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NTT DoCoMo, USA: Can it Bring the Wireless Internet to America?

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1. Introduction

In 2000, Japanese cellular carrier NTT DoCoMo embarked on an ambitious campaign to provide its extremely successful wireless Internet product outside of its home market. In this international expansion, its strategy has proven hugely unprofitable. In April 2002, the firm took a \$10.9 billion write-down in its investments in overseas partners (*Reuters* 2002).

The global challenge that DoCoMo has faced is rolling out its i-mode services successfully in less technologically advanced mobile environments, such as the United States. In addition to traditional cell-phone services, NTT DoCoMo offers a wireless service called i-mode, which is in essence a proprietary Internet accessible from a cellular phone. i-mode has been a huge success in Japan, where it has become one of the best-recognized brands in the country. The phenomenal success of DoCoMo and i-mode represents the high-water mark in the global expansion of the telecommunications industry. In many ways the firm stands as a metaphor for the Japanese economy as a whole: achieving fantastic success early on, then stumbling in face of slowing growth. DoCoMo now faces the question whether it can return itself to growth or settle into mediocrity.

Technological adoption of a third-generation (3G) platform, allowing introduction of far richer mobile content, is looming on the horizon. But the immediate- and medium-term challenges are not only about technology. The U.S. market is potentially nearly twice as big as the Japanese market. Moreover, in contrast with Japan, the U.S. mobile phone market is bigger and more geographically diffuse. DoCoMo faces a very different culture as well as a more competitive landscape and a more liberal regulatory environment in the U.S.

In this paper, we assess the current status of DoCoMo's initial international strategy and evaluate potential alternatives going forward. To carry out this evaluation, the paper addresses two questions: Are the competitive advantages DoCoMo enjoys at home transferable to the U.S. wireless market? and Will its current strategic positioning allow it to transfer these advantages effectively? We analyze a variety of strategic alternatives, ranging from technology licensor to network operator, and recommend an optimal positioning to capitalize on the company's strengths. As part of this analysis, we also offer a critical assessment of DoCoMo's choice of a strategic partner in the U.S. market—that of AT&T Wireless.

2. Analysis of NTT DoCoMo

2.1. Company Overview

NTT DoCoMo¹ is the world's largest telecommunications company by market capitalization, with a value of \$138 billion at the end of March 2002 (*FT 500* 2002). The firm is 64 percent owned by Nippon Telegraph & Telephone (NTT). In its home country, NTT DoCoMo dominates the mobile wireless communications market. With only two competitors (J-Sky and AU), NTT DoCoMo has captured more than a 50 percent market share, with over 38 million subscribers. It currently offers two types of cellular phone services: personal digital cellular (PDC) and a lower-priced service personal handyphone system (PHS). It also offers several other smaller radio-based services.

In February 1999, NTT DoCoMo introduced i-mode in Japan. i-mode lets mobile users access the Internet from their cellular phones. It is based on a patented compressed HTML protocol (c-HTML), which creates, in essence, a proprietary Internet. i-mode has proven remarkably successful in Japan, signing up 32.2 million subscribers in just over two years. NTT DoCoMo has used i-mode to complement revenue from voice telephony, which has been leveling out. Appendix 2 shows the evolution of revenue sources NTT DoCoMo expects as mobile telephony matures. The average subscriber's monthly bill has risen more than 20 percent as a result of nonvoice traffic (Normile 2001).

2.2. Products and Services

2.2.1. i-mode

With i-mode, cellular phone users get easy access to more than 40,000 Internet sites, as well as such specialized services as e-mail, online shopping and banking, ticket reservations and restaurant advice. Users can access sites from anywhere in Japan—and at low rates, because their charges are based on the volume of data transmitted rather than the amount of time spent connected. NTT DoCoMo's i-mode network structure not only provides access to i-mode and i-mode-compatible content through the Internet, but also provides access through a dedicated leased-line circuit for added security.

NTT DoCoMo places itself between users and content by making i-mode a closed and tightly controlled network. Web pages and e-mail can only reach an i-mode handset by c-HTML or i-HTML, DoCoMo's patented protocols. Furthermore, i-mode users must connect to the Internet through DoCoMo's gateways. NTT DoCoMo has, however, made it easy for third parties to convert existing Web sites to i-mode format, largely automatically, with only minor changes to the existing code. In addition, NTT DoCoMo bills i-mode users on behalf of the content provider. This system reduces transaction costs and credit risk. NTT DoCoMo charges content providers a 9 percent commission for the clearinghouse billing system service. i-mode users can also gain access to other i-mode-compatible content through the Internet, but a menu-driven interface gives preference—and valuable “real estate”—to i-mode sites.

¹ In this paper, we use the conventions “NTT DoCoMo” to refer to the Japanese parent company and simply “DoCoMo” to refer to the company's international operations.

2.2.2. FOMA² third-generation (3G) wireless network

DoCoMo, as do most other wireless network providers, views i-mode as an interim step on a migration to advanced networks termed third-generation (3G). NTT DoCoMo is one of the leaders in this migration. In October 2001, NTT DoCoMo deployed the first commercially available 3G wireless network, with limited availability in central Tokyo. Third-generation expands upon the possibilities offered by i-mode, providing significantly faster speeds for the transmission of data, which lends itself to use in video conferencing and other multimedia applications. Surprisingly, the technology-minded Japanese market has adopted 3G service much more slowly than expected. This has been attributed to the absence of so-called killer applications to drive subscription demand. In addition, handsets are priced rather expensively at \$490. By March 2002, DoCoMo had signed up only 89,000 users versus its earlier projection of 150,000 users (Belson 2002).

2.3. Growth Strategy

After achieving market dominance in Japan on the back of spectacular revenue growth, NTT DoCoMo has experienced gradual erosion of its performance as measured by the main yardstick in the telecommunications business, average revenue per user (ARPU). This erosion was the result of Japanese competition catching up with NTT DoCoMo's advanced i-mode and other services offerings.

To counter this trend, at the end of 1999 NTT DoCoMo implemented a three-pronged growth strategy:

- Vertical integration
- Additional domestic services
- International expansion

2.3.1. Vertical integration

NTT DoCoMo has begun to vertically integrate into branding of handsets and other hardware. The company maintains a close relationship with vendors and therefore has significant leverage over handset manufacturers. It further achieves growth through economies of scale. By branding (and, where appropriate, inserting its own technology into) the handsets, networks, content interfaces and billing system, NTT DoCoMo has established control over the entire i-mode value chain.

2.3.2. Additional domestic services

NTT DoCoMo has also started to roll out additional services domestically. Appendix 3 shows the deteriorating revenues for voice traffic, somewhat offset by nonvoice revenues. The spending habits of early and late adopters of the network have a profound effect on the network's development and the strategy the network provider should pursue. The early adopters of a network will afford externalities, increasing demand, in effect subsidizing late adopters. The network operator must, however, be prepared to serve the needs of both. A further challenge comes in cultivating demand among the late adopters. Naturally, these users have lower elasticities of demand and spend less on incremental services. In the progression of the penetration of a network, when late adopters are added to the network, the growth rate of average revenue per

² Freedom of Mobile Multimedia Access (NTT DoCoMo's 3G mobile communications service)

user will slow. DoCoMo's main hope for the future is the successful take-up of 3G services. If the market for 3G does not take off, a carrier might strand investment in its network. i-mode has been focused on increasing the availability of additional services to all users.

2.3.3. International expansion

To gain a network footprint and captive customer, DoCoMo has expanded internationally through the acquisition of minority equity stakes in associates in Europe (KPN, E-Plus and Orange), the United States (AT&T Wireless) and Brazil. Its network of international investments was intended to leverage DoCoMo's know-how from the advanced Japanese market. Initially, i-mode-type services would be rolled out based on "2.5G" (an intermediate network platform between digital cellular and 3G networks available in the United States and Europe), to be followed by 3G products and services—by then well developed in Japan—using a 3G network.³

First, we analyze the characteristics of the U.S. market, and then we discuss DoCoMo's mode of entry into the United States. We consider DoCoMo's strategic options by expanding its current partnership as well as by other means.

³ See Appendix 4: Global Network Evolution.

3. The U.S. Wireless Market

3.1. Industry Players and Competition

The U.S. wireless market is highly contested, with seven⁴ nationwide carriers providing primarily mobile voice services, cellular services and personal communications services (PCS).

The U.S. market has witnessed some consolidation driven by the inability of small players to support the investments necessary to create a nationwide cellular network. This early consolidation has in turn created a highly competitive environment that is very different from Japan's market, which has only three nationwide carriers. The intense competition has led to flat-rate calling plans insensitive to local and long distance, ultimately resulting in ARPU erosion.

Competitive pressures for voice telephony are expected to intensify further. In the United States today, airtime minutes are a commodity, and roaming charges are expected to disappear altogether. The rate of growth of new subscribers, as well as ARPU, is flattening. Carriers are trying hard to differentiate between their offerings but are constrained from making significant investments because of the ballooning debt in the industry.

3.2. U.S. Wireless Technology

3.2.1. *Slow next-generation network deployment*

The United States has proven a laggard in the adoption of wireless technology. In contrast to the migration to 3G networks that is already under way in Japan and in Europe, the United States is only now seeing full second-generation network coverage and some 2.5G service providers. These networks enable carriers to deploy a wider variety of features in their wireless network, including mobile text browsing of the Internet. Although the limited 2.5G data transmission speed does not support advanced multimedia services, it may be sufficient to provide basic content that satisfies customers. In fact, no network is sufficiently advanced to be marketed as i-mode under DoCoMo's minimum contractual standards.

A 3G rollout is not expected in the near future in the United States because of

- the inability to finance a network over an area as dispersed as the United States, given the financial position of the large carriers;
- the desire to recoup other investments previously made; and
- the limited availability of the radio spectrum, because the FCC has only recently reallocated small bands away from existing Department of Defense uses.

3.2.2. *Wireless application protocol*

The current preferred protocol for mobile information services in the United States is the wireless application protocol (WAP), which allows users to connect to the Internet and advanced telephony services. It requires use of wireless markup language (WML) to create content (Internet sites) that is sufficiently pared down to be supported using a 2.5G connection. WAP is an open standard, not controlled by a single vendor. Such main handset vendors as Ericsson, Nokia and Motorola work together in an effort to set specifications for developing applications over wireless networks. DoCoMo does not endorse WAP, using its own protocol in combination with its proprietary c-

⁴ AT&T Wireless, Cingular/SBC/BellSouth, MCI WorldCom Wireless, NextTel, Sprint PCS, Verizon Wireless/Vodafone and VoiceStream/Deutsche Telekom.

HTML language. WAP suffered technical drawbacks, and its widespread adoption is uncertain. Instead, carriers may wait for 3G standards to emerge before adopting a wireless protocol.

3.2.3. Content

Content represents a major competitive challenge. Various companies provide different types of content, such as search engines, portals and e-commerce applications, for wireless use. Wireless portals gather content from regular Web sites but reduce the download intensity. These portals are generally maintained by wireless network providers, which have an exclusive lock on, or at least relationship with, the wireless user. The range of sites currently operational is limited, which is not surprising given the limited use of mobile Internet services. There may consequently be little role for DoCoMo to play in this arena without having to displace an incumbent.

In Japan, NTT DoCoMo has expanded i-mode services by partnering with such companies as America Online and Sony. NTT DoCoMo plans combine the i-mode platform and Sony's Playstation to create gaming and e-commerce services. Other partner services include using DoCoMo mobile phones with car navigation systems, vending machines and other forms of online retail. In the United States, DoCoMo would be starting from square one in terms of developing these agreements.

3.3. Current Services in the U.S. Market

Increasing ARPU in a market where the main component—voice—is a commodity, is the next big challenge confronting the wireless industry. Most carriers have now begun to introduce mobile Internet access based on a WAP protocol, but similar capabilities are also offered by providers of mobile e-mail services, such as Blackberry, and of wireless personal digital assistants (PDAs), among which Palm is the market leader. The distinction between cellular phone and PDA is beginning to blur as new cellular handsets incorporate PDA functionality and wireless PDAs are voice enabled.

Although partial online traffic for e-mail is considered reliable, full Internet access is generally considered deficient. Connections are not always on or secure, both defects of the WAP protocol. This results in slow speed of traffic and obstructs safe online financial transactions.

4. DoCoMo in the United State

4.1. Obstacles

For DoCoMo's entry into the U.S. market to be successful, the company will have to offer users benefits not available from other networks. The cost of handsets is at present highly subsidized by the wireless carriers. Users of an i-mode-type service in the United States would either have to be so convinced of the benefits of the service that they would be willing to trade up to a much more expensive handset or attracted by heavy handset subsidies that DoCoMo might offer to persuade them to switch.

Key success factors in this respect are

- the transferability to the United States of the core competencies that DoCoMo developed in Japan, such as its marketing expertise and experience in achieving entry by third-party content providers;
- the dedication and complementarity of its U.S. partner;
- the utility (both practical and emotional) of the services offered to U.S. subscribers.

4.2. Transferability of Core Competences

We have identified the core competences that DoCoMo possesses from its long experience in the Japanese market. These competences have been categorized and their transferability evaluated. Appendix 5 shows our analysis and the detailed outcome. Overall, we have concluded that NTT DoCoMo's key transferable competencies are technology related, in particular its proprietary handset technology, communications protocol and coding language.

But to capitalize on its technological assets, DoCoMo will need to remedy some major strategic weaknesses. We believe DoCoMo's international expansion to be handicapped by its lack of international management experience, by its lack of in-house marketing and distribution ability outside of Japan and by the absence of a strong international brand. In our view, DoCoMo must choose one of three options:

- Remedy these deficiencies by itself (a significant and challenging task).
- Select a partner that can compensate for these deficiencies.
- Find an international business model that does not require strength in the handicapped areas.

4.3. Partnership with AT&T Wireless

DoCoMo's partnership with AT&T Wireless has been a marriage with a rocky start. This relationship is characterized by divergent goals and ways of competing. Although AT&T Wireless is bound by a strict operating agreement to roll out DoCoMo's i-mode technology in the United States, it is observing only the minimum requirements of the agreement. Specifically, it is not aggressively pursuing network upgrades or marketing the i-mode product. At the time of writing, AT&T Wireless's network was not sufficiently advanced to allow it to offer a product called i-mode under

the terms of DoCoMo's marketing standards. AT&T Wireless has historically chosen to compete on price, offering flat-rate nationwide calling plans.

DoCoMo's exclusive arrangement with a single U.S. partner solidified by a minority stake has not delivered on the company's international strategic objectives. In fact, the greatest barrier to implementing i-mode in the United States may be the unwillingness of AT&T Wireless to deploy i-mode. AT&T Wireless is just now beginning to offer an i-mode-like service called mLife, but because it relies on WAP, it is not compatible with i-mode's technology base.

We believe the choice of AT&T Wireless was a "lesser of two evils" approach, arrived at through a process of elimination of other alternatives. DoCoMo selected AT&T Wireless in large part because of AT&T's national footprint and because it would agree to implement DoCoMo's W-CDMA standard by the end of 2003 and to deploy i-mode.

Other major carriers were conflicted as a result of other partnerships or their technology platforms. Specifically, DoCoMo wanted to partner with a Global System for Mobile Communications (GSM) carrier. This primary decision was motivated by the two-part goal of being able to offer global roaming and, more importantly, of achieving greater economies of scale in the manufacture of its handsets and network equipment, which employ DoCoMo's 3G protocol, W-CDMA. Still, as DoCoMo was a latecomer to the U.S. market, partnerships with most carriers were foreclosed to it. Verizon was not an option, because of its venture with Vodafone, as was also the case with VoiceStream (now T-Mobile) and Deutsche Telekom. Similarly, Cingular was too closely aligned with the Regional Bell Operating Companies SBC Communications and BellSouth. Another carrier, Nextel, was pursuing a very different strategy with Motorola. In the end, DoCoMo justified the AT&T Wireless relationship as a vehicle to expand the adoption of its 3G standard. Nonetheless, the exclusive choice of AT&T Wireless may not have been the best response to this issue.

5. Strategic Alternatives

We identify four major categories of strategic alternatives for DoCoMo concerning the introduction of its products to the U.S. market. These are

- Network Operator
- Packager of Mobile Services
- Technology Provider
- Withdrawal from United States

5.1. Network Operator

One potential way for DoCoMo to enter the U.S. market is as a network owner and operator. As such, DoCoMo would build its own network infrastructure with a national footprint and retail i-mode services directly to customers. As a network operator, DoCoMo, USA, would offer retail cellular telephone services as well as on-demand mobile Internet services using i-mode technology. Such a strategy would also enable the company to establish a beachhead for offering advanced future services based on 3G, such as multimedia content, video on demand, video conferencing and high-bandwidth Internet content and services.

This strategy has significant drawbacks. For DoCoMo to own and operate its own cellular network it would have to undertake very costly infrastructure development and marketing expenditures. The company does not currently have adequate capital resources to pursue this approach, and both the public and private capital markets remain tight, especially in telecommunications.

After DoCoMo's recent write-downs, the company may have difficulty obtaining approval for such massive additional investments from its parent company in Japan, NTT. The company does not have a strong brand in the United States, necessitating further huge expenditures on marketing. Finally, this would all be a time-consuming process—not a means to establish a market presence quickly.

Regulatory issues would also need to be considered. Rather than waiting for successive spectrum auctions or buying spectrum from other carriers, DoCoMo could try to obtain the spectrum from the now defunct NextWave as a speedier entry method. This option, however, would be hampered by the fact that DoCoMo is legally prohibited from owning spectrum in the United States under its current ownership structure. (U.S. law prohibits ownership of spectrum licenses by an entity that has more than 25 percent foreign ownership.) Moreover, NextWave's licenses have been tied up in ongoing bankruptcy litigation. Thus, DoCoMo would have to drastically alter its ownership profile, which its corporate parent might find objectionable.

5.2. Packager of Mobile Services

This strategy is similar to the network operator in that DoCoMo would provide retail cellular and i-mode services. It would operate its network, however, by purchasing and reselling spectrum and connectivity from other U.S. carriers while focusing on its retail, marketing, customer service and value-added applications. The advantages of this approach:

- Faster speed to market;

- Lower initial capital investment; and
- Spectrum ownership restrictions are no longer a problem.

The disadvantages of the strategy:

- The cost of obtaining nationwide spectrum could still prove very substantial.
- U.S. carriers would consider DoCoMo a direct competitor, so they would not be likely to offer favorable rate structures.
- It is a difficult market to break into (see our discussion in the Network Operator section).
- It would be more difficult in a “rented” network to execute the technological changes required for i-mode or future 3G rollouts.

Long-term profitability under this strategy is uncertain. Moreover, this “resale” approach has not proven successful for the wireless division of MCI WorldCom or for the vast majority of the competitive local exchange carriers in the fixed-wireline segment. At best, such a strategy could be a loss leader to enter the market while the company deploys its own facilities.

5.3. Technology Provider

Under this option DoCoMo would license its proprietary technologies to cellular operators and handset manufacturers. DoCoMo’s technologies are more sophisticated than almost anything currently employed in the U.S. market. Much of this sophistication, however, derives from the unique demands of the Japanese market and may not provide a significant competitive advantage in the United States. For example, the menu-driven interface and keyboard character-entry technology are geared particularly toward the complexities of the Japanese language but offer little advantage in the United States. The text-based system uniquely serves the needs of the Japanese, especially the young, who have the disposable income to enjoy such services and want text-based services because they are hesitant to speak aloud over the cellular phone in public, due to different cultural norms. Conversely, text-based e-mail, paging and messaging are already available in the United States but have not been widely adopted because U.S. consumers prefer verbal, rather than text-based, cellular communication services. U.S. consumers are much more willing to make cellular calls out loud in public locations.

Without proven demand for 3G or other features, i-mode’s packet-based technology for on-demand multimedia and the Internet may afford little current advantage. Other technologies and protocols are and will become available from other sources, including Microsoft, a company that is always difficult to compete against. Microsoft is the main competitor in the United States for the operating system (OS) within cellular handsets, whereas DoCoMo is an application service firm, not an OS firm. Furthermore, content development using i-mode and c-HTML has not yet achieved the critical mass necessary for widespread appeal in the United States.

i-mode’s billing system, an intermediary between the seller and the consumer, provides a viable business model for extracting transaction-based revenue and is a significant part of DoCoMo’s business model in Japan. In the United States, however, a number of popular online

transaction storefronts, such as Microsoft Passport, Yahoo! Wallet, PayPal, and Amazon, have already gained strong footholds in this area. Since U.S. Internet users take advantage of these existing services, along with offerings from credit card companies, this may mitigate the benefits from i-mode's built-in billing system. Furthermore, state and federal regulations governing a telecommunications carrier's ability to bill and collect for ancillary services may make it impossible or at least undesirable for the carrier to bill charges to its subscribers' cell phone bills. For example, the carrier may find it impossible to suspend a user's service for nonpayment of content-related charges.

The cost to content providers of developing and maintaining additional computers as servers for i-mode, which would be required to host the translation of the original HTML content, may prove too high a hurdle for widespread adoption. The distinct advantages of i-mode services in a commodity market with eroding margins may not justify the rollout costs for cellular providers and handset manufacturers unless there is clear demand from U.S. consumers. The lack of a significant amount and variety of content presents a major barrier to entry. Without such demand for content, the network will be unable to achieve a sufficient level of consumer demand to sustain itself. Compounding this procyclical dilemma, content providers will not make the expenditure, even if slight, to translate their content without a sustaining level of consumer demand.

5.4. Withdrawal from United States

Another option would be for DoCoMo to withdraw entirely from the U.S. wireless market. In doing so, it would abandon its U.S. presence and partnerships, potentially liquidating its investment in AT&T Wireless. It could then tightly focus on the domestic Japanese market, where it has been losing momentum. Its U.S. and European expansion may be distracting the firm from its domestic efforts to maintain its leadership advantages in Japan.

Under this scenario, DoCoMo would pull back on international expansion, except where it could establish a clearly profitable and sustainable competitive position. This might be in other Asian countries (China, Hong Kong, Singapore), which are much more likely to be complementary markets for its services and technologies (for example, exploiting DoCoMo's character-input system for complex Asian languages on handsets) and have better growth potential.

Although this strategy is certainly economically viable, it would deny DoCoMo access to huge potential growth markets. And although the company has written off substantial sums, its levels of indebtedness are far lower than those of many of its major competitors, which invested vast sums in 3G spectrum auctions in Europe. This would seem a curious time for one of the most financially healthy mobile telecommunications companies to quit the world stage.

6. Recommendation: Technology Provider

We rule out the network operator strategy because it would require huge investments beyond DoCoMo's current resources or ability to raise funds in the capital markets and because it is difficult to circumvent U.S. laws regarding foreign ownership of U.S. spectrum. As an outsider without a well-recognized brand name, it would be difficult for DoCoMo to become a late-entry cellular provider in the United States. This is also the major problem with the approach of becoming a packager of mobile services. And, finally, though potentially a reasonable option from a short-term financial point of view, it is likely that withdrawal from the United States would not be considered a viable option by DoCoMo's executive management. After all, this would deny DoCoMo access to a huge potential growth market.

The most likely successful strategy for DoCoMo would be to remain in the U.S. market as a licensor of its i-mode and eventual 3G technologies. Under such arrangements, DoCoMo would receive a license fee for every i-mode product sold or bit transported using its technologies by a large array of wireless providers and handset manufacturers. This is similar to the strategy DoCoMo recently announced for the French market, where it reached an agreement to license i-mode to Bouygues Telecom, the No. 3 wireless carrier in France.

DoCoMo's major competitive assets that are transferable to the United States are the fruits of its R&D on mobile communications technology. Its R&D investments have been much greater than those of any other carrier worldwide. DoCoMo would be able to add value in the U.S. wireless market in the following way. Currently, network operators control the market for handsets through the selection of standards and features. Equipment cannot be connected to the network without their permission. This can stifle innovation and the adoption of new services (Noam 2002). For carriers that are seeking ways to offer premium services beyond the commodity of voice airtime, DoCoMo could leverage the advantages of its i-mode terminal equipment and applications. Its patented c-HTML would be an important technology to leverage.

Third-generation services have not yet taken hold in the United States, but there is latent demand. Consumers can increasingly access multimedia, video and other bandwidth-intensive content via their computers. As consumers increasingly use these services, the desire for comparable mobile services when on the go should increase as well. By cultivating demand for i-mode services among early adopters, establishing the technology in the United States and developing brand loyalty, DoCoMo would position itself well to offer 3G technologies to U.S. carriers at a later date. By the time demand for 3G reaches commercially viable levels in the United States, DoCoMo would then have a significant head start in offering these products and services from its 3G experience in Japan.

For this strategy to work, DoCoMo would best be served by not being locked into an exclusive relationship. Its current exclusive partnership with AT&T Wireless seems likely to hinder, not promote, the widespread adoption of its technologies in the United States. AT&T Wireless is a large and slow-moving organization that is encumbering DoCoMo's progress in the United States. DoCoMo should instead license its innovative technologies throughout the cellular industry, attempt to establish the widespread adoption of its technology as standards in the industry and commit to this approach as its global strategy.

7. Conclusion

Culturally, the Japanese have long viewed themselves and their industry as a notorious adopter of foreign technologies, rather than as an innovator of technology. To describe its industrial and cultural history of adoption, the Japanese have a particularly literate expression: *wakon-yosai*, which translates literally as “Japanese passion; Western intelligence.” It is oftentimes used to describe the Japanese borrowing, adaptation and improvement of technologies developed in the West. Yet Japanese industry not only adopted experience learned from outside Japan but also improved upon it in a particularly Japanese way. The time may have come to reverse this trend.

A Japanese industry now has the novel position of being the innovator. To successfully bring i-mode to the United States is a new challenge for a Japanese company. DoCoMo’s experiences with i-mode are clearly ahead of its U.S. counterparts. This is a challenge that embodies *yokon-wasai*—“Western passion; Japanese know-how.” DoCoMo, USA, will have to adapt its technologies for foreign uses. As an organization, its culture will have to be that of the educator. DoCoMo can profit by its experiences and lessons learned—both positive and negative—in deploying advanced wireless networks. DoCoMo’s setbacks with its FOMA 3G wireless network may prove to be as valuable to foreign carriers as its success with i-mode.

References

- Belson, Ken. 2002. Japan slow to accept new phones. *New York Times*, 22 April. *Financial Times*. 2002. FT 500: The world's largest companies, 10 May.
- Noam, Eli. 2002. Opening the "walled airwave." In *Telecommunications competition in a consolidating marketplace*, edited by R. Entman. The Aspen Institute.
- Normile, Dennis. 2001. Coming to America: Will DoCoMo's i-mode translate to the U.S. market? *Electronic Business* October: 69–70.
- Reuters*. 2002. NTT—Deeper into the red after write-downs. 10 May.

Appendix 1: Interviews

Noam, Eli, Professor and Director, Columbia Institute for Tele-Information, Columbia Business School. Interview by Kenneth Carter (New York, NY) 30 April, 2002.

Waverman, Len, Professor, London Business School. Interview by Kenneth Carter (New York, NY) 30 April, 2002.

Ono, Nobuharu, President and CEO, NTT DoCoMo, USA. Interview by Kenneth Carter and Richard Katz (New York, NY) 22 April 2002.

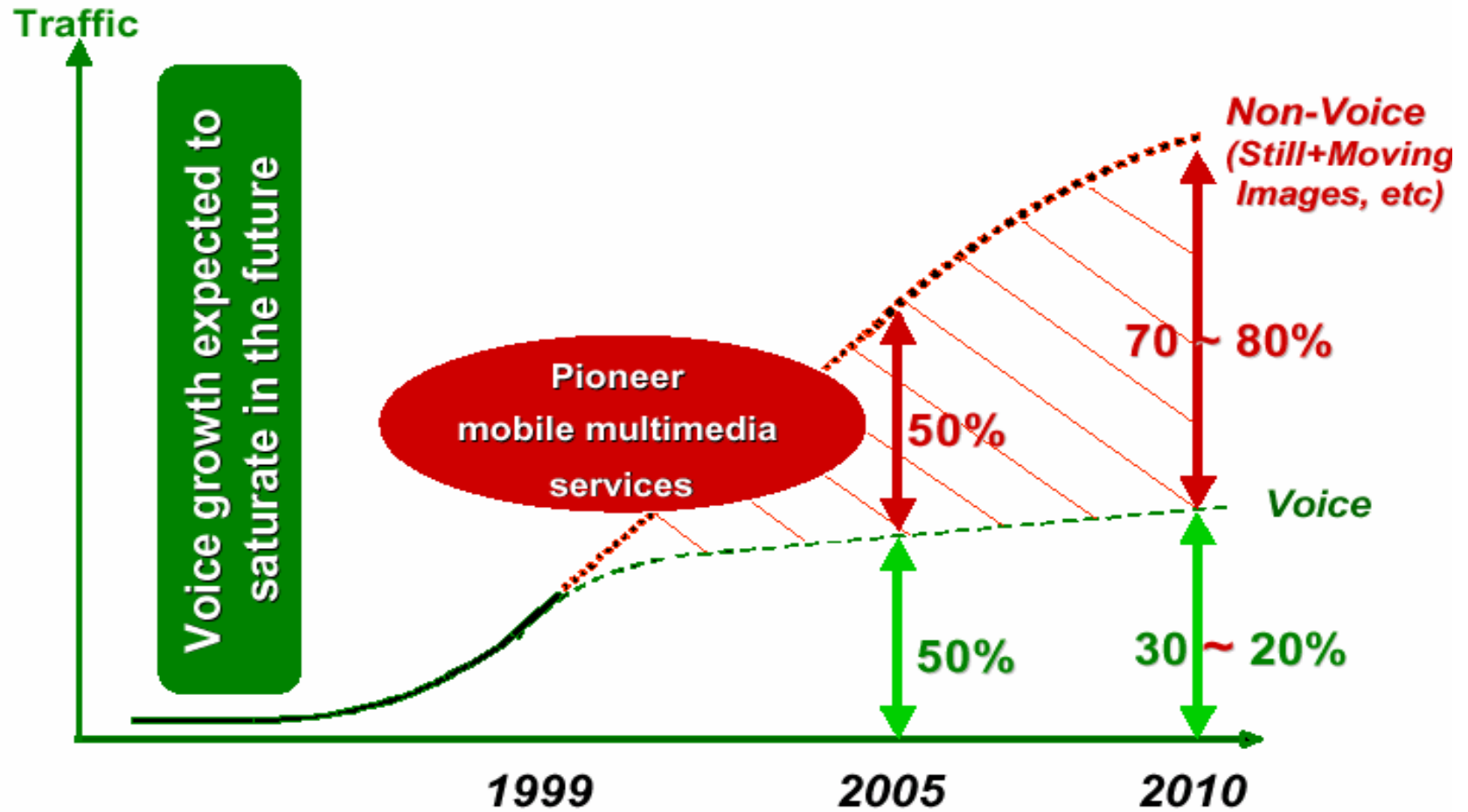
Sato, Hiroataka, Senior Vice President and COO, NTT DoCoMo, USA. Interview by Kenneth Carter and Richard Katz (New York, NY) 22 April 2002..

Ogawa, Satako, Manager Corporate Communications, NTT DoCoMo, USA. Interview by Kenneth Carter and Richard Katz (New York, NY) 22 April 2002.

Alleman, James H., Visiting Professor and Research Director, Columbia Institute for Tele-Information, Columbia Business School. Interview by Kenneth Carter and Richard Katz (New York, NY) 22 April 2002.

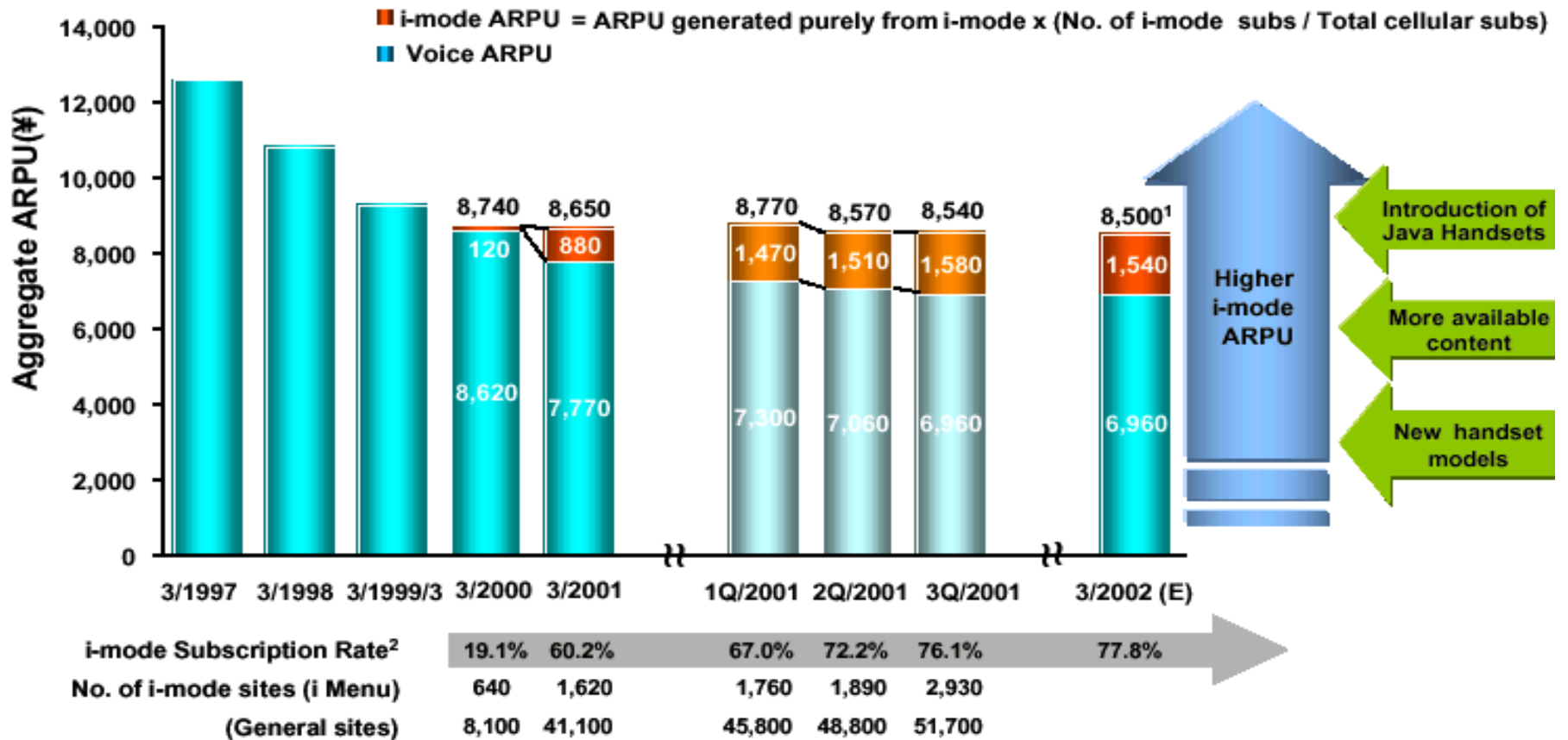
Name withheld by request, Private Telecommunications Consultant (former RBOC senior executive and international and wireless telecommunications expert). Interview by Kenneth Carter, Richard Katz, William Pitt, and John van Rossen (New York, NY) 1 April 2002.

Mishima, Shun, Vice President, Business Development, NTT DoCoMo, USA. Interview by Kenneth Carter, William Pitt, and John van Rossen (New York, NY) 27 March 2002.



Source: NTT DoCoMo, USA

Aggregate ARPU Boosted by i-mode ARPU



1) Includes the ¥310 increase resulting from the access charges income from mobile to mobile communication

Source: NTT DoCoMo, USA

Appendix 4: Global Network Evolution

1G 1980s	2G 1990s	2.5G 2001	3G 2003?	4G ??
Analog Cell	Digital voice and PCS, some data	Text-based Internet	High-speed Internet	WOW-Factor
TACS/E-TACS used outside Nordic and United States	CDMA Adopted by Korea, Verizon, Sprint Ericsson bought Qualcomm's CDMA manufacturing unit European Telecom Standards Institute (ETSI) endorsed CDMA as the next generation	i-mode	UMTS IMT-2000 (ITU) (GSM based)	??
AMPS/D-AMPS Advanced mobile phone system	TDMA Adopted in United States by AT&T, SBC and Bell South (Cingular)	GPRS can increase transmission rates on GSM networks 115 kbit/s Real speeds likely slower	W-CDMA	??
NMT Nordic Mobile Telephone System	GSM is a TDMA standard Global System Mobile	EDGE	CDMA-2000	??
	Frequency division multiple access (FDMA)	2G with enhancements (HSCSD, GPRS, EDGE, etc.) High-speed circuit-switched data (HSCSD) 57.4 kbit/s		
	PCS, PHS in Japan			
	I-DEN (by Motorola; Adopted by Nextel) PDC (personal digital communications, Japan)			

Signal process chip can support various standards for wireless phones.

Note: Combining CDMA and TDMA/ GSM is technically difficult and costly.

Appendix 5: Transferability of i-mode to the United States

Technology	Transferable to US
▪ Existing network footprint	No
▪ Packet network	No
▪ shared bandwidth (capacity)	
▪ addressable	
▪ Spectrum availability	No
▪ Proprietary technology	
▪ c-HTML (compact HTML)	Yes
▪ Network components	Yes
▪ Handset technology	Yes
▪ Network economy of scale	No
▪ Content	Somewhat

Market position and environment	Applies in US
▪ Market dominance, first to market	No
▪ Pricing, affordable (two tier pricing)	Yes
▪ Established brand (NTT)	No
▪ Competing modes of internet access	No
▪ Efficient micro-billing system	Yes

Culture	Applies in US
▪ Culturally homogenous population	No
▪ Greater cultural affinity for text vs. voice	No
▪ Affinity for technological gadgets	Somewhat
▪ High mobile phone penetration	Less than Japan
▪ Brand consciousness of consumers	Less than Japan