



global mobile

APPLICATIONS and INNOVATIONS for the
WORLDWIDE MOBILE ECOSYSTEM

edited by

PETER A. BRUCK and
MADANMOHAN RAO

Praise for *Global Mobile*

“Nothing gets marketers closer to their consumers than mobile and nothing captures or educates on that better than *Global Mobile*. It’s a must read for the future.”

—Greg Stuart, global CEO, Mobile Marketing Association

“One might easily mistake this for a book about mobile. It’s really about the history of our world at the precipice of transformation. Full of astonishing facts and insights, this easy-to-read and well-edited compendium helps us understand the prolific and profound shifts that augur the world’s most accelerated global upheaval.”

—Florie Brizel, author and mobilologist

“Timely, comprehensive, and ambitious, catching and documenting the world as a major transformation takes place; an excellent resource ... just what students need to dip into frequently as background to the wider world of mobiles and mobiles in the wider world in order to see the broader social, cultural, and economic context of the changed world of learning.”

—John Traxler, professor of mobile learning and director, Learning Lab

“Mobile is now a global phenomenon. But different geographies have different emphases within mobile. Few books provide the global perspective. Bruck and Rao’s excellent book provides insights from global experts and thus helps cross pollinate ideas. I very much recommend it.”

—Ajit Jaokar, founder, feynlabs/futuretext, London

“A must read ... presents the various dimensions of the mobile ecosystem that has become omnipresent in our daily lives and work. These various perspectives also inform us of the world we inhabit today and the future we are heading into globally, from multiple lenses.”

—Sundeep R. Muppidi, PhD, MDP, past secretary general of the Asian Media Information and Communication Centre, Singapore, and associate professor of communication, University of Hartford (CT)

“Mobile is redefining the way we service the citizen, student, shopper, and user. While mobile consumers have become faster, incumbent institutions have not managed to keep up. *Global Mobile* provides key insights from mobile leaders across the world. This book is an essential toolkit for governments, businesses, and brands that need to reconnect to their mobile consumer.”

—Gary Schwartz, author, *Fast Shopper, Slow Store*, and mobile chair emeritus, Interactive Advertising Bureau and Mobile Entertainment Forum

“*Global Mobile* provides a tour de force examination of the transformative impact of mobile communications around the world.”

—John Pavlik, Northwestern University, Qatar

Contents

Preface	ix
Introduction: A World Gone Mobile	1
<i>Madanmohan Rao</i>	
Part One	FOUNDATIONS
Chapter 1	Mobile and Megatrends 29
<i>Tomi Ahonen</i>	
Chapter 2	The Psychology of Mobile Technologies 47
<i>Pamela B. Rutledge</i>	
Chapter 3	Mobile Theories and Frameworks 73
<i>Yi-Fan Chen</i>	
Chapter 4	Digital Gemeinschaft, the Control Revolution, and Technologies of Social Mediation 93
<i>Rich Ling</i>	
Chapter 5	Competition and the Evolution of Mobile Markets 109
<i>Chetan Sharma</i>	
Chapter 6	The Business of Mobile in Japan 121
<i>Lawrence 'Lars' Cosh-Ishii, Mobikyo</i>	
Chapter 7	Mobile Web Design Strategies 139
<i>Janine Warner</i>	

Chapter 8	Mobile Spectrum: Overcoming Challenges of Scarcity	159
	<i>Lynne Gallagher</i>	
Part Two	MOBILE IMPACTS	
Chapter 9	Mobile Health	175
	<i>Patricia Mechael, Ada Kwan, and Dayle Kern</i>	
Chapter 10	Mobile Education	197
	<i>Jon Mason</i>	
Chapter 11	Mobile Phones and Journalism	213
	<i>Stephen Quinn</i>	
Chapter 12	The Mobile Media Experience	227
	<i>Xu Xiaoge</i>	
Chapter 13	Mobile Entertainment: The World Is Overflowing With Screenagers!	243
	<i>Ralph Simon</i>	
Chapter 14	Mobile Value-Added Services	257
	<i>Sanjay Uppal</i>	
Chapter 15	Mobile Workforce: The Rise of the Mobilocracy	275
	<i>iPass, Inc., Kate Blatt, and John Gallagher</i>	
Chapter 16	The Role of Mobile Social Media in Enterprises	293
	<i>Tobias Brockmann and Stefan Stieglitz</i>	
Chapter 17	Social + Location + Mobile: SoLoMo Analytics and the Transformation of Shopping	311
	<i>Phil Hendrix</i>	

Chapter 18	Mobile and Small Business: Emerging Trends and Scenarios	329
	<i>Andrew Pearson</i>	
Chapter 19	The Mobile Opportunity in ICT4D	345
	<i>Ken Banks</i>	
Chapter 20	Mobile Phones and Financial Inclusion	363
	<i>Anir Chowdhury and Partha Sarker</i>	
Chapter 21	Rural Mobile	385
	<i>Bashir Patel</i>	
Chapter 22	Mobile Telephony in Rural Areas: A Case Study in Puno, Peru	409
	<i>Mireia Fernández-Ardèvol, Roxana Barrantes Cáceres, and Aileen Agüero García</i>	
Chapter 23	Mobile Government	429
	<i>Seang-Tae Kim</i>	
Chapter 24	Mobile China: Opportunities and Challenges ..	447
	<i>Xu Xiaoge</i>	
Part Three	THE ROAD AHEAD	
Chapter 25	Mobile Innovation Ecosystems: The Global Mobile Monday Community	467
	<i>Jari Tammisto</i>	
Chapter 26	Mobile Excellence: Awards and Mentorship Processes for Innovators	483
	<i>Osama Manzar</i>	
Chapter 27	Mobile Innovation Trends: Beyond the Hype Cycles	505
	<i>Anuraj Gambhir</i>	

Chapter 28	Mobile Operators: Shifting Value Chains	521
	<i>Karim Taga and Clemens Schwaiger</i>	
Chapter 29	Policy and Regulatory Issues in the Mobile Internet	539
	<i>Russell Southwood</i>	
Chapter 30	Mobiles and the Law	555
	<i>Pavan Duggal</i>	
Chapter 31	Mobile Partnerships and Alliances	567
	<i>V. Sridhar</i>	
	About the Contributors	581
	About the Editors	591
	Index	593

Mobile and Megatrends

Tomi Ahonen

Editors' Note: This panoramic chapter captures the scale and scope, as well as the excitement and passion, of the mobile movement. In just over three decades, the mobile industry has crossed the \$1 trillion mark, the youngest and fastest industry to do so. This chapter traces the convergence path of mobiles with industries such as news, games, advertising, payment, music, photography, and social media. Mobile as the 7th mass medium has nine unique capabilities, including being personal, permanently connected, always on, and accurately measurable. Mobiles also enable augmented reality and can capture the social context of consumption. The innovation in mobile is relentless, and some predict that the world will change more in the next 10 years than it has in the preceding 100 years.

At the start of the new millennium, there were many new technology areas that seemed roughly as promising when compared to each other. The internet was among the strongest. Traditional media and telecoms were in strong growth, television was nearing the 1 billion mark in TV sets used worldwide, and fixed landline telephones had passed that lofty level worldwide. Wireless technologies, from Wi-Fi to satellite phones to cellular telecoms, were abundant. Mobile phones included many wireless technologies: cellular telecoms, infrared, and such new short-distance technologies as Bluetooth. In all fairness, the promise of cellular telecoms, or “mobile,” was actually more risky, even more doubtful, because of the vast expense involved in 3G infrastructure. There were some pundits and forecasters who even suggested 3G would bankrupt the whole mobile industry. The October 11, 2001, cover story in *The Economist* stated that the mobile internet was “the biggest gamble in business history.”¹ A safe bet would be to believe in personal computers (PCs) or television or the internet. A far more risky bet was to believe in mobile.

Since then mobile grew at a mind-boggling pace. During the past decade, mobile became the fastest-growing major industry on the planet, and by 2009, mobile passed the \$1 trillion level in annual income, becoming one of the biggest industries on Earth. So to be clear, mobile today is far bigger than broadcast media (television and radio combined), far bigger than the computer and information technology industry, and far bigger than music, movies, video gaming, and the print industry (magazines, books, and newspapers). Mobile accounts for about 2 percent of the total gross domestic product of the planet and sits alongside a few other giants in the \$1 trillion annual revenue club—the automobile, housing and construction, food, military, banking, and insurance industries among them.

However, whereas many \$1 trillion industries are older than 100 years—and some are thousands of years old—the mobile industry is only in its 30s. The world's first commercial cellular telecom service went into production in 1979 in Tokyo, Japan, when Nippon Telegraph and Telephone (NTT) started a cellular mobile telecom service. Mobile was the fastest industry ever to go from zero to \$1 trillion dollars in annual revenues. In the past three decades, we have witnessed the emergence of the fastest-expanding industry ever seen by humankind. That is pretty dazzling, and it is no wonder we see such astonishing success stories in mobile as Apple and Google and Angry Birds.

Megatrends Converging

But that was the past. What about the now and the future? We are living in a time when more giant industries are converging than ever before. We will witness a different type of world record in this decade. This chapter does not address the evolution of mobile “from inside” the telecom industry, but looks at other industries from the outside of mobile.

The mobile industry is the ultimate cannibal among industries. Mobile cannibalised voice calls from the fixed landline telecom business. Today, if you telephone someone, in five cases out of six, the phone that answers will be a mobile, not a landline, phone. Similarly, email celebrated 40 years in 2011. Mobile messaging entered consumer use in Finland only 18 years ago and is already far larger than email. SMS (short message service) text messaging, the world's biggest data service, has three times more users than email and seven times more users than Facebook. It is quite reasonable to expect that the utility of a mobile phone or mobile messaging device will soon drive the mobile side to dominate communications.

What of noncommunication uses of mobile? Content or data services on mobile started in Finland in 1998 with the advent of the first downloadable ringtone. Today, basic ringtones outsell MP3 files in digital downloads.

Speaking to the CTIA Wireless and IT Entertainment Conference in San Francisco in 2005, the chairperson of Warner Music, Edgar Bronfman Jr., said, “Wireless will become the most formidable music platform on the planet.”²

Since then, subscription music services have appeared on mobile, starting with ringback tones, which are now bigger in revenues than global iTunes music sales. Sony brought its Walkman brand to music phones, and Apple admitted that it had to create the iPhone because music phones such as Sony’s Walkman phones were cannibalising iPod sales.

The next big media content category for mobile was video gaming, which started when Nokia introduced the Snake on its mobile phones. It did not take long for games to find their market. Already in 2007, John Riccietello, chief executive officer (CEO) of Electronic Arts, the world’s biggest video gaming company, said that mobile devices help video gaming grow. Since then, the iPhone has become the world’s widest-reaching gaming platform, with more gaming users than the PlayStation platforms or the Xbox or Nintendo gaming devices (according to Morgan Stanley).

What of TV and radio? The world’s first downloadable video clips viewable on mobile phones were introduced by MTV3, the television broadcaster in Finland, in 2001. Simultaneously in the U.K., video music channel MTV invented interactive television voting via SMS text messaging on the TV show *Video Clash*. The broadcast industry has been on a rapid collision course with mobile ever since. The BBC’s general manager, Greg Dyke, said in 2005 that in the future all broadcast content will be available on mobile phones.³ Now not only do people watch full television episodes and even full movies on the tiny screens of their phones, but there are premium “voice” services that deliver niche radio services via the mobile phone to specialised groups and smaller audiences. In India, for example, radio services (often live cricket games and Bollywood music) delivered via cellular phone networks generate more money than the total radio broadcasting industry.⁴

What of the PC industry? The world’s first smartphone was the Nokia Communicator, and early on, most PC executives were dismissive of the smartphone as “a real computer.” That story changed when they saw Apple’s iPhone, and since then, the major computer makers—HP, Dell, Acer, Lenovo, and Toshiba—have accepted the smartphone as a true computer. In 2011, for the first time, more smartphones were sold than all types of PCs combined (including desktops, laptops, and even tablets such as the iPad). Apple is the world’s largest computer maker if we count all its computer products, including smartphones such as the iPhone. Nokia is the second-largest computer maker, ahead of HP, and Nokia’s ranking is based on selling only smartphones—no desktops, laptops, or tablets of any kind.

On the internet side, the world’s first full, “real” internet service on mobile was launched in Japan by NTT DOCOMO in 1999, so the mobile internet was

only 14 years old in 2013. But already today, more people are accessing internet services from their mobile phones than are using PCs. Google has been saying for 5 years now that the future of the internet is mobile. That is also what Yahoo! has been saying for many years.

What of news? The first mobile phone-based news service was introduced in Finland by the Tampere-based newspaper *Aamulehti* in 1995 via SMS text messaging. It took a while, but in 2011, at the Associated Press (AP) Media Editors' conference, the AP's CEO and president, Tom Curley, said: "Media companies lost revenues with the internet but have a chance to change that with mobile."⁵ So newspaper editors see that mobile is indeed a different medium from the internet. In my sixth book, *Mobile as 7th of the Mass Media*, I argued that mobile had unique abilities as a mass media channel and should be considered a new, distinct mass medium. Also of note, the AP managing editors clearly felt that it is easier to make money on mobile than to make money on the legacy internet formatted for PC screens.

Advertising arrived on mobile phones in 2000 with MTV3 of Finland offering a free news headline service via SMS and sponsored by advertising. The advertising world moved slowly to mobile, but after the iPhone, global mobile ad spending roughly doubled annually for 3 years straight. Mobile advertising now receives increasing endorsements. Omnicom is the world's biggest ad agency group, and its largest arm is BDDO, whose CEO, Andrew Robertson, said in 2005, "We are rapidly getting to the point where the single most important medium that people have is their wireless device. It's with them every single moment of the day. It's genuinely the convergence box that everyone has been talking about for so many years."⁶ That is quite a powerful endorsement of the advertising opportunities in mobile.

However, what of the advertisers? Ford became the first global advertiser to say that it will include mobile in every campaign it will run in the future. It said so in 2011.⁷ And Coca-Cola says the way to do mobile advertising is to follow Coca-Cola's 70:20:10 rule, whereby 70 percent of the money goes to mobile messaging, 20 percent to the mobile internet, and only 10 percent to smartphone apps.⁸ That is well in line with U.S. food giant Kraft, whose mobile marketing strategy is built on "No Phone Left Behind."⁹

One more giant global industry, credit cards, also endorses mobile. Visa said in 2011 that the future of payments is mobile. Developments on the money frontier include cheques, plastic money in credit cards and bank debit cards, contactless payments such as Oyster and Octopus cards, and emoney such as PayPal. But none of these have killed cash. Mobile money was invented in Finland in 1999 when Coca-Cola introduced the world's first vending machines that could be operated with payments from premium SMS. Soon, mobile operator Smart in the Philippines launched a full mobile banking and payment system based on SMS, and the world's first full mobile

wallet launched in Japan on NTT DOCOMO using near field communication (NFC). Today, one in five Japanese consumers uses the DOCOMO system called Osaifu-Keitai and branded FeliCa.

But let us return to Visa's proclamation. Sweden was the first country to start discussions in 2010 about the end of cash, as Sweden already has nationwide payments working on mobile, and every Swede has a mobile phone. Kenya, Somaliland, Estonia, South Korea, and many other countries are in the race to be the first to eliminate cash and replace it with mobile money. The Dutch merchants association is lobbying the Netherlands government to allow shopkeepers to stop accepting cash payments in Euros. But the first country to give a definite date was Turkey, which said in 2011 that by 2025 it will stop manufacturing cash. Wow! After thousands of years of cash, we will see the end of it, and Turkey may well become the first cashless country in the world.

Every Threat Is an Opportunity

Various industries are struggling with the opportunities and threats of this grand convergence. Industries deep into the transition offer valuable insights and guidance. No other business has been more disrupted by mobile than the camera and photography business. Mobile took only 80 percent of the business of the fixed telecoms, but in the camera industry, mobile has snatched 90 percent of the market.

So let us consider the plight of the major camera, photography, and film brands. Cameras have existed for more than 150 years. In the past century, every decade saw roughly a doubling of the global camera population. The industry was growing at a rate comfortably faster than that of the global economy, and the big photography industry brands—Nikon, Canon, Minolta, Konica, Polaroid, and Kodak—entered the new millennium as strong, profitable companies. In 2000, nobody was suggesting that mobile phones would replace cameras. The world had not even seen the first rudimentary cameraphone.

Whereas the previous century had seen steady growth of the camera industry, roughly doubling in size every decade, the 10 years from 2000 to 2010 witnessed the golden age of photography. The global camera population did not double in that decade; it grew 10-fold. Today, 90 percent of people who use a camera had never used one 10 years ago. But the incumbent camera giants did not fare well in the golden age of photography. Minolta and Konica have quit the camera business totally. Kodak went bankrupt. Polaroid did one better: It went bankrupt—twice. Canon and Nikon survived by shifting strongly to professional photography.

Today the world's bestselling camera brand is Nokia. More people take pictures and shoot video today on a Nokia-branded cameraphone than on all Nikons, Canons, Minoltas, Leicas, Hasselblads, Konicas, Polaroids, and Kodaks—and whatever other camera brands ever existed—combined. The golden age of photography saw all the incumbent photography brands suffer or indeed disappear. The winners are cameras with brands such as Motorola, Samsung, SonyEricsson, LG, Apple, BlackBerry, HTC, ZTE, Huawei, and Nokia. A traditional camera industry brand that best capitalised on the mobile opportunity is the optical camera lens manufacturer Carl Zeiss, which provides the optics for premium Nokia cameraphones such as the 808 PureView.

There was a huge growth opportunity in the grand convergence, when a camera brand such as Minolta, a mobile handset brand such as Nokia, or a PC maker such as Apple, who recently started to make smartphones, could compete. There could have been smartphones by Konica, Polaroid, Kodak, Minolta, Canon, or Nikon—but there were none. They did not see cameraphones as a serious threat. It was like the big computer makers of the 1970s such as Burroughs, NCR, Control Data, and Univac, who did not conceive of the PC as a threat to their business. For every industry involved in this massive digital collision, every rival industry is both a threat and an opportunity.

Who would have thought that a computer manufacturer could become a music store (Apple iTunes), that a telephone manufacturer could replace compasses and maps (Nokia Navteq), or that an internet search provider would manufacture smartphone operating systems (Google Android). If Vodafone can become a bank (M-Pesa across many African and Asian countries), then why can't Citibank become a mobile operator or carrier? That is not a laughing matter; it has already happened in the Ukraine, where PrivatBank has launched its own SIM cards and branded mobile telecom services as a mobile virtual network operator, similar to the more familiar Virgin Mobile in markets from Canada to Australia.

Mobile Is the 7th Mass Medium

There are seven mass media (in order of their introduction):¹⁰

- 1st mass media channel: Print
- 2nd mass media channel: Recordings
- 3rd mass media channel: Cinema
- 4th mass media channel: Radio
- 5th mass media channel: Television

6th mass media channel: Internet

7th mass media channel: Mobile

This categorisation of the media channels is useful to highlight differences and similarities. Recordings (early recordings were only “records” of music) are a sound-oriented mass medium similar to radio. Television is similar to cinema in being a “moving picture” type of multimedia channel. Television and radio are both broadcast media, so they are received simultaneously by the millions who have the right type of receivers. And so on.

When many look at a mobile phone, they easily see a small pocket computer or pocket internet device. It is very easy to fall into the trap of thinking that a mobile service is “the same as the internet” and also that at some point, the legacy PC-based internet and the newer mobile phone-based mobile internet will merge. While that makes sense on first viewing, a deeper analysis of the opportunities involved reveals the fallacy in the logic.

Mobile is actually a distinct mass medium and offers plenty of opportunities that the legacy internet cannot deliver. Just to give one example, ringtones are not installed on laptops, only on mobiles. But ringtones are a multibillion-dollar content industry that thrives only on mobile phones. That alone is proof that mobile is a unique mass medium: It can sustain unique content types that cannot be replicated on earlier media. Technologists now need to discover what kind of business opportunities exist on this new media channel and how to best capitalise on those opportunities.

Mobile Has Nine Unique Abilities

Early on it was difficult to prove that mobile might be more than just a small pocketable computer and internet device. But as the industry grew up in the past decade, unique abilities of mobile have been and are being discovered. There are at least nine unique abilities accounted for so far:

Mobile is the first personal mass medium.

Mobile is permanently connected.

Mobile is always on.

Mobile has a built-in payment mechanism.

Mobile is available at the point of inspiration.

Mobile is most accurate in measuring an audience.

Mobile captures the social context of consumption.

Mobile enables augmented reality in media.

Mobile provides a digital interface to the real world.

A unique ability, as the name suggests, is the ability to do something not possible before. When recordings first appeared, there was no way to do recorded sounds before. It was only possible to sell sheet music so that someone could sing songs or play them on the piano or guitar or violin. The career of a pop star could not thrive in the print-medium era. An Elvis or the Beatles or Lady Gaga could not be “heard” through the newspaper or book or magazine. The ability to deliver sound as a media format was unique to recordings 120 years ago, when recordings joined print as a mass media channel.

Pictures could be captured in print, but pictures could not be included in early sound recordings before videotape and the computer CD. Then came the moving picture or motion picture, with movies today epitomised by Hollywood, Bollywood, and Nollywood. Movies had found another unique ability, since neither print nor (early) recordings could replicate moving pictures.

Now we have mobile, the 7th mass media channel. Consider the popular concept of location-based services. Location-based services are often mentioned as a promising area for new innovations and services for mobile media. They seem on first view to be unique to mobile. Location-based services cannot be done on television or recordings. Location accuracy on the internet might be possible but can rather easily be circumvented or disguised. So one might think location is a unique ability. Except that it is not unique to mobile. Cinema is location-based. Location-based advertising can be in the movies—by showing an ad for a local restaurant, for example, that is walking distance from that one cinema only. In another movie theatre, an ad could be sold to another restaurant. So location-based services are not unique to mobile.

Mobile has nine unique abilities. Mobile is personal, permanently connected, and always on. It has a built-in payment mechanism, is available at the point of inspiration, and is most accurate in measuring an audience. It captures the social context of consumption, enables augmented reality (AR), and provides a digital interface to the real world.

Mobile Is the First Personal Mass Medium

The internet suggested it was a personal medium, but that turned out to be an illusion. People share PCs too often and use multiple devices; often the devices sit behind firewalls; users can delete the cookies spying on their internet behaviour. When the internet first became a mass media channel in 1994, many tech pundits promised a targeting and personalising nirvana, with a marketing concept of the “segment of one.”

The internet did not fulfill the promise of that segment of one or of the truly personalised mass medium. That degree of personalisation did not

come about until the mobile industry added the concept of the globally unique subscriber identity with every individual mobile account. Our phone number is the nearest thing to a global digital identity number. The landline could not deliver this, as the home phone was used by all members of the family. But most people do not share their mobile phones, not even with their spouses.

Services that fit into the personal attribute include just about anything that any individual might find to his or her personal taste, be it Formula One racing or James Bond movies or cooking or jogging. What is appealing to one might be unpleasant to someone else. The more powerful side of the personal attribute is that it includes all those things we may not want to reveal, such as a problem with health or a financial trouble. Mobile can address such issues without the shame and public humiliation. A notable example is the mobile service that helps older women in Pakistan learn to read. Modern Pakistani boys and girls get to go to school, but in earlier times, often only boys went to school and girls did not. Thus there is still a lot of adult illiteracy in Pakistan, mostly among women. Now there are simple lessons that teach basic reading and writing of Urdu, and an older woman can take one lesson at a time. These lessons are also designed for working in pairs, so that, for example, a daughter can teach her mother to read. Mobile is perfectly suited for such types of services.

Mobile Is Permanently Connected

The second unique ability is that mobile is permanently connected. Other media, such as radio, TV, or internet, can also be permanently connected, but they were not designed to be left on 24/7, nor were the services built upon those electronic media designed to take advantage of the ability. In most cases, people are taught to turn off their radios and TV sets and PCs to conserve energy. In the cases of laptops, the battery usually does not last more than 3 hours, so permanent connectivity is not even feasible. But mobile phones were designed from the start to be left on for 24 hours and remain connected. That is how we are able to be reached, which in turn created the concept called *reachability*. Reachability is why most people, when told to turn off their phones at conferences or in meetings, will not in fact turn them off; they turn off only the ringers. People do not want to be unreachable.

Permanently connected means that people even take the phone to the bathroom and sleep with the phone within arm's reach. It is of course an alarm clock, calendar, and calculator as well. The mobile is quite literally the last thing people look at before they go to sleep and the first thing they see when they wake up in the morning.

Permanently connected also means that mobile can reach people at any time. It is good for communication services, but it is literally lifesaving in terms of natural disasters. New Japanese phones come with earthquake and tsunami warning systems that alert the subscriber even if the phone had been set to silent. In many countries with life-threatening natural disasters, SMS messaging has been adopted as the primary national alert system because, better than television, radio, or the internet, an SMS message reaches most of the population *and* does so near instantly. For example, national SMS alert systems are in use in Indonesia for tsunami warnings and in Guatemala for volcanoes and earthquakes.

Mobile Is Always Carried

The third unique ability is that mobile phones are always carried. The phone is taken everywhere. It used to be said that if a house was on fire, people would run into a burning building to save their photographs. Kodak chief marketing officer and author Jeffrey Hazlett says that is no longer true.¹¹ Today, people value their mobile phones over their photographs, and it is mobiles that people will run into a burning building to retrieve.

No other medium is carried permanently. There have been pocketable TV sets since the early 1980s, and they were much cheaper than the early phones with colour screens. Yet people do not carry those pocket TVs everywhere—how many even bothered to buy one? What of iPods or Playstation Portables or digital cameras? According to the Jacobs Media and Arbitron study in 2010,¹² now that mobile phones are widely adopted, the use of all other pocketable and portable electronics is in decline. People are carrying even less their digital cameras, MP3 players, gaming devices, laptop computers, and the like.

As the mobile phone is always carried, it means the mobile can be used to deliver digital solutions when traditional means are not practical. Typical early examples were the SMS-enabled Coca-Cola vending machines in Finland, parking meters in Estonia, and luggage storage lockers in Japan. More recently, airlines have adopted mobile phone-based check-in and boarding passes. A survey of airline travellers in 2011 by SITA and Air Traveller World¹³ found that 17 percent of airline travellers worldwide are already using mobile phone-based boarding passes or check-in services.

One great example of what can be done with this ability comes from the German post office, which enabled mobile phone-based postage stamps, first deployed on the E-Plus network. To mail a letter or postcard in Germany, one can send a text message via mobile phone to the post office to purchase a virtual stamp. The post office sends a unique, 12-digit alpha-numeric code by return text message, and the consumer just prints out those 12 digits on

the top right corner of the envelope, where the postage stamp would normally go. No trees need to die for postage stamps anymore, and these mobile phone-delivered virtual stamps can be sold anytime, anywhere in Germany. No more looking for the nearest post office and waiting in line to buy stamps: a brilliant, simple, and elegant solution that makes life a little bit better. It would be great if every post office adopted this solution; the idea has already spread to Denmark and Sweden.

Some telecom experts claim that *permanently connected* is the same as *always carried*. They may seem to be similar, and they, no doubt, have some overlap, but they are not the same. One can have a digital device that is permanently connected but not always carried, such as the home fixed landline telephone. Meanwhile, it is possible to have a digital device that is always carried but not permanently connected, such as a laptop. So it is important not to mistake these two as being one benefit. Mobile has both these unique abilities, and useful mobile services can be built on either one of them or on both.

Mobile Has a Built-In Payment Mechanism

The fourth benefit is that mobile has a built-in payment mechanism. This is perhaps the biggest key to understanding why mobile content is already far greater in value than fixed-internet content and why content owners fall in love with mobile: the money. For the first time ever, it is possible to enable a “click-to-buy” button on a mass medium and get payments: not just advertise to customers, but offer them a direct call to action. This is actual purchase enablement. In addition to being able to make payments, users can receive payments on any mobile phone. This ability has recently spawned mobile banking and mobile wallet-type services in many countries. In 2012, the World Bank reported¹⁴ that the number of countries where 10 percent or more of the population uses mobile payments has crossed 20; fifteen of them are in Africa, where a very large part of the population is unbanked.

An outstanding example of innovations using this ability is the virtual credit card. In Kenya, MasterCard, Standard Chartered Bank, and mobile operator Airtel have joined to offer virtual credit cards via mobile phones. Kenyan subscribers can order a disposable, 16-digit, single-use-only credit card number via phone and receive the related security codes needed for a purchase. The charge is deducted from the user’s mobile banking account. The credit card number cannot be used more than once. In this way, subscribers who do not qualify for a credit card can still make a credit card payment. This is a creative way to deliver MasterCard services to people who may not even want a regular credit card but who may need the card for one-time use, such as in travel.

Mobile Is Available at the Point of Inspiration

The fifth unique ability of mobile is that it is available at the point of inspiration. This could be the need to take a picture, shoot video, write a Twitter comment, or record a sound. The only comparable instrument is the pen that many people carry to be able to take notes and write in any situation. But a pen is not a medium; it is only a creative instrument. Mobile is both a creative instrument and a mass medium. This means that mobile is natively suited for any user-generated media content, including reports in online citizen-journalism newspapers such as OhmyNews of South Korea or viewer-generated videos and pictures of breaking news on CNN's iReport.

A perfect example of how this ability can be used comes from the U.K. Three museums got together with British high schools to create My Art Space (ooknet.com/web), a treasure hunt and adventure in the museum. Students were encouraged to use their cameraphones to capture aspects of art they liked or disliked and then to share their photos with other students through blogs, forums, and mashups. For those students who did not have a good cameraphone, the museums loaned cameraphones. The program was so successful that students spent 4.5 times longer on the museum visits, in the presence of their teachers. One can imagine they learned much more in this way than from a traditional guided tour through the museum.

Mobile Is Most Accurate in Measuring an Audience

The early, false promise of the internet was that it would deliver a “segment of one,” or perfect audience measurements. But this hope has been belied by multiple accounts, corporate firewalls, shared computers, internet cafes, deliberately falsified identities, anonymous servers, and the blocking and deleting features for cookies. The promise of perfect audience data via the internet turned out to be a mirage—but not so on mobile. On mobile, it is possible to know every individual mobile phone subscriber uniquely and perfectly. Having a prepaid account is no way to hide. Even without knowing subscribers' names, it is possible to get their full digital footprint. Anything can be measured if a mobile element is included with it, from television and magazines to radio and billboards. Mobile is truly the Magical Measurement Machine.

What mobile adds, of course, is the full power of the computer in the pocket and the connectivity, as well as all sorts of sensors and other data. A perfect example of incredible measurement via mobile comes from Japan. Imagine a normal dieting service or app for a phone or other digital diary or laptop. After every meal, users would need to enter information on what they ate, which would be quite a lot of keystrokes or other actions on the phone or device. The Caloriephone on the NTT DOCOMO network, on the other hand,

has image recognition software programmed to identify food. The software can correctly identify the 1,000 most common dishes eaten in Japan today, from sushi to a cheeseburger and fries at McDonald's. Now all users need to do is snap a picture of their plate, and the system does the rest, recording the meal and its approximate calories. Magical perhaps, but clearly mobile is a genius at measuring.

Mobile Captures the Social Context of Consumption

The seventh unique ability is that mobile can capture the social context of consumption. This sounds complicated, and it is. The point is not what is actually consumed (or when or where) but with whom. Think of Amazon and its recommendation algorithm (although that is based on analytics of the actual consumption, not the social context of it). Amazon measures what individual book buyers do. Amazon sees what surfers buy, for example, and then compares the data of other buyers to derive very powerful patterns of similar purchases in a number of categories. But Amazon does not know who the book was shared with later, who was called or messaged while reading the book, who it was recommended to, or whether the recommendation led to another purchase. That is the social context of the consumption.

The social context of the consumption is a measure, not of what is consumed, but of who is communicated with relating to that consumption. It is also possible to have a social context of consumption even if an item is not purchased (e.g., just by viewing a product profile). This is what many try to collect via the internet, but the consumer has to voluntarily indicate a preference—such as by using the Like button on Facebook or giving a rating on Amazon. But on mobile, and only on mobile, can the system automatically capture the social context of consumption.

An early example from the Obama presidential campaign of 2008 should be illustrative. (As this is truly bleeding edge ability for mobile, very few applications of it exist in any space.) The Obama iPhone app for supporters with iPhones replaced the normal phonebook with the Obama campaign-related phonebook, and on the basis of U.S. area codes for phones (which tend to relate to the states), the Obama app would show the “context” of the presidential election polls for each state. Therefore, for any name and phone number in the phonebook, the Obama app would show the current polls at that moment for that state. This is an example of social context and *not* consumption. The app provided poll status information without someone needing to vote or being eligible to vote and without knowing other people's candidate preferences. This information was collected merely by being able to capture the context of that consumption (i.e., interest in the election polls) without even the need of consumption (in this case, any voting activity).

Mobile Enables Augmented Reality in Media

The eighth unique ability of mobile is that it enables AR. AR has existed for some time in highly specialised technical instruments, such as advanced helmets and goggles used by fighter pilots. From about 2008, AR entered into mainstream mass market uses through the cameraphone. AR offers an overlay for the live reality seen through the cameraphone screen. For example, AR apps can help locate facilities in a city such as a cash machine or public toilet if the city has been programmed to show such information and the phone has the necessary ability, such as pinpoint positioning and a compass. The AR app can then show a dot or box on the image on the cameraphone screen to indicate the location of the desired facility. A similar app could also be used in a museum setting to overlay an actual image of an animal over its skeleton.

AR is a very rapidly evolving area of mobile technology, and countless examples appear almost daily. Furniture store IKEA offers an AR-based furniture tester for the home. Users can pick any item from the IKEA catalog, point the cameraphone at a location in their home, and then position the item of furniture to see if it matches interior decorations elements (e.g., to verify if the colour of the sofa matches the carpet and drapes).

Mobile Provides a Digital Interface to the Real World

The ninth and most recently identified unique ability is that mobile offers a digital interface to the real world. Mobile can turn an analog element into one with a digital interface. Examples include magazines with QR codes and AR; billboards with Bluetooth and NFC; and TV and radio programmes with SMS interactivity.

But mobile is actually far more than just a method of bringing digital benefits to analog media. Mobile can also be used as a kind of remote control for managing things; for instance, farmers in India can control their irrigation pumps by SMS, and public toilets in Copenhagen can be operated via SMS. The German town of Lemgo has a novel solution for saving money on electricity at night: The street lights on the main streets are lit all night, but the street lights on the side streets are turned off. When local residents walk home on the side street, they can send an SMS to turn on the lights for a short time, say 15 minutes, after which the lights turn off automatically. Lemgo has a population of about 42,000 and saves €50,000 annually with this innovation, in addition to conserving energy.

Where Is the Future?

As this chapter has suggested, many giant industries see mobile technology in their future. What of other trends? The giant global trend of social networking

goes far beyond commerce—just recall the role of Twitter, YouTube, and Facebook in the Arab Spring of 2011. The book *Communities Dominate Brands* (Tomi Ahonen and Alan Moore, futuretext, 2005) maintained that social networking was the biggest change in human history in the past 100 years. Others have put it in equally dramatic terms. *Business Week* said in 2005 that social networking was the biggest change to humankind since the Industrial Revolution.¹⁵ *The Economist* took a more business-oriented view, stating in 2005 that companies that would not adapt to social networks would not survive.¹⁶ Google's chairperson Eric Schmidt has said that social networking and user-generated content such as citizen journalism constitute "the defining aspect of humanity for the next 20 years."¹⁷

Already more than half of Twitter users access Twitter from mobile phones. In February 2012, for the first time on Facebook, more than half of Facebook users accessed the service on mobile phones on a regular basis. Every major social network has said that the future of social networking is mobile!

What of cloud computing? That is also another major tech trend, and most experts say that mobile phones will be the primary access method to services that are in the cloud. Cloud computing thus also supports the trend to mobile.

This is not to suggest that everything on the planet will migrate to mobile. We cannot do teleportation (yet), so cars, bicycles, buses, trains, and airplanes will still be needed. We cannot eat "virtual food" (yet), so we need a real food industry and the agriculture that supports it. But I would dare to say that there has never been any industry that is at the centre of so many other giant industries. Yes, the internet changed a lot, but even at its strongest point of growth, the internet was not seen to disrupt as many giant industries as mobile is now.

The same is true of electricity. Its impact was immense and global, yet mobile today transcends the reach of electricity because mobile phones have batteries and so can be used in regions with no electricity. It is not uncommon for people in villages in Africa and less affluent parts of Asia and Latin America to send mobile phones or their batteries to nearby villages to be charged. Some teachers use that as a gimmick to make sure the children come to school. Where the homes do not have electricity, the parents send phones with the children to school to be recharged.

That means that mobile will continue to grow, and it is likely to grow even more rapidly. The numbers are already truly mind-boggling. The world had 7 billion people and 5.9 billion mobile phone subscriptions in 2011.¹⁸ Although not all those active mobile phone accounts are unique users, the planet is well past the point at which more than half of its population has a mobile phone in their pocket.

At the end of 2011, the world had 4 billion unique users of mobile phones, walking around with 4.8 billion actual mobile phone handsets.¹⁹ This means, obviously, that many subscribers have two phones. In Europe, more than half of people with a mobile phone actually have two (or more) mobile phone accounts, which mostly means two phones.

Where Next?

But the story does not end there. The world's largest lock maker, Assa-Abloy, is deploying locks for hotels and homes that can be operated by mobile phone. Google, Vodafone, NTT DOCOMO, and many more mobile giants are in a race to deploy mobile money solutions around NFCs—19 percent of Japanese already make such payments daily.

There was a border-crossing incident on the U.S.–Canadian border where a stranded visitor had lost his passport but had a scan of it on his iPad and was allowed to cross the border. In the future, citizens' passports will reside on their mobile phones. In any case, citizens should make scans of their passports and drivers' licenses and save them on their phones in case of loss or theft of documents.

The innovation in mobile is relentless. In 2010, Turkey became the second country, after Spain, to accept SMS-based signatures as legally binding in contracts; Estonia became the second country, after Norway, to accept SMS-based tax returns.

A tech giant that was recently reporting losses—Apple—became the most profitable tech company on the planet only after it changed its focus from computers and music players to mobile. PC industry tycoon Bill Gates was the wealthiest person on the planet. That honour now belongs to Carlos Slim, CEO of Mexico-based America Movil, the mobile operator-carrier across much of Latin America. Rovio of Finland, creator of the Angry Birds game, is spreading from mobile phone games to soft toys, T-shirts, and onward into movies, television, and even amusement parks.

Mobile statistician and forecaster Chetan Sharma says the world will change more in the next 10 years than it has in the preceding 100 years. The driving force in that change is mobile, as mobile is a robust, economically sound industry that is not clinging desperately to advertising-based revenues alone. This is the best economic opportunity of our lifetimes. And not just in strict monetary terms, but obviously also in new creative and intellectual opportunities such as m-learning and m-health. Mobile is the richest and most rewarding opportunity and the epicenter of creativity today. No wonder Google's chairperson Eric Schmidt says "Put your best people on mobile projects."²⁰

Endnotes

1. "The Internet, Untethered," *The Economist*, October 11, 2001, accessed January 22, 2013, www.economist.com/node/811934.
2. Elizabeth Biddlecombe, "Music Industry Highlights Wireless Opportunity," *Total Telecom*, September 29, 2005, accessed January 22, 2013, www.totaltele.com/view.aspx?ID=358313.
3. *The Business*, November 7, 2005.
4. *Wall Street Journal*, November 24, 2009.
5. Associated Press Media Editors' conference, Denver, Colorado, September 15, 2011.
6. Gary Silverman, "Mobile Phones Will Replace TV as Most Important Medium, Says Ad Agency Chief," *Financial Times*, April 7, 2005, accessed January 22, 2013, www.ft.com/cms/s/0/67fb82e0-a702-11d9-a6df-00000e2511c8.html#axzz2Jjc2eKze.
7. "Ford Making Mobile Marketing the Cornerstone of Its 2011 Vehicle Advertising," *Mobile Marketing Watch*, February 11, 2011, accessed January 22, 2013, www.mobilemarketingwatch.com/ford-making-mobile-marketing-the-cornerstone-of-its-2011-vehicle-advertising-13140.
8. Coca-Cola presentation to the Mobile Marketing Association Forum, New York City, New York, October 2011.
9. Martin Wilson, "Going Mobile Need to Optimise at 3 Levels," *Bob Bermel—Niagra Mobile Marketing*, October 3, 2011, accessed January 22, 2013, bobbermelconsulting.blogspot.com/2011_10_03_archive.html.
10. Tomi Ahonen, *Mobile as 7th of the Mass Media* (London: futuretext, 2008).
11. Kodak presentation to the Mobile Marketing Association Forum, New York City, New York, June 2010.
12. Jacobs Media and Arbitron Survey of USA Smartphone Users, September 27, 2010.
13. Kevin May, "What Are Passengers Doing on Their Mobile Phones at Airports?" *Tnooz*, October 4, 2011, accessed January 22, 2013, www.tnooz.com/2011/10/04/mobile/what-are-passengers-doing-on-their-mobile-phones-at-airports.
14. "Mobile Money in Africa: Press 1 for Modernity," World Food Programme, April 30, 2012, accessed January 22, 2013, www.wfp.org/content/mobile-money-africa-press-1-modernity.
15. *Business Week*, June 20, 2005.
16. *The Economist*, April 2, 2005.
17. "A Conversation with Eric Schmidt, CEO of Google," *Charlie Rose*, March 6, 2009, www.charlie-rose.com/view/interview/10131.
18. "The World in 2011: ICT Facts and Figures," ITU Telecom Worldwide, accessed January 22, 2013, www.itu.int/ITU-D/ict/facts/2011/material/ICTFactsFigures2011.pdf.
19. TomiAhonen Almanac 2011.
20. "Global CIO: Google CEO Eric Schmidt's Top Ten Reasons Why Mobile Is #1," *Information Week*, April 14, 2010, accessed January 22, 2013, www.informationweek.com/global-cio/interviews/global-cio-google-ceo-eric-schmidts-top/224400178.

About the Editors

Peter A. Bruck, PhD, is a researcher, manager, professor, and entrepreneur in media, communications, and ICTs. He is chairman of the World Summit Award (www.wsis-award.org) and holds a volunteer position supporting the United Nations (UN) World Summit on the Information Society follow-up process. As CEO and chief researcher of Research Studios Austria (www.researchstudio.at), he heads seven units in applied information and communication technology (ICT) research and manages innovations from universities into markets. He is honorary president of the International Center for New Media (www.icnm.net), which for more than 15 years has pioneered and organised national, European, and global contests promoting best practices in the use of ICTs for value added content and high quality applications.

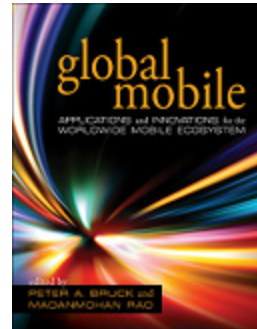
Bruck studied law, economics, sociology, and communications at the Universities of Vienna, Iowa, and McGill, and has taught in Canada, the U.S., Europe, and the Middle East. He has founded research centres in communication, cultural studies, and IT, and served on the board of a leading telco as chief content officer. He has been an advisor to national governments, the European Commission, and the UN. He recently founded a mobile micro-learning start-up in Europe and California (www.knowledgefox.net).

Madanmohan Rao, PhD, is an author and consultant based in Bangalore, India, and editor of five book series: *The Asia-Pacific Internet Handbook*, *The Knowledge Management Chronicles*, *World of Proverbs*, *Global Citizen*, and *AfricaDotEdu*. He is research projects director of Mobile Monday (www.mobilemonday.net), for which he produces annual mobile innovation reports for the regions of Africa, Asia, the Middle East, Europe, and the Americas. Rao has been communications director at the UN Inter Press Service in New York, vice president of IndiaWorld Communications in Mumbai, and research director for the Asian Media Information and Communication Centre (AMIC) in Singapore.

Rao is the author of more than a dozen books from leading international publishers and has spoken at conferences and seminars in more than 80 countries. He is also a DJ and editor for world music and jazz at World Music Central and Jazzuality. He graduated from the Indian Institute of Technology at Bombay and the University of Massachusetts at Amherst, with an MS in computer science and a PhD in communications.

Read book reviews by Rao at www.techsparks.com and follow him on Twitter at @MadanRao.

If you enjoyed reading this chapter of *Global Mobile*, please visit our bookstore to order a copy.



books.infotoday.com/books/Global-Mobile.shtml