many regulators and industries unaware and underprepared.[157] As each new generation of networked and converged technologies and services develops, it "creates new challenges to be addressed by regulators and competition authorities."[158] This environmental scan has tracked the emergence of new paradigms for converged and adaptive regulation and social policy initiatives that respond to these new technologies, business models, and consumer behaviors.

The challenge is to design systems of governance and regulation that are "highly dynamic, adaptive systems" agile enough to respond to quickly changing conditions in the telecommunications marketplace.[159]

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[156] Geppert Cited in Wernhard Moschel, 2004. Regulation and Deregulation in Telecommunications. European Business Organization Law Review Vol 5: 353-361.
[157] Paul W. J. de Bijl. The Need for a Communications Regulator: A Lesson from the Netherlands. Intereconomics Review of European Economic Policy; January 2011: 21-26
[158] Christian M. Bender, Georg Gotz, and Benjamin Pakula, Effective Competition in Telecommunications, Rail, and Energy Markets. Intereconomics Review of European Economic Policy; January 2011: 4-20.
[159] For more on the concept of adaptive regulation and governance models, see Johannes M. Bauer, Regulation, public policy, and investment in communications infrastructure. Telecommunications Policy. Vol 34 (1/2) February 2010: 65- 79. Abstract online: http://ideas.repec.org/a/eee/telpol/v34yi1-2p65-79.html

Bridging Digital Divides

In a knowledge society, the digital divide---a technology capacity gap separating the gadget-owning information-rich from the unplugged information-poor---is one way to measure inequality.[160]However, having access to computer technology does not automatically confer digital literacy, a situation that is compounded when terms of service agreements are presented in inaccessible formats. Closely related is the issue of accessibility and digital resources, something the CRTC had addressed recently.[161] The European Commission continues to work on harmonizing and facilitating accessible ICT products and services, constructing lists of accessibility requirements and developing on-line toolkits as part of the 2015: Digital Agenda for Europe initiative.[162] Similarly, the International Telecommunication Union (ITU) is busy raising awareness of the need to ensure that mobile and online digital media and gadgets are useable by persons with disabilities, and elderly persons specifically. To create an "all-inclusive information society," the ITU argued that it is integral that all disadvantaged users can be fully engaged.[163]

Governing bodies and regulators have a role to play in promoting digital literacy and encouraging citizens to access and utilize digital information, communications, and technologies.[164] One way to do that is to design, update and reform standards and policies that "promote a high level of trust, security, privacy and consumer protection in ICT services." (Ibid) Increased digital, mobile and social media literacy in Canada will contribute to the co-creation of a diverse and richly connected culture benefiting all members and participants.

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[160] Flora F. Tien and Tse-Tan Fu, 2008. The Correlates of the Digital Divide in Korea, Computers and Education Vol 50: 431-436.
[161] Source: Broadcasting and Telecom Regulatory Policy CRTC 2009-430: Accessibility of telecommunications and broadcasting services in Canada.
[162] For more information about the EC's European Accessibility Requirements for Public Procurement of Products and Services in the ICT Domain (Mandate M 376) see: http://www.mandate376.eu/
[163] For more information of on the ITU's Dynamic Coalition on Accessibility and Disability: http://www.intgovforum.org/cms/dynamic-coalitions/80-accessibility-and-disability also see http://www.itu.int/ITU-D/asp/CMS/Events/2011/DigitalInclusion/index.asp
[164] Rob Frieden. Lessons from Broadband Development in Canada, Japan, Korea and the United States. Telecommunications Policy Vol 29 (2005): 595-613.

Appendix 1: Regulators

Acronyms for regulatory and policy offices, organizations, and bodies cited in this report.

ACMA. Australian Communications and Media Authority
AEPC. Spanish Data Protection Agency
CRTC. Canadian Radio-television and Telecommunications Commission
DPA. Hamburg Data Protection Authority
EPIC. United States. Electronic Privacy Information Center
EC. European Union. The European Commission
FCC. United States. Federal Communications Commission
FDA. United States Food and Drug Administration
FTC. United States Federal Trade Commission
ICO. UK. The Information Commissioner's Office
KCC. South Korea Ministry of Communications and Information
OFCOM. UK. Office of Communications
OPC. Canada. Office of the Privacy Commissioner
OPTA. Netherlands Independent Regulator
PSB. People's Republic of China. Public Security Bureau

Appendix 2: Social Listening Tools

Beyond a standard literature search, this environmental scan was produced with the help of some social listening and trend tracking applications to take advantage of the way that discussions about media convergence unfold online. By monitoring mainstream new coverage and mentions of key concepts on social websites including blogs, it is possible to identify a range of regulatory, legal, and policy issues across jurisdictions.

Social listening is a term used by public relations professionals to describe the activity of tracking and measuring consumer and citizen sentiment about brads, organizations and public figures. It can provide early warning signs of consumer unrest, confusion, resistance or other emerging issues best handled quickly and before reputational damage occurs. For a project like this environmental scan, social listening tools were used to track activities that regulatory bodies in selected jurisdictions are grappling with, in regards to converged, social and mobile media. For example:

> Google News Alerts (free) and Google RSS Feed Reader (free) Description: Results from keyword searches via email or RSS feed. Searches blogs and news.
>
> Social Mention (free) Description: Social Mention tracks blogs, blog comments, Twitter, mainstream news, images, video, and audio. Searches can be saved as an RSS feed.
>
> LexisNexis ($) Description: Indexes news, magazines, academic journals, professional reports and white papers.
>
> Radian6 ($) Description: Monitoring across blogs, forums, news, Twitter, and more. Advance sentiment analysis to help make sense of data.

Listening Station

To build a listening station, RSS feeds from the following sources were added, in addition to news alerts for convergence and regulatory keywords.

comScore	"measuring the digital world...with a powerful combination of behavioral and survey insights."
eMarketer.com	"publishes data, analysis and insights on digital marketing, media and commerce."
Forrester Research	"independent research company that provides pragmatic and forward-thinking advice to global leaders in business and technology."
GigaOM	"online media, events and research for global technology innovators, located at the intersection of business and technology."
Globe and Mail Technology	"technology news, reviews and commentary"
New Media Age UK	"news in new media, digital, internet & interactive from the UK's leading resource for new media professionals"
New York Times Bits Blog	"reports on the technology industry, including start-ups, the Internet, enterprise and gadgets."
Nielsen Company Inc.	"measures activity and engagement at every consumer touchpoint – from TV screens to smartphones, from viral videos to shopping carts."
MediaPost.com	"on-line publishing resource for all advertising media professionals - TV, cable, radio, print, interactive."
Pew Internet	"a nonpartisan, nonprofit "fact tank" that provides information on the issues, attitudes and trends shaping America and the world."

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