

Mapping the rise of the iPhone

Between phones and mobile media

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Abstract

This article discusses a cluster of specific technologies and practices in the history of the mobile phone in the U.S. and Europe that have been crucial for the success of Apple's iPhone. It argues that Apple has integrated these developments along three major strategies: all-in-one, customization, and location-awareness. Unraveling these histories and strategies allows us to circumvent the blind spot created by looking at the iPhone solely as a magic object catering to the personal needs of the mobile user. What lies between the object and the subject is a complex assemblage of technologies, actors, and space-bound practices that situate the product and the consumer in an expansive, commodified, and increasingly modulated environment at the heart of which lies the entanglement of user agency and corporate control.

Keywords: Apple, convergence, customisation, iPhone, location-awareness, mobile media

Introduction

In June 2007 Apple introduced its first generation iPhone, which proved the beginning of a very successful new line of smartphones. At that time smartphones were no more than a convergence of telephones and personal digital assistants produced by Nokia and Sony in Europe, NTT DoCoMo in Japan, and Blackberry in the United States. Apple was the company to break with the predominant business model in the U.S. mobile phone industry.¹ Up until 2007 giant network operators such as Verizon in the U.S., Vodafone in Great Britain, and DoCoMo in Japan subsidised the production of handsets

and determined the software – and hence services – on offer through the phone. The entire industry operated on the principle that the hardware design of phones was secondary to the infrastructure and services in the hands of a few telecommunication players, and since it was those carriers who decided what kind of phone customers would upgrade to there was little incentive among the handset manufacturers to innovate. Since cell phones were leased at a loss to customers profits had to be made

by tying customers into proprietary services: call charges, Internet access, ringtones, and the like. Apple convinced AT&T that these services should be bundled with the contract and the phone hardware paid for at its true cost.²

Steve Jobs understood that if Apple wanted to enter the phone industry he had to obtain control over the hardware as well as the software and convince specific carriers to enter into an exclusive services contract with him. Through such a closed system the ties between handsets (vendors), services, and customers were in the hands of Apple, while telephone and mobile internet operators such as AT&T in the U.S. and T-mobile and Orange in Europe were relegated to the position of ‘a mere service provider supporting the phone, rather than the central player in the customer relationship’.³ After that point iPhones were sold to customers directly, together with the operators’ mobile data service plans.

An important moment in the convergence of these business plans was when in 2008 the App Store was launched with a wide range of mobile computer software – ‘apps’ approved by Apple that could easily be bought, downloaded, stored, arranged, activated, and updated. Besides enhancing the personalised capabilities of the iPhone the apps turned the device into the magic mini-computer or ‘Swiss army knife’⁴ that many of us have come to cherish in our daily lives. We were told that with the right apps our phone could be transformed into a music player, television screen, piano keyboard, torch, compass, or heartbeat monitor.

The introduction of these customer-friendly applications came with a lot of self-promotion on the part of Apple, which basically styled the iPhone as a ‘revolution’. In the words of Hjorth, ‘the iPhone’s success has been contingent upon the applications and, in particular, the way in which Apple has managed to re-brand personalization as if it was an Apple invention’.⁵ As Goggin has argued, Apple has a genius for collecting many established technologies, practices, and actors and selling these as an innovative and revolutionary object.⁶ Through the App Store, Apple has expanded the usability of the iPhone in various directions while positioning itself as the magic intermedi-

ary between the personal needs of the clients and the services of many businesses. In this networked media ecosystem characterised by the ties between the thing (the hardware), the technologies, and the software, the customers and their surroundings are completely entangled, albeit in a dispersive way. Thus the kinds of connections enabled by the iPhone far transcend those associated with communication or computer networks only. Goggin describes the workings of the iPhone as a messy *combinatoire*⁷ of technologies and practices characterised by various tensions, at the heart of which lie those between user friendliness and corporate control.

This essay is a multi-faceted contribution in line with recent work already done on the iPhone by the authors referenced, but also on related, larger topics concerning media convergence (Jenkins), customisation (Zittrain), media governance (Castells, Galloway), and media archaeology (Uricchio). While these important academic studies inform my own approach to the rise of the iPhone they will not be addressed explicitly. The iPhone crystallises key developments that characterise the cultural and media industries at large, while it also constitutes a micro-system with a complex history of its own. I will first briefly discuss the major developments in the history of the mobile phone that have enabled the successful emergence of the iPhone. Central to this survey is the argument that Apple has appropriated these historical developments along two principles: the dynamics of convergence called all-in-one, and the increasing customisation or personalisation of the phone and its applications. The two principles are interrelated and, unsurprisingly, central to a larger economy in which the marketing of media-clusters, the movement of content across integrated platforms, and the niche-targeting of individuals on the move are inseparable.

I will show how Apple has managed to build a brand identity on this constant flow of things, content, and people. Here, a closely related third aspect proves to be central to the workings of the iPhone: location-awareness as a tool that makes it possible to open up the mobile consumer's surroundings to a navigational space owned by Apple. Seen together the three strategies of all-in-one, customisation, and location-awareness allow us to problematise the notion that we can easily identify what is 'revolutionary' in the iPhone without asking the following questions: what is the arrangement of heterogeneous networks that made it possible (the all-in-one); and to whom specifically does it matter (customisation) and in what contexts (location-awareness)? In other words, by drawing attention to the three strategies we can circumvent the blind spot created by looking at the iPhone solely as a magic object catering to the personal needs of the mobile user. What lies between the object and the subject is a complex assemblage of

technologies, actors, and space-bound practices across the agency-control divide.

What's new?

Despite the hype about the iPhone as revolutionary and new, also propagated by the magazine *Time* in 2007,⁸ the device needs to be located in a series of traditions and practices that can be summarised accordingly. Mobile communication and cellular telephony in particular had a long technical history prior to the arrival of the iPhone.⁹ These forms are an offshoot of the radio-based communication developed by Marconi in the 19th century. Originally used for one-to-all (broadcast) marine communication and for coordinating the tasks of police officers, firefighters, and taxi drivers, mobile communication became available for private one-to-one communication in the 1940s and gradually spread in the 1970s:

[i]n 1976, the system in New York City, for example, had almost 550 users sharing 12 lines. There were 3700 customers on a waiting list (Encyclopedia Britannica 2002). The mobile terminals themselves were ponderous things requiring batteries heavier than a car battery. Thus, mobile telephony at this point often meant automobile-based telephony.¹⁰

It is in Europe – particularly in the Scandinavian countries – that the successful automated and standardised cellular system was developed across national borders in the 1980s, soon to be followed by the European-wide adoption of a digitally-based Global System for Mobile Communications (GSM):

GSM allows for international roaming, is backward compatible with other systems, allows for various national tariff systems, and includes the ability to send and receive various data-based services, such as the much-maligned Wireless Application Protocol (WAP) and the much-adulated Short Message System (SMS). In addition, it includes items such as caller ID, call waiting, and voice mail.¹¹

Interestingly, SMS was originally a minor application for the deaf and was never intended by the industry to be the success it has become, which for Hjorth goes to show how planned customisation and the industry's promise of the personal are not to be confused with actual user practices.¹² Still,

according to Hjorth it is against this potentially subversive usage of personal mobile technologies that the iPhone's closed platform was first developed.

Together with the introduction of GSM the manufacturers of handheld devices were reducing the size and weight of the receivers which, rather than being mounted on cars, could be carried in pockets. This was immensely popular because, like the Sony Walkman before that, they were small, for individual use, and they could be carried anywhere. As such, mobile phones soon became active parts of daily life. From a functional object for communication the mobile phone became something that people carried with them on a daily basis and, like other personal items such as watches and clothes, something that signified the status and taste of the owner:¹³ Blackberries were for businessmen, the colorful Nokia devices for teenagers, and Japanese *keitai* for youth street cultures.¹⁴

It is safe to say that by the late 1990s the mobile phone in Europe had not only achieved an iconic status but also that its market of users was completely saturated.¹⁵ Originally a tool for voice and text interaction, the mobile phone had to become more like a computer if production companies wanted to avoid stagnation. Hence, especially after the release of the Ericsson R380 'Smartphone' in 2000, Western users were introduced to a mobile device combining the different functions of communication and information, enabling not only phone calls and text messaging but also limited and expensive access to an adapted, minimal version of the internet and to PC synchronisation, which provided users with email, calendars, and content such as photos, casual games, and ring tones. Beyond simply communicating at a distance people also used their mobiles for 'secondary engagements' during empty moments: to kill time by text-messaging, play Sudoku, or read email.¹⁶ Besides communication devices these mobiles became modes of entertainment and – to the extent that they helped us avoid talking to strangers – they were also means of selectively 'interfacing'¹⁷ our immediate surroundings. Mobile phones had gradually grown into personalised mobile media.

In Japan, where advanced mobile Internet services called i-mode were launched in 1999, the 'popular uptake of mobile devices, and innovative handset design by Japanese companies stole the wireless limelight in the twenty-first century'.¹⁸ A unique element in the i-mode system was that its parent company, the wireless carrier DoCoMo, controlled the development of web-like sites offering access to a variety of information services. In the words of Ling, it was more like an extended intranet than an open Internet. The company also

handles the billing and charges a 9% fee for all revenue generated by the various sites. In addition, DoCoMo receives the standard payment for transmission of data through its network. Thus, I-mode is not so much a technology as a system of infrastructure and marketing.¹⁹

Among the early mobile services offered in Japan were real-time mapping and direction applications based on *i-area* – a system that offered information concerning the whereabouts of the cellular phone on the basis of the *i-mode* base stations with which the connection was made.²⁰

As early as 2001, the Japanese were already using *i-mode*-based LBS (location-based services) that allowed users to find information about the closest restaurant and shops. The *i-area* service, for example, delivered location-specific weather, traffic, and dining information to users all over Japan.²¹

All-in-one and customisation

By the time Apple launched its iPhone, first in the U.S. and then elsewhere, users as well as researchers were quite familiar with the idea of a mobile device combining the different functions of communication, computation, entertainment, and positioning. Even the multi-touch screen – in the popular imagination *the* invention by Apple – had been with us for quite some time, though it had never been commercialised on such a scale. What was different in 2007 was the iPhone's design (marked by its large touch screen, offering a keyboard only when held in a particular way) and its improved Safari web browser. Otherwise, its innovation was to integrate and exploit old technologies and practices efficiently through the end-to-end systems design typical of Apple, which implied a convergence of hardware, software, and content delivery. Isaacson describes this as follows in his biography of Jobs:

[h]e believed that for a computer to be truly great, its hardware and its software had to be tightly linked. When a computer was open to running software that also worked on other computers, it would end up sacrificing some functionality. The best products, he believed, were 'whole widgets' that were designed end-to-end, with the software closely tailored to the hardware and vice versa. This is what would distinguish the Macintosh, which had an operating system that worked only on its own hardware,

from the environment that Microsoft was creating, in which its operating system could be used on hardware made by many different companies. 'Jobs is a strong-willed, elitist artist who doesn't want his creations mutated inauspiciously by unworthy programmers', explained ZDNet's editor Dan Farber. 'It would be as if someone off the street added some brush strokes to a Picasso painting or changed the lyrics to a Dylan song.' In later years Jobs's whole-widget approach would distinguish the iPhone, iPod, and iPad from their competitors. It resulted in awesome products. But it was not always the best strategy for dominating a market.²³

As Burgess has argued, there has been considerable debate as to whether the iPhone is to be seen as an open or closed device, whether it is hackable or simply usable;²³ the pros and cons differ with the respective ideologies at stake. While the high-tech avant-garde regret that they cannot tinker with the software so easily, the democratic 'populists' applaud the easy accessibility of the interface. However, seen from the perspective of business operations, and as Isaacson has noted, we can regard Apple's model as a closed one: the company builds the whole widget from the ground up, develops operating systems that only run on its own machines, offers content on the iTunes store that is not only formatted but also approved by Apple, oversees the distribution of its machines through carefully chosen retail outlets and, in the case of the iPhone, decides which singular mobile operators to work with in which country and what percentage of monthly subscriber revenue it will take from them. The design of the hardware, its technological capabilities, the operating system, and the way the content is on offer (through websites or apps) work together to produce an experience of user-friendliness controlled by Apple. According to Chen, this is a vertical business model that has also been exploited by Starbucks and that goes all the way back to Henry Ford, who 'owned iron ore mines, made [his] own windshields, and had end-to-end control over everything from manufacturing to sales'.²⁴

Ironically, Microsoft's 'open' and decentralised business model has been perfected and turned into a gigantic *closed-off* ecosystem by mega-corporations such as Google multiplying its reach across smaller and bigger companies such as YouTube (bought in 2006), DoubleClick (in 2007), and Motorola Mobility (in 2012) to guarantee control over the cross-platform flows of data and over a completely integrated user experience. Google's success in the mobile phone industry is a direct threat to Apple's empire. While Apple's walled garden aims to control operating systems, data plans, and media content in order to sell superior consumer devices, its major rival

Google Android is more interested in walling off the mobile Web, controlling the content industry, and safeguarding mobile ad delivery on YouTube, for instance.²⁵ Whatever the outcome of the ongoing battles between Apple and its competitors it is safe to conclude that through this rigid, vertically-integrated approach, Apple has delivered successful cult products such as the iMac, the Notebook and, in particular, the iPod to a generation of aesthetically-conscious users willing to pay double the price for a brand that presents itself as ‘think[ing] different[ly]’ from Microsoft. In more marketable terms, Apple has presented this hegemony as a user-friendly ‘all-in-one’. You buy an iMac and you get monitor and computer – user interface and hardware – in one; you buy an iPod to listen to your favorite songs and you get a complete music industry with it. This convergence of hardware, software, and distribution of content has led to ‘a consumer-oriented ethic of endless, seamless usability’.²⁶

And then came the iPhone – the epitome of airtight control sold as all-in-one. According to his biographer, this is how Jobs announced it at the annual Macworld Expo of early 2007:

‘[t]oday, we’re introducing three revolutionary products of this class. The first one is a widescreen iPod with touch controls. The second is a revolutionary mobile phone. And the third is a breakthrough Internet communications device.’ He repeated the list for emphasis and then asked, ‘[a]re you getting it? These are not three separate devices, this is one device, and we are calling it iPhone.’²⁷

With the birth of iPhone (‘it’s a son and we are calling him...’), Apple announced it was changing its name from Apple Computers to Apple Inc. to mark the fact that it was now more than a computer firm. As Burgess has put it, ‘the iPhone moment’ had to reposition the Apple brand in the midst of a wider range of consumer technologies while inviting us ‘as users, to be repositioned in relation to the technologies we integrate into our lives’.²⁸ The question we need to address now is how exactly that repositioning of the user by that all-encompassing mobile device happened.

In much the same way that Apple launched the iPod music player together with iTunes in 2001 – and the iTunes Music Store with thousands of songs distributed by Apple for only 99 cents in 2003 – the iPhone had to become a user-friendly, digital portable hub for communication, information, and entertainment with an accompanying Apple-customised content industry. But how to deliver all these data and services to a customer on the move and with neither the time nor the desire to go through elaborate

searches on the mobile web while walking to his car or buying groceries in the store? Apple realised that for the iPhone to function as an always-on mini-computer in the streets it had to offer the same browsing experience as on the PC, including fast connections, big screens, and touch-driven interfaces – but that was not enough. Along with smooth access to the mobile web all kinds of prepackaged web ‘apps’ needed to be developed that were easy to find and that acted as extensions of the central operating system. Apps are functions and usages that add to the iPhone’s capabilities and literally make it into all-things-in-one, wherever one is, 24 hours a day.

As Chen has noted, by early 2008 there was a mobile gadget, a browser, an operating system with apps, and even an open invitation to third-party app-developers, but no platform to make the app business lucrative and deliver the coded packages to the user automatically and all-in-one. Hence, together with the GPS-enabled iPhone 3G, the App Store was launched. The App Store application is part of the iTunes Store and has been installed on every iPhone since. In terms of design this is how it works: when you buy an iPhone the interface is dark and blank, inviting you, as the user, to fill it according to your needs. You turn it on and a limited amount of native icons appear, one of which is iTunes. Through this central button you access hundreds of thousands of apps and literally turn the gadget into anything you want, for as long as you want: a microphone, a game console, a video player, a camera; also a guitar tuner, a medical device, a museum guide, a children’s book, and so on. It is up to the user to decide which app to buy or add for free. In this process of customisation in which the user is invited to personalise the blank slate as she or he sees fit, the integration into our daily lives is greatly enhanced. One does not have to understand how it all works. Apple has continued to remind us that on its user interface the way it feels is how it works. Just push the button and use it.

Despite the fact that the App Store has been heavily criticised for completely controlling what is on offer first by the company’s stringent technical, financial, and editorial rules and regulations, and then by a team of reviewers who are said to have censored content deemed unfit,²⁹ the platform has helped to operationalise the phone in daily life. It has also explicitly positioned the iPhone ‘as an integrated component in two existing value systems’:³⁰ the iPod entertainment distribution and the mobile phone industry. The hype created around the App Store proved to be the influential part that essentially took over the phone industry and put Apple on the broader map of content and service providers in order to sell consumer devices. Since apps are constantly updated they are the perfect environment for the always-on, mobile lifestyle of Apple users in search

of enhanced phone experiences that cater to a variety of tastes, desires, needs, and activities. Moreover, by integrating the App platform into the existing iTunes Store users are encouraged to stay in the i-Cosmos of Pods, Phones, Pads, TVs, and Clouds which together constitute an ecosystem that provides Apple with a gigantic unified market for producers, developers, and consumers alike.³¹ While rival players Google, Windows, Nokia, Blackberry, Samsung, and operators such as Vodafone and Verizon respond with their own touch screen phones, mobile operating systems, content distribution websites, and exclusive joint contracts on data plans, only Google Play seems to be able to compete with the App Store downloads and revenues.³²

Selling location and navigation

Given this essay's claim that Apple has managed to integrate the phone and entertainment industries for the sake of selling personalised consumer technologies to a customer on the move, it is time to look at that movement in more detail. We will see that besides the principles of all-in-one and personalisation discussed so far, strategies of locating and navigating also played a major role in the success of the iPhone as a platform providing access to all kinds of services and information 'wherever you are'. The emphasis here is less on *what* is available through the iPhone than on *where* this is taking place. Since we are dealing with mobile users in changing situations the 'where' is always moving as well. Apple has placed its product as aware of the user's varying spatial locations, thereby helping her or him to control these locations. The ideal Apple customer is a mobile consumer in control of his or her gadget, life, and changing surroundings. Ultimately I will argue that the importance of location and navigation is all about situating the consumer's agency in an expansive, commodified, and increasingly modulated environment owned by Apple.

Before discussing the importance of 'location-awareness' further let me sketch its technological history and explain what is meant by GPS-enabled location-awareness in its most basic sense. Most of the literature on the topic speaks of 'location-aware technologies' as capable of locating themselves in space through triangulation or Global Positioning Systems (GPS); they are therefore able to provide users with location-specific information or help users to find the location of things and people around them. Location-awareness applies to technologies, content, and users. Technically, cellular phones have always been location-aware since cellular mobile networks

need to locate users in order to transmit and receive the signals that make communication possible:

[w]hen D.H. Ring at Bell Labs developed the cellular concept in 1947, he proposed that mobile phones should exchange radio signals with the three closest cell towers ... By triangulating waves, mobile phones can not only transmit voice, but also be located. The ability to locate mobile phones was what the U.S. Federal Communications Commission (FCC) took advantage of when, in 1997, it required that all mobile phones in the United States be locatable for emergency calls, that is, if somebody called 911 from their mobile, their wireless carrier should provide emergency services with the mobile phone's number and the cell site or base station transmitting the call.³³

Since one of the main technical characteristics of mobile phones is to repetitively locate the device or user through permanent triangulation, it should come as no surprise that the phone industry has encompassed these capabilities to move a saturated market forward. The i-area in Japan is a good example of this. Many of the early applications developed for the mobile device were generating located data as the basis of commercial services for their traveling customers. Location-based apps enable their users to pull information from the web on the basis of where one is and wants to go to, anywhere and anytime, and in a manner that helps to integrate the data on offer into our moving spatial surroundings. This combination of information, physical location, and movement happens through a collaboration of wireless networking, computing technologies, positioning systems, and portable receivers. Just as our computers are positioned vis-à-vis the Internet through unique numbers (IP addresses) that correspond to a precise physical location at home or at work, mobile devices are constantly positioned in space through calculations in networks. Whereas cell tower positioning is limited in range (about one mile between device and tower), and WiFi or Bluetooth connections happen through devices that are in close proximity (no more than a hundred yards), GPS works with precise satellite signals that cover the earth.

Originally developed for military surveillance in the 1970s, GPS has been selectively open to the public for decades, but full accuracy of signals for civilian and commercial usage in the U.S. and Europe only became available in 2000. This is how global positioning works: in a network of twenty-four satellites and five ground stations signals are constantly broadcast, specifying the time and the position of the satellites at an altitude of 11,000 miles.

'A GPS receiver measures the time that the different signals take to reach it, and by comparing that with what it learns about where the satellite is, the receiver can calculate its own position.'³⁴ As soon as the default disruption of signals available to civilians was suspended by the U.S. government Global Positioning occurred with an accuracy of five yards.

Soon after that the Amsterdam-based TomTom introduced its first GPS devices for car-navigation. When the FCC enhanced the 1997 law in 2005 and required that the location of each mobile phone calling 911 should be determined by emergency services within an accuracy of 100 yards, most phone providers automatically incorporated a GPS receiver within the mobile device. As was the case with most early GPS cell phones the calculation of the longitude and latitude of the mobile phone occurred in a collaboration with the signals of other wireless networks (WiFi, cell towers) in a process called 'GPS-assisted'. Operators were already investing heavily in 3G networks at around the same time.

We could say that all ingredients were available for location-based services on the smartphone well before 2007, but instead of focusing on these opportunities mobile carriers were emphasising

the opportunity to stream videos and watch TV on their phones ... But contrary to their expectations, early 3G phones were slow to take off ... one of the reasons for this initial failure was a lack of vision from mobile providers that insisted in paying their debt by charging users too much for accessing mobile applications.³⁵

It took the entrance of Apple's iPhone in the 3G networks to fully exploit this commercial potential and use located data as the basis of all kinds of services for traveling customers. From the beginning, Apple promoted its device as completely intertwined with the user and his surroundings. To put it in the celebratory words of *Time*:

[o]ne of the big trends of 2007 was the idea that computing doesn't belong just in cyberspace, it needs to happen here, in the real world, where actual stuff happens. The iPhone gets applications like Google Maps out onto the street, where we really need them.³⁶

And the street was there to be navigated, with a view to (increasingly personal) connection, entertainment, mobility, and consumption.

In order to illustrate how the iPhone was sold from the very beginning as a smooth combination of telephone, entertainment device, and positioning

technology, let us take a look at Apple's 'Calamari' ad which aired on U.S. television in May 2007, one month before the phone came out.³⁷ In the ad we see anonymous hands holding an iPhone in close-up and tapping an iPod button to watch Disney's *Pirates of the Caribbean* on the phone. In the film fragment on (the) display giant squid-like creatures slip from a ship into the sea among blasting guns while a male voice-over suddenly associates the fish with food: '[s]ay you're watching *Pirates of the Caribbean*... hmm...did someone say calamari?' Having thus been led in a different direction by a man craving seafood, a chain of other movements sets in. In the next shot we find ourselves looking at the iPhone's dock menu to switch between applications; as the fingers press the Map-icon a map of San Francisco opens up, thereby locating the anonymous user as an urbanite on the West Coast. The fingers type 'seafood' in the accompanying search window and several red pins appear on the map indicating the nearest seafood restaurants. Voice-over continues: '[t]he closest would be...ah!' As the label of the restaurant *Pacific Catch* is pressed we see its phone number, address, and website. The ad ends with the man choosing the phone number to call in his order.

In the television ad a causal chain of movements and gestures driven by a man's hands, personal tastes, and associations takes us on a journey across Apple's native icons – from iPod to Maps to phone – while we switch from movies watched in private to restaurants visited in public. Along the way the iPhone user transforms from a wizard with phones and a private fan of Disney into a mobile consumer of seafood. Telephone, media content, the user's personal taste, and the surrounding space are presented as all-in-one. Together they integrate the iPhone in a personal mobile lifestyle of immediate urban consumption. We can see what kind of user type ideally emerges, as it is inflected with the local:

a *mobile* consuming subject, one who has a mastery not merely over the iPhone technology itself but also over the urban environments in which the iPhone would quickly become commonplace after its 2007 launch. Apple also implies that the iPhone user can afford to pursue these activities, both financially and in terms of leisure time.³⁸

Whereas the highly-acclaimed advertising for Apple's iPod music player represented listeners as withdrawn and detached from the urban spaces they move through, here, thanks to the location-aware function of Maps, the iPhone consumer is put back in a city of consumption. Apple serves as the gateway to the selected services and places on offer in urban spaces.

As GPS functions have been added to the iPhone from 2008 onwards the promotion is less about locating the mobile user in real space than about targeting all the possible environments he or she might want to visit and getting them there immediately. Besides location the emphasis is on navigation; and more than the deictic realism of positioning ('you are here'), the vector of 'affective calculation' ('you want to go there and the iPhone directs you to it') is highlighted.³⁹ Movement through different places and the desire to move become the basis for all kinds of calculated services. While place-based consumption is still a driving force the information on offer on the phone is increasingly geared to economising movements. What is the most efficient or desirable way to get to a place? What can we offer you along the way? How can we stimulate you to share as much spatial information as possible with providers as well as other consumers?

Thanks to the GPS-enabled smartphone, the fast 3G mobile networks, and Apple's vision to launch the App Store, location-aware apps have become available to the general public and helped to boost spatial positioning and movement through a calculated space as taken-for-granted dimensions of our smartphone experience. Among the most popular usage we count the many maps and tracking systems that not only tell us where we are but also how to navigate the streets to reach our destination. There are spatially-annotated wiki-entries, restaurant reviews, sales on offer, and hotel booking systems that relate to where we might want to go based on previous bookings. Extremely popular in the U.S. are social networks such as *Foursquare* that allow us to 'check in' at places, leave comments, and share that information with a network of friends. Finally, there are *Layar's* augmented reality views of touristic locations, or buildings that enable us to access historical information about them and add our own geo-tagged pictures. These and other location-based services

comprise the fastest growing sector in web technology businesses with a forecasted profit growth from \$515 million in 2007 to \$13.3 billion in 2013. And within LBS, personal navigation – services that allow users to access and share location and information with friends – is the fastest growing area.⁴⁰

The more mobile the users the more important all the place-based information through which they can monitor and buy their many relations to their changing surroundings. Apple's App Store – constituted at the intersection of hardware, software, content, and user – offers a tightly-controlled and

integrated access to this lucrative world, with the company receiving one-third of the revenues generated through its digital distribution system.

Beyond the producer-user divide

The impact of these commercial developments on the way people interact with their devices, the urban environment, private and public spaces, and social communities has been discussed at greater length by Gordon and de Souza e Silva. Both have drawn our attention to the fact that not only does location-awareness enable us to locate ourselves in an offline world, in close proximity to other users and businesses, we are also *being* located in and by these networked technologies in a way that we ourselves do not control. Again, we see the close intertwinement of user agency and corporate power. Who has access to the spatial data that we leave behind on all these platforms, and to what end? This is not only limited to peers and service providers but also other commercial players, and even governments. There is a reason for such concern: Apple not only enables its customers to monitor their movements through apps approved by the company, it also uses locative (meta)data generated by the users without their knowledge and consent. Consider for instance the general outrage that erupted when two U.K. researchers found out in 2011 that ever since iOS4

your device has been storing a long list of locations and time stamps. We're not sure why Apple is gathering this data, but it's clearly intentional, as the database is being restored across backups, and even device migrations ... Anybody with access to this [unprotected] file knows where you've been over the last year, since iOS4 was released.⁴¹

In a long reply meant to control the damage Apple explained that it needed to gather the data not to have private information on its customers but to generate a collective database of the locations of all the cell towers and WiFi Hotspots around its users so that it could optimise the location and tracking capabilities of the phone.⁴² In other words, users were co-creating their own and other's improved locations unwittingly, even if they had chosen to disable the tracking functions on their iPhones. Everybody was contributing to Apple's database for free while making its space-based services more valuable by the day.

Unwitting crowd-sourcing has become a major venue for collectively increasing the set of spatial data, feeding it back to customers on the move,

and contributing to a constant profiling of users and their surroundings. Of course, we can say more generally that crowd-sourced location has become a useful form of data aggregation, as evidenced by the introduction of location-aware functionalities on Facebook, Twitter, Flickr, Wikipedia, and the success of Google Maps mashups enabling users to upload their own location-specific information. But while this kind of location-awareness has been adopted on desktop services because of the social desire to locate ourselves in relation to information, or because geographical longitude and latitude have proven to be an economically-efficient way of organising information online, it has become central to mobile phones and mobile applications, and hence extremely difficult to control. The phone has been transformed into a platform for carefully-targeted entertainment, commercial service delivery, social networking, and increasingly also for involving the user and his or her movements and surroundings unawares. Thanks to the location-awareness and tracking-capabilities of mobile phones users can now get the right kind of commercial service at the right place at the right time – and Apple gets masses of money and user (meta)data in return.

The preceding analysis has demonstrated once again that there is nothing revolutionary about the iPhone's locational and tracking capabilities. The successful working of the device depends on the way it links into existing networks, infrastructures, and practices with distinctly different provenances and manages to combine and integrate these, thereby furthering their development in particular directions: context-specific consumption and, increasingly, extreme commodification of individuals' spatial practices and the places they travel through. Collecting spatial (meta)data and letting the user update the spatial databases for the sake of optimising commercial services, including the services of personal location and tracking, is the logical final step in Apple's combined strategies discussed in this essay: all-in-one, customisation, and location-awareness. It shows how a company that became big in the computer industry and then repositioned itself as a producer of consumer technologies and an accompanying content-industry is moving in somewhat unexpected directions, that of user-generated content, bringing it closer to its main competitor the Google Android.

YouTube, Google's most successful product, has excelled in luring the more 'creative' user eager to upload her or his own videos and make them available to a broad audience. Not unlike Facebook, Google has become rich by putting the user to work. As Jeroen de Kloet and Jan Teurlings have put it:

YouTube (the company) does not produce a single second of the millions of hours of video on its website, but relies on its collective user base to generate

its content. As a result, YouTube has managed to reduce its production costs to zero, only bearing a portion of the distribution costs, which is – roughly – comprised of server costs and software development. And the main party doing the creative work, supplying artistic content, as well as executing technical chores, is the audience ... The role played by the audience in this new ecosystem is no longer the limited role of ‘the consumer’; rather, the new system joins producer and consumer into a single role – the role of prosumer so often heralded by futurists and business gurus alike.⁴³

Google has also brought all of its products, including YouTube, Maps and Streetview, under one common license, enabling it to ‘combine and merge all behavioral and profiling user data from all Google platforms’.⁴⁴ Apple’s iPhone-turned-media, or its handset-turned-platform, operates within this expanding ecosystem of applications and services designed to generate new options constantly, outdo competitors, and encroach upon each other’s territory with one goal only: increase the benefits for the platform developer by maximising the agency of the users in their daily surroundings as fully as possible. Channeling users across interconnected platforms from searches to maps, commercial services to user-generated content, and, increasingly, unwitting crowd-sourcing leads to user empowerment, commodification and exploitation.

Today such a user-driven environment thrives through hidden privacy transgressions and monetising tactics that are bound to run up against public protests, as witnessed by the 2011 case described above, also the recent NSA scandals unleashed by Edward Snowden. The future of the GPS-enabled smartphone will be about who owns the users’ (meta)databases of location and tracking that render social space subject to novel forms of commodification and user-involvement.

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Notes

1. For a good discussion of the impact of the iPhone on the telecommunication industries in the U.S. and Europe see West & Mace 2010. For the impact in China see Hjorth 2012 and in Korea see Dong-Hong Lee 2012. A PDF file ‘Apple’s Pricing Strategy’ authored by D.

- Sliwinska, J. Ranasinghe, and I. Kardava is circulating on the web, discussing the different pricing strategies that Apple conducted in the U.S. and Europe in 2007 and 2008: (accessed 13 September 2013).
2. Isaacson 2011, p. 23.
 3. West & Mace 2010, p. 275.
 4. Goggin 2012, p. 20.
 5. Hjorth 2012, p. 197.
 6. Goggin 2012, p. 19.
 7. Ibid., p. 23.
 8. Lev Grossman from *Time* calls the iPhone the 'Invention of the Year' on 1 November 2007. http://content.time.com/time/specials/2007/article/0,28804,1677329_1678542_1677891,00.html (accessed on 5 September 2013)
 9. Ling 2004; Ling 2008; de Souza e Silva & Frith 2012.
 10. Ling 2004, p. 27.
 11. Ibid., p. 28.
 12. Hjorth 2012, p. 191.
 13. Fortunati & Katz & Riccini 2003.
 14. Ito 2005.
 15. Ling 2004, p. 12.
 16. Ling 2008, p. 100.
 17. de Souza e Silva & Frith, 2012.
 18. Ito 2005, p. 2.
 19. Ling 2004, p. 29.
 20. This information can be found at http://cellular.co.za/news_2001/07152001-ntt_docomo_launches_area_informa.htm (accessed on 5 September 2013).
 21. de Souza e Silva & Frith 2012, p. 88.
 22. Isaacson 2011, p. 94.
 23. Burgess 2012, p. 30.
 24. Chen 2011, p. 88. Such a corporate model is often contrasted with what is called the 'horizontal' outsourcing and licensing activities of Microsoft, which develops software that runs on multiple PCs and allows external developers to build applications for Windows. Likewise, Google's strategic commitment to openness is demonstrated by its decision to make its mobile operating system Android open source and the Nexus One phone unlocked. Microsoft's open business model eventually outplayed Apple Computer in the 1990s and it remains to be seen what Google's plans are for the world of media content. Ever since the success of Google's application downloading platform Android Market (now Google Play), which requires closer cooperation with network operators, Google appears to have given up its search for openness and succumbed to the corporate control of carriers such as Verizon, which, in turn, is trying to win back the pole position it had to give up to Apple's iStore, in terms of mobile content delivery. (Chen 2011, pp. 108-109)
 25. For a lengthy discussion of Google and Verizon's dubious 'A proposal for an open internet' (2010) see Chen 2011. Chen claims that Google and Verizon's plea to treat the traffic of content on the mobile web differently from that on the Internet 'would effectively enable Google and the telecom industry to regulate Internet connections for phones to their own benefit. For instance, Google could strike deals to have YouTube video stream faster than their competitors' videos, or telecom companies could speed up services that they offer while slowing down or raising costs for smaller companies wishing to offer services for web-connected phones.' (Chen 2011, p. 111)
 26. Burgess 2012, p. 36.

27. Isaacson 2011, p. 266.
28. Burgess 2012, p. 29.
29. For a discussion of how Apple's censorship works against certain app developers in the U.S. see Chen 2011, pp. 91-94. In contrast, Goggin's article on 'Ubiquitous apps' (2011) scrutinises the politics of openness at work in various app platforms and from a transnational perspective, covering both the enormous economic industries behind mobile media culture and the tradition of user resistance in China's iPhone experience.
30. West & Mace 2010, p. 275.
31. The term i-Cosmos is taken from Fischer 2011, based on an exhibition on the design history of the 'i-family' held in Frankfurt in 2011.
32. In the introduction to *Moving Data*, Snickars and Vonderau state that 'for all of its success in the mobile smartphone business, the Apple iOS has lately been surpassed by other mobile operating systems. In 2011, Americans were buying more Android mobiles than iPhones – mainly because there are so many models using the latter operating system.' (Snickars & Vonderau 2012, p. 9)
33. de Souza e Silva & Frith 2012, p. 87.
34. Kurgan 2013, p. 39.
35. de Souza e Silva & Frith 2012, p. 96.
36. http://www.time.com/time/specials/2007/article/0,28804,1677329_1678542_1677891,00.html
37. The advertising trade publication *Adweek* has put Apple's early television campaign on its website. The television spots were produced by the international advertising agency TBWA. The 'Calamari' ad can be found at <http://www.adweek.com/news-gallery/advertising-branding/apples-iphone-tv-ads-complete-campaign-143628#calamari-4> (accessed on 5 September 2013).
38. Tryon 2012, p. 125.
39. The term 'deictic realism' is based on what Verhoeff has called the 'deictic markers' in digital cartography: '[d]eixis is a term borrowed from linguistics to explain how language is context-dependent ... Deixis indicates the relative meaning of the utterance, tied to situation of utterance, an I in the *here* and *now* ... Deixis establishes the point of origin, or deictic center, of the utterance.' (Verhoeff 2012, p. 126) In a wonderful discussion of Google's location platform Places, Barreneche has argued that the algorithms and databases of geocoded information serve to introduce a spatial ordering of subjects for the purpose of economic governance. Through reviews and likes Google is able to use sentiment analysis as 'a form of "environmental power" that works as a modulation of the relationship between the user and his/her environment through "affective calculation" and the modulation of affectivity – perception of place.' (Barreneche 2012, pp. 336-337)
40. de Souza e Silva & Frith 2012, p. 9.
41. Alasdair Allen and Pete Warden's announcement at the 2011 *Where 2.0* Conference in Santa Clara can be found here: <http://radar.oreilly.com/2011/04/apple-location-tracking.html> (accessed on 15 November 2012).
42. Apple's press release from April 2011 is available on <http://www.apple.com/pr/library/2011/04/27Apple-Q-A-on-Location-Data.html> (accessed on 15 November 2012).
43. de Kloet & Teurlings 2008, pp. 350-351.
44. Van Dijck 2013, p. 124.

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