Digital lives in Ghana, Kenya, and Uganda

The MasterCard Foundation

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In the last decade, the boom in mobile phone access and use around the world has been nothing short of astounding, mobile/cellular devices have become not only nearly ubiquitous replacements for traditional fixed line telephones, but also the most widespread means of accessing the Internet itself.

There are burgeoning literatures emerging around this boom. Some focus on the uses of digital technologies in specific purposive ways "for" development: for example, exploring applications in mobile health, mobile learning, mobile money, even mobile agriculture and mobile government. Other efforts look more broadly, capturing the wide range of human activities mediated by digital technologies, from flirting to entertainment, sharing to religion.[1] In this report we distinguish these frames as the difference between "instrumental" and "non-instrumental" uses of technologies.

This is, therefore, a moment of profound change for the community of practice for those who would seek to use digital technologies in the service of socioeconomic development. Thanks to the mobile internet boom, the possibilities (and risks) of digital connection, consumption, and production computing are no longer limited to those with means to buy a PC, or those who can visit cybercafés in libraries. The possibilities (and risks) are, instead, literally in the hands and pockets of a far greater array of people. Youth and the poor, urban and rural, men and women, all are using mobile devices in increasingly dynamic and varied ways in their own lives. Granted, and importantly, not all are doing so with the same skill, or intensity, or effectiveness, but the shift to digital is underway even among resource-constrained communities.

With these new digital practices come new opportunities and challenges for traditional domains of development practice; to be more effective, these domains (for example, agriculture, education, livelihoods, health, and participation) must adapt to the changing landscape of communication and digital connection. Such adaptations require up-to-the-minute insights about technology use in practice. It is in that spirit of open inquiry that this work was commissioned. Through dialogues with technology experts and with interviews with users in three countries, this research project explores how everyday practices around digital technologies—particularly mobile technologies—are changing, and how the development community might begin to take greater advantage of these changes.

Specifically, we argue that development programs with an eye on instrumental outcomes are well-served by the cultivation of an understanding of broader digital practices—of people's increasingly *digital* lives. This work explores not only what devices people use, but also how they get online and what they do once there. These representations of digital practices must be fluid and current, given the rapidly changing landscape of Internet connectivity and digital services, and must identify opportunities for new inclusive business models and behavioral interventions.

Therefore, this report contributes to the evidence base for development practice and for theory in several ways.

- Chapter One offers a sketch of Caribou Digital's three-part overarching approach to understanding emerging digital practices in context, with an eye specifically on bridging the gaps between development and daily life, and between the micro-level perspective of individual users and the macro-level forces impacting the landscape of digital resources available to them.

- Chapter Two details results from extensive interviews with experts in the field of Information and Communication Technologies for Development (ICT4D) that help place the current M4D wave in the context of more durable past and future factors.

- In Chapter Three, our reports on new primary research with users in Uganda, Ghana, and Kenya yield a broader and up-to-the-minute story of how mobile technologies are currently the center of users' digital lives.

- Chapter Four concludes the report with a synthesis of these two streams, suggesting that our portrayal of users' "Digital Days" can provide a user-centric lens to understand how technologies and practices are intertwined, how they vary between contexts, and how they might enable and structure development interventions.

1 Jonathan Donner, "Research Approaches to Mobile Use in the Developing World: A Review of the Literature," *The Information Society* 24, no. 3 (2008): 140—59, doi:10.1080/01972240802019970.

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The Study

This report has been prepared in partnership with The MasterCard Foundation,[2] a philanthropic foundation focused on promoting education, skills training, and financial services for people living in poverty, primarily in Sub-Saharan Africa. Although we have conducted our research keeping The MasterCard Foundation in mind as the central audience for the findings, the results presented here are intended to be read by and useful to a wider range of practitioners and researchers in ICT4D and development.

Caribou Digital[3] is a consultancy, founded in 2014, focused on projects that promote the strengthening of inclusive digital economies in emerging markets. We do this by research, advisory, and delivery work with our partners. We have decades of experience across the telecommunications industry, development practice, and academia, and as a result, have a particular perspective on ICT4D and the shift to a digital world. Some of that perspective is in evidence in this document.

The MasterCard Foundation engaged Caribou Digital to undertake the research activities supporting this project—literature reviews, expert interviews, and the focus groups and interviews with users in Sub-Saharan Africa—between April and September 2015.

Summary of Findings by Chapter

The remaining sections of this executive summary address the main points of each chapter, in turn.

Theoretical Approach

We say this emphatically: the digital opportunity has never been and will never be exclusively about handsets, mobile phone calls, or text messages. Mobile is best understood as an important part of a broader tapestry of information technologies, which includes everything from media production and satellite infrastructures through to the exchange of USB sticks at a market stall and shared-access telecentres.

To capture some of these contexts and interconnections, Caribou Digital has developed an integrated approach bringing together three domains of research: **Internet Access Modalities**, **User Digital Repertoires**, and **Global Ecosystems and Platforms**. None of these is mobile-specific, however each allows for greater insights into the centrality of mobile at this moment.

We use the term **Internet Access Modalities** to represent the particular configurations of technologies, business models, industry players, regulatory frameworks in place to connect Internet users, via devices, over "last mile" networks, to the services and systems on the broader global Internet. When described this way, the most dominant Internet Access Modality—by far—is mobile handsets using a cellular wireless protocol (like Edge, 3G, or LTE) to access the Internet via Mobile Network Operators (MNOs). The same user would encounter a different modality when she comes in range of a Wi-Fi hotspot at a local community center. The affordances of the modality shift as she transitions from a pay-by-the-bit plan with her MNO to a free 30 minutes offered by the center, even if the device is unchanged. Her modality might shift again if she goes inside and sits down at a shared-access PC. In each case, the affordances of the modality will create different Internet experiences.

Switching to the user level, we use the holistic term **Digital Repertoires** to stress how individuals, households, and organizations are not passive "beneficiaries" or "audiences" in the shift to a digital world; but rather are active participants, choosing, appropriating, and adapting platforms, content, services, and technologies in the ways that work best for them. One element of user choice involves toggling between available Internet Access Modalities, but practice is much broader than that, including also the skills, incentives, routines, and habits that each individual brings to her repertoire.

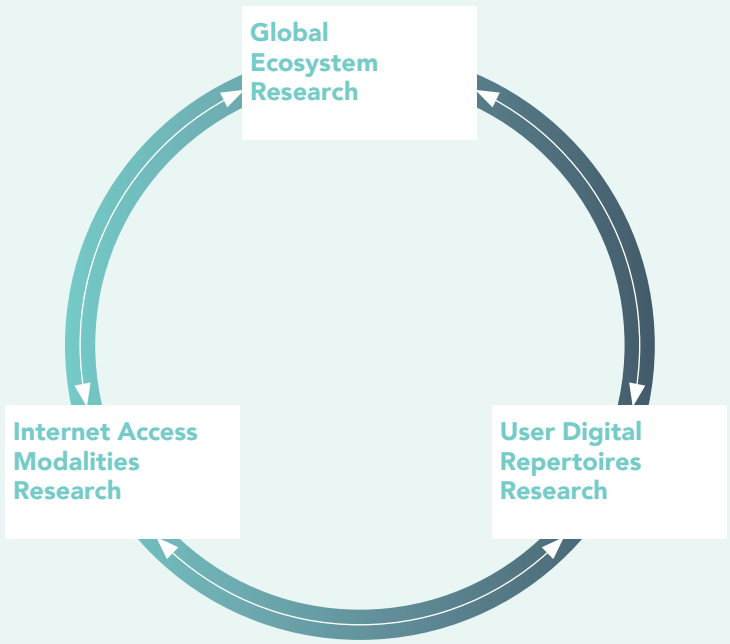
Finally, there is a crosscutting force influencing both the shape of available Internet Access Modalities and the patterns of user repertoires. These **Platforms** are the large international information technology companies that have come to dominate the consumer (and therefore the global) Internet. Amazon, Facebook, Apple, Google, Microsoft, and a few others offer a host of interconnected services, technologies, partnerships, and business models that operate across myriad devices and networks, binding together people's identities and experiences across multiple domains into proprietary platform ecosystems. These platforms have become global giants in large part because they underpin the services that end-users care about. Posting photos to Facebook, sending e-mail via Gmail, playing an iPhone game, editing a Word document; it is these activities or tasks that users want to engage in that define the user experience for most people.[4] When a new customer in Zambia walks

2 www.mastercardfdn.org

3 www.cariboudigital.net

4 Bryan Pon, Timo Seppälä, and Martin Kenney, "Android and the Demise of Operating System-Based Power: Firm Strategy and Platform Control in the Post-PC World," *Telecommunications Policy* 38, no. 11 (2014): 979—91, doi:10.1016/j.telpol.2014.05.001.

Executive summary
continued



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into a store to purchase their first smartphone, they do not ask for a device based on its operating system, or which network protocols it can access. They instead ask for a device that has Facebook and WhatsApp, and soon dive into a platform (or two).

In aggregate, these three research lenses are parts of a broader whole that engages with the intersections of development and digitization in new ways. Some of these circuits are outlined in *After Access* (MIT Press, November 2015)—Jonathan Donner's new book. *After Access* examines the implications of the shift to a more mobile Internet for ICT4D practice, and provides the framework for much of Caribou Digital's research. As a holistic set, the three elements offer interconnected wide-aperture lenses on digital practice and the shift to a more digital global society. They allow a broader approach beyond "Mobile" but allow for an understanding of the centrality of mobile (constraints and all) in people's digital lives.

Executive summary
continued

Crosscutting themes in digitally enabled development

We used semi-structured interviews with 26 experts in the academic, policy, practice, and technology communities to reorient discussions around the current and near-future states of play for providing access. In these interviews, under the banner *"Disruptive Internet Access Technologies by 2020"*, we invited experts to participate in "a conversation matching new and emerging Access Modalities (like satellites and community Wi-Fi) with the broad digital needs and behaviors of resource-constrained people in Sub-Saharan Africa." To augment the interviews, we reviewed secondary sources from the practitioner and scholarly literature.

It is perhaps somewhat ironic that this framing invited a global, decontextualized conversation about "technologies" in the ideal and in the abstract. Indeed, the most generalizable and important elements of the conversations became five crosscutting themes, relevant to the evaluation of almost any Internet Access Modality, and/or to most Information and Communication for Development (ICT4D) projects. While not the only factors at play, these five factors clearly can frustrate the best-intentioned ICT4D practitioner.

- We flagged **"top-downism"**—a confidence that digital outcomes can be prescribed or designed from above or afar—as a significant threat to the success of potential access disruptors. No one new innovation is likely to solve all the remaining access challenges from the top down, even with the support of large and deep-pocketed institutions, but nor are those institutions likely to succeed without community support and buy-in.
- Several experts led us to offer a suggestion to **embrace entertainment and leisure practices** as part of a more holistic understanding of users' digital lives and repertoires. Understanding the way in which entertainment plays into uses of digital technologies is central to understanding the factors that drive uptake, development of digital skills, and the allocation of constrained resources to digital services and devices.
- We identified the persistence of what some in the research community call **"second level digital divides"**[5]—gaps in demand and differences in usage resulting from limited skills, literacies and availability of appropriate content. These gaps persist, indeed, may be amplified, even after the initial access challenges might seem to be addressed.
- Experts raised concerns about other ongoing differences of usage due to differences in the *technical* capabilities of various Access Modalities—that some configurations and trade-offs, like prepaid Internet or cached content, were **"constrained connectivity"** relative to a full and open Internet
- And finally, we synthesized the four preceding themes to dismiss any suggestions, strawman or otherwise, that there is a single silver bullet waiting in the wings which will address the remaining access and post-access challenges. The heterogeneity of responses we received about what was coming next was itself good evidence that we should be pursuing multiple, complementary modalities rather than a single silver bullet.

This theme, in particular, helps place the anticipation around new "moonshots" like drones, stratospheric balloons, and low earth-orbit satellites, into better context. We suggest that development practitioners need to remain mindful of shifting narratives and changing business models, without discounting their exciting prospects entirely.

Use in Context

This chapter explores trends in ICT use in Sub-Saharan Africa, and specifically the digital repertoires and content consumption patterns of young people in Ghana, Kenya, and Uganda. These descriptions answer the foundational question that drives this element of research—"what do digital repertoires, usage practices, and content consumption patterns look like amongst young digital technology users in Ghana, Kenya, and Uganda." It transcends a divide between what is considered "instrumental" and "non-instrumental" use, by framing questions that aim to develop understanding through focusing on users' perspectives on the practices and patterns that characterize their digital lives.

In each country, we first undertook 10 focus groups, five with men, and five with women. Each of the five focused on different themes—news, music, gaming, and two focus groups (oversampling) on skills and job-seeking. The demographic was broadly 18–24 year olds, living in peri-urban areas, first-generation urbanites (i.e., parents working in agriculture, families still likely owning or working on land), and an income of roughly under $2 a day.

5 Eszter Hargittai, "Second-Level Digital Divide: Differences in People's Online Skills," *First Monday* 7, no. 4 (2002): 1—20; Jan Van Dijk and Kenneth Hacker, "The Digital Divide as a Complex and Dynamic Phenomenon," *The Information Society* 19, *no. 4 (2003): 315—26*.

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continued

Our guiding research questions for this activity focus on documenting multimodal usage practices under constrained conditions. What are the existing states of: (a) digital technology usage practices, (b) digital content consumption, (c) hybridization between technologies and online/offline (a digital/non-digital ecosystem), and (d) user innovation in Ghana, Kenya, and Uganda?

Our research shows most users' consumption of digital content is dominated by news, games, music, movies, and social networking. These echo results of some previous studies, but our findings provide three additional themes that go beyond the current literature and evidence base.

- Firstly, we articulate the value of exploring non-instrumental use to reveal new insights about individual digital practices. Although many activities are non-instrumental in the strictly functional sense, the situated practices that surround and enable them reveal the extent to which digital technologies are part of individuals' everyday lives. Mobile devices, in particular, have become a part of the whole day, from waking to sleeping again, as users are watched over by alarm clock applications.
- Secondly, we find that these practices often mirror those observed in societies where the digital transition is further underway. Given that this is the case, we argue that current global concerns about the implications of these digital transitions for political engagement and content production are applicable in resource-constrained settings. This overlap broadens the scope of questions and challenges presented by the digital shift in these settings beyond development into participation and inclusion.
- Thirdly, and perhaps most significantly, we find that non-instrumental consumption practices are interlaced with very functional tasks, as users exploit their digital repertoires to find jobs, advance their education, and increase their income. This interlacing of instrumental tasks on social platforms offers great opportunity to develop interventions that "go with the grain" of intuitive technology adoption and use, but carry their own set of constraints and challenges, not least of which is the reality that for most, online social network platforms by default tend towards enabling interaction within offline social networks.

Digital Days

The challenge and opportunity confronting this final chapter is to contribute integrative frames that help bridge concepts operating across these levels and perspectives, in a way that captures both the context-specificity of individual's technology behaviors, as well as the broader forces at play in providing digital access and services.

Our approach is the idea of a Digital Day. There is a digital component to almost any human endeavor; it is not simply about selling crops or buying bus tickets. It is also about expression and feeling good, spirituality and memory, connection and culture. Instrumental and non-instrumental, these digitally enabled practices are intertwined and, thanks in no small part to the embrace of the mobile phone by younger generations, are transforming activities in every part of the day.

As a means of representation, the Digital Day is a synthesis and adaptation of several methods and perspectives with broad and established communities of practice, Participatory Rural Appraisal, User Centered Design, market research, and the social sciences. The Digital Days we portray in this report are the results of a first iteration of this approach, developed over the course of the overall project. The specific techniques we used to gather data and the exact graphic treatments of the Digital Days are ripe for further refinement and calibration.

There are six Digital Days shared in Chapter Four. We reproduce Nakato's, below, as an illustration

Executive summary
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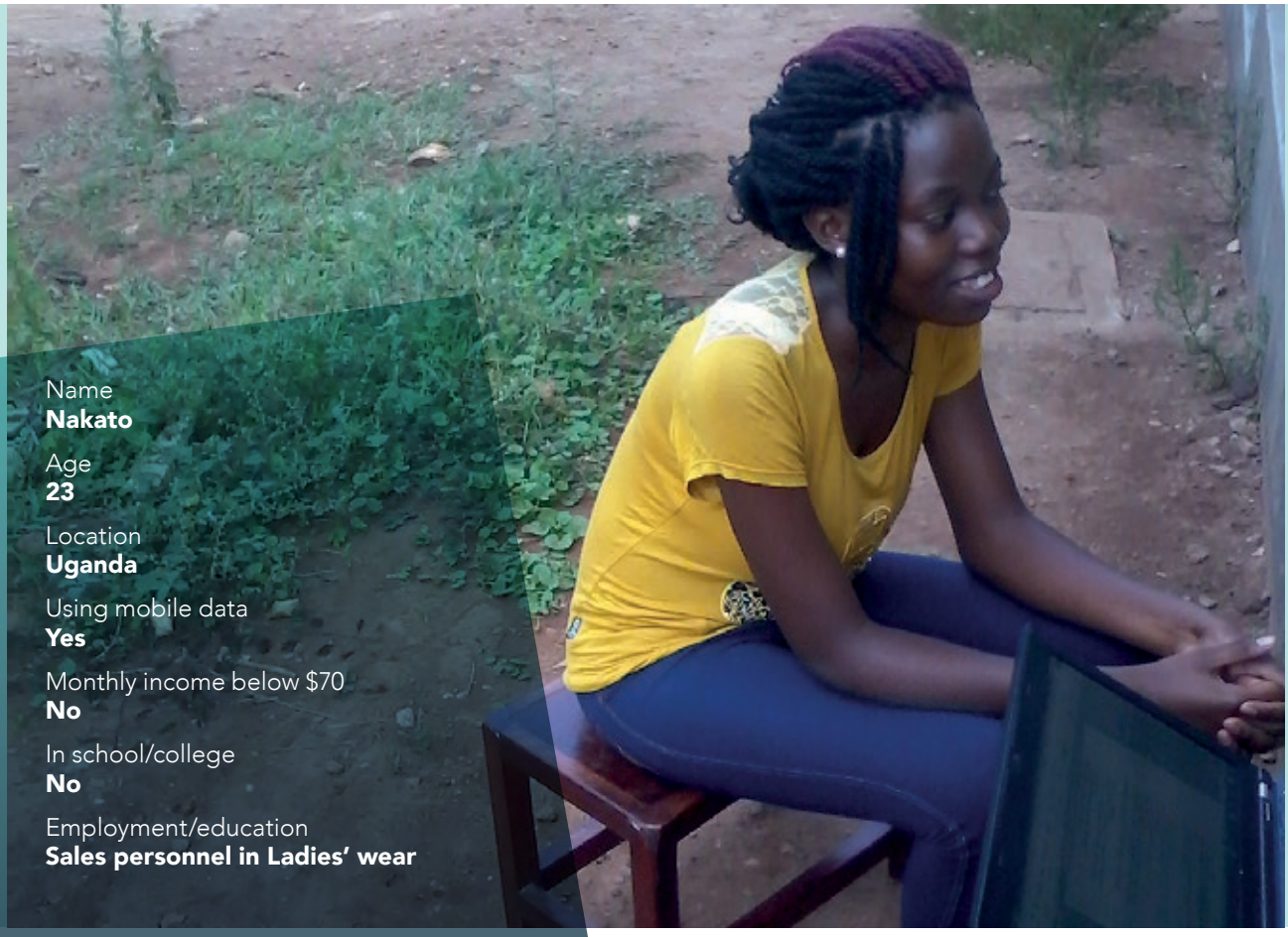

Nakato, a 23-year-old sales assistant, describes her Itel 1520 smartphone as her "second friend" as it "tells me a lot." She uses it for everything, from social networking and finding the latest music news to reading the Quran. For her, it is also a way of saving money on costly newspapers. For Nakato, data is "costless," and she describes getting a lot from her smartphone (in terms of information) without putting a lot into it.

During the workday, Nakato describes how she uses her phone when there are no customers in her shop, she uses her phone to see what is being posted on social networking services or to look up information about her favorite music artist. She also messages other shop attendants to find out how their stores are doing and plays games to relieve her stress if she has just dealt with a rush of customers.

In the evening, Nakato mostly uses her laptop to browse news and videos on the Internet. Many of these videos are from religious leaders and she views them as informative, providing her with information about "marriage, dowries and business." She also uses her phone to access social networking services. The ability to access this information makes Nakato feel "good."

The interview ends with Nakato offering some of the disadvantages of mobile Internet and her smartphone. These include the addictiveness of her smartphone and the cost of data, which contradicts her first statement about data being "costless." She complains that she spends a lot of money on mobile data.

Executive summary
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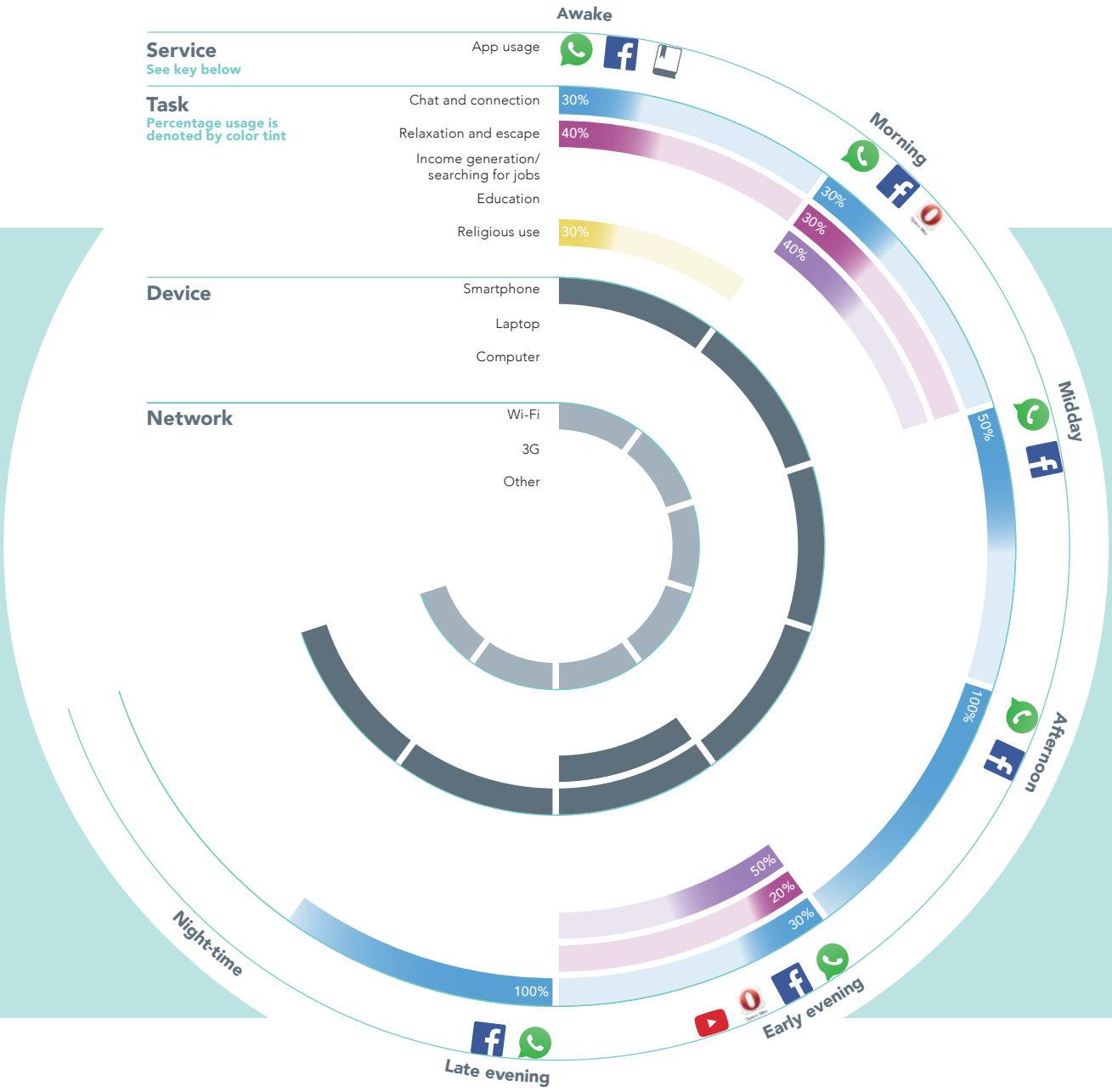

Service key

- WhatsApp
- Facebook
- Instagram
- Opera
- YouTube

Executive summary
continued

The Digital Days approach works like a time-lapse photo of a person in digitally mediated motion, helping make visible the connections between an individual, her tasks and goals, and the technical and social structures enabling and constraining her. With these time-lapse representations, we can revisit and reinforce many of the themes discussed earlier in the report, including the needs for the development community:

- To work with the centrality of entertainment, and the blurring of social and functional activities in people's digital practices.
- To remain aware of skills gaps and second-order divides.
- To design for the persistence of constrained connectivity scenarios and the elusiveness of an "always on" life.
- To look for the way gender, as an elemental social force and contested area, intersects with any and all digital practices, from downloading music and chatting with friends to job seeking to sharing health information.
- To understand that, already, digital use is more complex that "mobile use"; mobile devices and networks are used as parts of Internet Access Modalities, allowing individuals to read and write to remote series in ways that are influenced not only by devices and services, but also by skills, literacies, practices, and platforms.

Summary

This report has been a chance to work through several elements of one of the greatest shifts in the organization of human life, on par with introductions of agriculture, printing, and manufacturing. It is a platitude to restate that the shift to digital is well underway globally. More controversial—and germane to this report—is the extent to which resource-constrained youth in Sub-Saharan Africa are currently involved in this shift, and on whose terms.

Our methodology means we cannot show a sample large enough to claim reliable representations of populations as a whole, yet this report reveals how orientations toward digital tools and platforms among some youths are changing quickly, thanks particularly to the introduction of mobile internet technologies, and are worthy of significant additional scrutiny by the development community. We are not interested just in whether people are "online," but instead how online and digital resources are transforming everyday life, offline and proximate, in ways specific to the challenging contexts in which many youths find themselves.

For these reasons, our study focused on developing new approaches to understanding situated digital practices. This has allowed us to focus on the tasks rather than the technology—whilst logging usage of specific networks and terminals is useful when considering infrastructure investments, or at a macro level for a country diagnostic, it cannot show the granularity or interconnectedness of a digital life in the same way as we can here.

Executive summary
continued

We presented the **Digital Days** methodology—a way of presenting a time-lapse photo of a person's digital practices over a day. It is through this method (itself integrating elements of our theoretical lenses: repertoires, Internet Access Modalities, and platforms) that we are able to link the voices of experts to the experiences of everyday people, and to identify several significant themes for development practice. We can see, though these integrations, the growing centrality of entertainment and social networking in structuring and enabling digital interactions (and literacies), and see the intersections between online and offline practices and roles, such as gender, in enabling and constraining individuals as they seek to use the Internet effectively.

The broadest implication of the report for digital development practice is that those seeking to harness or accelerate this digital shift in the service of digitally enabled development (and/or M4D) must maintain an open mind, thinking expansively and non-judgmentally about ways to work with the dynamic practices of entertainment and social networking among users in target communities. We think there is great promise in exploring these themes in more detail, and that the new Digital Days framework can yield further insights, moving forward.

Chapter 1
Introduction and framing

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Introduction and framing

It has been a decade since the influential *Economist* magazine ran a cover photo of a smiling African boy, holding a mud-encrusted mobile phone to his ear.[1] Mobile telephones, heralded the accompanying articles, were more useful, desirable, appropriate technologies for the Global South in 2005 than PCs, and were more likely to spread without significant donor interventions. It was to be a mobile boom, not an Internet boom, which would close the so-called digital divide.

That magazine issue was prescient, and its enthusiasm was not unfounded. The booms in mobile coverage and adoption have exceeded even the most optimistic projections made at that time, and in the last decade, a thriving community of practice has emerged around the practice of mobiles for development (M4D).[2]

Yet in technology, a decade is an extremely long time. As it turned out, mobile/cellular devices have become not only telephonic *alternatives* to the Internet, but also as the most important means of accessing the Internet itself. By 2013, in India, for example, 90% of all connections to the Internet came via mobiles.[3] High profile reports from (for example) the World Bank,[4] the GSMA,[5] and the scholarly community[6] now trumpet the potential of the mobile phone to close the *Internet* access divide. Indeed, the proliferation of data-enabled "feature" and "smart" phones—and the services that support them—has already reshaped "the character of the Internet."[7] Studies in the U.S. suggest people spend more time in apps, and in Facebook in particular, than they do in the World Wide Web.[8] For many people in the developing world, for almost all intents and purposes, the Internet is whatever Internet is available through the mobile phone.

This is, therefore, another moment of profound change for the community of practice for those who would seek to use digital technologies in the service of socioeconomic development. Thanks to the mobile Internet boom, the possibilities (and risks) of digital connection, consumption, and production computing are no longer limited to those with means to buy a PC, or those who can visit cybercafés in libraries. The possibilities (and risks) are, instead, literally in the hands and pockets of a far greater array of people. Youth and the poor, urban and rural, men and women, all are using mobile devices in increasingly dynamic and varied ways in their own lives. Granted, and importantly, not all doing so with the same skill, or intensity, or effectiveness, but the shift to digital is underway in places and among communities that we would not have expected, even a decade ago when the *Economist* was celebrating that basic mobile phone.

With these new digital practices come new opportunities and challenges for traditional domains of development practice; to be more effective, these domains (for example, agriculture, education, livelihoods, health, and participation) must adapt to the changing landscape of communication and digital connection. Such adaptations require up-to-the-minute insights about technology use in practice. It is in that spirit of open inquiry that this work was commissioned. Through dialogues with technology experts and with interviews with users in three countries, this research project explores how the everyday practices around digital technologies are changing, and how the development community might begin to take greater advantage of these changes.

1 "The Real Digital Divide," *The Economist*, 2005, www.economist.com/node/3742817.

2 Jonathan Donner, "Framing M4D: The Utility of Continuity and the Dual Heritage of 'Mobiles and Development,'" *The Electronic Journal of Information Systems in Developing Countries* 44, no. 3 (2010): 1—16.

3 Telecom Regulatory Authority of India, "The Indian Telecom Services Performance Indicators" (New Delhi: TRAI, 2013), www.trai.gov.in/WriteReadData/PIRReport/Documents/Indicator Reports -01082013.pdf.

4 World Bank, *Information and Communications for Development 2012: Maximizing Mobile* (Washington, DC: The World Bank, 2012), http://elibrary.worldbank.org/doi/book/10.1596/978-0-8213-8991-1.

5 GSMA, "Bridging the Gender Gap: Mobile Access and Usage in Low- and Middle-Income Countries" (London, UK, 2015), http://www.gsma.com/connectedwomen/wp-content/uploads/2015/02/GSM0001_02252015_GSMAReport_FINAL-WEB-spreads.pdf; GSMA Mobile for Development Intelligence, *Scaling Mobile for Development* (London: GSMA, 2013), https://gsmaintelligence.com/files/analysis/?file=130828-scaling-mobile.pdf.

6 Wallace Chigona et al., "Can Mobile Internet Help Alleviate Social Exclusion in Developing Countries?," *The Electronic Journal of Information Systems in Developing Countries* 36 (2009): 1—16.

7 Harmeet Sawhney, "Innovations at the Edge: The Impact of Mobile Technologies on the Character of the Internet," in *Mobile Technologies: From Telecommunications to Media*, ed. Gerard Goggin and Larissa Hjorth (New York, New York, USA: Routledge, 2009), 105—17.

8 Benedict Evans, "Mobile Is Eating the World" 2014, http://a16z.com/2014/10/28/mobile-is-eating-the-world/.

Chapter 1
Introduction and framing continued

This project is not the first to look at the informational activities of resource-constrained individuals and communities. Instead, it echoes and builds upon several existing research traditions. Perhaps the most influential of these efforts is the *Portfolios of the Poor*[9] project, which draws on diaries and interviews to document the financial practices of the world's poor in an approachable, lucid, and lasting way. Other efforts, more specific to informational practices, include a multi-year, multi-country effort carried out by research teams at LIRNEasia, Research ICT Africa, and DIRSI, and sponsored by the Canada's IDRC, documented in the *Information Lives of the Poor: Fighting Poverty with Technology*.[10] Similarly, there are several reports and datasets related to media and digital use made available via Intermedia's *Audiencescapes* project, an effort launched initially with support from the Bill and Melinda Gates Foundation. A great deal of this work was ground-breaking when published, but already risks being overtaken by the rapid spread of Internet enabled devices into resource-constrained communities.

Quite different are the approaches supported by private-sector market and design research, commissioned and controlled by firms like Google and Facebook. Although much of this work is more timely and surprisingly nuanced, it remains inaccessible to the broader research and practice communities because it is proprietary and critical to the business models of those private organizations. The challenge is to build on the spirit of actionable user-centered design recommendations without losing the specific development focus. This work will explore how to represent not only what devices people use, but also how they get online and what they do once there. These representations of digital practices must be fluid and current, given the rapidly changing landscape of Internet connectivity and digital services.

Therefore, this report contributes to the evidence base for development practice and for theory in several ways, beginning with the framing exercise offered here in Chapter One. Chapter Two details results from extensive interviews with experts in the field of Information and Communication Technologies for Development (ICT4D) that help place the current M4D wave in the context of more durable past and future factors. In Chapter Three, our reports on new primary research with users in Uganda, Ghana, and Kenya yield a broader and up-to-the-minute story of how mobile technologies are currently the center of users' digital lives. Chapter Four concludes the report with a synthesis of these two streams, suggesting that our portrayal of users' "Digital Days" can provide a lens to understand how technologies and practices are intertwined, how they vary between contexts, and how they might enable and structure development interventions.

A note on the funder, the research institution, and the project brief

This report has been prepared in partnership with The MasterCard Foundation, a philanthropic foundation focused on promoting education, skills training, and financial services for people living in poverty, primarily in Sub-Saharan Africa. Although we have conducted our research keeping The MasterCard Foundation in mind as a central audience for the findings, the results presented here are intended to be useful to a wider range of practitioners and researchers in ICT4D and development.

Caribou Digital[12] is a consultancy, founded in 2014, focused on projects that promote the strengthening of emerging market digital economies. We do this by research, advisory, and delivery work with our partners. We have decades of experience across the telecommunications industry, development practice, and academia, and as a result, have a particular perspective on ICT4D and the shift to a more digital world. Some of that perspective is in evidence in this document.

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9 Daryl Collins et al., *Portfolios of the Poor: How the World's Poor Live on $2 a Day* (Princeton, NJ, USA: Princeton University Press, 2010).

10 Laurent Elder et al., *Information Lives of the Poor: Fighting Poverty with Technology* (Ottawa, Ontario, Canada: International Development Research Centre, 2013), www.idrc.ca/EN/Resources/Publications/Pages/IDRCBookDetails.aspx?PublicationID=1275.

11 www.mastercardfdn.org

12 www.cariboudigital.net

Chapter 1
Introduction and framing continued

Overarching theoretical approach: integrating three wide-aperture frameworks

By seeking an up-to-date assessment of changing digital practices in resource-constrained settings, and by exploring the implications of these changing practices for development, the research questions guiding this report are quite open ended by design. The work is broadly inductive, and specific themes we discuss in the subsequent chapters emerged directly from the work.

However, the work is also informed by our own prior research and professional experiences in the field. In particular, our perspectives on the implications of the shift from basic telephony to a "more mobile Internet" are outlined in Jonathan Donner's new book *After Access* (MIT Press, November 2015).[13]

Caribou Digital has integrated the discussions in *After Access* with several other sources and perspectives to develop an integrated approach bringing together three domains of research: **Internet Access Modalities, User Digital Repertoires, and Global Ecosystems and Platforms**. None is mobile-specific, however each allows for greater insights into the centrality of mobile at this moment.

Internet Access Modalities

Anything more than a cursory discussion of Internet "access" will necessarily involve a host of interconnected factors. Like any others,[14] Perkins and Neumayer suggest we view communication technologies like mail, telephony, and the Internet not as unitary and separate, but rather as "complementary networks of physical artefacts, supporting infrastructures and users."[15] In this view, these networks are products of interactions with specific places, with local supply and demand, with investment models, with international trade patterns, and with national regulatory and political environments.[16]

We use the term **Internet Access Modalities** to capture this complementarity and complexity. Specifically, instead of discussions of "business models" or "technologies" in isolation, we consider Internet Access Modalities to encompass each of these, and more. *An Internet Access Modality is the particular combination of technologies and business models mediating the way users read and write to "the Internet."* To distinguish an access modality from the Internet itself, the modality is restricted, conceptually, to extend only to the point where data going to or from the user crosses a gateway, exchange, or server connected via fiber to the broader Internet; it excludes (or at least, holds constant) what's happening on the servers or in backhaul. Most simply, an Internet Access Modality is the combination of the affordances[17] of an access device and a last-mile network. In practice, there can be multiple hops in the network, and multiple elements to the device including software and applications; the affordances (and the pricing, and the impact) are in the details.

When described this way, the most dominant Internet Access Modality (by far) is mobile handsets using a cellular wireless protocol (like Edge, 3G, or LTE) to access the Internet via Mobile Network Operators (MNOs). But keep in mind that the same user would encounter a different modality when she comes in range of a Wi-Fi hotspot at a local community center. The affordances of the modality shift as she transitions from a pay-by-the-bit plan with her MNO to a free 30 minutes offered by the center, even if the device is unchanged. Her modality might shift again if she goes inside and sits down at a shared-access PC; the affordances of the device will give her more options for browsing and searching, and for information production.[18] She might shift yet again when she gets home and turns on the set-top box on her TV; if it is internet-enabled, streaming content from Netflix or YouTube directly to her TV, it will represent a far different modality indeed, with different strength and weaknesses.

The key is that a modality cannot be reduced to the device or to the network alone. Terms like "mobile vs PC" or "fixed vs mobile broadband" only capture some of the ways in which

13 Jonathan Donner, *After Access: Inclusion, Development, and a More Mobile Internet* (Cambridge, Mass., USA: The MIT Press, 2015).

14 E.g., Tarleton Gillespie, Pablo J. Boczkowski, and Kirsten A. Foot, *Media Technologies: Essays on Communication, Materiality, and Society, Inside Technology* (Cambridge, Massachusetts: The MIT Press, 2014).

15 Richard Perkins and Eric Neumayer, "A Brave New Geography of the Internet Age? The Determinants of Telecommunications Growth in Historical Perspective," 2007, https://www.lse.ac.uk/geographyAndEnvironment/research/Researchpapers/121%20RP%20%20EN.pdf. p. 11.

16 Ibid.

17 Victor Kaptelinin and Bonnie A. Nardi, "Affordances in HCI: Toward a Mediated Action Perspective," in *Proceedings of the 2012 ACM Annual Conference on Human Factors in Computing Systems—CHI'12* (New York, New York, USA: ACM Press, 2012), 967—76, doi:10.1145/2207676.2208541.

18 Donner, *After Access: Inclusion, Development, and a More Mobile Internet*.

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interactions between devices and networks shape the experience of end-users. Similarly, they mask the particular combinations of interdependent technologies and business models that intersect in each modality.

Thus Internet Access Modalities, holistically, are comprised of last mile networks, possibly middle mile networks, hardware, operating systems (and platforms), and possibly of software, which all directly influence the nature of a user's internet connection. Building on Perkins and Neumayer, Internet Access Modalities are also influenced by a tangle of structural, regulatory, and industrial factors, both enabling and constraining. The technologies themselves and the business models of the players involved are the most obvious here, but also at play are regulatory rules on spectrum and content, license fees and standards, and the adjacent strategies and business models and interests of "platform" players, which may include cross-subsidies and complex incentives for use. All these factors play a role in creating various qualities of service, at various pricing schemes, available to users in variable geographies and contexts, and with very different user experiences. With this approach comes several caveats and implications.

Access modalities foreground systems, not users. Users are, of course, active participants in feedback chains of appropriation and influence, and over time, these modalities generally evolve with users, not apart from them.[19] We use a complementary concept, Digital Repertoires,[20] which inverts the focus, allowing a view of the user's dynamic, multifaceted interactions with various Internet Access Modalities. This second approach underpins the second part of this report (the focus groups).

Different Access Modalities yield varying Internet experiences, with different implications for digital inclusion. Some may deliver blazing fast, always on connections; others only stored/asynchronous content. But speed is not the only issue. Modalities can be examined (and compared) also many dimensions, including impacts on user privacy, on generativity[21] and agency, on the accessibility of services or content which may be encouraged (or prevented) by a given modality, and, of course, on the costs experienced by resource-constrained users. We'll return to questions of "how much is enough" and whether all IP-based digital experiences are actually *Internet* experiences later in the document.

These are nested assemblages—every one of these elements in an Internet Access Modality is itself a complex socio-technical system. Consider for example the hundreds of patents in a smartphone, or the dozens of protocols behind data transfer. Like a chemist has to grant physics (and a biologist often has to grant chemistry) we have to sometimes grant the underlying complexity of these elements of Internet Access Modalities, surfacing these complexities only when necessary.

Conversely, modalities are always in dialogue with each other. Demand and supply play out relative to each other; users (as market actors) choose between modalities when possible. Further, our understanding of the validity and appeal of modalities shift as individual modalities shift. As a user, a policymaker, or a development practitioner, one cannot really evaluate any given Internet Access Modality independently of what other modalities are available.

Digital Repertoires

The other side of the coin from business models and underlying technologies is user choice and user context. For these matters, we use the holistic term **Digital Repertoires** to explore and represent how individuals, households, and organizations are not passive "beneficiaries" or "audiences" in the shift to a digital world; but rather are active participants, choosing, appropriating, and adapting platforms, content, services, and modalities in the ways that work best for them. One element of user choice involves toggle between available Internet Access Modalities, but practice is much broader than that, including also the skills, incentives, routines, and habits which each individual brings to her repertoire. In all, digital repertoires are the combination of devices, networks, and services, available and in use by individuals, as well as the skills and habits they bring to bear on them.

The concept of a digital repertoire revolves around individual users as agents, as people who can choose between the best digital options available to pursue whatever goals they might have. On the one hand, the digital repertoires lens can feed into market research and user research exercises, such as segmentations and persona-building. On the other hand, the same digital repertoires lens can help connect and ground these user choices in broader, contextually specific tapestries more reminiscent of anthropological and ethnographic

19 Marshall Scott Poole and Gerardine DeSanctis, "Understanding the Use of Group Decision Support Systems: The Theory of Adaptive Structuration," in *Organizations and Communication Technology*, ed. Janet Fulk and Charles Steinfield (Newbury Park, CA: Sage, 1990), 173—93.

20 Donner, *After Access: Inclusion, Development, and a More Mobile Internet.*

21 Jonathan Zittrain, *The Future of the Internet and How to Stop It* (New Haven, Conn., USA: Yale University Press, 2008).

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approaches.[22] These broader contextual perspectives, like digital ecologies, material cultures,[23] and situated digital practices, are discussed in Chapters Three and Four.

This work, particularly the user work, builds on this "digital repertoires" approach. The approach places the mobile at the center of most people's digital repertoires without losing sight of complementary Internet Access Modalities, such as Wi-Fi and public access, and the digital services and platforms services that people may use.

Thus, too narrow a focus on "the mobile phone" as the exclusive digital means for development and informational inclusion will miss the forest for the trees. To the development, policy, and technology communities, the needs and behaviors of the "next billions" across these multiple devices, networks, and services are often inscrutable, or oversimplified, or both. Traditional research methods strain to capture ground realities when deployed in contexts of extreme resource constraint and cultural variability. The research gaps are often twofold, of both imagination (focusing on mobile) and operationalization (asking only about mobile). More precisely, this research project helps highlight these gaps in understanding, and rectify an error in framing, by generating new insights about the constrained digital repertoires in use by the communities The MasterCard Foundation is working with. Our goal is not only to create snapshots of current conditions, but also to focus on near-term evolution, 2–5 years out, in which more multimodal behaviors will become more widespread.

Global Ecosystems and Platforms

Finally, there is a crosscutting, force influencing both the shape of available Internet Access Modalities and the patterns of user repertoires. At the server level, back in the air-conditioned data centers housing the world's dominant Internet services, in the boardrooms of Silicon Valley, and installed on billions of devices worldwide, are the markers and footprints of what Bruce Sterling calls "The Stacks"[24]—the large international information technology companies which have come to dominate the consumer (and therefore the global) Internet. Amazon, Facebook, Apple, Google, Microsoft, and a few others offer a host of interconnected services, technologies, partnerships, and business models which operate across myriad devices and networks, binding together people's identities and experiences across multiple domains into proprietary platform ecosystems.

These platforms have become global giants in large part because they underpin the services that end-users care about. Posting photos to Facebook, sending e-mail via Gmail, playing an iPhone game, editing a Word document; it is these activities or tasks that users want to engage in that define the user experience for most people.[25] When a new customer in Zambia walks into a store to purchase their first smartphone, they do not ask for a device based on its operating system, or which network protocols it can access. They instead ask for a device that has Facebook and WhatsApp.

Services therefore wield power because they often are the most salient touch point with the end-user, the element of the experience that is most difficult to substitute. They become a key part of users' *digital repertoires*, especially when we entrust them with our personal data—our photos, messages, e-mails—as this locks us in to a provider once we have already invested parts of our digital lives.

But some services are also powerful because they are enveloped within larger platform ecosystems, where business processes and technology structures organize innovation and value capture among participating organizations.[26] The goal for platform owners is to reach a defensible critical mass, the art of which requires designing user incentives—often,

22 This work is reminiscent of anthropological modes of inquiry into the complex "materiality" of daily life, with updated digital methods, studying the situated use of communication technologies in resource-contained settings. One current example is the *Global Social Media Impact Study*. Coordinated by the University College of London, funded by the European Research Council, and drawing on Miller and Marciano's theories of "Polymedia." The study is documenting social media use worldwide, particularly in poor communities, uncovering more heterogeneity in uses and "impacts" than one might see by focusing on the Global North M. Madianou and Daniel Miller, "Polymedia: Towards a New Theory of Digital Media in Interpersonal Communication," *International Journal of Cultural Studies* 16, no. 2 (August 2012): 169—87, doi:10.1177/1367877912452486.

23 Peter Menzel and Faith D'aluiso, *Hungry Planet: What the World Eats* (Napa, Calif, USA: Material World Press, 2005); Peter Menzel, *Material World: A Global Family Portrait* (San Francisco, Calif., USA: Sierra Club Books, 1994).

24 Alexis C. Madrigal, *Bruce Sterling on Why It Stopped Making Sense to Talk About "The Internet"* in 2012, 2012, www.theatlantic.com/technology/archive/2012/12/bruce-sterling-on-why-it-stopped-making-sense-to-talk-about-the-internet-in-2012/266674/.

25 Bryan Pon, Timo Seppälä, and Martin Kenney, "Android and the Demise of Operating System-Based Power: Firm Strategy and Platform Control in the Post-PC World," *Telecommunications Policy* 38, no. 11 (2014): 979—91, doi:10.1016/j.telpol.2014.05.001.

26 Gawer, Annabelle, ed., *Platforms, Markets and Innovation* (Edward Elgar Publishing, 2011).

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pricing subsidies—that drive adoption in sufficient numbers to harness network effects.[27] Because, once a platform becomes dominant, those positively reinforcing network effects create barriers to entry that lead to monopoly like power in the market.

Unlike providers of access technologies or devices, these platforms are defined by software, and therefore have a flexibility and dynamism that offers both tremendously wide scope and granular control.[28] Facebook can run on just about any PC, smartphone, feature phone, or, soon enough, watch. Whereas a 3G cellular tower, once installed, will operate essentially unchanged for its lifetime, Xiaomi releases a new version of its operating system every week. Privacy policies, terms and conditions for developers, access to APIs, black box algorithms, and more can be updated and pushed out to millions of users—or to only those users who meet specific criteria—in real time.

These platforms continue to grow in scope and scale, entering new industries and regions in a race to capture and lock in users. They are integrating their services with new access technologies and devices, payments and identification, transportation and smart objects, and in so doing, are increasingly mediating and structuring our access and inclusion in the digital economy. Therefore, platforms don't just appear in most modalities, and they aren't just a component in most people's digital repertoires; these platforms are the glue that holds each of the other two factors together.

Synthesis

In aggregate, these three research lenses are parts of a broader whole that engages with the intersections of development and digitization in new and holistic ways. Paths of causality are bi-directional and dynamic between each of the domains. As a holistic set, the three elements offer interconnected wide-aperture lenses on digital practice and the shift to a more digital global society.

We do not seek to dispute or diminish the fact that at this moment, mobile technologies are at the center of almost any discussion about the digital divide, of almost any project to promote digital inclusion, and of almost every desire to use digital technologies to promote socioeconomic development. Mobile technologies are at the center of the conversations with experts and users in this study, too, precisely because mobile technologies are so ubiquitous.

However, we are of the mind that the near-universal attention in research and practice on mobile use and interventions—to the near exclusion of discussion of other means of access and use—is becoming a disservice to communities we wish to engage with and empower. Although mobile handsets are many people's first and primary digital devices, they are frequently used in contexts that include both legacy and complementary information technologies: TV and Radio, Cassette and DVD, sometimes PC or tablet. Similarly, the networks used to connect these devices are increasingly multiplex, ranging from individuals carrying memory cards from place to place, to satellites and terrestrial broadband. They are all ICTs. Further, the services they connect to play an increasingly important role in structuring the experiences and potentialities of users. The code, algorithms, and information stored in data centers in Palo Alto, Mountain View, Redmond, not to mention in several colder-climate small towns around the world, play growing roles in structuring development outcomes—roles that will remain unclear if we focus exclusively on devices or even on apps.

We say this emphatically: the digital opportunity has never been and will never be exclusively about handsets, mobile phone calls, or text messages. Mobile is best understood as an important part of a broader tapestry of information technologies, and M4D must be understood as part of a longer and still-unfolding history of ICT4D.

They allow a broader approach beyond "Mobile" but allow for an understanding of the centrality of mobile (constraints and all) in people's digital lives.

Methods

The project involved three primary activities: expert interviews, the in-country user research, and reviews of secondary research. We describe methods underpinning the literature reviews in Appendix Two, and the two other methods below.

Expert Interviews

We used semi-structured interviews with 26 experts in the academic, policy, practice, and technology communities to reorient around the current and near-future states of play for providing access. In these interviews, under the banner "*Disruptive Internet Access Technologies by 2020*", we invited experts to participate in "a conversation matching new and

27 Rochet, Jean-Charles and Jean Tirole, "Platform Competition in Two-Sided Markets," *Journal of the European Economic Association*, 2003.

28 Evans, David Sparks, Andrei Hagiue, and Richard Schmalense, *Invisible Engines: How Software Platforms Drive Innovation and Transform Industries* (Cambridge, MA: MIT Press, 2006).

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emerging access modalities (like satellites and community Wi-Fi) with the broad digital needs and behaviors of resource-constrained people in Sub-Saharan Africa." To augment the interviews, we reviewed secondary sources from the practitioner and scholarly literature.

It is perhaps somewhat ironic that this framing invited a global, decontextualized conversation about "technologies" in the ideal and in the abstract. In practice, each of the experts we consulted took the conversation about disruptive access technologies in different directions. Many spoke of the technologies they were most involved with, while relatively few offered a holistic view of the Internet access space. In aggregate, the interviews are complementary, and covered a range of issues and technologies, though no two participants answered the same questions, about the same specific technologies, in the same order. That said, the interview script, shared in advance with participants (Appendix One), generally covered several of the questions below:

- What does the arrival of viable non-mobile modalities mean for access as a whole? How will this shift alter the Internet?
- Which Internet? Will Internet users have the Internet as we understand it (open/unmediated/neutral/prioritized) where the web is central and every bit is the same?
- Which groups/communities/demographics, previously excluded, will be brought online? Who risks being left offline?
- What are the implications of new Internet Access Modalities for community and shared access models?
- To what extent are these new modalities complements to mobile Internet, vs substitutes? What opportunities emerge if/when resource-constrained people have multiple modes of access to choose from?
- How can local entrepreneurs participate in the access landscape of 2020?
- What are priority areas for intervention and investment to improve last-mile options for the resource-constrained?

The recruitment list was seeded with several well-known researchers and practitioners in the ICT4D space, and then was expanded using "snowball" recommendations to identify others. The final list included researchers, consultants, industry program managers, entrepreneurs, C-level business leaders, and ICT4D practitioners.

Pilot interviews were conducted face-to-face at the ICTD2015 conference in Singapore in May 2015. The rest were conducted via Skype in June–July. All were recorded for transcription and coding, participants were told that their names would be included in the report. However, to encourage frank answers, we agreed to review quotes with interviewees before publication, and gave interviewees the option to remove direct attribution, which several elected to do. Procedures were reviewed with the experts involved, both in the interview invitation and again before the interview. The (oral) informed consent was granted (and recorded) at the beginning of each interview. No incentive was offered for participation, beyond the promise that we would share the report with each respondent.

In addition, Charlotte Smart drew on the expert interviews for her 2015 Master's Thesis from the Oxford Internet Institute, exploring the discourses around new communication technologies.[29] This was also discussed with all expert interviewees before the interviews commence, and Charlotte received prior approval from her advisors and from the human subjects committee at Oxford to proceed. All quotes in the thesis were anonymized prior to publication.

Primary Research With Users

This section of the study adopted a bottom-up inductive approach to examining trends in ICT use in Sub-Saharan Africa, using focus group discussions (FGD). To do so, we focused on lower middle class (defining this in each country context but broadly based on income), peri-urban youth (aged 18–24) in Ghana, Kenya, and Uganda. The rationale for this specific demographic is that these youth are already emerging as the next (creative) generation of digital—particularly Internet and mobile—technology users and producers in Sub-Saharan Africa, yet face economic constraints. As resource-constrained "early adopters," their usage patterns serve as pointers toward potential trends in wider digital repertoires. In Uganda and Ghana we worked with The MasterCard Foundation partners—respectively Restless Development (Uganda) and Yes (Ghana) to recruit participants, and in Kenya, we worked through iHub, who we have worked with before and who are experienced in focus groups, digital technologies and social inclusion. We conducted 10 focus groups per country, with an equal balance of male and female youth participants (see below for further breakdown).

29 Charlotte Smart, "'Connecting the World from the Sky': How Are Discourses about Connectivities Afforded by New Technological Modalities Employed?" (Oxford Internet Institute, 2015).

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We started the research with two inductive focus groups that explored the broad terrain of ICT use, followed by focus group discussions that contained a more detailed focus on consumption practices. This reflects our experience and anticipation for the content of the focus groups on these topics to funnel down from a broader inductive discussion (e.g., what kind of technologies do you use every day?, in what ways?, what might improve your day-to-day life?) to specific questions on instrumental (how might you use technologies for job searching and income improvement?) and non-instrumental use (what else might you use technologies for—for example entertainment in your spare time—and how?). This funnel reflects usage patterns indicated in the literature as well as our own experience conducting research on digital repertoires and consumption patterns.

Understanding these usage patterns is important because "instrumental" development interventions take place within the context of behavior repertoires that are dominated by non-instrumental-related content consumption. Yet many "supply-led" ICTD (particularly now mobile centric) development interventions—such as the mainstays of health, education, agriculture[30]—struggle to achieve the usage and scale of "demand-led" content such as news, music and games. Understanding intuitive, "demand-led" consumption patterns can thus contribute to the success of supply-led development interventions through an increased fit within existing practices. The GSMA also argues that entertainment might help "sugar the pill" of "serious" but unexciting content, and thus help take mobile for development (M4D) initiatives to scale.[31] Furthermore, there is a growing body of research that argues for a greater understanding of the role of entertainment in broader development outcomes.[32] In other words, understanding the usage patterns around dominant "demand-led" content will provide insights to inform the design of ICTD interventions that succeed because they are aligned with existing digital repertoires.[33]

In each country, we first undertook 10 focus groups, five with men, and five with women. Each of the five focused on different themes—news, music, gaming, and two focus groups (oversampling) on skills and job-seeking. The demographic was broadly 18–24 year olds, living in peri-urban areas, first-generation urbanites (i.e., parents working in agriculture, families still likely owning or working on land), and an income of roughly under $2 a day (obviously not a criteria for the unemployed group).

The FGD method is particularly recommended when interaction and discussion between participants tease out insights, differences, frictions, and convergences that would not emerge in individual interviews. This was one of the reasons we decided to keep the male and female groups separate (which did mean interesting group discussions around pornography, fashion, and so on, which perhaps would not have happened with such freedom in mixed groups). We accept the limitations of non-representative sampling in focus groups, but for this overview we felt it was the most insightful yet resource efficient. ■

30 See for example, http://icow.co.ke/.

31 Kristen Roggemann, "Entertainment: The Missing M4D Value-Added Service," *Mobile for Development*, accessed August 27, 2014, http://www.gsma.com/mobilefordevelopment/entertainment-the-missing-m4d-value-added-service.

32 Araba Sey and Peppino Ortoleva, "All Work and No Play? Judging the Uses of Mobile Phones in Developing Countries," *Information Technologies & International Development* 10, no. 3 (2014): pp—1; Neha Kumar, "Facebook for Self-Empowerment? A Study of Facebook Adoption in Urban India," *New Media & Society*, 7, 1461444814543999, doi:10.1177/1461444814543999; Syeda Hina Batool and Kamran Mahmood, "Entertainment, Communication or Academic Use? A Survey of Internet Cafe Users in Lahore, Pakistan," *Information Development* 26, no. 2 (May 28, 2010): 141—47, doi:10.1177/0266666910366650; Nimmi Rangaswamy and Edward Cutrell, "Anthropology, Development and ICTs: Slums, Youth and the Mobile Internet in Urban India," in *Proceedings of the Fifth International Conference on Information and Communication Technologies and Development* (ACM, 2012), 85—93, http://dl.acm.org/citation.cfm?id=2160685; Payal Arora and Nimmi Rangaswamy, "Digital Leisure for Development: Reframing New Media Practice in the Global South," *Media, Culture & Society* 35, no. 7 (2013): 898—905; Agha Ali Raza et al., "Job Opportunities Through Entertainment: Virally Spread Speech-Based Services for Low-Literate Users," in *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, CHI '13 (New York, NY, USA: ACM, 2013), 2803—12, doi:10.1145/2470654.2481389.

33 George Kamberelis and Greg Dimitriadis, *Focus Groups: From Structured Interviews to Collective Conversations* (New York, NY: Routledge, 2013).

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Research Questions

Our guiding research questions for this activity focus on documenting multimodal usage practices under constrained conditions.

- What is the existing states of (a) digital technology usage practices, (b) digital content consumption, (c) hybridization between technologies and online/offline (a digital/non-digital ecosystem), (d) and user innovation in Ghana, Kenya and Uganda, and
- How do they differ from more affluent and established economies?
- From these insights, what recommendations can be made for stakeholders [ISPs, mobile phone operators, research funders etc.] to address over the next 2–5 years?

From this broad, inductive enquiry, we allow respondents to focus on more specific research questions, firstly for "instrumental" purposes such as:

- How do people currently find jobs or skills enhancement opportunities?
- How do digital repertoires fit into the search for jobs and skills enhancement?
- How do people envision future digital repertoire practices for income gain?
- How much do people know about "micro-work" services?
- How might digital technologies affect young women in job-seeking or skills enhancement in particular?

Secondly we allow respondents to describe "non-instrumental" usage practices:

- How do digital technologies change entertainment consumption, such as listening to music, watching videos and game playing?
- In what ways does increased use of digital devices impact users' consumption of news?
- In what ways may existing within a changing digital world impact on young women's lives?

It is important to state that each and all FGDs are grounded in inductive enquiry followed by a more focused discussion, allowing respondents to lead and own the discussion. The inclusion of specific focused questions allows us to help respondents describe in detail specific practices that reflect indigenously rooted digital repertoires.

Chapter 2
Crosscutting themes in digitally enabled development

The previous chapter presented the general research questions guiding this study: that given the rapid uptake and use of data-enabled mobile devices in the Global South, there is a need and an opportunity for re-examinations of how everyday practices around digital technologies are changing, and of how the development community might begin to take greater advantage of these changes.

Chapter 2
Crosscutting themes in digitally enabled development

This chapter presents the results of one of the major research activities we undertook to explore these questions—the 26 in-depth interviews with leading experts in the extended IC4D community of practice.

We found a set of five crosscutting themes in evidence that are relevant to the evaluation of almost any Internet access Modality, and/or to most ICT4D projects thinking about improving acesss. While not the only factors at play, these five factors clearly can frustrate the best-intentioned ICT4D practitioner. By addressing these first, before we present the results of the user studies in the next chapter, we both link this document to long-running tensions in the ICT4D practice community, and establish additional factors to inform the discussions of individual access modalities.

We described the interview recruitment methods in the previous chapter. However, note that all interviews were transcribed from recordings. We then coded for emergent themes by using the Dedoose software package.

Crosscutting themes from the interviews

Top-downism

Discussions frequently surfaced a long-standing tension within ICTD research and practice, between "top-down" and "bottom-up" attempts to improve connectivity.[1]

Mike Gurstein, Director of the Centre for Community Informatics Research, explained:

I looked at the list of access technologies you are presenting and I think they probably can be divided into two. One is the top-down technologies, the Loons, the balloons, and satellites and so on, and then you have the bottom-up ones. Now we have had that distinction and we have had those two parallel tracks as long as we have had the Internet. We've been discussing that for the last 15, 20 years.

Some voiced concern at the lack of community engagement in more 'top-down' approaches. For example, Mariya Zheleva, Assistant Professor in the Department of Computer Science at University at Albany, SUNY, raised concerns about how proposed plans for drones might integrate with community dynamics:

I think most definitely a community needs to have a good understanding of why technology is needed, and what this technology is going to look like.… It should be a mutual agreement that it is necessary and accepted. That is why there is a big need for local community leaders to pick up on the technology, appreciate it, and promote it from inside in the community.

Similarly, Telecoms Consultant and Social Entrepreneur Steve Song stressed complementarities between particular technologies whilst arguing for the importance of community based approaches:

It is not just about one access technology. You have to have the ecosystem of access that supports that technology. And [drones, satellites, and balloons] are a very top-down kind of approach… whereas others are creating bottom-up ecosystems that are driven by entrepreneurs that understand their markets. I think is a very different sort of approach.

Yet problems remain in the reception and scalability of "bottom-up" approaches. ICT4D and Telecommunications researcher Carlos Rey-Moreno, for instance, discussed the barriers to community mesh solutions.

There is a lot of lack of awareness and confidence from within the communities and lack of support and credibility from other partners that need to be involved, from the telecom providers, to banks, to government, to actually believe that this can be possible.

He discussed how these might be overcome through wider publicity and advocacy:

I would think that many other communities would jump into that as the technology, the regulations, and the business models are starting to make sense because in a way access to electronic communications is already there. Mobile network operators are providing access to electronic communications so people are already deciding to spend big proportions of their income on them. So I think it is going to be more of a focus on showing them there are other ways of using that money to communicate more and cheaper and convince other partners involved that this is a win-win situation for all.

Whilst Gurstein put forward advantages and disadvantages of both approaches, and discussed the dominance of 'top-down' approaches in terms of external resources:

1 Richard Heeks and Alemayehu Molla, "Compendium on Impact Assessment of ICT-for-Development Projects" (Ottawa: IDRC, 2009), http://www.cipaco.org/sources/idrc-ia-for-ict4d-compendium.pdf.

Chapter 2
Crosscutting themes in digitally enabled development continued

Each of the two strategies, the top-down or the bottom-up, have their own advantages and disadvantages. But I think the advantage of the bottom-up strategy is its long-term sustainability and viability. Certainly, that's the one which means that if people are invested in developing their own means of access, they are very much more likely to be willing to invest their time and energy in ensuring that that continues. Secondly, the value of the process of the bottom-up, is that that process itself also builds many of the significant applications and uses of the technology as it's going forward. So the link between a wireless network and a local co-op or a local farmer's movement is part of the process of enabling those kinds of community organizations with the technology; as well as infusing the technology into those community organizations and creating a longer-term viable mix and strengthening of the resource at the local level.

I see the two as, in some sense, in conflict or certainly in competition. Looking two or three years out I don't see the likelihood of the community at the grassroots base taking off in any significant way, given that there are very little external resources that go into it, given the social and economic limitations. On the other hand, I see those as being extremely valuable ways of proceeding. So do I think the good guys are going to win? No. Do I think it's worthwhile to support the good guys? Yes.

Our recommendation is to flag "top-downism" as a significant threat to the success of potential access disruptors. No one approach is likely to solve all the remaining access challenges from the ground up, without support of large and deep-pocketed institutions, but neither can those large institutions succeed without community support and buy-in.

Non-instrumental uses

And what would such communities buy into? What if users aren't (always) using "the Internet" "for development"? Our discussions revealed some concerns about what the literature calls non-instrumental use.[2] For example, David Johnson, Leader of the Net4D group at South Africa's CSIR Meraka Institute, reflected:

I am quite critical of the over consumption of too much entertainment and that is probably because I have kids that do it all the time. Of course, entertainment plays a massive part in what people use the Internet for, but I would say if it links to the question of development and human progress, then the knowledge resource of the World Wide Web and the Internet is what interests me most.

Likewise, Kentaro Toyama, Associate Professor at University of Michigan School of Information, highlighted "harmful consequences" which he saw resulting from the extension of Internet access amongst low resource populations:

Conceivably, many of the things that we supply via the Internet are becoming a kind of opium of the masses. People may feel that they are possibly even happier in the short term because they have better access to movies and music and communication with their friends in the city and so on, but it may end up only taking away their own time and ability to engage in more productive activities that could actually support them.

In particular, Toyama voiced criticisms of the potential impact of social networks on productivity:

Facebook is potentially a serious time waster and a killer of productivity for a population that does not know how to use the tool well, and I would count among that many fairly well educated, wealthy people as much as very poor people. But certainly on the whole, people who don't completely understand the value of time and productivity are likely to be the ones who end up spending most of their time in unfruitful ways on products like Facebook.

Yet Osama Manzar, founder of the Digital Empowerment Foundation in India, articulated how such an approach could be problematic and "patronizing":

Whenever we talk about rural we always keep thinking: education is important, health is important. Nobody thinks entertainment is more important, because we think that very patronizing kind of attitude: that they should not watch a movie, they need food first, they need water first, and we do not realize that they are also humans. They do not have as many entertainment options as we have, and therefore they need to have this. We do not realize that. All the time we keep on harping on the necessary part.

2 Araba Sey and Peppino Ortoleva, "All Work and No Play? Judging the Uses of Mobile Phones in Developing Countries," *Information Technologies & International Development* 10, no. 3 (September 10, 2014): pp. 1–17; Syeda Hina Batool and K. Mahmood, "Entertainment, Communication or Academic Use? A Survey of Internet Cafe Users in Lahore, Pakistan," *Information Development* 26, no. 2 (May 1, 2010): 141–47, doi:10.1177/0266666910366650; P. Arora and N. Rangaswamy, "Digital Leisure for Development: Reframing New Media Practice in the Global South," *Media, Culture & Society* 35, no. 7 (October 1, 2013): 898–905, doi:10.1177/0163443713495508; Agha Ali Raza et al., "Job Opportunities through Entertainment: Virally Spread Speech-Based Services for Low-Literate Users" (ACM Press, 2013), 2803, doi:10.1145/2470654.2481389.

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Indeed, several experts outlined how social or leisure users of the Internet provided the initial impetus that drives uptake. Zheleva drew on evidence from her research in Macha, a rural village in Zambia, to illustrate the importance of entertainment in driving demand:

Connectivity brings economic opportunity. It can help promote learning through taking remote classes, it can help promote healthcare…. These are the big topics, but if you go down to what users actually want to do with the Internet, they just want to use it the same way people in the more urban areas or in the Western world do. Do you know what the most access services online that we have found? Facebook, Google and news…. When it boils down to the end user, entertainment is the first thing that they demand, and then other things come around this.

Likewise, Kurtis Heimerl, founder of the community cellular startup Endaga, emphasized how he expected use of social network Facebook to dominate any use of Internet connections amongst rural communities. In response to the question "what kind of Internet do you think people will use." He reflected on data from a school in Papua New Guinea,) to argue:

Right now, we plug into the school's network where they have a satellite connection. We are able to see the school traffic and it's almost all Facebook. Sixty percent Facebook. Then there is some educational content, YouTube, stuff like this. But I would expect it to be almost all Facebook.

Helani Galpaya, CEO of the research think-tank LIRNEasia, pushed back further on a prescriptive approach to ICT use, pointing to entertainment as a driver of demand for connectivity.

We always talk about "oh, people should be checking up on market prices" and "people should be doing this and that." [But] people use the Internet in the ways they want. The evidence at this moment says people want to use Facebook. Which is probably the worst thing that development professionals hear, but if you look at the data that is what's driving Internet use. Now somewhere in that, there is a small percentage of what we development professionals would call "valuable use," and there's emerging evidence for this, that people are finding job information and doing basic communication on Facebook. But people assume that Facebook is a mostly trivial use of the Internet. I don't think we can say because people are poor or rural that they should be using the Internet in a certain way, and the people who are richer and younger and living in cities, "oh yeah they can use for anything they want, that's fine." So I don't think that we can dictate what people should use and how they use it.

Bringing in experience from India, Manzar also laid out the importance of entertainment. Asked what created the maximum requirement on rural community access points, he argued:

Entertainment, education, and general information services that is what I would say. If you ask me to put them hierarchically, I would perhaps put entertainment first. Watching videos, playing games. I would say even going on Facebook is fun, for them it is entertainment because they don't have outside friends…. There are three things people come for. Facebook, YouTube, and then Google basically to search for information

Indeed, the relationship between non-instrumental and instrumental use may not be just competitive, and not just complementary, but even more complicated. Jacob Korenblum, President and CEO of the mobile services company Souktel, discusses this blurring:

We deliver financial literacy content through an entertainment medium; it is actually like a soap opera with a plot. So while we do not really have anything to do with entertainment as an end goal we provide services that have a specific social purpose to them… we look at entertainment as a vehicle for delivering instructional content and that always leads to greater uptake.

I would argue that if you have a cell phone and are playing games you are acquiring some skills that could then be translated into the use of other apps which could have a socioeconomic purpose. So if you are good at categorizing, sorting, making quick decisions, even the basic motor skills, you also know aspects of navigating through your smartphone or responsive touchscreen design. All of that is great and you can bring that over into an app for a socioeconomic purpose.

As a summary, we would suggest that entertainment has a more complex relationship with social and economic goals that makes it hard to define purely instrumental and non-instrumental uses of technology. Indeed, entertainment can act as a driver of demand, can enhance the delivery of content relating to livelihoods and social development, and can transfer skills and improve some forms of digital literacy. These interplays (which will vary in scope and magnitude from context to context) is further complicated by the "blurring" of instrumental and non-instrumental content supported on many of the common content platforms and social networks.[3] Manzar explains:

YouTube is not only entertainment. It is education also. Facebook is not only entertainment or a social network. It is Government also, because our Government organizations are also coming on

3 Jonathan Donner, "Blurring Livelihoods and Lives: The Social Uses of Mobile Phones and Socioeconomic Development," *Innovations: Technology, Governance, Globalization* 4, no. 1 (2009): 91–101.

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Facebook and making official Facebook pages and saying that you can complain there and we will take it. So it is Government also. It is not only entertainment.

As will be reflected in the following chapters of this report, our suggestion is to embrace, or at least understand, entertainment and leisure practices as part of a more holistic understanding of users' digital lives and repertoires. Understanding the way in which entertainment plays into uses of digital technologies is central to identifying the factors which drive uptake, development of digital skills, and the allocation of constrained resources to digital services and devices. Another respondent makes the link back to user behaviors, needs, and repertoires quite succinctly:

"They are going to be using it for social reasons. That is the hook …what are their basic needs and desires? Like what do they want to use it for? That's where you are going to find better triggers for the uptake of the innovative technologies."

Second order divides

If one concern is that "everyone seems to want entertainment," then another might be "not everyone seems to want to use the Internet." Of course these concerns can't both be true simultaneously, but it was the case that discussions with several interviewees stressed that even a successful deployment of physical access infrastructures might not bring whole populations online. Echoing concepts in the digital literature of "second order divides"[4] interviews revealed how gaps in demand often result from limited skills, literacies, and availability of appropriate content. For example, Hernan Galperin, Research Associate Professor at the Annenberg School for Communication at the University of Southern California, explained:

In our estimates there is a sizable "demand gap"…. It could be between 30 and 50 percentage points, meaning you've got 90 percent of the population covered in a country with 2G/3G mobile network and you still have less than 50 percent of people subscribing to mobile data services…. I do not think it is that people don't want to be connected, but finding the right combination of technology, business models, and services is critical in the most constrained communities. It is important to remind ourselves that the demand is just not obvious…as you go into the lower economic levels the value of Internet connectivity is less and less obvious, because the farther you are from people that depend on information as an input to their work it is less and less obvious what the value of a general data plan is.[5]

Various factors help to explain why demand might be lower than anticipated. Jorge pointed to the importance of affordability:

There are many choices that individuals or citizens, need to make. As to "do I get this" or "do I get that"? "Do I get access to the Internet once a week or once a month" or "do I get access to a mobile phone to call my family and see if everybody is alive"? Versus "do I put those very limited resources into getting a little bit more seed for extra corn crop, etcetera"? Those tensions and those choices are very difficult for many citizens in developing countries…. The only way to make [access] realistic is to be very conscious of the cost of providing such access.

Galpaya discussed the importance of network effects and knowledge of the benefits of the Internet:

The majority are not coming online and what are the barriers? We can only hypothesize. One is probably network effects…. The unconnected people do not have a lot of other [connections] who are on the Internet. So nobody is asking you "oh please join Facebook, you can see my kids' photos." They are not in that kind of a network and it could be that you need to break that. It could be they just do not know what is going on. They tried it, had a bad experience because, the connection speeds are low or somebody said "look, you know if you are downloading something you wait for X number of minutes, it's really not worth it." It could be a whole lot of things…I am not saying I have the answer to this but there's a real problem which is not just about price. Skills and digital literacy have also been raised as key barriers to wider uptake of Internet access.

Skills and digital literacies have also been raised as key barriers to wider uptake of Internet access. Galpaya also noted how these remain substantial, non-infrastructural barriers:

So digital literacy is a barrier, although I am yet to see strong sort of systematic evidence on how you solve that and then lots of people come online…. Language [is another]. Language has many multiple dimensions. So, obviously the fact that most people don't speak English is a problem if most of the content is in English…. Then the language problem comes across in other more technical ways, like in Myanmar fonts…. Language and fonts are related and they are part of the problem.

4 Eszter Hargittai, "Second-Level Digital Divide: Differences in People's Online Skills," *First Monday* 7, no. 4 (2002): 1–20; Jan Van Dijk and Kenneth Hacker, "The Digital Divide as a Complex and Dynamic Phenomenon," *The Information Society* 19, no. 4 (2003): 315–26.

5 Raul L. Katz and Hernan Galperin, "Addressing the Broadband Demand Gap: Drivers and Public Policies," SSRN Scholarly Paper (Rochester, NY: Social Science Research Network, December 28, 2012), http://papers.ssrn.com/abstract=2194512.

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Likewise, Gurstein put forward a distinction between mobile use of Facebook and use of wider digital resources:

I was recently in Egypt and talking to some people about where they want to go, in terms of their digital investment…. What I gathered there was three things. One, it was very low connectivity. Two, there is extremely low literacy of any kind, let alone digital literacy. Three, there was very little knowledge, and what they really needed or what they were really looking for were ways of getting some kind of digital consciousness into those villages, into the young people, and into the schools, and into the teachers, and so on. Not that they had any less proportions of mobile users in those communities than anywhere else but somehow—and I think this is maybe more common than we would anticipate—there's a "disconnect" or perceived disconnect between people who use their mobiles and even access Facebook, and people who understand or are thinking about the Internet, for example, getting teachers to think about digital resources for the classroom.

Another concern is the lack of relevant content. One respondent[6] discussed how both content and recognition of the value of particular content acted in tandem:

There is so little content on the Internet for people. For example Wikipedia, how many pages in regional languages? So the question is, how many of us…are willing to contribute content and how do we do this? [Another] part is the capability for the people to recognize the value of the content. So I do not want to be preachy about it, but the point is that many people say, look "I am a farmer. I want to know about my crop, fertilizer, or subsidies that the Government gives me, what other need do I have? I really do not need to find much else on the Internet."

Francisco Proenza, Professor at University Pompeu Fabra Barcelona, described links between public access and ICT skills:

If everybody has phones, a lot of the communication and networking needs are provided for. I have seen many attempts to have market information systems. But the best market information system is you call your buddy in the next field: "hey, how much did so and so pay for that." And so the big powerful communication and demand is going to be supplied. Having a phone substitutes that part, so the question is what are the other parts that you do not substitute? I think it's the learning…. People are hungry for [ICT] training because they know that if they want a job, they better be trained and there, you know, schools are not always providing that kind of assistance. …Now, my question is, what is happening with the schools? If the schools are providing ICT education, which is very seldom that they do, then you don't need anything else, but chances are that schools are deficient and it's useful to have a telecenter, a training center that supplements school facilities…. And it needs to be subsidized.

Paul Garnett, Director of Affordable Access at Microsoft, discussed technology labs and shared access points introduced in schools. He noted the importance of both technology and Internet access and offline training in supporting the development of digital literacy skills for children:

It is a combination of online and offline [access allowing users] to essentially have access to all kinds of new learning content that they didn't have before…what we make sure happens is also a training piece for the teachers themselves because, there are a lot of sad stories about technology being delivered to schools and even Internet access delivered or both and it's really not being used because the professionals who are in the schools don't really know how to use the technology.

For all these reasons—skills, content, awareness, relevance, it may be a while, if ever, before 100 percent of people in a geography or target segment come "online," no matter how much progress is made on the access challenges. Yet we would suggest that this is not a terrible outcome in the meantime; it just means that, on the one hand, initiatives to close digital divides have to account for these second order divides, and that, conversely, great strides can still be made in "access." Song explains

I'm a big fan of the generative nature of the Internet and how it allows business models to emerge from local context and need, like the emergence of Nollywood…you know that phrase from Field of Dreams you know "build it and they will come"? That was a term that came to be vilified in terms of websites, how building a website in no way guaranteed that anyone would come to view it. However, when it comes to access I do believe that "build it and they will come" works and that when you build affordable access people use it. The demand always fills what is available, assuming access is truly affordable.

6 In a few cases participants are not named, when they requested that a specific quote be published without direct attribution.

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Constrained connectivities

So what needs to be built? It is not surprising that in ICT4D practice, compromises are required; there are elements of constraint throughout last mile and broad-access modalities. However, these compromises make for a far more varied conceptual terrain than was the case with the "universal access" efforts in telecommunications—everybody being near a phone and a dial tone—establishing what constitutes meaningful or valuable or even sufficient Internet access is increasingly difficult.

We opened our discussions with an icebreaker question about "why connectivity was important," but this often led to a discussion of what kind of connectivity was important. Experts put forward very different ideas of what a minimum level of Internet connectivity would look like. Osama Manzar suggested that some kind of "broadband" access would be central to social inclusion of isolated populations:

Not just mobile connectivity, but broadband connectivity.… It should be taken as a primary right. Because it is my understanding that for the last 10 or 12 years, everything is now dependent on connectivity…because the world is becoming more and more online. If you do not do rural online then you are—if not by design but certainly by priority—giving priority to the provision and rights and entitlements to the rich people or the middle class or lower middle class and not to the poor.

Others, suggested that contextually specific answers that provide "as much as you can get" might be a pragmatic answer. For instance, Zheleva argued that:

People are excited to get as much as they can. We have seen a lot of benefits in communities that have been connected through simple services such as voice and SMS, but once you get access to more advanced services and you understand benefits of having access to the Internet, it gets harder to depart from having it. So, it is good to have whatever level is possible, depending on the context. Ideally, you would have the full portfolio of Internet connectivity services.

Likewise, Sonia Jorge, Executive Director of the Alliance for Affordable Internet, set out affordable broadband as an ultimate goal, yet discussed how constrained and limited Internet use should still be considered of value:

In many places an "Internet user" refers to the ability to go once a week to a place where you have access to the Internet and then go back the next week and catch up and do what you need to do. In some very remote or marginalized communities, the ability to do that once a month is an incredible opportunity. Is that what we want? Absolutely not. That is something that is good to be there. It is good that people can see what they can get, but it is definitely not what we want folks to have. The ultimate goal is to have what many of us more privileged already have, which is 24/7 access at affordable rates to the experience that the Internet can provide.

There is also a need to understand how access is constrained beyond Internet infrastructures. Galpaya outlined various factors that intervene to determine a user's experience. Asked what would constitute a "minimum infrastructure" she noted:

So I would focus primarily on two things. The first is the pipes. And I don't necessarily mean physical pipes—they could be wireless—but I consider all of this how the data travels from one place to the other, so it could be a combination of spectrum and the big pipes. But the pricing of that, open access to that or costing data into transparent pricing. And bottlenecks removed, whether it's local or international. I consider that a very, very basic infrastructure.

Then there's the question of the end terminal. So there's a different type of experience that we get out of a big screen versus a computer, versus a mobile phone. We would be talking about a world where we all have computers, but the fact is we do not. So the reality is that the terminal device is going to be some tiny screen. Then the basic infrastructure is how do you optimize everything to make sure the user experience is as good as it can be on a very tiny screen? So that experience and the optimization I would put that under basic services, because that really impacts how people feel about using the Internet and their experience and whether they are going to continue using it or not

This discussion of experiences invokes both the digital repertoires and access modalities lenses we described in Chapter One. It is not the device, or the network, or the service that structures the nature of an Internet experience, but rather it is a combination of these factors, and more.

It also depends on what value and meaning users see in their experiences. Susan Wyche, Assistant Professor at Michigan State University, discussed how in the fieldwork she conducted in Kenya, mobile phones continued to be seen as communication rather than information devices:

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I don't think they see the phones as devices that deliver content, they are just using it to call people. I am thinking of some examples I have heard, so I have had people who are interested in the Bible and learning about the Bible, and sharing input from things they learn in church and that kind of information online.

And, indeed, communication, particularly voice, may still information as cornerstone of connectivity.[7] As Song argues,

Voice is still the killer app of access. It addresses issues of literacy. It addresses issues of knowledge flow in terms of what can be communicated. It has always been underrated in the access sphere and tends to get discounted exactly in this kind of discussion where we talk about Internet connectivity. It is the elephant in the room if you like in terms of communication infrastructure.

There are demonstrable benefits for anyone with access to those technologies. You know as simple as being able to ask for help or staying in contact. The social safety net is enabled through communication infrastructure, and then there is the economic side of access which is simply being accessible for employment or being able to communicate skills and your ability to participate in employment. So I think a lot of the benefits of Internet connectivity are not so much to do with the resources on the Internet, but more about connecting people to people…. The primary benefit actually comes from the interpersonal contact that is generated through these services.

And yet, the bright line between "phones" and "Internet" is collapsing thanks to the spread of mobile data, Song again:

I struggle to disaggregate access to communication in general from Internet connectivity…. These technologies form a continuum and the overlap between voice and data gets very, very muddy, especially when you talk about applications like WhatsApp or traditional technologies that are now carried by data infrastructure. So I would refer to it as "communication infrastructure" in general.

Likewise, Rey-Moreno noted how voice over IP (VoIP) was being integrated into community mesh telecom network he works on in South Africa.

So even though I am talking about voice, there are ways of making the voice cheaper by using data, by using IP networks instead of GSM networks to reduce the cost of voice communications. In this case (VoIP), voice is also data because at the end of the day it is transported in IP datagrams which is what you call data.

It is important to understand how this convergence influences the way in which users understand and use Internet-enabled technologies. Eduardo Villanueva, Associate Professor at Pontifical Catholic University of Peru, pointed out that how distinction between "the Internet" and particular applications is fuzzy for many users.

The Internet is something different for all people. What a significant number of people understand is cellular, cell phones right now are devices that allow you to do a number of things, including Facebook, WhatsApp, and so on. They aren't necessarily aware that there is such a thing as Internet. They just get to get what they want in a cheap way and when they're told that, for instance that Facebook exists in computers too, they say "okay it's great" and there's an Internet connection and it's a different cost and everything is okay, they use it. But it's not necessarily awareness that there is such a thing as the Internet separated from cellular services.

These overlaps between voice and data, between communication and information, can make calculations of affordability very difficult. Galpaya outlined how benchmarks for the amount of data consumed were shifting. Yet she also highlighted how such benchmarks often depend on context:

You look at connecting people. You need some kind of affordability barrier for some entry level Internet package. Then in a few years you benchmark yourself and think "oh, 500MB is really nothing, we need to be looking at you know maybe 8GB a month" or something like that. The target is moving…. I think it really depends on whom and when, not just what. For example, if you can't afford anything else it may be the case that 500MB is good enough for a very short period of time. What we find when we talk to young people is they want to consume a lot. So 500MB is not enough.

7 Jonathan Donner, *After Access: Inclusion, Development, and a More Mobile Internet* (Cambridge, Mass., USA: The MIT Press, 2015).

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Jorge argued that the "ultimate goal" for the Alliance for Affordable Internet was "unlimited 24-hour access to experience what the web can provide." Although not overtly critical, her discussion touched on the value of an open, un-curated Internet experience. She touched on what the "experience the web can provide" should be, and how it remained out of reach for many:

The ultimate goal is to have what many of us more privileged already have, which is 24/7 access at affordable rates to the experience that the Internet can provide. Whatever the experience is, whatever the choices that the citizens make to use that connectivity is up to them, but they will have that choice to make for themselves. Right now, very few people actually have that choice at that level.

If the "full" Internet is not available all the time at a cost that the resource constrained can afford, there are several compromises and constraints available:

- Users can pay for a little bit of the "full" Internet at a time. Examples of this include metered use, common on cellular networks.
- Users can access the "full" Internet, but only for a limited time or limited level of use. Examples: public access and public Wi-Fi) with time limits or MB vouchers.
- Users can access a restricted, curated Internet, where subsets of content are selected, cached or subsidized, and then made available to them at lower cost. Examples of this are zero-rating (subsidizing) the data charges to visit certain sites via mobile networks (Facebook's Internet.org/"Free Basics" program does this in several geographies), and broadcast technologies, for example satellite broadcast startup Outernet.

A broad technical discussion of these trade-offs is beyond the scope of this chapter, however, it is worth flagging that these are complex decisions to make on someone else's behalf. Gurstein put forward some of these issues with others determining particular use cases of the Internet at the cost of others:

You begin the process [of using the Internet] very often in halting or very unsophisticated ways, where people begin a process of exploring via the Internet. Now somebody standing outside of that, like a Facebook standing outside of that, or a regulator standing outside of that, can say well "these people don't need anything much more than Wikipedia or Google or 500 megabit caps because they're never going to use it." Well, that may be true but it is not for those outsiders to say. That is not what they should be saying, because they do not really know and the reality of the opportunity of the Internet comes from not having that question asked and answered in that way.

Arjuna Sathiaseelan, Senior Research Associate and leader of the Networking for Development Lab at the University of Cambridge, suggested that rationing, although less than ideal, could be a solution. He argued that rationing in terms of capacity (rather than time) was likely to have greater benefit:

I do not think capping someone's usage for half an hour or time limiting would be an ideal solution. Of course, if there is no other options then it is better to have something in place…. But I don't think capping per se in terms of time is the right option. Whereas capping per capacity would be a much more ideal option, because you can always access the Internet when you need it.

Gurstein refuted the idea that there could be a minimum number of bits. Instead, he contrasted rationed access with what he saw as the "generative nature" of the Internet:

There cannot be a minimum number. There cannot be a minimum number or a maximum number. I mean it is the capacity to use the platform. That is in the free, open, and freewheeling way that we are able to use it.

He raised an important critique about how both curated and rationed approaches constrain what users could achieve and make assumptions—which through implementation can become truths—about how resource-constrained users will use the Internet:

The problem with [zero-rating] applications, as is the problem with a 500MB cap, is the assumption that the Internet in some sense, is a consumer's device. What you are doing is you're consuming, not producing. In the zero-rating scenario the assumption is that Facebook knows what you want to consume on the Internet. You want to consume Wikipedia. You want to consume Google. Whatever it is, they have some knowledge of what it is you want to consume. Even if they engage with you to find out what it is you want to consume, there is the assumption that you know what it is that you want to consume. At the base of the Internet is that we do not really know what it is we want to do with the Internet before we actually start doing something with it. That, I think is as true for people in remote villages as it is for people in developed areas. What they will use the Internet for, as a productive device, is not something that is predictable. It is something that they have to have the opportunity to work their way through. And the problem with the 500MB cap, or Internet.org approach, is that they're assuming that you are simply consuming and not that you're engaged in a process of production.

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In contrast, Galpaya examined the assumptions behind the notion of unlimited Internet for all, to argue that this norm might be unnecessarily costly. Discussing a 500MB minimum, she outlined:

The question is do we now all want unlimited broadband connections? Sure, in this theoretical world we want unlimited broadband connections, but I run a whole office where people have dongles with about 1-2GB downloads. Of course, they come to the office and we provide them Internet but when they go home, they have 1GB, so it's complimentary use. It is not their only use. So 500MB is better than nothing. Is that enough? No. Sure, I would like unlimited broadband in Sri Lanka but I actually do not have an option for unlimited broadband.

Comments by Zheleva also revealed the complexity entailed in attempts to determine the optimum amount for users to consume. Her research revealed how, paradoxically, increasing the bandwidth available to the community through a higher-bandwidth gateway resulted in lower performance for the community:

One of our studies in that community in rural Zambia focuses around the transition of their community gateway from 256KB per second satellite link to 2MB per second, three times more expensive wireless terrestrial link. You would think that the increase of bandwidth to the gateway would promote better adoption and better network performance, but what we see happen is actually quite controversial. The network performance deteriorated. Just because people saw the increase in capacity… and began adopting more exciting services. So while before they were only able to browse textual websites, now they are going to upload photos to Facebook or stream videos. And that actually ended up deteriorating the network performance.

This example illustrates the complexity entailed in any attempt to calculate what might be enough. She outlined how this might relate to determining minimum access:

It is hard to know how much is enough really. It would depend on the adoption of Internet services, how the demand looks, and how is it going to change as you introduce more capacity. It is not a black and white problem. I do not think you can identify a threshold where if you provide gateway of a certain size it will be fine.

James Cemmell, Head of Government Affairs at the Satellite Company Inmarsat, discussed the role of cached content as part of a broader offering:

Demand for content and information is defined very locally. So it is difficult to go around to every community on the planet trying to figure out what is the 80 percent demand for content, and then tailoring that content and then pushing it, unless you're in a commercial enterprise and you're making money out of doing it.

You can to some degree work with local government or enterprises in local communities to identify some key content that needs to be there. That would give people a lot of utility, but that also needs to be complemented with unique content. In Kenya, I think the method we are working to is 80 percent cache, twenty percent over the air. But that could be a lot of cached data. Even if you look at some of the new LEO constellations that have been discussed, they are talking about using a lot of caching as well. For example, they are talking about caching the education syllabus for a school. You don't need to go to create a Cloud environment specifically to do things in cases where you know you're going to be accessing the same content.'

In sum, although it is easy to put forward ideals of widespread "broadband" and unlimited connectivity, interviews reveal a far more complex picture. The notion of "broadband" is complicated by metered, rationed, and curated "solutions" which offer Internet access with some degree of constraint. These solutions are increasingly a reality in attempts to bring isolated and resource constrained populations online, and, as we'll show in the next chapter, the constraints and trade-offs inherent in the way a limited Internet is priced and made available will be reflected in the choices and adaptations made by users.

Elusive silver bullets

The upshot of the four tensions is the basis for the fifth, and perhaps most important, tension we will discuss. There is no single, universal modality which will resolve all the access challenges. That leading ICT4D experts can disagree about the paths forward is itself good evidence that we should be pursuing multiple, complementary modalities rather than a single silver bullet.

Consider these contrasting quotes on what the "future" of connectivity entails. Funke Opeke, CEO of the Nigerian telecommunications infrastructure company MainOne, suggests the future is "mobile":

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Mobile will see further developments in technology, as well as availability of new kinds of spectrum, but I really think the future is mobile, because the areas where you have these two billion people are where we are most lacking in infrastructure and economic capacity. So I do not believe in a loon or a drone or low earth orbit stuff being the solution for underserved and impoverished people, I truly believe its leveraging on solutions they already have access to, or solutions whose costs have been partly defrayed by other services.

While another respondent says the future depends on fiber:

But at the least the majority of the work is just work which needs to be done and that will be much more mundane technologies like, extending fiber networks to reach those communities…. I'm not a believer in these moon shot kind of theoretical magic technology approaches, I think it's just the hard work of building out systems, very similar as I see it for electricity. Ultimately, we need to build all these types of networks and connect people to them….

Echoing the sentiment about "all these kinds of networks," Steve Song reminds us that fiber, unlicensed spectrum and GSM, will need to work together as an eco-system:

I think that the combination of fiber and unlicensed spectrum, Dynamic Spectrum, Micro GSM initiatives together is going to deliver far more access than any drone satellite, or balloon ever will. The reason for that is that access is an eco-system; it is more than just one particular technology of access. Affordable last mile access will depend on an environment that allows a diversity of access solutions to flourish.

Sathiaseelan underscored the importance of understanding fiber in the context of other infrastructural constraints:

So you can put in fiber infrastructures, but if there is no proper content, or services, or content server infrastructures provided by Google and others because there is no peering and they are using satellites to peer into the European Internet exchange points and stuff, then latency starts being an issue. To answer your question whether fiber is actually needed or not: it is needed, but then you need to create a demand for it. And for that you need to solve the other problems [such as content and services].

For now it should be clear that because of the variety of access challenges, and in light of these durable tensions around community involvement, non-instrumental use, second order divides, and variants of compromised and constrained use, no silver bullet will emerge. We must be comfortable with multi-actor systemic thinking, and new variants on the "network of networks"[8] that is the Internet.

Discussion

The discussion section focuses on the implications of these five themes for those who seek to use digital technologies in their development practice. We first deal with the gaps (and potential complementarities) between practice and theory, and then discuss how these general themes may influence how to evaluate new and disruptive Internet Access Modalities.

Merging theory, technical change, and development practice

Interviews pointed to various tensions between those working within the frame of ICTs for development. Several respondents discussed the difficulty aligning approaches within academic, development, and technologically focused communities of research and practice.[9]

Mark Davies, CEO at Esoko, noted a tension between those working in development and tech-focused businesses. He explained how the actions of development agencies and other actors could dramatically reconfigure markets for start-ups, with negative consequences:

The other piece is the disruption of development [itself]. Service providers, whether they be private or public, struggle with a very unpredictable market. I come from the private sector and we are working in scenarios where we may be out of business tomorrow because the World Bank has chosen to do something. I think there is a danger in development. I do not think that there's really good accounting that exists locally when you enter some of these markets with some innovations. I think you are asking some questions but generally people come up…and say here's a project, we want to do it. So I think there's a danger and I think that conversation isn't discussed enough. And then obviously I think there isn't really any real accountability in terms of how most of the development factor is working. I know that is a whole huge other topic but I do think that it translates into very real opportunities and challenges on the ground, when you are looking to deploy services like ours.

8 Paul Craven and Barry Wellman, "The Network City," *Sociological Inquiry* 43, no. 3–4 (July 1973): 57–88, doi:10.1111/j.1475-682X.1973.tb00003.x.

9 Arul Chib et al., eds., *Linking Research to Practice: Strengthening ICT for Development Research Capacity in Asia* (Singapore: Institute of Southeast Asian Studies, 2012).

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Likewise, Gurstein examined how technology communities focused on particular issues. When asked about the degree to which the tensions between "bottom-up" and "top-down" approaches had been considered in projects he had worked on involving the design and development of new technologies, he echoed established points[10] in the ICTD literature by noting:

In most cases, from my experience, it never did. Partly because, you are starting with the telephone engineers. Their interest is in getting the hardware out there or getting the connectivity out there, in the most effective and the cheapest, most technologically proficient fashion possible. That does not often involve the very messy and much slower processes of engaging with communities. The fact that you will find the history of those kinds of processes over time is a really a dire one. A history of failed projects and programs…and expenditure of huge, and wasting of huge amounts of resources—unfortunately the lessons have not been learned. I mean the South African Government spent 125 million Rand on their first telecenter program. They just basically dumped the telecenters into the communities and said, "Go ahead. Do with it what you will." Well, once the money ran out the operators and local managers skipped and took the technology with them and they burnt down the centers and that was it. It is that top-down process which is continuously being repeated.

Several respondents also noted difficulties with the pace of academic research. For instance Gurstein, [himself an academic], noted the challenges of aligning policy informing research with the topics and the demands of academia. Reflecting on an upcoming conference he noted:

I think that not a lot of the conference conferring is going to deal with these kinds of issues because there are not academic issues. There are in a sense, practice issues, or policy issues that we have been discussing. I think that's a major failing in the academic environment that these kinds of dynamic issues aren't able to be absorbed or reflected in the academic world, at least in a timely fashion.

Heimerl noted how the pace of technological innovation sat uneasily with research attempts:

None of it should be ignored, it is technology, there is churn, ideas need to be tried, you cannot predict in advance whether these things are going to work or not, and that is something that the development community needs to have a better understanding of. You cannot spend five years analyzing whether this thing is going to work or not, because things are going to change in five years.

In all, we would suggest that the five overarching themes are worthwhile for practitioners and technologists to keep in mind as they are engaging with the work of ICT4D and digitally enabled development. Engaging on deep issues about the nature of digital solutions, they might best be seen as complements to more practice-oriented Principles for Digital Development that have recently been shared widely in the ICT4D practice space.[11]

On how to think about moonshots

Finally, and as a conclusion for the chapter, we can think briefly about the five themes as a grounding for discussion about disruptive access modalities. This is not a general assessment of the prospects for these technologies (that is for another report) but instead, simply a few framing thoughts about some of the new ventures generating buzz in the popular and practitioner press (Drones, Low Earth Orbit Satellites, Balloons, etc).

The first sense, from our respondents, is that relatively little is known about these projects, beyond what has been released by tightly controlled media programs by Google, Facebook, SpaceX, etc. Song noted:

I think it is pretty clear that they're not relevant yet and we haven't seen any of them in active operation to my knowledge but do they have the potential to be relevant? I think they're very interesting experiments and I will be very pleasantly surprised if any of them pay off. If you are asking me would I bet on their success? I would not.

10 Richard Heeks, "Information Systems and Developing Countries: Failure, Success, and Local Improvisations," *The Information Society* 18, no. 2 (2002): 101–12.

11 "Principles for Digital Development" (Digital Development Principles Working Group, 2015), http://digitalprinciples.org/wp-content/uploads/2015/05/Principles-Overview.pdf.

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Experts discussed various unanswered questions that would prove difficult for what Google and Facebook are trying to achieve. Without details, there was room for healthy skepticism. About Facebook's proposed drones, Zheleva wondered:

On top of the few basic questions about technology, including cost and robustness and energy efficiency and all that, there are other questions of feasibility. For example, how stable can they be if you are flying so many kilometers above ground? A little deviation in position might end up shifting coverage completely out of the community. All in all I just look forward to seeing more specific reports from deployments of these technologies, and to actually see them work in the field. I think they are promising, but, I think they come with more challenges than the more terrestrial based counterparts.

Likewise, another participant raised the issue of spectrum:

Google, Facebook, you know, they are spending non trivial amounts of money, in solutions for this, so that should be a bit of a wake-up call to progressing from a regulatory position…. [But a new regulatory question is] how you are going to get a balloon or a drone to co-ordinate because spectrum is going to be different in every country, and if it is traveling globally…those kinds of questions that they are going to be interesting to answer in the future.

With one of the strongest warnings about top-downism expressed in the interviews, Jane Coffin, Director of Development Strategy at The Internet Society, put forward a more fundamental critique of the use of drones:

Saying this from someone's perspective who's been on the ground…you are going to tell me that this is going to work in my community and you don't know me, you don't know how I think and what my social norms are, right, and you're going to come in as Company B, and it looks like it's a marketing scheme, it doesn't look like you care at all about the community, that you care about the country and that you are there for the long term. A lot of people see Internet technology as fast, quick, people who are trying to make a lot of money and they don't think of it as something where people want to be socially invested, and I would say that some of the roll out for some new Internet company platforms, was not well done.

In a similar vein, Zheleva discussed the importance of integrating a technology within the community.

Imagine you are a farmer taking care of their crops and all of a sudden have this futuristic thing fly above your head and bringing who knows what…[it] can't be just, be dumped onto people's laps without some sort of introduction

And, drawing on the silver bullets and second-order divides frames, Tim Hatt, Director at the GSMA, raised how these solutions would likely complement existing cellular connections rather than substituting for them.

I do not believe that they are actually trying to disintermediate mobile operators from connecting individuals and step in as full-play, connectivity providers. Partnerships [with operators] are needed to scale these propositions, even in remote rural areas. I think that's been evident through Google's Loon partnerships—with Telstra in Australia, Vodafone in New Zealand, Telefonica in South America—and indeed some of the satellite players (Thuraya has a partnership with Airtel in Africa to backhaul from remote communities through satellite linkages). I think these types of solutions are innovative and interesting given that they could help to address coverage gaps in rural areas where the economics of rollout are very challenging, but ultimately for scale and viability, partnerships with operators are a necessity.

We need be mindful of shifting narratives and changing business models without discounting the exciting prospects, entirely. In the meantime, in the right-now, the missing piece to situate discussions of these disruptive modalities not only light of the five themes, but from additional insights about demand and use patterns "on the ground" among resource-constrained communities. That is the topic of the next two chapters.

Chapter 3
Use in context: Voices from users

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Aim

This chapter explores trends in ICT use in Sub-Saharan Africa, and specifically the digital repertoires and content consumption patterns of young people in Ghana, Kenya, and Uganda. These descriptions answer the foundational question that drives this research—"what do digital repertoires, usage practices, and content consumption patterns look like amongst young digital technology users in Ghana, Kenya, and Uganda." This question aims to transcend a divide common to much research and thinking on digital technology in development, between what is considered "instrumental" and "non-instrumental" use. It does so by framing questions that aim to develop understanding through focusing on users' perspectives on the practices and patterns that characterize their digital lives.

We approached these questions through a bottom-up, inductive research strategy exploring "intuitive," demand-led usage patterns and digital repertoires in Ghana, Kenya, and Uganda. The broad, open foundational question was further developed through an iterative process that led to more focused questions that explored users' perspectives on their digital repertoires, usage practices and consumption patterns of news, entertainment, and functional tasks of education and job-seeking. Whilst the research questions and strategy are inductive and descriptive, the ultimate aim of this research is to draw insights that can contribute to the design of development interventions more likely to succeed because they go "with the grain" of existing digital practices.

Our research shows that for most users, consumption of digital content is dominated by news, games, music, movies, and social networking. These findings echo themes in the existing research literature, further advancing these themes in three ways:

First, we show the value of exploring non-instrumental use in revealing new insights about individual digital repertoires in practice. Although these activities are non-instrumental in the strictly functional sense, the situated practices that surround and enable them reveal the extent to which digital repertoires are part of individuals" everyday lives, from waking, throughout the day and even as people sleep, watched over by alarm clock applications.

Second, we also find that these practices often mirror similar practices in more prosperous parts of the world, where the transition to digitally mediated daily life is further underway. These commonalities signal the importance of a widening array of issues associated with the digital shift, from political engagement and the distribution of content, to the pro-social value of gaming. The terms influencing inclusion, participation, and expression are being renegotiated and impacted alongside those for development and wellbeing.

Finally, and perhaps most significantly, we find that non-instrumental consumption practices are interlaced with very functional tasks, as users exploit their digital repertoires to find jobs, advance their education, and increase their income. This entwining of instrumental tasks on social platforms offers great opportunity to develop interventions that "go with the grain" of intuitive technology adoption and use, but carry their own set of constraints and challenges, not least of which is the reality that for most, online social network platforms by default tend towards enabling interaction within offline social networks. The chapter concludes with pointers for future action, particularly around understanding better the dynamics of this linking of social and instrumental usage practices.

This chapter is structured as follows. First, we briefly review the questions, data collection, and coding methodology (with greater detail available in Appendix 1). Although this was outlined in the introductory chapter, we provide more insight into the process so as to contextualize the findings. Secondly, we review findings that explore the practices and implications around the consumption of popular content genres, namely news, music and movies, and games. Thirdly, we explore in depth some of the functional tasks that users pursue through social networking platforms, focusing on job-seeking, education, and income generation. We end with implications and recommendations for development practice.

Questions

Our research approach was developed as a strategy to answer a basic, fundamental question: "what do digital repertoires, usage practices, and content consumption patterns look like amongst young digital technology users in Ghana, Kenya, and Uganda?"

This inductive, bottom-up research question was refined and unpacked through an iterative process that started with a substantive and systematic literature review, discussions with experts and colleagues in each country, and pilot interviews and focus groups. This iterative process led us to develop further, more detailed questions that probed the practices and consumption patterns that the literature, experts and pilot respondents had indicated offered the richest vein for further enquiry. This funnel like approach—starting with a broad umbrella question and following with an elaboration

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of more refined, probing yet still inductive questions—reflects the broader shape of this report. The report, which started with a broad illustration of the terrain of digital technology in developing countries, is now transitioning to sections which hone down on the specific repertoires and consumption practices of users in Ghana, Kenya, and Uganda.

Methods

The methods adopted for the empirical research chapters of this report were selected to reflect the nature of the questions and the underlying principles of the report. That is, the methods reflect commitments to understanding digital repertoires from a users' perspectives, and to giving space to allow the voices of users to come through directly.

Data collection

We carried out a total of 30 focus group discussions (FGDs), 10 each in Ghana, Kenya, and Uganda. We selected focus groups as a method specifically because of the interaction between respondents and discussion they generate (while also bearing in mind the restrictions of the group environment[1]). In each country, five groups were conducted with female respondents and five with male respondents. Both for the sake of efficiency and to achieve deeper insights, we worked with experienced, local facilitators—a male and female team in each country.

Focus groups were conducted in a mix of English and local languages (Kiswahili in Kenya, Ga in Ghana, Lusoga in Uganda) in peri-urban areas of Nairobi (Thika and Limuru), Jinja, and Accra. In total, these 10 focus groups resulted in a sample of 198 group participants—105 men and 93 women. We had experience working with all the facilitators, but to ensure quality control, we also considered the first focus group (on news) a pilot study. The pilot helped verify facilitator skills, and align expectations through feedback and debriefing. Later, when some of the transcripts revealed use of technology that seemed particularly sophisticated, we checked back with the facilitators to ensure that they were working with the required demographics. The responses were reassuring both because we were confident that they were targeting the right demographic, and because they confirmed that our questions were generating informative responses.

From Kenya, our facilitator reassured us about the demographics:

"The overall screener was 7,500 Kenyan shillings/month ($2.50/day). I am sure if we recruited participants who earned a higher amount, they would be even more tech savvy! For myself, I do not see this as unusual. From my own experience, especially in urban environments, youth tend to see the value of technology and are becoming increasingly tech savvy."

[iHub management, Kenya]

Whilst in Ghana, the facilitators confirmed that our questions were producing useful and informative insights:

"we didn't expect people from this area to be so sophisticated…the way they dress, the way they talk, we, I had a certain perception. Then they start showing you things they do with their phones and…I mean…even I don't know all this."

[Charles, Ghana facilitator].

All data was transcribed and subsequently analyzed through Dedoose—a free and open source qualitative coding software (for codes see Appendix 1).

Findings: Content Consumption

This section outlines the consumption patterns and implications of news, music and movies, and games. For each of the content genres, we outline emerging practices and their positioning within digital repertoires. We also show how these practices related back to consumption patterns, and to issues identified in the literature.

News

"When you're listening to TV or radio you listen to what they are saying but when you are browsing you are searching for a specific thing unlike when listening to radio where the tell you and choose for unlike using a smartphone where you choose for yourself. Like if Obama is coming next week you choose on what to read unlike when they are telling you they choose for yourself."

Melanie, a 23-year-old barber from Kenya.

News is one of the most common categories of content consumed by respondents in the FGDs, as well as in the wider literature. It is important for issues around civic and political participation. Changes in the consumption patterns of news raise questions about the role of news in civic and political development.

1 Kamberelis, G., & Dimitriadis, G. (2014) "Focus Group Research: Retrospect and Prospect" in Leavy, P. ed. The Oxford Handbook of Qualitative Research. Oxford University Press, Oxford, pp. 315-340. Ritchie, J. and Lewis, J eds. (2013) Qualitative research practice: A guide for social science students and researchers. SAGE, London.

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Diversity and Polarization

Changing news consumption patterns has a big impact on content diversity. Research in 2014 by the Reuters Institute of Journalism in five developed markets found that smartphone users access a narrower range of news sources than desktop or tablet users, with 37 percent using a single source each week compared with 30 percent on the latter platforms.[2] Yet only around 1 in 10 online news consumers pay for it. Pew research suggests that digital devices appear to be an additive experience, rather than displacing existing news sources with 24 percent of consumers gaining additional news sources on two or more devices. Although laptops remain the primary platform for 54 percent of Americans, around half of all desktop owners also own a smartphone.[3]

In our research, many respondents described how they accessed news via social media, particularly Facebook, on their mobile phones, emphasizing the flexibility of use and constant presence of device and network access. As one male respondent from Kenya said:

"Most of the time in my case I am using the mobile because I am with it everywhere I go so if I want to go to the Internet to check my Facebook or maybe I want to search for something I just use my mobile phone because it's portable and I am with it everywhere I go."

Accessing news on Facebook for many is characterized by actively visiting a specific page. Melanie, a female respondent from Kenya, described accessing a local newspaper's page:

"I use Facebook. When I want to know what is happening around this place I get to Limuru wall book and see what's happening on Facebook."

In Uganda, Musoke describes accessing specific newspapers:

"On top of entertainment, I also use my phone to get news. Like for example, I am basically interested in the local news because there is no need to know the international minus knowing what is happening in my own country. Like I can read New Vision online, I can read Daily Monitor."

In Ghana, Briana describes how increasingly turning to social networks displaces existing news sources when accessing information that matters to her:

"I now get information from there, from Instagram. News on celebrities like if someone famous dies I get to know through Twitter, SMS, WhatsApp."

Financial Implications

Changing consumption patterns also involves changes in financial behaviors, particularly when digital content displaces traditional media. As Picard notes in the Reuters Institute Digital News Report, changes in advertising and content consumption paint a picture "of low growth in paid content consumption and a digital advertising market that is not highly favorable for news providers."[4] As with other forms of digital content, the shift from physical material to digital data heralds changes in advertising as well as consumer purchase, who are increasingly shifting towards a "metered mindset," in which content is financially assessed in terms of the cost of data rather than the cost of content. The implications of this for media organizations and the sustainability of independent media that supports civic participation and democratic accountability are complex. As Picard goes on to note, "The outlook for local digital news remains uncertain. It is proving difficult for local news providers in many countries to gain large numbers of paid digital users."[5]

These trends are evident in our research as well. In Kenya, for example, when asked if anyone had paid for the news they accessed via the Internet, one male respondent replied:

"No. It will depend if it's a newspaper I would pay for the newspaper but when it's on the net, no."

Aaron, also in Kenya, said:

"Most of the times I use WhatsApp as he has said it's cheaper and the others I use when I find free Wi-Fi and download things."

In Uganda, Kitamirike and Mwesigwa describe how they now rarely pay for the news, and are very selective about the content they access:

2 "Reuters Institute Digital News Report 2014" (Oxford, U.K.: Reuters Institute for the Study of Journalism, 2014).

3 Mitchell, Amy, Tom Rosenstiel, and Leah Christian. "Mobile Devices and News Consumption: Some Good Signs for Journalism." Annual State of the News Media. PEW Research Centre, 2012.

4 Nic Newman, "Reuters Institute Digital News Report 2015" (Reuters Institute for the Study of Journalism), 93, accessed June 16, 2015.

5 ibid.

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Kitamirike:
"Media houses like newspapers and so forth, they can be easily be accessed without going into buying them. Unlike in the past, you do not need to go to the media house for a newspaper that was for yesterday day or the other day. You can easily get the news."

Mwesigwa:
"Newspapers are now more accessible because a newspaper would go up to 3,000/= shs. whereby if you have your phone, you can just upload it using 500/=."

But many users don't make the distinction between paying for the news and paying for data. In Uganda, focus group respondents described how they felt they had already paid for the news through paying for cellular data:

"Facilitator: So have you paid for the news you access?
Chorus: Probably.
Facilitator: Can you tell us?
Musoke: Of course we pay by buying MBs.
Facilitator: You pay through buying MBs?
Musoke: Yes. That is already a cost.
Facilitator: That is already a cost. Do you agree with him?
Bukenya: Yes."

In summary, the move towards mobile and digital consumption patterns has financial implications that reflect the trends observed in more mature markets, where the decline in news purchase revenues and advertising rates raises fundamental questions about the business models of independent media.

Personalization and Individualism

One of the ways the literature describes news media as contributing to civic participation and citizenship is through providing news consumers with balanced views and exposure to ideas and perspectives that they might not agree with. As Cass Sunstein writes: "It is hardly possible to overstate the value of placing human beings in contact with other persons dissimilar to themselves, and with modes of thought and action unlike those with which they are familiar.... This is [the] primary source of progress."[6] Yet the growth of individualized news consumption, particularly through social media platforms, is described by many as challenging this diversity. In the Reuters Digital News Report, Emily Bell, at Columbia University, suggests WhatsApp and Facebook are "even further removed from the broadcast environment we are all used to as a driver of news and discussion."[7]

Our research found that many of the changing news consumption patterns, particularly the individualization and personalization that underpin concerns in the literature were present in the descriptions that focus groups' respondents gave of their media consumption habits. In Kenya, Aaron, a 19-year-old student and part-time casual laborer, described how news consumption had changed from being a group activity with other members of the community to one characterized by individual choice and consumption:

"I would say accessing information through my phone has really changed whereby compared to the television, in the village we had one television and you had to go to the neighbor to know what is going on through the country but with the phone now you are able to access the news anytime and anywhere."

The personalization of information choice was also a common theme in respondent's description of how their digital repertoires informed their news consumption practices. In Uganda, for example, Byansi, a 25-year-old volunteer with The MasterCard Foundation partner Restless Development, described how using his phone to access New Vision—his favorite newspaper online—meant that he no longer read the whole newspaper, but instead only the stories he was already interested in.

"Byansi: It is like if I want an article in New Vision, I will not buy the whole newspaper anymore. I will just go and read my article. If I am looking for jobs, I will just go to that article having jobs and I will just see what job I want. I am contented with what New Vision delivers."

Summary

In summary, for many of the focus group respondents, mobile only and low-skill repertoires shape news consumption in the following ways. Many of the trends identified in the literature on changing patterns of news media consumption in mature markets were reflected in the practices described by respondents. For many, accessing the news through digital technologies displaced traditional forms of news media, replacing or reducing newspaper and television consumption. These changes result in new forms of consumption, with less shared consumption of

6 Cass R. Sunstein, *Republic.com 2.0* (Princeton University Press, 2009).

7 Nic Newman, "Reuters Institute Digital News Report 2014 Tracking the Future of News," 2014.

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the same content and more individual and personalized patterns of news media consumption. This disruption of established news media consumption patterns has financial implications, with the shift from product consumption to what Donner calls "a metered mindset"[8] towards mobile data consumption results in many users saying they are reluctant to pay for news.

Changing news media consumption patterns have implications across a number of different areas. The move towards personalized individual consumption is described by many as having implications for the politics and nature of wider civic engagement and participation. Changes in modalities and services used to access news involve shifts in control from news sources to distribution platforms. The shift from editors to algorithms and services, such as Facebook's Newsfeed algorithm or Opera's data-compression algorithm, introduce platform politics that play an increasingly significant role in shaping the news people consume, and thus the political system in which they live. These shifts have wider implications, such as the formation of Anderson's oft cited "imagined community."[9]

These changes also have economic implications. Shifts in purchase patterns from content to data challenge the business model of traditional media organizations in emerging markets as much as in mature markets. This challenge will only grow as the potential for ad-blocking grows. Whilst citizen journalism is often heralded as a solution,[10] our research suggests that a shift towards a metered mindset raises serious questions about the possibility of citizen journalists to make income selling content.

Music and Movies

"Listening to music has become more regular than before. Like at home I have a lot of siblings, there is a TV set and a radio which is kept by an auntie. Whenever she is leaving she says, "this radio is for Bujingo" [pastor] so you will misuse my battery and the girls at home will say "I won't share" so I wouldn't get time to listen to music because of the fights at home but now whenever I feel like listening to music, I control it."

Daniel, Uganda.

Although music dominates users" digital repertoires, the literature review identified very little in-depth, methodologically rigorous and theoretically deep articles on developing country contexts. Indeed the resulting corpus consisted mainly of news items and reviews of industry reports.

Broadly viewed, consumers of streaming music in Africa (if not throughout the developing world) appear to want local content. However, the prohibitive cost of data, low levels of digital literacy, operators demanding a large share of revenues and underdeveloped regulatory environments around licensing present the biggest challenges to local content creation and sale. For users, this drives innovation as they develop sophisticated practices to overcome constraints, whilst music providers must devise innovative ways (in most instances partnerships with phone companies or other services) to lure developing market consumers away from the easy availability of pirated material. It is unclear whether the approach taken in developed countries of accessibility to large back catalogs will work when data remains expensive. In short, the demand for music is such that the barriers to access drive innovation, but the cost of this innovation is the disintermediation of payment to artists.

Innovative practices: side-loading and interlacing

The demand for music combines with barriers such as data costs to stimulate innovative practices that integrate different services, modalities and even networks. For example, in Uganda, Nimurungi describes the services and devices she uses to access and share music: "You can use a memory card and you can also download a song like from Facebook and you go and listen to it." Also in Uganda, Namazzi describes in detail how music sharing has changed, and the complex interlacing of devices and services that enable him to listen to music in ways that he wants to:

"OK, erm those times you have to take a cassette then you give it to friend so that he can also listen to it but then this time around, the moment I have the music on my phone, I can just Bluetooth to share if or if he doesn't have Bluetooth, or if it's not compatible like an iPad, I copy it to my laptop then transfer it through it through cable for him. And also through the social media. Somebody is listening to some audio somewhere not necessarily music but some audio somewhere with some music inside and you

8 Jonathan Donner, *After Access: Inclusion, Development, and a More Mobile Internet* (Cambridge, Mass., USA: The MIT Press, 2015).

9 Benedict Anderson, *Imagined Communities: Reflections on the Origin and Spread of Nationalism*, vol. 45 (Verso, 1991).

10 O. Westlund, "News Consumption in an Age of Mobile Media: Patterns, People, Place, and Participation," *Mobile Media & Communication*, 2015, 1–9.

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want me to hear it. You just put it on through the social media and I can pick it up from there and am also listening so rather seeing the person face to face, and again gain to copy, or giving a cassette out in exchange, so that's how we share music."

Innovative practices: Choice, Individualism and Literacies

These practices reflect user's cultivations of mobile-centric digital repertoires. This shift introduces greater choice, but also a more individual, personalized experience. As Namazzi continues to describe:

"On TV, sometimes you can be forced to change the channel because the things they are showing are of no interest to you. But when using a mobile phone, you load or put music of your own preference, unlike radios or TVs, whatever they bring to you is what you take, whether you understand the language or not."

In Uganda, Daniel explains how his mobile centric digital repertoire allows him greater individual freedom, and privacy to listen to the kind of music in the way that he wants to:

"Listening to music has become more regular than before. Like at home I have a lot of siblings, there is a TV set and a radio which is kept by an auntie. Whenever she is leaving she says, "this radio is for bujingo" so you will misuse my battery and the girls at home will say "I won't share" so I wouldn't get time to listen to music because of the fights at home but now whenever I feel like listening to music, I control it."

In the same focus group, Nkuutu explained exactly his music video and listening location preferences: "I love videos where by women show their bintu (things) so I just go to my room and watch them privately."

But the interlacing of practices, devices, and services also creates the possibilities for misunderstandings. Mbabazi explains his understanding of how YouTube works, confusing the cost of data packages with a subscription service:

"Mbabazi: I went to an outlet and asked them to download for me YouTube. They did it for me and so I had to register. They wanted my e-mail to YouTube. I have to pay every month because if I don't, I will be disconnected. So I write in any songs that I want and then they give them to me right away. I do not pay per month but I just have to be active; like per day I have to put 500/- or 1,000/=. You have to be active on YouTube so that they don't disconnect you."

Innovative practices: Digital Economics

As the literature flagged, the economics of music is one of the great challenges and opportunities of increasingly mobile digital repertoires. Our focus group discussions highlighted these issues. For example, a Ghanaian male respondent said that "most Ghanaians don't download, they wait till somebody downloads and then you go and copy with a pen drive and then transfer onto your phone and laptop. So it's like costless, like they don't even pay a penny." In Kenya, Beth speculated about the impact of this shift for artists, noting, "I even wonder, I feel for the artists whether they make their money or their profit. Because once the music is released, you can get it online and stuff."

Summary

Mobile music is important for any understanding of the changing nature of digital economies. Music is big business, but as consumers replace paying for CDs and cassettes with mobile data bundles mobile operators disrupt the flow of revenue to producers. If musicians are to make money, engaging with this will be critical. Yet we do not argue that this should be a priority area of intervention. The value of understanding changing music consumption patterns is the role these changes play in driving innovation. As users interlace networks and devices with services and content to listen to music, they provide insights into digital repertoires that offer insights to those who would strengthen instrumental uses of digital technology in emerging markets.

Gaming

"I don't play games but what I learn is that after playing these games, you get a lesson of being focused and having a goal in mind. It is like when you are playing chess, you have to set a goal; what do you want? Do you want to be a loser or a winner?"
Latif, Uganda.

It is important to understand the role of gaming in digital technology users" lives because gaming plays a big part of what many seek to achieve through their digital repertoires. It is also important because gaming is a growing industry the nature of consumption has implications for who benefits from the growing use.

Gaming Drives Adoption

In 2014, an average of 365 million daily users played Facebook games,[11] and the literature suggests that one aspect of significance of this growth is the role of gaming as a driver of technological adoption, creating demand for higher specification phones that can also be used for more

11 Staff Writer, "Mobile and Social Gaming Industry 2014 Highlights," *Renatus*, 2014.

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productive purposes. The literature suggests online gaming drove Korea's increased demand for broadband in the early 2000s.[12]

In our focus groups, a number of respondents described this relationship between the kind of phone and the gaming experience. In Kenya, Jason described how more complicated games demanded more capable phones:

"Jason: The better the phone or the more advanced the smartphone the better the experience in the gaming world."

In Uganda, Namuddu described friends who bought phones specifically to play particular games.

"Namuddu: I haven't yet done that, but I've seen friends do it; they buy bigger phones to access temple run (all laugh) more games, and the bigger the phone, the better the view, the smaller the phone, the uncomfortable. Even a bigger memory... (So the memory of the phone) yes that's what matters the most."

Gamers are Diverse

The literature also describes how those playing games are not just the archetypal young male. One 2014 report by Deloitte on U.K. digital media consumption found that "while the average console gamer is a 16–24-year-old male, the average casual gamer (playing on tablets, smartphones, and social networks) is a 25–34-year-old woman."[13] Although the literature review didn't identify any research into the gender dynamics of digital gaming in emerging markets, the level of use by female users in mature markets suggests that further research on this topic might be useful, for example exploring whether, and to what extent, mobile gaming might be a driver for increasing female ICT and thus technological inclusion.

In our focus groups, we found a diversity of responses, with many respondents describing game playing as being a male more than female activity, while others went on to describe active game playing practices. In a female-only focus group in Ghana, when asked if they thought their female friends and relatives play games, all the respondents said no. In female-only focus groups in Kenya, all five respondents said they played games.

Gaming Time

Gaming time is important because it highlights an important aspect of digital technology users' digital repertoires, and also the purpose gaming serves for game players. The literature describes how mobile gaming is particularly prevalent at specific times, notably in the evening,[14] a finding that was also borne out by the focus group discussions. One contribution to existing research was the number of respondents who described their daily commute and travel as the main time they played games. In Kenya, Anne works in Nairobi but lives in peri-urban Limuru, 40 kilometers away, says that she plays games most when stuck in the city's congested traffic:

"I play games at any time of the day especially when I am in a matatu heading to town or heading to Limuru from town that is when I play games." But for most, the popular time for playing digital games is in the evening, when the practice is associated with relaxing at the end of the day. In Kenya, Beth said that "...when I have finished some of my chores like cooking supper and doing my assignment, so I like playing my games when I want to rest." In Uganda, many described similar patterns, such as Betty, who said "According to me, it's in the evening when I'm done with work, that's when I play games the most."

One of the benefits of mobile gaming described in the literature is the contribution to technological capabilities[15] as well as cognitive and personal development.[16] In our research, we found that many respondents described how they linked playing games to helping them develop their own technology capabilities, particularly as they used USB, Bluetooth and shared Wi-Fi hotspots to share games between phones.

But the more common finding was how gamers describe their belief that playing helps develop their cognitive capacity. For example, in Ghana, Babra describes how puzzle games help her to think: "For instance, looking at the puzzle game, sometimes it makes you use your brain to work. And the more you use the brain to work it's like your brain will become very active and sometimes you become creative in doing that." Men also articulated the same sentiment, as Latif from Uganda describes: "I don't play

12 Hyeryoung Ok, "New Media Practices in Korea," *International Journal of Communication* 5 (2011): 320–48.

13 Deloitte, "Media Consumer 2014, The Digital Divide" (London: Deloitte, 2014).

14 Matthias Böhmer et al., "Falling Asleep with Angry Birds, Facebook and Kindle—A Large Scale Study on Mobile Application Usage," in *Proceedings of the 13th International Conference on Human-Computer Interaction with Mobile Devices and Services*, 2011.

15 Nimmi Rangaswamy and Edward Cutrell, "Anthropology, Development, and ICTs: Slums, Youth, and the Mobile Internet in Urban India," *Information Technologies & International Development* 9, no. 2 (June 10, 2013): pp. 51–63.

16 Araba Sey and Peppino Ortoleva, "All Work and No Play? Judging the Uses of Mobile Phones in Developing Countries," *Information Technologies & International Development* 10, no. 3 (2014): pp—1.

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games but what I learn is that after playing these games, you get a lesson of being focused and having a goal in mind. It is like when you are playing chess, you have to set a goal; what do you want? Do you want to be a loser or a winner?" Also from Uganda, Cathy describes how playing games developed her work ethic: "Never to give up, now like you are playing temple run, you don't get to the end, you keep on playing like "leeronin'okutukayo" (I have to hit the mark today) like that, you keep on playing."

Gaming as Development

At the level of social development, the literature describes how games contribute to changes in social relationships and interaction. Christensen and Prax for example describe how the increasingly popular social networking aspect of games plays an important role in helping structure how people develop new ways of relating to each other.[17]

Focus group respondents also described changing patterns of game playing with implications for changing forms of social interacting. For example, Jonathan from Uganda said that he used to go to Internet cafés "and pay 1,000/= and spend about five hours" playing games, but respondents described how solitary gaming on mobile phones was increasingly dominant.

There is also a significant relationship between games and identity, with literature pointing towards an emerging area that links play with identity formation.[18,19] For example, many described how male and female users preferred games that reflected socially agreed gender norms, and in Kenya, Anne described a game that specifically targets female users" admiration for Kim Kardashian and for fashion:

"Girls love girlie stuff. Like for example there is this game, I don't know its name where you have met Kim Kardashian and you are a servant somewhere, she has come to buy something and she has found you are closing and because you know her she is a star, you tell her you will work overtime for her. Then you start dressing her, it's a game you are playing, you start dressing her, making her hair so that kind of game is mostly applicable to girls but when you come to boys you find they are not interested in such games because they find such games are for girls only. They are not interested in such girlie stuff."

Games are also described as playing an important role in cultural development, not least because it's such a significant part of people's digital lives. One study in Ghana found that 24.6 percent of 118 mobile phone subscribers play mobile phone games at least once a day, yet the authors caution that this demand fails to translate into a domestic industry largely because "the gaming industry requires a level of technical skill and interest that is not yet evident in the country,"[20] a finding echoed in other research that cautions against viewing app economies as sure-fire sources of income and economic growth.[21]

The challenges of "discovery" and payments combine to make application in general and game development in particular a difficult business. In focus groups, only about four or five respondents said they were aware of locally developed games. In Uganda, for example, Kalulu describes a locally developed game called Matatu (the local minibuses that act as public transport in East Africa): "I enjoy Matatu, yes Matatu we play Matatu," whilst in Ghana only two women, Afua and Amma were able to describe local games that they were aware of: "Yes, I saw this "kwaku Ananse" game. [Kwaku Ananse is a Ghanaian folklore character]." Yet, they were interested in more locally developed games.

Even more fundamental a challenge than discovery is payment. The transition to a metered mindset, like with other forms of digital content, means that people are often unaware or unclear about how the producers of content are actually paid. The respondents from a male-only focus group in Uganda described their understandings of how games makers are paid: "They are paid through the data that is bought. Like the musicians, the way they play the song on TV, the more this musician gains."

Summary

Gaming is one of the dominant tasks that characterize how people apply their digital repertoires. It plays an important role in driving adoption, including the possibility of it acting as a promoter of female ICT use. The extensive use of gaming at night-time highlights the value gaming has for users as part of relaxing, and also as part of an activity that is, in its modality of the mobile phone, increasingly individual. Although the literature describes how gaming

17 Christian Christensen and Patrick Prax, "Assemblage, Adaptation and Apps: Smartphones and Mobile Gaming," *Continuum: Journal of MEdia & Cultural Studies*, no. September (2012): 37–41.

18 Sey and Ortoleva, "All Work and No Play?"

19 Valerie Frissen et al., eds., Playful Identities: *The Ludification of Digital Media Cultures* (Amsterdam University Press, 2015).

20 Araba Sey, "New Media Practices in Ghana," *International Journal of Communication* 5 (2011): 380–405.

21 Wagner, Sarah, and M. Fernandez-Ardevol. 2015. *"Local Content Production and the Political Economy of the Mobile App Industries in Argentina and Bolivia."* New Media & Society, 1–19.

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has a broader contribution to sociocultural development, focus group respondents emphasized their belief in the role gaming plays in increasing individual cognitive capacity.

Much of this activity is outside the scope of directive intervention, as processes such as sociocultural change are complex and driven by multiple factors. There is perhaps greater potential for intervention in enabling local app development, as this is where research findings challenge dominant assumptions and the techno-utopianism that characterizes much of the technology for development sector. Targeted research to explore the feasibility of interventions that lower barriers to discovery and payment could have catalytic value, unlocking the economic potential for local development, and in turn contributing to more locally led sociocultural change.

Findings: Social Networking for Functional Purposes

Job Seeking

Charles, Uganda: "Actually it is technical know-how. On the Internet, technical know-how is limited but here, I know you, you know we are friends and it is easy. It is easier for my relative to give me a job than going to the Internet where people don't know you."

Kenya female facilitator: Okay, someone else do you know other people who use digital technology, to find work? Linda

Linda: No.

Kenya female facilitator: You don't know of people or friends who use digital technology to find work?

Linda: I do but I don't know how they do it.

Three key findings emerge here. First, while FGD participants mention websites and text alerts for jobs, existing social relationships prevail above dedicated job sites, reflecting findings from several earlier studies.[22] Participants in our focus groups mention WhatsApp as the most common medium for sharing job details. Second, self-promotion and advertising oneself and one's products, particularly through photography, are innovative uses of job-searching (we expand on this below). Third, participants in the male focus groups talk much more about using their devices for work and job-searching than the female focus groups.

Existing and changing patterns of job-searching

First, participants in our groups hear of job advertisements through friends, on electricity posts, newspapers, and radio. In Uganda, Charles says: "in connections actually if someone knows you, he can call you for interviews and if you succeed, then you begin working. And in most cases you find someone working because he knows someone." Similarly, Priscilla hears of jobs: "through friends…like if I have a friend, he can come and I tell him that I am looking for a job. He can tell me like, 'I have friends who are looking for someone to work.' Then you can succeed from there if God wants that job to be yours." Ultimately, it is about contacts and networks. Afusa says "for me it is friends who connect me. They call me and tell me that there is an opportunity, you apply and bring your document." As Kagabo says: "but as we talked of technical know who, someone will just send you any jobs and say; 'try your luck.'"

Some male participants sign up to text alerts (in Ghana, an Airtel Sabena shortcode job search service and MTN in Uganda). Trust in offline newspapers transfer to searching for job ads in online newspapers—for example, Daily Monitor (Uganda), and Daily Graphic (Ghana). Faisal in Uganda says "I use my smartphone to search for employment opportunities, the jobs wherever they are. I also use it to apply for most of these employment opportunities."

However, it is through existing social media platforms, and particularly WhatsApp, that many described creating and applying for job opportunities. Ali in Kenya states: "most of the time in applications of WhatsApp you find you are in groups where you find that because you know each other and networking and they know what you do, the moment they find an opportunity or a job related to you they send you links." In the same focus group, Steve added: "so many jobs —there is that group of engineers which I have joined and I have been able to get several jobs." Wantimba in Uganda says: "On WhatsApp, we create groups, so if you have friends who can get you the job, then tell to that friend that I need a job, I want to do this, or if you can find me a job, in that

22 N. Kumar, "Facebook for Self-Empowerment? A Study of Facebook Adoption in Urban India," New Media & Society, 2014, 1461444814543999—; Jonathan Donner and Andrew Maunder, "Beyond the Phone Number: Challenges of Representing Informal Microenterprise on the Internet," in *Living inside Mobile Social Information*, ed. James E. Katz (Dayton, Ohio: Greyden Press, 2014), 159–92; Susan P. Wyche, Andrea Forte, and Sarita Yardi Schoenebeck, "Hustling Online: Understanding Consolidated Facebook Use in an Informal Settlement in Nairobi," in *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems—CHI '13* (New York, New York, USA: ACM Press, 2013), 2823–32, doi:10.1145/2470654.2481391; Gary W. Pritchard and John Vines, "Digital Apartheid: An Ethnographic Account of Racialised HCI in Cape Town Hip-Hop," in *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems—CHI '13* (New York, New York, USA: ACM Press, 2013), 2537–46, doi:10.1145/2470654.2481350.

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group, there are friends who know, who can tell you about the opportunities and you try to get a job through them, so he tells you, or she tells you that I have this job, if you can come to Kampala or you can come to Jinja, this part we see if you can get it."

While OperaMini, CareerPoint, Jobberman in Ghana, Brighter Monday in Uganda, and LinkedIn are mentioned as sites where jobs can be found, "liking" company pages in Facebook, posting a Facebook status that you are looking for a job or posting on WhatsApp groups are the particularly common methods of actual job searching. 22-year-old Wantimba in Uganda says: "through WhatsApp and this boutique I opened it through my brother who is in Tanzania, so we do business via WhatsApp."

Similarly, Kisame:
"Like I've got friends in central market in Jinja, they sell jeans, if he's got a good trouser, he takes a pic, sends it to you, you negotiate on the price, and you find yourself doing business, using phones."

Photographing the self at work

Second, most, if not all, participants use photography to promote oneself in the job search. A young contract road worker who is always looking for new construction opportunities asks a friend to take photos of him while working, on his phone and then sends it the engineer he is already working for to ask him to pass it on. As the photo also captures the location, it verifies his work there. Another participant, Geffrey, works as an usher part-time while he studies and says "as ushers, you can take picture and put it on Facebook. If you are looking for ushers, contact this and this and this." Jonathan, who helps set up functions says: "we can get a picture of certain function and we send it to the one who is ordering. Should you like this one, should we decorate for you in this form." Davis Quaynor, 19, mentions that you can make "your complimentary card and take a picture and upload it on Google, Facebook. So if anything [comes up], they can just call you." In two focus groups, a male and female respondent separately mention the idea of female modelling—posing, taking a photo and sending it to a contact for a job but neither has direct experience of doing so. These practices again blur the distinction commonly made in ICT and "development" literature between the "useless" and "useful" activities.[23, 24]

The high prevalence of mobile photography use suggests value in further research on the use of photography through mobile phones and ways it is integrated as an instrumental tool within non-instrumental social media platforms.

Gendered differences in job-searching?

While these are innovative ideas and mentioned frequently in the male focus groups, there is less confidence in the female focus groups, for example, Linda and Beth below:

Kenya female facilitator: Okay, someone else do you know other people who use digital technology, to find work? Linda

Linda: No.

Kenya female facilitator: You don't know of people or friends who use digital technology to find work?

Linda: I do but I don't know how they do it.

Similarly, Beth says:

Beth: They might find a job online.

Kenya female facilitator: They might find a job online?

Beth: Yes.

Kenya female facilitator: Like in which platform online is broad?

Beth: Facebook, twitter. You can also use the laptop.

There's still an expectation of the jobs being "out there," particularly by women:

Becky: "Companies advertise online nowadays, so one has to be online to have knowledge of available job vacancies. So those who use the Internet frequently are most likely to find out about such vacancies."

On the other hand, in the female focus groups, women mentioned offline opportunities such as posters more than online site, for example in Kenya:

R: Even when walking on the road you can just see them.

23 Araba Sey and Peppino Ortoleva, "All Work and No Play? Judging the Uses of Mobile Phones in Developing Countries," *Information Technologies & International Development* 10, no. 3 (2014): pp—1.

24 Rangaswamy, N., & Cutrell, E. (2012, March). Anthropology, development and ICTs: slums, youth and the mobile Internet in urban India. In Proceedings of the fifth international conference on information and communication technologies and development (pp. 85–93). ACM.

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Kenya female facilitator: Yes.

R: Electricity posts.

Kenya female facilitator: So they put on electricity posts?

R: Through media, newspapers are printed those back pages there are job vacancies so you can apply if you qualify the job is yours.

Kenya female facilitator: Anywhere else?

R: Through friends.

Kenya female facilitator: Yes.

R: Maybe you can get a friend who may connect you.

We need to conduct deeper research on why there is such a marked difference in job-searching online by men and women, uniformly in our focus groups in Ghana, Kenya, and Uganda.

Summary

Searching for jobs and employment opportunities is still largely conducted through existing personal social networks—with high reliance on WhatsApp—more so than dedicated job sites and more than Facebook. The women in our focus groups are less confident about using job searching tools online. Job searching is highly entrepreneurial, i.e., taking photos and promoting oneself. Job search systems should work with existing communication and photo sharing platforms, rather than starting fresh. The tools to network and portray are already there, understood and extensively used in these platforms (to a larger extent by men than women).

Education

Steve, Kenya: "I think every day is a learning day…if you are in a certain profession and you don't go online studying what is happening you are doomed to fail miserably because maybe you will not be able to keep up with the current trends."

Facilitator: "Is that something that you can do using your smartphone?"

Steve: "Yes, that is what we do."

Hannah, Kenya: "You can also learn like you Google history or geographical, geological."

Facilitator: "So you educate yourself?"

Hannah: "Yes."

A spectrum of "educational" uses of mobile Internet and devices in general arise in the Ghana, Kenya, and Uganda focus groups, from supporting formal in-school use to informal self-education. The women in the focus groups attribute a benefit of mobile Internet as being able to look up information discretely.

Supporting in-school education

First, students enrolled in school mention use of WhatsApp for sharing notes, forming the same class group to exchange questions (Facebook is not mentioned for this), and accessing past papers online in Ghana and Kenya to study. One student says: "it has enabled us to form some groups, you find a group of classmates or a group of friends we have WhatsApp groups." Senanu, 19, says: "we use WhatsApp as a medium to share most of our information in class including news and pictures of past questions and stuffs so it's good when you have WhatsApp on your phone so that you can be part of the class. Yeah these are some of the criteria on which I choose my app." Senanu mentions how "we can use the PDF reader—most of the books we use online you know you can't buy. The hard copy so, imagine buying 15 engineering books and every year no, you can't do that so when soft copy of the book and then you can read it using your PDF reader." However, WhatsApp also presents limitations in file sharing for him—"WhatsApp can send media files but then it can't send texts, it can't send, like word files and PDF but telegram can send PDFs and word files so that that is also the difference maybe I have a book I want to send a friend somewhere WhatsApp can't do that but telegram can do that."

Second, photography again arises as a useful feature in education—another student says: "sometimes you get broke you don't even have money to do the photocopy so as you have your device, you take pictures of the pages and with that you have your handout already."

Self-study

Wikipedia, YouTube, Google are go-to sites for quick searches. Kumian in Ghana does home tutoring and uses Google to help her answer student questions. Also in Ghana, Abena says: "whatever skills you want to improve you can get resources online [tutorials]. You can always research about organizations online and the probability to

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get employed is higher [if you are tech savvy]." Njambi mentions YouTube as a key source of her knowledge. In Uganda, 19-year-old Komugisha likes the idea of someone having traveled a lot and teaching through Skype. For Afua in Ghana, it is the appeal of not having to "study for four years to learn a trade. My brother read Banking and Finance in school but he has an app that has taught him how to fly a plane. He actually feels he can fly a plane now. He has another app that is used to design buildings hence he often says he doesn't see the need to hire an architect when he is ready to build a house."

While we discussed the educational aspects of gaming above, they also arise when the facilitators ask questions on education, not gaming—it "helps so much in concentration since your mind is there" (Hannah, Kenya), and the challenge appeal of puzzle games and timed games (Babra, Ghana). Again, we see a blurring of the instrumental/non-instrumental distinction in digital practice, echoing Amartya Sen's capability approach of development—that development cannot be defined in a normative fashion ("you must use mobiles to find out about health, education, etc.") but rather respecting the agency of users while also trying to understand how this may better lives.[25]

When this self-learning aspect of mobile Internet arises, Winston in Kenya sees a training opportunity: "not everyone can be able to operate a mobile phone, there are some who have never used at all, so when it comes to the smartphone it's expensive for them to buy so for the future I think the companies can be able to provide education sessions for people who can't operate the phones so that they can be able to get a certain knowledge so that they can be able to expound on the e-commerce business and the wider the business is becoming to more the people are advanced to mobile phones, so in future many people will be using smartphones on what it does."

Kagabo makes a similar point that: "in schools, they have introduced that [computer] as a subject. So, the government should set up institutes for those who are already out of school so that they go there and get the skills of using the computer. Then from there, they adopt in the issue of using smartphones." Instead of (or as well as) training academies for computer-skills, donors and private sector companies could invest in training for smartphone use.

"Educating" oneself through the Internet cannot be easily defined—it can be for immediate functional use, e.g., watching a YouTube video to know how something can be done like changing a tire, to a more ambitious end. One participant who enjoys downloading tutorials related to school says "it's like school at home you download tutorials and you get to learn from someone else." Yet there is also aspirational use: One participant hoping to become a commodities trader says "I start reading news, look at the commodity prices, oil prices, how the trends are going in the market so that is also are of the ways yeah, it helps us a lot …ok it helps me to, it tells you to plan your career." In Ghana, Addo says: "sometimes in what you want to achieve in future…let's say you want to be a lawyer in future. If you want to know about lawyers you Google it and read more about lawyers." Steve in Kenya says: "I also believe I use the Internet to get a lot of skills not just in the construction skills but even outside even in terms of how to develop relationships, how to develop my health, so apart from getting jobs, apart from getting training, there is so much especially the young people can learn from the Internet." Similarly, in Uganda, Namazzi: It may not be specifically on work. However there are other issues that are important to us and they lead to success of our work.

While very few question the information available on the Internet (contextualization, relevance, trustworthiness), Steve in Kenya is a lone voice when he states: "not all that is on the Internet is the truth so I would really like to know what are they getting."

Discreet searching

In contrast to job-searching, self-study is empowering but somewhat isolated for women as the women in our focus groups allude to looking "educational" information up on their own. Betty [training to be a nurse] says: "like sometimes in the hospital, coz that's where I work, a patient might come in with a condition, and the doctor tells you this is this and this condition, have you heard about it before, and you're like no I haven't it, and he'll be like, search about it, so I go in the nurse's room, get your phone and then type in that information about that condition, like the causes, side effects, even the treatment, then you'll be able to help that patient, using the information you have got." Njambi is a camera-woman and enjoys tutorials online, although she

25 Araba Sey and Peppino Ortoleva, "All Work and No Play? Judging the Uses of Mobile Phones in Developing Countries," *Information Technologies & International Development* 10, no. 3 (September 10, 2014): pp. 1–17; Nimmi Rangaswamy and Edward Cutrell, "Anthopology, Development, and ICTs: Slums, Youth, and the Mobile Internet in Urban India," *Information Technologies and International Development* 9, no. 2 (2013): 51–63, doi:10.1145/2160673.2160685; Jonathan Donner, "Blurring Livelihoods and Lives: The Social Uses of Mobile Phones and Socioeconomic Development," *Innovations: Technology, Governance, Globalization 4, no. 1 (2009): 91–101; Dorothea Kleine, Technologies of Choice?: ICTs, Development, and the Capabilities Approach* (MIT Press, 2013).

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does not have access to most of the equipment used in the tutorials. In Ghana, Babra Addo says: "I also use it for research. Sometimes a lecturer will come and teach you alright yet you will realize that you don't understand some petty things so you just go to Google, type the topic then when you read, sometimes you get more information and you are able to understand it better." Naa Adukwa adds: "Maybe you have heard about a certain course, but you don't have any knowledge about the course but you can Google it and read more about it and have knowledge about what you want to go in for."

Having a smartphone close to you means ease of research—Namazzi in Ghana finds "they have eased research. Instead of going to a café and invest in money as in researching about any topic that has been given to you, but when having a smartphone with some MBs, you can easily Google out and access the topic of study that you need to know about." Another young woman says it helps learning: "some women are very shy hence may find attending seminars and workshops uncomfortable. Therefore they can sit in the comfort of their homes and learn what they want to learn without having to meet people and being under pressure. Beside, having people around can affect how fast you can learn."

Summary

WhatsApp and WhatsApp groups are frequently mentioned for those in school to support education—for example, sharing notes, discussions. Self-teaching online, particularly by women who may be too shy (either considered as such by men or by themselves in narratives). Not just education in formal sense, but everyday learning, learning at individual pace, and available at finger tips—"if you don't go online studying what is happening you are doomed to fail miserably."

Income generation

You can be creative about something then you post it, then people will like it and then you write there your phone number and you get rich.

Nanjira,Kenya.

"I am into like this video editing…wedding programs, wedding invitation, I do it for them like it's in a form of video so I use my mobile phone. And I have this app, I have [put] some of the jobs that I do like the video editing on OLX so that is where people call to find out how I go about it."

Senanu, Ghana.

Activities associated with income generation were a key component of the digital repertoires revealed in the focus groups, from the most fundamental—for example simply calling—to use of photography to more technically skillful work (designing, programming) and even more creative methods, discussed below. Second, we explore how the "instrumental/non-instrumental" divide is blurred because of social media and other seemingly entertainment focused platforms being used for income generation. Third, a common difference consistently arose in our focus groups between actual income generation and that which is "heard of" but there is no direct evidence of the participants themselves using it as such. We discuss female income generation in more detail below.

Actual use: pakapaka and byeyo

First, there are very fundamental plain mobile—not mobile Internet—uses for income generation. For example, a participant in Ghana says:

A: *My mum sells eggs.*

Facilitator: *OK so.*

A: *And same time she is having a provision shop so I take care of the eggs. People call me so that I send them eggs.*

In Uganda, 20-year-old Kalulu says: "OK like me, I do auto wiring, that's in cars, so when any client wants to repair his or her car, she calls me, she can use her phone and she calls me on my phone, that I have this, my car is doing this, you have to help me or you have to come, so if I go there, I work, she can say I will send you the money on your phone, I'll send you that…that's how the way I use my phone." Calls are particularly important for quick, informal work ("pakapaka" in Ghana or "byeyo" in Uganda), and especially mentioned by students in focus groups. There is also acknowledgement of not trying to earn through the online

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Use in context: Voices from users continued

aspect of the mobile, but by repairing it—"it is something you don't have to go to school for but you can still earn through it" (Ghana).

Second, there is extensive use of online selling, such as shoes, clothes and other products, whether new or second-hand, either through social media such as WhatsApp (to a lesser extent, Facebook) or dedicated selling platforms. In Uganda, for example, a participant describes OLX: "it's an app, you want to get rid of this phone, you don't want it anymore, so you just take a picture of it, then post it, put there your address, the amount you want that phone, put your phone number then begin selling, so if I see it and I've liked it, we meet in this place, I give you the money, you give me the phone." Similarly, in Kenya, Ton-a-ton is popular for buying and selling. Ebay or other selling platforms were not mentioned in the focus groups.

Third, there is use of online advertising and marketing either of oneself or for others—perceived as strategic as well as a good earner. One participant, mentions advertising "for a company that earned me 2,000 shillings for only two hours." In the above section, we mentioned examples of the contract road work and ushers who took photos of themselves at work to advertise themselves for work.

There is often mention of mobile phones for writing and deeper production work. Melanie in Kenya states: "I use my smartphone probably if I want to type a simple document. Like if I want to design a letter, I can go to it and type my simple document." Sometimes, these assignments are for payment. Joe in Kenya says:

I have friends who do jobs for people like assignments online.

Facilitator: Which job does your friend do?

Joseph: They write research projects, do assignments.

Similarly, Ester: "I have a friend who works on the Internet, they are people who are overseas send to him a question and then he is the one to write the…to break that statement to an essay and then after he has finished he sends back the whole essay to that person and they pay him in dollars.

Writing articles and/or "giving news update on what is trending" is something a few of the participants mention. Steve in Kenya has experience of this: "There is a site you can write articles and you get paid. It depends on the size of your article—the minimum is four hundred words, so if you write an article with four hundred words you get paid and then the money adds up until its fifty dollars or a hundred dollars you can redeem. But you cannot redeem less than fifty dollars. That is something that I do every day."

There are more creative uses for youth to use the Internet, from charging for downloading games (one participant mentions earning USh 200 [US $2.00] per download), acting as informal estate agents (taking pictures of housing and acting as sales agents), to being currency middlemen, video editing on mobile phones, and online betting such as through Sportpesa ("I bet on football, what you do is predict the scores and if they are correct you get paid and to predict you have to sent a certain amount of money which is like a registration and if you lose you lose the money.") One participant, Wachira has started a small business where he downloads and prints pictures sent by WhatsApp: "I print it on paper then he will come for it or maybe I will take it to him and he gives me money and we do that to so many people…for a good quality poster for one movie advertisement it goes for KSh 50 [US $0.50] and if you do that for 10 movies that's KSh 500 [US $5.00]. Another participant says "I have seen this guy who has made an application that helps farmers who keep rabbits so this application is like a reminder when it's time for feeding, it remind you on the schedule" but it is unclear whether this is in the participant's immediate network or something seen on social media or elsewhere.

It is for this reason for the phone being a fundamental tool for communication that most in the focus groups were reluctant to share phones (contrary to previous common findings that devices are often shared in developing countries—although of course this is a particularly unique demographic of youth in peri-urban areas). One participant said: "maybe you are expecting someone to give you money or you are expecting contract and your phone is off, at that moment if the person is calling you, they can't get you"—it is the immediacy of the phone that is critical.

Anticipated sources of income generation

However, although these were documented uses of income generation, more commonly we heard of anticipated use—many participants were aware of potential but had not exactly tried it themselves. There is a notion of online marketing being profitable: "yes for online marketing there are those people who do business with their phones can work from anywhere then you get your money...there is also the micro work of selling shares, and buying the ones that are profitable" but again, anticipated rather than actual. Focus group participants regularly mention "my friend" or "my cousin" or even others who knew of someone who used mobile Internet for income generation in some way. Sharon

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Use in context: Voices from users continued

in Uganda who mentions "a friend who does web designing. He designs for schools and churches web pages and he earns a lot of money. He designs webs for churches and schools" or Naa Adukwa in Ghana who says "I have a cousin who creates websites for people."

For example, one participant mentions blogging:

Facilitator: How is that one done?

Isabirye: You have...that is for example Google, then start posting online, posts per day or per week.

Facilitator: And do you earn from that?

Isabirye: Yes. It is more of a long process because the more deals you get, the more money.

Yet Isabirye says he has not done this himself. Similarly, respondents were aware of online advertising and marketing, but some are more proficient than others. Ester acknowledges that advertising is essential for small businesses and Melanie in Kenya says: "I was thinking about arts and design, you can advertise your products online and if the designs are liked by people they are bought online" but provides no experience of this. Linda (also in Kenya) says:

Linda: I can market online.

Facilitator: Like market what?

Linda: Maybe clothes, I can make soaps and market it online.

Facilitator: And how can you market it online?

Linda: You have to have a phone with Internet.

Facilitator: And then, how will you use Internet to market your goods?

Linda: You will have to have a page or an account then you post it online for the people to see.

A similar response in Uganda also implies lack of clarity:

Benja: Use it to advertise business.

Facilitator: And what type of business would that be?

Kagawa: Business information.

Facilitator: Business information is very broad. What type of business information?

Kagawa: Getting new goods on the market, the price prevailing in the market.

Participants reference writing and publishing online with lower barriers to entry but there was little actual evidence of this: "you can market your book, then you can maybe sell your book online because people can read in their phones, they are called electronic books." We also saw curiosity around how income can be generated, for example one male participant questions how software developers earn money through Google ads "the ones which pop-up when you are downloading a game" and how it is possible to get involved in that.

Amongst male participants particularly, there is a desire to progress in IT skills to earn although not restricted to mobile platforms: "if let's say I am a website blogger, I have some skills in PHP and HTML programming so I may make website that may be required by other companies so when I sell to them the websites they pay me like say KSh 15,000 [US $15.00] per web page. That is how one may earn in the future." In another focus group, a tangential conversation arose around what one participant called "tin viewer" [team viewer] and how this enables remote software support and a source of income, which other participants were very interested in.

Summary

Overall, as with job-seeking, it appears that income generation is largely through existing networks. More fundamental uses appear in the Ghana and Uganda focus groups (phone calls, buying and selling online) and more sophisticated ones (website design, printing posters, etc.) in Kenya. Yet, social media is the default platform for income generation. Third, a common difference consistently arose in our focus groups between actual income generation and perception—a feeling that there is potential but lack of clarity on how to achieve it. Online income generation training ("microworking"), payment systems around this and trust would be a tangible area for the development industry to explore. Ultimately, there is still a "technological determinism" of the positive benefits of technology without accompanying understanding of how that can be precisely achieved. For example, Musa in Kenya says "by taking technology to the rural it will bring more market on online shopping it's the only way it will increase the number of people buying and selling via the Internet."

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Use in context: Voices from users continued

Gender

Andrew, Uganda: "According to what I see because I do not do it but what I see; sometimes it leads to neglect of other duties because I have a young sister of mine; when it comes to time of playing games on phone; she even forgets cooking. So, we are like; "tetuulye?" ["won't we eat?"] [Participants laugh].

Mercy, Kenya: "One can read some articles about the strength of a woman and one might get encouraged or raises self-esteem."

Gender empowerment through ICTs has been a contested area. While early academic and policy literature extolled the empowerment of women through ICTs including mobile Internet, another school of thought argued that it increased gendered divides, while a third more nuanced approach is that empowerment is neither straightforward nor isolated from context and needs to be understood as inextricably intertwined with culture and entrenched gender relations.[26] It is this third perspective which arises in our focus groups. We see some use of income generation by women, a more surprising reliance on mobile Internet for "emotional" reasons such as self-esteem and for connecting with friends and family through social media, and some resentment by men towards women using mobiles and going online.

Economic empowerment?

On the one hand, we see a variety of use by women—one young woman uses an app to track monthly menstruation cycles, another uses a fashion app for inspiration on how to dress, a third uses an app to access recipes, and then sells the dishes she makes using her WhatsApp network. Yet, at least in this sample of 99 women, use of mobile Internet for direct income generation by women was sporadic—largely restricted to buying and selling. As mentioned in the above section, there was more of a sense of potential but a lack of clarity around this:

Facilitator: What kind of work might you do on your devices?

Linda: I can market online.

Facilitator: Like market what?

Linda: Maybe clothes, I can make soaps and market it online.

Facilitator: And how can you market it online?

Linda: You have to have a phone with Internet.

Facilitator: And then, how will you use Internet to market your goods?

Linda: You will have to have a page or an account then you post it online for the people to see.

Mercy: We can write an article then post it.

Facilitator: Where?

Mercy: Maybe on a certain page then if you got the right person to guide you, you can earn some money there from it.

Facilitator: Okay so thank you Mercy, someone else? Nyambura.

Nyambura: You can be creative about something then you post it, then people will like it and then you write there your phone number and you get rich.

Yet, the specifics around this remain unclear—it is clearer when simple sending/receiving is considered: "women like things the easy way. Even with cars women prefer automatic [transmission] they don't like the manual. In your work, if you have a branch in another region, you easily send information through the computer or even the phone" [Ghana, Adukwa].

Non-economic empowerment?

Non-economic empowerment (while we accept this is a broad term) arises as a more commonly discussed topic amongst the women. Increasing research on women's use of social media in developing countries is already emerging. A recent report launched by the World Wide Web Foundation[27] found that in a survey of men and women in low income urban areas in 10 developing countries, 97 percent of women access the web through social media, especially Facebook, while female Internet users are 25 percent less likely to search for jobs online (although we did

26 Masika, R., & Bailur, S. (2015). Negotiating Women's Agency through ICTs A Comparative Study of Uganda and India. *Gender, Technology and Development, 19*(1), 43-69.

27 World Wide Web Foundation, (2015). Women's Rights Online Translating Access into Empowerment. *Global Report* (London: U.K.) http://webfoundation.org/about/research/womens-rights-online-2015/.

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Use in context: Voices from users continued

not see much evidence of this in our male groups either). Yet, it is dismissive to regard women's use of social media as purely entertainment. Consider for example, this conversation in one of the Ghana focus groups:

"Facilitator: Does technology liberate women who use it?

Randina: Yes. A woman wouldn't have to rely on other people to know what is going on/updates. For example fashion trends, etc."

There is a sense of being connected and feeling up-to-date with others, here. Similarly, Mercy and Ester below equate empowerment to self-esteem:

"Mercy: One can read some articles about the strength of a woman and one might get encouraged or raises self-esteem.

Ester: You can get an inspiration from the Internet, maybe you feel so discouraged you can benefit from that inspiration.

Facilitator: So in which platforms do you get this like encouragement?

Ester: From Facebook you can get inspiration, there is a magazine, those magazines for inspirations, I can't recall the names but there is.

Facilitator: So how do you get the magazines?

Ester: Through the Internet you just Google."

Equally, others share to educate and inspire others:

Beth: I share the poems to educate.

Facilitator: On what?

Beth: violence and corruption.

Hannah: Posting on Facebook, maybe you can come with positive information like sharing my experiences to inspire others to move on.

Facilitator: How is technology helping you and other ladies find jobs and skills enhancement? Is technology in any way helping you enhance skills and find jobs?

Nyambura: Maybe through experiences of other people in the Internet…. You may chat even if you don't know each other face-to-face then they may tell you the experiences then you start from there.

First, this points to a wider benefit of the Internet, particularly on such an accessible device as a mobile (in comparison to going to a cybercafé). Such belief in empowerment of the Internet is similiarly raised by Gitau et al (2010)[28] and the World Wide Web Foundation (2015). However, if many of these young women feel inspired by the Internet, and by others" experiences—and if in some cases, with strangers as Nyambura implies—first, how much awareness do they have of personal security, and secondly, would they conversely be affected by malicious remarks, trolling, etc? These are issues we need to explore more in future research.

Another use mentioned by women—just as it was by men—was of checking on their partners. In Ghana, Georgina mentions "I think with what I said that my friend tracking her partner on the Internet, it is a form of liberation for her to find out that her boy is unfaithful. If she has not been on the net, she won't have found out that the guy is not faithful." This is similarly discussed in one of the male focus groups. Is this empowerment in leveling the playing field on checking on partners?

Biased perspectives and resentment

As well as designing gender segregated focus groups on the assumption that conversations would flow more easily, we included one focus group question on "what do you think men/women use their devices for." It was interesting that each gender pointed to the overwhelming entertainment use by the other ("guys like soccer, they are always playing games"; "girls are always chatting"), although women perceived male use as more work-focused than men did of women. Male perception of women's use is more critical:

Ghana facilitator: Do you think technology is helping your female friends get jobs or improve their skills? Your female friends, your sisters, your relatives, do you think technology is helping them find jobs or improve their skills?

Geffrey: Ladies don't like searching.

28 Donner, J., Gitau, S., & Marsden, G. (2011). Exploring mobile-only Internet use: Results of a training study in urban South Africa. *International Journal of Communication, 5,* 24.

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Use in context: Voices from users continued

Karl: They are scared of like the typing. Some of the ladies are scared of the typing and the searching. If you give your phone to a lady to search something for you, it'll take like two hours before she'll get there.

Facilitator: OK. Davis do you have any view?

Davis: Yes, I agree.

Karl: Some of the ladies are scared.

Facilitator: Some of them are scared. Of what?

Karl: Scared of computers and phones and laptops.

Similarly, female device use is perceived by men as "only" wasteful entertainment:

Samuel: Well for me, I would say pertaining to females, mostly it's for chatting.

Facilitator: Chatting?

Samuel: Social media.

Senanu: OK pictures.

Andrew: Instagram thing.

Another comment in the Ghana focus group was: *"females as in nature, they have this, they like to talk, so most of them will love to share quality time in chatting so that social media makes it a point so you find that more females are a glued to their phones instead, some of them that have this phobia for talking to people (face-to-face) tend to rely on phone a lot to talk to people."*

Is mobile Internet considered too disruptive by men? : Nampala in Uganda says: "Yeah, for instance, when I apply online, and my sister also applies, if the person receiving the applications is a male person, he will first consider the female OK, nebwabateyasoma? (even if they are not educated) [Participants laugh]…we are all accountants, that person will first of all first consider ladies first." Is the lowering of barriers due to technology threatening for some men? Similarly, Andrew in Uganda states: "according to what I see because I do not do it but what I see; sometimes it leads to neglect of other duties because I have a young sister of mine; when it comes to time of playing games on phone; she even forgets cooking. So, we are like; "tetuulye?" [Meaning "won't we eat?"] [Participants laugh].

Facilitator: She is always on games and she forgets other things?

Andrew: Because it is accessible any time and it is not like when you have to go to a café. She gets the phone, then she is in the bed busy playing games and she forgets cooking."

From a narrative perspective, Andrew excludes himself from this behavior by saying *"according to what I see because I do not do it but what I see."* This raises bigger questions of whether technology—particularly mobile Internet because it is so accessible because "it is not like when you have to go to a café."

At the same time, while women may embrace their freedom, they are also aware of the repercussions:

Randina: It creates problems in marriage.

Facilitator: Why?

Randina: "I for instance I like mingling with male friends. Let's say I have a guy who doesn't like the idea of me mingling with male friends on certain platforms. He would think that I am cheating. It will bring problems."

Summary

As with job-seeking, education and income-generation, economic empowerment for women—at least in our focus groups—appears to be somewhat limited to buying and selling online within established networks such as WhatsApp, OLX or other apps. However, "empowerment" is not considered as economic only—there is more emphasis on self-esteem, inspiration, and "being connected." This raises questions on how impressionable these young women might be—we did not discuss the negative side of this in our focus groups, but it is an important area for the development industry to explore, particularly the discussions around online bullying, self-esteem and mental health emerging in mature markets. Another emerging finding is of how women's online presence is being perceived by men in a contradictory manner: on the one hand, largely entertainment-based time-wasting, but on the other hand, also a potential threat in the job market. What is clear is that it is precisely the mobile aspect of this which is key—as Andrew says "because it is accessible any time and it is not like when you have to go to a café." We end with a caveat,

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however, that gender is not a binary issue—we need to pay careful attention to intersectionality—that is we need to pay attention to age, class, religion, sexual orientation, and several other factors (McCall, 2014).[29]

Conclusions and Recommendations

This chapter has reviewed a wide array of content consumption practices and tasks that individuals seek to achieve through their digital repertoires. Although we took an inductive approach to the research, this analysis and write-up is a necessarily narrow slice through the extensive data. As the codes referred to in the beginning of the chapter indicate, this approach to exploring individual digital repertoires and practices provides a rich and textured snapshot of individuals and their situated practices.

There are conclusions to be drawn from the insights that we have outlined and their implications for future action by those seeking to engage with the role of digital technology in Ghana, Kenya, and Uganda—and arguably in other developing countries too.

The first conclusion is as much a caveat as it is a conclusion. Our snapshot is constrained by scope and time. Digital repertoires vary between users (even if most repertoires are mobile-centric, the mix of skills and applications varied across our sample); at the same time, these repertoires are also evolving as new devices, modalities, and services emerge. Therefore, our conclusions reflect insights based on this snapshot in time, in these particular places for these particular respondents. We are wary of generalizations, and state conclusions carefully.

First, as we have said throughout this chapter, non-instrumental tasks characterize and drive the usage practices of nearly all the people interviewed for this report. The knowledge, capabilities[30] and vision that users have for their technology usage is animated by their desire to understand the world around them through accessing news, to find relaxation and enjoyment in listening to music that is shared through innovative side-loading practices and above all to connect and communicate with those that they already know. The social networking dimension of everyday usage is as important to users in Nairobi as it is to users in New York. Instagram, Facebook, and WhatsApp are the kinds of services that drive people to access the Internet through the devices they have available. Understanding that in this context, *digital* is heavily *social* is an important insight to draw from this research.

Second, we argue that these practices are wrapped up in larger debates about the implications of a digital transition that disrupts industries, institutions, and politics. These debates are well advanced in societies where adoption of many of these services is nearly ubiquitous. Concerns about the implications of social media's control over users, political information and engagement are already strong in the United States and elsewhere, and debates about the role of Facebook in shaping access to political news is as relevant in Accra as it is in Toronto. Similarly, the challenge to ensure that content producers are able to benefit from their endeavors has led to high profile altercations with companies such as Spotify and Apple. These debates are also significant for aspiring musicians and artists who seek to make a living in Kampala and across the developing world. Finally, concerns about the impact on cultural norms of social and gaming platforms has a long history that can be traced back to debates about the impact of global satellite television and the importance of local content in maintaining local cultural norms and practices.

These are all broad and many faceted debates, but that so many of these are entangled with the implications of digital repertoires underpins how significant the adoption of these technologies is for so many aspects of social and political life. Not all of these are important or priorities for any one organization, of course, and nor should they be. But they warrant further unpacking and disentangling to identify which, if any, of these wider debates are of particular importance to those seeking to engage with the role of digital technology in developing countries.

Our third conclusion offers more tangible and specific entry points for action. We believe that our recognition of the interlacing of instrumental tasks with non-instrumental, social platforms and services provides an important contribution to exploring how to help make digital repertoires serve development needs. Of course, it is not particularly surprising that people turn to the tools at hand to strive towards their goals, but we believe that this points towards an area that demands greater understanding and points towards possible areas of intervention. Indeed, that absence of reference to much vaunted forms of digital employment such as micro-work highlights that it is from users' practices not intended solutions that we must understand the role of digital repertoires in economic development.

29 McCall, L. (2014). The complexity of intersectionality. *Signs, 40*(1).

30 Our use of the term capabilities draws on Dorothea Kleine's application of Amartya Sen's "Capability Framework" to understand digital technology users" full repertoire of skills, knowledge and ability as well as an enabling context in which use can take place (Kleine, 2013).

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Use in context: Voices from users continued

Our research only touched the surface of how people are searching for jobs, advancing their education and seeking to increase their income through the use of social platforms like Facebook, WhatsApp, and even Instagram. However, it already revealed that there are significant issues that merit further exploration, such as gender disparities in male and female usage practices and further refining what enables or constrains instrumental use of social platforms.

This overview highlights some key takeaways that inform our recommendations for future action:

- All organizations and individuals can benefit from mapping out a position within the complex terrain of debates that emerge from the digital transition. Unpacking these debates, exploring which debates connect with specific issues and priorities can help navigate to a position that reflects an organizational or individual mandate and mission.
- Focus attention on "working with the grain': this means understanding that efforts to strengthen the capability of young people to use digital technologies to advance their prospects must start from where and what these young people are already doing. Interventions that seek to advance this should look to strengthen users' existing capabilities and means to expand their digital repertoires. These expansionary interventions could include exploration of ways to increase users' ability to consider and imagine using technologies for instrumental purposes as well as looking to expand and strengthen innovations that map onto the existing platforms and services that young people are already active on. Specific areas of intervention worthy of further investigation in this regard are the use of photography skills, data transfer ("side-loading") and marketing of services and opportunities through social media platforms.
- Pay particular attention to gender differences and particularly to strengthening the prospects for women's digital repertoires to advance their life prospects. This is of course itself a broad terrain, but this initial research points towards key areas of intervention aimed at addressing the many constraints that intersect to limit womens" use of digital technology. These interventions range from straightforward efforts to increase female access to digital technologies to much more nuanced engagement with socio-technical eco-systems such that they may support the participation of women in social, economic, and public life.

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Chapter 4
Discussion: Digital Days

This closing chapter engages with the challenge (and opportunity) of integrating the three quite distinct kinds of insights offered across the three chapters that preceded it.

Chapter 4
Discussion: Digital Days

Chapter 1 offered holistic but relatively abstract theoretical and practical framings for the work, focusing on the interplay between Internet Access Modalities, new digital platforms, and people's digital repertoires. Chapter 2 connected readers with the perspectives offered by more than two dozen expert researchers and practitioners in the ICT4D community, exploring how we might contextualize the quickly changing patterns of Internet use (mobile and otherwise) in the Global South. The insights in Chapter 3 were quite different, drawing on extensive focus group discussions with young users of the mobile Internet in Ghana, Kenya, and Uganda. The discussions in Chapter 3 revealed important implications and priorities for understanding technology use in context, by individuals with a variety of goals and constraints, skills and dreams, rather than exclusively as targets for stylized information campaigns or narrow, instrumentalist interventions.

The challenge and opportunity confronting this chapter is, therefore, to contribute integrative frames that help bridge concepts operating across these levels and perspectives, in a way that captures both the context-specificity of individual's technology behaviors, as well as the broader forces at play in providing digital access and services. Such frames and insights, if made replicable, could help guide new approaches to the use of technology in prosocial and development initiatives in the Global South, as well as to the development of new technologies themselves.

Our approach, developed throughout this chapter, is the idea of a Digital Day. Although far from complete, the digitization of everyday experience in everyday life is well underway, even in the Global South. There is a digital component to almost any human endeavor; it is not simply about selling crops or buying bus tickets. It is also about flirting, and feeling good, and spirituality, and memory, and culture. Instrumental and non-instrumental, these digitally enabled practices are intertwined and, thanks in no small part to the embrace of the mobile phone by younger generations, are transforming activities and commanding our attention from the moment we wake to when our eyes close again—even afterwards, thanks to alarm clock apps and midnight social networking messages. As the results in Chapters 2 and 3 suggested, understanding and leveraging the potential of digital to enable instrumental usage requires frames that account for non-instrumental usage. The frames should be as expansive and flexible as the behaviors and practices themselves, and must move with individuals across the domestic, public, and productive spheres. Hence, our "Digital Days" graphics presented below.

While we acknowledge that all efforts at portrayals of complex behaviors, whether qualitative or quantitative, are inherently reductionist, and must obscure some complexities, we think that the clarity of the Digital Day allows for conversations which move between platforms, access modalities, and repertoires in rapid yet connected ways.

It is critical that we look at digital technologies in a user-centric way, and therefore in this research we anchor around people, and the ways they interact with these digital technologies. The approach seeks to build empathy with individuals as people situated in specific contexts, who know best the challenges and opportunities that they face on a day-to-day basis. It is a research approach that goes with the grain, building an understanding of people's lives and goals from the bottom up. It rejects the narrow, researcher or outsider led enquiry, based on priorities and assumptions external to the individual and the context.

The field research that we carried out demonstrated that there is a great deal to learn about how people use digital technologies to achieve specific tasks—from using social networking as a way of "feeling good, so good" to using messaging applications for innovative ways of finding out about employment opportunities. Yet, as we advanced through the focus group activities, through data collection and analysis, we realized that even the inductive, funnel-like approach of the focus groups only revealed narrow, thematically specific elements of user experiences. We recognized that the ubiquity in ownership and use and the level of technology domestication meant digital devices had become fully entangled in users' lives. Following the principles of grounded theory[1] we recognized that there was a significant gap in our understanding of what it meant for digital repertoires to be entangled with such a diverse array of user practices. What happens in people's lives outside the questions asked of them? We recognized that while the focus group discussions offered far richer information than surveys, but were limited in their detail of individual practice. We also recognized that the in-depth, longitudinal ethnography of sociological and anthropological enquiry were beyond the scope of this research. Thus, we drew on approaches combining commercial research and development practice, and developed the Digital Day.

1 Barney G. Glaser and Anselm L. Strauss, *The Discovery of Grounded Theory: Strategies for Qualitative Research*, ed. Howard S Becker (Aldine, 1967).

Chapter 4
Discussion: Digital Days continued

Background to Digital Day

Just to clarify; a "Digital Day" is not a digital repertoire. A "Digital Day" is a means to capture and represent that repertoire (as it intersects with platforms and access modalities) without stripping all the dynamism from the concept. As a means of representation, the Digital Day is a synthesis and adaptation of several methods and perspectives with broad and established communities of practice, including:

- Development methodologies such as Participatory Rural Appraisal and its precursor "Rapid Rural Appraisal,"[2] as well as consumption diaries.[3]
- Human Computer Interaction design methods such as User Centered Design.[4]
- Experience sampling from communication research and psychology.[5]
- Personas, from market research and design communities.[6]

Thus, we are quite far from the first researchers to use a hybrid of quantitative, qualitative, and visual portrayals to represent a complex array of interconnected behaviors. However, the Digital Day has three elements that collectively distinguish it from its influencers.

First, like experience sampling, or the "transect walk" method in the Participatory Rural Appraisal toolkit, the Digital Day introduces a temporal walk through 24 hours of an individual's life. It divides the day up into waking, morning, midday, lunchtime, afternoon, early evening and late evening. This time dimension is important for situating multiple activities (sometimes at cross-purposes) possibly occurring in relationship to one another.

Second, its main components (device, network, and service) allow clear links between the user-level practices and skills captured by the digital repertoires lens and the broader structural and technical factors. The Digital Day methodology integrates modality, platform, and repertoire in the same method of enquiry and output of insight. It produces an overview of the different modalities, platforms, and repertoires anchored at the experience of the user, enabling in-depth insight and representation of how digital technologies are integrated into users' lives.

Finally, it foregrounds the idea of a task as worthy of scrutiny. As we will discuss below, "task" is not without complications and limitations, but is a powerful bridge between an inductive approach to user practices and an "instrumental," interventionist outcomes-focused perspective that remains perhaps unavoidably at the core of development practice.

The Digital Days we portray below are the results of a first iteration of this approach, developed over the course of the overall project. The specific techniques we used to gather data and the exact graphic treatments of the Digital Days are ripe for further refinement and calibration. In this case, more extensive facilitator training and a sample with greater diversity of repertoires might have improved the depth of the portrayals. That said, there is plenty to address amongst the profiles we developed, and the linkages between the Digital Days portrayals and the broader takeaways of the report are apparent, abundant, and complementary.

2 Robert Chambers, "Participatory Rural Appraisal (PRA): Challenges, Potentials and Paradigm," *World Development* 22, no. 10 (October 1994): 1437—54, doi:10.1016/0305-750X(94)90030-2.

3 Daryl Collins et al., *Portfolios of the Poor: How the World's Poor Live on $2 a Day* (Princeton, NJ, USA: Princeton University Press, 2010).

4 Hugh Beyer and Karen Holtzblatt, *Contextual Design: Defining Customer-Centered Systems* (San Francisco: Morgan Kaufmann, 1998).

5 Joel M. Hektner, Jennifer A. Schmidt, and Mihaly Csikszentmihalyi, *Experience Sampling Method: Measuring the Quality of Everyday Life* (SAGE, 2007).

6 Jonathan Grudin and John Pruitt, "Personas, Participatory Design and Product Development: An Infrastructure for Engagement," in *Proceedings of Participatory Design Conference (PDC)* (Citeseer, 2002), 144—61, http://ojs.ruc.dk/index.php/pdc/article/view/249/241.

Chapter 4
Discussion: Digital Days continued

A note on "tasks"

Task is perhaps the most important and complex element in the Digital Day; it is the bridge between the human and the technical/structural, and it is through understanding Task that meaning is unpacked and developed. This link into individual intent encompasses not only the changes that individuals seek to bring about, but also the practices and behaviors they employ to try to do so. Task is thus a simple way of capturing the complexity of meaning behind digital activities. Fundamentally, it is a way of opening up the answer to the question of "hey, what are you doing," and extending it into the "why are you doing that?"

Asking about tasks is not just a pragmatic, utility oriented question, as it might be in much of the HCI literature. For us, the term task is a window into the broader set of sociological processes and structures that underpin and situate human behavior.[7] This is a lot of weight to place on one term, in one graphic, and we acknowledge that Task indeed stands in for a black box of entangled, contextually and culturally contingent human and material processes that constitute situated practices. It won't all fit on a single graphic, but through this term we hope to unpack some of what is left invisible in much of the instrumental or positivist approach to questions that ask "what are you doing?"

The idea of opening the black box of tasks is an important metaphor for the work we intend it to serve. Bruno Latour, a sociologist of science and technology, states that black boxing is "the way scientific and technical work is made invisible by its own success. When a machine runs efficiently, when a matter of fact is settled, one need focus only on its inputs and outputs and not on its internal complexity. Thus, paradoxically, the more science and technology succeed the more opaque and obscure they become."[8]

"The Digital Days approach works like a time-lapse photo of a person in digitally-mediated motion, helping and make visible the connections between an individual, her tasks and goals, and the technical and social structures enabling and constraining her."

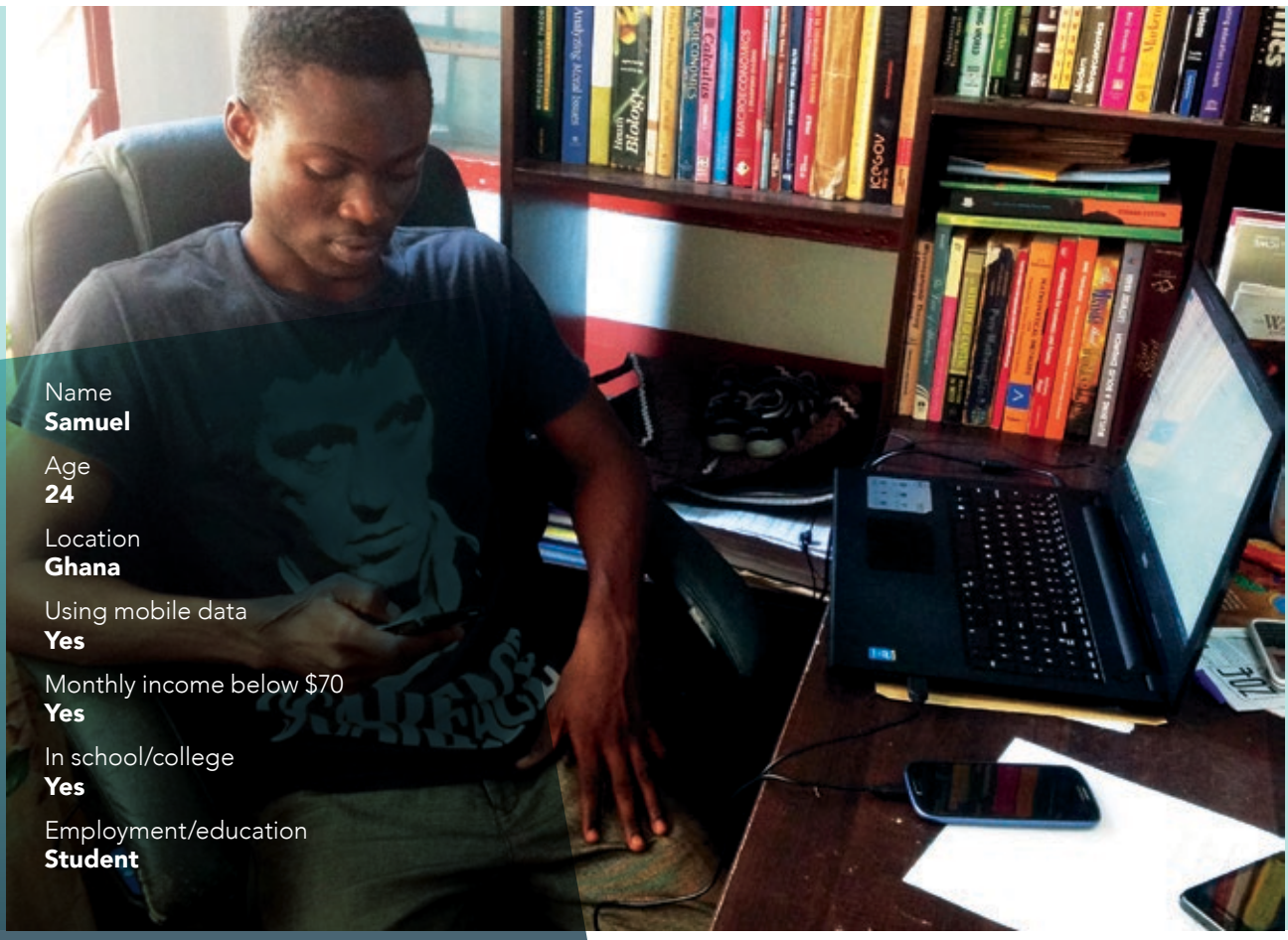
The term "Task" is thus the window we sometimes can choose to open to the internal complexity of meaning in the answers users give when asked what they are doing. The window of the term task also opens onto exploring user agency, intent, and contextually and culturally situated practice.

Thus, task is the shorthand term we use to capture and explore a full range of practices and appropriations of digital technology by people, in their everyday lives. Some tasks are of interest to the development community prima facie; others, probably remain not so much; but the Digital Days approach helps reveal how some tasks are more interesting to development practice than would appear at first blush, thanks to the complex ways in which digital is becoming woven into everyday life.

7 And not just human behavior, as we recognize that tasks, particularly in the context of digital repertoires, include actors that play active roles in nature of action—for example algorithms that structure users' newsfeed and thus influence what an individual knows about the world.

8 Bruno Latour, *Pandora's Hope: Essays on the Reality of Science Studies* (Cambridge, MA: Harvard University Press, 1999), 304.

Chapter 4
Discussion: Digital Days continued



Name
Samuel

Age
24

Location
Ghana

Using mobile data
Yes

Monthly income below $70
Yes

In school/college
Yes

Employment/education
Student

Six Digital Days

Waking up

Samuel checks his e-mail on a laptop and messaging service WhatsApp as soon as he wakes, using them for social networking and school messages. At the same time he may use his phone to listen to music or preachers.

Morning

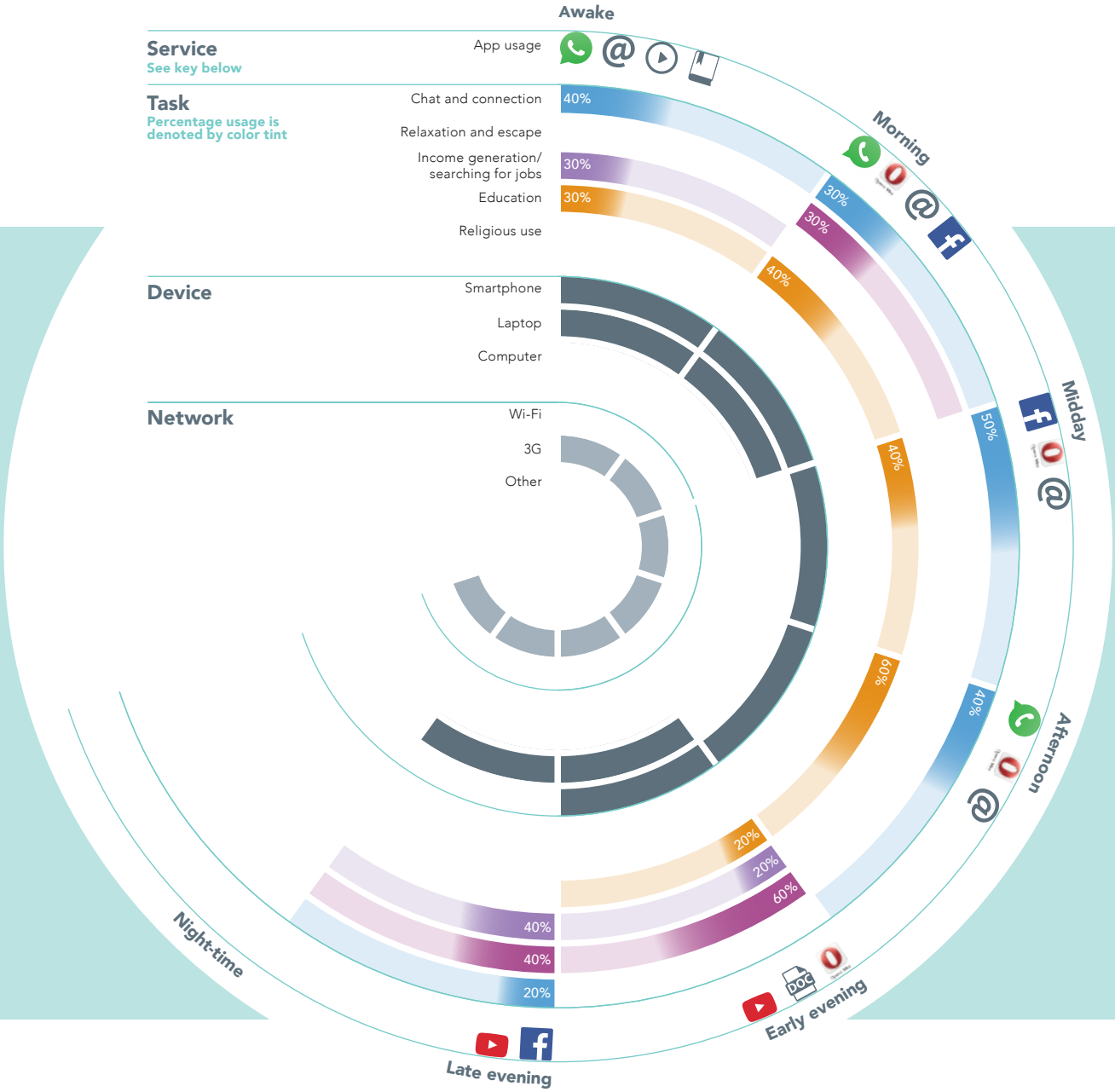
In the morning, Samuel uses his smartphone during classes to check his social media notifications and see if any of his other classes have been canceled. Although this is not allowed by the teachers, he describes doing it anyway so as to stay connected and not make trips to canceled lectures.

He also gets online by connecting his laptop to his smartphone's internet connection, thereby using the latter device as a "hotspot." He then uses his laptop to check the news, browsing global sites and issues, such as Gay Rights protesters in America. He describes the ability to do this as "amazing" and "wonderful."

Lunchtime

By lunchtime Samuel often checks his e-mails for notifications from an online programming course he is taking. However, he describes occasionally being interrupted when the data signal cuts on his smartphone.

Chapter 4
Discussion: Digital Days continued



Afternoon

Samuel's afternoons require him to be "on the move," so he describes the ability to check social media notifications (if he has new messages) on the fly as "simple." He describes WhatsApp as useful, as it is cheaper than a call and you can see when a contact has read your message.

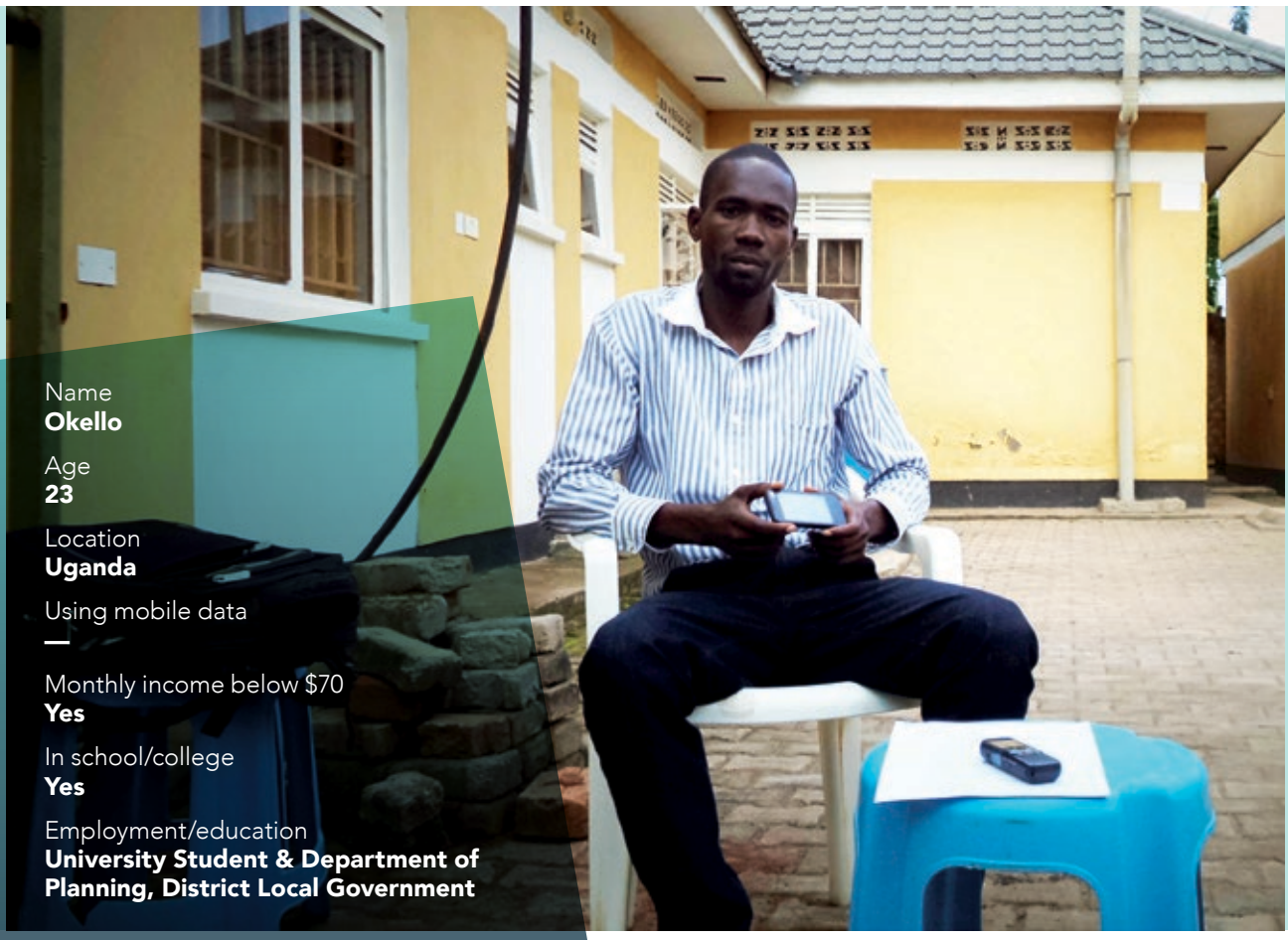
During the early evening Samuel uses his laptop to do homework and watch movies. He describes turning his mobile data off so as not to get disturbing notifications.

At night Samuel likes to watch programming videos and fall asleep to the radio. He also describes having a laptop as great, as if he wakes up he can get on with practicing his programming, even making software for phones.

Service key

- WhatsApp
- Email
- Music
- Religion
- Opera
- Facebook
- YouTube
- Word

Chapter 4
Discussion: Digital Days continued



Name
Okello

Age
23

Location
Uganda

Using mobile data
—

Monthly income below $70
Yes

In school/college
Yes

Employment/education
University Student & Department of Planning, District Local Government

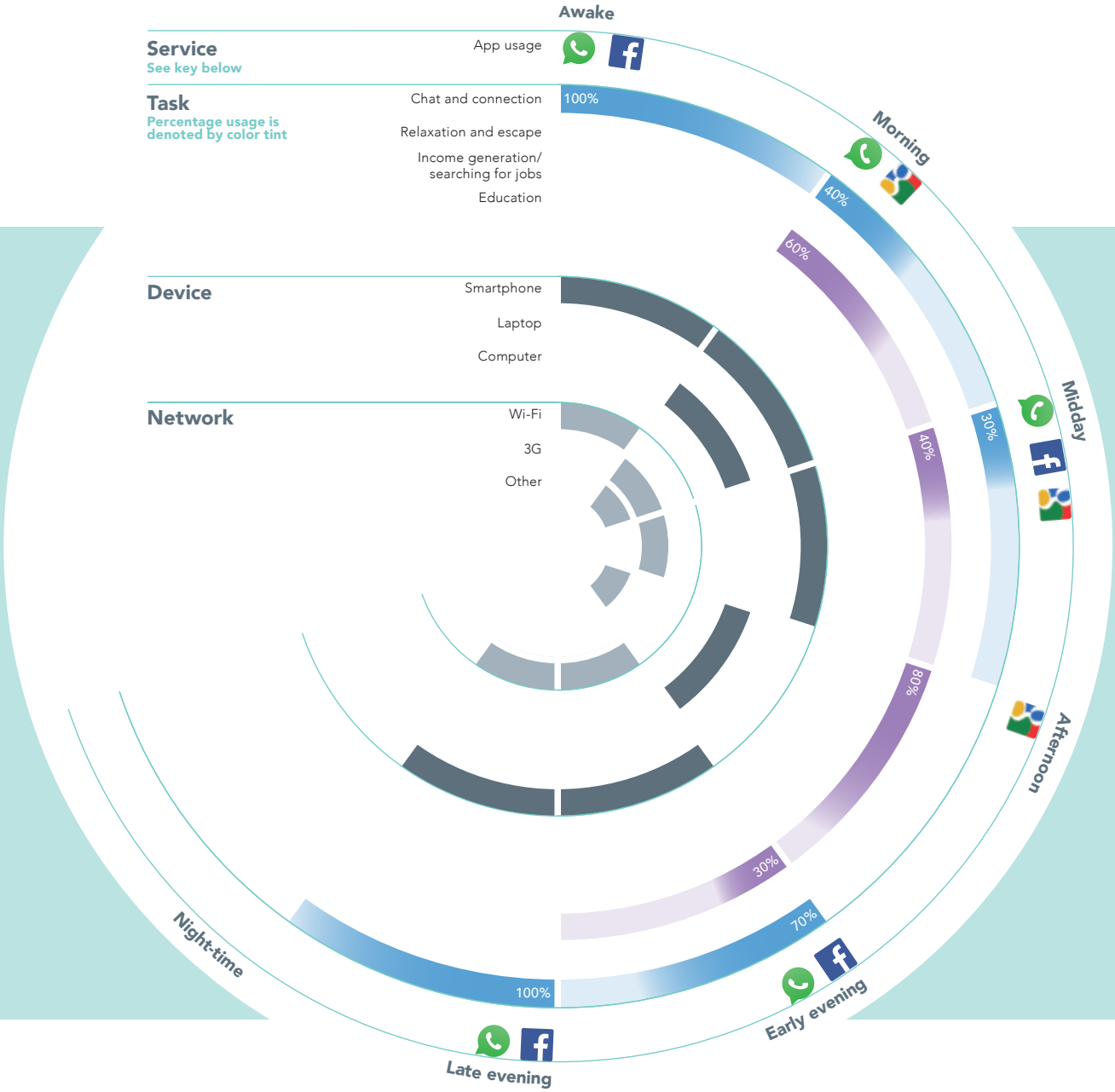
Morning

Okello is 24 and describes how in the morning he checks his phone for missed calls and to see if he has any notifications on social networking services. He praises these services for being cheaper than a phone call. However, he does not see these services as part of the "Internet."

Lunch/Afternoon

Okello describes himself as being online throughout his working day, as he works as a volunteer for a local UNICEF project. All the work is done on an online management information system. Whilst at work he uses his smartphone to check WhatsApp, which he describes as making him feel closer to his friends and as if they are around him all of the time. Okello uses Facebook to job hunt and download application requirements, arguing that if you want to get a job in Uganda it is vital. Okello describes Google and VRS as both used to facilitate his work for UNICEF.

Chapter 4
Discussion: Digital Days continued



Evening

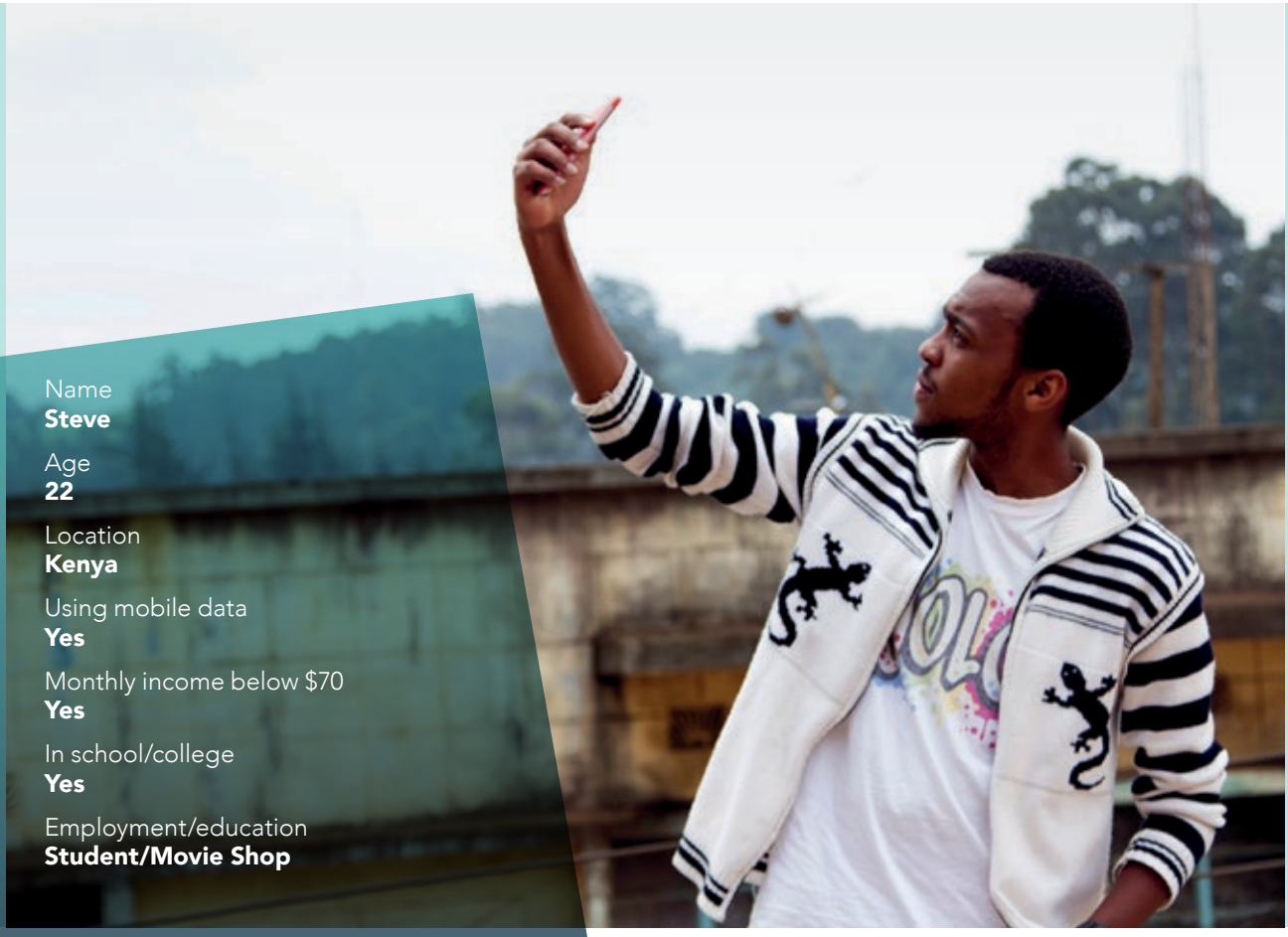
Okello describes how up until 10:00P.M. or so most of his friends are online and communicating with one another through social networking services. He also mentions that he uses his laptop to continue his job hunt and to browse some online retailers. However, he has never purchased anything online.

When pressed as to why he does not use the Internet to make money by posting sponsored content, that he has heard people do, Okello replies that because he has not met anyone "face-to-face" that has done this, he has not explored the possibility further.

Service key

- WhatsApp
- Facebook
- Google

Chapter 4
Discussion: Digital Days continued



Name
Steve

Age
22

Location
Kenya

Using mobile data
Yes

Monthly income below $70
Yes

In school/college
Yes

Employment/education
Student/Movie Shop

Morning

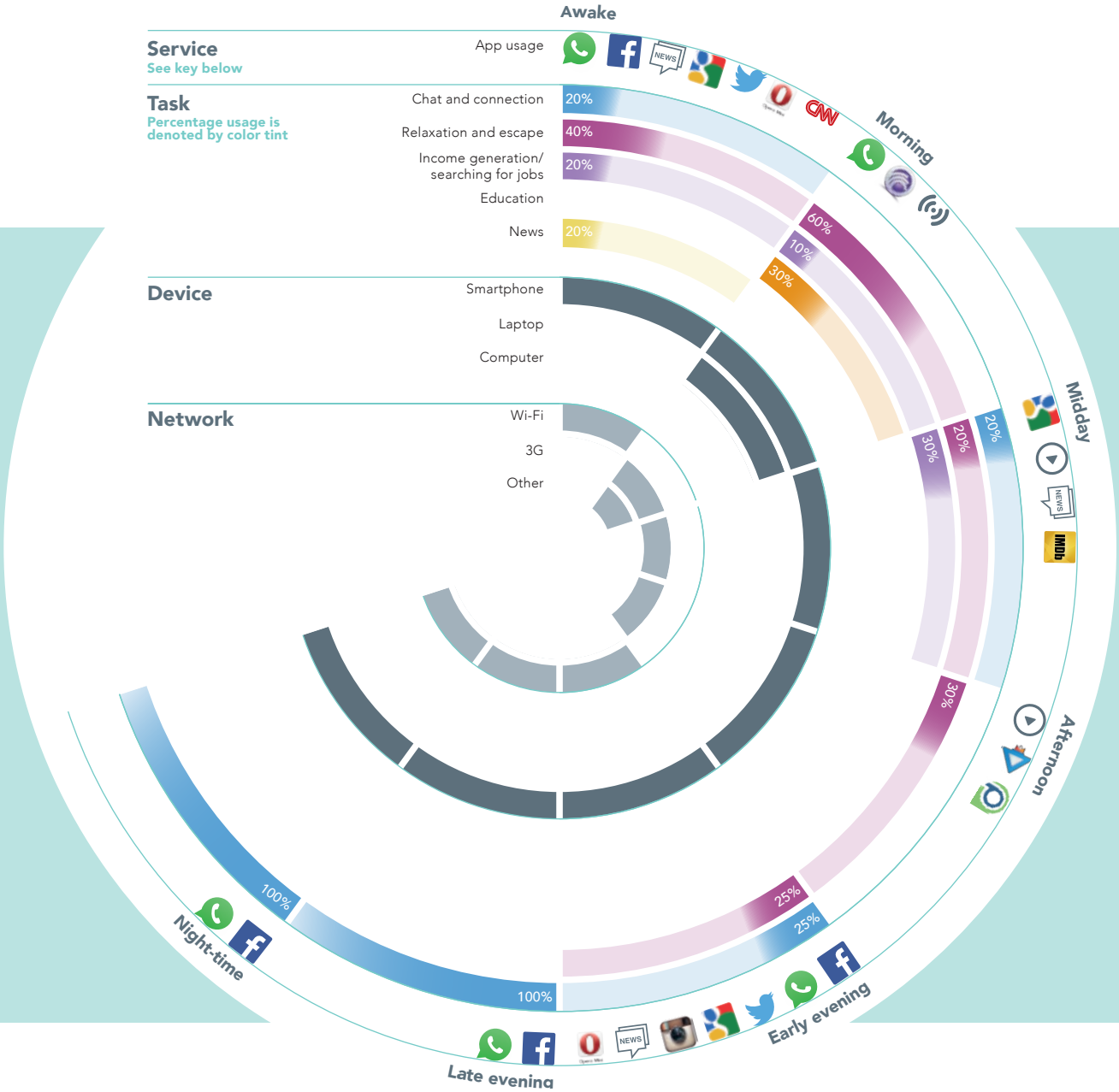
Whilst still in bed in the morning, Steve searches on his phone for news and other current information. Steve uses Opera and Google when he does not have a "direct app" to find the news. Steve also describes how important radio is for more local information, such as finding out about current deals in local shops and job adverts.

Steve says that once he is having breakfast he moves onto social networking and checking his notifications. Steve advertises his "designs" on Facebook and customers contact him through it. Steve describes his relationship with this mode of searching for work as mixed, and says it's disappointing when he puts in the time but doesn't get the job.

Whilst at school, Steve uses both his laptop and phone for his education. The former he uses to practice 3D graphic design and the latter to download tutorials to help with the former. On days when he is not at school, he spends mornings downloading movies via Torrents onto his phone and working at a movie shop.

Steve describes how the lunchtime radio show he listens to on HomeBoyz Radio often contains links to online job adverts. For him, the radio host likes to "empower" youth by showing them how they can earn money.

Chapter 4
Discussion: Digital Days continued



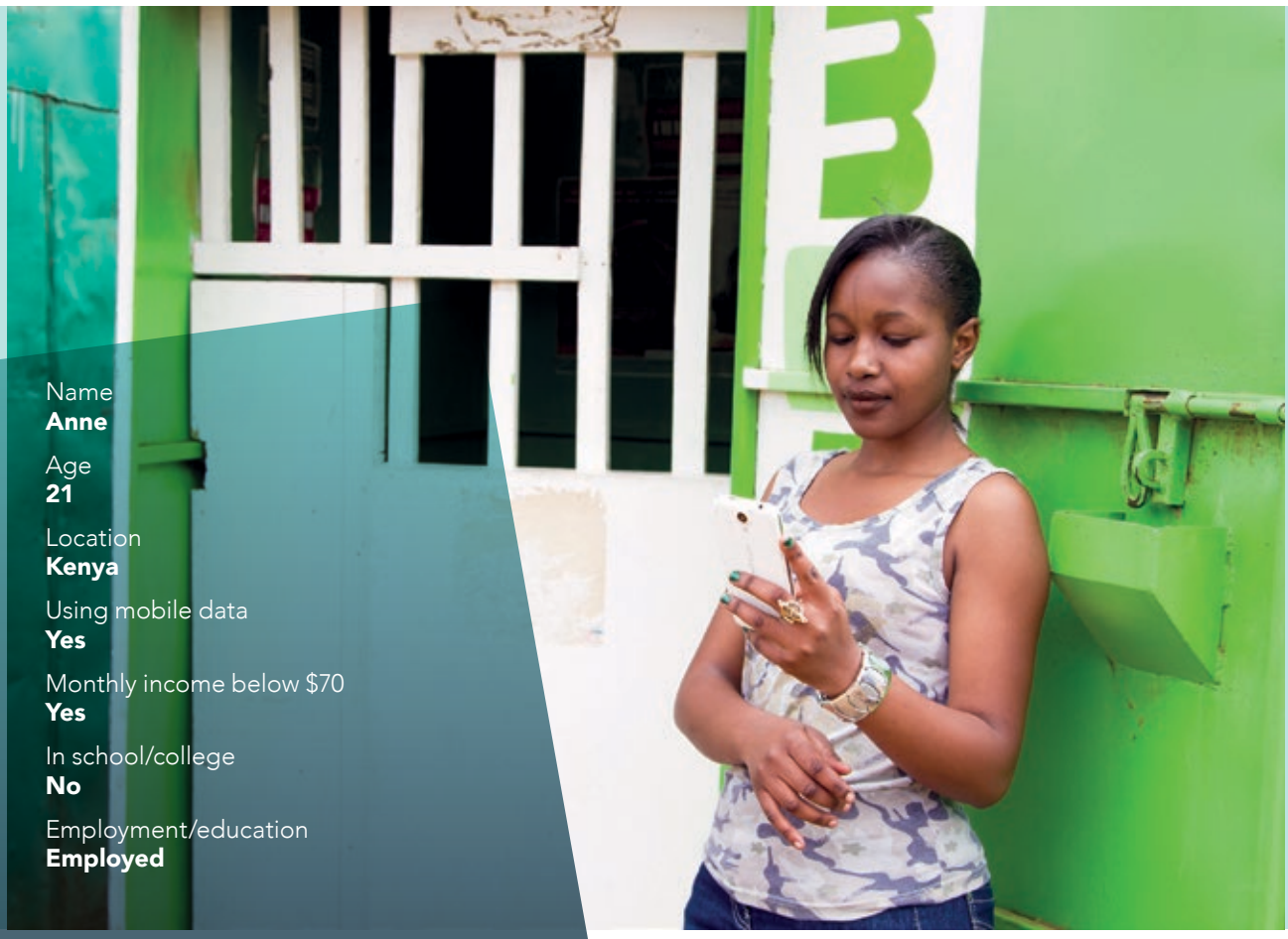
At the end of a long day at work, Steve likes listening to music and poetry on his smartphone. Steve also describes using CNN to find out how Kenya is being portrayed to the wider world, especially with regards to terrorism. He also argues that social networking helps him to stay connected to those friends that are far away and that this helps improve his mood.

Steve suggests that when he wakes up at night he uses social media to just quickly check for any notifications.

Service key

- WhatsApp
- Facebook
- News
- Google
- Twitter
- Opera
- CNN
- Bittorent
- IMDB
- Rocket player
- Power app

Chapter 4
Discussion: Digital Days continued



Name
Anne

Age
21

Location
Kenya

Using mobile data
Yes

Monthly income below $70
Yes

In school/college
No

Employment/education
Employed

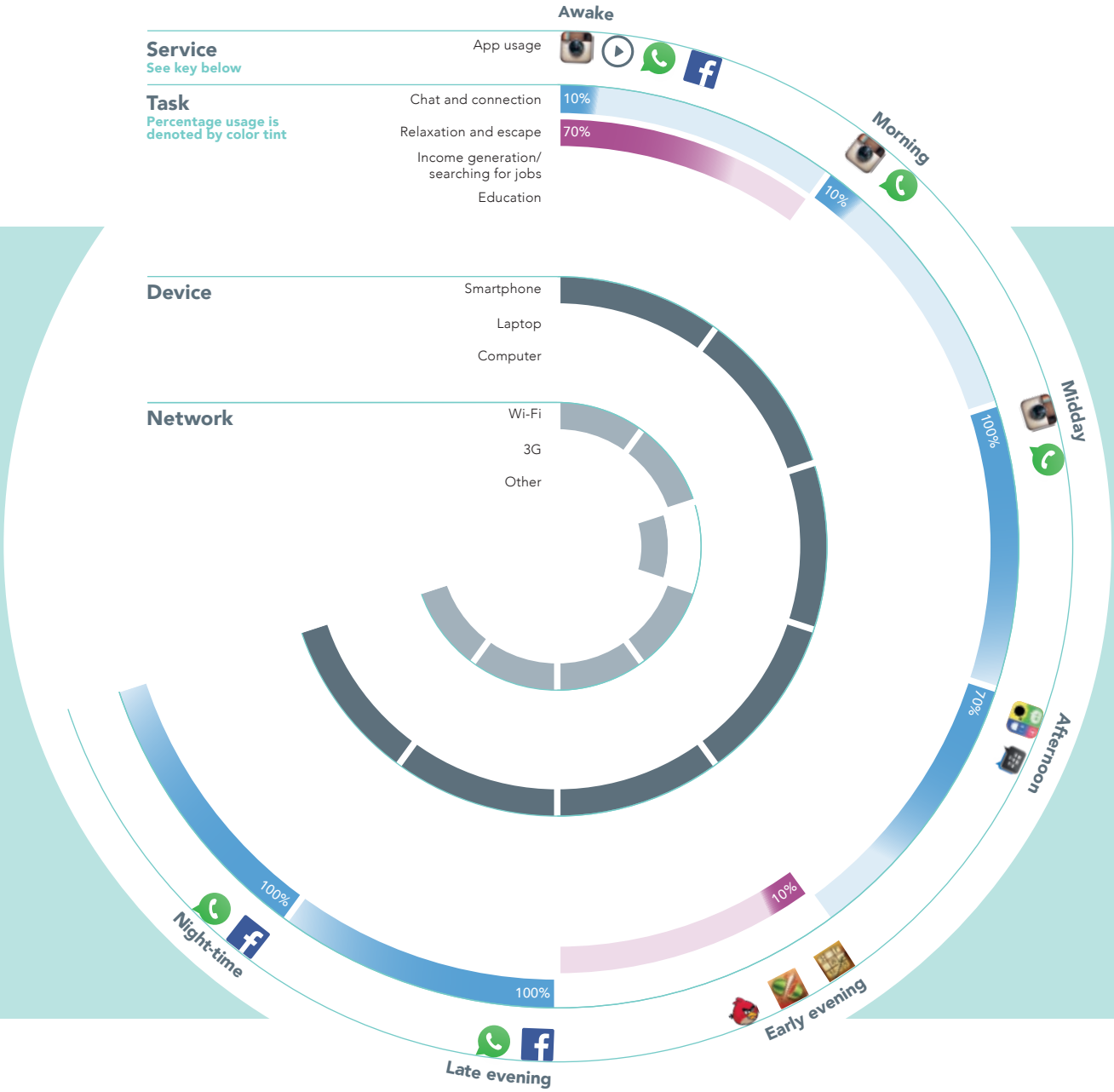
Morning

Anne describes her morning routine of listening to music on her smartphone whilst having breakfast or on the way to work as refreshing and preparing her for the day ahead. Anne describes Instagram as both challenging and educating her, as she competes to post pictures that will win approval from other users, and in the process learns about their lives.

Anne often edits her photos in the afternoon while at work. She describes how by sharing them through social media services she learns about others and can share her problems with her networks who give her advice. "Those photographs help her know whether she is growing prettier or not, and what I have to correct." She continues that by sharing photos with other social media/networking users she gains emotional "self-esteem," and feels that it is a good way to identify and hook-up with people that are "familiar" (like her).

On her way home, and in the evening, Anne says she likes playing games on her smartphone. She said that "games make you think big outside the box because some of them are very tricky" and that they "make you sharper and

Chapter 4
Discussion: Digital Days continued



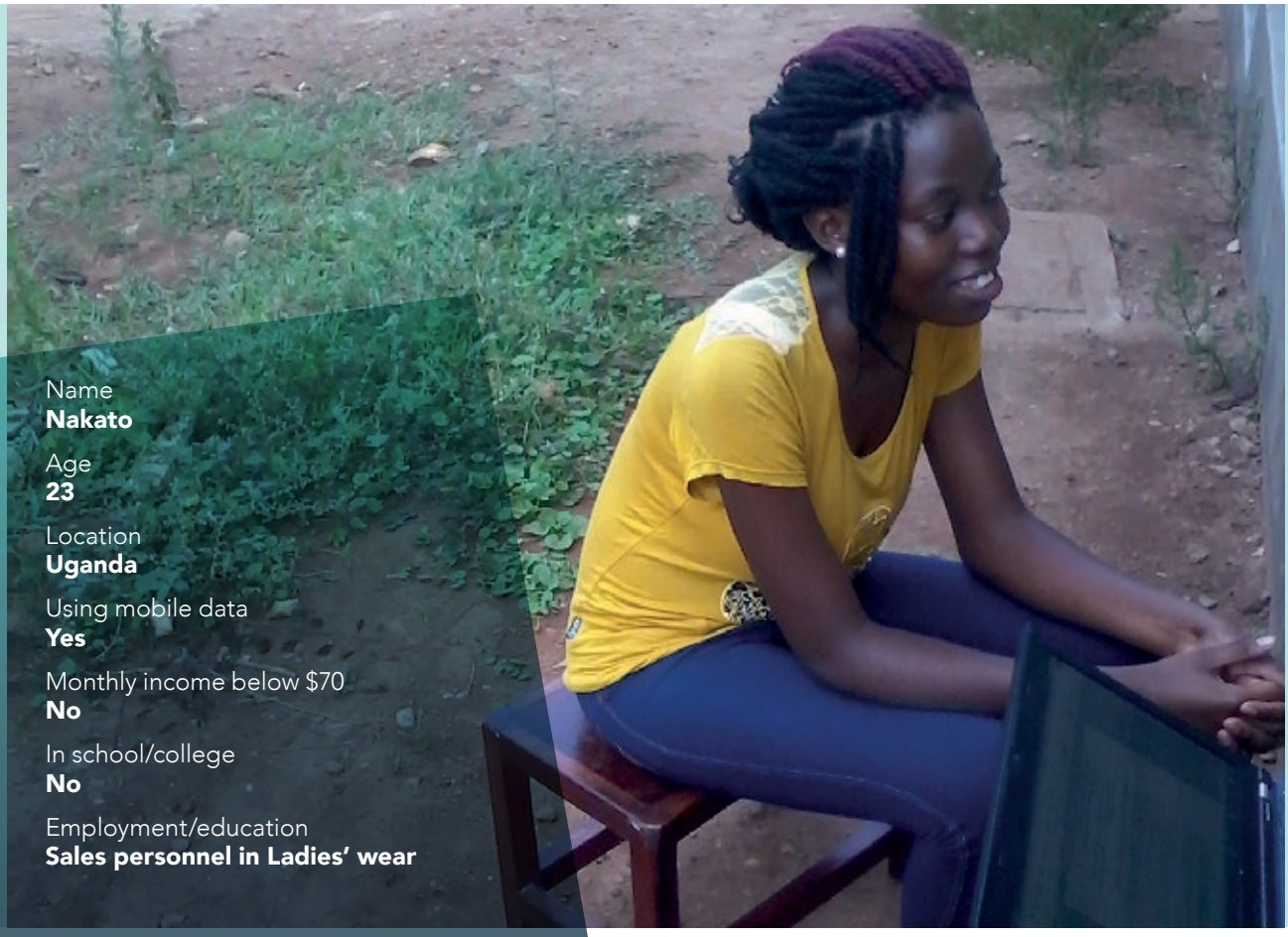
improve your speed because you have to be fast so that you can score." Anne says that games allow her to meet and bond with other people who play the same game.

At the end of the day Anne and her friends debrief over the day's events on social networking services, mainly Facebook and WhatsApp. They share their feelings about the day as well as photos and music. Anne says that she finds access to social networking reassuring, because if she wakes during the night there are people around to converse with until she falls asleep again.

Service key

- Instagram
- Music app
- WhatsApp
- Facebook
- Photo Grid
- Blackberry
- Sudoku
- Fruit Slice
- Angry Birds

Chapter 4
Discussion: Digital Days continued



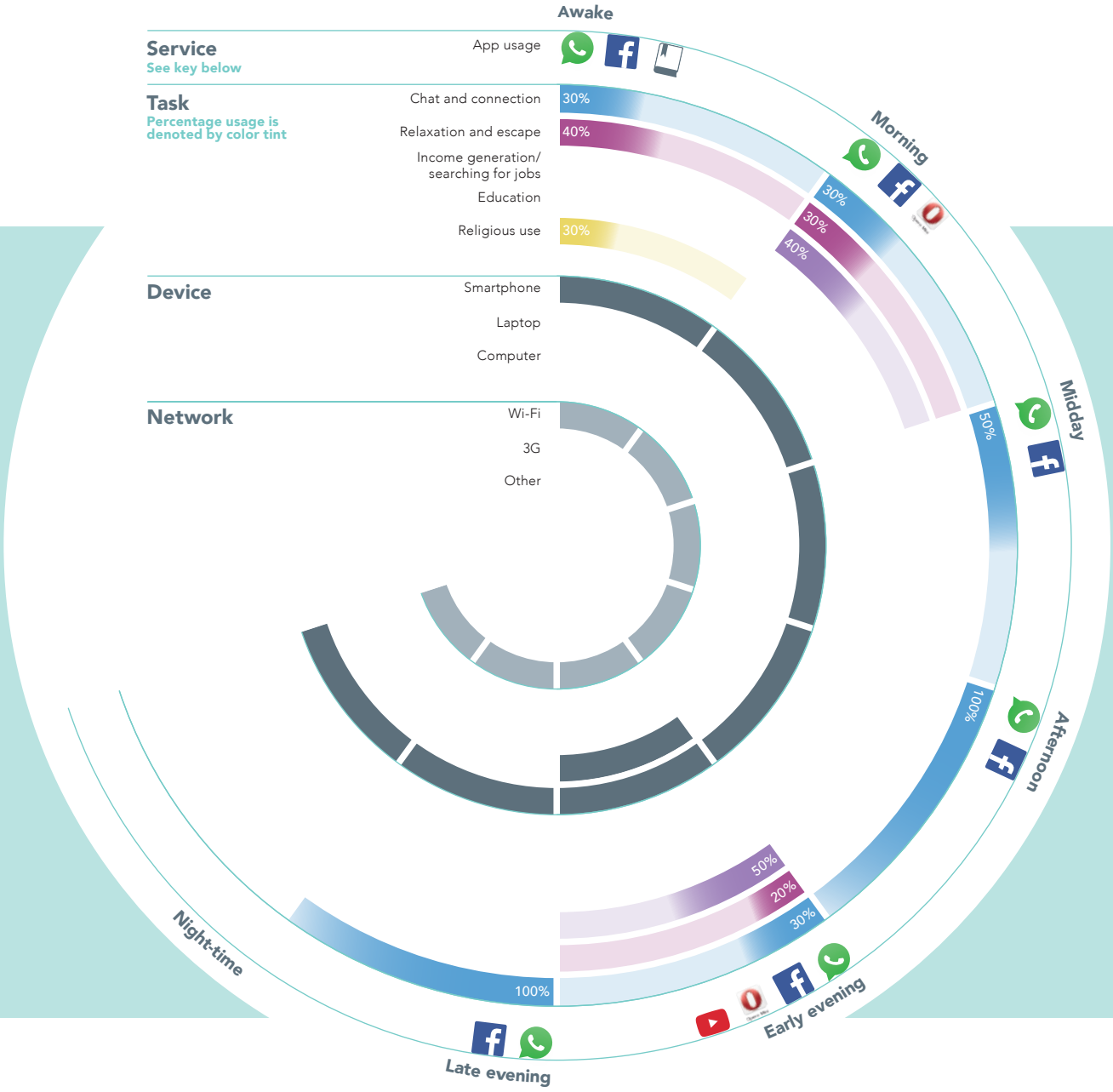
Nakato, a 23-year-old sales assistant, describes her Itel 1520 smartphone as her "second friend" as it "tells me a lot." She uses it for everything from social networking and finding the latest music news to reading the Quran. For her, it is also a way of saving money on costly newspapers. For Nakato, data is "costless," and she describe getting a lot from her smartphone (in terms of information) without putting a lot into it.

During the workday, Nakato describes how she uses her phone when there are no customers in her shop, she uses her phone to see what is being posted on social networking services or to look up information about her favorite music artist. She also messages other shop attendants to find out how their stores are doing and plays games to relieve her stress if she has just dealt with a rush of customers.

In the evening, Nakato mostly uses her laptop to browse news and videos on the Internet. Many of these videos are from religious leaders and she views them as informative, providing her with information about "marriage, dowries and business." She also uses her phone to access social networking services. The ability to access this information makes Nakato feel "good."

The interview ends with Nakato offering some of the disadvantages of mobile Internet and her smartphone. These include the addictiveness of her smartphone and the cost of data, which contradicts her first statement about data being "costless." She complains that she spends a lot of money on mobile data.

Chapter 4
Discussion: Digital days continued



Service key

- WhatsApp
- Facebook
- Instagram
- Opera
- YouTube

Chapter 4
Discussion: Digital Days continued

Name
Naba

Age
25

Location
Uganda

Using mobile data
Yes

Monthly income below $70
No

In school/college
No

Employment/education
Employed. Business development officer in an IT firm

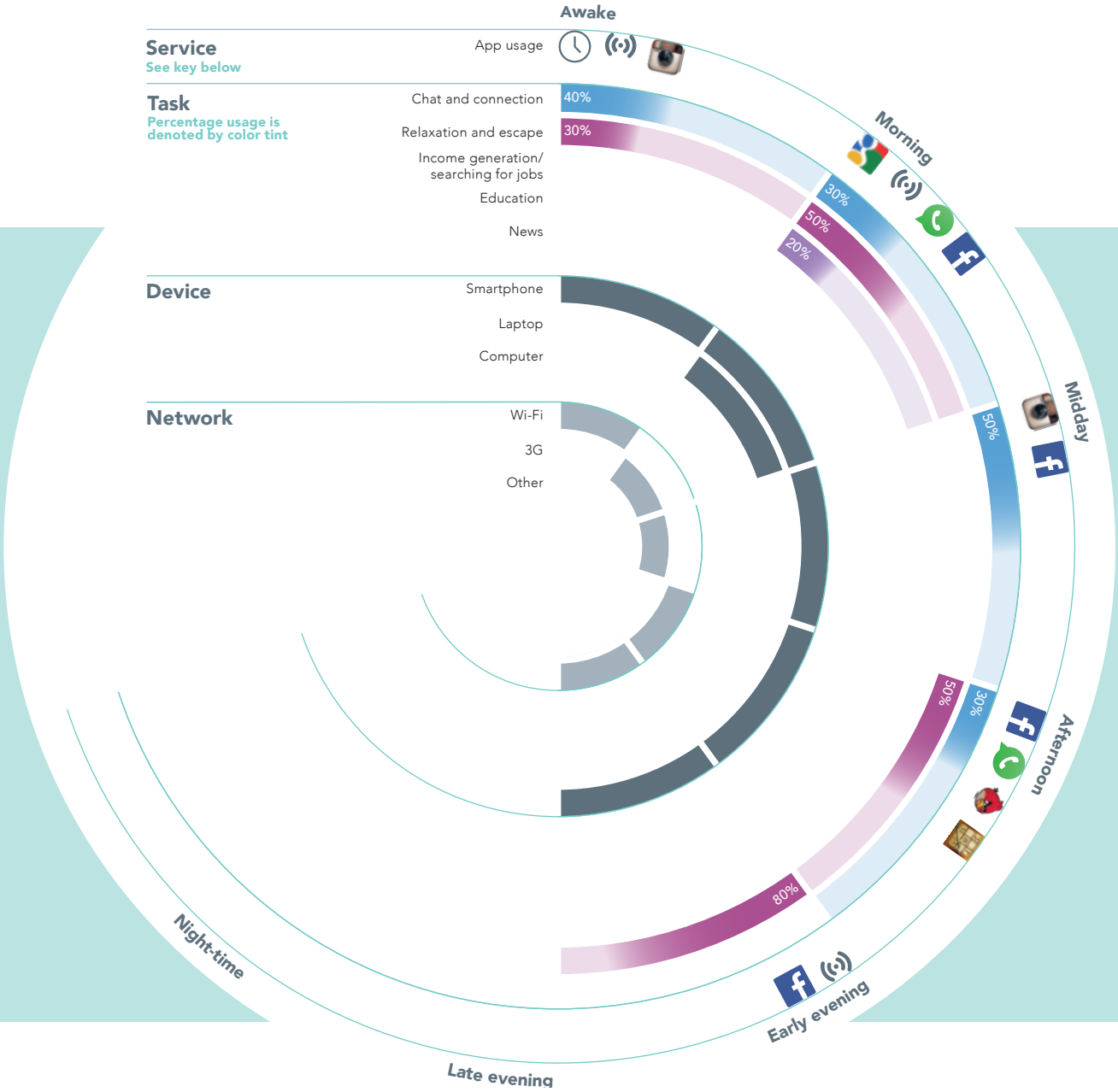
Naba's smartphone is central to her morning routine. It allows her to both check the time so as to know when to rise and to stay informed with current events. Indeed, the radio function means she does not even have to leave her bedroom to hear the latest news.

Whilst on the way to work, Naba uses her phone for four purposes: social networking, music, news, and to prepare for the workday by checking industry news.

Throughout the work morning Naba stays connected with friends and family, as well as browsing job adverts on WhatsApp group chats specially created for young graduates. The apps Naba uses make her feel good because she can read motivational messages on social networking services, gets her news from a few sources and save money by not buying a newspaper. Before working at the app company, Naba didn't really know much about these different apps—it was the company that encouraged her to develop her knowledge and use of these new services.

During lunchbreak Naba uses her phone to browse her friends' photos. She remarks that it makes her happy to see wedding photos and imagine posting her own photos in the future.

Chapter 4
Discussion: Digital Days continued



In the afternoon, after work, Naba uses her phone to stay connected with friends, and reconnect with old ones.

In the evening, Naba uses her phone to listen to music to help her unwind from the day's activities. Although she has other digital devices, laptop, TV, and radio, she does not use these often, preferring to use her smartphone. However, Naba doesn't use her phone much before she sleeps, only using it to check the time and keep a mental record of how many hours sleep she gets.

Service key

- Clock
- Radio
- Instagram
- Google
- WhatsApp
- Facebook
- Angry Birds
- Sudoku

Chapter 4
Discussion: Digital Days continued

Discussion: Digital Days and a Summary of the Major Report Themes

As we mentioned at the beginning of the chapter, the Digital Days approach works like a time-lapse photo of a person in digitally mediated motion, helping and make visible the connections between an individual, her tasks and goals, and the technical and social structures enabling and constraining her. With these time-lapse representations, we can revisit and reinforce many of the themes discussed earlier in the report.

Work with the centrality of entertainment, and the blurring of social and functional activities

The most consistent finding across the literature, expert interviews, focus group discussions, and Digital Days research is that the digital activities of the people we spoke with are not, at least in terms of time and attention, dominated by what we would consider narrow "instrumental" use. It is, instead, entertainment and social networking which takes the bulk of digital attention. Like public opinion and academic research in the developed markets of the U.S. and Europe,[9] our findings show that users turn first to social media and networking, closely followed by news, music, gaming, and movies.

For many with phones, the first marker on a Digital Day comes early. Samuel in Ghana connects to social media as soon as he opens his eyes, and Steve in Kenya checking the news whilst still in bed. This continues throughout an individual's day, with high levels of social media use, such as Anne's use of Instagram to gain "self-esteem" and Okello's use of Facebook and WhatsApp to chat to friends until at least 10P.M.

Yet, it is unwise and inaccurate to discount these activities, en masse, as non-instrumental. Rather, instrumental and non-instrumental tasks are so blurred[10] and interlaced[11] on social network platforms as to make the distinctions difficult to separate. In Kenya, Steve describes how he posts his graphic designs on Facebook, whilst in Uganda, Nakato describes how she uses WhatsApp to find out from other shop attendants how their business is going. Yet several of the more instrumental tasks have yet to deliver on their potential, with Steve for example emphasizing that he does not get much work from his Facebook promotion. In Uganda, Okello describes how, although he browses the Facebook page of different retailers, he has yet to buy anything because he is sceptical about mobile money and buying online.

Susan Wyche (one of the experts we interviewed in Chapter 2) describes similar behaviors as "Hustling Online"[12]; Horst and Miller call it link-up;[13] Ilahiane, bricolage.[14] Along with these framings, this finding is one of the biggest departures from the bulk of the information and communication technology for development (ICT4D) literature, and points to areas of innovation and opportunities for intervention. Interlacing instrumental practices through entertainment offers an entry point that "goes with the grain," whilst the extent of attempted yet unsuccessful interlacing of instrumental tasks with non-instrumental use highlights common barriers, such as questions of trust, that need resolving in order to further strengthen effective instrumental use.

We observed a great deal of this functional use through social networking in both the focus groups and in the Digital Days discussions. It is essential for those interested in using digital technologies more effectively in their

9 Jonathan Donner, *After Access: Inclusion, Development, and a More Mobile Internet* (Cambridge, Mass., USA: The MIT Press, 2015); Simon Khalaf, *Flurry Five-Year Report: It's an App World. The Web Just Lives in It*, 2013, http://flurrymobile.tumblr.com/post/115188952445/flurry-five-year-report-its-an-app-world-the.

10 Jonathan Donner, "Blurring Livelihoods and Lives: The Social Uses of Mobile Phones and Socioeconomic Development," *Innovations: Technology, Governance, Globalization* 4, no. 1 (2009): 91—101.

11 Rich Ling and Jonathan Donner, *Mobile Communication* (Polity, 2009).

12 Susan P. Wyche, Andrea Forte, and Sarita Yardi Schoenebeck, "Hustling Online: Understanding Consolidated Facebook Use in an Informal Settlement in Nairobi," in *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems—CHI'13* (New York, New York, USA: ACM Press, 2013), 2823—32, doi:10.1145/2470654.2481391.

13 Heather A. Horst and Daniel Miller, "From Kinship to Link-up: Cell Phones and Social Networking in Jamaica," *Current Anthropology* 46, no. 5 (December 2005): 755—78, doi:10.1086/432650.

14 Hsain Ilahiane, "Mobile Phone Use, Bricolage, and the Transformation of Social and Economic Ties of Micro-Entrepreneurs in Urban Morocco," *International Journal of Business Anthropology* 2, no. 1 (2010): 31—49.

Chapter 4
Discussion: Digital Days continued

development practice to stay up-to-date with social networking behaviors and profiles; not just by counting the specific development-related pages on networks like Facebook, but rather and in addition, by understanding how individuals are able to mobilize and cultivate social capital by using these systems.[15]

Similarly, entertainment—even without a social dimension—comprises such a large component of people's Digital Days that development practitioners cannot ignore it. There is a literature discussing the direct appropriation of entertainment forms for social messaging.[16] In addition, consumption and navigation of entertainment content may build literacies and skills, and at the very least will influence how people expect to interact with content online. Even apart from these potentially complementary interplays between entertainment and instrumentality, it is important to note that even "free" digital entertainment costs money when downloaded on metered plans. Development practitioners must be aware that they are competing for attention and share of wallet, in apps and on the mobile web, with a variety of potentially more compelling digital offerings.

Remain aware of skills gaps and second-order divides

Digital Divides are not determined exclusively by questions of access, but also of skills and literacies. The literature shows how once digital access becomes ubiquitous, digital literacies and skills are the key determinant of effective use, as Hyeryoung Ok shows in the use of gaming as a driver of Korean ICT access and effective use.[17] In emerging markets research indicates that these skills are no less important, and those who already have capabilities become important intermediaries, passing on skills and literacies to others.[18] Findings from the FGDs and from the Digital Days highlight how for many, their understanding of the technologies they use is limited, and partial. For example, many demonstrated a lack of awareness of what constitutes the Internet, such as Okello in Uganda, who described using social networking services from the moment he woke up, but did not regard these services as being of the "Internet."

Overcoming these barriers of knowledge and literacy is not simply a matter of natural discovery. Many require exogenous factors to motivate and catalyze the development of digital skills. In Ghana, Naba describes how she always felt disadvantaged by her lack of technology skills, and it was her employer, a mobile apps company, that pushed her to learn how to use different news and social networking apps. Developing these digital skills contribute to broader capabilities as well, as Anne from Kenya describes how gaming has increased her ability to use her device as well as to "think outside the box." These paths of discovery to digital capability are not the result of latent skills suddenly manifesting themselves but of external factors such as intermediaries or desire for entertainment and games.

The prevalence of interlacing utilitarian practices within entertainment and social platforms highlights the importance of conceptual capabilities and mobile literacies as well as basic access to digital technology and the Internet. Findings from the focus group discussions highlighted the importance of understanding the affordances of mobile technologies and social networking platforms as precursors to using social platforms for economic activities. Users had to have developed an in-depth understanding of the features and attributes of WhatsApp and Facebook before they could use the platforms to sell products or access information about employment.[19] In order to take advantage of the opportunities presented by social network platforms, users require not just access but digital capabilities and, crucially, the conceptual capability to pivot to considering social platforms from a utilitarian perspective. Such a pivot is critical to development, because increasingly, as Okello in Uganda describes, using Facebook is "vital" if you want to find a job, whether it is in Kampala or elsewhere.

15 Nicole B. Ellison, Charles Steinfield, and Cliff Lampe, "The Benefits of Facebook 'Friends:' Social Capital and College Students' Use of Online Social Network Sites," *Journal of Computer-Mediated Communication* 12, no. 4 (July 1, 2007): 1143—68, doi:10.1111/j.1083-6101.2007.00367.x.

16 Arvind, Singhal, and Everett Rogers. *Entertainment-Education. A Communication Strategy for Social Change*. Marwah, New Jersey: Lawrence Erlbaum Associates, 1999; Rogers, Everett M. "Communication and Development The Passing of the Dominant Paradigm." *Communication Research* 3, no. 2 (April 1, 1976): 213—40. doi:10.1177/009365027600300207;

17 Hyeryoung Ok, "New Media Practices in Korea," *International Journal of Communication* 5 (2011): 320—48.

18 Jonathan Donner, Shikoh Gitau, and Gary Marsden, "Exploring Mobile-Only Internet Use: Results of a Training Study in Urban South Africa," *International Journal of Communication* 5 (2011): 574—97.

19 Marion Walton, "Mobile Literacies: Messaging, Txt and Social Media in m4Lit," in *Multimodal Approaches to Research and Pedagogy: Recognition, Resources and Access*, ed. A. Archer and D. Newfield (London: Routledge, 2014), 108—27.

Chapter 4
Discussion: Digital Days continued

Don't assume an always-on digital user; account for limited access and difficult economic trade-offs

The literature review reveals a growing critique of the optimism around mobile only digital repertoires. Research shows that broadband adoption lags amongst lower income groups in the U.S., and though some literature finds that mobile data use helps counters political and income inequality, lack of access to broadband remains correlated with lower levels of income.[20] This is not just an issue for societies with a broad mix of digital technologies, but one that has particular significance for countries that are predicted to "leapfrog" fixed-line connections and go straight to mobile devices and networks. The implications of mobile only Internet access as described by authors such as Napoli et al are the emergence of a "mobile Internet underclass" who are excluded from the benefits of laptops and faster, cheaper, fixed-line access.[21]

This is not to say that Digital Divides along issues of access are no longer important. Indeed, quite the opposite, as the shift from paying for products to a metered mind-set[22] raises new challenges and divides, particularly along lines of cost but also of knowledge and capability. In Uganda, Nakato enjoys accessing the news for free but also complains how expensive data is. Limited knowledge and capability also divides those who can exploit digital repertoires most effectively from those who cannot. For example, in Uganda, many of Okello's friends told him he could make money from posting "sponsored content" on social media, but although he is excited by the idea, because he hasn't met anyone face-to-face he doesn't know how to explore the possibility further. Someone like Steve, in Kenya, is able to leverage his digital knowledge and capability to effectively apply his digital repertoire and listen to streaming radio in the morning through his smartphone. Digital repertoires are about interlaced platforms as much as they are about Internet access and device modalities. The Digital Days methodology helps reveal and highlight the detail of these practices to reveal the complexity and challenges that individuals face in maximizing the benefits of increasingly sophisticated digital repertoires.

Look for how gender issues intersect with digital practices

This project deals primarily with the increasing digital elements in every life, but as a crosscutting force influencing individual and community practices, "gender" certainly matches and probably exceeds "digitization" in power, range and scope. Thus, the intersection of these two great and different forces, gender and digital, as manifest in daily life, is complex indeed. Our data did not fail to reflect these complex interactions. Critical issues, such as ability to pay and household microeconomics, illustrated in Nakato's comments about costs (and about researching dowries online via her phone) are indicative of established issues that are diffracted through digital technologies.

The entanglement of digital technology with everyday life introduces new tensions, as Georgina experiences in Ghana when tracking her boyfriend online reveals infidelity. These tensions reflect the way digital technology complicates social dynamics as relationships, as other literatures show how mobile technologies introduce both new opportunities for liberation but also control, as Doron describes how Indian mothers-in-law justify limiting their new daughters traveling to their parental visits because they can talk on the phone instead.[23] Whilst industry bodies such as the GSMA and development theorists such as Amartya Sen describe communication technologies as inherently "freedom giving,"[24] our research highlights how offline constraints limit women's online behaviors. In Ghana, Randina described how she avoids chatting to male friends on social platforms because her partner might object, a pattern that echoes Bailur and Masika's findings of the way female ICT

20 David Crow, "Digital Divide Exacerbates US Inequality," *Financial Times*, October 28, 2014, www.ft.com/cms/s/2/b75d095a-5d76-11e4-9753-00144feabdc0.html; Karen Mossberger and Caroline J Tolbert, "Measuring Digital Citizenship : Mobile Access and Broadband Measuring Digital Citizenship : Mobile Access and Broadband," *International Journal of Communication* 6 (2012): 2492—2528.

21 Philip M Napoli et al., "The Emerging Mobile Internet Underclass : A Critique of Mobile Internet Access," *The Information Society : An International Journal* 30, no. 5 (2014): 323—34, doi:10.1080/01972243.2014.944726. See also, Donner, *After Access: Inclusion, Development, and a More Mobile Internet*.

22 Donner, After Access: *Inclusion, Development, and a More Mobile Internet*.

23 Doron, Assa. "Mobile Persons: Cell Phones, Gender and the Self in North India." *The Asia Pacific Journal of Anthropology* 13, no. 5 (November 2012): 414—33. doi:10.1080/14442213.2012.726253.

24 GSMA, and Cherie Blair Foundation for Women. "Women & Mobile: A Global Opportunity. A Study on the Mobile Phone Gender Gap in Low and Middle-Income Countries." GSMA Development Fund & Cherie Blair Foundation for Women London, 2010; Sen, Amartya. "The Mobile and the World." *Information Technologies & International Development* 6, no. SE (November 18, 2010): pp. 1—3.

25 Masika, Rachel, and Savita Bailur. "Negotiating Women's Agency through ICTs A Comparative Study of Uganda and India." *Gender, Technology and Development* 19, no. 1 (2015): 43—69.

Chapter 4
Discussion: Digital Days continued

users in Uganda and India limit their use of technology to conform to existing gender norms.[25] These findings highlight the crosscutting complexity of gender and digital practices.

We can return to the expert interviews for additional framing of gender as an intersectional and crosscutting issue. For example, during the expert interviews described in Chapter Two, Jane Coffin, Director of Development Strategy, at The Internet Society, suggested:

The thing that drives me crazy is that most business models start with the assumption that no matter how poor you are you still have a choice where you set your priorities so you can...trade between, your phone costs versus your food costs verses your kids school fees costs. The head of household, the most powerful member of the household, has that possibility to choose, but the next person down in the household hierarchy chain doesn't have that, and, so if your view is to basically empower less powerful members of the household, and that includes women and youth, then you can't operate on a basis where all have the ability to pay.

Naba's digital activities ebb and flow during the day, only as her job permits. Dorothea Kleine, Director ICT4D Centre, Royal Holloway, University of London, describes how place, time, and power intersect with gender in these kinds of moments:

I'm interested in the choices people make in their technology use, but then also the sense of choice that they have, what they can actually use. So, for instance, not all of the apps. A woman might actually know that particular apps are out there or that she could contact someone, but she might still feel that if there is a trace of that on her phone, she would still not want that to be known. Not just a woman, you know, there are lots of guys who would equally think that…. So we need to understand power relationships, we need to understand time and space in relation to power. We need to also understand data traces, privacy, and how that links with sense of choice.

Ineke Buskins had this wonderful quote for us, for a different report, which was basically saying "South African women don't make health decisions just between themselves and their mobile phones," they kind of bring their phone into a space, and then chat with other women around them. So I wouldn't assume that it's one device per person.

Account for the variety of digital practices already emerging

Even in the case of "mobile only" digital repertoires, there are already a variety of modalities and services in the mix. To echo the points from our expert interviews, cautioning against silver bullets, it is notable how these forms are already so diverse[26] that there is no one-size-all network, or content, or modality, that will support everyone, all the time.

For example, consider Steve in Kenya, describing listening to "the radio" in the morning and at lunchtime. Steve listens to a radio broadcast, but through an application on his phone. At home this means he accesses the Internet through 3G cellular services, on his mobile, so he carries the device around with him as he listens in order to obtain local information that includes job adverts and good deals. But this changes when he is at work, and listening through headphones on Wi-Fi to the HomeBoyz radio station that broadcasts "youth empowerment" content.

In all, the expert interviews and primary research all suggest that we should be optimistic, trusting users to build more effective repertoires out of combinations of modalities, though at the same time, we should be wary about how the platforms structure these choices. On the one hand, our data reminds us that there is no such thing as a singular "Facebook," but rather a variety of content and interactive experiences that each individual plays a role in tailoring for his own purposes. At the same time, the centrality of Facebook as the integrated platform for all of these experiences means that neither the tailoring nor the control of identity or privacy remains entirely in that same individual's hands.

26 M. Madianou and Daniel Miller, "Polymedia: Towards a New Theory of Digital Media in Interpersonal Communication," *International Journal of Cultural Studies* 16, no. 2 (August 2012): 169—87, doi:10.1177/1367877912452486.

Chapter 4
Discussion: Digital Days continued

Refinements

There are several avenues that could be pursued in detail, capitalizing further on the flexibility and integrated perspective of "Digital Days."

First, the Digital Days approach is capable of representing the utilization of multiple Internet Access Modalities by the same person, even in the course of a single day. For example, we can represent whether individuals are able to offload their phones' potentially costly media consumption to Wi-Fi. We can also pick up when, if at all, they visit public access centers, or are lucky enough to use personal computers at home or in the workplace. Just because the particular array of youths we spoke to for this study had primarily mobile-only digital repertoires, this does not mean that these patterns will continue. It would be very helpful to expand the Digital Days data-gathering to include those with broader digital repertoires, as well.

Second, since the Digital Days approach captures use of services and platforms, it is a helpful way to represent the behind-the-scenes activities on servers. The individuals we spoke to for this study already had multiple identities—including logon IDs and mobile phone numbers—being tracked by multiple services. Facebook and its owned subsidiary, WhatsApp, were the most salient services, both in terms of attention and utility, but it would be helpful to understand the depth and breadth of the information ascribed to each individual currently residing online. The Digital Day, in this sense, becomes a "tip of the iceberg" indicator to explore further issues of identity, privacy, and security now extending to those with mobile-only and mobile-centric digital repertoires.

Third, it would be helpful to have expanded the Digital Days analysis to include rural users in addition to the peri-urban ones in the sample. There is a lot to unpack in a rural versus urban comparison. Holding levels of connectivity, literacy, and income constant, one might not actually uncover great differences in the online behaviors of people who happen to live in high-density or low-density environments. On the other hand, one might—the Digital Days framework is a powerful and novel way to explore this split in more detail. Bringing rural users into the discussion might reveal additional variability around digital repertoires and platform use.

Finally, an additional path might be to use the framework to explore the health of the mobile web, compared to that of apps. There are other sources for this sort of information, but our initial discussions with Digital Days interview participants suggested that while use of Facebook and WhatsApp took the lion's share of use, we saw enough evidence of use of the mobile web to forestall any declarations of its death.[27] The Digital Days perspective, if populated with more comprehensive data, would shed additional light on this subject.

Methodologically, there are three things we might seek to do to improve the capacity of the Digital Days approach. Facilitators require additional training to be able to capture the subtleties of the day comprehensively. Individuals often toggle between multiple devices with fractional attention (interlacing). The framework will support this but only if the data-gathering does so as well. Similarly, further iterations would involve more targeted questions around networks and services: which networks (Wi-Fi, which cellular) and how much people spend as a proportion of income; which specific applications/websites, to allow unpacking of the wider modalities and platforms with which people are engaging. These changes would require significant longer interviews, which we think would be advisable.

Conversely, additional questions and probes around the significance of tasks to individual—the meaning behind the tasks—would be helpful. As we mentioned at the beginning of the chapter, "task" is a complex term and an excellent bridge between the instrumental, the technical, and the cultural. For example, when Nakato describes "browsing online" for news and videos, she offers little meaning behind that basic phrase. Further probing reveals that these videos are of religious guidance on marriage and business, and further dimensions begin to emerge. In our initial interviews we began to touch on these issues but with further facilitator sensitization we could have gone much further.

Finally, it might be possible to convert representations from actual portrayals of specific Digital Days to higher levels of abstraction, either by creating a composite across multiple days of a single individual's life, or even assembling multiple individuals into archetypes. These aggregations are common in segmentation and persona writing activities, and the Digital Days framework would be amenable to a version of them. Particularly when aligned with different forms of data-gathering, perhaps recognized or focused on passive phone-based gathering, additional patterns could be revealed and represented via the Digital Days framework.

27 Chris Anderson and Michael Wolff, *The Web Is Dead. Long Live the Internet*, 2010, www.wired.com/magazine/2010/08/ff_webrip/.

Chapter 4
Discussion: Digital days continued

Next steps

The broadest implication of the report for digital development practice is that those seeking to harness or accelerate this digital shift in the device of digitally enabled development must maintain an open mind, thinking expansively and non-judgmentally about ways to work with the dynamic practices of entertainment and social networking among users in target communities. This need to work with the grain of non-instrumentality is not exclusively because of the prevalence of mobile technologies (people used cybercafés for games and chats too), but the particular ways in which the Internet is used, when mobile, are a major part of the puzzle. The mobile phone may have started out as a way to make emergency calls and mission-critical business communication,[28] but it has evolved into a fluid, personal, intimate way of accessing the Internet in all (or at least most) of its diversity; this is no different for resource-constrained users as it is for those in the prosperous Global North. Productivity and instrumentality are all well and good, but they are on a journey alongside everything else digital—from sharing funny videos[29] to surreptitious status updates.

We propose that to understand Digital Lives in their entirety we must examine everything a user is doing, whether instrumental or not, and look at the weaving of tasks across Internet access modalities during the course of a digital day. And then, as we begin to understand the user motivations and activities, go deeper and question the limitations and opportunities that the underlying technologies and business models offer that user.

This is important because, as time progresses, we will start to see the concept of "digital" fall away as something innovative, new, and isolatable. Increasingly, we will refer not to digital economies and digital societies, but just economies and societies where the impact and penetration of digital technology is so pervasive as to become mundane.

We have titled this report "Digital Lives," but as the participants in our focus groups continue to strive and survive in the 21st Century, digital will dictate the entirety of the future map of their livelihoods, families, and societies. Starting to illustrate that map in the way we have done here is, we think, an important first step in helping development organisations to enable people to navigate their digital lives with a sense of control, power, and personal value. ■

28 Ling and Donner, *Mobile Communication*.

29 Ethan Zuckerman, *The Connection between Cute Cats and Web Censorship*, vol. 2009, 3 July, 2007, www.ethanzuckerman.com/blog/2007/07/16/the-connection-between-cute-cats-and-web-censorship/.

Appendix 1
Supporting materials

This is the full list of interviewees. Each agreed to have their name listed, but in a few cases, elected to keep some or all of their quotes as unattributed.

Appendix 1
List of expert interview participants

Arjuna Sathiaseelan
Senior Research Associate, University of Cambridge

Dr Arjuna Sathiaseelan is a Senior Research Associate at the Computer Laboratory, University of Cambridge. He leads the Networking for Development (N4D Lab). The research group conducts research on novel Internet architectures for improving and reducing the cost of Internet access. He is the Chair of IRTF Global Access to the Internet for All (GAIA) research group and a member of the Internet Research Steering Group (IRSG). His research interests also include architecting the Future Internet, enabling quad-play (voice, video, data, mobility) convergence and mobile systems especially inter-RAT mobility. He has co-authored and contributed to several Internet standards and drafts (IETF) and contributed to the DVB-RCS2 standardization at the ETSI TM-RCS.

Carlos Rey Moreno
University of the Western Cape

Carlos Rey-Moreno (forthcoming PhD in 2015) received a telecommunications engineering degree at the Carlos III University of Madrid (UC3M, Spain), a Masters Degree in Development and International Relations at Aalborg University (AAU, Denmark) and a Masters Degree in Telecommunications Networks for Developing Countries at Rey Juan Carlos University (URJC, Spain) in 2006, 2008 and 2010, respectively. From 2007 to 2011, he was a researcher at the EHAS foundation and URJC, working in the field of rural broadband networks for developing countries, participating in the design and implementation of long distance Wi-Fi networks in Spain, Peru and Malawi. Since 2012, he is with the BANG group at the University of the Western Cape. He was instrumental in the co-creation of Zenzeleni Networks LTD with Mankosi Community, rural Eastern Cape, particularly evaluating its socio-economic impact; as reported by his PhD thesis and numerous publications. Currently, he is involved in the replication of the initiative in other rural areas of South Africa and Namibia.

David Johnson
Research Group Leader, Net4D, CSIR Meraka Institute and Senior Lecturer, ICT4D, University of Cape Town

David Johnson leads the Net4D research group at the CSIR Meraka Institute and the networks research group in the center of ICT for development at the University of Cape Town. He recently completed his PhD at UC Santa Barbara on Internet architectures for rural developing regions and continues to work in this area. David helped design and build South Africa's first rural and urban wireless mesh networks and built a novel indoor 49-node indoor mesh simulator (one of three in the world) that resulted in many well-referenced studies on mesh networking. He has also published widely on Internet architectures for poorly connected regions, rural Internet traffic analysis, and TV white space networks. He is co-author of the book "White Space Communication" and continues to carry out research to build a case for license-exempt use of unused TV frequencies.

Dorothea Kleine
Director ICT4D Centre Royal Holloway, University of London

Dr Dorothea Kleine is Reader in Human Geography and Director of the ICT4D Centre at RHUL (affiliated with the UNESCO Chair in ICT4D)—www.ict4dc.org—which brings together researchers working in the field of information and communication technologies and development. She also directs the MSc in Practicing Sustainable Development, including the specialism in ICT4D. Dorothea Kleine has written and published extensively on these subjects and her most recent book is *Technologies of Choice: ICTs, Development and the Capabilities Approach* (MIT Press). Her research ranges from policy analysis and theoretical work to participatory action research, implementation, evaluation and iterative and participatory design.

Eduardo Villanueva
Associate Professor, Pontifical Catholic University of Peru

Eduardo Villanueva Mansilla (PhD, Political Science) is an associate professor at the Communications Department, Pontifical Catholic University of Peru. He is author of Vida Digital (PUCP, 2010), coeditor of ICTs for global development and sustainability (ISR, 2011), associate editor of the *Journal of Community Informatics*. He was coordinator of the "New Perspectives on ICT for Development in Latin America" invited session at the ICTD 2010 London conference, as well as a consultant on ICT for Development and ICT for Education in Peru.

Appendix 1
List of expert interview participants continued

Francisco Proenza
Professor at University Pompeu Fabra, Barcelona

Francisco J. Proenza is an economist with a PhD, from the University of Florida. He has extensive experience working for international agencies (Investment Centre of Food and Agriculture Organization of UN, World Bank, Inter-American Development Bank, International Fund for Agricultural Development, Asian Development Bank) in 40 countries worldwide. He is a leading authority on rural access to information and communication technologies and ICT applications for poverty reduction. Dr. Proenza is Visiting Professor at Universitat Pompeu Fabra (Barcelona). He is editor of *Public Access ICT across Cultures: Diversifying Participation in the Network Society*, published by MIT Press in May 2015.

Funke Opeke
CEO, MainOne fibre

Ms. Funke Opeke is a telecommunications executive who founded Main Street Technologies and is the CEO of MainOne. Ms. Opeke returned to Nigeria in 2005 after a 20-year career in the United States. Prior to her return, she was the Executive Director in the Wholesale Division of Verizon Communications. Ms. Opeke worked with MTN Nigeria and advised on the privatization of NITEL where she briefly served as the interim Chief Operating Officer, before founding Main Street Technologies.

Helani Galpaya
CEO, LIRNEasia

Helani Galpaya is CEO of LIRNEasia, a pro-poor, pro-market think tank working across the emerging Asia Pacific on ICT policy and regulatory issues.

She researches, does consulting work and engages in public discourse on issues related to net neutrality, policy and regulatory barriers in Internet access, e-Government, broadband quality of service, and how knowledge and information disseminated via ICTs can improve inclusiveness SMMEs (small, medium, and micro enterprises) in agriculture and micro-work markets. She has been working in Myanmar since 2013, and is currently carrying out an impact analysis of the mobile phone roll-out that is taking place.

Prior to LIRNEasia, she worked on at the ICT Agency of Sri Lanka implementing e-Government projects. She was a management consultant at Booz&Co. (now Strategy&) in New York and has also worked at Citibank and Merrill Lynch in U.S.A. She has a MS in Technology & Policy from the Massachusetts Institute of Technology, Cambridge, U.S.A. and a BA in Computer Science from Mount Holyoke College, Massachusetts, U.S.A..

Hernan Galperin
Research Associate Professor at the Annenberg School for Communication, University of Southern California

Hernan is Research Associate Professor at the Annenberg School for Communication, University of Southern California. Dr Galperin leads several research projects on regulation and the impact of new information and communication technologies (ICTs) in Latin America, whose funding comes from foundations and donors such as IDRC (International Development Research Centre), Internet Society, the Inter-American Development Bank (IADB), and Fundación Telefónica.

Jacob Korenblum
President and CEO, Souktel

Jacob leads Souktel's growing team, building on his past experience managing economic development and emergency relief projects for the US Agency for International Development (USAID) and the Canadian International Development Agency (CIDA). Fluent in Arabic and French, Jacob has worked in the aid and development sectors in the Middle East, East Africa, South Asia, and the Caribbean. He is a frequent panelist on technology and development—with speaking engagements ranging from the GSMA Mobile World Congress to the World Bank Human Development Forum. He has written articles on mobile technology and development for the MIT Innovations Journal, CNBC Online, and UNICEF's "State of the World's Children" report, among others. His work as a Souktel co-founder has been profiled by *The Wall Street Journal*, *Forbes*, *Fast Company* and the U.K.'s *Guardian* newspaper. Jacob holds an Ed.M. from Harvard University, where he also served as a Harvard Reynolds Foundation Fellow in Social Enterprise from 2005–06.

James Cemmell
Head of Government Affairs, Inmarsat

James Cemmell is Head of Government Affairs at Inmarsat, with responsibilities that include Africa and international programmes. In the run-up to the launch of the flagship Alphasat satellite in 2013 and subsequent, he assembled a group of leading digital economy experts. These are now mobilised through the "I-Sat Connection: Pushing Digital Frontiers programme." to leverage satellite in the pursuit of bridging the digital divide and delivering truly inclusive digital economies. The program operates in Kenya, Nigeria and Philippines—Ethiopia and Brazil are also under study. James has a Masters Degree in International Development from the Bradford Centre for International Development and an Advanced Certificate in International Trade Law and Regulation from the World Trade Institute, Bern.

Appendix 1
List of expert interview participants continued

Jane Coffin
Director of Development Strategy, the Internet Society

Ms. Jane Coffin is the Director of Development Strategy at the Internet Society and is responsible for a global Internet exchange point (IXP) project, working closely with ISOC's regional, public policy, and technical teams. She also is responsible for development strategy, where her work focuses on coordination of collaborative strategies for expanding Internet infrastructure, access, and related capacities in emerging economies. Prior to joining ISOC, Jane worked on Internet and telecommunications policy issues at the Office of International Affairs at the National Telecommunications and Information Administration—U.S. Department of Commerce. She also served as Chief of Party and Deputy Chief of Party on two separate USAID projects in Moldova and Armenia. Jane has worked for AT&T as a Director of International Affairs/Government Affairs, where she worked on international telecommunications issues, including VOIP, ENUM, and ICAIS, and was a Rapporteur in ITU-D Study Group 1 for universal access/universal service in rural and remote areas.

Kentaro Toyama
Associate Professor, University of Michigan School of Information

Kentaro Toyama is W.K. Kellogg Associate Professor of Community Information at the University of Michigan School of Information and a fellow of the Dalai Lama Center for Ethics and Transformative Values at MIT. He is the author of *Geek Heresy: Rescuing Social Change from the Cult of Technology*. Previously, he was a researcher at UC Berkeley and assistant managing director of Microsoft Research India, which he co-founded in 2005. At MSR India, he started the Technology for Emerging Markets research group, which conducts interdisciplinary research to understand how the world's poorer communities interact with electronic technology and to invent new ways for technology to support their socio-economic development. The award-winning group is known for projects such as MultiPoint, Text-Free User Interfaces, and Digital Green. Kentaro co-founded the IEEE/ACM International Conference on Information and Communication Technologies and Development (ICTD) to provide a global platform for rigorous academic research in this field. He is also co-editor-in-chief of the journal *Information Technologies and International Development*.

Kurtis Heimerl
Founder of Endaga and Postdoctoral Researcher at the University of California, Berkeley.

Kurtis works on technology for developing regions. His thesis topic was The Village Base Station (VBTS), a low-cost, low-power cellular system (based off OpenBTS). Their goal is to provide community cellular: local, community-owned cellular networks in areas without existing cellular coverage. Kurtis started a company to commercialize this research, Endaga. He will join the Department of Computer Science & Engineering at the University of Washington as an Assistant Professor.

Mariya Zheleva
Assistant Professor, University at Albany

Mariya Zheleva received her PhD in Computer Science from University of California, Santa Barbara. Currently she is an Assistant Professor in the Department of Computer Science at University at Albany, SUNY. Her research focus is in the intersection of wireless networks and information and communication technology for development. She is broadly interested in wireless networks, deployment and monitoring, cognitive radio and dynamic spectrum access, networking for developing regions.

Mark Davies
CEO, Esoko

Currently Mark is leading the Esoko initiative, which is registering farmers and traders throughout Africa and connecting them with each other and international buyers through mobile alerts and services. Esoko is a pioneering market information exchange that allows farmers, traders, businesses and government to exchange critical commercial information via mobile phones in public or private networks.

Mark Summer
CEO and founder, EveryLayer

Co-Founder & CEO of EveryLayer, Co-Founder of Inveneo.

Appendix 1
List of expert interview participants continued

Michael Gurstein
Director, Centre for Community Informatics Research

Michael Gurstein is widely known for his knowledge and experience as a researcher, a practitioner and a policy advisor in the area of Information and Communications Technology (ICT) and specifically ICT for Development. As a researcher, he is often acknowledged as the "Father of Community Informatics," the academic discipline concerned with the community and grassroots use of ICTs and has conducted numerous studies and has published widely in a variety of academic and non-academic venues. As a practitioner, he was responsible for perhaps the first community based institute concerned with the use of ICTs for economic and social development, the Centre for Community Innovation and Networking in Nova Scotia, Canada.

Osama Manzar
Founder, Digital Empowerment Foundation

Osama Manzar is a global leader on the mission of eradicating information poverty from India and Global South using digital tools. He is a social entrepreneur, author, columnist, impact speaker, angel investor, mentor, and sits on several government and policy committees in India and on international organizations working in the areas of Internet and digital divide.

Paul Garnett
Director, Affordable Access Initiatives, Microsoft

Paul Garnett is Director of Microsoft's Affordable Access Initiatives Team, where he is working with network operators and other partners to reduce the cost, improve the quality, and extend the reach of Internet access so that billions more consumers can affordably get online, access the content of their choice, and use cloud-based services and applications. Paul has also supported Microsoft's Mobile Business on various business- and policy-related activities.

Rekha Jain
Professor, Indian Institute of Management

Rekha Jain is Professor, Indian Institute of Management, Ahmedabad, India and the Executive Chair of the IIMA-IDEA Telecom Centre of Excellence. She has a PhD from the Indian Institute of Technology, New Delhi, India. She was a recipient of senior Fulbright Fellowship on Telecom Regulation in 1997–98.

She has consulted with several leading national and international organizations in her areas of research interests such as Telecom Policy and Regulation, ICT Strategy and Management, Spectrum Management, Internet Governance, Information System Implementation and Impact Assessment in the ICT domain.

She has several publications in national and international journals. She is on the editorial board of *Journal of Global Information Management* (JGIM) and Board Member of several professional organizations. She has been a member of several key national level committees in the telecom and IT sectors.

Saul Freidner
Principal Consultant, Real Wireless

Saul has 10 years' experience in spectrum management having spent most of his time working for Ofcom, the UK communications regulator. Saul's experience spans across many facets of radio spectrum management including broadcast technical planning, mobile radio planning and licensing, and radio equipment standardization. Saul has worked for numerous clients including Ofcom, the British Red Cross, and Communities and Local Government. He has extensive knowledge of key technologies such as LTE, WiMAX, TETRA, FM and DAB broadcast systems and other mobile radio systems. His work has included the development of a national frequency plan, TETRA radio coverage verification, spectrum policy and strategy development, and a valuation for piece of highly sought-after radio spectrum. Saul spent two years working for a global engineering consultancy company and brings a wealth of knowledge and expertise of project management and implementation of both large and small scale technical projects.

Appendix 1
List of expert interview participants continued

Sonia Jorge
Executive Director, Alliance for Affordable Internet

Sonia N. Jorge is an expert in the confluence of development and communications policy. She has over 20 years of diverse international experience in a career spanning both the private and not-for-profit sectors. Her work has included ICT policy and regulatory advice and analysis, strategic industry planning, national ICT/broadband policy development, creating new legal and regulatory frameworks (to address issues including competition, interconnection, cost-based pricing, spectrum allocation and management, infrastructure sharing and convergence), understanding universal access and digital inclusion in the context of development, and promoting gender analysis and awareness in the ICT planning process.

Steve Song
Consultant

Steve is a research associate and consultant with the Network Startup Resource Center where he works to expand the use of wireless technologies through shared spectrum strategies and to enable greater Internet access throughout Africa and other emerging markets. He is also the founder of Village Telco, a social enterprise that builds inexpensive Wi-Fi mesh VoIP technologies to deliver affordable voice and Internet options in under-serviced regions. Previously, Steve worked at the International Development Resource Centre, where he led the organization's Information and Communication Technology (ICT) for Development program in Africa and funded research into the transformational potential of ICTs across Africa.

Susan Wyche
Assistant Professor, Michigan State University

Susan Wyche is an Assistant Professor in the Department of Media and Information at Michigan State University. She is also affiliated with MSU's Global Center for Food Systems Innovation funded by USAID in their Higher Education Solutions Network (HESN). Her research focuses on information and communication technologies and development (ICTD).

Tim Hatt
Director, GSMA intelligence

Tim is a Director at GSMA Intelligence, having joined the team in October 2012. In this capacity, Tim has responsibility for a team of analysts producing research reports and presenting externally at conferences and public speaking engagements. Prior to joining the GSMA, Tim spent six years in London as an analyst covering telecoms and a variety of other sectors.

Appendix 1
Expert interview materials

Modalities in 2020

Established players	Possible disruptors
Copper wireline	Zero-rating
Cellular	LEO satellite
Fiber	Google Loon
Traditional Satellite	Facebook drone
	Unlicensed dynamic spectrum
	Microtelcos/fem2 cells
	Community mesh networks
	Long distance wireless

Description and Consent

Disruptive Access by 2020—Interview Guide

This is a rough interview guide for a conversation matching new and emerging access modalities (like satellites and community Wi-Fi) with the broad digital needs and behaviors of resource-constrained people in Sub-Saharan Africa.

The study is conducted by Caribou Digital, a consultancy, with support from The MasterCard Foundation. The study will result in a public report in late 2015, as well as scholarly publications, including a master's thesis by Charlotte Smart at the Oxford Internet Institute in the United Kingdom.

We anticipate the semi-structured interview lasting about 40 minutes. With your permission, we will record the interview, in order to conduct analysis, and will use quotes and attributions in the report, but will review all attributions in the draft report with you before publication. The raw transcripts and recordings will remain confidential, and will not be released to the public or to other participants.

We will ask for your consent to proceed with the interview before we begin the interview; however, you can elect to stop anytime.

If you have any questions about this interview guide or about the study, please do not hesitate to contact me at jonathan@cariboudigital.net

Appendix 1
Expert interview materials continued

Interview Questions

- Is improving Internet connectivity and access for rural and underserved communities important? And, if so, why?
- If you had to go out on a limb, which technology would you say is going to make the most important contribution to improving and expanding Internet access connectivity by 2020 and why?
- What do you see as the most important ways (if any) that the addition of these alternative modalities[1] will have on the character of the Internet, as a whole?
- In your view, which groups or demographics are most likely to benefit from a wider range of modalities? Which will be most disadvantaged?
- What impact (if any) do you think these modalities are likely to have on community and shared access models?
- What kinds of opportunities (if any) might there be for local people who are able to choose between multiple modes of access?
- What opportunities (if any) might exist for local entrepreneurs in these multiple modes of access?
- To your view, what are the main implications of these access modalities likely to be for device and services? What would you identify as the most significant changes in user experience as a result of these modalities?
- How do you think policy could best improve the outcomes for the resource constrained?
- What outcomes (economic, social, and political) are likely from the introduction of these new technologies?
- In what ways does the approach of your organization reflect these goals?
- Next steps
- Who else should we speak to?
- What should we absolutely be reading, about 2020 access scenarios?
- Would you want to contribute a longer statement as an annex, or as a publication?
- Would you want to join a follow-up workshop or roundtable to further explore these issues?

1 We mean modalities to be a combination of last mile and middle mile technologies, and business models.

Appendix 1
Focus group materials

Consent Form

Caribou Digital Research: Consent Form for Focus Group Discussions on Digital Technology Usage

To the facilitator: Please translate this form into writing or explain it orally into the language you are using to conduct the FGD. Please make sure you explain this clearly but in a non-intimidating fashion. At the end, if respondents are willing, please ask them to sign the consent form.

XXXX [Names of facilitators]

Address

Telephone

E-mail

We are conducting research for an international development organization into how people use digital technologies. During this FGD, you will be asked some questions about the use of digital technologies in your daily life. This discussion is designed to be approximately an hour. However, please feel free to talk about related ideas if you feel the questions we ask are not relevant. Also, if there are any questions you feel you cannot answer or that you do not feel comfortable answering, please say so and we will move on to the next question.

All the information will be kept confidential. We will keep the data in a secure place—on password protected file storage. Upon completion of this project, all data will be stored in a secure location. It will be published but all names will be made anonymous.

We would like to record the discussion and transcribe the audio but will keep your names anonymous if you wish. We would also take photographs of you and your usage (without capturing any personal information of usage) but again, if you would like to opt out of this, please let us know.

Finally, we would like to send you the report and ask for your feedback on findings if you would like to keep up to date—if so, please write down your e-mail address or let us know how we can contact you.

If you are not happy with any aspect of this, please say so now—if you are silent and stay in the focus group we'll assume that you are happy to proceed. There is no compensation or direct benefit from participation in this focus group, but there is also absolutely no penalty or loss if you decide not to.

Participant's Agreement

I am aware that my participation in this interview is voluntary. If, for any reason, at any time, I wish to stop the interview, I may do so. I understand the intent and purpose of this research.

I am aware the data will be used for a research report for international publication. I have the right to review, comment on, and/or withdraw information prior to the report's submission. The data gathered in this study are confidential and anonymous with respect to my personal identity unless I specify/indicate otherwise.

I have understood the above form and I consent to participate in today's interview.

Participant's signature

Date

E-mail address:

Appendix 1
Focus group materials continued

Notes for Facilitators

All facilitators are being recruited based on experience of conducting qualitative research, running focus groups and understanding of technology. We are writing a Terms of Reference document with detailed guidelines for facilitators and are also in the process of organizing Skype training sessions, to be conducted when clearance from MCF is obtained. There will be one facilitator per group of six participants (which we have found to be the optimum number based on collective experience). They will lead and take notes but also have the recording to transcribe. We have also set up a Skype group so common questions can be asked there. We will ask for the transcription and report back after the first focus group for course correction and to inform the more detailed practices.

The following are draft notes for the facilitators:

Pre-FGD

- Make sure demographics fit (youth; 18–25; ask occupation).
- Ask permission for recording.
- Test your recording will be clear enough and have a backup recorder if necessary.
- Choose a quiet place.
- Try to limit to six (politely say no if too many people interested or tell them about subsequent FGD).

During FGD

- When recording starts—go round asking for names and ages and occupation—on record for transcription but repeat privacy intentions.
- Repeat into the recorder so we have it twice.
- State date and location of FGD on record.
- If in download shop/community center (although hopefully a quiet part of either!)—ask how often they come there.
- Remind when attention dropping that only a few more questions/minutes to go.
- Please take photos—snapshots of conversation; usage of devices as you see in front of you—if agreed in consent form. If only some have agreed to being photographed, ensure that they are not in the shot. At the end of the focus group recheck that everyone is happy for the photographs to be used.
- Observe and note down any interactions while participants are talking—if they share content, what topics interest them, what they learn from each other, etc.
- Ask if respondents ok to share e-mail addresses in case we have more questions and also if they want to see the report and usage of digital technologies in other countries, and please note these addresses down on the consent form. Ask what would interest them to see in the research findings.

Post-FGD

- Take pictures of the group but please make sure you have consent from all participants. Do not take pictures of any personal information on phones.
- Translation and transcription—If the interview is not in English—it should be as close to a literal translation as possible.
- Within the transcribed text, a time marker should be included every five minutes.
- Inaudible parts of the interview should be flagged with […]
- Suggestions/guesswork on inaudible content flagged by ?[I like gaming or whatever the phase is]?
- The transcription should be spell-checked.
- We find for the audio a .mov output is best and best played in Apple's QuickTime player which has some useful hotkeys for transcribing, like "back two seconds" but whatever works for you.
- The output transcription should be as a .doc or .rtf file.
- Please upload the recording and transcription into the relevant country folder in the Dropbox folder (link sent to you) and with the filename structure, e.g. Male FGD Gaming Kampala 20_03_2015 for example or Female FGD Music Accra 20_03_2015.

Appendix 1
Focus group materials continued

Coding and analysis

We drew up an initial coding framework in collaboration with the facilitators, and drawing on the following documents:

- The focus groups and interviews themselves and emerging themes as we read through them.
- Triangulating and cross-checking coding with the first half of our literature review on access.
- Our preliminary literature review on digital repertoires in developing countries, particularly sub-Saharan Africa.
- Donner (2015)'s After Access publication and framework on mobile Internet(s).
- The MasterCard Foundation Strategic Plan 2015–17 to help shape analysis and guide insights.

On a first read of the transcripts coming in, we drafted three top-level codes: types or modalities of digital repertoires, use cases, and impact. We added sub (or child) codes for each of these.

Under modalities of use (i.e., usage patterns, restrictions, etc.), we coded:

- Main device used (so the assumption was not immediately about mobile or indeed mobile Internet but gave participants the option to talk about other devices).
- Flexibility of utility (what particularly it was about that technology that they liked).
- Innovation (e.g., different methods of uploading content etc).
- Constraints (including negotiating constraints).
- Privacy (including hiding activities).
- Trust (online/offline).
- Sharing
  - Expressive (i.e., comments around why they are sharing).
  - Functional (what is being shared—more hardware than software).
  - Content (types of content shared).
- Finance (around digital devices, e.g., data bundles, etc.)
- Skills and digital literacy.
- Self-limiting (due to financial as well as other restrictions, e.g., acknowledgement of distraction).

Under use cases, we developed the following:

- Job Search
  - Actual
  - Anticipated
- Income generation
  - Actual income
  - Anticipated income
- Entertainment
- Gaming
- Music
- Betting
- Fashion
- Photos
- Video
- Sports
- Education
  - Actual education
  - Anticipated education
- Content production
- Mobile money
- Social Networks
- News
- Apps and Browsers

Appendix 1
Focus group materials continued

The third and final high-level code was that of impact, which had the following child codes:

- Income generation
- Being connected
- Positive emotional effect (including distraction from problems)
- Placelessness
- Placefullness (digital access re-affirming belonging to a place)
- Changing consumption patterns (own as well as influencing others to change their patterns)
- Gender-specific empowerment
- Ethics and morals
- Identity
- Religion
- Influencers (feeling empowered in some way—not necessarily monetarily)
  - Profiting as intermediaries
  - Symbolic capital
  - Political Capital

We found it useful to code two initial transcripts together, to ensure a shared understanding. After this stage, we coded in parallel, but always conferring on codes—why some codes were not being used, whether we should merge them, the need for new codes, etc., while bearing in mind that there was also the potential for codes to overlap.

Appendix 1
List of expert interview participants

Ghana Digital Day

Pseudonyms	Age	Occupation
Juli	20	Student
Akosua	18	Student
Diana	25	Employed at Gamada
Abena	23	Student
Love	23	Student
Bosomtwi	24	Unemployed
Billy	21	Unemployed
Elliot	21	Unemployed
Nene	25	Unemployed
Isaiah	23	Unemployed
Lucas	20	Unemployed
Ransford	22	Unemployed
Amina	25	Business officer
Georgina	23	Student
Millicent	21	Student
Kumian	25	Employed at university
Fafa	29	Software Engineer
Samuel	24	Student
Senanu	24	Teaching assistant
Andrew	24	Teacher
Edward	17	Student
Bernard	17	Student
Evans	18	Café worker
Randina	22	Student
Fredrica	22	NGO worker
Babra	19	Student
Naa	24	Student
Victoria	20	Haidresser
Joyce	20	Unemployed
Panford	21	Student
Christian	17	Student
Alexander	23	Construction worker
Gerald	23	Student
Kris	19	Student
Seth	21	Unemployed
Timothy	23	Footballer/Unemployed
Afua	21	Student
Abena	22	Student
Aku	21	Student
Amma	21	Student
Angi	19	Student
Mawulie	21	Student
Naa	22	Student

Appendix 1
List of expert interview participants continued

Ghana Digital Day continued

Pseudonyms	Age	Occupation
Davis	19	Seller of drinks
Daniel	18	Designer
Geffrey	19	Usher
Isaac	19	Seller of drinks
Joshua	19	Seller at sports stadium
Karl	19	Usher
Seth	19	Student and seller of drinks
Gifty	18	Unemployed
Afi	25	Employed
Patience	18	Unemployed
Ester	18	Unemployed
Becky	19	Unemployed
Wendy	18	Unemployed
Charity	18	Student
Abdallah	20	Student
Jonathan	24	Unemployed
David	19	Student
Kwaku	23	Unemployed
Suleman	20	Student
Solomon	18	Student

Appendix 1
List of expert interview participants continued

Kenya Digital Day

Pseudonyms	Age	Occupation
Vincent	25	Accountant Intern
Wachira	20	Cyber café assistant
Aaron	19	Bata shoe company
David	23	Sales Manager/Intern
Jason	25	Marketer with world venture
Stephen	23	Part time at hotel
Melanie	22	Barber
Anne	19	Salon
Briana	18	Part time sales
Ellen	23	Clerk
Nanjira	22	Part time cashier
Nancy	20	First aid volunteer
Beth	18	Actress
Hannah	19	Mpesa agent
Madeline	18	Internship as a nurse
Mercy	18	Sales
Andrew	23	Driver
Matt	18	Part time teaching
Ken	19	Internship at hotel
Martin	20	Phone technician
Joe	24	Sales
Steven	21	Accountant intern
Anne	18	Part time job IT assistant
Beth	21	Part time accountant
Helen	19	Part time graphic designer
Lucy	20	Part time at a hotel
Mercy	18	Part time at a salon
Jason	22	Part time jobs on online jobs
Joe	22	Animator/graphic designer
Steve	23	Artist
Alykhan	18	Sales at boutique
Jason	21	Sales at mobile shop
Vincent	24	Part time junior legal assistant
Mercy	21	Sales at boutique
Linda	19	Chemist assistant
Beth	23	Job seeking
Ester	23	Job seeking
Nyambura	21	Intern wedding/event planner
Musa	24	Insurance agent
Ali	24	Job seeking
Joe	24	Job seeking
Jacob	19	Job seeking
Steve	25	Interior designer
Jason	20	Job seeking
Njambi	23	Job seeking
Sylvia	22	Informally employed at hotel
Anne	22	Job seeking
Nyambura	21	Job seeking
Beth	21	Job seeking
Nora	21	Job seeking
Josaih	22	Informally in movie shop
Musa	20	Informally in movie shop
Peter	22	Jobseeking
Winston	23	Jobseeking
Sam	25	Informally as sales man
Joseph	23	Unemployed
David	20	Jobseeking

Appendix 1
List of expert interview participants continued

Uganda Digital Day

Pseudonyms	Age	Occupation
Nalukwago	26	Unemployed
Nakazzi	23	Unemployed
Namubiru	23	Unemployed
Nabirye	23	Unemployed
Naigaga	19	Unemployed
Komugisha	19	Unemployed
Kagoya	23	Unemployed
Muteesi	19	Unemployed
Kapere	25	Unemployed
Mwanga	21	Student
Mulungi	24	Student
Jamwa	24	Employed
Mukungu	22	Student
Byansi	25	Unemployed
Isabirye	25	Unemployed
Walakira	20	Unemployed
Namazzi	21	Student
Bulyaba	28	Waitress
Mbabazi	21	Receptionist
Namuli	17	Receptionist
Nalugwa	25	Waitress
Simon	24	Employed
Ahmed	21	Student
Daniel	23	Women in leadership
Kairu	21	Valuers and surveyors
Jose	24	Uganda depot
Mbugga	23	Enterpreneur
Paul	23	Clerk
Salah	20	Employed

Pseudonyms	Age	Occupation
Cathy	19	Student
Tracy	23	Employed
Betty	22	Unemployed
Babrah	19	Student
Namuddu	21	Student
Bridget	22	Student
Menya	24	Unemployed
Sunday	25	Unemployed
Miro	25	Unemployed
Zziwa	24	Employed
Benja	23	Student
Walakira	21	Employed
Kantu	23	Employed
Ongom	23	Student
Kwagala	20	Student
Nakato	24	Ministry of Affairs
Kamukama	25	Chef
Nimurungi	20	Student
Kikazi	25	Employed, kakira sugar works
Ateng	20	Student
Mucunguzi	19	Not recorded
Kisame	22	Not recorded
Nampala	23	Not recorded
Wantimba	22	Not recorded
Wambi	22	Not recorded
Kalulu	20	Not recorded
Azam	24	Not recorded
Musa	24	Not recorded

Appendix 1
List of expert interview participants continued

Uganda Digital Day continued

Pseudonyms	Age	Occupation	Pseudonyms	Age	Occupation
Namugga	19	Unemployed	Mpijja	19	Unemployed
Kirabo	19	Unemployed	Kagawa	25	Unemployed
Nabunya	21	Unemployed	Wanyama	24	Unemployed
Kisakye	20	Unemployed	Kagabo	25	Unemployed
Ssanyu	22	Unemployed	Kutty	23	Unemployed
Namusoke	23	Unemployed	Otai	27	Unemployed
			Kibaru	22	Unemployed
			Mubiru	25	Unemployed

Table of Focus Group Discussions
Demographics

	Male	Female	Age range
Ghana	31	26	18–25
Kenya	34	30	17–29
Uganda	40	31	17–28
Total	**105**	**87**	**17–29**

Total in sample	**192**

Appendix 1

Appendix 2
Literature review

To support the project's primary research activities (interviews with ICT4D experts and with users in the field), we conducted a systematic literature review on current information practices and needs among rural and resource-constrained communities, with a focus on mobile Internet. This appendix describes the methodology and lists details of articles included in the review.

Appendix 2
Literature review on mobile Internet

Methods

The search focused specifically ***mobile*** **Internet use** (not Internet use in general, or mobile use in general) and used specific keywords in selected countries across specified date ranges. The key words we selected were "mobile Internet"; "mobile data" and "mobile services." We focused on this narrow range of key words in order to exclude more general literature, such as that which would have been identified under more general terms such as "mobile phone," Internet or ICTs. The countries we focused on were Indonesia; Philippines; India; Sri Lanka; Pakistan; Kenya; Ghana; Uganda; and Nigeria. We focused on these specific countries because of their diversity in market maturity, levels of mobile adoption and specific focus of the empirical data collected and analyzed in this report. We restricted the search dates to literature published after 2010 in order to limit the results to contemporary data on mobile Internet use in emerging markets.

Whilst the search was conducted through an academic library, it also included academic and practitioner literature, reports and data from the private sector including from mobile companies, market research agencies and industry consulting companies. In addition, "grey"[1] and policy literature was also included in the final corpus. The results from the systematic literature were then reviewed and any key literature referenced was incorporated into the corpus. The resulting literature corpus from the systematic review was saved into the Zotero bibliographic library tool, and then categorized according to whether the literature referred to developing or developed countries, and whether they contained primary or secondary data.

The journals searched were:

Asian Journal of Communication
Balancing Act Africa
Communications of the ACM
Critical Studies in Media Communication
Development in Practice
Development Policy Review
Electronic Journal of Information Systems in Developing Countries
European Journal of Development Research
First Monday
Global Media Journal
Human-Computer Interaction
ICTD (Proceedings)
Information Technologies & International Development
Information Technology for Development
Information, Communication & Society
Innovation and Development
Innovations: Technology, Governance, Globalization
International Communication Association (ICA) (Proceedings)
International Journal of Communication
International Journal of Technology, Policy
Journal of Computer-Mediated Communication
Journal of Information Technology & Politics
Journal of Development Studies
Journal of International Development
Media, Culture & Society
Mobile Media & Communication
New Media & Society
Social Science Computer Review
Sociological Inquiry
Telecommunications Policy
The Information Society
Third World Quarterly
Wired
World Development

1 Hannah R. Rothstein and Sally Hopewell, 'Grey Literature,' in *The Handbook of Research Synthesis and Meta-Analysis (2nd Ed.)*, ed. H. Cooper, L. V. Hedges, and J. C. Valentine (New York, NY, U.S.: Russell Sage Foundation, 2009), 103–25.

Appendix 2
Literature review on mobile Internet continued

Framing literature

Mascheroni, G. and Olafsson, K.
The Mobile Internet: Access, Use, Opportunities and Divides among European Children
New Media & Society (2015)

Source Academic journal paper.

Focus Europe (Belgium, Denmark, Ireland, Italy, Portugal, Romania, and the United Kingdom).

Data A series of regressions using data collected through the Net Children Go Mobile survey of approximately 3,500 respondents aged 9–16 years. However, the data somewhat suffers from low response rates.

Theory The authors add to emerging literature on mobile Internet use that suggests "those who are already in more privileged positions are more likely to use the medium for activities from which they may benefit."[2] Much of this literature suggests that rather than reducing digital inequalities, smartphones reproduce the "second level digital divide" as the types of activities they are used for are dependent on users' socio-economic backgrounds. Whereas previous studies have examined usage patterns and socio-economic backgrounds among adults, this paper focuses on children.

Argument The authors caution against subscribing to the potential "leapfrogging" effect of smartphones to bridge the digital divide as they find little evidence that smartphones are themselves used in beneficial ways. Rather they find indications that children from higher socio-economic backgrounds engage in more productive uses of the Internet through smartphones, which strengthens arguments that offline processes of socialization into disparities are mirrored online.

Trends The study finds little evidence that smartphones provide computer-less children with an alternative access point to the Internet. Furthermore, contrary to the literature on adults, socio-economic background does not have a simple and direct effect on children's adoption of smartphones. Instead it is the domestication (parents' habits) of smartphones that is important, both at a family level and at a country level.

Internet access through smartphones was strongly correlated with ownership, as was the availability and cost of connectivity. Once again, this emphasizes that the domestication of smartphones as using them to access the Internet is largely dependent on parents providing Internet plans, especially among younger children.

Lastly, the research found that children that were socialized into accessing the Internet at a young age and those that enjoy relative autonomy of use as they progress, tend to use their smartphones for a wide range of activities. Yet, whereas overall smartphone use is correlated with an increase in social networking, only daily use is correlated with more capital-enhancing activities (sometimes referred to as the "ladder of online opportunities") such as homework.

Napoli, P.M. and Obar, J.A.
The Emerging Mobile Internet Underclass: A Critique of Mobile Internet Access
The Information Society: An International Journal 30, no. 5 (2014): 323–34

Source Academic journal paper.

Focus Developing countries, although much of the secondary data they use comes from developed countries.

Data A comparative analysis of mobile and PC-based Internet access. With regards to Technological Capabilities this comparison includes "memory, storage capacity, and speed"; "content availability"; "network/platform architecture." In terms of Usage Patterns the authors examine "information seeking" and "content creation."

Theory N/A

Argument The authors suggest that the limitations of mobile Internet, specifically in terms of content and functionality, is creating what they term a "mobile Internet underclass." This is particularly important as consumers in developing countries that "leapfrog" computers may miss out on much of what the Internet offers, including the ability to shape it.

2 Hargittai, E. and Hinnant, A. 'Digital inequality differences in young adults' use of the Internet.' *Communication Research* 35 no. 5 (2008): pp 602–621.

Appendix 2
Literature review on mobile Internet continued

Thus the challenge is, on the one hand, increased Internet access in developing countries, and, on the other, equality of participation in the Internet's various uses. Without efforts towards the latter the danger remains that the Internet will shape itself around mobiles' limited functions, rather than mobile functionality improving to a level of parity with PCs.

Trends In late 2010 the number of broadband Internet subscriptions over mobile technologies overtook the number of subscriptions over fixed technologies.[3] Moreover, worldwide there are expected to be 788 million mobile-only Internet users by 2016.[4]

Evidence suggests mobile users extract much less information than PC users (PC-based users habitually access an average of 8.64 categories of websites, whereas mobile-based users habitually access an average of 3.58 categories), enter shorter search queries and are less likely to click-through to returned pages.[5] This has spurned commentators to liken the software architecture used for mobile access to "snorkelling" equipment compared with PCs set up for deeper explorations.

As importantly, it is increasingly recognised that mobile users have limited ability to create content. This gives rise to the notion of "participation divides," in which new content conforms to—and thus potentially reinforces—existing social stratifications.[6]

Sey, A. and Ortoleva P.
All Work and No Play? Judging the Uses of Mobile Phones in Developing Countries
Information Technologies & International Development 10, no. 3 (2014): 1–17

Source Academic journal paper.

Focus Worldwide, with an emphasis on developing economies.

Data The paper focuses on computer and mobile phone gaming through a variety of secondary data, including numerous industry and academic surveys of mobile usage in developing countries. Much of this data suggests that "people everywhere, when given a powerful tool, are as apt to use it for entertainment as for other 'productive' uses."[7]

Theory The authors draw on philosophy, psychology, cybernetics and anthropology to explore and unpick typical stances toward mobile phone uses within the ICTD community. They question common distinctions between "useful" and "useless" activities, and the implication that only "useful" activities may be ingredients of cultural and economic development. Instead they posit "play" as an activity in which games may become tools for education, interpersonal communication, organizational life, adaptation to new technologies, identity formation, cultural exchange and/or for scientific research.

Argument The authors develop the idea of a "right to play" in "new communication environments." They argue that this right must be acknowledged by those examining ICTD irrespective of the poverty status of the intended beneficiaries of technological advances. Indeed it is important for human development rather than economic or social development. In this manner they question assumptions that ICTs can and should be deliberately used to pursue specific development goals, and that a logical path leads from ICT use to socioeconomic change (indeed they talk of "myths" associated with different technological platforms that are unthinkingly transported from context to context).

Trends For them, such debates are especially relevant given that the admittedly patchy data (mostly from the private sector) suggests gaming is the second or third most frequent activity on mobile phones (behind interpersonal communication and social networking), and gaming apps the most downloaded.[8]

3 Bold, W. and Davidson, W. (2012). 'Mobile broadband: Redefining Internet access and empowering individuals.' In; Dutta, S. and Bilbao-Osorio, B. Eds. *The Global information technology report 2012*. Geneva, Switzerland: World Economic Forum and INSEAD: 67–77. (Accessed 25/05/15)

4 Horner, L. 2011. *A human rights approach to the mobile Internet*. Melville, South Africa: Association for Progressive Communications. (Accessed 25/05/15)

5 Ishii, K. 'Internet use via mobile phone in Japan.' *Telecommunications Policy* 28 (2004): 43–58.

6 Blank, G. 'Who creates content?.' *Information, Communication & Society* 16 No. 4 (2013): 590–612.

7 Smyth, T., Kumar, S., Medhi, I., and Toyama, K. (2010). 'Where there's a will there's a way: Mobile media sharing in urban India.' CHI 2010: *HCI and India.* Atlanta, GA.

8 GSMA. (2013). *The mobile economy 2013.* A.T. Kearney. (Accessed 25/05/15).

Appendix 2
Literature review on mobile Internet continued

Newman, N. and Levy, D.A.L., Eds. (2014)
Reuters Institute Digital News Report 2014: Tracking the Future of News
University of Oxford and Reuters Institute for the Study of Journalism

Available at: www.digitalnewsreport.org/ (Accessed 25/05/15).

Source Grey literature.

Focus The developed world: France, Germany, Denmark, Finland, Spain, Italy, Japan, Brazil (the only country with Internet penetration below 50%), and the U.S. In the U.K. there was a slightly longer questionnaire.

Data A comprehensive online questionnaire conducted by YouGov was designed to capture all aspects of news consumption in early 2014.

Theory N/A

Argument The report argues that tablets and mobiles are "disrupting" traditional news consumption patterns, with more ways of accessing news and more ways on monetizing it. At the same time the news has to compete for attention with alternative Internet content. Yet, despite the rise of what they call "weird news" (Huffington, Buzzfeed, etc.), the research suggests notions of credibility, immediacy, and relevance remain Brands' core ingredients of success.

Perhaps the most interesting caveat to these conclusions are found where Google, Facebook, and Twitter have become—as in France, Germany, Italy, the U.S., and urban Brazil, and among younger groups—intermediaries for a large proportion of "news journeys" online.

Trends More than a third of online news users across all countries (39%) use two or more digital devices each week for news, and a fifth (20%) now say their mobile phone is their primary access point. Smartphone users are also getting older, with a jump in usage among the 22–44 age group. Facebook is by far the most important network for news (35% say they use it for news), with Twitter also widely used in the U.S., Spain, and the U.K. Among younger people U.S. social sharing news sites like Huffington Post, Buzzfeed, and Upworthy are beginning to make inroads around the developed world.

Smartphone users use a narrower range of news sources than desktop or tablet users, with 37% using a single source each week compared with 30% on the latter platforms. In Denmark and the U.K. smartphones are the main way of accessing news on public transport such as trains and buses (69% vs 21% and 53% vs 40% respectively). Yet only around 1 in 10 online news consumers pay for it.

In Italy, Google News is accessed by 25% of weekly online news users and in Germany by 11% compared with only 2% in Finland and 5% in the U.K. Those that use Twitter for news tend to be highly "active": 57% click further to read or watch (story, video, or picture); 60% actively share or favorite or comment on the news; and 65% check their newsfeed to see what's new.

Newman, N., Levy, D.A.L. and Nielsen, R.A. Eds. (2015)
Reuters Institute Digital News Report 2015: Tracking the Future of News
University of Oxford and Reuters Institute for the Study of Journalism

Available at: https://reutersinstitute.politics.ox.ac.uk/sites/default/files/Reuters%20Institute%20Digital%20News%20Report%202015_Full%20Report.pdf (Accessed 14/06/15).

Source Grey literature.

Focus The developed world: Core questions were asked in France, Germany, Denmark, Finland, Spain, Italy, Japan, Brazil, Australia, Ireland, the U.S., as well as the U.K., where there was a slightly longer questionnaire.

Data A comprehensive online questionnaire conducted by YouGov was designed to capture all aspects of news consumption in early 2015.

Theory N/A

Argument Complexity is key this year. Indeed, reflecting new strategies by social networking services, this year's report sees the paradox of a growth in online video, especially among the under 35s, accompanied by the centrality of traditional news mediums such as television. The report also concentrates on the solidifying of the

Appendix 2
Literature review on mobile Internet continued

smartphone as the "defining device for digital news," whilst offering some solace for those worried about the narrowing of news sources with evidence that many people still use online searches to achieve a diversity of opinions.

Perhaps the greatest challenge for providers is the age split, with younger people abandoning traditional news mediums in favor of a multitude of digital sources, and older people sticking with traditional mediums whilst also turning increasingly to digital content.

Trends Particularly in the U.K., U.S., and Japan, average weekly usage has grown from 37 to 46% across all our countries from 2014–15. Two-thirds of smartphone users (66%) are now using the devices for news every week.

Whilst 70% of smartphone users have a news app installed on their phone, people in most countries say they are likely to access news via a mobile browser. However, the average number of trusted news sources is 1.52 per person across all countries.

Perhaps unsurprisingly, online is the main source of news for 18–24 year olds with its popularity declining among older age cohorts. However, TV is valued most for accuracy by many, with only 12% saying news through social media is best for accuracy, compared with 37% for TV.

In the social media space, Facebook is becoming increasingly dominant, with 41% (+6) using it to find, read, watch, share, or comment on the news each week—more than twice the usage of its nearest rival. However, 18–24 year olds are increasingly adopting other services such as WhatsApp and Snapchat to share news, and publishers are reacting by setting up a branded account on services such as Snapchat Discover.

On Facebook the pursuit of news is secondary, with the main aim social networking. While Twitter is a destination for news by an audience that is deeply interested in latest developments.

There has been a significant increase in the consumption of online news video, notably in Spain (+10), Denmark (+8), U.K. (+5), Italy (+5), and Japan (+5). The most popular format is short-recorded clips that add drama to a news event (49%) or add context or analysis to a text story (46%).

A trusted brand (37%) is a key factor likely to influence the choice in a social network, whereas the relevance of the headline is by far the most important factor in search results.

Those who visit news sites regularly, sign up for e-mail, or receive mobile notifications are heavily male skewed.

Mobile Internet in developing countries
GSMA (2014)
Digital Inclusion 2014
GSM Association

Available at: http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2014/11/GSMA_Digital-Inclusion-Report_Web_Singles_2.pdf (Accessed 25/05/15).

Source Grey literature.

Focus Global with emphasis on mobile Internet in the developing world.

Data Mostly secondary data.[9] Brief country case studies of the four focus areas described below.

Theory The underlying theory concerns removing capability barriers to Internet adoption, providing conducive environments for investment and encouraging governments to support mobile providers where possible. In this sense it is a holistic call to support the roll-out of mobile Internet.

Argument The report argues that as mobile Internet usage increases within the developing world there are four main areas of concern:

Firstly, gaining government support to extend network coverage into remote regions, including subsidies. Secondly, reducing ownership costs by reducing government taxes and red tape. Thirdly, increasing Internet awareness and reducing illiteracy, which remains a barrier to Internet adoption even when costs are low. Lastly, ensuring relevant content is available on as many devices as possible, while acknowledging that government-produced content is a major contributor in many developing countries.

9 In particular see: Mckinsey and Company (2014). *'Offline and falling behind: Barriers to Internet adoption.'* (Behind paywall) and Mckinsey and Company (2013). *'Lions go digital: The Internet's transformative impact in Africa.'* (Accessed 25/05/15).

Appendix 2
Literature review on mobile Internet continued

Trends In the last five years the Internet has accounted for 10% of total GDP growth in China, India, and Brazil. McKinsey and Company estimates that the Internet could account for up to 10% (U.S.$300 billion) of Africa's annual GDP by 2025.[10]

Mobile Internet users in the developing world will double from 1.5 billion in 2013 to 3 billion by 2020, rising from 25% today to 45% of the developing world population. For many of them mobile will be their first experience of the Internet.

Mobile operators currently cover 85% of the global population with 2G and 55% with 3G mobile signal. However, smartphone penetration remains low (10%) in the developing world (40–50% in developed world).

Currently, most content consists of data-heavy, and therefore costly, apps produced in English which only 5% of the global population speak. The problem is further compounded by strong negative correlations between illiteracy and Internet penetration, and by low levels of "digital literacy" in developing countries. The latter is increasingly cited as a larger barrier to Internet adoption than cost or coverage.[11] These problems are particularly acute among women, children, and rural populations—traditionally marginalized groups.

Balancing Act (2014)
The Sub-Saharan African Media Landscape—Then, Now and in the Future
Balancing Act: Telecoms, Internet and Broadcast in Africa

Available at: www.balancingact-africa.com/sites/balancingactafrica.com/files/products/3.%20Feature%20Phone%20Report%20FV.pdf
(Accessed 15/25/15)

Source Private sector report.

Focus Ethiopia, Ghana, Kenya, Nigeria, Senegal, Tanzania, and South Africa.

Data Secondary sources, mostly online.

Theory N/A

Argument Sub-Saharan Africa is the cockpit of change in terms of the global digital divide and changing media use; in little over a decade it has gone from being largely unconnected to the Internet to having millions of people using it. However, this has created two kinds of Sub-Saharan Africans in terms of media and communications: the haves and the have-nots. On almost every measure, those living in rural Africa are at a disadvantage to their urban counterparts. The most striking shortfall is found among rural populations' ability to access media.

Trends Those living in rural areas have far fewer sources of information and the number of people or sources whose opinion they might trust is far smaller than in more populous areas.

Nonetheless, over five years Facebook has grown from practically no users in Sub-Saharan Africa to become the most widely used social media platform. In the four countries where face-to-face surveys were carried out for this research, between 14% (Tanzania) and 27% (Ghana) of all respondents were using it. People "like" news media (newspapers, radio, and TV stations) on Facebook to get information and receive similar "news" or "research" alerts from friends and colleagues.

The report predicts that countries with upwards of 5% Internet use will continue to see gradual increases in Internet use levels. It is far less clear whether those in the below 5% category will all make the same progress.

The report predicts that for the covered countries smartphone use will grow to between 10–20% of the population over the next 3–5 years, with up to 25% of people accessing the Internet through such devices (suggesting sharing).

Balancing Act (2014)
Face-To-Face Survey Overview Summary Results
Balancing Act: Telecoms, Internet and Broadcast in Africa

Available at: www.balancingactafrica.com/sites/balancingactafrica.com/files/products/2.%20F2F%20Survey%20Results%20FV.pdf
(Accessed 15/25/15)

10 See note 8 (2013).

11 For example see findings by Google and Basis Research: Afritorial. '2012 Internet usage and behavior in Africa: Google.' *Afritorial*, 2012. (Accessed 25/05/15).

Appendix 2
Literature review on mobile Internet continued

Source Private Sector Market Research.

Focus Tanzania, Senegal, Nigeria, and Ghana.

Data A random of 1,000 15+ year old respondents in each country, using multi-stage stratified sampling.

Theory N/A

Argument This further supports the arguments surrounding the growth of mobile Internet but continued dominance of radio as a source of news and media found in the previous report.

Trends Mobile ownership in all of the four surveys was around 90%, making the mobile phone the most widely owned device media device, both used as a media carrier (radio) and a media in its own right (Internet, SMS).

It is clear that feature phone users want to be smartphone users "when they grow up" especially if smartphones go below $50–75.

When asked what features they would look for in a new phone, the majority were looking for things found on a smartphone. For example, in Ghana the results were as follows: Play Music (90%); Access Internet (89%); Play Video (86%); Touch Screen (83%); and Download Apps (77%).

Daily use of the Internet on respondents' mobile phones varied between just under 20% to almost 30% (in descending order): Ghana (28%); Tanzania (26%); Senegal (22%); and Northern Nigeria (17%). Social media use is broadly similar. Although use levels are higher than this in urban areas and lower in rural areas

Balancing Act (2014)
Feature Phone User Survey: Ethiopia, Ghana, Kenya, Nigeria and South Africa
Balancing Act: Telecoms, Internet and Broadcast in Africa

Available at: www.balancingact-africa.com/sites/balancingactafrica.com/files/products/3.%20Feature%20Phone%20Report%20FV.pdf
(Accessed 15/25/15)

Source Private Sector Market Research.

Focus Ghana, Northern Nigeria, Senegal, and Tanzania.

Data A total of 1,000 respondents of 15+ years were selected using random, multi-stage stratified sampling for interview in each of the countries, namely: Tanzania, Senegal, Nigeria, and Ghana. A semi-structured questionnaire was used to collect the data.

Theory N/A

Argument The report emphasizes that mobile Internet users within the surveyed countries are very "active," with many engaged in various types of social networking activities, consuming media or creating content. Indeed the findings imply that there are a considerable number of online opinion formers and influencers in the total populations of these countries. At the same time, however, it highlights that radio remains the dominant medium for obtaining news and information.

Trends Mobile ownership in all of the four surveys was around 90%, making the mobile phone the most widely owned media device, both used as a media carrier (radio) and a media in its own right (Internet, SMS).

Daily use of the Internet on respondents' mobile phones varied between just under 20% to almost 30% (in descending order): Ghana (28%); Tanzania (26%); Senegal (22%); and Northern Nigeria (17%). Social media use is broadly similar.

After Facebook—Tanzania (56%); Senegal (42%); Ghana (37%); and Northern Nigeria (30%)—the most popular online activity (on a once a week or more basis) was posting on forums: Northern Nigeria (14%); Ghana (9%); Tanzania (10%); and Senegal (5%).

However, less than a fifth of all those surveyed used their phone for the following: Games, Apps, Photo/Video Clips, Live TV, and YouTube. Use of these services is currently constrained by a combination of lack of data coverage, insufficient bandwidth and the high price of data.

Appendix 2
Literature review on mobile Internet continued

Balancing Act (2014)
Qualitative Research
Balancing Act: Telecoms, Internet and Broadcast in Africa

Available at: www.balancingact-africa.com/sites/balancingact-africa.com/files/products/4.%20Qualitative%20Research.pdf (Accessed 15/25/15).

Source Private Sector Market Research.

Focus Ethiopia, Ghana, Senegal, Tanzania, and South Africa.

Data Focus groups and one-on-one in-depth interviews. Participants were a mixture of educated professionals, health professionals and non-professionals.

Theory No theory as such, but a focus on the "disconnect between health information and behavior change."

Argument Although the interviewees in the main had absorbed and responded to the key health messages being put out, both traditional and religious attitudes, and poverty and rural isolation, play a key part in how health messages are taken up.

Trends The educated (including health professionals) were most likely to use the Internet and see it as a key method to obtain information. However, with the exceptions of Tanzania and South Africa, interviewees saw rural areas as where access would not be possible.

There were fears about the impact of the Internet, particularly amongst the religious and less well educated, but in countries where there was wider access (Tanzania and South Africa), they were less likely to see the Internet just as a threat. However, for urbanites, the Internet is used for breaking news instead of radio or TV.

Balancing Act (2014)
Africa's Converged Content and Services Space—Finding out what's what and who's who in the new digital economy
Issue no. 735 28th November

Available at: www.balancingact-africa.com/news/en/issue-no-735 (Accessed 26/05/15).

Source Private sector online technology and media bulletin.

Focus Africa.

Data Secondary sources, with some of Balancing Act's own primary research including from their media tracking platform smartmonkeytv.com.[12]

Theory N/A

Argument Continuing Balancing Act's drum beat for the Internet's potential in Africa, the issue argues that with the arrival of cheaper mobile Internet and much larger numbers using, the continent now faces the question of what the Internet's going to be used for and how.

Trends There are over 100 video-on-demand platforms in Africa and over 100 music-on-demand platforms. The report suggests these figures will continue to grow in the future.

Improvements in bandwidth are creating new forms of media, especially on mobile. These include channels devoted to video clips of sports and news.

While online retail is limited, estimates suggest there are now around 2 million people in Nigeria ordering online, which the issue sees as vital for the health of small start-ups.

In a video interview, Nicola D'Elia of Facebook describes social media platform as an "on-ramp" for Africa's first-time Internet users.[13]

12 Smartmonkeytv.com tracks and analysis the arrival of Africa's digital content and services economy looking at how far things have got to and the barriers holding back further development. It publishes between 10–15 video clip interviews (5–10 minutes in length) a month, providing a Who's Who of the players in the new African digital content and services economy.

13 See http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0CB4QtwIwAA&url=http%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3DlObgp7jMVKc&ei=Nh1kVZvTLtPnuQS95YFo&usg=AFQjCNFt8ZGciuSgL3n2c4fRzhKgrdT-_Q&bvm=bv.93990622,d.c2E.

Appendix 2
Literature review on mobile Internet continued

Wa, S. and Khaemba, S.
A comparative study of critical success factors in implementation of mobile money transfer services in Kenya
European Journal of Engineering and Technology 2, no. 2 (2014): 8–31

Source Academic journal paper.

Focus Kenya.

Data Alongside an extensive literature review, the study commits to using data derived from Communication Commission of Kenya Base Transmitter Station Portals. However, it is not clear how this primary data is used or why it is gathered. Instead this reads like a proposal for a thesis.

Theory The study purports to assess the success, threats and failures of four mobile money transfer (MMT) efforts—MPESA, Airtel Money, Orange Money, and Yu Cash—in Kenya in the last three years. The authors uses the dual lenses of "systems theory" and "cultural theories." The former aids them to view MMT services as a wider strategy for mobile operators to retain customer loyalty and reduce churn rates; whilst the latter gives them a way to approach resistance (or the avoidance of uncertainty) to adopting new technologies among Kenyans. Lastly, they harness "process theory" to understand the critical success factors for MMT. However, these theories are not utilized to their potential.

Argument The study is confusing and has little to no argument throughout. At best, it concentrates on security vulnerabilities to MMT but there is no indication of how this is affecting uptake.

Trends The Kenyan Mobile Phone Industry is more advanced compared to other countries in the continent. Safaricom is the market leader with 64.5% of the total market share, totaling 30.4 million subscribers. Safaricom's MMT service M-Pesa has more than 14 million subscribers. It allows subscribers not only to send and receive money but also to pay utility bills. The service also works through fixed ATMs and a network of 18,000 agents. M-Pesa processes transactions worth U.S.$4.98 billion annually (17% of Kenya's Gross Domestic Product).

The success of MMT in Kenya has been attributed to the fact that it has provided the much needed financial facilities to a large number of the country's unbanked population. 95% of Kenyans consider mobile banking cheaper, faster, and more reliable than normal banking services.

The other three studied providers have only received licenses in the recent past.

Gitau, S., Marsden, G. and Donner, J. (2010)
After access: challenges facing mobile-only Internet users in the developing world
CHI 2010: HCI and the Developing World, Conference Paper, April

Gitau, S., Marsden, G. and Donner, J.
Exploring Mobile-only Internet Use: Results of a Training Study in Urban South Africa
International Journal of Communications 5 (2011): 574–579

Source Conference paper and academic journal paper respectively.

Focus The developing world, with research participants from South Africa.

Data "Ethnographic Action Research" among women in "livelihood collectives" trained to use of the data (Internet) features on the phones they already owned. None of these women had previous experience of the Internet. The study also conducted follow-up interviews with participants.

Theory The exercise was designed to reveal both the promise of, and barriers to, mobile Internet use by first-time, mobile-centric users. It is predicated on the theory that users that have not traditionally had access to the Internet through PC, now have access through mobile platforms. The authors argue this is a potential paradigm shift that promises a new surge of digital inclusion.

Argument The challenge was not about access. Indeed the Internet was already accessible via the participants' handsets. Thus the research set about uncovering why the participants needed a "gentle push" (training) to begin using their phones' Internet functions. It uncovered two categories of obstacles to uptake: firstly, issues with understanding how to set up their devices; and secondly the "communications ecosystem" in which they use their devices, including confusion over the term "password," few mobile versions of websites devoted to local content, and a lack of fully mobile-only oriented e-mail services (especially when signing up). The authors conclude that "many elements of the mobile Internet have been deployed with the assumption that would-be users would have access to a PC, and/or previous experience with the PC-based Internet." This presents a significant barrier to usage in developing country contexts.

Appendix 2
Literature review on mobile Internet continued

Focused on the study's participants, it was noted by an observer that the biggest impact on the women's lives was not in the actual use of the technology but rather in "the knowledge that one has the ability on how to do that [browse on the Internet]… is empowering in itself."

Nonetheless, the authors argue that findings suggest that "digital skills are acquired over time and are only one piece of an equation including access to (and command over) physical, digital, human, and social resources."

Trends Excitement around "mobiles for development" (M4D) has come in three waves: the first focuses on the usefulness of the basic voice call; the second wave on leveraging the text messages (SMS); and the most recent on the mobile Internet.

Alongside smartphones, "feature phones" also support data connections. For as little as $70, they have GPRS (General Packet Radio Service) which allows users to access premium content from operators, to download applications, or to browse the web, all via mobile-specific technologies such as WAP2.0, XTML, or Opera Mini.

In terms of results, on the one hand, the participants retained skills (and even acquired some new ones) six months after the original training; on the other, not one of the seven women we revisited had secured a job via the mobile Internet, even though doing so was among primary motivations for the engaging in the mobile Internet training.[14]

With regards to "play," the participants also used the Internet to find gospel music, craft profiles, send birthday party invitations, and even "friend" hip-hop stars. They also used e-mail and social media to create fake personas and reach out to local radio stations. These processes were said to have given them confidence to explore Internet further, including through use of PCs. Some participants also became known within their community as people with Internet literacy and passed their skills to other.

Horst, H.
Free, Social, and Inclusive: Appropriation and Resistance of New Media Technologies in Brazil
International Journal of Communication 5 (2011): 437–462

Source Academic journal paper.

Focus Brazil.

Data Blogs and popular accounts of the described practices, alongside interviews, conversations, and reflections with a range of Brazilian scholars.

Theory Theories of consumption and technology appropriation that are particular to Latin America: cannibalism, baroque, and creolization.[15]

Argument The author argues that three key concepts dominate attitudes and values around new media technologies: inclusion, which seeks to increase access and consumption of new media among marginalized populations; free culture and the importance accorded to ownership of the processes of distribution and production; and networked sociality, practices that are largely accorded the status of consumption but, given the affordances of digital media, begin to blur the boundaries between consumption and production. The aim is to understand how three key factors—national policy, opportunities for innovation, and sociocultural factors—shape everyday practices and orientations around new media.

Trends The paper argues that Brazilians are leaders in the use and innovation of social media: 8.6 million Brazilians (23% of the population) on Twitter; 36 million unique visitors on Orkut (a Google-owned social networking platform); and 9 million visitors to Facebook. Brazil also possesses the largest mobile phone industry in the Latin American region, and it is the sixth largest mobile phone market in the world.

The government's support has been central to the spread of the values of inclusion, free culture and networked sociality; its support of the spread of an open source culture through initiatives such as Creative Commons and localization movements (for music and video games); and hands-off attitude to social media and other forms of networked

14 For more on the link between mobile phones and job searches in developing country contexts see: Bhavnani, A., Won-Wai Chiu, R., Janakiram, S. and Silarszky, P. (2008). 'The Role of Mobile Phones in Sustainable Rural Poverty Reduction.' ICT Policy Division, Global Information and Communications Department, World Bank, Washington, DC.

15 Bar, F., Pisani, F., and Weber, M. (2007). 'Mobile technology appropriation in a distant mirror: baroque infiltration, creolization and cannibalism.' (Accessed 27/05/15).

Appendix 2
Literature review on mobile Internet continued

culture through platforms such as Orkut. However, using a somewhat clichéd Latin American trope, the author argues that much of this support has been an attempt to counteract the hegemony of global corporate actors such as Microsoft whilst saving money which could be used in other areas of need in Brazil.

Srinuan, C., Srinuan, P. and Bohlin, E.
An analysis of mobile Internet access in Thailand: Implications for bridging the digital divide
Telematics and Informatics 29 (2012): 254–262.

Source Academic journal paper.

Focus Thailand.

Data A discrete choice econometric model is employed to examine whether price, service, and application attributes, socioeconomic variables, and service provider have a systematic link with the decisions of consumers. The study uses data from a national survey in 2010 commissioned by the National Telecommunications Commission (NTC) of Thailand.

Theory No explicit theory other than the factors affecting mobile's potential to close the digital divide.

Argument The study's results show that price, availability of fixed telephony, age, and living area are recognized as the strongest determinants for mobile Internet adoption. Indeed it finds that under-development of the infrastructure for fixed lines can stimulate use of mobile Internet, suggesting the platform's potential to close the digital divide.

The authors also argue that free applications and locally relevant content, in local languages, may encourage consumers to adopt mobile Internet. Nonetheless, they place stress on "as useful and easy-to-use applications."

Trends In 2010, Thailand's mobile penetration rate had reached 100%. Mobile Internet was first introduced to the market in 2000.

Interestingly, in contrast to similar studies in Japan, the research that finds the core segment for mobile Internet usage is people of working age (25–50 years old) and that most are likely to use mobile Internet to search rather than send e-mails. The authors attribute these differences to culture without explaining further.

Rangaswamy, N. and Cutrell, C.
Anthropology, Development, and ICTs: Slums, Youth, and the Mobile Internet in Urban India
Information Technologies & International Development 9, No. 2 (2012): 51–63.

Source Academic journal paper.

Focus India, slums (or "constrained access ecologies').

Data Through ethnographic work with teenage slum dwellers, the paper seeks to uncover the engagements and strategies marginal populations use to integrate technologies into their daily lives.

Theory The authors start from an anthropological perspective that holds that the ICTD community's distinctions between developmental and entertainment uses of mobile phones are arbitrary and may even be harmful, because they unnecessarily blinker observers to examining a narrow slice of the full range of experiences of the people who use the technologies.[16] Thus, following Sen's argument in "Development as Freedom," they view the poor as a dynamic social category with active agency to adopt technologies, rather than inert recipients of developmental action.[17] This allows them to set about "contextualizing a variety of rich user appropriations" of mobile phone functions.

Argument Similarly to the work Sey and Ortoleva (2014), the authors argue that information about everyday ICT use may be relevant for development research, even if it is largely dominated by entertainment uses. This is especially the case if we consider social interaction, entertainment, or religion as human needs with beneficial outcomes for human development in a broad sense.

The research among the teenage slum dwellers reveals entertainment practices as: (1) leading to discovering new skills and abilities; (2) offering a space to experiment with technology; and (3) leading to valuable social spaces functioning as informal technology hubs.

16 Heek, R. (2014). 'Mobiles for impoverishment.' (Accessed 27/05/15).

17 Sen, A. (1999). *Development as Freedom*. New York: Knopf Press.

Appendix 2
Literature review on mobile Internet continued

In conclusion, the authors praise the sense of freedom, agency, and choice mobile Internet brings, alongside its ability to build skills. Nonetheless, they argue these skills are a consequence of the users' engagements with mobile Internet and not their premise—entertainment.

Trends While technology adoption and use in "constrained access ecologies" may be motivated by non-instrumental usages that may not seem immediately beneficial or developmental, they argue that through using their mobile phones for entertainment the teens displayed agency in the adoption and diffusion of ICTs and associated skill-sets.

To facilitate their access to entertainement through the Internet, the teens had to master skills such as identifying appropriate content, programs, apps, and virus management. The authors argue these can be considered as positive developments, that demonstrate skillful and creative usages.

Nonetheless, the research uncovered "subjects enthralled with the freedom and functionality afforded by the Internet as wearable, palm-sized phenomena over what they actually did with it." They show that this freedom and functionality also leads to a feeling of empowerment as teenagers are able to cut out the traditional gatekeepers (market-stall holders) to music and film, and learn to manage money to feed their growing Internet habits.

Zainudeen, A.
Are the Poor Stuck in Voice? Conditions for Adoption of More-Than-Voice Mobile Services
Information Technologies & International Development 7, No. 3 (2011): 45–59.

Source Academic journal paper.

Focus Asia, with a focus on "bottom of the pyramid" (BoP) or low social economic group mobile users in Bangladesh, India, Pakistan, the Philippines, Sri Lanka, and Thailand.

Data Logical regressions using a data set of 9,540 BoP telecom users to model the adoption of "more-than-voice" or "non-voice" services.

Theory The study explores i) diffusion theory; that different categories of technology adopters can be identified, including innovators, early adopters, early majority, late majority, and laggards. ii) The Theory of Reasoned Action (TRA) that explains adoption decisions as being influenced by attitudes and social norms. And iii) domestication research that tries to understand how ICTs are "domesticated" when brought into the home.[18]

Argument While Asian markets are characterized by intense price competition over calls, many are developing new services and applications beyond voice (and peer-to-peer SMS), including information services, news alerts, mobile money applications and mobile Internet, to chase revenue. Many of these services have obvious benefits for development.

The authors argue that social influence, coupled with appropriate pricing strategies (especially to account for irregular incomes), could be the most promising channel through which many current non-users of these services among BoP groups may be more inclined towards them among the poor.

For their part, governments are encouraged to offer more non-voice based services over mobile networks and to implement policy that places taxes on operators.

Trends The ratio of mobile SIMs to fixed connections in India was 9.2:1 in 2008; this ratio was 19.9:1 in Pakistan and 33.2:1 in Bangladesh. Even among low-income earners within these markets, more than 90% of phone connections were mobile by late 2008.

The largest predictor of more-than-voice adoption is that those using the Internet through computers are 600% more likely to use more-than-voice services on mobile than those that don't. Education is the second largest contributor, with completion of tertiary education, as well as secondary education, leading to increases in the odds of more-than-voice use by 47.8% and 27.4%, respectively. The next largest predictor is socialization; for each additional mobile-owning contact within the respondent's closest contacts, the odds of using more-than-voice services increases by 18%.

Being a female is negatively associated with the odds of more-than-voice use, leading to a 14.2% reduction in the odds of more-than-voice services. It is also surprising that the data does not indicate that higher income earners or those in urban areas are more likely to use more-than-voice services.

Awareness and use of these services in Bangladesh, Pakistan, and India are seen to be very low. Awareness of such services is seen to be relatively high in Sri Lanka, the Philippines, and Thailand.

18 For the seminal text see: Rogers, E.M. (1983). Diffusion of Innovations. 3rd ed. The Free Press: New York, NY.

Appendix 2
Literature review on mobile Internet continued

Most non-users either feel that such services are not applicable to them, or they simply don't know how to use them. Some also feel that the pricing of these services is too high.

Burns, C. and Dolan J.
Building a Foundation for Digital Inclusion: A Coordinated Local Content Ecosystem
Innovations: Technology, Governance, Globalization 9, No. 3–4 (2014): 33–42

Source Academic article.

Focus Developing world—can the digital economy's rise in developed countries be mirrored in developing countries and, if so, how inclusive will that rise be?

Data Authors' own experience of working for USAID and secondary sources. The two authors are leading figures in USAID's efforts to spread the digital economy to "underserved" groups.

Theory N/A

Argument They argue that whether or not developing country populations take part in the booming global digital economy is "a complex and interconnected set of issues, but at the most basic level they boil down to whether an individual is connected, whether she has the requisite skills to engage online and can afford the products and services that allow her to do so, and whether she derives any value from her participation in the digital economy."

They argue that there are many efforts to connect people to the Internet, but few to give them things to do once they are online. Putting people front and centre of analysis of emerging digital economies brings into focus the importance of content, often designed in collaboration with users, as opposed to technologies.

They call for a "stronger digital content value chain" to stitch together the fragmented digital economies in developing countries. At the heart of this call is greater coordination between government and the private sector to increase the delivery of health, educational, agricultural, and other relevant life-enhancing content (much of which is already available but non-digitised) to end-users. An important leg of this aim is further, iterative research to understand how content can be "localized," and increased support of open-source platforms and information sharing initiatives.

Trends In many developing countries the digital economy is accounting for more and more GDP. For example, ICTs now contribute 12.1% to Kenya's GDP.

Roughly 25% of the world's population speaks English to some degree, yet more than 55% of online content is in English. Furthermore, while 14% of the world's population live in Africa, less than 3% of Wikipedia articles concern the continent.

As an example of joining together fragmented information to create a strong value chain, the authors highlight Sesame Street's successful adaptation to different contexts by (1) creating valuable educational content; (2) identifying the necessary local partners and investing the resources required to adapt their existing characters and content to local market context; and (3) leveraging powerful distribution channels.

Graham, M.
Inequitable Distributions in Internet Geographies: The Global South Is Gaining Access, but Lags in Local Content
Innovations: Technology, Governance, Globalization 9, No. 3–4 (2014): 17–35

Source Academic journal paper.

Focus Digital geographies—the paper explores why many people are left out of online global networks, debates, and conversations. To do this, it seeks to understand both "the geographies of information (or data shadows) and the geographies of the production of that information (or digital divisions of labor)."

Data Secondary data detailed Internet access, including maps.

Theory No explicit theory, but an underlying assumption that access to information and the ability to shape it is empowering and a vital part of human development; Sen is referenced.

Argument "Ultimately, the uneven geographies of information that we've seen can all shape what is known and what can be known, which in turn influences the myriad ways knowledge is produced, reproduced, enacted, and re-enacted."

Appendix 2
Literature review on mobile Internet continued

Put another way, power imbalances between where knowledge is produced and where it is consumed have always partially shaped our social world. Yet as we increasingly encounter knowledge in digital form more actors have the possibility of participating in these processes and addressing harmful knowledge imbalances through the creation of local content.

This view was echoed by, in 2012, Hamadoun Touré, secretary general of the International Telecommunication Union when he declared that soon "all the world's citizens will have the potential to access unlimited knowledge, to express themselves freely, and to contribute to and enjoy the benefits of the knowledge society."[19]

However, the author argues that connectivity and access has not yet begun to address the imbalances in information production he describes. Indeed, content creation in the Global South lags behind the North. Through data, he shows that "uneven data shadows and digital divisions of labor matter because they shape not merely the contours of websites but what we know and what we can know about the world."

He concludes that beyond access, issues of digital literacy, culture and infrastructure matter, and that the demands of persistent poverty are also likely reflected in the digital geographies he describes.

Trends Where knowledge is produced has historically been, and continues to be, highly uneven. For example, Switzerland produces three times as many academic journals as the entire Africa continent. At the same time, the author uses ancient maps to show that the focus of knowledge is also highly uneven, with producers interested in content that relates to their own experiences. These interdependent phenomena create a "knowledge dependence" between creators and consumers with uneven power reserves.

At the end of 2011, there were 6 billion mobile connections globally, meaning that about 85% of humanity was connected in some way by modern technologies.

One of the paper's most interesting findings explores what Google Maps "know about the world" as a proxy for Internet content and to discern where the silences (which the author argues are often deliberate) are. It finds that there is more information indexed on the Tokoyo metropolitan area than the entire continent of Africa.

To illustrate the importance of power dynamics, the author examines ratios of content created by Arabic and Hebrew linguistic groups that physically occupy the same areas in the Middle East. Using the data on content creation, he argues that real world power imbalances are reflected online despite ubiquitous access to the Internet.

Guilford, M.
To the Next Billion: Mobile Network Operators and the Content Distribution Value Chain
Innovations: Technology, Governance, Globalization 9, No. 3–4 (2014): 35–47

Source Academic journal paper.

Focus Content provider and MNO partnerships for ICTD worldwide, with a focus on Telenor's experience.

Data Insights from Telenor and other MNOs have acquired about how to scale high-impact mobile content most effectively.

Theory N/A

Argument While there has been a turn towards locally produced and relevant content, this paper focuses on the "process of bringing the content to the user" "in low-income environments with poor infrastructure, where the distribution of content is much more complex than simply publishing it online."

It argues that to sell content at scale, producers should form partnerships with MNOs that have done the hard work of identifying a potential pool of customers. Both parties may even benefit from co-creating content, especially as MNOs in developing countries often play a broader role in society than their counterparts in developed countries. At the same time, content creators from these countries often lack commercial abilities.

Such partnerships can be organized around value chains with five key functions: refinement and localization, packaging and product development, marketing and demand generation, distribution and payment, and feedback and insights. These functions are developed fully in the paper.

19 Dr. Hamadoun I. Touré, secretary general of the International Telecommunication Union, November 2012. See www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0CB4QFjAA&url=http%3A%2F%2Fwww.wired.com%2F2012%2F11%2Fhead-of-itu-un-should-Internet-regulation-effort%2F&ei=tPBmVdCaMPiAsQSFjoKICg&usg=AFQjCNHQJDtm7smUApXaaPIURKyvGgZB1w&bvm=bv.93990622,d.cWc.

Appendix 2
Literature review on mobile Internet continued

The author also offers advice for content creators looking to establish such partnerships: Firstly, it is recommended that they think about where to anchor collaborative endeavors, such as in commercial or corporate social responsibility arms of MNOs. Secondly, creators must help MNOs build the business case to boards and shareholders. Content creators must make it easy on MNOs by shielding them from complexity and by phasing access to their customer bases through roll-out strategies.

Trends Creating digital content is fundamentally a high fixed-cost, low variable-cost endeavor. Indeed, the incremental cost of offering the same content to a second—or a 10,000th—user is very low. Thus producers are incentivized to sell at scale.

The average MNO in a mid-size market may have a customer base of tens of millions of people.

Yong Liu Hongxiu Li.
Mobile Internet Diffusion in China: an empirical study
Industrial Management & Data Systems 110, No. 3 (210): 309–324

Source Academic journal paper.

Focus China—an investigation of the diffusion process of mobile Internet use (MIU) in China.

Data Regressions using survey data from 736 student participants.

Theory The paper challenges the simplicity of the widely used "technology acceptance models" (TAM and TAM2) which suggests that two beliefs (perceived ease of use and perceived usefulness) predict attitudes towards use.[20] To do this, it incorporates these models into innovation diffusion theory (IDT), with mobile Internet adoption in China as the case of interest.[21] The author does a good job of overviewing both of these theories and their derivatives.

Argument In addition to a "general principle" of motivating users by making services more enjoyable, the findings suggest that practitioners should take the differences of adopter groups into account. Making the mobile Internet easy to use and compatible with users' lifestyles would promote the use of technology across user groups, whilst not over-complicating technological advances is important for later stage adopters.

In terms of policy recommendations, the author suggests the mobile industry should integrate more entertainment into mobile Internet services. For practitioners, he indicates that entertainment-oriented mobile services, such as mobile gaming, have the greatest potential within China's market.

For researchers, it is argued that disaggregating users through the use of frameworks such as IDT is important to challenge received wisdoms.

Trends The perceived enjoyment of consumers is the most important predictor of MIU. The finding was particularly strong amongst "innovators." The "use context" was much more important for "early adopters." Whilst for later users issues such as computability, observability and the perceived complexity of mobile technology become important.

These results indicate that the adopter distributions do not necessarily follow the rigorous bell-shaped curve suggested by IDT. Furthermore, "mobile Internet, as a more personalized technology, is perceived by Chinese young generations in a way that is different to traditional productivity oriented innovations. In other words, the perceived productive value of content is of little relevance to most users.

China is likely to form the biggest mobile, with the mobile Internet market reaching RMB¥9.7 billion in 2008, representing an increase by 54.5% compared to 2007.

As of 2008, mobile news (90.8%), mobile chat (47.9%), mobile search (46.9%), mobile reading (18.9%), and mobile gaming (15.6%) were the most used mobile services in China.

20 Davis, F.D. 'Perceived usefulness, perceived ease of use, and user acceptance of information technology.' *MIS Quarterly* 13, No. 3 (1989): 319–40. Venkatesh, V. and Davis, F.D. 'A theoretical extension of the technology acceptance model: four longitudinal field studies.' *Management Science* 46, No. 2 (2009): 186-204.

21 See note 16.

Appendix 2
Literature review on mobile Internet continued

Pearce, K. and Rice, R.
Digital Divides From Access to Activities: Comparing Mobile and Personal Computer Internet Users
Journal of Communication 63 (2013): 721–744

Source Academic journal paper.

Focus Armenia—"Here, PC-based Internet and mobile phone-based Internet have become affordable over the same recent time period, and with greater wireless than wired connectivity, allowing for more equivalent comparisons of the influences on and by these devices." Furthermore, many Armenian Internet users only access via a mobile device. Thus country's digital divide can be explored in terms of "technologies," "use," and "outcomes."

Data Surveys by the International Telecommunication Union, the Caucasus Barometer, and the Gallup World Poll.

Theory Probes two of the three explanations for the digital divide; the "Matthew effect" (the rich get richer); the "knowledge gap" (more cognitive and financial resources increases the capacity to benefit from the knowledge on the Internet); and what could be called the "capital effect" (how different types of social and material capital affect adoption and usage). Rather than adopting any one explanatory theory, the author prefers to focus on "multiple divides."

Argument The study finds pervasive differential divides for access, pervasive but weaker divides for device type, fewer divides for usage frequency, almost no divides for usage duration (which is positively related to usage frequency), and many (including some device and some usage frequency) divides for activities.

Trends Those with lower age, more education, and greater economic well-being used the Internet significantly more frequently, but only proficiency in English had significance for the duration of that use.

Mobile-based users were more likely to have significantly lower economic well-being.

Likelihood of activity breadth varied by device, significantly higher for PC-based Internet use and for both PC and mobile-based use, than for those only accessing the Internet via a mobile. Greater English ability also increases the likelihood of seeking and using a slightly wider breadth of sites and activities.

Tangaza, J. (2011)
Challenges and Obstacles of Creating Mobile Content for Audiences in Rural Africa: A Case Study of the BBC Hausa Village Road Show
Reuters Institute Fellowship Paper. University of Oxford and Reuters Institute for the Study of Journalism.

Available at: http://reutersinstitute.politics.ox.ac.uk/publication/challenges-and-obstacles-creating-mobile-content-audiences-rural-africa (Accessed 28/05/15).

Source Academic working paper.

Focus Developing, Nigeria—an assessment of the challenges and obstacles of creating mobile phone content for illiterate audiences in rural Africa seen through a study of the BBC's efforts to stage a Hausa roadshow and how content arising from it was consumed by mobile users.

Data Case study that draws on secondary contextual literature and survey data collected in two villages visited by a BBC-funded mobile roadshow in rural Nigeria.

Theory N/A

Argument Africa has a unique media history and attitude toward news consumption that stems from associations with colonial and post-colonial political agendas. Especially in rural areas, radio has long been the favored means of mass communication. Many local stations continue to run alongside international ones and offer content in local vernaculars. At the same time, Africa's press have often provided radical voices in the face of colonialism and authoritarianism.

The production and consumption of mobile content faces three main obstacles: (1) the fragmentation of the mobile market, (2) cost to the end user, and (3) the editorial suitability of content. With respect to the latter, the main challenge is offering locally relevant content to an audience used to consuming news through the radio.

The BBC's roadshow was aimed at filling this "editorial gap" in Northern Nigeria. Locally it was considered a success at engaging people because it focused on "issues that matter to the audience at the heart," with an emphasis on local living conditions. However, the roadshow did not drive its audience to access content through their mobile phones and radio remained the main platform.

Appendix 2
Literature review on mobile Internet continued

Follow-up surveys found that 67% of mobile owners said they would like to listen to BBC mobile programmes if it did not have any cost implication to them, but that they still prefer to listening to 30 minute long radio programmes.

The author concludes that it may not be worthwhile for news organizations to provide multimedia content to users. This is because only a negligible percent of the rural population has access to 3G phones and even for the third that can read or write using "Roman text," the cost attached to Internet connection and download are unaffordable. Furthermore, many of those with mobile Internet did not know how to connect to it.

Therefore, international news organizations should "accept the primacy of radio as a communication tool in rural Africa." In the short term they may look to provide breaking local news via mobile, whilst in the long run they should use their brand awareness and domination to seed the ground for future mobile users that may be more inclined towards exploring mobile content as technology advances and costs reduce.

Trends BBC Hausa's mobile site went from 3,355 users in 2009 to over 100,000 by 2011. Nonetheless, Nigeria (Africa's biggest mobile market with over 120 million users) has relatively low numbers of mobile Internet users.

Historically mobile phones have been used far more frequently for SMS than voice or Internet services; 72% of mobile subscribers send or receive 664 texts per month vs. making or receiving only 176 phone calls.

As of 2010, only 21% of people in the developing world had Internet access, with the lowest connectivity in Africa with 9.6%. Nonetheless, according to the *Guardian online*, Africa was the "first continent to have more mobile phone users than fixed-line subscribers" in the world.[22]

In Nigeria, Radio is estimated to be used by 83% of the population weekly.

Balancing Act (2014)
MTN Play Côte d'Ivoire getting 5,000 video views a month: Broadband access is not an issue anymore

Available at: www.balancingact-africa.com/news/en/issue-no-707/top-story/mtn-play-c-te-d-ivoi/en (08/06/15).

Source Online news bulletin.

Focus Developing, Côte d'Ivoire—video on demand.

Data Secondary and interview an editor at MTN.

Theory N/A

Argument To achieve success, MTN has struck clever deals with the owners of content adapted to mobiles and app creators such as Afrinolly (an app that enables African movies and entertainment enthusiasts to watch movies, music videos and comedy).

Trends Rights owners get between 30 and 60% revenue share depending on the quality of their content and the traffic they get.

Revenue-wise, music, SMS and ringtones make the bulk of the MTN Play's revenues. VoD comes after them.

MTN has also launched a VoD app in Nigeria.

22 Andrew Meldrum. 'Mobile phones the talk of Africa as landlines lose out.' *Guardian Online*, 2011. (Accessed 28/05/15).

Appendix 2
Literature review on mobile Internet continued

Stork, C., Calandro, E. and Gillwald, A.
Internet going mobile—Internet access and use in 11 African countries
Info 15, No. 1 (2013): 34–51

Source Academic journal paper.

Focus Mobile Internet access and use trends in 11 African countries—Namibia, Botswana, Uganda, Ethiopia, South Africa, Kenya, Nigeria, Tanzania, Rwanda, Cameroon, and Ghana.

Data Representative data for households and individuals in residential and semi-residential areas, as defined by national census samples.

Theory No fleshed out theory. However, to move beyond the simplistic quantification of access to ICTs as a measure of the digital divide, the paper investigates how the Internet and social media applications are accessed and used in its case study countries. It views usage patterns as "policy outcomes" that are valuable data for those crafting future policies.

Argument In the surveyed countries, the mobile phone is now the key entry point for Internet use. Its uptake is being driven by social networking applications. Indeed the authors argue "the mobile phone has become the most easily accessible and ubiquitous communications device in rural areas due to the affordability of the handset and the prepaid mechanism."[23] This usage is being driven by social networking, with the study finding that mobiles are used less in most countries for reading and writing e-mails than for networking.

The authors argue that "If social networking contributes to the accelerated Internet adoption primarily through mobile platforms, then one would expect mobile Internet users to be younger. One may also expect mobile Internet users to have less income than desktop or laptop users since mobile phones are cheaper in terms of initial expenditure and require fewer skills to use."

To capitalize on mobile uptake, the authors recommend the common mix of public-private partnerships to roll-out mobile infrastructure to difficult-to-reach places; education for increased digital literacy; and the fostering of a favorable environment (especially though reduced taxes) for market competition to lower prices. They mention the importance of relevant content, but do not elaborate.

Trends The World Bank asserts that in low- and middle-income countries, every 10 percentage point increase in broadband penetration accelerates economic growth by 1.38 percentage points.[24] However, others, including the author of this paper, argue that establishing causality is difficult.

Mobile phone ownership in all of the countries except Ethiopia and Rwanda is higher than the 40% threshold that many argue triggers the network effects associated with economic growth.[25] However, in Tanzania, Uganda, and Ghana, the number of users that have mobile phones capable of browsing the Internet is two to three times larger than those that actually use it for this purpose.

Either complementarily to computer access or exclusively, above 80% of Internet users in Namibia, Uganda, and Ethiopia accessed the Internet via a mobile phone in the last 12 months. For South Africa, Kenya, Nigeria, Tanzania and Rwanda, the Internet was accessed through a mobile phone by 70% of Internet users. In all of the countries except Cameroon and Ghana, the mobile phone has overtaken the Internet café as a way to access the Internet.

Social networks and the "free" message services attached to them, or as part of smartphone offerings, appear to be substitutes for the mobile voice and SMS services, which remain relatively expensive.

23 For a similar argument see note 20.

24 Kim, Y., Kelly, T. and Raja. S. (2010). 'Building Broadband: Strategies and Policies for the Developing World.' Global Information and Communication Technologies (GICT) Department, World Bank, Washington, DC, January.

25 For evidence of this threshold see: Roller, L. H. and Waverman, L. 'Telecommunications infrastructure and economic development: a simultaneous approach.' *American Economic Review* 91, No. 4 (2001): 909–923.

Appendix 2
Literature review on mobile Internet continued

Fuksa, M.
Mobile Technologies and Services Development Impact on Mobile Internet Usage in Latvia
Procedia Computer Science 26 (2013): 41–50

Source Conference paper in academic journal.

Focus Latvia—mobile Internet use and acceptance.

Data A survey focused on users' behavioral intention to use the mobile Internet and level of mobile Internet use and acceptance. 2,000 questionnaire participants aged 15–60 submitted "valid" responses.

Theory Through reviewing existing technology adoption theories, the paper seeks to build and apply a "mobile Internet prevalence model that would let users determine levels of mobile Internet acceptance and use, and their impacting factors." The resulting Unified Theory of Acceptance and Use of Technology (UTAUT) model concentrates on performance expectancy, effort expectancy, social influences, and facilitating conditions as determinants of technology adoption/usage.

Argument The author concludes that the main prerequisites for mobile Internet adoption and usage are previous Internet usage experience, quality of the mobile Internet service and mobile operator support, mobile phone suitability for using mobile Internet, as well as a desire to use mobile Internet. Social influence has little

However, the vast majority of such phone users connect to Internet using Wi-Fi technology.

Trends It is predicted that in 2014, mobile Internet usage worldwide will overtake desktop Internet usage.[26] The global mobile industry is the most vibrant and fastest growing. It is expected that the total revenue in the industry will touch approximately $1.5 trillion in 2012 with mobile data representing 28% of the mix.

In the developing world, 31% of the population is online, compared to 77% in the developed world.

Mobile broadband subscriptions have climbed from 268 million in 2007 to 2.1 billion in 2013. This reflects an average annual growth rate of 40%, making mobile broadband the most dynamic ICT (information and communication technology) market.

Yet huge disparities remain between mobile broadband penetration in the developing (8%) and the developed world (51%).[27]

As of 2011, Microsoft's data suggested that worldwide mobile Internet use is focused on social activities—91% of cases. One-third of Facebook's 600 million use the mobile version and over 50% of Twitter users are using the mobile version. People also use their mobile phones to play games (61%), find out the latest weather forecast (55%), use maps/search features (50%), listen to music (42%) or read the news (36%).[28]

Colloquium: Jonathan Donner discusses mobile Internet and digital inclusion in the developing world
Department of Communication, University of Washington, September (2014)
(Accessed 29/05/15)

Source Online press release.

Focus Abstract for a lecture entitled: "After Access? Mobile Internet and digital inclusion in the developing world."

Data Media summary of Donner's research interests.

Theory Reducing the enthusiasm about the potential for mobile Internet to close the digital divide.

Argument In short, most Internet content is produced for access by those using PCs and most of it is not specific to the interests of those in the developing world. This means that those in the developing world do not have the opportunity to use their mobiles in "productive" ways as much as the developed.

26 This happened reasonably early in 2014, see here: Danyl Bosomworth. 'Mobile Marketing Statistics 2015.' *Insights*, 2015. (Accessed 28/05/15).

27 International Telecommunication Union. 'Key statistical highlights: ITU data release June 2012.' (Accessed 28/05/15).

28 "Infographic: Mobile Statistics, Stats & Facts 2011.' *DigitalBuzz*, 2011. (Accessed 28/05/15)

Appendix 2
Literature review on mobile Internet continued

Donner argues that such "persistent digital stratifications" will only be reduced if technologists, researchers, practitioners, and policymakers work to ensure that developing world consumers can take part in creating relevant content.

Trends N/A[29]

Donovan, K. and Donner, J. (2010)
A Note on the availability (and importance) of pre-paid mobile data in Africa
Prepublication draft of a paper to be presented at the 2nd International Conference on M4D—Mobile Communication Technology for Development, Kampala, Uganda. 10–11 November, 2010

Available at: http://research.microsoft.com/apps/pubs/default.aspx?id=142774 (Accessed 28/05/15).

Source Prepublication draft of conference paper.

Focus Africa.

Data Desk-based assessment of major phone operates in 53 African countries.

Theory With regards to voice and SMS, being able to manage expenditures through inexpensive, discrete prepaid options has been central to the widespread accessibility and adoption by the poor.[30]

Argument Prepay data will be as essential to the widespread adoption and use of the mobile Internet in developing countries as access to pre-pay airtime was to the adoption of the mobile telephone. However, a set of "intermediate barriers" to adoption, including poor marketing by operators, few options, high costs, and the need to request data activation, is likely to prevent faster uptake. Therefore, "As a piece of the overall adoption puzzle, clear, coherent, and enthusiastic public promotion of prepaid mobile data by the industry itself seems to be a factor that is lagging behind."

Trends At least one operator in 38 countries offered prepay data in 2009, but in three countries no prepay data was available for purchase. However, in many instances the information offered by companies (including their own marketing) was vague and unclear. This was due to unclear websites, poor support, and the lack of a common terminology to describe services

Neil Cough
Chinese Now Prefer Mobile When Going Online
New York Times, 22 July (2014)

Available at: http://sinosphere.blogs.nytimes.com/2014/07/22/smartphones-surpass-computers-for-Internet-use-in-china/?_r=0 (Accessed 28/05/15).

Source Online news.

Focus China.

Data Survey by the China Internet Network Information Center.

Theory N/A

Argument For the first time, more Chinese people are gaining access to the Internet with mobile devices than with personal computers. However, China's Internet usage is still somewhat subject to state control.

Trends Of the 632 million Chinese Internet users in June 2014, 83.4% reported accessing through mobiles.

Interesting declines in use were registered in two categories: social networking websites, on which the number of users declined 7.4% to 257 million from December 2013 to June 2014; and microblogs, like Sina Weibo, whose users fell 1.9% to 275 million, probably reflecting the effects of a government crackdown that started last year.

29 See Gitau, Marsden and Donner (2010).

30 Dhawan, R., Dorian, C., Gupta, R., and Sunkara, S.K. 'Connecting the unconnected.' *The McKinsey Quarterly* 4: 61–70. Hodge, J. 'Tariff structures and access substitution of mobile cellular for fixed line in South Africa.' *Telecommunications Policy*, 29, No. 7 (2005): 493–505.

Appendix 2
Literature review on mobile Internet continued

GSMA (2015)
Bridging the gender gap: Mobile access and usage in low- and middle-income countries
GSM Association.

Available at: www.gsma.com/connectedwomen/wp-content/uploads/2015/02/GSM0001_02252015_GSMAReport_FINAL-WEB-spreads.pdf (29/05/15).

Source Private sector report (with funding from donor agencies).

Focus 11 low- and middle-income countries: Niger, India, the Democratic Republic of the Congo (DRC), Mexico, Indonesia, China, Turkey, Kenya, Colombia, Egypt, and Jordan.

Building on 2010's report, "Women and Mobile: A Global Opportunity," this study examines mobile ownership among women in low- and middle-income countries, their usage, and the barriers to adoption and use compared to men.

Data Interview with 11,000 participants.

Theory Explaining the "gender gap."

Argument Whilst "women understand the inherent value of mobile phones," significant barriers to their adoption and usage remain. Ensuring women in these countries own phones and can use mobiles is a $170 billion market.

To aid this process, the report offers detailed country profiles (more on Kenya below). It also offers detailed recommendations for mobile operators, policymakers, donors and the development community, and academics and research organizations.

Trends Over 1.7 billion females in low- and middle-income countries do not own mobile phones. Of the women in the 11 surveyed countries, at least 89% said mobile phones help them (or would help them) stay in touch with friends and family; 68% in every country reported they make (or would make) them feel safer; and 58% in every country said they felt (or would feel) more independent and autonomous with a mobile. In short, mobiles are potentially empowering for women.

In terms of the "gender gap," women on average are 14% less likely to own a mobile phone than men (its 38% in South Asia). Women also report using phones less frequently and intensively than men, especially for more sophisticated services such as mobile Internet. In this sense, women are moving up the "digital ladder" more slowly than men. In general the wealthier countries have smaller gender gaps (Kenya is an exception to this correlation).

Women own less expensive and more basic mobile phones than men in every sample country except Turkey, Egypt, China, and Jordan, where ownership profiles are more similar. Thus fewer women are able to access the Internet through mobiles than men.

While cost is the greatest barrier to adoption and use, harassment and security (particularly in Jordan, Egypt, and Kenya) are within the top five. Women also cite social norms, lack of mobile infrastructure and their own digital literacy as barriers.

Kenya has a fast-growing unique subscriber penetration and a relatively small gender gap in mobile ownership of 7%. However, the gender gap in ownership is much higher among poorer households (16%). The market remains fairly basic, with only 14% of all connections 3G, and ARPS2 is stable at $10. Safaricom has the dominant market share, followed by Airtel and Orange. The introduction of M-Pesa (mobile money) is hypothesized to be increasing mobile phone ownership among Kenyan women.

In terms of recommendations, the report recommends focusing on reducing costs, finding solutions to reach Kenya's 75% rural population and content that meets the needs of illiterate women.

Appendix 2
Literature review on mobile Internet continued

Min T.T. (2014)
Consumer demand for the mobile Internet in a greenfield emerging market: The case of Myanmar
Conference paper

Source Conference paper.

Focus Myanmar—explores consumers' demand for mobile technology and services in an emerging market.

Data Survey among mobile users in urban areas (60–70% of the country is rural but network coverage was considered too low to make research among them useful). The incentivized respondents were collected in cybercafés and malls. The majority were female, young and have a high school level education. 62% own a mobile phone and of them 86% have smartphones.

Theory Not fleshed out but Myanmar is interesting as after being isolated by military dictatorship for 59 years, it has recently emerged into the digital age; thus the author argues it has "greenfield advantage to leapfrog over intermediate stages of economic, political and social development." Indeed it couples a low Internet penetration of around 10% and a market of over 50 million customers.

In 2007–2013, the number of individuals using the Internet in China has increased 30%, whereas that in India, Lao P.D.R, and Thailand has grown 11%, 11% and 9% respectively. However, Myanmar has just achieved the growth of 1% in the past seven years. Its uniqueness as a market and as a research site is obvious.

Argument There is no real argument or attempt to explain the results. There are, however, pointers for further research.

Trends The results show that gaining help in an urgent situation and communicating are the main motivation for mobile ownership. However, social networking and entertainment services were highly ranked against usage (25% each). Gaining news and other information was also cited as a common use by around 17% of respondents.

Mobile Internet is the most used mobile service in Myanmar. With respect to its future, community information, news and healthcare were cited as services participants would like to use more.

As with many immature markets, the greatest barrier to ownership of mobiles is cost and coverage.

In January 2014, the government issued four mobile licences: two to Telenor and Ooredoo and two to native operators.

BCG (2013)
Asia's Next Big Opportunity Indonesia's Rising Middle-Class and Affluent Consumers
The Boston Consulting Group

Available at: www.bcgperspectives.com/content/articles/center_consumer_customer_insight_consumer_products_indonesias_rising_middle_class_affluent_consumers/ (Accessed 29/05/15)

Source Private sector report.

Focus Indonesia.

Data Secondary sources and vignettes (not clear how gathered).

Theory N/A

Argument Companies should tap into affluent Indonesian consumers' desire to be socially connected and ahead of the curve in terms of trends and brands.

Trends Due to its economic rise, there are 74 million "middle-class and affluent consumers" in Indonesia. This number is set to double by 2020. There are 25 locations in the country where there are concentrations of more than 500,000 of these consumers.

Indonesians are "highly connected." In 2012 there were 50 million Facebook users, along with 29 million Twitter accounts. More Twitter posts originate in Jakarta than any other city in the world.

Appendix 2
Literature review on mobile Internet continued

Velmurugan, M.S. and Velmureugan, M.S.
Consumers' Awareness. Perceived Ease of Use Toward Information Technology Adoption in 3G Mobile Phone's Usage in India
Asian Journal of Marketing (2013)

Source Academic journal paper.

Focus India—potential adoption and usage.

Data Questionnaire with 552 respondents and secondary data. The majority of respondents had five or more years of experience with mobile phones and almost all regularly used mobiles, suggesting a tech savvy population.

Theory Uses the TAM adoption model to explore India consumers' awareness of mobile Internet and the perceived ease of use.[31] It was hypothesized that awareness and perceived ease of use will be positively correlated to adoption and usage of mobile Internet.

Argument The findings suggest that consumers' confidence in their ability to use mobile Internet functions must be taken into account by providers. Furthermore, the expected utility of new services was also significant.

The author recommends providers conduct both awareness raiding campaigns and digital literacy training. At the same time new services must be thoroughly market tested for ease of use.

Trends At the end of 2013 India had 906 million mobile subscribers (73.3% of the population). Around 70.6 million of these were 3G subscribers. The mobile subscriber rate is expected to grow at 10% per annum until the end of 2016.

At least a quarter of the study's respondents were aware of and interested in using 3G functions. Of those already using such functions, e-mail and search were the greatest use, with functions such as weather, health, GPS, and banking regularly engaged in by between 30–50% of the respondents.

Pearce, K.
Convergence Through Mobile Peer-to-Peer File Sharing
International Journal of Communication 5 (2011): 511–528

Source Academic journal paper.

Focus Armenia—the type of content shared by users of mobile P2P platforms.

Data Interviews with 25 university (that classic participant pool) participants and ethnographic observations.

Theory Armenian consumers' leapfrogging of computers towards mobile Internet breeds creativity. In particular, sharing of content through mobile P2P platforms exemplifies "convergence" or the integration of digital audio, video, text, and data, as well as a social change in the way media circulates." Following others, the author argues that "device convergence" can mean that mobile devices go beyond phones and are used essentially as computers.[32]

The author also discusses mobile P2P sharing as a way of maintaining and building social capital. She argues that as device convergence increases, opportunities for social capital maintenance also increase.

Argument Echoing Donner and Gitau (2009), the author postulates that Armenians' experiences of Bluetooth peer-to-peer file sharing of entertainment content may have trained them for sharing political content.[33] However, whilst the skills are present among the population, she concedes more research is needed to understand if they translate into a desire to share political content.

Trends Only 14.7% of Armenian households own a personal computer, 77.4% of people report no basic computer skills, and 71% report no Internet skills. Furthermore, 6.2% of Armenians are said to be Internet users. In contrast, around 80–85% of the population owns a mobile phone.

31 See note 19.

32 For more on 'convergence' see: Ojanpera, T. 'Convergence transforms Internet.' Wireless Personal Communications 37 (2006): 167–185. Jenkins, H. The cultural logic of media convergence. International Journal of Cultural Studies, 7 (2006): 33–43.

33 Donner, J. and Gitau, S. (2009). 'New paths: Exploring mobile-centric Internet use in South Africa.' Paper presented at the International Communication Association Conference, Chicago, IL. Available at: http://research.microsoft.com/apps/pubs/default.aspx?id=1020027 (Accessed 29/05/15).

Appendix 2
Literature review on mobile Internet continued

In Armenia SMS and MMS messages are more affordable than voice calls on a mobile device. Two primary content areas emerged: entertainment and political information.

The most common type of entertainment use was found to be sharing "clips"—music, slapstick and sensational videos of celebrities and politicians. With regards to political information, there was some evidence that MMS was seen as an alternative news source, with citizens passing video clips of police brutality to one another. Indeed the activist community the author got to know used Bluetooth as a way of passing video clips.

We Are Social and IAB Singapore (2015)
Digital, Social & Mobile in APAC in 2015
We Are Social

Available at: http://wearesocial.sg/blog/2015/03/digital-social-mobile-in-apac-in-2015/ (Accessed 30/05/15).

Source Private sector report.

Focus 59 countries around the Asia-Pacific region.

Data Secondary statistics on the region's digital economy (also some good introductory statistics on the world's digital trends).

Theory N/A

Argument Invest the Asia-Pacific region.

Trends Globally mobile social media usage is growing by roughly 1.1 million active accounts every day, or 13 every second. Globally 976 million people access Facebook through mobiles, compared to 889 million through computers.

Over one-third of APAC's (Asia Pacific) population uses the Internet, and more than one-quarter have used social media in the past 30 days.

Current trends suggest that mobile's share of web traffic in APAC will likely pass that of personal computers before the end of 2015. Furthermore, people in the region accessing social media from mobile devices in the region has reached 900 million and it's expected to hit 1 billion by early Q4 2015.

Mobile's share of web traffic in APAC will likely pass that of personal computers before the end of 2015. Furthermore, around one-third of APAC's population uses 3G or 4G.

In terms of social media use, India recorded the largest absolute growth, up 6 million active Facebook accounts (+5%) to 124 million at the time of writing. APAC is also home to the world's most socially active country—90% of Singapore's population have used Facebook in the past 30 days. However, 21 countries around the region still have social media penetration levels below 10%, including three of the region's most populous nations: India, Bangladesh, and Myanmar.

Social media use varies significantly around the region, with marked differences between East and Southeast Asia. For instance, Malaysians, Thais, and Indonesians spend more than two hours per day on social media too, whilst the Japanese claim to spend less than 20 minutes per day.

The penetration of mobile social media is also uneven. Singapore leads the way at 87%—almost four times the regional average—but North Korea and Papua New Guinea both register less than 5%. Pakistan, India, Bangladesh, and Myanmar are still below 10%.

Eagle, N.
Don't let developing countries lag behind in the smartphone revolution
Guardian, December 2014

Available at: www.theguardian.com/global-development-professionals-network/2014/dec/18/developing-countries-smartphone-revolution-Internet-access (Accessed 29/30/15).

Source Online news.

Focus Developing countries, spread of smartphones.

Data Secondary.

Theory N/A

Argument In the latest draft of the United Nations' sustainability goals beyond 2015, an aim is to "strive to provide universal and affordable access to Internet in LDCs least developed countries by 2020."[34] While smartphones hold great potential for individual empower and the

34 United Nations (2014).' Report of the Open Working Group on Sustainable Development Goals established pursuant to General Assembly resolution 66/288.' Available at: www.un.org/ga/search/view_doc.asp?symbol=A/68/L.61&Lang=E (Accessed 29/05/15).

Appendix 2
Literature review on mobile Internet continued

collection of big data, how can international organizations help bring speed Internet access—especially when costs are prohibitive to many?

The answer seems to be more public-private relationships, and innovative ideas such as Google's "Project Loon" (Wi-Fi from balloons).

Trends Most of 2014's 1 billion-plus smartphone sales shipped to emerging-market consumers: 283 million in China, 225 million in India, 47 million in Brazil, and 46 million in Indonesia.

"M-Pesa users in rural Kenya report that they have increased income by 30% by using mobile payment technology. In India, over 5 million people are learning via Bharti Airtel's mEducation platform. In Tanzania, patients in isolated rural communities are diagnosed by dermatologists in Dar es Salaam, all through a smartphone app."

Many governments in developing countries are lowering taxes on smartphones or offering subsidies. Nonetheless, according to data collected by McKinsey, the average 500MB data plan costs the equivalent of five days work in some countries.[35] Furthermore, last year, a Nielsen study of 10,000 smartphone users in India found that 50% had deactivated the Internet capability of their phone.[36]

Globe/Facebook (2015)
Driving Internet Adoption in Developing Markets and the Role of Mobile Carriers: A Philippine Case Study
A Globe/Facebook Whitepaper

Available at: www.globe.com.ph/documents/50301/15939122/2015-03-05+FB+Globe+Whitepaper (Accessed 29/05/15).

Source Private sector report.

Focus Philippines—a case study on the increase in Internet adoption in the Philippines since 2007 and the role of Globe Telecom (Globe—a Philippine mobile carrier), with a focus on strategic partnerships between mobile carriers and digital content providers such as Globe and Facebook.

Data Company's own statistics and secondary data.

Theory N/A

Argument Whilst infrastructure and cost are important, companies should do more to spread awareness of the Internet. One model is the "free Facebook" initiative carried out by Globe and Facebook. All Globe subscribers—new and existing—could opt-in to unlimited Facebook on mobile. After the trial, subscribers would upgrade to paid data plans.

The general argument is that introducing potential consumers to the Internet through relevant services such as social networking can quickly familiarize them to its benefits and, when after the initial free period, convert them to paying customers.

Trends According to a Deloitte study in 2014, Internet access can promote long-term productivity, better health, and improved literacy.[37]

The 2006 Philippine Government liberalized its telecommunications licensing, driving fast Internet adoption from 2008–2012 (500% increase in users). At the same time, an estimated 67% of the Philippines is below 35 years of age, providing a critical mass of young, tech-savvy early adopters.

From 2011 to 2013, smartphones costing PHP5,000 ($113) or less jumped from 2% of sales to 38%.

Following the initiative, the number of data users on Globe's network doubled (however, it should be noted they use Facebook accounts as a proxy of users, which fails to account for multiple accounts), and the number of those paying for data almost doubled. Indeed even after the free Facebook campaign ended in April 2014, users continued to join Globe's network at a 2x rate of the pre-campaign baseline.

35 See note 8.

36 Nielson. 'Smartphones Keep Users in India Plugged in.' *Nielson*. Available at: www.nielsen.com/us/en/insights/news/2013/smartphones-keep-users-in-india-plugged-in.html (Accessed 29/05/15).

37 Deloitte (2014). 'Value of connectivity Economic and social benefits of expanding Internet access.' Facebook, on behalf of Internet.org. Available at: www.Internet.org/press/value-of-connectivity (Accessed 29/05/15).

Appendix 2
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YouGov and Upstream (2013)
Emerging Markets Mobile Attitudes Report 2013

Available at: www.upstreamsystems.com/2013-emerging-markets-mobile-attitudes-report/ (Accessed 29/05/15).

Source Secondary data.

Focus Developing and developed world—Brazil, India, KSA, U.K., U.S.

Data 35,000 respondents to an online survey, the results are weighted according to population.

Theory N/A

Argument The next billion customers for big brands (content providers, mobile network operators and hardware) are going to come from the developing world. However, many of these are leapfrogging Internet use of computers.

The research suggest that MNOs are in the best position to shape the mobile data revolution in these new lucrative areas (unlike in the West where they have lost out to "over the top" services such as WhatsApp). Indeed MNOs brand credibility, the lack of debit/credit card banking in the developing world and free access to apps and social networking sites means that MNOs are in a strong position. They can increase this by providing tailored content to consumers and affordable data plans, thereby, becoming both "King and King makers in the race to the next billion."

Trends Analyst firm Ovum expects that there will be 1.6 billion new mobile connections by 2017—with Africa identified as the fastest growing region. Additionally, according to the GSMA, sub-Saharan Africa is expected to add 175 million new mobile users just in the coming three years.

Brand popularity:

Brazil:

Samsung (35%),
Nokia (23%),
Apple (19%)

India:

Samsung (38%),
Nokia (20%),
Apple (19%)

Nigeria:

Nokia (37%),
Blackberry (21%),
Apple (15%)

Saudi Arabia:

Samsung (42%),
Apple (31%),
Nokia (8%).

Which content is of interest:

Brazil:

69% Social Media
39% Education
Business 33%
Health 37%

India:

70% Social Media
50% Education
40% Health
49% Travel

Nigeria:

80% Business
78% Social Media
74% Education
56% Health

Saudi Arabia:

61% Social Media
44% Education
34% Travel
31% Health

Thirty-one percent of consumers want a phone designed by social network companies with relevant content and apps preloaded. However, 12% of emerging market consumers would prefer to use Facebook Zero, a free text only version of the social network.

Appendix 2
Literature review on mobile Internet continued

Pew Research Center (2014)
Emerging Nations Embrace Internet, Mobile Technology
Pew Research Center, February

Available at: www.pewglobal.org/2014/02/13/emerging-nations-embrace-Internet-mobile-technology/ (Accessed 29/05/15).

Source Pew's website news bulletin.

Focus Mobile Internet adoption and usage in the developing world.

Data A survey conducted among 24,263 people in 24 emerging and developing economies.

Theory N/A

Argument N/A

Trends Using the Internet is significantly more common among the young: in 14 of 24 nations, at least half of 18–29 year-olds say they are online.

Smartphone ownership is more common in countries with higher levels of per capita income, yet in many, traditional cell phones still outnumber their smarter cousins three to one. Furthermore, there is no country in the study where even half of the population owns a smartphone.

Among smartphone owners there is a significant age gap, with people under age 30 much more likely than others to own an iPhone, BlackBerry, or Android device. Education and income levels are also positively related to smartphone ownership and Internet usage.

People who use their mobile online tend to become avid users, with half or more doing so daily.

Social networking is the most popular usage, with 96% saying they use it to keep in touch with family and friends. Sharing views about pop culture is also common, with a median of 73% saying they use social networks to post opinions. Across 22 countries, a median of 38% among social networkers say they share views about politics using social media sites.

Making or receiving payments is one of the least common cell phone activities. However, it is more common in Africa, and more specifically, Kenya (68% of phone owners) and Uganda.

Tobbin, P. (2013)
Examining the Adoption and Use of Mobile Data Services: A Consumer Behavior Analysis
PHD Thesis, Center for Communication, Media and Information Technologies Aalborg University, Denmark

Source Academic, six paper PhD thesis.

Focus Developing world, an examination of how these environmental factors interact with the technological and individual characteristics and determine the consumer's acceptance, use and adoption of the mobile data services, with an emphasis on mobile money.

Data A mix of quantitative and qualitative field studies.

Theory The thesis views technology adoption as a process and applies different perspectives of the consumer's technology acceptance, use and adoption literature.

Argument The findings indicate that aside the usual technology characteristics and individual characteristics, individuals' social networks, social practices, and private and symbolic meanings of offered services affects the acceptance, use and adoption of the technology. To understand this, the thesis introduces an integrated mobile money adoption model (iMoMAM) which provides an understanding of consumers' socially influenced decision processes that guide the decision to adopt and use mobile money services.

Trends In many of the papers "trust" and MNOs' relationships with consumers were found to be the key determinants of the adoption of services, including mobile money. Furthermore, mobile banking creates "technology anxiety" for many rural consumers. Services' compatibility to existing social practices was found to be essential for individuals to overcome such barriers and accept the technology.

Further exploration of the domestication of mobile money in Kenya found social networks (and their influence), functional and symbolic meanings, and existing social practices around money to be factors that affect consumers' decisions to accept, use, and adopt mobile money services in Kenya.

Appendix 2
Literature review on mobile Internet continued

Sam, S.
Exploring Mobile Internet use among Marginalized Young People in Post-conflict Sierra Leone
The Electronic Journal of Information Systems in Developing Countries 66, No. 5 (2015):1–20

Source Academic journal paper.

Focus Sierra Leone—Taking a conflict-affected setting, the paper asks "how the behavioral patterns of marginalized young people are shaped by the technology that is available to them, and equally how they shape technology to respond to their needs."

Data 50 individual interviews, 22 key informant interviews, and five focus group discussions in two rural and urban remote communities.

Theory The paper depicts individuals as self-actualizing agents to understanding how mobile Internet is integrated into their everyday routines. It uses "domestication theory as a dialectical lens." The concept of domestication theory is built on the notion of the moral economy of the household.[38] However, the author argues it can also be understood as a pragmatic approach to bridge the gap between research frames of the ICT4D community and the technology and society community.[39]

Argument The author argues that because of the low socioeconomic status of the study's users, the motivation to adopt and appropriate mobile Internet was largely based on perceived benefits and the expectation to secure better economic opportunities either by connecting with family, making friends, scamming or engaging in online betting. However, these uses reflect the offline, daily activities and routines of Sierra Leone's marginalized. In this sense, the technology is being domesticated without leading to new users.

If the potential of mobile Internet is to be realized in Sierra Leone, costs must be reduced, productive content offered (and people made aware of it), and digital literacy training made available. This is important before the contemporary enthusiasm for mobile Internet dissipates when users fail to reap the livelihood rewards they seek.

Trends More than half of the population (3.5 million) has access to mobile phones, and more than 80% of the country is within coverage area.

There is anecdotal evidence that mobiles are being used to network by war-affected youth and Sierra Leone has a growing disaster alert network.

As with other studies in South Africa, the research found youth approach trusted people to aid them in getting mobile Internet proficient. However, some also pursued informal education outside of their social networks.

It was found that evidence of successful marriage relationships through the use of social media platform motivated many to adopt and use mobile Internet. Equally, another motivation was revealed to be online betting through the country's online betting website Mercury International.

Internet use at individual level could extend beyond social media and web browsing to include e-mails, e-commerce, job searching and e-governance. However, this does not reflect in the case of this study. The author attributes this to a lack of domestic e-mail services, few job websites and no platforms for online political participation. There was also little awareness that mobile Internet extended beyond social networking, news, and entertainment media.

Facebook for Every Phone and its impact on the developing world
Mobile in the Developing World

Available at: https://mobileinthedevelopingworld.wordpress.com/2013/08/11/facebook-for-every-phone-and-its-impact-on-the-developing-world/ (Accessed 29/05/15).

Source Blog.

Focus Developing world—the "Facebook for every Phone" scheme.

Data Secondary sources.

Theory N/A

38 Silverstone, R., Hirsch, E.D., and Morley. (1994). Information and Communication Technologies and the Moral economy of the households. In Hirsch, E.D. & Silverstone, R. (Eds.), Consuming Technologies: Media and Information in Domestic Spaces. London: Routledge.

39 For example see: Donner, J., Gitau, S., and Marsden, G. 'Exploring Mobile-only Internet Use: Results of a Training Study in Urban South Africa.' International Journal of Communication, 5, No. 24 (2011).

Appendix 2
Literature review on mobile Internet continued

Argument There is a danger that users see Facebook as the entire Internet, instead of just a small part of it. As powerful Internet giants such as Facebook, Microsoft, and Google continue to see emerging markets as a priority, there should be a limit to their influence allowing home-grown developers and mobile applications to launch and thrive in the developing world.

Trends "Facebook for Every Phone" had already reached over 100 million users in 2013.

Facebook purchased an Israeli company called Snaptu to re-engineer Facebook's software to reduce its capacity and allow it to run off minimal data requirements.

Facebook for Every Phone includes all the phones most popular features, including News Feed, Messenger, and Photos, and is optimized to use less data than other Java apps and mobile sites.

Kumar, N.
Facebook for self-empowerment? A study of Facebook adoption in urban India
New media & society 16, No. 7 (2014): 1122–1137

Source Academic journal article.

Focus India—the development friendly outcomes of mobile Internet use through the lens of Facebook by low-income youth.

Data Ethnographic—a snowball sample of 25 Facebook users, male, aged 18–22 years old in Delhi. Mobile retailers from 10 shops all within a mile of each other. See "tends" section for note on girls' exclusion from study.

Theory Uses Jenkins' focus on "literacies" to uncover informal learning spaces.[40] While there is no clear theory, the author grounds the study in some of the influential exploration of Facebook usage and some of the literature that focuses on non-instrumental uses of mobile Internet, which it is argued often afford users training in digital literacy.[41]

Argument Indian youth swiftly negotiate social boundaries and technological hurdles, to become "legitimate members of a global community." The diverse ways in which the poor and the marginalized use and rework media technologies in their everyday lives for social networking, entertainment…and to express and experience their sexuality, relationships, pleasure, and intimacy (all arguably non-instrumental uses of mobile Internet) are argued to be empowering.

The author goes as far as to argue that the youth are using Facebook to challenge and break away from a heavily class- and caste-based society.

Trends Eighty percent of Facebook users reside outside the United States, and developing countries such as India, Brazil, and Indonesia have the second-, third-, and fourth-largest number of Facebook users in the world.

Picking up on mobiles' use as status symbols, the author comments that "Facebook, personal and unmediated Internet access, and advanced mobile technology are innately linked in the minds of these youth. Together these create an identity that they consider critical for social acceptability."

The youth are argued to be immersed in the culture of "jugaad," a colloquial Hindi term that is used variously to refer to innovative and improvised solutions as a response to the scarcity of resources (in short, doing more for less). The paper explores this through the youth's efforts to learn English so as to read online content and communicate with their global social networks. Such processes are argued to be central to the youth acquiring new aspirations and skills.

Entertainment, however, was said by participants to be "a passing phase"; they soon move on to concerns of livelihood. There is a move from using Facebook to cultivate virtual ties, to using it to maintain real world ties that may be useful.

Indian girls lag behind the boys in their access to and use of technology, and in their freedom online. Thus they were excluded from the study.

40 Jenkins. H. (2009). *Confronting the Challenges of Participatory Culture: Media Education for the 21st Century.* Cambridge, MA: The MIT Press.

41 For a review piece see: Caers, R., De Feyter, T. and M. De Couck, M. 'Facebook: a literature review.' *New Media & Society* 15, No. 6 (2013): 982–1002. For influential work on non-instrumental usage see: Kolko, B.E. and Putnam, C. (2009) Computer games in the developing world: the value of non-instrumental engagement with ICTs, or taking play seriously. In: International Conference on Information and Communication Technologies and Development, pp. 46–55.

Appendix 2
Literature review on mobile Internet continued

Gemalto, S.
How to drive mobile data adoption for new smartphone users in the developing world
Gemalto, 2015

Available at: http://blog.gemalto.com/blog/2015/03/10/how-to-drive-mobile-data-adoption-for-new-smartphone-users-in-the-developing-world/ (Accessed 29/05/15).

Source Private sector online blog.

Focus Developing countries—encouraging adoption of data services in the developing world.

Data Secondary sources.

Theory N/A

Argument Costs, awareness and digital literacy are all cited as reasons for low data usage by smartphone owners.

To bridge this gap MMOs must collaborate with "over the top" service providers (WhatsApp, Facebook, etc.) to create simple apps that educate people about data services, often by allowing them to do what they are already doing on regular feature phones online.

Trends In the developing world, only 20 to 25% of smartphones or data-enabled phone owners do use their mobiles for Internet access.

Out of 100 people successfully creating their Facebook account from Gemalto's SMS-based app "Facebook for SIM," 22% migrated to mobile data after only 30 days. This figure goes up to 100% for users with 20 friends or more in the Facebook community.

On Device Research (2014)
Impact of mobile Internet on people in Kenya, Nigeria & South Africa

Available at: https://ondeviceresearch.com/blog/mobile-Internet-kenya-nigeria-south-africa-2014 (Accessed 05/06/15).

Source Private sector online technology and media bulletin.

Focus Africa—Kenya, Nigeria, and South Africa.

Data Survey with 2000 "representative" respondents across the three countries, conducted via mobiles. In Kenya 74% of the respondents were using a feature phone, in Nigeria 72%, and in South Africa 46%. In Kenya and Nigeria 20% of the survey participants were women, in South Africa the figure was 35%. This is a natural fallout of the mobile Internet sample in these countries.

Theory N/A

Argument The main takeaway from our latest survey that discovered that 63% of Africans find that mobile Internet has "greatly improved" their lives, compared to 40% of people in the U.K.

Trends Better access to education, entertainment, ease of paying bills and staying in touch with friends and family rank the highest of aspects that have improved lives.

The most popular activity on mobiles in Africa is listening (67%) to music, followed by social networking (54%), and finding information (52%).

The survey suggests mobile Internet has become the largest "media channel" in Africa and calls on advertisers to take note.

It also highlights the "mass adoption" of mobile money.

Forty-six percent of respondents went online for the first time with their phone in the last two years. Most of these mobile Internet users are very young, which also reflects general demographic trends on the continent.

Appendix 2
Literature review on mobile Internet continued

World Bank and InfoDev (2012)
Information and Communications for Development 2012: Maximizing Mobile
Washing DC: The World Bank

Source Grey literature.

Focus Developing world—ICT4D with a focus on agriculture (the value chain), health, mobile money, and democracy (transparency and accountability).

Data Secondary Data—useful country by country breakdown of key mobile adoption, ecosystem, and general development statistics.

Theory N/A—nonetheless, this optimistic report seems to underpin many of the pro-mobile/ICT4D arguments that are now being challenged through a greater focus on how people actually choose to use mobile Internet.

Argument With the upsurge in ownership, "mobile communications now offer major opportunities to advance human development—from providing basic access to education or health information to making cash payments to stimulating citizen involvement in democratic processes."

Compared to the developed world, the developing world is following a "mobile first" technology trajectory, with many innovations, such as multi-SIM phones and low-cost recharging, being spurned by the mobile explosion. Locally developed applications must follow these advances in hardware to further domesticate mobiles in the developing world.

Trends Mobile applications are argued to not only empower individuals but to stimulate growth, entrepreneurship, and productivity throughout the economy as a whole.

To be of the greatest benefit, mobile apps require a healthy mobile ecosystem, with many different players, including "software developers, content providers, network operators, device manufacturers, governments, and users."

Although the private sector is driving the market, social intermediaries, such as nongovernmental organizations (NGOs) are said to play an important role in customizing applications to meet the needs of local communities.

The chapter on democracy coins the phrase "mGovernment" and argues that the "revolutionary aspect…lies in making government available, anytime, and anywhere, to everyone." Nonetheless, the report contains a good section on "social networking and democracy," running through the history of mobiles and social change.

Ramburn, H. and Van Belle, J. P.
Inhibitors and Enablers of Mobile Data Services Use in South Africa
Communications of the IBIMA (2011): 1–11

Source Academic journal paper.

Focus Developing—South Africa and an apparent contradiction of widespread mobile ownership but limited mobile Internet adoption (compared to developing countries).

Data Survey among mobile phone users, with sub-samples from South Africa's student and business communities.

Theory N/A—the article lists and discusses the major obstacles and inhibitors to mobile Internet adoption in South Africa.

Argument The authors argue that "new services should be introduced at a relatively low price for a specific time period to promote trialability." "Additionally, increased transparency with regard to the billing and cost of some transactions is essential."

Trends In 2011 mobile use stood at around 83% of South Africa's population and the telecommunications sector contributed 6% of GDP.

The article claims South Africa was an early investor in mobile data infrastructure. However, it offers no figures to back up its claim of low data subscribers in 2011.

Sixty-seven percent of the sample use SMS several times and 17% engage in web browsing. Eleven pecent use online chats several times daily while only 9% use e-mail several times daily. Very few respondents use their mobiles for other services more than once daily.

The results suggest that the high cost of data combined with the relatively low incomes—these can be taken together as an "affordability" indicator—appear to reduce usage of important services and stop further usage of entertainment-based services.

Appendix 2
Literature review on mobile Internet continued

Smith, D.
Internet use on mobile phones in Africa predicted to increase 20-fold
Guardian, June 2014

Available at: www.theguardian.com/world/2014/jun/05/Internet-use-mobile-phones-africa-predicted-increase-20-fold (Accessed 05/06/15).

Source Online news website.

Focus Developing—African mobile Internet adoption.

Data Based on research by Ericsson.[42]

Theory N/A

Argument Due to the declining prices of handsets and data, along with faster transmission speeds, Internet use on mobile phones will increase 20-fold in the next five years. Much of this demand will be driven by social networking services, video, and mobile money.

The reporter claims the findings confirm Toby Shapshak's claim that: "Africa is a mobile-only continent. There never was a landline infrastructure to begin with, apart from urban areas. Mobile has allowed anyone to have a phone in places that were previously impassable and uncontactable. It has also been enabled, from a business perspective, by prepaid payments that handily remove the equally widespread legacy problem in that very few people have bank accounts. It really is that technology leapfrog the industry likes to talk about."[43]

Trends "By the end of 2014, it is forecast that there will be more than 635 million mobile subscriptions in Sub-Saharan Africa. This is predicted to rise, to about 930 million by late 2019, when it is estimated that three in four mobile subscriptions will be Internet inclusive."

Seventy percent of users in the countries the Ericsson report researched browse the web on mobile devices, compared with just 6% who use desktop computers (does not say which countries).

Beckmann, E.
Learners on the move: mobile modalities in development studies
Distance Education 31, No. 2 (2010): 159–173

Source Academic journal article.

Focus Developed—Australia—how mobiles provide opportunities for solo and peer learning among development workers.

Data Data from "action research cycles" in 2008 and 2009 on a postgraduate development studies programme in Australia.

Theory N/A

Argument For mobile to benefit learners and afford them agency in choosing how and when to learn, pedagogy must drive technology adoption, not the other way round. To achieve this, mobile technology must shadow already established learning practices (domestication) and not try to reinvent the wheel. Furthermore, non-mobile technologies, such as personal audio players and laptops, should be seen as valuable complements to mobiles. However, without high quality Internet, distance learning opportunities are quickly eroded.

Trends The author focuses on the "attributes that facilitate a rich mobile Internet experience," which in many ways eco discussions around mobile ecosystems, only in this case at an individual level. They are: Ubiquity, access, richness (focused on the ease of downloading information), efficiency, flexibility and reliability, security, and interactivity.

Distance online learning options provide unique opportunities for students to reflect on their work as they learn and, through the peer networks fostered by the program, to discuss a range of solutions to identified problems.

42 See: Ericsson (2014). 'Sub-Saharan Africa: Ericsson Mobility Report Index.'

43 See: Toby Shapshak (2013). 'You don't need an app for that.' *TED*.

Appendix 2
Literature review on mobile Internet continued

Wagner, S. and Fernández-Ardèvol, M.
Local content production and the political economy of the mobile app industries in Argentina and Bolivia
New Media & Society, February (2015)

Source Academic journal article.

Focus Developing—app production in Argentina and Bolivia. In particular, the article explores the political, social and economic conditions that connect or disconnect commercial app developers and local users' interests.

Data Two sources: the content analysis of 195 mobile app firm websites and 18 semi-structured interviews with app developers and related practitioners.

Theory Delves into the critical literature on media production and power asymmetries. The authors argue that while much of this work has "dried-up" in Western academia in recent years, "political activism and the examination of media conglomerates have remained main-stage in Latin American scholarship."

Argument Google and Apple dominate the app market, both through their online app marketplaces and the fees they charge developers. Nonetheless, governments in Argentina and Bolivia are aiming to support their local app developers. While Argentina is focused on developing apps for the international market, and therefore content that follows mainstream interests, it faces significant blocs imposed by the aforementioned companies' dominance of access. In contrast, Bolivian developers are more keen to explore developing apps for their local market and for social development purposes. Yet they too are constrained in marketing these apps by the dominance of the aforementioned companies.

To address these obstacles, the authors call for a re-thinking of how development aid can be used to challenge existing power asymmetries. Furthermore, they suggest government funding to alternative distribution platforms or quotas for locally developed apps on the national portals could create a conducive environment for locally produced apps and locally relevant content.

Trends The corporate monopoly of Internet sharing platforms has raised two main sorts of concerns. First, user traffic is about advertising revenue and data collection, which means the political content of online media is often "filtered out" so that companies can get at the commercial value. Second, "the structure of sharing platforms is rooted in the cultural assumptions of the producers or managers, shaping the manner in which users interact and share contents."[44] Often this reinforces existing inequalities between developed and developing countries.

Mobile-broadband penetration, while minimal, more than doubled between 2010 and 2012 in both countries.

App developers from the U.S.A and Europe were the biggest sellers in the Argentinian and Bolivian stores. At the same time, local app developers felt that app store sales were not an effective business model—they explained it was too difficult to popularize an app or even get it seen.

While most of their app development business was undertaken for foreign companies, domestic NGOs producing apps focused on local issues were considered an interesting and lucrative target market for firms in Bolivia. In Argentina, two app developers had experimented with free apps developed for domestic audiences, but most felt that the market was not large enough to make developing domestically focused commercial products worthwhile.

A recent study in the United States found iOS and Android users spending 86% of their device-based time within apps.[45]

44 For more on this see: Srinivasan, R. 'Re-thinking the cultural codes of new media: the question concerning ontology.' *New Media & Society* 15, No. 2 (2012): 203–223.

45 Khalaf, S. (2014). 'Apps solidify leadership six years into the mobile revolution.' *Flurry Insights.*

Appendix 2
Literature review on mobile Internet continued

Surman, M., Gardner, C. and Ascher, D.
Local Content, Smartphones, and Digital Inclusion
Innovations: Technology, Governance, Globalization 9, No. 3–4 (2014)

Source Academic journal article.

Focus Developing world—Digital inclusion.

Data Secondary.

Theory N/A

Argument The authors argue that "In many ways the mobile Internet is 'read only,' not just because authoring content is difficult on small screens but because mobile content—media, apps, and services—are distributed through much more restrictive channels than the early web, or even Web 2.0." Furthermore, the bar to create content and apps is actually rising; a trend that reverses the Web's promise of easy content creation. Indeed the authors worry that the next billion Internet users will simply be "consumers, not creators." The main reason for this is the small number of platform providers that "hold the keys to the kingdom" (Google, Apple, Microsoft, etc.).

To reverse this trend, they suggest that "the health of the local content ecosystem is a key indicator of the inclusiveness of the Internet in practice, with clear cultural, political, and economic implications." Central to this "health" is the ability to understand what has been the key drivers of content creation, as opposed to mere consumption, in the past (the answers; building blocks, skills, and an open platform).

Throughout they explore a three-step path of Internet use: from exploring, to building, to participating. They suggest that many of the barriers to full participation occur at the exploring stage, with utilities such as Facebook and WhatsApp deliberately shielding users from the Internet's full potential. The authors even suggest the practice of "zero-rating" (such as Internet.org) retards users' progression from exploring to building.

A large part of their proposed solution to the lack of locally relevant content is to provide training and the software to allow users in the developing world to create on HTML 5, thereby bypassing the need to distribute through app stores.

Trends 20% of the population in the developing world has mobile broadband now, compared to 84% in the developed world.

4.8% of the world are native English speakers, yet 55.7% of websites are in English.

The top ten Internet sites in India, as measured by traffic, have just two fully Indian representatives: the *India Times* newspaper and the mobile shopping site Flipkart. The rest are Indian versions of Google properties, Facebook, Yahoo, and Wikipedia.

While the authors argue that M4D services represent a leap forward for many that have not had access to the enabling technology or information, current efforts have not managed to scale up, and offer little prospects of users creating their own content.

Schoemaker, E.
The Mobile Web: Amplifying, But Not Creating, Changemakers
Innovations: Technology, Governance, Globalization 9, No. 3–4 (2014): 75–85

Source Academic journal article.

Focus Developing—Mobile Internet usage and ICT4D.

Data Secondary sources.

Theory Following others that have argued for the importance of framing habits and toolkits, the concept of "culture" is used as a lens to understand the choices people make that may or may not affect development. At the same time, the idea of technology as "an amplifier of human intent" is deployed to move the focus back onto people's agency to shape technology use.

Argument Unless people have the capacity to create mobile Internet content, the technology risks amplifying existing patterns of poverty and inequality. Indeed, studies increasingly find that social media might limit diverse debate, instead creating an "echo-chamber" in which like-minded people are fed content they agree with and reinforce one another's views.

However, instead of concentrating on mobiles' potential impact on economic growth, research should examine how social networking and "entertainment consumption"

Appendix 2
Literature review on mobile Internet continued

through mobiles affects "cultural attitudes and values." This is particularly important given mounting evidence that entertainment is the primary usage for most mobile Internet users.

To ensure some of this usage has developmental benefits, local change agents that are already harnessing technology and entertainment for social purposes must be supported to use technology and build alliances on the ground. Top-down strategies to spurn attitude change rarely have the desired results.

Trends Whilst acknowledging its developmental potential, the author argues that "the function and effects of the mobile phone as a media device are the most significant aspects of the technology in terms of social change."

Perhaps only 10% of the web is mobile-ready (formatted for mobile devices) and sites which are often strip down the information they offer to those accessing via computers.

Studies are increasingly finding that social media might limit diverse debate, instead creating an "echo-chamber" in which like-minded people are fed content they agree with and debate with one another. This can even lead to the entrenchment of increasingly extreme views as people reinforce one another's attitudes and beliefs.

GSMA Intelligence
Local world—content for the next wave of growth
GSM Association

Available at: https://gsmaintelligence.com/research/?file=140919-local-content.pdf&download (05/06/15).

Source Private sector report.

Focus Developing markets—locally relevant content as a barrier to digital inclusion.

Data Secondary sources.

Theory N/A

Argument "Many individuals in emerging markets are yet to fully embrace the mobile and digital revolution because they lack sufficient 'local content' that is accessible, useful and relevant to their livelihoods, wants, and needs."

However, local consumers are best positioned to define what counts as "relevant" content. Thus the authors highlight an ideal situation in which "content that is locally generated, in the local language, and locally relevant to users in emerging countries" is created within the markets themselves.

Yet to encourage this, mobile social networking services/platforms need to be tailored to local languages and levels of digital literacy, and challenges around payment limitations, cultural factors and government or third-party support must be overcome. Furthermore, given adoption rates, content must remain accessible through both feature- and smartphones (a good example is India's txtWeb).[46]

It follows that handset makers, content developers, Internet players and NGOs must act collectively.

Trends In the developing world 3G networks currently cover between 50% and 70% compared to over 80% in the developed world. Furthermore, it will be another 3–4 years before smartphone users surpass feature-phone users (for example, smartphone ownership is around 10% of mobile users in many African countries).

Global mobile data traffic is forecast to increase tenfold between 2013 and 2018, led by strong growth in the regions that mainly comprise developing nations—Middle East and Africa, Asia Pacific, and Latin America.

There are about 900,000 small and medium businesses (SMB) in India actively using Facebook for advertising purposes and to communicate directly with their customers.

Of the 436 global Internet exchange points (IXPs) listed by Telegeography, only 28 (6%) are in Africa, and out of the 86 content delivery network (CDN) locations run by Level 3, one of the world's largest CDNs, 64 (75%) are based in Europe and the U.S., with only three in Africa. Establishing more IXPs in developing countries would reduce the cost on international transit while improving performance.

Hosting websites locally has search engine optimization benefits, as search engines such as Google, Yahoo, and Bing will determine and rank search results based on, amongst other criteria, the content's locale, prioritizing content that is in the local language and locally hosted.

46 See: www.txtweb.com/home—the service allows users to make and receive Internet searches via SMS.

Appendix 2
Literature review on mobile Internet continued

Watkins, J., Kitner, K. and Mehta, D.
Mobile and smartphone use in urban and rural India
Continuum: Journal of Media & Cultural Studies 26, No. 5 (2012): 685–697

Source Academic journal article.

Focus Developing India—Mobile phone adoption and smartphones for ICT4D.

Data Two qualitative studies compared: An interview-based study of urban, "middle-class" smart- and feature-phone users, and a participant observation among community radio reporters issued with smartphones.

Theory Mobile and smartphone adoption will be impacted by "multiple economic and cultural factors" that most quantitative studies do not capture. To uncover these features the first study sought the "threads of meaning" participants give to their mobile usage; while the second adopted the conceptual framework of the "communicative ecology" to explore how mobile technology fits into its wider context.[47]

Argument Both studies suggest that low levels of income and digital literacy, and certain social structures and cultural norms may further constrain India's forecasted mobile and smartphone adoption rates.

Trends For almost all the participants in the first study, the mobile device (smart or not) was considered a necessity for daily life. Furthermore, for many, the mobile was their first "personal device," creating a strong "intimacy" with the technology that "led to a change in the perception of personal space and increased freedom." In particular, it was argued mobiles permit "unsupervised personal relationships, in some contrast to older generations."

Reporters from the second study felt that the smartphones were less obtrusive than a microphone and MP3 recorder and made villagers feel more comfortable during interview recording. However, the study also uncovered how smartphones would be largely unable to "leapfrog" the local radio station's rigid recording and broadcasting schedule, and local social norms that acted as barriers to listeners interacting with reporters or being directly involved in program-planning activities.

Balancing Act (2015)
Mali—the Internet and Social Media but Not As in Other African Markets

Available at: http://allafrica.com/stories/201502170889.html (Accessed 06/06/15).

Source Online news Bulletin.

Focus Developing—Mali's strange telecoms development path.

Data Secondary.

Theory N/A—The piece identifies a clear pattern for emerging African telecoms markets: "international wholesale fiber prices go down; some time later retail Internet prices go down; speeds steadily increase with fiber, ADSL and 3G+; the numbers of Internet users (largely on mobile) goes up and as this happens Internet content and services begin to start.'

Argument Mali's market suffers from high costs due to a "cosy duopoly; between Malitel and Orange. This duopoly" encourages "rent-seeking rates" because there is no competitive pressure. Furthermore, the operators have not installed the Wi-Fi hot spots witnessed in other African countries, and neither have a network presence outside of the capital.

Combined with a small domestic market of only 14.5 million people and expensive electricity, Mali has not seen the growth of local content creation as elsewhere in Africa. Local content creation is also hampered by the local language, Bambara, not being a written language and social norms in Francophile countries that present barriers to sharing information.

Without more competition to bring prices down and locally based music and video streaming services (in relevant languages), the danger is that the Internet will enter a "cul-de-sac" of the same people recycling the same news stories and little to no creativity.

Trends There are now over 100 VoD platforms in Africa and a similar number of mobile and Internet music platforms.

It is estimated smartphones might be as much as 10% of Mali's market.

Facebook is the most used social media site and has 230,000 users in the country. However, the big surprise in Mali is the use of Viber for calling rather than What'sApp.

47 Slater, D. and Tacchi, J. (2004). 'ICT innovations for poverty reduction.' New Delhi: UNESCO.

Appendix 2
Literature review on mobile Internet continued

Mims, C. (2012)
Facebook's plan to find its next billion users: convince them the Internet and Facebook are the same
Quartz

Available at: http://qz.com/5180/facebooks-plan-to-find-its-next-billion-users-convince-them-the-Internet-and-facebook-are-the-same/ (Accessed 06/06/15).

Source Online news bulletin.

Focus Developing—Facebook and "zero rating."

Data Secondary.

Theory N/A.

Argument By offering "free" access to Facebook, the company is able to set the next 100 billion mobile Internet users' conception of what the Internet is. The popularity of this service means that "Facebook is literally becoming the Internet."

It is suspected that Facebook does not pay mobile operators for the data this "free" service requires. Rather they sign-up to the scheme as a way to access and hook poorer customers. Indeed "through a series of canny partnerships, acquisitions, and roll-outs, Facebook has made its service usable for anyone, whether they're using the latest iPhone or a five-year-old gray-market Nokia."

Key to Facebook's strategy is that no matter where users start on the ladder of mobile technology, from the most basic device to the newest smartphone, Facebook becomes better and more fun to use as they upgrade. Thus users never feel the need to exit.

Trends In May 2010, Facebook announced Facebook Zero. It is a simplified, text-only version of Facebook that can be accessed at 0.facebook.com if you're in the right country and you've got the sort of WAP-enabled "feature phone" (i.e., non-smartphone).

In the developing world, the average monthly spend on mobile connectivity, which is often just voice and text, is 8–12% of the average take-home pay of a cell phone user.

In the 18 months after Facebook Zero launched in Africa, the number of Africans on Facebook increased by 114%.

At the end of 2011, according to Nielsen Research, a third of the Philippines' citizens were on the Internet, or 33.6 million people. Today, the number of Facebook users in the Philippines is 29.4 million. Of the 10 countries with the most Facebook users, six are emerging markets, and five of them—India, Brazil, Indonesia, Turkey, and the Philippines—represent 217 million Facebook users.

Facebook was able to sign up 50 mobile carriers in 45 countries when Facebook Zero launched.

In Kenya, which is typical for the continent, 99% of access to the Internet is accomplished on mobile devices.

Sass, E. (2015)
Mobile Internet Soars In Developing World
Mobile Marketing Daily: MoBlog

Available at: www.mediapost.com/publications/article/241636/mobile-Internet-soars-in-developing-world.html (06/06/15).

Source Online news bulletin.

Focus Developing—mobile Internet adoption in India, China and Africa.

Data Secondary (a variety of sources, many of which are covered in the review).

Theory N/A.

Argument The boom looks set to continue, with the developing world offering larger markets than the developed.

Trends By the middle of 2015, mobile Internet will account for 60% of India's total 354 million Internet connections. At that point, India will be a bigger Internet market than the U.S., second only to China in the world. Indian e-commerce sales will jump from $3.1 billion in 2013 to $22 billion in 2018.

In Sub-Saharan Africa, mobile Internet penetration will increase from 17% of the population in 2014 to 37% by 2020. While the continent's mobile money transaction volume will reach $160 billion by next year.

Appendix 2
Literature review on mobile Internet continued

China remains the world's biggest mobile Internet market by a large margin, with 389 million smartphones shipped last year alone, including 171 million 4G handsets. The total number of smartphone users in China will reach 700 million by 2018 (over half the country's population). While the volume of mobile commerce will reach $41 billion by 2016.

Staff Writer (2014)
Mobile Videos Becoming Mainstream Among Mobile Internet Users in Emerging Markets
VUCLIP

Available at: http://finance.yahoo.com/news/mobile-videos-becoming-mainstream-among-140000270.html (06/06/15).

Source Online news bulletin.

Focus Developing—mobile video.

Data Primary Data—global survey of more than 12,000 people predominantly from India, Southeast Asia, and the Middle East.

Theory N/A

Argument Mobile video's popularity in the emerging markets has moved beyond just a few early adopters and is fast becoming mainstream.

Trends 67% of respondents prefer mobile as their primary method for watching their favorite movies, music videos, and TV shows.

70% of men and 56% of women prefer to watch their favorite videos, TV shows, and movies on mobile; compared to 20% of men and 29% of women who still prefer their televisions.

85% of men and 75% of women said they will increase the amount of time they watch videos on mobile in the future.

65% of men and 54% of women prefer to pay through their mobile carrier to purchase mobile videos; followed by credit/store payment and net banking payment, respectively.

The appetite to watch mobile videos in India (74%) is higher than the global average of 67%

Balancing Act (2014)
Nigeria Airtel Takes ICT to Rural Communities
Balancing Act

Available at: www.balancingact-africa.com/news/en/issue-no-721/Internet/nigeria-airtel-takes/en (06/06/15).

Source Online news bulletin.

Focus Developing—Nigeria and adoption.

Data Secondary.

Theory N/A

Argument Airtel Nigeria is seeking to expand its market for mobile Internet through an awareness raising and free data program called "Boost ICT Usage in Rural Area."

Trends Currently, Nigeria has 55,930,391 mobile Internet users out of a population of 174,507,539 representing 32.9% penetration rate with heavy concentration in the urban areas. See more at: www.balancingact-africa.com/news/en/issue-no-721/Internet/nigeria-airtel-takes/en#sthash.tFTtPWIL.dpuf.

Wei, R., Lo, V. and Xu, X.
Predicting mobile news use among college students: The role of press freedom in four Asian cities
New media & society 16, No. 4 (2014): 637–654

Source Academic journal article.

Focus Asia—use of mobile news services (including consuming news through social networking services) and its relationship to press freedom.

Data Primary—survey of more than 3,500 college students in Shanghai, Hong Kong, Singapore, and Taiwan. 51.9% of particpants owned a smartphone and 48.1% had a non-smartphone.

Appendix 2
Literature review on mobile Internet continued

Theory The study contains a good review of research that has used "culture" as an explanatory variable for mobile phone usage. However, it sets itself up to examine mobile usage variation within a single, Confucian, culture and posits economic and political differences as the crucial variables.[48] Thus it asks if the use of mobile phone for "news-getting" differs due to each of the four studied city's socioeconomic development, the diffusion of new media, the media environment and the marketing strategies of mobile phone companies. To do this it uses "the expectancy-value approach" to focus on the "perceived benefits offered by the medium (mobile news) and the differential values associated with those benefits."[49] This puts users' agency at the forefront of the study.

Argument As an alternative to government-sponsored news, mobile news services, such as microblogs, provide an avenue for journalists and citizens to create content, and to interact with one another. Indeed "from the perspective of mobile users in China, their mobile phone is the platform to get breaking and thrilling un-sanctioned news posted on microblogs." In this sense, "mobile phones play a crucial role in bypassing authoritarian information control in countries with no or limited press freedom."

Trends As many as 34% of China's mobile Internet users had microblog (Weibo—a Twitter like service) accounts by 2010.

College students in China, especially Shanghai (classed as a country with less press freedom and a higher rate of smartphone adoption), were more likely to follow microblog news posts than their counterparts in other Asian societies.

The findings also show that college students across all the studied cities "read mobile news and follow news posts on mobile microblogs when they believe more strongly that the mobile phone can facilitate communication, that they can customize news to personal interests, and that they can interact with it."

Liyanage, H., Edge, P. and Dharmasena, U. (2013) Smart Devices to poor communities! Too early?
eNovation4D

Available at: http://enovation4d.blogspot.com/2013/06/smart-devices-to-poor-communities-too.html (Accessed 06/06/15).

Source Online news bulletin.

Focus Developing—the impact of smartphones and training introduced to 15 poor rural Sri Lankan communities.

Data Primary data.

Theory N/A

Argument Smartphones have a quicker and more diverse impact in rural communities than other forms of ICT. There is also an emerging potential for scalability as costs reduce and mobile infrastructure is rolled out.

Trends Schoolchildren (below age 13) have identified Android Apps (Google Sky Map and Star Chart App) to stargaze for their school projects. Teachers at pre-schools started using smartphones to teach English language in rural locations. Micro-entrepreneurs have used smartphone devices to market their handicrafts through Facebook.

Social media marketing, using Facebook as a tool, has become a trend among Enterprise Promotion Officers where they sell cattle, passion-fruit, even compost and many other local products of micro-entrepreneurs.

48 The authors do note some minor cultural differences between the cities, such as the working culture, but these are not investigated as explanatory factors.

49 Palmgreen, P, and Rayburn, J. 'Gratifications sought and media exposure—an expectancy value model.' *Communication Research* 9, No. 4 (1982): 561–580.

Appendix 2
Literature review on mobile Internet continued

Delgado, R. (2015)
The New Space Race: Bringing Internet to the Other 4 Billion
Wired

Available at: www.wired.com/2015/01/the-new-space-race-Internet/ (06/06/15).

Source Online news bulletin.

Focus Developing—Access for hard-to-reach communities/markets.

Data Secondary data.

Theory N/A

Argument Google is the company arguably most invested in bringing the Internet to hard-to-reach consumers. However, three major efforts are of note:

- Project Loon: Google's own high-altitude, solar-powered balloons that float on "sub-atmospheric wind" to provide network coverage. This project is still at the testing phase but the results are promising.
- Oneweb: A plan to launch nearly 700 satellites into space, creating a network built to provide high-speed Internet at a low cost.
- SpaceX Elon Musk's plan to offer a similar, yet competing, satellite system to Oneweb.

Trends There are an estimated 4.4 billion people currently without Internet coverage.

Oneweb has secured $2 billion from backers like Qualcomm and Virgin Galactic.

Musk has yet to secure rights to a broadcast spectrum, which many think will be a deal breaker.

Mohla, K. (2015)
The next emerging billion mobile Internet users matter: Mobile World Congress in Barcelona
Yourstory

Available at: http://yourstory.com/2015/03/emerging-billion-mobile-Internet-users-mobile-world-congress/ (06/06/15).

Source Online News Bulletin.

Focus Trends at the 2015 Mobile World Congress.

Data Secondary Data.

Theory N/A

Argument The author argues that Google and Facebook are sincere about their desires to connect the next billion mobile Internet users, particularly through partnerships with carriers.

Google is also the most likely to launch its own mobile network—in this it will be an MVNO (Mobile Virtual Network Operator) who will not own any of the infrastructure but will partner with existing providers.

Mobile entertainment is going to become extremely tied to device, data, and identity.

The intersection of consumer data along with their connected lifestyle that will bring about the next wave of consumer mobile adoption.

Trends Mobile connectivity is an important focus area with Google having paid out $7 billion to mobile developers in 2014.

Appendix 2
Literature review on mobile Internet continued

Kessler, S. (2011)
Why the Web Is Useless in Developing Countries—And How to Fix It
Mashable

Available at: http://mashable.com/2011/02/04/web-developing-world/ (Accessed 06/06/15).

Source Online Magazine.

Focus Developing countries and the utility of Internet, with an exploration of the World Wide Web Foundation's efforts to make the web relevant and usable in developing countries.

Data Secondary data.

Theory N/A

Argument While more people are expected to login to the Internet through mobiles, "the problem is that for a person in a developing country, the current Internet is nearly useless." The reason; a lack of useful, locally relevant content. The main obstacles to both using the web and creating content are the affordability of data, illiteracy and digital literacy.

The WWWF believes that as more content is created "increased demand for the Internet in these areas will drive increased investment by telecom companies, bringing down data costs to a point that is affordable to more people in the developing world." A virtuous cycle of sorts.

Trends The WWWF's schemes to kick-start this cycle include developing voice browsers and an entrepreneur program that will train developers in Africa to code simple web services.

Wallace, C.
The social meanings of mobile phones among South Africa's digital natives: a case study
Media, Culture & Society 36, No. 3 (2014): 398–408

Source Academic journal article.

Focus Developing—the social role of mobiles among students at Cape Town University.

Data Primary—online survey with 100 student respondents and focus group data.

Theory Not clearly outlined, but the article seems to begin from Castells' argument that the phone comes across as an essential and unavoidable link between the "network" and the self.[50] It also focuses on the youth's abilities to appropriate the technology for their own ends, whilst remaining aware of the differences among them as to how they go about this.

Argument The article notes that mobiles have arguably become a key pivot around which youth culture is organized (both for academic pursuits, and for maintaining and enhancing one's social networks and status), while at the same time being appropriated and shaped creatively by the youth to address their varying interests.

Yet, Moyo has argued, as Moyo cautions, the existing research on mobiles on the continent "has often been descriptive and celebratory to the extent that it inadvertently augmented the more instrumental research conducted by the wireless network companies seeking to know more about markets and the emerging patterns of mobile use."[51] In contrast there has been a lack of questions around policy and regulation, and the political economy of mobile phones in Africa.

Adding to Moyo's critique of the less addressed elements of mobiles' impact, the article seeks to explore its social dimensions.

50 Castells, M., Fernadez-Ardevol, M., Linchuan Qiu, J. and Sey, A. (2007). *Mobile Communication and Society: A Global Perspective*. Cambridge, MA: MIT Press.

51 Moyo, D. 'The new media as monitors of democracy: mobile phones and Zimbabwe's 2008 election.' Communicare: *Journal for Communication Sciences in Southern Africa*, 29 (2010): 71–85.

Appendix 2
Literature review on mobile Internet continued

Trends In South Africa, access to mobile phones is now well over 80%, and is growing.

In 2010, "The price of the cheapest mobile phone in Kenya, for example, costs half the average monthly income, whereas the price of the cheapest mobile phone in Niger is equivalent to 12.5 kilograms of millet, enough to feed a household for five days."[52]

Many students own an average of two phones, a smartphone and a cheap feature phone for when they go out in case of muggings. The smartphone was often also reserved for academic uses or for business relationships, while the cheaper phone for "mundane" social activities.

Average time spent on the mobile was three hours (4.5 hours females, to 2 hours for males) a day (and double during weekends).

The predominant use of the mobile phone among the youth in this study fell within the hierarchies of pleasure seeking and "networking."

Hjorth, L., Qui, J. L., Zhou, B. and Wei, B. (2014)
The Social in the Mobile: QQ as Cross-Generational Media in China
In; Hjorth, L. Ed. The Routledge Companion to Mobile Media. London: Routledge

Source Book chapter.

Focus Chinese working class youth with a focus on the role of participatory forms of media spurned by Web 2.0. In particular QQ.

Data In-depth series of interviews and focus groups with thirty Fudan University students (including twenty parent and student interviews), and references to a quantitative study.

Theory Limited theory but the authors argue "QQ can be seen as the main repository for emerging digital cultures, literacies, and practices in China's new twenty-first century technocultural scape."

Argument A key part of China's contemporary mobile media space involves the convergence of locative, social, and mobile media. This convergence allows China's generation Y, the ba ling hou, to document, illustrate, and narrate a sense of identity, sociality, and place in new ways. Central to this is the creation of emplaced "visualities" or the process of curating one's identity through location tracked images and social networking.

QQ (a Chinese social networking and media platform), it is argued, has long occupied "a specific role within the lives of the young working class as they migrate to middle class through educational and information technology (IT) policies." Indeed it is described as a "right of passage" for young working class Chinese seeking to better themselves and argued to represent "a type of Chinese nationalism," with many attaching sentimental value to the service's place within their lives.

Crucial for QQ to fill this space has been the state's education policies, which are slowly being devolved to the more local level. At the same time, QQ users are migrating and exploring other platforms as they gain digital literacy. Nonetheless, the article appears to champion state involvement in the sector and social media as a way to smooth sharp class- and age-based dividing lines.

Trends In China, mobile web users now total just over 463 million. There are over 200 million smartphone subscribers (along with countless millions of shanzhai or copy versions).

380 of 590 million of the country's Internet users are on the Twitter-like service Sina Weibo. For its part, Jiepang (sometimes called the Chinese version of Foursquare) has over 5 million users.

In 2014, it was estimated that around 808 million people use QQ's 15-year-old service monthly.[53]

52 Aker, J.C. and i.M. Mbiti. 'Mobile phones and economic development in Africa.' *Journal of Economic Perspectives* 24, No. 3 (2010): 207–232.

53 Bischoff, P. '200 million Chinese people use Tencent's QQ…at the same time.' *TechinAsia*, April, 2014.

Appendix 2
Literature review on mobile Internet continued

GSMA (2014)
The Mobile Economy 2015
GSM Association

Available at: https://gsmaintelligence.com/esearch/?file=bb688b369d64cfd5b4e05a1ccfcbcb48&download (Accessed 07/06/15).

Source Private sector report.

Focus Worldwide global mobile economy.

Data N/A

Theory N/A—However, the report does appear to subscribe to the questionable virtuous cycle argument that more people connected to the Internet through mobile will add to state's GDPs and lead to more socially beneficial services, especially in the developing world.

Argument "Mobile is at the heart of the new digital ecosystem. It is driving innovation and the development of new services in areas such as digital content, social networking, and online commerce." However, the unconnected "population is predominantly rural, with low incomes and high levels of illiteracy creating barriers to mobile Internet adoption."

Getting them connected requires a combination of a "supportive regulatory framework" (set by states) that encourages investments and for "Players from across the digital ecosystem, ranging from mobile operators to new entrants and existing players in adjacent industries" to collaborate for the sake of innovation.

Trends Half of the world's population now has a mobile subscription—up from just one in five 10 years ago. There were 7.1 billion global SIM connections at the end of 2014, and a further 243 million machine-to-machine (M2M) connections.

Mobile broadband connections will account for almost 70% of the global base by 2020, up from just under 40% at the end of 2014. Smartphones account for 60% of all connections.

Slowing subscriber numbers, as well as competitive and regulatory pressures, has led to a slowdown in industry growth rates, with a compound annual growth rate (CAGR) of 3.1% per annum through to 2020, down from 4% in the period 2008–2014.

However in 2014, the mobile industry generated 3.8% of global GDP and it will continue to grow fast the other global industries.

Sixty percent of the world's population, or approximately 4.4 billion people, remain unconnected to the Internet. Yet, at the end of 2014, there were 2.4 billion individuals using mobile devices to access the Internet across the globe, of which 1.8 billion were in developing markets.

Around 60% of the population in developed markets have mobile Internet access, while in developing markets the figure is only 28%.

McKinsey has suggested that if Internet access achieves an impact on the same scale as mobile telephony has in Africa, it could account for as much as 10% of total GDP by 2025, up from only 1% today.

Appendix 2
Literature review on mobile Internet continued

Balancing Act (2013)
The irresistible Law of Circles—getting mobile and online content to African users in a fragmented market

Available at: www.balancingact-africa.com/news/en/issue-no-668-0/top-story/the-irresistible-law/en#sthash.vlWVFT8Y.dpuf (Accessed 07/06/15).

Source Online industry news bulletin.

Focus Africa—incentives for service and content creation.

Data Secondary data.

Theory N/A

Argument Due to the adoption rates of different types of phone and the expense of data packages, the goal for many African entrepreneurs is "to build a service or content of an absolute "must have" nature around 160 characters' (or SMS length). In this sense, designing smartphone apps is not currently a sensible choice.

The author argues that the only way to side-step this problem, which is essentially one of small markets, is to design mobile and content services that can appeal across several countries. This goes against the localization arguments proposed by others. A distant alternative is to use platforms such as "biNu" which can present graphics on feature phones that mimic smartphone content and use low-bandwidth cloud-based channels.

However, providing an ecosystem that drives the price of data down is seen to be the key to getting entrepreneurs to design services and content for mass consumption.

Trends In Africa, "it is very exceptional for content or services to attract more than 5% of all subscribers."

One SMS aggregator reported that it got twice the response levels from SMS campaigns that were in Nigerian Pidgin than it did in English.

Deloitte (2015)
The Deloitte Consumer Review Africa: A 21st century view Contents

Available at: www2.deloitte.com/ng/en/pages/consumer-business/articles/consumer-review-africa.html (08/06/15).

Source Private sector report.

Focus Developing—Africa, Egypt, Kenya, South Africa, and Nigeria.

Data Primary—a consumer survey of 2,000 16+ year-old adults in the four aforementioned countries. To make its point the report also has a number of illustrative case studies alongside the survey data on initiatives such as M-Pesa and Jumia (the "African Amazon').

Theory N/A

Argument The consumer opportunity in Africa rests on five pillars: the rising middle class, population growth, the dominance of youth, rapid urbanization, and the fast adoption of digital technologies.

The results of survey suggest that young Africans are demanding innovative and quality products, but the supply is currently inadequate.

Trends Africa has an annual growth rate of around 8% (about double the rate of developed economies), with Ethiopia, Uganda, and Mozambique growing fast, and the large economies under scrutiny in this report continuing to perform well.

By 2030 over half a billion Africans are projected to be "middle class." However, it should be noted that today we consider African's middle class on an income of between $2–4 per day.

Only 20% of Africa is online, compared with 75% in Europe and 32% in Asia.

Appendix 2
Literature review on mobile Internet continued

Currently 20% of Africans are between 15–24 years old. 7 in 10 of the surveyed young Africans use social networking sites on their phones. The top four markets in Africa for Facebook penetration are Tunisia, Mauritius, Cabo Verde, and Morocco. In Kenya, South Africa, Tunisia, and Morocco Internet penetration is around the 50% mark.

By 2017 Africa will be the second largest market for European investors. Furthermore, by then 90% of Africa will have a mobile subscription and 30% a smartphone.

Quality of products rank as more important to consumers across all the surveyed countries and younger consumers are described as "brand conscious."

Africa's "middle classes" predominantly live in the south and west of the continent.

Balancing Act (2014)
Nigeria's Entertainment Revenue Will Hit $8 billion by 2018

Available at Source www.balancingact-africa.com/news/broadcast/issue-no188/investment/nigeria-s-entertainm/bc (08/06/15).

Source Online News Bulletin.

Focus Developing—Africa, Kenya, and Nigeria.

Data Secondary—a PWC report.[54]

Theory N/A

Argument The Internet is driving growth in Kenya and Nigeria's entertainment industries.

Trends Nigeria's entertainment and media revenues is expected to hit an estimated $8.5 billion by 2018.

The Internet will be the key driver for Nigeria, where the number of mobile Internet subscribers is forecast to surge from 7.7 million in 2013 to 50.4 million in 2018.

Similarly, the Internet will drive Kenya's fortunes. It recorded $1.7 billion in entertainment and media revenues in 2013, and this is forecast to rise to $3.1 billion in 2018.

All Africa (2014)
Flying blind into the bright lights of Africa's data future—Spotting the known unknowns

Available at Source http://allafrica.com/stories/201411031887.html (Accessed 08/06/15).

Source Online news bulletin.

Focus Developing—Africa and accurate data.

Data Secondary.

Theory N/A

Argument For Africa's market to develop as it did with voice, transparent data on usage needs to be freely available. Businesses in Africa, such as Konga and Jumia, increasingly rely on accurate information about Internet connectivity and usage.

Regulators should also publish data on what types of device are used, such as smartphones vs feature phones.

Trends Only 10 regulators in Africa provide regular data on Internet usage and only eight are reasonably well updated.

54 The link to the PWC report is broken.

Appendix 2
Literature review on mobile Internet continued

Africa (2013)
African smartphone usage driven by savvy young South African, Kenyan, and Nigerian consumers

Available at: www.oafrica.com/mobile/african-smartphone-usage-driven-by-savvy-young-south-african-kenyan-and-nigerian-consumers/ (Accessed 07/07/15).

Source Online news bulletin.

Focus Developing—Africa, Sub-Saharan countries (Nigeria, Ghana, South Africa, Kenya, Senegal, Cameroon).

Data Secondary—based on annual consumer survey and subsequent reports conducted by Ericsson ConsumerLab with over 100,000 people in 40 countries.[55]

Theory N/A

Argument African "smartphone usage is driven by South African, Kenyan, and Nigerian consumers under 30 years of age who work full time or are still in school and own a smartphone costing less than US $150."

Mobile financial services have, in many cases, "put Africa on the map" and provide a crucial way of consumers gaining digital literacy.

Trends 44% of consumers want to upgrade to a smartphone in order to surf the Internet (34% to go on social networking sites).

Ownership of entertainment apps greatly exceeds interest in productivity apps—but more phone owners aspire to use productivity apps in the future.

Accessing the news in developing countries

Westlund, O. and Färdigh M.
Accessing the News in an Age of Mobile Media: Tracing Displacing and Complementary Effects of Mobile News on Newspapers and Online News
Mobile Media & Communication 3, No. 1 (2105): 53–74

Source Academic journal article.

Focus Developed—Sweden. The effects of news consumption through mobile on legacy newspapers' media's business models and democratic functions. In particular, whether different age groups consumption patterns lead to complementary or cannibalization.

Data Secondary—27 scientific omnibus postal surveys conducted annually from 1986 to 2012 in Sweden.

Theory No clear-cut theory. Instead the authors suggest that there is little evidence to conclude that new media is displacing or complementing legacy media. Thus a more nuanced view is needed that looks at different age groups' consumption patterns.

Argument The future role of the "press" as a creator of news and an informed citizenry has become increasingly uncertain with the rise of mobile and online news platforms. At the same time, traditional business models are seeing reduced advertising revenue.

As methods of accessing news (print, computer, and mobile devices) are significantly related to age, there is an increasing "necessity for legacy news media to gear towards compensating for the diminishing effect of the newspaper by exploring and exploiting the opportunities arising from emerging forms of news consumption."

55 Ericsson (2013). 'Bridging the Digital Divide: How mobile phones are playing a key role in connecting people in Sub-Saharan Africa.' (Accessed 07/06/15).

Appendix 2
Literature review on mobile Internet continued

Many of the newer platforms for accessing news (mobile and tablet) provide the opportunity to target content to specific age cohorts, which the data suggest will be important for efficient and cost-effective news production.

Trends The findings suggest that the Swedes mostly engage in single-media, rather than cross-media news consumption. In this sense, new media forms are likely to be displacing.

People born in the 1930s mainly access news from evening tabloid printed papers. While accessing news only from online sites is significant among those born in the 1970s, yet much less common among those born in the 1930s.

The use of print news thereafter continuously decreases among younger age cohorts, and almost appears at the bottom among people born in the 1980s. Indeed by 2012 31% of people born in the 1990s report only accessing news via their mobiles.

An interesting finding is that there are no age groups with the habits of accessing news by print and mobile.

Bosch, T.
Digital journalism and online public spheres in South Africa
Communication: South African Journal for Communication Theory and Research 36, No. 2 (2010): 265–275

Source Academic journal paper.

Focus Citizen and digital journalism in South Africa, and the role played by mobile phones and social networking apps, particularly Facebook and Twitter.

Data Secondary sources. Two case studies of news outlets harnessing new technology platforms and citizen journalism.

Theory Uses Habermas' idea of the public sphere as place for political discussion.[56] Nonetheless, recognizes that issues such as access, digital literacy, and commercialization all combine to mean the Internet by no means offers an equal opportunity for everyone to engage in political discussion. One way to widen partition, the author argues, is through Internet-enabled phones and social networking apps.

Argument South African journalists, via community media and tabloid newspapers, have long embraced the notion of civic or community journalism, framing news "in a way that facilitates people thinking about solutions, not just problems and conflict" (Hoyt 1995).[57] This has a created fertile environment for "convergence" between traditional news and social media, with media outlets using social networking platforms to engage their audiences, solicit feedback, and identify content. The author argues this convergence is going some way towards creating new online public spheres in South Africa, many of which are allowing citizens to engage in journalism. This "citizen journalism," it is argued, "is probably the most striking manifestation of digital journalism in South Africa."

The investigation into these trends leads the author to argue research on "glocalization" must start from the local, and investigate how both old and new media combine to fulfil the content needs of local spaces. However, for these processes to become "democratic" more digital literacy training and greater equality of access is needed.

Trends Only around 4 million members of South Africa's population were online in 2010, and the author argues that there is an evident digital divide between rural and urban areas. Yet one online news source had around 1.5 million unique browsers in the election month, suggesting an appetite for online news.

One definition of "digital journalism" is "to deliver (or make accessible) news and information to an increasingly computer-literate audience."[58] In South Africa, digital journalism is increasingly a supplement to print or broadcast news. The author argues its rise is tied to global trends that have seen fully staffed newsrooms and investigative journalism give way to increasing "news from the wire" or aggregator services.

56 Habermas, J. (1989). *The structural transformation of the public sphere.* Trans. Burger, T. and Lawrence, F. Cambridge, MA: MIT Press.

57 While this is a nice quotation from 'Hoyt,' the paper's author does not have a reference for it in the bibliography and nothing turns up with a quick search.

58 Kawamoto, K. (2003I. *Digital journalism: Emerging media and the changing horizons of journalism*. Oxford: Rowman and Littlefield Publishers.

Appendix 2
Literature review on mobile Internet continued

For its part, citizen journalism is loosely defined as mechanisms through which citizens can be involved in collaboration with professional journalists to shape content, often through reporting in stories that are then followed up on.[59]

The study found no online newspapers or blogs in African languages (i.e., not Afrikaans or English). There is also a paradox in that much of the online content produced is "shovelware;" content already in the newspapers' traditional platforms. The author argues these two phenomena combine to consolidate barriers historically imposed to confine non-English speaking African peoples.[60]

Chan, M.
Examining the influences of news use patterns, motivations, and age cohort on mobile news use: The case of Hong Kong
Mobile Media & Communication (2015): 1–17

Source Academic journal article.

Focus Developed—Hong Kong, the relationships among demographics, news use patterns, and mobile news use.

Data Primary—computer-assisted telephone interviewing among 503 randomly selected respondents.

Theory The "medium-centric approach" supports the idea of news platforms displacing one another as users (if content is assumed to be equivalent) gravitate towards the ones that offer the greatest breadth of features (known as niche theory).[61] Picking up on this, the paper explores to what extent mobile news displaces news use from other media?

However, the paper also adopts a "user centric approach" to explore the alternative that users adopt whichever medium will most efficiently (conceptualized as availability) bring them to the content they require. This idea is informed from complementary theory.[62] Thus it also asks: To what extent does mobile news complement news use from the other?

Lastly, the paper explores whether different motivations of mobile phone use, or gratification theory, may predict mobile hard news and mobile soft news use differently?[63] In particular, it looks at users' motivations for consuming hard news (news of a substantive nature) or soft news (human interest pieces or entertainment news).

Within all three questions, the paper examines trends among different age groups.

Argument Those in the 18–34 and 35–54 cohorts were mostly multiplatform users of news, yet subgroup analysis reveal different patterns of complementary uses and displacement. For example, newspaper and television use declines and mobile online news increases as the age cohorts get younger; suggesting some measure of growing displacement. Moreover, results showed that different gratifications predict mobile hard news use and mobile soft news use, with soft news most likely to be consumed as a "passing time" activity. The authors speculate that this use of mobiles was enabled by Hong Kong's mature ecosystem for mobile Internet (Wi-Fi in public spaces).

Trends Hong Kong has among the highest Internet (83%), smartphone (87%) and tablet PC (57%) penetration rates in the world.

According to the State of the Media 2013 Report, 64% of tablet owners and 62% of smartphone owners use their devices to access news in the U.S. Moreover, 75% of smartphone owners also get news from their laptops and desktops.[64]

Overall, and consistent with the U.S.A, television dominates news consumption across the age groups.

Unsurprisingly, mobile news access ranks second for the 18–34 cohort and fourth for the 35–54 cohort. It ranks last for the 55–70+ cohort.

59 For more see: Bowman, S. and Willis, C. (2003). 'We media: How audiences are shaping the future of news and information.' The Media Centre. Available at: www.hypergene.net/wemedia/download/we_media.pdf (Accessed 29/05/15).

60 Also see: Crystal, D. 2007. *English as a global language*. Cambridge: Cambridge University Press.

61 Dimmick, J., Chen, V. and Z. Li. 'Competition between the Internet and traditional news media: The gratification-opportunities niche dimension.' *Journal of Media Economics* 17, No. 1 (2004): 19–33.

62 Dutta-Bergman, M. J. 'Complementarity in consumption of news types across traditional and new media.' *Journal of Broadcasting & Electronic Media* 48, No. 1 (2004): 41–60.

63 Blumler, J. G., and Katz, E. (Eds.). (1974). *The uses of mass communications: Current perspectives on gratifications research*. Beverly Hills, CA: Sage.

64 Sasseen, J., Olmstead, K., and Mitchell, A. (2013). 'Digital: As mobile grows rapidly, the pressures on news intensify the state of the news media 2013.' Pew Research Center. (Accessed 07/06/15).

Appendix 2
Literature review on mobile Internet continued

Over 80% of the 18–34 cohort and 70% of the 35–54 cohort were multiplatform consumers of news, utilizing three to six media. Mobile news consumption is most popular among the 18–34 cohort.

There was no strong evidence of displacement across the board, which is consistent with national sample findings in other countries. The authors argue that "Theoretically, this can be explained by niche theory in that mobile phones offer extended opportunities for news consumption in certain parts of the day and in certain locations where it has clear superiority over other media." Yet there was evidence of growing displacement among young mobile users.

Bohmer, M., Hetch, B., Schoning, J., Kruger, A. and Bauer, G. (2011)
Falling Asleep with Angry Birds, Facebook and Kindle—A Large-Scale Study on Mobile Application Usage
Proceedings of the 13th International Conference on Human Computer Interaction with Mobile Devices and Services

Available at: http://dl.acm.org/citation.cfm?id=2037383 Accessed 07/06/15).

Source Conference paper.

Focus Developed—The U.S. and Europe. The paper sets out to descriptively answer some very basic questions about apps usage, both in terms of how they are used and the contexts in which they are used.

Data Primary—application usage information from over 4,100 users of Android-powered mobile devices. Gathered by the authors' own data mining app, "AppSensor," this information encompassed apps' lifecycles (installation, updates, use, etc.) on users' phones.

Theory N/A.

Argument The results suggest that mobile phones are still first and foremost communication devices (voice, e-mail, SMS, voice over IP, instant messages, etc.). However, at night people make more use of the non-communication applications (including social applications) and spend more time with applications.

The authors suggest a number of ways that mobile operating system designers could make app placement more efficient, and gather further insights from regular usage and contextual data.

Trends In 2011 there were more than 370,000 apps available for the Android platform and 425,000 for Apple's iPhone.

The average app session lasts less than a minute, even though users spend almost an hour a day using their phones. Application usage (in terms of launches) is at its maximum in the afternoon and evening, peaking around 6P.M.

"Mobile devices are most likely to be used for communication every hour of the day, especially in the afternoon and evening (11A.M.-10P.M.) with a probability of more than 50%. News apps have the highest probability of being used in the morning (from 7A.M. to 9A.M.). Around 11A.M., finance apps briefly become quite prominent. After communication winds down late in the evening, games have their highest probability of use. Social applications also have their highest probability of use in the late evening (from 9P.M. to 1A.M.)."

In nearly half of all application chains (described as continuous opening of different apps), the first application opened belongs to the category of apps coded as "Communication." In contrast, a browser was only used first in 5.9% of application chains.

When travelling at speeds over 25kmph, users were 2.26 times more likely to be using an app of the "Multimedia" category.

Stephens, M., Yoo, J., Mourao, R., Vu, H., Baresch, B. and Johnson, J. T.
How App Are People To Use Smartphones, Search Engines, and Social Media for News?: Examining Information Acquisition Tools and Their Influence on Political Knowledge and Voting
Journal of Information Technology & Politics 11, No, 4 (2014): 383–396

Source Academic journal article.

Focus Developed—U.S.A, the implications of the growing use of tablet and smartphone news applications, search engines, and online social networking platforms for political and news information.

Appendix 2
Literature review on mobile Internet continued

Data Secondary data from a state-wide Texas opt-in survey with 800 respondents.

Theory The paper explores the "direct effect" hypothesis, or instrumental perspective, which suggests that the Internet's lower opportunity costs will lead to greater political engagement, including a higher propensity to vote.[65] This is important as smartphones can be seen as increasing the ease of access for news and providing passive news consumption through social networking sites.

However, the authors are aware that the latter argument is contested, with some studies finding that social networking sites allow users to avoid news content and focus on entertainment. Thus the paper also explores the "differential-effects approach" which suggests the motivation or interest of users is more important than simple ease of access or exposure to the news.[66]

They examine these theories through the lens of accessing news via news applications, search engines and online social networks.

Argument Search engines were the only news access method to significantly contribute to political knowledge. The authors argue that this is likely to be the case because they require of users a certain level of prior motivation (political interest). Whereas many young people predominantly use news apps for non-news-related activities such as checking maps and social networking services for staying connected. Thus, they conclude, "incidental exposure (to news) is less likely to boost knowledge and voting behavior as much as an intentional, motivated search for information."

Trends Online news was the only news category to see user numbers increase in 2012.[67]

Nearly half of all Facebook and Twitter users get news from those online networks.

None of the three news accessing methods affected voting behavior.

Jackson, J. (2013)
How mobile has changed daily news consumption and why you need to understand it
theMediaBriefing

Available at: www.themediabriefing.com/article/usage-lifecycles-user-day-mobile-news (07/06/15).

Source Online news bulletin.

Focus Developed—mobile news consumption.

Data Secondary—website analytics collected by the *Financial Times* (FT) and *Guardian*.

Theory N/A

Argument The key point is that the bulk of newspapers, new online traffic is "additive"—traffic to news websites is increasing when there was previously very little, simply because people now have a way of accessing it; smartphones. Thus the Internet is fundamentally changing publication priorities, "making continuous publishing throughout the day not only feasible, but increasingly necessary." To capitalize on this transition to multiple devices, content creators should tailor content to the device and time.

Trends Mobile is by far the most common method of access to news websites during the weekend and early in the morning. Desktop news access is a work activity, with viewed content reflecting work-related themes as compared to lifestyle and entertainment-related content at the weekends and during evenings.

Sedghi, A. (2014)
How popular are the Internet and apps for news consumption?
Guardian

Available at: www.theguardian.com/news/datablog/2014/jul/02/how-popular-are-the-Internet-and-apps-for-news-consumption (Accessed 06/06/15).

Source Online legacy newspaper.

65 Bimber, B. (2003). *Information and American democracy: Technology in the evolution of political power.* New York, NY: Cambridge University Press.

66 Xenos, M. and Moy, P. 'Direct and differential effects of the Internet on political and civic engagement.' *Journal of Communication* 57, No. 4(2007): 704–718.

67 Sasseen, J., Olmstead, K., and Mitchell, A. (2013). 'Digital: As mobile grows rapidly, the pressures on news intensify the state of the news media 2013.' Pew Research Center. (Accessed 07/06/15).

Appendix 2
Literature review on mobile Internet continued

Focus Developed—U.K., news applications usage.

Data Secondary—survey research from Ofcom.[68]

Theory N/A

Argument While online news consumption is increasing, as elsewhere, this is being driven by the young.

Trends Accessing news on the web and mobile apps is now as popular as reading a newspaper. 41% of people say they now access news on websites and apps, up significantly from 32% in 2013.

Among 16–34s this has increased from 44% in 2013 to 60% in 2014.

Across all platforms, U.K. adults use an average of 3.8 sources for news.

McKinsey & Company (2103)
iConsumers: Life online

Available at: www.mckinsey.com/client_service/high_tech/iconsumer (Accessed 08/06/15).

Source Private sector report.

Focus Worldwide—With a concentration on the U.S. and Europe, and Africa, Brazil, and China, and how consumers are spending and what they are doing across different platforms.

Data Primary survey data with over 200,000 consumers in the past few years. However, the method is not fully explained.

Theory N/A

Argument To adapt to the rise of digital content and services, and increasing digital literacy, companies must understand the nuanced differences in consumption patterns across age cohorts and locations.

Trends Smartphones may be the first fully personal devices: with 55% of users in Europe describing the devices as "their own."

Around 25% of iphone and ipad users have purchased games in the last six months, compared to only 8% in the overall population.

27% of time U.S. citizens spend online is on social networking, whilst advertisers only devote 6% of spend to this area.

55% of European 25–34 year olds see the Internet as the most useful news source. However, there is a paradox in that younger Internet users do not trust news websites.

Differences between U.S. consumers aged 13 to 34 (youths) and consumers aged 35 to 64—and the implications these differences raise could be strategically decisive for telecoms, media and entertainment, and high-tech companies. Indeed $500 billion is the estimated size of the aggregate high tech, media, and telecoms market that will be affected by the youth cohort.

American youths are 30 to 50% more likely to go online to communicate via social networks and VoIP/video chat or access entertainment such as online and over-the-top video than 34–64 year olds. The report identifies a post youth stage in consumers mid to late thirties when career and family demands mean their consumption, and early adoption, of online entertainment content and services drops.

China has the most active social media population, with 91% of respondents saying they visited a social networking site in the last six months. Furthermore, of all consumers, the Chinese are most likely to buy a product or use a service seen on a social networking site or recommended by other users on a social networking site.

With around 46 minutes per day, Chinese users spend more time on social media site than Americans and Japanese.

68 See: 'Digital News as Popular as Newspapers for first time.' Ofcom, June, 2014. (Accessed 97/06/14).

Appendix 2
Literature review on mobile Internet continued

Goggin, G., Martin, F. and Dwyer, T.
Locative News
Journalism Studies 16, No. 1 (2015): 41–59

Source Academic journal article.

Focus Developed—Hong Kong and the U.K. The piece explores the implications of mobile media devices abilities to determine, sense, incorporate, and conjure with the relative locations of reporting and audiences.

Data Secondary—case studies of locational news services.

Theory Not explicated laid out. However, it explores the idea of "locative media" or 'hyper local news'—"the possibility for news to be shaped, called up by, and curated in response to locational information about a news user," which has been hailed as the most important development in mobile journalism in recent years.[69]

Argument In the transition to digital media and locative news, traditional print media's shrinking profits mean they have struggled to adapt to and embrace the potential of new technologies. There has also been a failure to grasp differences in how content is produced through different platforms such as apps and the Internet. In summary, the authors argue that political and cultural economies may be retarding the development of locative news.

Trends Google has been at the forefront of locational news services, with "News Near You" and "Google Now."

The *New York Times*, *The Financial Times*, *Wall Street Journal*, and Canada's *National Post* network used the location-based networking platform Foursquare to distribute news.

A report from the U.K. found that "users" rationale for hyperlocal media consumption appeared to be more about getting functional information, such as local weather, entertainment, and venues, or breaking news.[70]

Hong Kong's Next Media's strategy for "locative news" is "driven by international production trends, and less by news than advertising and entertainment." Central to this is partnerships with other companies to ensure it has opportunities for advertising alongside its locational video offerings. Furthermore, it uses location services to allow its users to play an online virtual game that turns their movements it actions in a virtual world. In this sense, the authors argue providing "locative news" is a secondary concern for Next Media.

Experiments by NESTA in the U.K. with locative news found that the important ingredient was to makes news "hyper local." Thus platforms, including a blog and an app with landing pages for local business, were provided to boroughs in two major cities. They had some success whereas other locative news services had failed, that the authors attribute to user generated content and localism.

Mitchell, A., Rosenstiel, T. and Christian, L. (2012)
Mobile Devices and News Consumption: Some Good Signs for Journalism
Pew Research Center

Available at: www.stateofthemedia.org/2012/mobile-devices-and-news-consumption-some-good-signs-for-journalism/ (Accessed 09/06/15).

Source Online news bulletin.

Focus Developed, U.S.A—The differences between mobile news consumption and desktops, and whether consumers favor particular devices.

Data Primary—Pew telephone survey of 3,016 U.S. adults.

Theory N/A

Argument The move toward mobile holds some promising options for news producers, including increasing the amount of overall news being consumed. However, while still strong, trust in brands is diminishing and slowing being replaced with peer-to-peer sharing/recommendations.

69 Gordon, R. (2008). 'LoJo Lessons: Carving Paths towards the Locative Future.' Readership Institute.

70 NESTA. (2013). 'U.K. Demand for Hyperlocal Media: Research Report.' April.

Appendix 2
Literature review on mobile Internet continued

Trends Digital devices appear to be an additive experience with 24% of consumers gaining news on two or more devices. Although laptops remain the primary platform for 54% of Americans. Around half of all desktop owners also own a smartphone.

Half of all smartphone users get news through their device.

Trust in news brands is even more important for mobile consumption than it was on laptops, with people accessing content providers directly through websites or apps. Indeed just 9% of respondents follow social networking recommendations to news providers.

However, the data suggests that peer-to-peer sharing or recommending of news does appear to be an emerging trend and may become a part—if not soon a primary part—of news consumption. For example, it is notable that two-thirds (67%) of those who consume news on both their smartphone and tablet follow news recommendations on Facebook. The report argues this group may be indicative of future trends.

People spend far more time with news apps on the smartphone and tablet, visit more pages at a sitting, and return more frequently than they do on conventional computers.

While people use mobile devices to go straight to an app or news website, this may be no different behavior than on computers when most searches are a variation of a news website's name.

Hasen, J. (2012)
Mobile Driving News Consumption, Participation & Reporting
Mobile Groove Media

Available at: www.mobilegroove.com/mobile-driving-news-consumption-participation-reporting/ (Accessed 08/06/15).

Source Online News bulletin.

Focus U.S.—news consumption patterns on mobile across different "geographies."

Data Secondary—Pew survey data.[71]

Theory N/A

Argument There are significant differences between how people in rural and urban/suburban locations consume and participate in creating the news.

Trends Residents of large cities are more likely than those in small cities and urban areas to access "local" news content.

On average, residents of large cities and suburbs use just under four news sources per week (3.63 and 3.72, respectively) compared to those in small cities or towns and rural areas who use closer to three sources per week (3.31 and 3.28, respectively).

The most active "local news participators" also tend to reside in suburban and urban communities (53% vs. 45% large city, 36% small city, 32% rural), meaning they e-mail local stories to others, post news or information about the local community on social networking sites or Twitter, comment on local stories they read online, contribute to online discussions on message boards about the local community, and the like.

Wei, R.
Mobile media: Coming of age with a big splash
Mobile Media & Communication 1, No. 1 (2013):50–56

Source Academic journal article.

Focus The meaning of mobiles for news producers and scholars wishing to study it.

Data Secondary.

Theory None explicitly, although explores how a network society confronts, consumes, and appropriates news.

Argument Mobile media-supported communication, such as mobile news and mobile tweets, has accelerated what communication scholars have described as "the end of mass communication" or, in other words, the spread of mobiles increasingly means the "one-to-many model" of news reaching a large, mostly unconnected and geographically dispersed audience no longer applies. Another way of

71 Pew Research Center (2012). 'How people get local news and information in different communities.' (Accessed 08/06/15)

Appendix 2
Literature review on mobile Internet continued

putting this is that news now confronts a "network society" made up of connected individuals that enjoy instance membership in a community of mobile users.[72]

The major challenge facing mobile communication scholars is to strive for a holistic view that encompasses a sociological concern with context. Thus, future research should set itself in contrast to that on mass communication which tended to focus on "exposure" to news alone.[73]

Trends "Smartphone users are no longer satisfied with simply getting news; they often use the phone to follow a news organization or a specific journalist on social networking sites, follow a news blog or a news blogger, or to follow Twitter updates from a news organization or a specific journalist."

The news cycle is now very much 24 hour.

Central to the way a network society appropriates news is the ability to use social networks to share content.

Westlund, O.
Mobile News
Digital Journalism 1, No. 1 (2013): 6–26

Source Academic journal article.

Focus Developed—concentrates on the production of mobile news and synthesises literature found in the nexus of journalism and mobile media.

Data Secondary.

Theory N/A

Argument To capture and understand new trends arising from mobile news "the future research agenda should involve mixed approaches and methods, preferably aiming for cross-cultural comparisons rather than national studies, and time-series rather than cross-sectional studies. Moreover, not only the production but also the consumption of mobile news marks a critically important area for future research."

Trends Early studies witnessed a reluctance towards accessing news using mobile devices, which seemed to find a niche only in the interstices of everyday life, mainly accessed whilst "on the go" when other news media were not available.[74]

A global 2010 newspaper industry survey reported that 51% of media managers found mobile platforms an important priority for the future.

There has been a movement amongst news publishers towards adding more and more customized mobile news apps to their cross-media portfolios, with some (*Guardian*) focusing on breaking news and others (*Chicago Tribune*) concentrating on opinion pieces on the assumption that mobile users are the most engaged. In this sense, legacy news is still feeling out how best to use mobiles' potential.

"A prevalent tension exists between the producers and users of media that seems to be especially pronounced in the salient case of journalism. Seemingly reluctant to relinquish their historical authority and control, the long-established ideologies and practices of legacy news media continue to guide their approaches to participation, in general, and mobile-enabled citizen journalism, in particular." In this sense, legacy news producers are struggling to adapt to the two-way communication mobile platforms provide between themselves and consumers, let alone citizen journalism. Indeed they are trying to position themselves as the "gatekeepers" and "editors" of citizen-created content.

The Guardian hired its first dedicated mobile editor in March 2011, with the aim of publishing news manually adapted for the mobile. However, there are two emerging approaches to customization and repurposing content for mobile—"human led" (tailored content for different platforms) and "technology led" (automation, with few significant changes to content across platforms). The author argues that the trend towards the latter may reflect the economic pressures multiple platforms put on legacy news producers. These pressure "place journalistic institutions along the same lines of development as most other contemporary commercial enterprises."

72 Castells, M. (2006). Mobile communication and society: *A global perspective*. Cambridge, MA: MIT Press.

73 Lang, A. 'The shifting paradigm of mass communication research?' *Communication Theory* 23, No. 1 (2013): 10–24.

74 Westlund, O. (2007). 'The Adoption of Mobile Media by Young Adults in Sweden'. In; Goggin, G. and Hjorth, L. *Mobile Media 2007*. Sydney: The University of Sydney.

Appendix 2
Literature review on mobile Internet continued

Martin, J.
Mobile news use and participation in elections: A bridge for the democratic divide?"
Mobile Media & Communication (2015): 1–20

Source Academic journal article.

Focus Developed, U.S.A—individual-level variations in mobile election news use based on demographics, socioeconomic indicators, and mobile media activity breadth, and how mobile news use is associated with political participation.

Data Primary—2,250 participants from a random survey of adult Americans.

Theory Explores the "democratic divide": evidence that systematic differences in online political participation based on socioeconomic measures and other demographic indicators of societal privilege.[75] In particular, better educated, more affluent, males of majority racial status tend to be more likely to participate in online civic and political life as compared to less privileged individuals.

Argument Whereas early research found mobile phones may reinforce regressive sociodemographic patterns of use similar to other ICTs in which traditionally privileged social strata receive the greatest benefits, this author argues mobile news is contributing new forms of political engagement and positively affecting political participation offline.[76] He describes mobile news as a "phenomena of emerging importance in the democratic process."

Furthermore, for America's racial minorities, "mobile media may provide a bridge across the digital-driven democratic divide and a more effective means of engaging with digital election information than other ICTs."

Trends Mobile phone penetration has surpassed 90% in the United States, with smartphone penetration at 65%, and 63% of American adults have reported using mobile Internet at least occasionally.[77]

Overall, mobile election news use was a significant positive predictor of the odds of having voted and whether individuals used their mobile devices to make contributions during the campaign.

Furthermore, mobile "election news users tended to be younger, better educated, wealthier women, and stronger party identifiers than non-users. In fact, based on frequencies, the profile of the average mobile election news user is a white 47-year-old female Democrat with moderate political ideology, some college education, and a salary of about $40,000 per year." As with other studies, younger, better educated, wealthier, and more politically involved males were also more likely to use mobile election. This somewhat confirms the democratic divide theory.

However, minorities in three of four racial categories produced higher means for mobile election news usage than whites. Indeed "black and Native American respondents comprised a larger percentage of mobile election news users compared to the group of non-users, and the percentage of white mobile news-users was lower than non-users for the overall sample, indicating perhaps shifting patterns in the racial composition of mobile news users when compared to other ICTs."

75 Schlozman, K.L., Verba, S., and Brady, H.E. 'Weapon of the strong? Participatory inequality and the Internet'. Perspectives on Politics 8, No. 2 (2010): 487–509.

76 For early research see: Kwak, N., Campbell, S.W., Choi, J., and Bae, S.Y. 'Mobile communication and public affairs engagement in Korea: An examination of non-linear relationships between mobile phone use and engagement across age groups.' *Asian Journal of Communication* 21, No. 5 (2011): 485–503.

77 Duggan, M., and Smith, A. (2013). *Cell Internet use 2013.* Pew Research Internet Project.

Appendix 2
Literature review on mobile Internet continued

American Press Institute (2014)
Mobile's impact on news consumption by race and ethnicity

Available at: www.americanpressinstitute.org/publications/reports/survey-research/mobile-technologys-impact-on-racial-and-ethnic-groups/ (Accessed 08/06/15).

Source Online news bulletin.

Focus Developed, U.S.A.—how else is mobile technology influencing news consumption across racial and ethnic groups.

Data Secondary—survey data.

Theory N/A

Argument N/A

Trends Mobile owning African Americans are even more likely than whites to have signed up for news alerts (58% compared to 46% of Hispanics and 42% of whites).

Among smartphone owners, 78% say they have used their device to get news in the last week, including 85% of African Americans, 78% of Hispanics, and 74% of non-Hispanic whites.

Four in 10 Americans across racial and ethnic groups finding news through social media.

Twenty-three percent of Hispanics who get news from social media say they very much or completely trust that news. Twenty-one percent of African Americans and 12% of whites trust social media for news very much or completely.

Fifty-four percent of smartphone users say they have discovered news by sharing it with friends through e-mail or text messaging or other ways online.

Gunelius, S.
More than Half of Digital Content Now Consumed on Mobile Devices
ACI

Available at: http://aci.info/2014/05/14/more-than-half-of-digital-content-now-consumed-on-mobile-devices/ (Accessed 08/06/15).

Source Online Scholarly Blog.

Focus Developed, U.S.A.—the types of online content consumed through mobile compared with desktops.

Data Secondary sources (Millennial Media and comScore—but no detail on which reports).[78]

Theory N/A

Argument The number of content categories consumed on desktop computers more than mobile devices will decrease. News is likely to make the transition in the near future.

Trends 56% of online content is now consumed via smartphones (44%) and tablets (12%) while just 44% is consumed on desktop computers. Content consumption comparisons:

- Streaming Radio: Mobile = 95%
  (79% smartphones and 16% tablets) and Desktop = 5%
- Games: Mobile = 85%
  (79% smartphones and 6% tablets) and Desktop = 15%
- Social Media: Mobile = 72%
  (61% smartphones and 11% tablets) and Desktop = 28%
- Weather: Mobile = 70%
  (61% smartphones and 9% tablets) and Desktop = 31%
- Retail: Mobile = 53%
  (39% smartphones and 14% tablets) and Desktop = 47%
  (Equally across devices)
- Health: Mobile = 50%
  (45% smartphones and 5% tablets) and Desktop = 50%
  (More on desktops)
- News: Mobile = 45%
  (39% smartphones and 6% tablets) and Desktop = 55%
- Sports: Mobile = 44%
  (38% smartphones and 6% tablets) and Desktop = 56%

78 Millennial Media (2014). 'Cross-Screen Consumer Behavior: Decoded.' (Accessed 08/06/15).

Appendix 2
Literature review on mobile Internet continued

- Food: Mobile = 42%
  (27% smartphones and 15% tablets) and Desktop = 58%
- Business/Finance: Mobile = 38%
  (36% smartphones and 2% tablets) and Desktop = 62%
- TV: Mobile = 33%
  (22% smartphones and 11% tablets) and Desktop = 67%
- Travel: Mobile = 32%
  (21% smartphones and 11% tablets) and Desktop = 68%
- Auto: Mobile = 24%
  (19% smartphones and 5% tablets) and Desktop = 76%
- B2B: Mobile = 20%
  (12% smartphones and 8% tablets) and Desktop = 80%

Edmonds, R. (2014)
New research finds 92% of time spent on news consumption is still on legacy platforms
Poynter

Available at: www.poynter.org/news/mediawire/212550/new-research-finds-92-%-of-news-consumption-is-still-on-legacy-platforms/ (Accessed 08/06/15).

Source Online news Bulletin.

Focus Developed, U.S.A—how news consumers spend their time.

Data Secondary—McKinsey and Company report (link broken).

Theory N/A

Argument Consumers of legacy news tend to "lean back" and spend long periods with the publications, the TV or radio. In contrast, online news consumers perform periodic, quick checks.

While "the notion that "mobile is taking over the world" is mostly hype for now, at least as far as news is concerned," producers cannot slack off as mobile-centric news consumers represent a small but growing group.

However, the author cautions of reading too much onto the findings, suggesting "shorter digital sessions may be a more efficient way of consuming news and also lead to participation via comments and social media—a better experience for many now than passive reading alone."

Trends Measured as by time spent, rather than raw audience numbers, digital platforms are getting only 8% of consumers' time in the U.S.A.

Thirty-five percent of news consumption remains in newspapers and magazines, 16% in radio and other audio, and 41% television. Smartphones and tablets each account for 2% of time spent and desktop/laptop 4%.

Ausick P. (2014).
News Consumption Going Mobile: Reuters
24/7 Wall St.

Available at: http://247wallst.com/media/2014/06/22/news-consumption-going-mobile-reuters/ (08/06/15).

Source Online News bulletin.

Focus Worldwide, mostly the developed world: France, Germany, Denmark, Finland, Spain, Italy, Japan, Brazil (the only country with Internet penetration below 50%), and the U.S. In the U.K. there was a slightly longer questionnaire.

Data Secondary—online survey by YouGov for the Reuters Institute for the Study of Journalism at Oxford University.[79]

Theory N/A

Argument N/A

Trends Thirty-five percent, use Facebook to get their news. Google's YouTube is second to Facebook as a news source with 15% of users getting their news from YouTube. Some 9% get news from Twitter, 7% from Google+, 6% from WhatsApp, 3% for LinkedIn.

In the U.K. 47% use news apps while in the U.S. just 15% do.

In the U.S., 72% of news consumers read lists or stories. Among the 10 countries included in the survey, the U.S. had the highest percentage of video/audio consumers with 34%.

79 See: Newman N. and Levy, D.A.L. Eds. (2014). 'Reuters Institute Digital News Report 2014: Tracking the Future of News.' (Accessed 25/05/15).

Appendix 2
Literature review on mobile Internet continued

Westlund, O.
News consumption in an age of mobile media: Patterns, people, place, and participation
Mobile Media & Communication (2015): 1–9

Source Academic journal article.

Focus Introduction to a journal special section "documenting, describing, and explaining emerging patterns of mobile news consumption among different people in various places." These are broken into four categories: patterns, people, place, and participation.

Data Secondary—literature review and description of five articles in a journal special section (four of which are in this review).[80]

Theory No elaborated theory, but the author touches upon several of the major theories animating contemporary research into mobile news.

Argument In short, while research on mobile news is developing in a number of distinctive areas, more of a geographical spread is needed and studies must take care not to adopt rigid theories as the evidence for any one is currently weak.

Trends To date, studies of the rise of mobile news have revealed both displacing and complementary effects, at the same time the jury is also out on whether mobile news has increased consumption of news in general or not.

One important variable for patterns tends to be age, with younger consumers consuming more sources of mobile news, for longer than their older peers. Educated, employed males have also been shown to be more likely to use mobile news than others.

Studies have also shown that mobile news consumption varies much in relation to location, time, and other tasks in everyday life (e.g., commuting, at work, or home).

Emerging studies are also exploring how mobiles allow people to participate in the creation of news, especially among the young through social networking sites. Whilst others examine the link between mobile news consumption and political participation.

Lee, H. and Yang J.
Political Knowledge Gaps Among News Consumers with Different News Media Repertoires Across Multiple Platforms
International Journal of Communication 8 (2014): 597–617

Source Academic.

Focus Developing, South Korea—News consumption patterns and political knowledge among citizens that consume news through different sets of mediums or platforms (termed "repertoires").

Data Primary—survey with 2,098 respondents above 15 years old drawn from a larger, statistically representative online survey.

Theory Explores the "knowledge gap hypothesis" that shows information distributed through the media primarily reaches the already privileged (in terms of education and socioeconomic status), and emerging research into how unequal distributions of political knowledge run against democratic ideals of an informed, and thereby empowered, citizenry.[81]

Argument That levels of political knowledge remain static despite a recent proliferation of news sources suggests a polarization of information acquisition among people from different socioeconomic backgrounds. This polarization does not seem to be challenged by emerging mediums for consuming news such as through mobiles, the Internet or social networking services. Instead, consumption of traditional news sources and education levels are most highly related to political knowledge.

Trends The results identified three repertoire groups of news consumers: "news avoiders," "emerging news seekers" (10%—using emerging news platforms such as the Internet, mobile, and social networking sites), and "traditional news seekers' (17.7% that use television, radio, and print for their news).

80 See: *Mobile Media & Communication* (2015).

81 Tichenor, P.J., Donohue, G.A. and Olien, C.N. 'Mass media flow and differential growth in knowledge.' *Public Opinion Quarterly* 34 (1970): 159–170.

Appendix 2
Literature review on mobile Internet continued

Traditional news seekers score more highly on political knowledge than the other two groups. In line with other studies, this suggests that news consumers might benefit more from traditional mediums. However, this distinction disappeared after age and gender were entered as covariates because the group tended to be comprised of older males.

Interestingly emerging news seekers and news avoiders did not differ on their political knowledge scores, suggesting emerging mediums might not be good at imparting socially relevant news.

Villi, M. and Matikainen, J.
Mobile UDC: Online media content distribution among Finnish mobile Internet users
Mobile Media & Communication (2015): 1–9

Source Academic journal article.

Focus Developed, Finland—user-generated news content.

Data Primary—a Finnish survey of 1,081 respondents, distinguishing between users and non-users of mobile Internet.

Theory No theory as such, but a useful reviewing of the existing literature on user created content.

Argument The authors conclude that Finnish mobile Internet users are generally more engaged with user news content—in terms of both accessing and distributing online content—than the non-users of mobile Internet.

Trends Forty-two percent of tablet computer users use the device daily for reading newspapers and magazines, as compared to 25% of smartphone users.

The most frequently distributed content types are online news (58% of mobile Internet users in our study engage in this), photographs (52%), and newspaper content (47%).

Seventy-six percent of mobile Internet users indicated consuming online news shared with them by others and photographs (74%) remain the most popular types, with newspaper content trailing these two types of content (69%). Seventeen percent of mobile Internet users distribute television content, and 10% distribute radio content.

Mobile Internet users are more active in both accessing and distributing user-created content, and in the use of social networking services than non-mobile Internet users.

The decision to distribute a certain news item or another piece of online content is affected by such motivational factors as the entertaining character, personal importance, and topicality of the content. The entertainment factor has surfaced in other studies.[82]

Ziani, A., Elareshi, M. and Gunter, B.
The Use of Mobile Phone and the Internet in Obtaining Local News in GCC Regions: University Students' Perspectives
Donnish Journal of Media and Communication Studies 1, No, 1 (2015): 1–10

Source Academic journal article.

Focus Developed, Arabs in the Gulf Cooperation Council (GCC) region—students use news consumption patterns, with a focus on local news.

Data Primary—a sample of 1,221 media and communication students from across the GCC region.

Theory The authors state: "This study is not based on a theoretical approach, which of course it needs to, rather than calling for a new theoretical module to examine the matter." It fails, however, to hash out this model.

Argument Beyond some general comments on the prevalence of mobiles for consuming local news and social networking platforms, there is little in the way of an argument.

Trends The use of mobile phones for news or as a source of news and entertainment seems common, especially among young Arabs. Indeed, in most of these oil-rich regions, mobiles were used most of the time to access the Internet.

There is a tendency for users to engage with local news, especially in an interactive way in which they contribute their own content; this occurs more frequently among respondents who use dial-up to access the Internet rather than their mobile phones.

82 Berger, J. and Milkman, K.L. 'What makes online content viral?' *Journal of Marketing Research* 49 No. 2 (2012): 192–205.

Appendix 2
Literature review on mobile Internet continued

The use of mobile devices to gather news or information online about local communities, local sports scores or local sports updates and the like was very common among most of the users. Tweeting, e-mailing and using Facebook were the most popular online activities pursued in their free time. Since the recent Arab uprisings, Twitter and Facebook have become the preferred places for Arab users to place their postings, discussions, and updates.

Kormelink, T. and Meijer, I.
Tailor-Made News
Journalism Studies 15, No.5 (2014): 632–641

Source Academic journal article.

Focus Developed, Holland—under which circumstances users want to tailor-make news, and under which circumstances they do not.

Data Primary—and in-depth user interviews (24), a user survey (N = 270), production interviews with (chief) editors and policymakers (5), and an inventory of new "news products" on mobile and social media.

Theory No explicit theory, but the authors position the paper as different from mainstream journalism research in that they explore the motivations (if there are any) for users to create personalized news, and how they actually experience or value this process.

Argument Users have limited interest in personalizing or participating in news. What they desire in particular is control: to be able to consult all content (including politics, economics, and other important news) whenever and wherever they want it. In this sense, the study unpicks and nuances the declaration that news has become "portable, personalized, and participatory."[83]

Trends In 2010 28% of Internet users personalized their home page with news they were particularly interested in, and 37% of Internet users shared or commented about news or contributed to its creation.

However, 89% of the study's participants prefer to accept news sites and news apps the way they are. Furthermore, many users do not want to personalize their news in that they want the news organization to do this for them. That is, they want editors to select and present them with the most relevant and topical news.

As a news source, users rate (on a scale of 0 to 7) television (6.09)—as well as print newspapers (5.94)—as more enjoyable than laptops (5.89), iPhone (5.52), iPad (5.46), e-readers (5.07), and non-iOS smartphones (4.72).

Editors of 11 major news sites claim that reader surveys indicate little interest in "the more demanding and complex forms of personalization."[84]

Chanan, M.
Video, activism and the art of small media
Transnational Cinemas 2, No. 2 (2012): 217–226

Source Academic journal article.

Focus The empowerment opportunities provided by emerging platforms that allow for citizen journalism.

Data Secondary—cites many examples of small media in action, some of which is the author's own work. Uses a case study of the recent Chilean student protests against higher education costs.

Theory Social media as a tool of resistance against hegemonic discourses. The author also fleshes out what he means by "small media" which flourishes in the "margins and the interstices of the public sphere" and is "widely opposed to the big media which represent power and authority." To do this small media finds ways of escaping censorship.

83 Purcell, K., Rainie, L., Mitchell, A., Rosenstiel, T. and Olmstead, K. (2010). 'Understanding the Participatory News Consumer: How Internet and Cell Phone Users have Turned News into a Social Experience.' Pew Research Center, Pew Internet & American Life Project, and Project for Excellence in Journalism. (Accessed 08/06/15).

84 Thurman, N. 'Making 'The Daily Me": Technology, Economics and Habit in the Mainstream Assimilation of Personalized News.' *Journalism: Theory, Practice and Criticism* 12, No. 4 (2011): 395–415.

Appendix 2
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Argument The convergence of the personal computer, mobile communication, and small media has provided a huge potential for counter-hegemonic discourse. To illustrate this, the author argues that activists' harnessing of these platforms to create their own media represents "an authentic desire for real democracy in the face of either its absence" and an attempt to use products of consumerism to counter capitalist domination.

Central to the rise of small media with counter hegemonic power to "rewrite the narrative" of dominant media producers is video, especially as it is used in "citizen journalism." Video is used in a number of ways, from activists setting up streaming channels of their exploits, to counter culture voices creating and distributing teachings online, and citizens capturing events or perspectives on events otherwise overlooked by mainstream media.

In conclusion, "Web video is a motley medium capable of invigorating popular sentiment, of raising the political stakes and even affecting the course of events." Yet "To the slogan 'think global, act local' we need only add 'post it,' because the Internet is now the vital link between the two."

Trends Social networking platforms are important to the rise of small media and dissemination of counter-hegemonic videos.

Many videos made on mobile are "the result of chance and accident," and their power only realized later on, upon reflection.

Part 2: Digital Trends in Emerging Economies—Recognizing Fun, Context, and Social Norms

General—Internet in Developed Markets

Gaoa, S., Krogstieb, J. and Siauc, K.
Adoption of mobile information services: An empirical study
Mobile Information Systems 10 (2014): 147–171

Source Academic journal article.

Focus Developed, Norway—adoption of advanced mobile information software services.

Data Primary—usage, demographic, and questionnaire data gathered from 46 incentivized students using an information system (called eMSIS, it provides university news, lecture planner, maps, project planning, etc.) on a single university campus through their mobiles.

Theory They build on the Technology Acceptance Model (TAM),[85] which suggests that two beliefs (perceived ease of use and perceived usefulness) predict attitudes towards use, and instead propose a Mobile Services Acceptance Model (MSAM).[86] The MSAM adds "Trust, Context, and Personal Initiative, and Characteristics" to TAM.

Argument The authors suggest the success of "advanced" mobile services such as the eMSIS will depend on the ability of providers to identify how actual and potential customers are influenced and what they really expect (i.e., needs, and preferences).

Alongside "trust," the results showed that the most important determinant for intention to use is "personal initiative and characteristics." Furthermore, the entertainment factor of the service and the lack of accessible alternative platforms (laptops, computers) was found to be central to its adoption.

85 For a good introduction see: Davis, F.D. 'Perceived usefulness, perceived ease of use, and user acceptance of information technology.' *MIS Quarterly* 13, No. 3 (1989): 319-40.

86 The joins others that have sought to extend or modify TAM: Yong Liu Hongxiu Li. 'Mobile Internet Diffusion in China: an empirical study.' Industrial Management & Data Systems 110, No. 3 (210): 309—324. Venkatesh, V. and Davis, F.D. 'A theoretical extension of the technology acceptance model: four longitudinal field studies.' *Management Science* 46, No. 2 (2009): 186–204.

Appendix 2
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Further emphasizing the importance of "context," the authors argue that the weak impact of Perceived Usefulness on adoption is potentially explained by the easy accessibility of other devices on the campus to check university information.

They conclude, mobile "users need the right mobile service in the right context, at the right time."

Trends In general, foreign students from Asia and Africa at the Norwegian university were less comfortable with eMSIS than students from Norway at the Norwegian university.

The results suggest students are most likely to use such devices to increase interactions with course constructors outside of the classroom. This suggests socialization can be a key feature of such services.

Karaiskos, D. et al.
Affective and social determinants of mobile data services adoption
Behavior & Information Technology 31, No. 3 (2012): 209–219

Source Academic journal article.

Focus Developed, Greece—the inadequacy of user acceptance models for mobile data services and accounting for "fun and enjoyment."

Data Primary—online survey with 219 participants.

Theory Triandis theory of human behavior—a theory "considers affective beliefs and contextual issues, along with cognitive and social beliefs, to predict human behavior."[87] The authors review other papers to argue that these are increasingly recognised as important determinants of usage intentions.[88]

Argument The authors find evidence that intentions to use mobile data services is determined by perceived enjoyment, and their ability to help them gain social rewards and approval. However, actual usage is only associated with perceived usefulness and value. Thus European "users, seem to be attracted by enjoyable characteristics of the services and the urge to gain social rewards and approval; however, it is usefulness that will lead them to actual usage."

The authors argue that these findings suggest users' emotional responses to mobile data services are as important to early adoption and that service creators should consider incorporating ways to introduce "fun and enjoyment" from the start.

Trends N/A

Kima, S.C., Yoonb, D. and Hanc, E.K.
Antecedents of mobile app usage among smartphone users
Journal of Marketing Communications (2014)

Source Academic journal article.

Focus Developed, U.S.A.—factors affecting the acceptance of mobile apps.

Data Primary—online survey among 247 university students.

Theory Behavioral and gratification theory, and an extension of TAM to account for "non-traditional" and "individual" factors; in particular app user reviews (social psychology) and cost-effectiveness (marketing perspective).[89] The study also attempts to operationalize perceived usefulness as "perceived informative usefulness (PIU), perceived entertaining usefulness (PEU), and perceived social usefulness (PSU)."

Argument The authors argue that the findings strongly suggest an appropriate mix of entertainment and information is the most important determinant of app usage, especially given the prevalence of free apps that limit price competition. Positive user reviews—representing social influences and a method of sorting through lots of information quickly to decide upon adoption—of using particular apps are also significant.

87 Triandis, H.C. 'Values, attitudes, and interpersonal behavior.' *Nebraska Symposium on Motivation* 27 (1980): 195–259.

88 Venkatesh, V. et al. 'User acceptance of information technology: toward a unified view.' *MIS Quarterly* 27, No. 3 (2003): 425–478.

89 See note 1.

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Following from these results, they argue that future research would do well to supplement TAM, which was developed to look at adoption by organizations, with factors that account for individual preferences such as their own uses and gratification approach, which assumes use is based on individuals' needs in everyday life.[90] However, they do not explore "entertainment" as a variable in any depth.

Trends More than 450,000 mobile apps have been released across all major devices, including Android, iPhone, Blackberry, and Windows phone.

As of 2013, 62% of mobile phone users in the U.S.A. owned a smartphone.

Smartphone owners in the U.S.A. spend most time using apps while spending 2 hours and 42 minutes a day on mobile services. Specifically, users spend 2 hours and 19 minutes using mobile apps while spending only 22 minutes a day using the mobile web (study from 2014).

Nysveen, H., Pedersen, P. and Skard, S. 2015
A review of mobile services research: Research gaps and suggestions for future research on mobile apps
SNF Working Paper No: 01/15

Source Grey literature.

Focus A review of literature on mobile apps.

Data A systematic literature search of the online database Business Source Complete from EBSCO.

Theory N/A—the reviewed articles are categorized as conceptual, qualitative and quantitative (with a sub-category of econometric articles).

Argument A lot of the current literature focuses on adoption studies, particularly antecedents of successful adoption of various mobile services. Among the quantitative studies, surveys seem to be the dominant methodology. In what follows I pick out some of the interesting literature:

Conceptual—the majority of the articles look at the success criteria for mobile services. Seven focus on the adoption of mobile services, variously (but not only) examining the significance of attitude,[91] consumers' characteristics,[92] and "conversational interaction."[93]

Qualitative—Many of the qualitative success criteria articles have an explicit eye on adoption. One suggests five factors for the adoption of handheld devices; individual characteristics, communication/task characteristics, modality of mobility, technology characteristics, and context.[94] An article on adoption of mobile payment points to governmental, technological, and socioeconomic factors.[95] While another looks at factors affecting app adoption among generation Y such as "liking" and in-app advertising.[96] A particularly interesting piece pours doubt on the high expectations surrounding mobile Internet and claims it is merely an extension of PC-based Internet, unlikely to lead to new forms of usage.[97]

Quantitative—A gratification study finds that convenient entertainment, social stimulation, experiential learning, escapism, and purchasing information and advice are the main motives for using mobile phones.[98] Further emphasizing the importance of the "social" side of apps,

90 For foundational literature see: Katz, E., and Blumler J.G. 1974. *The Uses of Mass Communications: Current Perspectives on Gratifications Research*. Beverly Hills, CA: Sage.

91 Wang, A. 'A Preliminary Model for Mobile Payment Acceptance.' *International Journal of Mobile Marketing*, 7, No. 2 (2012): 37–51.

92 Vatanparast, R. and Asil, M. 'Factors Affecting the Use of Mobile Advertising.' *International Journal of Mobile Marketing*, 2, No. 2 (2007): 21–34.

93 Spurgeon, C. 'Losers and Lovers: Mobile Phone Services Advertising and the New Media Consumer/Producer.' *Journal of Interactive Advertising* 5, No. 2 (2005).

94 Sarker, S. and Wells, J.P. 'Understanding: Mobile Handheld Device Use and Adoption.' *Communications of the ACM* 46, No. 12 (2003): 35–40.

95 Pope, M., Pantages, R., Enachescu, N., Dinshaw, R., Joshlin, C., Stone, R. and Seal, K. 'Mobile Payments: The Reality on the Ground in Selected Asian Countries and the United States.' *International Journal of Mobile Marketing* 6, No. 2 (2011): 88–104.

96 Bhave, K., Jain, V. and Roy, S. 'Understanding the Orientation of Gen Y toward Mobile Applications and In-App Advertising in India.' *International Journal of Mobile Marketing* 8, No. 1 (2013): 62–74.

97 Nielsen, P. and Fjuk, A. 'The Reality beyond the Hype: Mobile Internet is Primarily an Extension of PC-Based Internet.' *Information Society* 16, No. 5 (2010): 375–382.

98 Grant, I. and O'Donohoe, S. 'Why Young Consumers are Not Open to Mobile Marketing Communication. *International Journal of Advertising* 26, No. 2 (2010): 223–246.

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especially for youth, a study found that consumers are more positively disposed to those that their most influential contacts uses these apps.[99]

In terms of gaps, only a few studies look into app-based mobile services themselves; only a few studies look into the effects of using mobile services; only a few studies seem to focus on mobile services developed for specific contexts; and very few use experiments as a methodological design. The authors suggest these gaps are surprising given the popularity and success of apps.

Trends By 2017 there are predicted to be 5.13 billion users, corresponding to 69.4% of the world's population.

There is also a predicted development of 1.55 billion mobile phone Internet users in 2012 to 2.97 billion mobile phone Internet users in 2017.

The number of smartphone users worldwide will increase from 1.13 billion in 2012 to 2.50 billion in 2017.

Shi, C.K., Hao, X.M. and Sharma, R.S.
A cross-market study of mobile data services and devices
Management of Innovation and Technology (ICMIT), 2010 IEEE International Conference on 2–5 June 2010

Sharma, R., Li, E. and Govindraj, R. "Adoption of mobile Internet devices and services: a multinational study." Int. J. Information Systems and Management 1, No. 1/2 (2014).

Source Academic conference proceedings.

Focus Developed—data services adoption patterns in Finland, Korea, the United States, Taiwan, and Singapore.

Data Primary—Questionnaire data collected as part of World Mobile Data Services Survey in 2008. Of 4,599 participants, only those that have used mobile data services were analyzed.

Theory Explores "means-end theory" which assumes adopters like to predict what kinds of benefits and values (functional and psychological benefits) they might obtain according to their personal expectations for the product attributes. Also looks at the cost-benefit paradigm from behavioral decision theory or, put simply, the trade-off between perceived cost (quality of effort) and perceived benefits (quality of outcome).

Argument In mature mobile markets such as Finland, where consumers have a long history of mobile use and knowledge of mobile data's actual attributes as opposed to its perceived benefits, adoption will likely be based on personal needs. Elsewhere the authors suggest adoption patterns are likely explained by "variety in culture, technology and social norm." For instance, Americans are motivated to purchase data to increase prospects of socialization, whilst the Taiwanese seek utilitarian goals, such as sharing information. However, the authors do not delve deeply into these differences and instead concentrate on offering weak strategies for data providers to increase their customer bases.

Trends By 2008, Finland's mobile communication (GSM) and its mobile phone penetration rate almost reached 130% in 2008.

The results suggest that among the five selected countries, the Finns tend to be most knowledgeable and confident about mobile products and services; whereas Koreans and Americans are more practical and cost conscious, and care more about what benefits for entertainment and socialization they might obtain if they use mobile data services. The Taiwanese consume mobile services mainly for utilitarian benefits, while the Singaporean consumption behavior is significantly restricted by income.

99 Taylor, D.G., Voelker, T.A., and Pentina, I. 'Mobile Application Adoption by Young Adults: A Social Network Perspective.' *International Journal of Mobile Marketing* 6, no. 2 (201): 60–70.

Appendix 2
Literature review on mobile Internet continued

Chong, X. et al.
An empirical analysis of mobile Internet acceptance from a value-based view
Int. J. Mobile Communications 10, No. 5 (2012)

Source Academic journal article.

Focus Developing, China—the individual acceptance of mobile Internet from a holistic view of mobile service attributes.

Data —a survey of 519 mobile users.

Theory Extension of TAM to account for values as the commercialization of advanced mobile technology continues. Draws upon the Information Systems field which has long used a perceived value construct to explain users' adoption of emerging information technologies.[100] Perceived value is defined as "the overall assessment of a consumer regarding product utility based on the perceptions of what is received and what is given."

Argument In addition to the traditional usefulness of TAM, attributes such as entertainment,[101] ubiquity, and network externality have significant, direct effects on the perceived value of mobile Internet. The most valued of these factors is ubiquity, conceptualized as the ability to have Internet anywhere, at any time. This is closely followed by network externality or how the perceived value of mobile Internet is dependent on the number of contacts believed to have adopted the product. Entertainment is also found to be the main reason for perceived usefulness.

Three "value-added" characteristics of mobile Internet services, namely: informativeness, personalisation and compatibility, are also argued to indirectly affect perceived value.

The authors appear to conclude that consumers are increasingly making adoption decisions based on a "maximum value" consideration.

Trends The number of mobile Internet users in China was expected to reach 750 million by 2014.

Ghose, A. and Han, S.P.
An Empirical Analysis of User Content Generation and Usage Behavior on the Mobile Internet
Management Science 57, No. 9 (2011)

Source Academic journal article.

Focus Developed, South Korea—how the mobile-based content generation relates to content usage behavior over time.

Data Primary—a 2.34 million individual-level mobile data records across 180,000 users.

Theory Does not go into any detail but references other works that have examined social networks.

Argument Probably due to technical complexity and digital literacy levels, content generation requires disproportionately more effort and resources than content usage. Furthermore, there is likely to emerge a division between where and when people create content as opposed to consume it. To somewhat mitigate these strong affects, the authors suggest offering monetary incentives to content creators.

Perhaps most interesting, the paper highlights the importance of social networks as influencers for content creation and to a lesser extent usage. Indeed, the authors argue that providers would do well to design mechanisms to "update a user instantly on the frequency with which his network neighbors have downloaded or uploaded a certain type of content can affect the incentives of that user to do the same."

Trends There is a significant negative effect between content generation and usage, an increase in content usage in the previous period having a negative impact on content generation in the current period and vice versa.

100 For example see: Chen, Z. and Dubinsky, A. J. 'A conceptual model of perceived customer value in e-commerce: a preliminary investigation.' *Psychology & Marketing*, 20 (2003): 323–348.

101 For a similar conclusion see: Kim, H. W., Chan, H.C. and Gupta, S. 'Value-based adoption of mobile Internet: an empirical investigation.' *Decision Support Systems*, 43 (2007): 111–126.

Appendix 2
Literature review on mobile Internet continued

The extent of geographical mobility of users has a positive effect on their mobile Internet activities, with users more frequently engaging in content usage when they are traveling.

Social networks also have a strong positive effect on user behavior, including content generation for mobile Internet.

Whilst AT&T has experienced 5,000% growth in data traffic over the past three years, 40% of that traffic is consumed by just 3% of its smartphone users.

Coursaris, C. K. and Sung, J.
Antecedents and consequents of a mobile website's interactivity
New media & society 14, No. 7 (2012): 1128–1146

Source Academic journal article.

Focus Developed, U.S.A.—how to implement a mobile website that attracts and retains students.

Data Primary—288 student users of two mock college websites.

Theory The study builds on literature (in particular Yang's thesis) that explores interactivity as a contributor to the perceived benefits of using websites and mobile data services.[102] However, it posits interactivity as a contributor to or extension of TAM's concentration on perceived ease of use usefulness. In the study interactivity is "defined and measured as the aggregate experience of increased levels of two-way communication, active control, synchronicity, richness of content, and connectedness."

Argument The authors argue that "long gone are the days where static presentment of information can offer sufficient value to web visitors and result in continued use of the website." In its place, they suggest interactivity has become a critical antecedent to perceived usefulness and ease of use. Perceived enjoyment must also not be overlooked by content creators as it was more important to students than perceived ease of use or usefulness, and highly correlated with perceived interactivity. However, they suggest that this factor can be broken into "how the person felt about the experience, what it meant to them, whether it was important to them, and whether it sat comfortably with their other values and goals" and that creator would do well to be aware of these aspects of enjoyment.

Trends The interactivity of the mock websites significantly affected their perceived usefulness, ease of use, and enjoyment.

West, J. and Mace, M.
Browsing as the killer app: Explaining the rapid success of Apple's iPhone
Telecommunications Policy 34 (2010): 270–286

Source Academic journal article.

Focus iPhone's success and consumers, expectations.

Data Secondary, case study.

Theory Touches upon diffusion and adoption theory.

Argument It is argued that Apple's promise to deliver the "real Internet" attracted users to its phone. The iPhone's success stands as a testament to the company's refusal to try to recreate the Internet for mobile users or offer "walled gardens."[103] Rather they sought to offer a "good client to the already-mature ecosystems" found on the Internet, whilst also leveraging the attraction of their home-grown ecosystems such as iTunes.

102 For examples see: Johnson. G.J., Bruner, G.C. and Kumar, A. 'Interactivity and its facets revisited: Theory and empirical test. *Journal of Advertising* 35, No. 4 (2006): 35–52. Jiang, Z. and Benbasat, I. 'Investigating the influence of the functional mechanisms of online product presentations.' *Information Systems Research* 18, No.2 (2007): 1–16. Yang, S. 2008. *Role of perceived interactivity in intended loyalty for mobile cell-phone*. Unpublished doctoral thesis, Purdue University, West Lafayette, IN.

103 For a good introduction to this term see: Domingo, C. 'A walled garden approach to the mobile web is stifling innovation.' Wired, 11 December 2012. Available at: www.wired.co.uk/news/archive/2012-12/11/innovation-mobile-web (Accessed 07/07/15).

Appendix 2
Literature review on mobile Internet continued

Turning to the future of mobile Internet, the authors argue that "evidence suggests that similar patterns are likely in other countries." This is because the existing Internet frames users' expectations to such a degree that inferior versions fair badly. They also argue the diffusion of the iPhone benefited strong social factors, with a strong word of mouth affect.[104]

Trends Three weeks before the release of the first iPhone, Steve Jobs predicted, ""people want the real Internet on their phone'."[105]

During the period 1997–2007, nearly all of providers' emphasis was on new mobile-specific solutions for two reasons: limited mobile data speeds and control of the value network.

Emphasizing the early Western mobile Internet model, "Funk (2001, pp. 56–57) concluded that DoCoMo and other Japanese operators successfully sought to achieve reach (widespread adoption) with limited richness, while Western operators sought to replicate the richness (bandwidth-intensive multimedia) of the Internet for a small niche of price-insensitive customers.'[106]

Koenigstorfer, J. and Groeppel-Klein, A.
Consumer acceptance of the mobile Internet
Marketing Letters (2012) 23: 917–928

Source Academic journal article.

Focus Developed, Germany—beginning from the recognition that "forecasts for the diffusion of both the mobile Internet and mobile commerce worldwide were over-optimistic," the study explores how the personality of different age groups and genders drives behavioral choices of new technology, and how the time to fulfil tasks using the media translates to the usability perception of the media.

Data Primary—Two studies were undertaken: In the first, a quasi-experimental design was applied to a non-self-selected, broad population sample of 169 people. Participants were asked to complete a task that asked them to locate a restaurant using either the Yellow Pages, a city map, or a mobile digital assistant with Internet access. In the second, sixty consumers were recruited in front of a café according to quota sampling. Participants were asked to perform three tasks using either an Internet enabled laptop, a map, or the Yellow pages. Task 1 was similar to first study's task, while Tasks 2 and 3 (finding the telephone number and the location of a copy shop and a theatre, respectively) were pre-tested to be equally time consuming.

Theory In particular, the study considers consumer innovativeness,[107] the desire for social contact,[108] and technology optimism,[109] as moderated by demographics, to be relevant personality characteristics for adoption and usage. Building on other studies, the authors also examine the importance of time for perceptions of the ease of use of the medium by contrasting mobile Internet with the Internet on laptops and non-technological media.[110]

Argument Males who perceive themselves as highly innovative and for females who have a low desire for social contact are most likely to make first contact with a technological innovation. Whilst older consumers may need more time to use a new technology, age seems to be less able to predict consumers' choice behavior. The study also reveals that perceptions of the ease of use erode as more time is spent using the mobile Internet, whereas there is no such relation for established media. In these ways, the study upsets some established truths about Internet adoption.

Trends Contrary to what was expected, the effects of innovativeness and desire for social contact on choice behavior are unaffected by age. Furthermore 41–50-year-old consumers with high technology optimism chose the mobile Internet.

104 For diffusion see: Rogers, E.M. (1983). *Diffusion of Innovations*. 3rd ed. The Free Press: New York, NY. Lopez-Nicolas et al. 'An assessment of advanced mobile services acceptance: Contributions from TAM and diffusion theory models.' *Journal Information and Management* 45, No. 6 (2008): 359-364.

105 Block, R. 'Steve Jobs live from D2007.' Engadget, 30 May 2007. Available at: www.engadget.com/2007/05/30/steve-jobs-live-from-d-2007/ (Accessed 07/07/14).

106 Funk, J.L. 2001. *The mobile Internet: How Japan dialled up and the West disconnected*. Hong Kong: ISI Publications.

107 Conceptualized as 'a tendency to be a technology pioneer and thought leader.' See: Parasuraman, A. 'Technology readiness index (tri), a multiple-item scale to measure readiness to embrace new technologies.' *Journal of Service Research* 2 (2000): 307–320.

108 For other examinations of this factor see: Dabholkar, P. A. 'Consumer evaluations of new technology-based self-service options: an investigation of alternative models of service quality.' *International Journal of Research in Marketing*, 13 (1996): 29–51.

109 Parasuraman, A. 'Technology readiness index (tri), a multiple-item scale to measure readiness to embrace new technologies.' *Journal of Service Research* 2 (2000): 307–320.

110 Kleijnen, M., de Ruyter, K., and Wetzels, M.G.M. 'An assessment of value creation in mobile service delivery and the moderating role of time consciousness.' *Journal of Retailing* 83 (2007): 33–46.

Appendix 2
Literature review on mobile Internet continued

Mossberger, K., Tolbert, C. and Anderson, C.
Digital Citizenship: Broadband, Mobile Use and Activities Online
Prepared for presentation at the International Political Science Association conference, Montreal July 2014

Available at: http://goo.gl/mCZE39 (Accessed 07/07/15).

Source Academic conference paper.

Focus Developed, U.S.A.—different forms of access as determinants of digital citizenship.

Data Primary—survey data from Chicago over a five-year period examining changes in broadband and mobile use among African Americans and Latinos, especially those who live in segregated and disadvantaged neighborhoods.

Theory Digital citizenship is defined as "the ability to participate in society online."[111] However, it requires multiple needs—for access to high-speed connections at home, hardware and software, technical skills, basic literacy, and information literacy, including critical thinking skills needed to evaluate and utilize information online. In this sense, the paper examines the "second-level digital divide" within a developed country.[112]

Argument Alongside political information, the Internet provides new venues for interacting with government officials, and for gaining access to government services. The findings confirm this, with broadband access most strongly associated with political and economic activities online and mobile also having a statistically significant effect on digital citizenship. Whilst mobile is not having the oft-mentioned "leapfrogging" effect in Chicago, the authors are able to argue that multi-modal access might be most able to release the Internet's potential.

They conclude that "The impact of mobile access for digital citizenship is greatest for populations that are disadvantaged in home broadband access, yet have been the most frequent adopters of smartphones." In Chicago this includes African Americans and Latinos, with the latter showing increased levels of economic and civic online engagement, especially amongst Latinos living in higher-density Latino neighborhoods.

Beyond the medium, significant hurdles such as lack of skills and context still remain.

Trends 30% of the U.S. population lacked home broadband access in May 2013.

Since 2011, African Americans and Latinos have been at least as likely as whites to access the Internet on smartphones.

We Are Social
Digital, Social & Mobile Worldwide in 2015
We Are Social, 21 January 2015

Available at: http://wearesocial.net/blog/2014/01/social-digital-mobile-worldwide-2014/ (Accessed 08/07/15).

Source Private sector online news bulletin.

Focus Digital, Social, and Mobile stats for more than 240 countries around the world, and profiling 30 of the world's biggest economies in detail.

Data Secondary statistics on the region's digital economy. Unclear how the data was collected.

Theory N/A

Argument It is predicted that mobile will help to push Internet penetration beyond 50% of the world's population during mid to late 2016. Furthermore, by the end of 2015 social media penetration is likely to reach one-third of the world's population. However, there remains a significant global digital divide, especially between those using mobiles for Internet access and those for more basic services.

Trends Worldwide social media users exceeded 2 billion back in August. Worldwide penetration of mobile phones passed 50% in September. The number of global Internet users passed 3 billion in early November. The number of active mobile connections surpassed the total world population just last month.

The reported number of Internet users in Bermuda, Bahrain, and Iceland almost equals those countries' total reported populations, but fewer than 0.1% of the populations of North Korea and South Sudan have access to the Internet.

111 Mossberger, K., Tolbert, C. and McNeal, R.S. 2008. *Digital Citizenship: The Internet, Society, and Participation*. Cambridge, MA: The MIT Press.

112 Hargittai, E. 'Second-Level Digital Divide: Differences in People's Online Skills.' *First Monday* 7 (4) (2002): 1–20.

Appendix 2
Literature review on mobile Internet continued

Mobile's share of global web traffic leapt 39% since the same time last year, with one-third of all web pages now served to mobile phones. However, usage varies worldwide: for example, mobile phones account for 89% of all pages served in Papua New Guinea, but barely 0.1% of pages served in some of the smaller Caribbean islands.

The average social media user spends 2 hours and 25 minutes per day using social networks and microblogs, with Argentinian and Filipino users at more than 4 hours per day.

Facebook dominates the social media landscape, claiming 1.366 billion active users in January 2015. Crucially, 1.133 billion of the platform's global users—83% of the total—now access the service through mobile devices.

More than three-quarters of the world's mobile connections are still pre-paid and 58% of the world's mobile connections still come from more basic, "feature" phone handsets.

Yang, S. et al.
Does Context Matter? The Impact of Use Context on Mobile Internet Adoption
Intl. Journal of Human–Computer Interaction 28 (2012): 530–541

Source Academics journal article.

Focus Developing, China—the effects of use context on consumers' perceived value and adoption of mobile Internet. "Use context" refers to the various situational and environmental factors that may affect a person using mobile Internet service.

Data Primary—questionnaire data collected from 507 mobile Internet users in China.

Theory Extension of TAM which, whilst the go to model for interpreting users, value perceptions, has been criticized for failing to account for context.[113]

Argument The context in which mobile Internet is used fully mediates the effects of utilitarian values and partially mediates the relationship between hedonic values and intention to use mobile Internet. This suggests, they argue, "that the reason users consider embracing mobile Internet is that it is useful to utilize time effectively when people are traveling and have nothing else to do."

Trends As with other studies, it was found that the two "hedonic value" factors—perceived enjoyment and concentration—affect intention to use mobile Internet.[114]

The investigated two utilitarian value factors—perceived usefulness and mobility—had no relationship with intention to use mobile Internet.

Zhou, T.
Examining continuance usage of mobile Internet services from the perspective of resistance to change
Information Development 30, No. 1 (2014): 22–31

Source Academic journal article.

Focus Developing, China—the factors affecting continuance usage of mobile services post-adoption.

Data Primary—277 questionnaire respondents interviewed whilst visiting three service outlets of China Mobile and China Unicom (mobile carriers).

Theory Four factors—perceived usefulness, trust, flow experience ("Flow reflects a holistic sensation that people feel when they act with total involvement'), and switching costs—are proposed to affect resistance to change and continuance usage.[115] Resistance to change is conceptualized as "a preference for maintaining the current status or situation."

113 See: Kim, H., Kim, J. and Lee, Y. 'An empirical study of use contexts in the mobile Internet, focusing on the usability of information architecture. *Information Systems Frontiers* 7 (2005): 175–186. Legris, P., Ingham, J. and Collerette, P. 'Why do people use information technology? A critical review of the technology acceptance model. *Information & Management*, 40 (2003): 191–204.

114 For example see: Hong, S.J. and Tam, K.Y. 'Understanding the adoption of multipurpose information appliances: The case of mobile data services.' *Information Systems Research* 17 (2006): 162–179.

115 For more on 'flow' see: Hoffman, D.L. and Novak, T.P. 'Flow online: Lessons learned and future prospects.' *Journal of Interactive Marketing* 23, No. 1 (2009): 23–34.

Appendix 2
Literature review on mobile Internet continued

Argument Consistent with other studies, trust and switching costs were found to have strong effects on resistance to change, which in turn affects continuance usage. In addition, trust affects perceived usefulness and flow experience.[116]

The authors recommend carriers to build trust by offering personalized, perhaps location-based, services and good interface design. To increase switching costs, it is recommended that carriers concentrate on "convenient" "value-added" services. In this sense, carriers must be aware of both enablers and inhibitors to continued usage.

Users' resistance to switch may help carriers retain users and facilitate their continuance usage.

Trends It has been discovered that the cost of acquiring a new customer is five times that of retaining an existing customer.[117] Furthermore, the switching costs are relatively low for mobile users.

Al-Debei, M. and Al-Lozi, E.
Explaining and predicting the adoption intention of mobile data services: A value-based approach
Computers in Human Behavior 35 (2014): 326–338

Source Academic journal article.

Focus Developing, Jordan—explaining the varied diffusion and adoption rates of mobile data services.[118]

Data Primary—a survey questionnaire of 267 responses, mostly from students.

Theory Exploring TAM by conceptualizing perceived value as "a multidimensional construct" consisting of not only the traditional utilitarian and hedonic values, but also uniqueness, epistemic, and economic value dimensions. It is also postulated that those value dimensions will be influenced by technological, social, and informational influences.

Argument Utilitarian value is, according to previous studies, an important adoption factor. Additionally, economic value is also important and significant. Nevertheless, it seems that in our context, hedonic, uniqueness, and epistemic value dimensions are not as important for the use of mobile data services. This accords with other studies that show "that perceptions of value dimensions differ across different societies and cultures."[119]

The authors, however, offer the weak explanation that Jordanians "can be characterized as professionals and business-oriented." More likely an explanatory variable is the "current modest economic situation of Jordan" mentioned a few lines later. Interestingly, to explain the limited predictor power of hedonic value, the authors suggest that people may try to rationalize their choices in ways deemed socially acceptable.

Trends N/A

Jung, Y.
What a smartphone is to me: understanding user values in using smartphones
Info Systems J 24 (2014): 299–321.

Source Academic journal article.

Focus Developed, South Korea—aims to investigate the various types of goals that users seek through their smartphones as an illustration of user-empowering IT.

Data Primary—laddering interviews with 54 student smartphone users.

Theory The authors suggest that "The diffusion of user-empowering IT should change the focus of technology adoption research from the effect of users' perception of given artefacts to the diverse goals or values which users seek." Thus they adopt a value-driven approach that does not assume users' reasons for adopting smartphones. However, to explore the breadth and variety of values,

116 Kim, H-W. and Kankanhalli, A. 'Investigating user resistance to information systems implementation: A status quo bias perspective. *MIS Quarterly* 3, No. 3 (3 (2009): 567–582.

117 Reichheld, F.F. and Schefter, P. 'E-loyalty: your secret weapon on the Web.' *Harvard Business Review* 7–8 (2000): 105–113.

118 For earlier writing on this unexpected diffusion see: Yang, K. 'Exploring factors affecting the adoption of mobile commerce in Singapore.' *Telematics and Informatics*, 22 (2004): 257–277. Carlsson, C., Carlsson, J., Hyvonen, K., Puhakainen, J., and Walden, P. 2006. Adoption of Mobile Devices/Services—Searching for answers in the UTAUT. In Proceedings of the 39th Hawaii international conference on system sciences.

119 For example: Lee, Y., Kim, J., Lee, I. and Kim, H. 'A cross-cultural study on the value structure of mobile Internet usage: Comparison between Korea and Japan.' *Journal of Electronic Commerce Research* 3 (2002): 227–239.

Appendix 2
Literature review on mobile Internet continued

and their relations, they combine this with a means-end chain approach.[120] It assumes that consumer knowledge is hierarchically organized into three levels of abstraction: attributes, consequences, and values. It also allows for inductive research to uncover values, and typically dependent on a laddering interview technique. The data from these interviews is later coded and values hierarchically sorted.

Argument The various functions on smartphones, including the proliferation of apps, mean users can have very individualized devices and services. Thus we need better methodologies to allow values attached to these very personal devices to be uncovered.

The interviews suggest Korean student smartphone users attempt to achieve several ultimate values, such as sense of confidence, amusement, sense of comfort and restorative. Socialization, productive daily lives, improving communication and acquiring information also have predominant roles in the study's means-end goal structure.

By investigating the relations among goals, the study shows that the subordinate goal of improving communication is central to socialization and intrinsic goals such as amusement and a sense of confidence. Indeed it illustrates that social factors can be antecedents for hedonic factors.

Trends N/A

Star Articles:

Nysveen, Pedersen, and Skard (2015)—offer a good review of the existing literature and highlight the gaps that are already emerging in the field of mobile. In particular, they capture how much research is concentrated on what makes for the successful adoption (indeed much of the literature reviewed here looks to extend TAM), rather than the effects, of mobile Internet.

Yang et al. (2002)—In yet another extension of TAM, the authors address one of its greatest limitations, namely accounting for context. This piece is referenced by many of the others as it provides the much needed justification to use context as a variable when examining perceptions of mobile Internet's value.

Jung (2014)—Whereas most of the reviewed literature seeks to extend the TAM model in some incremental way, this study rips it apart and plays with its assumptions. It achieves this by inductively allowing participants to name their own values for smartphone adoption. In turn, this allows the study to see relationships between values that may have previously been overlooked.

Gaming

Staff Writer
A gameplan to tap the mobile MMO gamer in emerging markets
Vserv, 24 March (2015)

Available at: www.vserv.com/gameplan-tap-mobile-mmo-gamer-emerging-markets/#sthash.P4nDHLWT.dpuf (Accessed 31/06/15).

Source Private sector online blog.

Focus Emerging markets—although not specific.

Data Secondary data from SuperData Research.[121]

Theory N/A

Argument Many developers within the mobile-based Massively Multiplayer Online (MMO) sector face the challenge of meeting consumers demands for sophisticated, and therefore expensive to produce games, whilst also providing much of their content for free (often termed free to play games or freemium games). This is forcing developers to think not only about how to attract players at launch, but also how to retain them for lengthy periods so as to entice them into spending on extra in-game/app options. However, another piece found significant differences between American and Korean users of mobile data services, with the latter interested in social values and the former not.[122]

Trends Eighty-three percent of players that logged in for the first time during the same month as the game's release, also logged in on the following day.

120 Olson, J.C. and Reynolds, T.J. (1983) 'Understanding consumers' cognitive structures: implications for marketing Strategy.' In: Percy, L. and Woodside, A.G. (Eds). *Advertising and Consumer Psychology*. Lexington Books, Lexington, MA, U.S.A. . pp. 51–57.

121 The piece is not clear which research piece it draws from. Although a quick Google search suggests it is likely to be behind SuperData's paywall.

122 Yang, K. and Jolly, L. 'The Effects of Consumer Perceived Value and Subjective Norm on Mobile Data Service Adoption between American and Korean Consumers. *Journal of Retailing & Consumer Services* 16, No. 6 (2009): 502–508.

Appendix 2
Literature review on mobile Internet continued

Staff Writer
Mobile gaming growth gets a Level Up" with Multiplayer Online Games
Vserv, 17 March (2015)

Available at: www.vserv.com/mobile-gaming-growth-gets-level-multiplayer-online-games/ (Accessed 31/06/15).

Source Private sector online blog.

Focus MMOs as a share of mobile gaming revenues.

Data Secondary data SuperData Research.

Theory N/A

Argument Alongside the general dominance of MMO games on mobile, the author seems to suggest that their success is down to their "social" nature, with users able to interact with one another in a way other games do not allow.

Trends In terms of enjoyment, gaming on mobiles is rated second only to bonding with family and friends on social media.

Forty-eight percent of all mobile gamers today come from emerging markets.

Mobile gaming revenues globally were US $25 billion in 2014, with an estimated US $11 billion in revenues going to MMO games. Of this, 4.2 billion came from the Asian market.

It is also notable that an estimated 3.3 billion of the revenue comes from in-game/app purchases.

Christensen, C. and Prax, P.
Assemblage, adaptation and apps: Smartphones and mobile gaming
Continuum: Journal of Media & Cultural Studies 26, No. 5 (2012): 731–739.

Source Academic journal article.

Focus The use of apps linked to the popular MMO World of Warcraft (WOW).

Data A study of the apps' functionality, with no data as such.

Theory The paper adopts the theoretical lenses of "adaptation" and "assemblage" to examine how various categories (chat, buy, security, etc.) of MMO game apps (not the games themselves) reshape how we think about technology, gaming, and within game relations.[123]

Argument The WOW apps take elements of play that are common to the desktop-based web and game community and transfer them to mobiles. Thus they are breaking down traditional distinctions between different types of players (casual and hard-core), and redefining how we think of mobile/smartphones.[124] They are eroding divides between normal and "play" time, with users able to take part in social play activities whilst away from their static desktops or in time traditionally reserved for other activities.

The authors argue that the apps are fragmenting gaming as they allow users to engage in non-core or "peripheral" gaming activities whilst away from their desktop. However, as these mobile-based activities affect, and are central to, users' experiences of the core desktop game (buying/selling equipment, chatting with clan members, securing accounts), the authors suggest they call for a redefinition of traditional casual/hard-core gamer distinctions. At the same time, the apps are turning phones into "part of the technological assemblage of the computer" as they are, in some instances, required to play the game on a desktop. They are also integrating the game into users' "real" lives by allowing the syncing of phone and game-based events calendars.

Trends MMOs have been described as games with which "millions of users voluntarily immerse themselves in a graphical virtual environment and interact with each other through avatars on a daily basis" and that "game-play within these virtual worlds is enhanced because players use them as traditional games as well as arenas in which to explore new relationships, new places, and themselves."[125]

123 See: Goggin, G. 'Adapting the mobile phone: The iPhone and its consumption.' *Continuum: Journal of Media & Cultural Studies* 23, no. 2 (2009): 231–44. Taylor, T.L. 'The assemblage of play.' Games and Culture 4, no. 4 (2009): 331–9.

124 On this blurring of traditional distinctions see: Consalvo, M. 'Slingshot to Victory: Games, Play and the iPhone.' In; Snickars, P. and Vonderau, P. Eds. (2012) *Moving Data: The iPhone and the Future of Media*. New York: Columbia University Press. pp. 184. Juul, J. (2009). *A Casual Revolution*. Cambridge, MA: MIT Press.

125 Cole, H. and Griffiths, M. 'Social interactions in massively multiplayer online roleplaying games.' *CyberPsychology & Behavior*, no. 10 (2007): 575–83.

Appendix 2
Literature review on mobile Internet continued

Goggin, G.
Facebook's mobile career
New media & society 16, No. 7 (2014): 1068–1086

Source Academic journal article.

Focus Facebook as a force within the spread of mobile media, with attention to its role in promoting photography and mobile games, and the social and cultural implications of this phase of mobile Internet.

Data Primary—draws on a qualitative study among young Australian adults conducted in 2009.

Theory The author argues that "to understand Facebook as a distinctive, influential form of new media (…) it is important to pay attention to the political and cultural economies of global mobile media, in which it has evolved." Thus he adopts du Gay et al.'s "circuit of culture" which encourages a rounded/many-sided approach to understanding cultural forms or objects, including mobiles place within the "informal economy" which he argues is often decisive to how it has been adopted and used.[126]

Argument The author overviews the literature on the take up of mobile Facebook to show that it has largely followed context dependent paths. For instance, in the Middle East its emancipatory role was cherished, whilst users in the Philippines used it to amplify already existing offline social practices and Trinidadians hope it will replace the Internet as a "one stop shop" for all their mobile Internet needs. The author argues more nuanced research is needed to understand how culture affects usage in different contexts.

However, the author does not see Facebook as entirely passive. Indeed he focuses on describing the way in which Facebook has spearheaded its move into the mobile social networking market through photo-sharing (by buying Instagram) and gaming (by partnering with the firm Zynga). Both are argued to be key to its success as mobile photography sharing allows users to experience an "intensive intimacy," with images becoming complex objects with multiple social functions, and mobile gaming increasingly comes with social networking functions.[127]

He concludes that Facebook looks set to continue this trend through its acquisition of WhatsApp—a messaging app. In this sense, mobile Facebook can be understood as seeking to retain mobile Internet users within its confines through offering a holistic suite of applications.

Trends By late 2009, Facebook claimed to have 65 million users on mobile, accessing the site mobile web browsers.

Bohmer, M., Hetch, B., Schoning, J., Kruger, A. and Bauer, G. (2001).
Falling Asleep with Angry Birds, Facebook and Kindle—A Large Scale Study on Mobile Application Usage
Proceedings of the 13th International Conference on Human Computer Interaction with Mobile Devices and Services

Available at: http://dl.acm.org/citation.cfm?id=2037383 (Accessed 31/06/15).

Source Conference paper.

Focus Developed—The U.S. and Europe. The paper sets out to descriptively answer some very basic questions about apps usage, both in terms of how they are used and the contexts in which they are used.

Data Primary—application usage information from over 4,100 users of Android-powered mobile devices. Gathered by the authors' own data mining app "AppSensor," this information encompassed apps' lifecycles (Installation, updates, use, etc.) on users' phones.

Theory N/A.

Argument The results suggest that mobile phones are still first and foremost communication devices (voice, e-mail, SMS, voice over IP, instant messages, etc.). However, at night people make more use of the non-communication applications (including social applications) and spend more time with applications.

126 du Gay, P., Hall, S., Janes, L., et al. (1997) *Doing Cultural Studies: The Story of the Sony Walkman*. Milton Keynes: Open University; Thousand Oaks, CA: SAGE.

127 Lambert, A. (2013). *Intimacy and Friendship on Facebook*. Basingstoke: Palgrave Macmillan.

Appendix 2
Literature review on mobile Internet continued

The authors suggest a number of ways that mobile operating system designers could make app placement more efficient, and gather further insights from regular usage and contextual data.

Trends In 2011 there were more than 370,000 apps available for the Android platform and 425,000 for Apple's iPhone.

The average app session lasts less than a minute, even though users spend almost an hour a day using their phones. Application usage (in terms of launches) is at its maximum in the afternoon and evening, peaking around 6P.M.

"Mobile devices are most likely to be used for communication every hour of the day, especially in the afternoon and evening (11A.M.–10P.M.) with a probability of more than 50%. News apps have the highest probability of being used in the morning (from 7A.M. to 9A.M.). Around 11A.M., finance apps briefly become quite prominent. After communication winds down late in the evening, games have their highest probability of use. Social applications also have their highest probability of use in the late evening (from 9P.M. to 1A.M.)."

In nearly half of all application chains (described as continuous opening of different apps), the first application opened belongs to the category of apps coded as "Communication." In contrast, a browser was only used first in 5.9% of application chains.

When traveling at speeds over 25kmph, users were 2.26 times more likely to be using an app of the "Multimedia" category.

Lunden, I
Flurry: China Accounts for 24% of the World's Connected Devices, with 261.3m Active Smartphones and Tablets
TechCrunch, 23 July (2013)

Available at: http://techcrunch.com/2013/07/23/flurry-china-accounts-for-24-of-the-worlds-connected-devices-with-261-3m-active-smartphones-and-tablets/ (Accessed 31/06/15).

Source Online sectoral news bulletin.

Focus China.

Data Secondary data from Flurry.[128] Random sampling of over 18,000 iOS and Android smartphone users in China.

Theory N/A

Argument The popularity of mobile gaming is rising across devices in China and this trend is likely to continue.

Trends On Android, some 56% of users' time is spent in gaming apps, compared to 47% on iOS (in the U.S. users spent about 32% of app time in gaming apps, with 18% on Facebook).

Lin et al.
From the wired to wireless generation? Investigating teens' Internet use through the mobile phone
Telecommunications Policy 37 (2013): 651–661

Source Academic journal article.

Focus Five developed cities in East Asia (Hong Kong, Seoul, Singapore, Taipei, and Tokyo)—an investigation of whether mobile phone will replace or reinforce teens' traditional Internet use through computers.

Data Primary—Surveys were conducted on 1,875 youths between 12 to 17 years old.

128 The link to the report is broken, but presumably it came from this organization.

129 Dimmick, J., Chen, Y., and Li, Z. 'Competition between the Internet and traditional news media: The gratification-opportunities niche dimension.' Journal of Media Economics 17, No. 1 (2004): 19–33.

Appendix 2
Literature review on mobile Internet continued

Theory Adopts "niche theory" to explore how "a new medium would compete with existing media for satisfaction, time, or advertising revenues from the consumers."[129] This also allows the authors to examine usage across function rather than across time which they argue has presented inconclusive and ambiguous results in past studies.

Argument After identifying three general activities areas among the teens—task-based activities, information seeking and communication activities, and recreational activities—the analysis suggests that mobile Internet primarily serves as an extension of teens' Internet activities via PC, rather than as a replacement.

In this sense, the study points to "media complementarities," with new mediums/technologies such as the Internet or mobile Internet acting as an additional tool for those already seeking information or entertainment elsewhere.[130]

Trends It is found that the teens tend to use the mobile phone for recreation and entertainment purposes, especially playing games and listening to music, than for information/communication-based activities like chatting and e-mailing (especially in Tokyo). They are less likely to use the mobile phone for more sophisticated purposes, such as petitioning, voting, or shopping.

These findings are broadly consistent with other studies, even down to the sophistication of Japanese users compared with those in other Asian countries.[131]

Staff Writer
Mobile and Social Gaming Industry 2014 Highlights
Renatus, 25 December (2014)

Available at: http://renatus.com/mobile-social-gaming-industry-highlights-2014 (Accessed 31/06/15).

Source Game developer blog.

Focus A look at the evolution of the mobile and social games industry over 2014—with emphasis on the profile of mobile gamers in the U.S.A.

Data Secondary.

Theory N/A

Argument Broadly, mobile and social games penetrated into the mass culture so deeply that most web-connected smartphone users can be called "gamers," They have also become a core revenue-generating product on the leading mobile platforms, with mobiles outstripping consoles as the medium for gaming. Accordingly the profile of the average gamer is now much harder to pin-down.

Trends In 2014 an average of 365 million daily users played Facebook games. The second most popular social gaming platform in the world is the China's QZone.

An almost perfect gender equality is observed in the U.S. gaming industry on the whole (source—ESA: male—52%, female—48%), but in mobile gaming segment alone female players dominate males: it's 57% vs. 43% (according to SuperData research).

Of these, females over the age of 18 account for the most numerous group of gamers across the U.S. (36%), with the second biggest group including middle-aged men (35%).

Forty-eight percent of female users play games both on mobile devices and consoles. Furthermore, women usually spend over 30% more money on in-app purchases than men, their average playing session is a third longer and they stick with the games they like for a long time.

Deloitte.
Media Consumer 2014: The digital divide

Available at: www.deloitte.co.uk/mediaconsumer/assets/downloads/Deloitte-Media-Consumer-Survey-2014.pdf (Accessed 31/06/15).

Source Private sector report.

Focus Developed, U.K.—new media consumption.

Data Primary—online survey of 2,000 consumers in the U.K.

Theory N/A

130 For early predictions of such trends see: Dutta-Bergman, M.J. 'Complementarity in consumption of news types across traditional and new media. *Journal of Broadcasting and Electronic Media*, 48 No. 1 (2004): 41–60.

131 Lee, W. and Kuo, E.C.Y. 'Internet and displacement effect: Children's media use and activities in Singapore. *Journal of Computer-Mediated Communication* 7, No. 2 (2002).

Appendix 2
Literature review on mobile Internet continued

Argument While trends in online social networking, news consumption, gaming, and music are going up across the board, legacy media (newspapers, TV, and radio) still account for much of consumers' time. Furthermore, some consumers "trust" legacy media more than new media.

The report's title refers to the changing profile of media consumers, with men no longer dominating the gaming sector and many of those who are prepared to consume media online doing so in "binge" sessions or in multiple ways.

Trends For the first time a narrow majority of U.K. respondents say they acquire more digital books than print ones.

Forty-nine percent of households own at least one smartphone, tablet, or personal computer—72% of them fall into the "ABC1" (well-off) demographic category.

Around £15 billion of sales in 2012 were influenced by information sourced on a smartphone.

Eighty percent of Brits read a newspaper online or in print, although only 51% pay for it themselves. 34% of respondents trust print news to be accurate, versus 29% who trust online outlets. Yet for under-35s, those percentages are 39% and 35% respectively.

Sixty-seven percent of Brits have a Facebook profile.

The report finds that "While the average console gamer is a 16–24 year old male, the average casual gamer (playing on tablets, smartphones and social networks) is a 25–34 year old woman."

One third of smartphone owners play games on their phones and half the people surveyed said they think games can be used as an educational tool.

"Eleven percent of under-35s and 8% of 34–44 year olds pay to stream music online and take-up across all ages has doubled since the previous year."

Staff Writer
Mobile App Usage: E-commerce gaining popularity, mobile gaming demand steady
Vserv, 13 January (2015)

Available at: www.vserv.com/mobile-app-usage-e-commerce-gaining-popularity-mobile-gaming-demand-steady/ (Accessed 31/06/15).

Source Private sector online blog.

Focus Mobile gaming adoption patterns.

Data Secondary—source is marked as Flurry but no specific.

Theory N/A

Argument While mobile gaming continues to rise, e-commerce and m-commerce will grow as consumer confidence improves.

Trends Overall global app usage grew 76% in 2014, in comparison to 2013, usage of e-commerce apps saw a 174% jump in 2014, with shopping via Android-based devices growing about 220%.

Forty-four percent of global smartphones and tablet users play games on their devices, with an estimated 1 billion players.

Annual mobile game downloads are predicted to grow from close to 35 billion in 2014 to 60 billion in 2018.

Appendix 2
Literature review on mobile Internet continued

Richardson, I. and Hjorth, L.
Mobile games: from Tetris to Foursquare
Goggin, G. and Hjorth, L. Eds. (2014). The Routledge Companion to Mobile Media. Routledge, United Kingdom, pp. 256–266

Available at: www.academia.edu/7560161/MOBILE_GAMES_From_Tetris_to_Foursquare_by_Ingrid_Richardson_and_Larissa_Hjorth (Accessed 31/06/15).

Source Book chapter.

Focus Sectoral—provides a critical overview of mobile gaming and its increasing linkages to social networking platforms.

Data Secondary.

Theory Assemblage and intimacy.[132]

Argument Location enabled games (those that use GPS) and "playful" augmented reality apps (those that use real world public spaces and other users as their boards and characters) are argued to "interweave the previously disparate domains of online social networking and mobile gaming, furthering what has been termed the "ludification" of culture—the translation of interpersonal, social, and communicative practices into "playful" activities." As users upload more and more information on their everyday activities (photos, locations, thoughts), mobile gaming apps enact a "hybrid, layered, and multifaceted experience of place, presence, and communication."

Furthermore, as playful activity extends into new spaces and times, the "real world" is no longer just filled with our physical presence, but also our online or mobile presence. In this sense, mobile gaming upsets traditional dichotomies such as work/life and casual/hard-core. However, it is not a simple colonization of time and space by mobile gaming. Instead mobile gaming's evolution is different in different places, and somewhat dependent on existing social practices.

For example, while mobile games and social networking platforms are used at home, in many situations time they are also used to afford a form of privacy in public spaces and, thereby, manage "the corporeal agitation of impatience, aloneness, and boredom." Thus instead of seeking to generalizations around mobile gaming's evolution, the authors argue that the most that can be currently said is that "mobile gameplay resides in the interstices of everyday life."

Nonetheless, they conclude that old terms used to describe gaming are no longer suitable for the rise of mobile gaming and its partnership with social networking platforms. Yet they do not clearly suggest alternatives.

Trends Seventy-five percent of all mobile phone downloads are games, and the mobile gaming industry is now valued at U.S.$50 billion, with some predicting that the mobile device will become the "primary screen" for games by 2016.[133]

In the App Store, 16 out of the 25 top all-time paid apps are games.

Despite the potential physical and network mobility afforded by mobile devices, studies show mobile games are often played in the bedroom.[134]

Staff Writer.
Mobile gaming economy gets a boost from smartphone growth in emerging markets
Vserv, 25 November (20014).

Available at: www.vserv.com/mobile-gaming-economy-gets-boost-smartphone-growth-emerging-markets/ (Accessed 01/07/15).

Source Private sector online blog.

Focus Global mobile games industry.

Data Secondary—Report by Newzoo.[135]

Theory N/A

Argument Low smartphone prices and cheap content is driving the mobile games industry, which is likely to make the mobile the preferred gaming platform very soon.

Trends The number of mobile gamers is expected to increase from 1.33 billion in 2013 to 1.82 billion in 2017.

132 See Christensen and Prax (2012) in this review.

133 Peterson, S. 'Mobile to be 'Primary Hardware' for Games by 2016.' Gamesindustry.biz, 30 April 30 (2013). (Accessed 31/06/15)

134 Chan, D. 'Convergence, Connectivity, and the Case of Japanese Mobile Gaming.' *Games and Culture* 3, no. 1 (2008): 13–25.

135 Can't find report, but here is a webinar based on the report: 'Peter Warman CEO Newzoo Zoom Out. Global Games Market Webinar Trends and insights towards a $100bn global market in 2017'

Appendix 2
Literature review on mobile Internet continued

The global mobile games market is projected to surpass US $41 billion by 2017, making up for almost 40% of the total global gaming market. Asia Pacific, the largest mobile gaming market, contributes 56% of the total revenues and is predicted to reach US $12.2 billion in 2014. However, it is the Latin American mobile games market that is leading the growth curve with 60% year-on-year growth from last year.

In 2013, while mobile gaming revenues from smartphones were an estimated US $12.8 billion, the 2017 revenue figures are pegged at US $25.8 billion.

Albarrán Torres, C. and Goggin, G.
Mobile social gambling: Poker's next frontier
Mobile Media & Communication 2, No. 1 (2014): 94–109

Source Academic journal article.

Focus A history, analysis, and theorization of the emergence of mobile social gambling.

Data A case study of the mobile app Zynga Poker.

Theory The paper describes gambling as part of a neoliberal reconfiguration of society and attitudes towards "risk." It also uses the idea of the "magic circle" of play, which suggests gaming traditionally took place with bounded areas (the poker table, playground, pitch) to explore how technologies have incrementally allowed risk to be introduced into play.[136] Furthermore, networked communities of mobile gamblers allow risk to permeate into socialization, forming "imagined communities" around emerging gambling practices.[137]

Argument Mobile gambling on smartphones and tablets extends earlier, already existing, cultural practices associated with gambling much deeper into the realm of the everyday. The deliberate extension and the normalization of gambling as entertainment—described as a blurring of distinctions between wagering and gaming—poses manifold ethical, cultural, and political implications.

The authors argue that this blurring is achieved through a combination of technological innovation, emerging online practices and a favorable regulatory environment. To illustrate this, they point out that "Zynga Poker's interface showcases elements related to participatory and convergent media, such as a login through Facebook, the use of avatars, and a list of contacts known as "Poker Buddies."

In conclusion, they argue "mobile social gambling is a significant innovation, because it taps into, and fuses with, the sociocultural shifts in gambling (as well as gaming) especially evident in poker." Its emergence calls for new understandings of "risk" and "society," and of the mobile as potential "cathedrals of consumption" or "portable theme parks of risk."

Trends Zynga is now available in 18 languages, and has been implemented across various platforms, including Apple iOS, Google, Android, the Chinese platform Tencent, and Facebook.

In early 2013, Zynga Poker was the fourth most played game on Facebook and has been a top 10 grossing game in the App Store.

Gunelius, S.
More than Half of Digital Content Now Consumed on Mobile Devices
ACI

Available at: http://aci.info/2014/05/14/more-than-half-of-digital-content-now-consumed-on-mobile-devices/ (Accessed 01/07/15).

Source Online Scholarly Blog.

Focus Developed, U.S.A.—the types of online content consumed through mobile compared with desktops.

Data Secondary sources (Millennial Media and comScore—but no detail on which reports).[138]

Theory N/A

136 Huizinga, J. (1955). *Homo Ludens: A study of the play-element in culture. Boston*, MA: Beacon Press. (Original work published 1938).

137 Couldry, N. (2012). *Media, society, world: Social theory and digital media practice.* Cambridge, U.K.: Polity.

138 Millennial Media (2014). 'Cross-Screen Consumer Behavior: Decoded.' (Accessed 08/06/15).

Appendix 2
Literature review on mobile Internet continued

Argument The number of content categories consumed on desktop computers more than mobile devices will decrease. News is likely to make the transition in the near future.

Trends Fifty-six percent of online content is now consumed via smartphones (44%) and tablets (12%) while just 44% is consumed on desktop computers. Content consumption comparisons:

- Streaming Radio: Mobile = 95% (79% smartphones and 16% tablets) and Desktop = 5%
- Games: Mobile = 85% (79% smartphones and 6% tablets) and Desktop = 15%
- Social Media: Mobile = 72% (61% smartphones and 11% tablets) and Desktop = 28%
- Weather: Mobile = 70% (61% smartphones and 9% tablets) and Desktop = 31%
- Retail: Mobile = 53% (39% smartphones and 14% tablets) and Desktop = 47%
- (Equally across devices)
- Health: Mobile = 50% (45% smartphones and 5% tablets) and Desktop = 50%
- (More on desktops)
- News: Mobile = 45% (39% smartphones and 6% tablets) and Desktop = 55%
- Sports: Mobile = 44% (38% smartphones and 6% tablets) and Desktop = 56%
- Food: Mobile = 42% (27% smartphones and 15% tablets) and Desktop = 58%
- Business/Finance: Mobile = 38% (36% smartphones and 2% tablets) and Desktop = 62%
- TV: Mobile = 33% (22% smartphones and 11% tablets) and Desktop = 67%
- Travel: Mobile = 32% (21% smartphones and 11% tablets) and Desktop = 68%
- Auto: Mobile = 24% (19% smartphones and 5% tablets) and Desktop = 76%
- B2B: Mobile = 20% (12% smartphones and 8% tablets) and Desktop = 80%

Sey, A
New Media Practices in Ghana
International Journal of Communication 5 (2011): 380–405

Source Academic journal article.

Focus Developing, Ghana—examines appropriation in four areas: mobile telephony, the Internet, new media production, and gaming.

Data Secondary—published and unpublished academic articles, media reports, and personal and institutional blogs, as well as websites.

Theory "Technology appropriation" and the attendant assumption that a gap exists between design and technology use, requiring users to adapt technology once it has been acquired.[139]

Argument Ghanian mobile users engage in a variety of appropriation behaviors, both "faithful" and "unfaithful" to the technologies' intended use. As with "flashing" (or drop calling), many of these "smart consumption" practices are designed to get around the high costs of mobile use. However, the authors stress that such practices are imbued with greater meanings, including signaling the flashers' social status (poor), and the ongoing struggle between powerful network providers and consumers. In this sense, appropriations of mobile technology reflect real world social dynamics.[140]

Contrary to expectations that mobile phones would be used for business or information seeking activities, social networking tends to be the dominant use, in particular for maintaining links with family and friends. However, the authors concede that maintaining social relationships can also be seen as a vital economic activity for the poor.

Mobile gaming is only just beginning to emerge in Ghana. One early domestically produced iPhone game requires players to protect livestock from wildlife, such as rhinos and hyenas. However, the authors argue "the gaming industry requires a level of technical skill and interest that is not yet evident in the country."

139 Heeks, R. (2002). *Failure, success and improvization of information systems projects in developing countries*. IDPM Working Paper No. 11. Manchester University, U.K.

140 For more on such power struggles see: Bar, F., Pisani, F., & Weber, M. (2007). *Mobile technology appropriation in a distant mirror: Baroque infiltration, creolization and cannibalism*. Prepared for discussion at Seminario sobre Desarrollo Económico, Desarrollo Social y Comunicaciones Móviles en América Latina. Convened by Fundación Telefónica in Buenos Aires, April 20–21.

Appendix 2
Literature review on mobile Internet continued

Trends Ghana's ICT for Accelerated Development Policy states its objective "to accelerate Ghana's socio-economic development process towards the realization of the vision to transform Ghana into a high income economy and society that is predominantly information-rich and knowledge-based within the next two to three decades or less."

In 2009 mobiles had a penetration rate of over 50%, compared with poor landline infrastructure. Yet for most Internet cafés and telecentres provide the cheapest form of Internet access.

One study found that 24.6% of 118 mobile phone subscribers play mobile phone games at least once a day.

Within Ghana users of new media technologies are often characterized by the government, media, and segments of the population as being inappropriate, unproductive, unprofessional, or criminal. Such characterizations are often aimed at the young.

Hyeryoung, O
New Media Practices in Korea
International Journal of Communication 5 (2011): 320–348

Source Academic journal article.

Focus Developing, Korea—explores local youth roles as early adopters of new media technologies and their appropriations, with a focus on the Internet, mobile phones, gaming, and new media production.

Data Secondary—review of studies on Korean digital youth.

Theory N/A—not explicit, although seems to be framed around adoption theory.

Argument The author argues that a combination of a youthful population, urbanization, high levels of literacy and a social-political discourse on the importance of ICTs make Korea a fertile ground for the diffusion of new media- and "techno-" cultures. Given this, the literature suggests Korean youth have come to easily accept "cyberspace as an extension of the real world and enjoy exploring diverse new media tools for self-expression."[141]

Whilst most online time is devoted to entertainment and social networking, the author suggests that "active knowledge building and informal learning" is motivated by membership within communities structured around diverse leisure activities. These communities also provide youth with an "emotional outlet" and a space within which to form an "alternative play culture and the democratic communication structure" otherwise repressed in real life.

Much of the literature suggests online gaming drove Korea's increased demand for broadband in the early 2000s. Some commentators also suggest that economic crisis in 1997 gave youth the time to devote to online gaming and that the proliferation of PC Bang gaming cafés provided the necessary infrastructure. Whilst gaming is occasionally the focus of media attention for negative reasons (addiction and crime), it is mostly lauded as an activity that increases digital literacy and some studies even suggest it provides learning opportunities for young Koreans.[142]

The literature suggests that the rise of mobile gaming has left the greatest impression upon females, giving them a space within which to play and express themselves free from real world social pressures (albeit that most game at home). Argued to be central to women's adoption of mobile gaming has been "cute" aesthetics and the ability to social network with friends while playing. Thus for some, mobile gaming forms part of a "casual intimacy oriented" youth techno-culture.[143]

The author concludes that Korean Youth's adoption of new media technologies is a vital part of the national concept of development. At the same time, the way this has happened has been shaped by the local culture.

Trends Korea has slightly fewer than 50 million people, and the youth population (under 25) makes up about 45.4%.

141 Soh, Y. (2002). *Internet communitywide hanguksahoi* [Internet community and Korean society]. Seoul, Korea: Hanul Academy. Hwang, S. 'Sinsedae(N sede)ui jagipyohyeungwa cyber gongganeseoui sanghojakyong: Sagowa hengdong yangsikui byeunhwareul jungsimeoro [Adolescents' self-expression and their interaction patterns in cyberspace: Exploration of behavior patterns and thoughts]. *Korean Journal of Psychology* 13, No. 3 (2000): 9–19.

142 Um, M., Kim, T., & Kim, C. 'Online gameeui ehodoeh gwanhan siljeungjeolk yeongu: Sanghojakyongseonggwa hyeunjongameul jungsimeuro [Exploratory study of loyalty to online games: Focus on interactivity and the sense of presence].' *Management Science* 22, No. 1 (2005).

143 Hjorth, L. 'The game of being mobile: One media history of gaming and mobile technologies in International.' *Journal of Communication* 5 (2011).

Appendix 2
Literature review on mobile Internet continued

In 2007, 77% of Koreans used the Internet on a daily basis. Whilst mobile phone subscriptions reached 90.2%.

Research shows that Korean youth use the computer mostly to find entertainment-related information, to play games (the predominant activity with 44.6% engaging in it), and to use e-mail.

In 2003, 89.1% of youth that used the Internet daily were part of "interest-driven online communities," with each belonging to an average of 13.7 communities.

Korea also has the second largest number of bloggers in the world, surpassed only by the U.S.

Staff Writer
Online games sector for PCs and mobile springs into life in Nigeria—free now, pay-for later
balancing act, 15 June (2011)

Available at: www.balancingact-africa.com/news/en/issue-no-609/top-story/online-games-sector/en (Accessed 01/07/15).

Source Online private sector news bulletin.

Focus How the mobile gaming sector will likely evolve.

Data Primary—Interviews with two Nigerian games developers. The article highlights the role on company incubators in supporting the sector.

Theory N/A

Argument Nigerian developers are giving existing games an African touch by customizing them for the local market. However, to test the market they are initially offering them for free.

Trends In 2011 the mobile sector had not really established itself outside of South Africa and was only emerging in countries such as Nigeria.

The market for mobile games in 2011 consisted of 44 million Nigerians who access the Internet via mobile.

Watkins, J., Hjorth, L. and Koskinen I.
Wising up: Revising mobile media in an age of smart phones
Continuum: Journal of Media & Cultural Studies 26, No. 5 (2012): 665–668

Source Academic journal article.

Focus Introduction to journal special issue on how smartphones are affecting the study of media and communication practices.

Data Secondary—small summaries of the special issues articles (relevant pieces are in this review).

Theory N/A

Argument Smartphones signal a movement towards media and technological convergence; at the same time as they allow users to appropriate technology in socially and culturally dependent ways. Indeed the uptake of smartphones is largely unique "across sociocultural, technological, economic, and linguistic differences."

Trends The authors suggest, following Goggin, that the iPhone represents the distinctive moment in mobile and that it requires that "notions about identity, individualism, lifestyle, and sociality—and their relationship to technology and media practice" be rethought.[144]

Star Articles:

Christensen and Prax (2012)—for describing how mobile apps are breaking down traditional distinctions between hard-core and casual gamers, and between play and normal time.

Torres and Goggin (2014)—for describing the interface between mobile social networking services, gambling and changing social norms as a neoliberal colonisation of everyday life.

Hyeryoung (2011)—for insights into how social norms around national development imperatives, a supportive government, and gaming can combine to increase digital literacy.

144 Goggin, G., and Hjorth, L. (2009). *Mobile technologies*. New York: Routledge. Quote from: Hjorth, L., Burgess, J., and Richardson, I. (2012). *Studying mobile media: Cultural technologies, mobile communication, and the iPhone*. New York: Routledge.

Appendix 2
Literature review on mobile Internet continued

Music

Staff Writer
90% Of Total Music Streaming Is Happening Through Mobile Phones [Hungama]
NextBigWhat, 12 January (2015)

Available at: www.nextbigwhat.com/online-music-consumption-india-data-hungama-297/ (Accessed 06/07/15).

Source Online private sector news bulletin.

Focus Developing, India—mobile music industry.

Data Secondary—it appears that most of the data is based on Hungama.com user figures.[145]

Theory N/A

Argument 2014 was an interesting year for digital music in India, especially given that licensing regulations were eased allowing room for new providers, and that there was a great uptake in mobile music.

Trends Music streaming in India saw 100% increase between 2013 and 2014.

Android platform saw increase close to 100% with regards to access of Hungama.com on Android alone.

2014 saw 90% of total streaming access through mobile phones due to increase in mobile Internet usage.

Staff Writer
African smartphone usage driven by savvy young South African, Kenyan, and Nigerian consumers
Africa: tracking Internet progress, 7 December 2013

Available at: www.oafrica.com/mobile/african-smartphone-usage-driven-by-savvy-young-south-african-kenyan-and-nigerian-consumers/ (Accessed 06/07/15).

Source Private sector online blog (industry analysts).

Focus Smartphone adoption in Sub-Saharan Africa—Nigeria, Ghana, South Africa, Kenya, Senegal, Cameroon.

Data Secondary—report from Ericsson.[146]

Theory N/A

Argument "In summary, smartphone usage is driven by South African, Kenyan, and Nigerian consumers under 30 years of age who work full time or are still in school and own a smartphone costing less than US $150.'

Trends Feature phones still dominate smartphones in terms of adoption.

Fewer than half of smartphone owners use the Internet on a daily basis.

Ownership of entertainment apps greatly exceeds interest in productivity apps—but more phone owners aspire to use productivity apps in the future.

Staff Writer
Africa's Online and Mobile Music Platforms—The Puzzle of Who Will Succeed in a Crowded Field
Balancing act, 27th February (2015)

Available at: www.balancingact-africa.com/news/en/issue-no-746/top-story/africas-online-and-m/en (06/07/15).

Source Private sector online blog (industry analysts).

Focus Developing, Africa—who are the big players in the mobile music industry.

Data Secondary—not clear.

Theory N/A

Argument While young, Africa's mobile music industry is booming with each country seeing their own providers springing up. Two important factors are shaping this growth: i) The need for individuals who know African artists' back catalogs to be working for content providers; ii) the desire of artists to win revenue back from those that pirate music and share it on U.S.B sticks; and iii) the slow pace of mobile Internet adoption means many services are entirely SMS based.

145 Based on the Hungama.com 'Digital Music Trends 2014' report (cannot find).

146 Ericsson (2013). 'Bridging the Digital Divide: How mobile phones are playing a key role in connecting people in Sub-Saharan Africa.' (Accessed 07/06/15).

Appendix 2
Literature review on mobile Internet continued

Within the industry there are "really only two business models: advertising or user pays." Nonetheless, advertisers have been slow to link up with providers and "frictionless" paying is not yet common place in Africa.

Trends International players are so far reluctant to enter a market with little respect for digital rights laws and loyalty to local content.

Staff Writer
Nigeria: A Nice Mobile Music and Video Service With a Handset Attached—Solo Launches in Nigeria and Turns the Business Model On Its Head
Balancing act, 29th November (2013)

Available at: www.balancingact-africa.com/news/en/issue-no-683/top-story/a-nice-mobile-music/en (Accessed 06/07/15).

Source Private sector online blog (industry analysts).

Focus Developing, Nigeria—the launch of a new handset which comes with a "free" music streaming service and data.

Data Secondary—interview.

Theory N/A

Argument Akindele is navigating the problem of piracy by offering customers that buy its handset a "free" music streaming service and some data to use it. The idea is to hook them into buying more data.

Trends N/A

Music Ally
Music Ally Report 332—Around the world: digital music in 2013
Music Ally

Available at: http://musically.com/2013/12/11/music-ally-report-332-around-the-world-digital-music-in-2013/ (Accessed 06/07/15).

Source Private Sector Report.

Focus Worldwide digital music industry—focus on America, Europe, the Asia Pacific, Africa and Latin America.

Data Secondary—industry reports.

Theory N/A

Argument Most markets are in flux, with trends too hard to call. However, a close analysis suggests that whilst digital downloads are on the wane, streaming is the future, with many services looking for creative and locally relevant ways to encourage adoption.

Trends U.S.A.: Subscription and Internet radio services took up almost a quarter (23%) of the average weekly music listening time of those aged 13–35 in the U.S. in 2012 and that was up from 17% in 2011. At the same time, digital album sales fell.

Europe: Digital music downloads were predicted to grow only 1.9% to €33.5 million, while streaming would see a 10.6% increase in growth.

Asia Pacific: Japan is the biggest recorded music market in the world ($4.3 billion versus $4.1 billion in the U.S. in 2012 according to the IFPI), however, streaming music faces adoption challenges with consumers not used to using services. One ways habits are beginning to be challenged is through creative partnerships between social gaming companies, like DeNA, and music streaming services. Similarly in India music streaming services are embedding in news providers' websites.

Latin America: Digital infrastructure, penetration and costs still trail behind those of the U.S. and Europe, and accordingly the three most developed countries, Brazil, Mexico, and Argentina, account for most of the region's revenues—$431.6 million out of $504.2 million (86%) in 2012. Many streaming music services are seeking to integrate themselves into bundles, thereby coming preloaded on new phones or as part of new provider contracts.

Africa: Despite a lack of available data, the reports argue "Africa is not a single music market: each country has its own characteristics. That's one reason not to see it as the stereotype of a 'developing market,' but also a reason why digital music services have to work harder to address people across the continent." It also points to a "growing middle class of African mobile users who were 'starting to demand more extensive data services on a widening range of smartphones, high-end feature phones, and tablets.'" It concludes that a cultural shift from live to recorded music is still needed.

Appendix 2
Literature review on mobile Internet continued

Lodder, A. R.
Cross-border use of WhatsApp, Pandora, and Grindr: on global norms and how to enforce these when the can be everywhere
BILETA (2014)

Source Academic working paper.

Focus Developed—the norms concerning contracting, privacy, advertisements, and security applicable to smart devices.

Data Secondary—three case studies.

Theory N/A

Argument Global norms are needed to protect and facilitate "smart users" and their information, whether at home or abroad. However, the interlocking norms surrounding contracting, privacy, advertisements, and security, and the multiplicity of actors in the mobile "app ecosystem," complicate legislation to protect users. The author aims to highlight this complexity through an exploration of the use of three apps—WhatsApp, Pandora, and Grindr—across borders.

The author argues that apps that offer their service on a "global scale, you should accept global norms." However, using Pandora (a mobile music streaming service) as an example, the author asks how could these norms be developed and who would enforce them? Furthermore, even if states can agree on global norms and the differences between different countries (for example, in Russia Grinder, a dating app for homosexuals, may be banned), who bears responsibility for informing users of the legislation?

The author does not offer in-depth solutions and only gives brief mentions of how global norms have had some measure of success in other areas (TRIPS and WIPO).[147] He concludes that "Theoretically, global norms, and local enforcement may be the most optimal solution" but concedes we may never accomplish this "ideal."

Trends "The moment what happens on the Internet (communication, dissemination of information) is linked to the physical world, *Internet law* originates."

Staff Writer
Digital Content Africa Z19—The Mobile Deal that is keeping Africans from having more music, film and TV on their mobiles
Balancing act, July (2014)

Available at: http://smartmonkeytv.createsend1.com/t/ViewEmail/r/45ACD7A418128F362540EF23F30FEDED (Accessed 06/07/15).

Source Private sector online blog (industry analysts).

Focus Developing, Africa—the price of content.

Data Primary—interviews from Smart Monkey TV.[148]

Theory N/A

Argument Africa's content ecosystem is suffering from low incentives to content creators. Indeed content distribution deals in Africa often mean that the mobile operator takes 70–80% of the gross revenues, leaving the balance to be shared by the SMS aggregator and the content owner (in Europe a 30%–70% split is offered). However, operators are gradually beginning to realize that this is stifling content creation because Africa has a thriving black market for local music and films (via U.S.Bs and copied DVDs).

Trends YouTube is in the top three most used websites ranked by Alexa.com for the range of African countries it covers.

147 For more information see: www.wipo.int/treaties/en/text.jsp?file_id=305907 (Accessed 06/07/15).

148 See: www.youtube.com/watch?v=2-pXunvMhtg (Accessed 06/07/15).

Appendix 2
Literature review on mobile Internet continued

Staff Writer
Digital music in Africa: Demand for local driving growth
Balancing act, July (2014)

Available at: www.balancingact-africa.com/news/en/issue-no-733/digital-content/digital-music-in-afr/en (Accessed 06/07/15).

Source Private sector online blog (industry analysts).

Focus Developing, Africa—local content creation and demand.

Data Secondary—behind pay-walled report on digital music in Africa.[149]

Theory N/A

Argument Whilst demand for digitized local music is growing, many providers are struggling with Africa's lack of legislative infrastructure, particularly around licensing for local artists' work. Furthermore, providers are having to help artists with the creation of things such as album covers.

Trends Research firm Informa Telecoms & Media predicts that smartphone connections on the continent will rise to 412 million in 2018, more than a five-fold increase from the estimated 79 million connections in 2012.

IFPI
IFPI Digital Music Report 2014: Lighting Up New Markets
IFPI, 18 March (2014)

Available at: www.ifpi.org/downloads/Digital-Music-Report-2014.pdf (Accessed 06/07/15).

Source Grey literature (the IFPI is non-profit industry association).

Focus Worldwide—the digital music market.

Data Primary—research by Ipsos MediaCT, but no methodology details.

Theory N/A

Argument Given that the author is an industry association, much of the upbeat focus on increasing digital sales is tempered with a concentration on the need to battle piracy. However, it is argued that streaming services are helping in the fight against piracy as they increasingly offer larger catalogs and begin to recommend music to users.

The report also suggests that record labels are teaming up with social networking platforms to capture market share. For example, it contains a case study of Sony Music Brazil which teamed up with Facebook, and uses Foursquare, Instagram and Google+, to reach consumers. This allows labels to actively engage people through competitions and other social interactions.

In Africa, Universal Music, Samsung, and Sony Music collaborated to launch THE KLEEK—a pan-African mobile streaming music service. Designed to work in a context of low digital literacy, it offers an interactive voice response service as well as an app featuring a huge range of playlists. Such services are also designed to work in an environment in which prepaid services are the norm and people often have limited incomes.

Perhaps more interestingly, the research suggests that consumers desire content from local consumers and with local artists making up the bulk of revenue in many markets. It also highlights that some record labels are looking to support artists in emerging markets to establish a foothold.

149 See: www.balancingact-africa.com/reports/broadcast/music-digital-music (Accessed 06/07/15).

Appendix 2
Literature review on mobile Internet continued

Trends It is estimated that more than 28 million people worldwide now pay for a music subscription, up from 20 million in 2012 and just eight million in 2010.

Streaming services helped the overall digital-music business grow 4.3% to $5.9 billion in 2013. This gave the digital format a 39% share of the global market, compared to a 36% share in 2012. Subscription and ad-funded streaming platforms now represent 27% of the digital business, compared to 14% in 2011.

Sixty-one percent of Internet users aged 16–64 engaged in some legitimate digital music activity in the past six months. Among younger consumers (16–24) this figure is higher at 77%.

Emerging economies saw their digital revenues increase in 2013. Argentina reported a 69% growth, Peru grew 149%, South Africa's digital business went up 107%, while sales in Venezuela shot up 85%.

An estimated 26% of desktop users worldwide still accessed music from unauthorized websites, whilst there are not figures for mobile piracy. However, 89% of Spotify users download illegally less often.

Davis, B.
How do we use the Internet and mobile devices in 2014?
Econsultancy, 7 August (2014)

Available at: https://econsultancy.com/blog/65296-how-do-we-use-the-Internet-and-mobile-devices-in-2014/ (Accessed 06/07/14).

Source Private sector news bulletin.

Focus Developed, U.K.—analysis of communications market with some statistics comparing to international markets.

Data Secondary—based on annual Ofcom report which uses a survey of 2,026 adults (16+).[150]

Theory N/A

Argument The author stresses that confidence with mobile Internet and music is dependent on age, with younger uses more keen to use mobile music services.

Trends Within the 25–34 age group streaming music is more popular than ownership.

Smartphone usage has risen from 39% in 2011, to 51% in 2012 and 61% in 2013.

The proportion of mobile Internet users purchasing goods has increased from 20% to 24%, 2013 to 2014.

Those that use desktop, laptop, tablet, and smartphone rate the tablet as their most important device for Internet access.

The research shows that we hit our peak confidence and understanding of digital communications and technology when we are in our mid-teens; this drops gradually up to our late 50s and then falls rapidly from 60 and beyond.

150 See: Ofcom. 'The Communications Market 2014.' August, 2014. (Accessed 06/07/15).

Appendix 2
Literature review on mobile Internet continued

Wang, G., Salazar, S., Oh, J. and Hamilton, R.
World Stage: Crowdsourcing Paradigm for Expressive Social Mobile Music
Journal of New Music Research (2015)

Source Academic journal article.

Focus Worldwide—crowd sourced music creation application.

Data Primary—case study of the *Leaf Trombone: World Stage* application which allowed users to create music on their mobile and tablet devices, and to have their musical skills judged by others, thereby putting "human judgment and aesthetics into the experiential loop, enabling new largescale social-musical interactions." The creators at Smule claim that *Leaf Trombone: World Stage* is "an instrument, a game, and a huge global social experience."[151]

Theory N/A

Argument The authors argue that presenting the application as a "game" lowers users' inhibitions to take part, learn how to play and be judged by others. They conclude that anonymous crowd-sourcing could be harnessed to create "additional music experiences."

Trends *Leaf Trombone: World Stage* has had over its lifetime an estimated base of more than 800,000 users on the iPhone and iPod Touch. Users have generated more than 7,000 individual songs.

Krishnan, S.
Should We Give Up on Consumers of Developing Countries Paying for Music
Music Services Asia, 20th May (2013).

Available at: http://musicweekly.asia/flipside/the-flipside-should-we-give-up-on-consumers-of-developing-countries-paying-for-music-spotify (Accessed 06/07/15).

Source Private sector online blog (industry analysts).

Focus Developing—music piracy and payment services.

Data Secondary

Theory N/A

Argument The author, a CEO at Spotify, argues by offering access to music for free, consumers can be converted into paying customers. A combination of a massive catalog, high quality and easy access are argued to drive users back into paying for music.

Trends Seventy percent of online users find nothing wrong with online piracy.

151 See: https://en.wikipedia.org/wiki/Leaf_Trombone:_World_Stage (Accessed 06/07/15).

Appendix 2
Literature review on mobile Internet continued

Staff Writer
Waabeh shows snapshot of Africa's music streaming industry
Balancing act, 14th March (2014)

Available at: www.balancingact-africa.com/news/en/issue-no-696/digtool/waabeh-shows-snapsho/en (Accessed 06/07/15).

Source Private sector online blog (industry analysts).

Focus Developing, Africa—Kenya.

Data Case study of Kenya's music streaming service Waabeh.

Theory N/A

Argument Key to Waabeh's success has been easy-to-use software (for consumers and uploading local artists) and the offer of higher sales royalties than its competitors.

Trends The startup has managed more than 10,000 downloads and also seen more than 330,000 streams.

Waabeh keeps 30% of the royalties while other companies usually keep as much as 80%.

Star Articles:

In short, the selection was poor, with few in-depth, methodologically rigorous and theoretically deep articles on developing country contexts. Indeed the batch mostly consisted of news items and reviews of industry reports. Nonetheless, several things were noticeable:

Broadly viewed, streaming music consumers in Africa (if not throughout the developing world) appear to want local content. However, the prohibitive cost of data, low levels of digital literacy, operators demanding a large share of revenues, and underdeveloped regulatory environments around licensing present the biggest challenges to local content creation and sale. Music providers must also devise ways (in most instances partnerships with phone companies or other services) to lure developing market consumers away from the easy availability of pirated material. It is unclear whether the approach taken in developed countries of accessibility to large back catalogs will work when data remains expensive.

Lodder (2014)—highlights the difficulty of creating and enforcing global social norms around app usage. Such problems are only likely to increase as developing countries with weak legislation begin to produce more apps and services that can be used globally.

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