

INFORMAL MOBILE ECONOMIES

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The iPhone—the flagship product of the world’s largest media company—is at the core of the global electronics hardware and content distribution industries. With its minimalist design, Apple’s iconic device has been a benchmark for innovation since the first version came onto the market in 2007. The iPhone is famous for other reasons: its success is attributed to its place within a proprietary media “ecosystem” controlled and managed by Apple. This stretches from the music and movies people purchase through iTunes to the closely regulated App Store, where third party software is licensed, taxed, and retailed. The result is a famously easy-to-use end-to-end model for digital consumption. What was once a fragmented array of diverse sources and services has become a unified and contained model, bounded by Apple’s strict licensing, app approval, and digital rights management policies.

The iPhone is also at the center of a parallel media economy that exceeds the boundaries of this carefully regulated ecosystem. Gray markets for iPhone parts and accessories exist everywhere, fuelled by Apple’s strict licensing regime. Unauthorized imports surge in markets where demand is constrained. Counterfeit iPhones of increasing complexity are available from street markets and online retailers around the world. Online reselling of iTunes gift cards and accounts enables users to find ways around Apple’s geographical market segmentation. Jailbreaking of iPhones is common and, according to some tastes, essential. The unauthorized Cydia app store—which offers a diverse array of pirated apps and unapproved software—offers yet more scope for modifying the iPhone against the wishes of its creator.

Such examples demonstrate the scale and depth of what we have called the “informal media economy.”¹ Informality in mobile industries takes different forms. A service or transaction may be informal in the sense that it is *untaxed*, as when a mobile handset is sold under the counter to avoid sales tax or when development or production labor takes place off the books. It may refer to goods and commodities that are *unlicensed*, like fake iPhone accessories, or practices that are *unauthorized*, like iPhone jailbreaking. Alternatively, it may refer to activities that have no reproachable dimension—such as the global market for second-hand handsets—but which are *unmeasured* because they lie outside the circuits of first-sale retail trade. Today’s mobile media industries are characterized by a dynamic push-and-pull between formal and informal activities, and between authorized and unauthorized transactions. How might this tension be explored analytically?

To understand the evolution of mobile media economies, and media economies more generally, it is helpful to have a more developed concept of formality and informality. This chapter outlines such a concept. Our broad argument is that mobile media technologies are transforming the boundaries between established media markets, expanding the reach of both formal and informal trade, but also working *across* the boundaries between the two spheres and connecting them in certain ways. In what follows, we attempt to pin down the specificity of this relationship and thus provide an alternative way of thinking about current controversies in mobile communications, from the politics of openness to illegal content piracy and hardware counterfeiting.

Framing the Informal Economy

To develop a framework for understanding mobile media, we have borrowed from a body of social science scholarship on informal economies that predates the rise of digital media. Although not commonly used in media studies, this diverse body of theory and empirical research provides powerful tools for thinking about mobile media industries.

Research into informal economic activities first emerged in the 1970s, mainly in the disciplines of economic sociology and anthropology, as a way of understanding aspects of social change in rapidly urbanizing societies, particularly in Africa and Latin America. Much of the early work was concerned with employment, and the perceived need for development practitioners to know more about the dynamics of large, youthful workforces in the growing cities of the third world. An influential 1973 study by Keith Hart revealed the extent of off-the-books employment in West Africa, a phenomenon which had received little sustained analysis. Hart coined a new concept, the informal economy, to explain the otherwise mysterious vitality of these urban labor markets.² From this point onwards, research on informal economies evolved rapidly and in multiple directions, linking up with diverse political and academic projects. In the 1980s and 1990s, urban sociologists turned their attention to informal activity in developed rather than developing countries, including the United States and the United Kingdom. Numerous studies of informal work practices and exchange systems appeared.³ At the same time, economists and regulatory theorists experimented with harnessing informality for growth, notably in Peru where a number of controversial reform projects were trialed.⁴

Scholarship of the informal sector has expanded in scope and theoretical sophistication. Informality is now understood not only through the activities of small enterprises but also more broadly in terms of relationships, especially employment relationships. It is no longer regarded as the exclusive province of the developing world, or of the poor; nor is it seen as a residual stage in economic development, a predecessor to more regulated economic relationships. Instead, the informal sector emerges from recent studies as a complex, growing, and permanent element within contemporary capitalist economies as well as transitional and developing countries. The most advanced thinking and research in this area is concerned with understanding how formal and informal systems intersect, interact, and cross-pollinate.⁵ It is within this tradition of analysis and debate that new frameworks for understanding media change can be found.

Informal Economies and Media Industries Research

What is the relevance of this body of scholarship to contemporary debates about mobile media? What can these old conversations reveal about new mutations in high-tech

industries? We see a number of useful parallels between the ideas canvassed in this literature and the current problems explored by scholars of mobile communication.

First, as a dynamic conceptual apparatus, the informal economies model allows us to approach mobile media as an economy of moving parts, spanning both the formal and informal realms, that brings together a diverse array of institutions, from corporations to criminal networks, and arranges them into particular combinations. The emphasis is not on the encounter between a technology and its users but on interactions between different parts of a complex socio-technical-economic system. Changes in the structure and organization of this system—and, by extension, users' quotidian practices and life-worlds—can be analyzed without placing the object itself, the phone, at center stage.

As we noted earlier, although studies of informality now extend deeply into the economic workings of rich countries, the conceptual provenance of this strand of analysis lies in the cities of the developing world. Hence there is a geographical dimension to the scholarship of informality that we believe is particularly apposite to studies of mobile media. The idea of the informal economy was hatched in a region, West Africa, that is now seeing a most remarkable and remarked-upon explosion of mobile usage characterized by the “leapfrog” (fixed-line bypass) effect, and fuelled by a vast, and mostly unregistered, trade in second-hand handsets.⁶ Clearly the informal economy is still vital to an analysis of mobile industries, and thinking about the global diffusion of mobiles in this way inevitably casts current debates about digital divides in a slightly different light.

However, following the arguments of the second wave of informal economies research, it also provides a paradigm for rethinking developments in the fast-moving industries of Northern Europe and the U.S., where informality is increasingly tied up with profit. Indeed, it is remarkable how closely issues that the first wave of informal economies research sought to explore—how corporations, states, and informal institutions interact, how workforces are restructured under the sign of flexibility, how changes in infrastructure shape ground-level practices, how industrial networks and structures get used “against the grain”—overlap with the current concerns of mobile communications researchers, both in northern and southern contexts. Revisiting these older debates and problems allows mobile communications studies to reconnect with longer traditions of thinking about technologies, economies, and social change.

How, in practice, can this approach be used to study mobile media? In our view it is a two-step process. The first step is to *expand our definition* of the range of participants included in conceptual models of media industries to include informal actors and institutions, from users and amateur programmers to pirates and unlicensed infrastructure providers. This brings into view the full spectrum of agents, practices and uses—like the parallel economies of black and gray iPhone-related phenomena described earlier. Analyzing the informal does not necessarily require a whole new frame of reference; indeed, many existing models for media industry analysis—such as value chain analysis and field analysis—can be additively adapted for this purpose with the inclusion of extra elements and variables. Scholars of mobile communications have already made many inroads into this territory, using a range of analytical languages. The task is to apply to these micro-studies a wider comparative frame.

The second step is to *analyze relationships* between elements in this diversified economy, focusing on the transactions, exchanges, and partnerships that take place within and across formal/informal divides. Mobile media has a particularly interesting story to tell here, precisely because it is an unstable combination of formal and informal elements. Mobile communications involve a constellation of heavily capitalized and

regulated players including telcos, major content producers, advertising companies, search companies, and electronics giants, and usually rely also on state-governed regulatory mechanisms, such as spectrum allocation. This is their formal dimension, which has been expertly analyzed by regulatory scholars and political economists.⁷ A diversified model of the mobile media economy includes these formal actors as well as the various institutions and infrastructures outside or at the margins of this system, and it assumes no a priori dominance on the part of formal players; each sector has its affordances, characteristics, and specific organizational forms, from the most ephemeral to the most rigid structures.

Formal–Informal Interactions in Mobile Media

Having provided some background to informal economies research and made a case for its utility in media industries analysis, we now consider in more detail some of the contrasting modes of interaction between the formal and the informal that characterize mobile media economies. It should be stressed there are no clear rules or teleologies here, only broad tendencies in flux. Here are a few examples.

Interdependency

A striking feature of today's mobile media economy is the degree to which informal elements become tied up with strategies of value creation. The fastest-moving parts of the mobile media ecosystem are all about harnessing and integrating the informal energies of customers. The spontaneous restaurant reviews that add value to search software, the user gameplay that adds value to game purchases, the locational check-ins that add value to social networking platforms—such phenomena involve the leveraging of spontaneous communication and expression for profit. This tendency has been well noted in academic research, which is increasingly concerned with the ethical stakes of such leveraging.⁸

One way to think about this phenomenon involves seeing it as the strategic incorporation of informality into mainstream communications business models, resulting in an interdependence between formal and informal activities. (What would Grindr be without user-uploaded photos, or TripAdvisor without user reviews?) In a flexible post-Fordist economy, informality, far from being an “outside” to corporate capitalism, becomes productively integrated into its functioning—as “content” for business models.⁹ Hence we are witnessing a convergence of the formal and informal worlds in organizational terms, with informally produced material playing a vital role in particular areas of mobile media, and especially in apps.¹⁰

There is more to the story, however. As the formal and informal become interdependent, new boundaries emerge to keep them apart. Informal activities can only be assimilated to the point that they are useful and generative; other kinds of informality must be pushed back outside the boundaries of mobile commerce. Consider the case of intellectual property protection. The strategy of record companies, film studios, publishers, and other rights holders has long been to erect clear demarcations between legal and illegal uses, placing rights holders and law enforcement agencies in the unenviable position of having to police these boundaries. Users must then be educated in the discrepant legality of different kinds of access: a paid download from iTunes or Google Play, free streaming of the same track via a YouTube app, free streaming from

an unauthorized video site accessed through a mobile browser, content shared between friends via Bluetooth, and so on. This attempt at demarcation between the formal and informal—“division,” to use Keith Hart’s vocabulary¹¹—is like building a fence on the beach at high tide: apparently random boundaries attempt to give formal shape to a vast and blurry expanse of circulation. Yet large-scale media business requires such regulatory work, which shores up the formal systems of trade that contain the informal. The picture of mobile media economies that emerge from this thought-experiment is of an infinitely recursive *mise-en-abyme* of inter-penetration between the formal and the informal, punctuated by regulatory incursions aimed at keeping the halves separate.

Transformation

As we have seen, mobile media is characterized by systems comprising formal and informal elements. A further issue to consider is the degree to which the relative formality or informality of any one of these systems can change *over time*. Formalization occurs when a system—or key parts of a system—move closer towards a state of effective regulation, monitoring, rationalization, and integration with government. Deformalization occurs in the reverse scenario, when organized and authorized systems become less visible, transparent, and consolidated. To think of media systems in this way is to add a temporal dimension to the analytical schemas outlined earlier, allowing for change and transformation within media companies, sectors, and industries.

Today’s mobile media landscape offers many examples of such transformations. Successful tech start-ups follow a trajectory of formalization, as bedroom app development fuelled by passion matures into a formal enterprise with Silicon Valley headquarters, venture capital, and other hallmarks of private and public accountability. Likewise, the licensing and retailing functions of the App Store work to formalize a market for low-cost or free software: the familiar assortment of games, utilities, and useful accessories. Formalization comes with benefits and trade-offs. In the past, independently-produced software was distributed on websites and File Transfer Protocol (FTP) servers: it was often obscure, hard to find, and the business models supporting it—the “shareware” model, for instance—were very uncertain. The alternatives offered by the mainstream software publishing industry were expensive, and often involved the transfer of intellectual property rights to the publisher. The App Store has reorganized these interactions.

While it has attracted criticism on several fronts,¹² the App Store has reduced the costs of the market for low-end developers, and it has ameliorated some of the challenges they face in finding customers. What was previously a highly fragmented market has become much less so. With formalization has come increased usability, along with control and commercialization. In contrast, other processes follow the reverse trajectory from formality to informality, involving the movement of activities out of regulation and centralized control into the black and gray zones. The migration of gambling services away from relatively regulated spaces (premium-number phone lines, for example) toward browser/app-based gambling illustrates this reverse movement towards digital deformalization.

Certain areas of the mobile economy may exhibit both vectors of transformation simultaneously. Consider the example of cross-platform music players, which have been so central to the popularity of mobile media devices. In the wake of the MP3 and file sharing platforms, widespread music piracy led to a profound deformalization of music markets. The implications of this include not only the oft-noted fall in sales for recorded

music but also a corresponding opening up of the sites and scenes of music listening, as a range of digital devices including mobile phones acquired functionality as personal music players. Having lost crucial intermediary functions, media companies had to find ways to reinsert themselves into a largely informal system. Leading the charge were the new giants of distribution, Apple, Amazon, and Google. Systems such as iTunes Match—a cloud service for music storage that synchronizes users' collections across their multiple devices—aspire towards a partial and tentative reformalization of music markets. Subscribers pay a small annual fee for the service, in return for which they get to keep their pirated MP3s and have them replaced with a high-quality, streamable, licensed copy, accessible on any iPhone or other iTunes-enabled device, and all managed and indexed within the iTunes ecosystem.

Services like Match, and to a lesser extent the mobile streaming services Spotify, Pandora, and Rdio, can be understood in one of two ways, both reflecting a competitive engagement with the informal economy. On the one hand these services involve a tacit recognition of MP3 piracy—an embrace of the informal—while shifting the emphasis away from punitive measures towards a realistic acceptance of the ubiquity of file sharing on personal computers and mobile devices. At the same time they also work to reformalize music markets, as file sharing transactions that were completely outside the sphere of corporate media become partially reintegrated into a commercial content ecology. Tracing the trajectory of mobile music consumption over the last decade thus reveals contradictory tendencies toward formalization and deformalization within a relatively short period of time. No single narrative—of corporate control or user liberation, for example—is enough to explain these dynamics of codependency.

Geography

Having outlined some of the temporal dimensions of informal media economies and their interactions with established industries, let us now consider issues of space and place. The messy and unstable field of mobile media has a geography that in part reflects its mix of formal and informal elements. Studying how these are organized can deepen our understanding of the field.

Consider the example of instant messaging systems. Instant messages are now provided by various social media platforms (Skype, Facebook), websites, dedicated apps (Viber, Line, WeChat, KakaoTalk), and through operating system providers, as in the BlackBerry Message Service (BBM) or Apple's iMessage. These are not routed through the telecommunications network in the same way as short message service (SMS) text messages: instead they are handled by the carrier as Internet data. Instant messages are popular on phones because they enable users to avoid the high prices telecommunications carriers often charge for SMS messages. Some phones may even be used for messaging without a current cellular service plan. Instant messaging applications may also enable users to include a wider range of content than SMS, such as photographs, video, movies, music, or animations.

The network effects generated by messaging systems can have interesting consequences, with some services clearly achieving critical mass in distinct national markets. In South Korea, the cross platform application KakaoTalk sees more than a billion messages pass across its network every day. In South Africa and Indonesia, BlackBerry's messaging system BBM has sustained the company's market share in the face of growing demand for other smartphone systems (in both countries BlackBerry was the

leading smartphone supplier in 2012). BBM is a central feature, as it offers the prospect of free messaging for the life of the handset. Robust encryption means that BBM messages are also difficult for states to monitor, as illustrated by recent controversies about the secrecy of BBM in the U.K., where BBMs were seen as central to the spread of riots through London in 2011, or in the United Arab Emirates, where BlackBerry phones have been banned outright. Laws requiring a domiciled data center are being debated in Indonesia, dubbed in the media a “BlackBerry nation” because of the dominance of the BBM network there.¹³ While the story has played out differently in different nations, the common feature of all direct messaging platforms is that they move messaging capabilities outside the normal channels, and thus move communications partially outside the reach of established techniques of state surveillance.

This movement involves a kind of deformatization, bringing into play new jurisdictional complexities and opacities, and reducing the regulatory power of the state. Yet this deformatization is driven by transnational corporations. On the iPhone, many third party apps offer messaging capabilities, but big social networks such as Facebook and Twitter, together with Apple’s own general-purpose system, dominate the platform. So, while instant messages are informal in terms of their relationship to regulation, in other respects they are features of a more formalized system, because they are integrated into larger, commercially organized information-gathering—whether it is the Apple “ecosystem” driven by hardware or the Facebook “ecosystem” driven by advertising. A new geography of regulation thus emerges, in which the relationship between territory, communication networks, and state control is reorganized.

Conclusion

We hope this discussion has demonstrated the value of an understanding of informal economic activity for the study of mobile media. There are several implications of the argument for wider debates in the field. In the first place, our framework suggests the need to reframe some familiar arguments about how we understand the extraordinary emergence of mobile media, and its economic, social, and cultural consequences. There is a widespread apprehension that mobile media, and the mobile Internet generally, are more commercial, more controlled, and less democratic than the services that were developed in an earlier period for the “desktop Internet” of personal computers and laptops. It’s not difficult to sketch the forces at work: the historical power of telecommunications carriers; the regulated but privatized global political economy of that industry; the “one-way ratchet” of intellectual property law in securing ever more far-reaching rights for content owners; and the costs of wireless infrastructure and licensed spectrum. All these are plausible contributors to a less open, more expensive, and more corporate network. The various “end-to-end” digital media systems of Apple, Google, and Amazon have, from this perspective, simply added media, advertising, and software as new layers of functional control to systems that were already more restrictive than the open Internet.

Such a history is familiar to readers of books such as Jonathan Zittrain’s well-known critique of “tethered media,” where the sterile “locked-down” devices of the new era are compared unfavorably with their “generative” alternatives.¹⁴ The main difficulty with Zittrain’s account is that the exemplary tethered device, the iPhone, sparked a period of innovation in software architecture and application development that was unprecedented in the mobile space, and bears comparison with the dynamism of the early web

or the PC. Jean Burgess has well described the tensions between the putatively “closed” character of the iPhone considered as an appliance as opposed to its generativity as a platform.¹⁵ Of course some devices *are* “tethered,” and some are unduly compromised: BlackBerry’s “Playbook” tablet, which upon release depended on a connection to a BlackBerry phone for access to e-mail, is one of countless egregious examples in the mobile domain. But it turns out that the staged melodrama of the tethered and the generative is not a shortcut to explaining the contemporary history of mobile media—and there are reasons to be just as skeptical about the familiar dialectics of “open” and “proprietary” systems.¹⁶ Instead of revealing special powers of innovation or liberation in any of these unhappy alternatives, the emergence of mobile media illustrates both the productive and problematic aspects of what we would call a formalizing dynamic—the reorganization and re-engineering of fragmented and uncoordinated services, whether these are in web advertising, digital music, or online retail.

The second consequence of our argument follows from the first: if the recent flourishing of mobile media can be framed in terms of a formalization of hitherto fragmented or disorganized services, then informal elements in the media ecology will continue to be significant as well. This is not to discount the significance of the concentration of ownership among those corporations that dominate global digital communications, or the challenge that this concentration presents for public policy. But our approach suggests a complementary overarching narrative. As the anthropology, sociology, and economics of the informal sector shows us, control in this context is always characterized by a certain relativity and contingency. The informal dynamics that have played such a notable role in the broader history of digital media and the Internet continue to exercise a powerful influence in the mobile domain. Informal mobile media continue to emerge, not only in reaction to regulatory or commercial code. Informal innovations derive from users’ adaptations and expectations; the inherently malleable quality of software; the finite resources of governments and businesses; and the inescapably unpredictable nature of technology, business, and creativity. In all cases, the apparently fateful match of the mobile with the formal decouples.

Theories of the informal economy, then, provide an alternative vocabulary through which to track shifts in the mobile media landscape. Thinking about mobile communications in this way explains change in a way that complements, but also departs from, the durable paradigms provided by political economy and business history. The informal doesn’t map directly onto the grassroots or the hegemonic, or open or closed systems, but is rather imbricated in all of them. When we follow this thread through the mobile landscape a different narrative of media transformation emerges, and a different set of futures, in which the largest structures are run through with informality, and the organizational logics of even the most ephemeral practices may be discovered.

Notes

- 1 This chapter draws on concepts we have developed in previous work. For a more detailed discussion of informal economies see Ramon Lobato, *Shadow Economies of Cinema: Mapping Informal Film Distribution* (London: BFI, 2012); Ramon Lobato, Julian Thomas, and Dan Hunter, “Histories of User-Generated Content: Between Formal and Informal Media Economies,” *International Journal of Communication* 5 (2011): 899–914.
- 2 Keith Hart, “Informal Income Opportunities and Urban Employment in Ghana,” *Journal of Modern African Studies* 11, no. 1 (1973): 6–89; see also International Labour Office, *Employment, Incomes and Equality: A Strategy for Increasing Productive Employment in Kenya* (Geneva: ILO, 1972).
- 3 Alejandro Portes, Manuel Castells, and Lauren A. Benton, *The Informal Economy: Studies in Advanced*

- and *Less Developed Countries* (Baltimore, MD: Johns Hopkins University Press, 1989); Louis Ferman, Louise Berndt, and Stuart Henry, eds., *Work Beyond Employment in Advanced Capitalist Countries: Classic and Contemporary Perspectives on the Informal Economy* (Lewiston, ME: E. Mellen Press, 1993); Colin Williams and Jan Windebank, *Informal Employment in Advanced Economies: Implications for Work and Welfare* (London: Routledge, 1989).
- 4 This was driven by the Peruvian economist Hernando de Soto, author of the best-selling book *The Other Path: The Invisible Revolution in the Third World* (New York: Harper & Row, 1989).
 - 5 Critical scholarship has stressed the dynamism and codependence of the informal and formal sectors, noting that informality can be actively produced by economic restructuring and downsizing, when work moves from the formal to informal zone. As Nezar Alsayyad notes, “informality does not simply consist of the activities of the poor, or a particular status of labor, or marginality. Rather, it is an organizing logic which emerges under a paradigm of liberalization.” See Alsayyad, “Urban Informality as a ‘New’ Way of Life,” in *Urban Informality: Transnational Perspectives from the Middle East, Latin America and South Asia*, ed. Ananya Roy and Nezar Alsayyad (Lanham, MD: Lexington Books, 2004), 26; Basudeb Guha-Khasnobis, Ravi Kanbur, and Elinor Ostrom, *Linking the Formal and Informal Economy: Concepts and Policies* (Oxford: Oxford University Press, 2006).
 - 6 The anthropologist Gordon Mathews estimates that 20 percent of Africa’s mobile handsets are resold in the Chungking Mansions shopping center in Hong Kong. Here, new, used, grey-market, and counterfeit handsets are sold in small lots to itinerant traders who frequently carry the phones back in their luggage. See Mathews, *Ghetto at the Center of the World: Chungking Mansions, Hong Kong* (Hong Kong: Hong Kong University Press, 2011).
 - 7 See for example Tomaso Duso and Jo Seldeslachts, “The Political Economy of Mobile Telecommunications Liberalization: Evidence from the OECD countries,” *Journal of Comparative Economics* 38 (2010): 199–216; Jennifer Holt “Platforms, Pipelines and Politics: The iPhone and Regulatory Hangover,” in *Moving Data: The iPhone and the Future of Media*, ed. Pelle Snickars and Patrick Vonderau (New York: Columbia University Press, 2012), 140–154.
 - 8 Mark Andrejevic, *iSpy: Surveillance and Power in the Interactive Era* (Lawrence, KS: University Press of Kansas, 2009).
 - 9 Keith Hart, “On the Informal Economy: The Political history of an Ethnographic Concept,” *CEB Working Paper N° 09/042* (Brussels: Centre Emile Bernheim, 2009).
 - 10 For a detailed analysis of Google’s uneven and strategic relationship to open-source software, see Goggin, “Google Phone Rising: The Android and the Politics of Open Source,” *Continuum* 26, no. 5 (2012): 741–752; Kimberley Spreeuwenberg and Thomas Poell, “Android and the Political Economy of the Mobile internet: A Renewal of Open-Source Critique,” *First Monday* 17, no. 7 (2012), <http://firstmonday.org/ojs/index.php/fm/article/view/4050/3271>
 - 11 Hart, “On the Informal Economy.”
 - 12 The most prominent example is Jonathan Zittrain’s manifesto *The Future of the Internet (and How to Stop It)* (New Haven, CT: Yale University Press, 2008). For incisive rebuttals and qualifications see Jean Burgess, “The iPhone moment, the Apple Brand, and the Creative Consumer: From ‘Hackability and Usability’ to Cultural Generativity,” in *Studying Mobile Media: Cultural Technologies, Mobile Communication, and the iPhone*, ed. Larissa Hjorth, Jean Burgess, and Ingrid Richardson (London: Routledge, 2012), 28–42; and Pelle Snickars, “A Walled Garden turned into a Rainforest,” in *Moving Data*, ed. Snickars and Vonderau, 155–168.
 - 13 James Ball and Symeon Brown, “Why BlackBerry Messenger was Rioters’ Communication Method of Choice,” *The Guardian*, December 7, 2011, <http://www.guardian.co.uk/uk/2011/dec/07/bbm-rioters-communication-method-choice>; Karishma Vaswani, “BlackBerry Maker’s Asia Boss remains Optimistic about Indonesia,” *BBC News*, March 29, 2012, <http://www.bbc.co.uk/news/business-17521908>.
 - 14 Zittrain, *The Future of the Internet*.
 - 15 Burgess, “The iPhone Moment.”
 - 16 Goggin, “Google Phone Rising.”