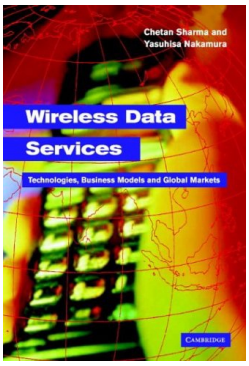

Wireless Data Services

Technologies, Business Models and Global Markets

by Chetan Sharma and Yasuhisa Nakamura
Cambridge University Press © 2003
361 pages

Focus

- Leadership & Mgt.
- Strategy
- Sales & Marketing
- Corporate Finance
- Human Resources
- Technology & Production
- Small Business
- Economics & Politics
- **Industries & Regions**
- Career Development
- Personal Finance
- Concepts & Trends

Take-Aways

- Wireless technology and globalization are mutually reinforcing factors in the development of the human race.
- Mobility is the defining characteristic of wireless technology.
- Although wireless technology is global, regional differences have emerged in usage patterns and the kinds of technology demanded.
- In the U.S., wireless is primarily a tool for business; in Europe and Asia, wireless is a household necessity.
- The wireless industry is intensely and globally competitive.
- Wireless networks are as ubiquitous as the air we breathe — in fact, wireless technology pervades the very air we breathe.
- The computer and communications industries (especially wireless) are converging.
- Wireless data services are particularly valuable when consumers need to respond immediately to changing facts or where a transaction is uncomplicated.
- Over time, chips will keep shrinking and batteries will last longer.
- Spectrum shortage and integration difficulties are tough issues in the wireless industry.

Rating (10 is best)

Overall	Applicability	Innovation	Style
6	**6**	**7**	**5**

To purchase individual Abstracts, personal subscriptions or corporate solutions, visit our Web site at www.getAbstract.com or call us at our U.S. office (954-359-4070) or Switzerland office (+41-41-367-5151). getAbstract is an Internet-based knowledge rating service and publisher of book Abstracts. getAbstract maintains complete editorial responsibility for all parts of this Abstract. The respective copyrights of authors and publishers are acknowledged. All rights reserved. No part of this abstract may be reproduced or transmitted in any form or by any means, electronic, photocopying, or otherwise, without prior written permission of getAbstract Ltd (Switzerland).

This summary is restricted to the personal use of Narayan Sau (narayansau@in.ibm.com)

Relevance

What You Will Learn

In this Abstract, you will learn: 1) How the global wireless industry and market are developing worldwide; and 2) How competing technologies and varied social factors shape regional wireless telecommunications markets.

Recommendation

This short analysis of the global wireless technology market is probably the most thorough book of its type. Authors Chetan Sharma and Yasuhisa Nakamura diligently track the development of the most important wireless technologies and standards, sketch the anatomy of the value chain and make some informed judgments about the future direction of various wireless industry segments. They also examine the social and cultural influence of wireless. The book is refreshingly free of the hype and hucksterism that characterizes so many books about the business of technology. However, some readers will find its relentless focus and its scrupulously neutral prose hard to take in any but small doses. *getAbstract.com* highly recommends this book to anyone in the wireless industry whose job demands an understanding of the field's broader business and technological context. The lengthy list of industry abbreviations and acronyms is a particularly valuable feature.

Abstract

Globalization

The world is shrinking. Globalization means that when financial markets collapse in Asia even South American coffee growers feel the impact. Migrants from China open companies in Costa Rica and Minnesotans vacation in Mongolia. Of course, communication is essential to globalization, and wireless is an essential part of communication.

"Ignoring fundamentals of business is always disastrous and this is especially true in the extremely competitive industry of wireless."

But globalization and wireless communication have dark and light sides. For a look at the dark side, consider the use that terrorists have made of cell phones. For an example of the light, consider the use that rescuers put them to during various calamities. For better or worse, we live in one world, knit ever closer by advances in communication and computing technology. In some regions — most notably Scandinavia and Japan — wireless devices are as ubiquitous as wristwatches and wallets. The average wireless device user is in contact with it every waking hour. Although regional differences in usage patterns may persist, global standards are developing for the most important wireless technologies. Global standardization offers the following advantages to these distinct audiences:

"Mobile life represents a lifestyle that uses wireless services as an essential lifeline for businesses and consumers."

- Advantages for operators — Increased traffic, portable numbers, economies of scale and mass production, and increased access to globally excellent vendors.
- Advantages for vendors — Access to a global market, the opportunity to collaborate across borders on research and development, lower costs due to mass production and shortened interoperability testing times.
- Advantages for end-users — Seamless service across borders, global roaming, guaranteed portable numbers, low costs and global access.

In this competitive market, some of the leading global wireless carriers are:

© Copyright 2004 getAbstract

"Access to e-mail, calendar and address book is by far the single most important enterprise application for mobile executives and professionals."

- Vodafone AirTouch Group (VF) — The world's biggest carrier follows a strategy of growth by merger and acquisition. It acquired AirTouch Communications, a U.S. company, in 1999, and then acquired Germany's Mannesman. In 2001, it took control of Japan's J-phone. With neat symmetry, VF is the majority investor in 13 companies and a minority investor in 13 others. The group had 112.5 million subscribers at the end of 2002.
- NTT DoCoMo — This spin-off of Japan's NTT pursues a global strategy of minority investment driven by its research and development power. It emphasizes its i-mode technology and W-CDMA. DoCoMo (meaning "anywhere" in Japanese) invested in AT&T Wireless and Telefonica Cellular in North and South America, in KPM Mobile in Europe, in KG Telecom of Taiwan, in Hutchison Telecom Cellular of Hong Kong and in Hutchison 3G U.K. in the United Kingdom. DoCoMo's i-mode, Japan's biggest internet access service, uniquely allows continuous mobile phone internet access.
- Telefonica Cellular (TC) — Spain's heavyweight telecom group targets only Spanish-speaking markets. While VF and DoCoMo aim at all geographies, TC promotes Groupe Speciale Mobile (GSM) service and has invested in Central and South America. Cultural affinity and a common language lower the barriers among its organizations.

(*Editor's note*: According to *webopedia*, CDMA is Code Division Multiple Access, a cellular technology using spread spectrum techniques. It does not assign a specific frequency to each user. Instead, each channel uses the full available spectrum. The alternative is TDMA, which uses Time-Division Multiplexing to deliver wireless service. TDMA divides a radio frequency into time slots and allocates slots to multiple calls. A single frequency can support multiple, simultaneous data channels. The GSM digital cellular system uses TDMA.)

"Antennas are a key component of the wireless network infrastructure. Their role is to establish radio transmission between base stations and wireless devices."

Although the wireless communications industry is steadily becoming more global, significant regional differences remain and should be considered individually.

United States

The U.S. subscriber base grew from 86 million in 1999 to 137 million at the end of 2003. Six national players make the American wireless market the world's most competitive. Margins are the world's lowest. The industry's U.S. growth potential is great, since U.S. penetration rates are quite low compared to Scandinavia and Japan. The 9/11 terrorist attack helped promote cell phone use, much as the Kansai earthquake made the advantages of cell phones apparent in Japan (many people who were buried under rubble called for rescue on their cell phones). On the downside, the six big U.S. players use different standards, need to invest billions to upgrade their networks and face constraints in the form of spectrum-caps.

"We need to pursue perfect human interface methods to satisfy consumers' needs."

The NextWave fiasco also slowed development. NextWave placed a $5 billion bid in a Federal Communications Commission (FCC) auction for wireless spectrum space in 1998. It won, but declared bankruptcy. Verizon and other carriers bid for NextWave's new license, since it failed to pay deposits. The FCC collected down payments from the bidders, but it did not release the spectrum due to ongoing litigation with NextWave. The companies demanded their deposits back, but the FCC made only partial refunds. NextWave's litigation went to the U.S. Supreme Court, which ruled in January, 2003, that NextWave could keep the licenses it won at auction. NextWave will probably sell the licenses to other carriers, but it must build a network first, since FCC rules forbid speculation in spectrum by firms without networks.

© Copyright 2004 getAbstract

"Existing Internet portals such as Yahoo! Mobile and AOL Europe have already set up mobile portals and pose a threat to operators and service providers."

South America

The South American market is enormous; Brazil is its biggest slice. The government-controlled Brazilian telecom market opened for competition in 1998. Until then, state-owned Telebras dominated the market. Now, Telefonica, TIM, Portugal Telecom (PT), BellSouth and NTT DoCoMo have toeholds. In 2000, the Brazilian telecommunications regulator ANATEL — which had accepted only U.S. standard technology up to that time — decided to accept European GSM/GPRS (general packet radio service, very efficient for small data bursts, such as e-mail) technology. Brazil is a high-potential market with a 2001 subscriber increase second only to China's. Prepaid service accounted for 70% of the market. Average revenue per user is less than a third of that generated by postpaid subscribers, though operators incur similar costs serving both.

Japan

The Japanese market boasts one of the world's highest penetration rates, almost 70% as of 2002. NTT's fixed-line service peaked at 61 million users in 1996 and has been falling by a million users per year since. DoCoMo leads in cell phone and Internet services. Many Japanese use their cell phones to access the Internet. Data speed, while desirable, is not enough to capture the Japanese market. Users demand extensive coverage areas, economies of cost, attractive devices and good content.

"Pay phones were very successful but their popularity disappeared as wireless phones became more pervasive, reliable and affordable."

The Tigers: South Korea, China, Taiwan and Hong Kong

South Korea's penetration rate was 63% in 2002. Its policy favors U.S.-standard CDMA and its mobile Internet service is based on WAP (a standard Wireless Application Protocol). The regional future of third generation (3G) CDMA technology is obscure, because of an unstable licensing situation. In China, Taiwan and Hong Kong, cell phones, which were status symbols, are now necessities, at least to those who use them. Taiwan and Hong Kong's penetration rates are among the world's highest, but China's is only about 6%. Clearly, the potential is mind-boggling. China favors three CDMA variations.

Europe

Europe's wireless market is the world leader. GSM technology unified the market and allowed competition for services while U.S. companies were still struggling over standards. European operators bill on a calling party pays (CPP) basis, so users keep their phones turned on all the time. In the U.S., where the user pays whether making or receiving a call, people have an economic incentive to turn off their phones. Some three-quarters of new European subscribers get pre-paid service. The Nordic countries are and will remain the most advanced in wireless. However, the U.K. is poised to be a major wireless data market and Germany presents the biggest revenue opportunity.

"The renewed optimism in this whole space is a result of traditional wireless carriers deploying packet-based networks, so-called 2.5G networks."

Africa

Corruption and the high cost of landline construction give wireless an advantage. The growth in adoption of wireless services far exceeds that in the Americas. African operators use CPP billing. Users favor short messaging service because it is even cheaper than voice.

"As everybody knows, frequency is the limited resource like a surface of the Earth."

Why i-mode Works

Internet access using the i-mode language is quite successful in Japan. In Europe and North America, operators do not understand why their WAP services have lagged behind i-mode. They usually attribute its success in Japan to spurious factors, such as low PC penetration that forces people to access the Internet via cell phones using i-mode, language barriers or the number of pedestrians in Japan. In fact, none of these

© Copyright 2004 getAbstract

"We do not have to wait till 2010 to start envisioning services and applications that will touch our lives. The time is now."

explanations holds water. Japanese PC penetration is one of the world's highest, though admittedly lower than in the U.S. The Japanese are no more committed to walking than anyone one else, except in big, congested cities. And as far as language is concerned, i-mode is also popular among foreigners living in Japan. Moreover, many Japanese use English language services, such as CNN and Bloomberg.

Technologically, i-mode has some advantages over WAP. For example, it uses HTML, the standard Internet script. In Japan, content is the main driver of i-mode's popularity, not technology. DoCoMo, the market leader, pays close attention to the changing demands of its consumers (especially the volatile youth market) and tailors its content to their demands.

Value Chain

The lengthy wireless value chain includes:

- Investors — Venture and corporate.
- Equipment — Suppliers and manufacturers of parts, components, devices, device operating systems, and computing and communication infrastructure.
- Network — Network operators including mobile virtual network operators.
- Software — Wireless Application Service Providers, middleware suppliers, developers of applications and systems integrators.
- Services — Content providers and aggregators, portals and application aggregators.
- End users — Consumers and business users.

"If we look at the progress made by Homo sapiens over the past 1000 years, the past 100 years have had more impact on us than the rest of the centuries combined."

New links are entering the value chain as additional voice and data services emerge. But the links are not equal in importance. Device manufacturers are quite significant because consumers tend to be more loyal to a device than to an operator. The devices are personal; they are even fashion statements. The competition for the smartphones market pits Microsoft against Nokia. Microsoft hopes to have its Smartphone 2002 OS (operating system) installed in a quarter of the world's smartphones by 2005. Nokia has given its smartphone blueprints to other handset makers to use in manufacturing Internet phones. Presently, the battle seems to be tilting in Nokia's favor, because of its wide support among handset makers. Microsoft has only Samsung in its corner.

Some links in the value chain are already commodities, such as voice services. Heavy investment by major players such as Sprint PCS led to a price war. Similarly, the availability of generic news, financial reports, weather and so on from many diverse sources puts pressure on content companies such as Yahoo! and AOL. The value in the chain will migrate to companies that provide differentiated products. The trend seems to favor applications and software providers, which were also big beneficiaries of the PC revolution.

About The Authors

Chetan Sharma is an expert on the strategy and implementation of wireless Internet and pervasive computing ideas and solutions. He is the author of *Wireless Internet Enterprise Applications* and the co-author of *VoiceXML: Strategies and Techniques for Effective Voice Application Development.* Yasuhisa Nakamura is a specialist in wireless telecommunications. He has more than 50 patents awarded or pending.

© Copyright 2004 getAbstract