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SMARTPHONES AS LOCATIVE MEDIA

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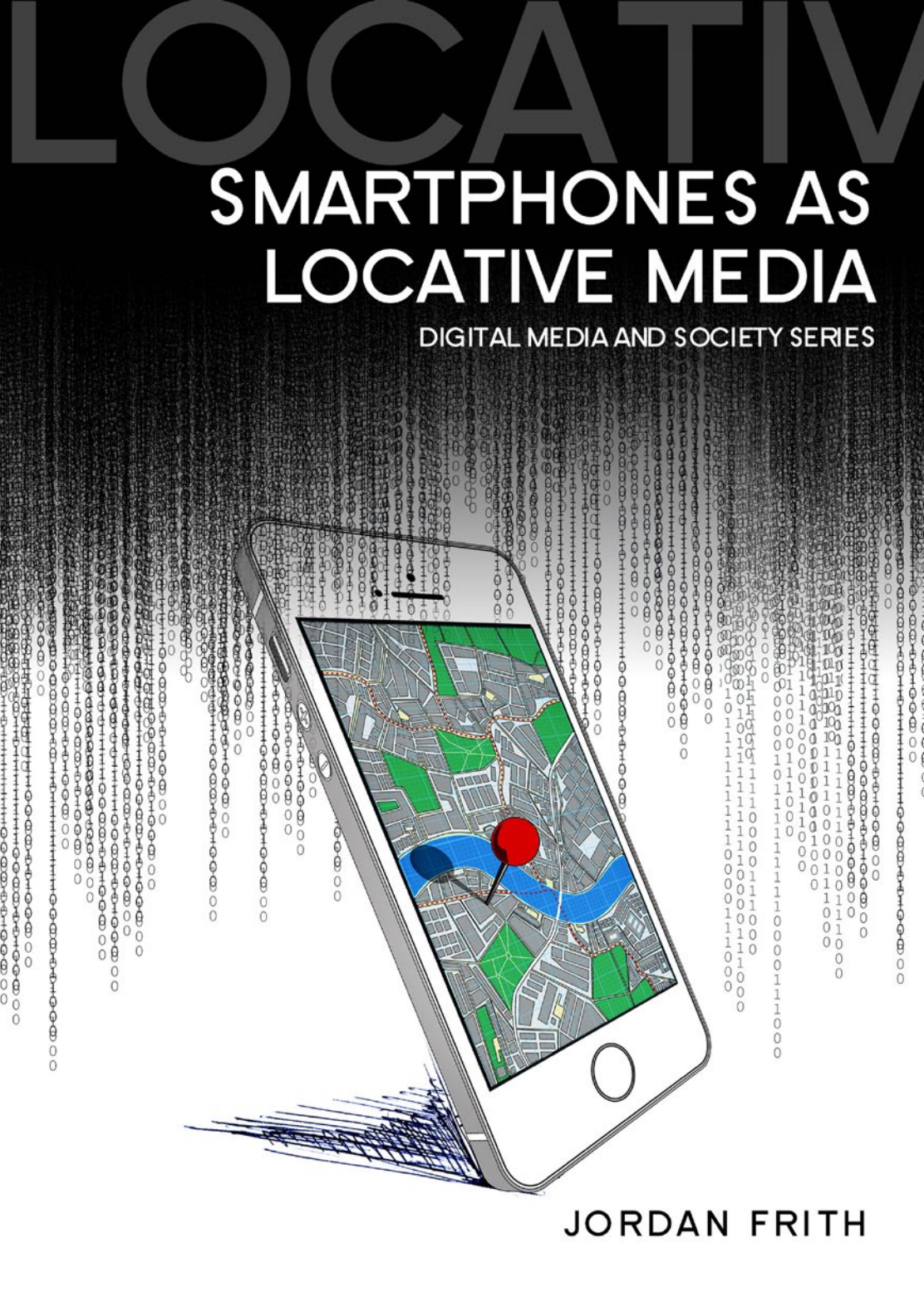

JORDAN FRITH

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For Lindsay, I hope we're still going to Canada when we're 80

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1

From Atoms to Bits and Back Again

Writing about emerging media presents a unique set of challenges. Whatever one writes will take long enough to complete and publish that many of the emerging media technologies analyzed will have changed. In few areas is that truer than in the study of mobile applications. In June, 2008, the Apple app store was still a month from being released; the Google app store did not exist. Slightly more than half a decade has now passed, and the mobile ecosystem has changed. Apple's app store has more than 1 million applications available for download, and the Android counterpart – the Google Play Store – now has over 1 million available applications that have been downloaded 50 billion times (Fiegerman, 2013).

Mobile applications are a key part of the move from basic feature phones to smartphones. Smartphones are mobile devices that allow people to place phone calls, send text messages, browse the Internet, use GPS and other forms of location awareness, and run third-party applications. Over half of all mobile phone users in at least 15 countries now own smartphones (Google, 2014), and the growth rates have been impressive. In the United States, 33 percent of the general population owned smartphones in 2011 compared to 56 percent just two years later (Smith, 2013); smartphone ownership rates in the UK nearly doubled over the same period (Ofcom, 2013). While many parts of the world have seen slower smartphone adoption, the International Telecommunication Union (ITU) points out that "In developing countries, the number of mobile broadband subscriptions more than doubled from 2011 to 2013" (ITU, 2013: 6). The increasing adoption of these miniature computers impacts

the time and place of the Internet. Many people no longer only use the Internet in certain places at certain times. Instead, the mobile Internet becomes intertwined with people's everyday practices, operating in the background of many of their conversations and travels through physical space (Gordon and de Souza e Silva, 2011).

Smartphone usage does not represent a simple extension of older Internet practices. People do use their phones to accomplish many of the same tasks as they would with desktop and laptop computers. They check Facebook to see what their friends are doing; they go to Wikipedia to settle arguments; they browse their favorite websites. However, many smartphone applications add an important element to the way people interact with digital information: physical location. They do so because smartphones are examples of locative media. Locative media refers to any form of media – ranging from in-car GPS displays to RFID tags – that feature location awareness, which is a device's ability to be located in physical space and provide users with information about their surroundings. As covered in chapter 2, smartphones rely on a variety of techniques for location awareness, and these techniques are what enable applications like Google Maps and Yelp to know where a smartphone is on a map of physical space. Not all mobile applications take advantage of smartphones as locative media, but many do, and these mobile applications are called location-based services. They are the focus of this book.

Location-based services include everything from mapping services like Waze to popular social applications like Instagram that enable people to tag photos with location information. The applications are able to map different types of information because the pieces of digital information include latitude and longitude metadata, meaning they can be precisely placed on digital maps and positioned relationally to the location of the smartphone. Location is only one of many types of metadata included in the information with which users interact, but the argument throughout this book is that location data is an increasingly crucial piece of digital information (Gordon and de Souza e Silva,

2011). When people open up a smartphone application to provide them with information about their surroundings, they access digital information as an informational layer intertwined with the physical space they experience. Consequently, possibly the major social consequence of location-based services is that they not only impact the types of digital information people access, but they can also affect the way people navigate physical space and interact with those around them.

Smartphones as locative media show how physical places have begun to affect the mobile Internet and how the mobile Internet has begun to affect physical places. In some ways, the growth of location-based information seems like an obvious step in the maturation of the Internet. After all, why would people not use the information at their fingertips to learn more about the places they inhabit? However, to understand why smartphones as locative media represent a change in how the Internet is understood, it helps to examine how the Internet was originally conceived as "placeless." As the next section shows, many people argued that the Internet would make place less important. People would move their social lives online, spend most of their time in virtual communities, work from home, and congregate in and travel through physical space less and less (Kellerman, 2006). The implicit assumption, still present in expressions like "in real life" that oppose the offline to the online, is that the Internet represents a separate space from the physical world. The examples of location-based services detailed throughout this book show why the conceptual separation of the physical and digital into two separate spheres is untenable. Instead, the digital and physical are being merged in new ways, and this chapter concludes by explaining how the intertwining of the digital and physical is addressed in the rest of the book.

Communication media and the annihilation of space and place

Human beings can only cover a limited distance with their physical bodies. If people attempt to communicate a message with no outside assistance, the distance they can communicate is limited by how loud they can yell. People overcome this limitation through media technologies. Written language allowed people to transcribe messages that were transported to other places. The printing press allowed for the mass distribution of the same communication across physical space (Eisenstein, 1979). People even experimented with non-textual, non-verbal media to overcome physical distance. For example, African tribes developed an intricate language of "talking drum" beats that allowed towns to communicate across distance using sound (Gleick, 2011).

The growth of electronic media, first with the telegraph and then the radio and telephone, also enabled messages to overcome great distances. The telegraph was an important development in communication media and represented the first instance of people sharing textual messages across physical space without the need for physical travel (Carey, 1989). To send a letter or distribute a book, a human body had to physically transport the document. Telegraphs removed bodies from the equation, and the importance of that change did not go unnoticed by contemporary observers. For instance, an 1844 article in the *Baltimore Sun* about the completion of the Washington–Baltimore telegraph line claimed that "Time and space has been completely annihilated" (Rosen, 2012). This same feeling – that space was being annihilated through new communication media – was later echoed when people could transmit their voices through the telephone (Fischer, 1994; Marvin, 1988), broadcast messages into homes using the radio (Peters, 1999), and watch live events taking place on the other side of the world on television (Meyrowitz, 1985; Parks, 2005). These media, along with physical transportation technologies such as the railroad and airplanes (Schivelbusch, 1986), all contributed to the experience

that physical space was being overcome. The far was brought near, the absent made present.

The Internet contributed to the same feeling of the annihilation of physical space, possibly to an even greater degree. With the development of the World Wide Web in the early 1990s, people were able to create chat rooms and Multi-User Domains to build relationships with distant others (Baym, 2010), companies built global networks of information flows that lessened the importance of national borders (Castells, 2000), and many scholars and popular sources argued that the Web would lessen the importance of physical space (Gordon and de Souza e Silva, 2011). This sentiment can be seen in a famous 1994 MCI commercial about the Internet. The commercial featured a 12-year-old Anna Paquin describing the "Information Super Highway" as a road that will connect all points on the globe. The most famous statement from the commercial is when Paquin says this road "will not go from here to there. There will be no more there. We will all only be here" ("No More There," 1994). Few quotes better encapsulate the belief that distinct places would be made meaningless by the new communication technology of the Internet. The Internet would allow people to be everywhere all at once, overcoming distance and lessening the importance of being in any one place at a given time.

Even the dominant earlier metaphor of the Internet – cyberspace – showed how people viewed the online world as separate from physical spaces, so separate that it needed its own spatial metaphor to differentiate it from other parts of daily life. And some cultural critics went so far as to argue that cyberspaces would begin to replace the importance of physical spaces. One of the most famous thinkers to do so was Nicholas Negroponte (1995), the founder of the MIT Media Lab. Negroponte's predictions opposed the world of atoms (the physical) to the world of bits (the digital). He argued that the future lay in bits not atoms, whether in the forms of digital spaces in which to socialize or digital spaces in which to trade (Morgan, 2004). As Negroponte claimed,

> As we interconnect ourselves, many of the values of the nation-state will give way to those of both larger and smaller electronic communities. We will socialize in digital neighborhoods in which physical space will be irrelevant and time will play a different role. (Negroponte, 1995: 6)

Negroponte predicted that people would turn away from physical space to live their lives online.[1] He was not alone in this line of thought. Futurists such as Hans Moravec (1990) imagined worlds in which people download their consciousness into wired mainframes. Philosopher Paul Virilio (1997) expressed fear that the age of instant access would lead to a future in which people would not even care about the physical world enough to meet up to have sex. People were supposedly heading toward a future in which the life of the body was replaced by life on a screen. As is fairly obvious, these predictions of the world of atoms being overcome by the world of bits never fully played out in reality.

Early Internet research did suggest that people who spent more time online tended to interact less offline (Kraut et al., 1998). However, these findings changed as more people went online and more scholars began studying the interactions between digital and physical sociability (Kraut et al., 2002). Sociologists Lee Rainie and Barry Wellman's (2012) book *Networked: The New Social Operating System* is an excellent synthesis of statistical research that shows people who spend more time communicating online also tend to spend more time communicating with people offline in physical space. Research has also shown that, in contrast to predictions that people would turn to the Internet as a substitution for physical travel, people who use the Internet frequently do not travel significantly less (Kellerman, 2006). Rather than replacing the need for physical social interaction and mobility, the Internet has instead been enfolded into people's everyday lives (Baym, 2010), and the online and offline "intersect with one another in a complex fashion" (Morgan, 2004: 5). People still travel to work, meet with friends, and walk city streets. They just now often do so in a way that intertwines the world of atoms with the world of bits.

While it is possible to look at oppositions of the digital and physical as outdated, strands of that thought survive today. People still use the phrase "in real life" (IRL) to compare interactions in the physical world to something that happens online, and best-sellers such as Sherry Turkle's (2010) *Alone Together* still argue that online life is distracting people from the physical world. The implication is that individuals have a physical life (real life) and an online life (unreal life?). "In real life" implies that what happens online is somehow less important, despite the relationships people build online and the online resources they use to accomplish a variety of offline tasks (Baym, 2010). The separation becomes even more tenuous when analyzing the uses of smartphones as locative media. Offline interactions are increasingly permeated by digital data, particularly through the growth of location-based services that provide people with information about their surrounding spaces.

The place of locative media

The number of mobile applications has increased rapidly over the last half decade, with more than a million applications available on Android phones and iPhones. Many of the most popular applications are location-based services. A national survey in the United States found that 74 percent of adult smartphone users use their phone to get information about their surrounding space (Zickuhr, 2013), and a national survey in the UK found that 69 percent of smartphone users access maps through their device (Ofcom, 2013). That 69 percent likely underrepresents the number of people who use location-based services because these applications cover far more than just mapping services. Review sites like Yelp use location to provide people with information; Facebook allows people to tag their posts with location information; Instagram includes location information in the photos people share.

These examples all show why it is not analytically useful to keep trying to separate the physical and the digital. Instead,

location-based services merge the two into what communication scholar Adriana de Souza e Silva (2006) calls a "hybrid space" – a key concept that forms part of the theoretical framework in the following chapters. Hybrid spaces are formed through a combination of three elements: social interaction, digital information, and physical space. The digital information people access in hybrid spaces is not exterior to the place; it becomes a part of that place for the user, just as a street sign or other physical informational becomes a part of a place. Hybrid space is a valuable conceptual tool because it refuses the urge to separate location-based digital information from the physical place it describes.[2] Instead, the digital plays a role in shaping how people "read" physical places (de Souza e Silva and Frith, 2012). If people use their smartphones to pull up a list of nearby restaurants on the mobile application Yelp, other people's reviews can impact how they read their surroundings and make choices about a place. If people report an accident on the highway using the mobile application Waze, they might encourage others to make an alternative mobility choice because of the merging of the digital and physical in the hybrid space. As sociologist Michael Hardey (2007) argued, digital location information "is providing new ways of seeing, experiencing and understanding the city" (p. 867).

These new ways of seeing and experiencing the city show why smartphones as locative media require an understanding of more than how people interact with their mobile screens; analyses need to examine how these interactions impact people's experience of their surrounding space. The focus on the relationship between locative media and place is the major thread tying the following chapters together, and unlike some media studies approaches, this book draws from spatial thinkers to discuss how the growth of hybrid spaces may impact society. Chapter 2 introduces key concepts to understand the social impacts of locative media and begins by focusing on the importance of place in people's social worlds before moving on to the mobilities turn, which focuses on the crucial role movement plays in people's lives. After all, mobile media, ranging from the newspaper to the

smartphone, are tools people use to exert control over their experience of physical movement (de Souza e Silva and Frith, 2012). And as shown in chapter 2, locative media represent a shift in the already complicated relationship between mobile media and place.

After establishing a conceptual framework in chapter 2, chapter 3 provides background on how location-based services work. The chapter explains location awareness by detailing GPS, Wi-Fi-enabled location, and cellular triangulation before moving on to an account of mobile "generations" to show how mobile telephony arrived at the 3G and 4G mobile connections so crucial to the growth of location-based services. The chapter concludes by discussing the two most popular smartphone operating systems – Android and iOS – and explaining how the growth of app stores has changed the mobile media landscape.

Chapters 4–6 analyze three types of location-based services: navigation applications, social networking applications, and applications that allow people to contribute and access geotagged information. Chapter 6 also mentions mobile gaming, though this book does not devote a chapter to mobile gaming because so much excellent research already exists on the topic (cf. Hjorth, 2011). Each of these chapters examines specific location-based services, but the focus is more on user practices and how location information impacts people's experiences than on the design of any specific application. As digital media researcher Nancy Baym (2010) wrote,

> Trying to list specific types of digital media is frustrating at best. Between this writing and your reading there are bound to be new developments, and things popular as I write will drop from vogue. *Let this be a reminder to us of the importance of remaining focused on specific capabilities and consequences rather than the media themselves.* (p. 13; italic emphasis added)

Baym's advice applies to the study of location-based services. Some of the mobile applications discussed in this book might not exist by the time the book is published; other applications may be updated and look significantly different than they do