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DoCoMo as a Global Force: The Challenge of Exporting Japanese Technological Developments

Journal of Internet Banking and Commerce, December 2005, vol. 10, no.3
(<http://www.arraydev.com/commerce/jibc/>)

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Abstract

NTT DoCoMo sparked a veritable revolution in the Japanese mobile Internet, vaulting the country to global leadership in this crucial high technology field. Having established a dominant position in the Japanese market, DoCoMo sought to export its technology and business model, hoping to capitalize on growing international interest in telephone-based Internet service. The expansion did not prove as smooth or easy as DoCoMo anticipated, as the company attempted to fight through the complex web of national telecommunications regulations and complex merger and joint venture agreements with a number of international firms. DoCoMo's experience demonstrated the formidable challenges involved in internationalizing Japanese technology and Internet-based services, drawing attention to the strong connection between DoCoMo's dramatic success in Japan and the unique needs and opportunities of the Japanese market.

At the turn of the century, analysts assumed that NTT DoCoMo would quickly introduce the mobile internet (accessing the internet over a mobile phone or *keitai* in Japanese) around the world and have the same astounding success it had in Japan in all the other markets it entered. The company's formidable success in Japan, backed by the most successful e-commerce implementation in the world, was truly unprecedented. From its launch in 1999, NTT DoCoMo's subscriber base grew by leaps and bounds. Within a year, it had 5 million users and three rival companies had entered the market; by 2004, 49 million Japanese were subscribers to the mobile internet, 42 million of them with i-mode. [1] (See the Spring JIBC issue for an overview of the early years of the internet and internet commerce in Japan). From early in the successful implementation in Japan, company executives began to discuss

overseas markets, recognizing the enormous opportunities that attended the firm or firms that established their product as the industry standard in many international markets. [2] However, although DoCoMo began in 2000 to launch i-mode in a variety of countries around the world, global success has been a little slower and more difficult than DoCoMo initially envisaged.

The scale and speed of DoCoMo's international investments in mobile Internet were, even for the expansionist and speculative IT sector, quite breathtaking. The firm opted for an alliance-based system, involving part ownership of major international telecoms, and licensing deals for specific countries or regions. They did not go the route used in Europe, where major firms engaged in bitter and costly takeover contests. In 2000, the firm committed an estimated \$23 billion to these acquisitions, including over \$15 billion for a share of AT&T Wireless, an investment which turned out to be ill-timed. I-mode's first overseas launch was with E-Plus of Germany in March 2002, followed by joint ventures with KPN Mobile of the Netherlands, BASE of Belgium and France's Bouygues Telecom later that same year. In 2003, Italy's Wind and Spain's Telefonic Moviles introduced i-mode followed by Greece's COSMOTE in 2004, just before the Olympics. DoCoMo also invested in supporting companies, including a partnership with America Online in 2000 and Verio, a web-company that cost the Japanese firm close to \$5 billion. The response to the services, however, did not match expectations.

Within Japan, DoCoMo had had to wade through a morass of telecommunications regulations; the challenge escalated as the company moved off-shore. Each country jealously guards and regulates its band-width, often through complex protocols and ownership requirements. In Japan, the corporate strategy was built around operating as a service provider not as a normal telecommunications firm, with an emphasis on addressing consumers' needs, rather than by functioning as a utility. [3] This meant, invariably, a clash of cultures with overseas telecommunications firms, which remained largely wedded to a business model built around the sale of voice and data services. DoCoMo discovered, as well, that it was entering a marketplace where competing standards, tied to specific companies or consortia, had yet to be resolved and where the level of consumer interest in Japan-style services and technologies remained largely unproven.

Although opportunities beckoned, DoCoMo was initially uncertain about how to respond to the promise of overseas expansion. David Macdonald, a Canadian employee of DoCoMo charged with managing a portion of the international operations, said in 2002, "For the longest time, I was the only guy other than Natsuno-san (Takeshi Natsuno, a leading executive with DoCoMo) who thought it was a good thing to do? Personally, I think the company struggled to become international because they'd been thrust into the spotlight without being ready for it. I know the company has really been gung ho to work overseas, but, from a personal point of view, it's been a hard struggle to make everyone understand." [4] Charged with managing the DoCoMo implementations in Europe, Macdonald discovered significant gaps between DoCoMo's strategy and European expectations. Some, like KPN Mobile's decision to offer pornography via the mobile Internet, did not fit with DoCoMo's Japanese strategy, which was to manage the sites available to its customers and to guarantee their quality. As Macdonald said in 2002,

I agree that we don't understand everything about Europe. And we're under no misconceptions that everything we do here will work one-for-one in Europe. We have to take what we do and come up with the best solution for our European colleagues. DoCoMo is not perfect. There is a lot of strong strategy behind it, but there are a lot of things we have to learn, too." [5]

As the mobile internet was introduced across Europe and in other countries, customers signed up in the thousands, not the tens and hundreds of thousands that had been eagerly anticipated. In North America, the patchwork of licenses, regulations and services interfered with the implementation of mobile Internet services. Travelers routinely discovered that their system worked only selectively, and typically only in larger centres, thus undercutting much of the utility of a portable system. The results proved demoralizing for DoCoMo. Two years after the speculative expansion, and at a time when over 35 million Japanese used the i-mode service, only 150,000 Europeans had signed on. The AT&T partnership also produced few returns, as American consumers proved to be surprisingly risk averse and shied away from the new technology. One commentator said near the end of the fiscally disappointing 2002, "It looks like DoCoMo's heady global vision will remain little more than a dream." [6] By that year, the company was looking at writing off almost Y600 billion of its investment in AT&T, part of a reassessment of its Y2 trillion in overseas commitments. [7]

In the midst of the expansion overseas, industry analysts began to sound warnings. DoCoMo's success rested, in many ways, on free access to wireless bandwidth (in contrast to the huge fees in other countries) and the high cost of competitive, telephone-based Internet services. One of the most comprehensive critiques came from a consulting firm, Ovum, which identified a series of major barriers to the success of DoCoMo outside Japan. These included: DoCoMo's inability to reproduce its position in Japan in the "value chain," the much greater Internet use via personal computers than in Japan, market resistance to Japanese-made cellular phones, longer handset replacement cycles in European countries, and technological problems associated with running i-mode over the European GPRS mobile telephone system. [8] The earlier failure of WAP-based wireless Internet service also undercut consumer confidence in the new technologies, creating a wait and see attitude toward the service. In contrast, the availability of some mobile Internet services over the SMS system meant that many consumers were not looking for a new delivery service. In comparison to Japan, where DoCoMo's i-mode established the very foundations of the mobile Internet industry, the European and other markets were crowded, suspicious or unimpressed. A few commentators wondered aloud about the transportability of the Japanese service; as one observer, who nonetheless encouraged investors to pay close heed to DoCoMo's expansion plans, wrote, "There is little indication that the gimmicky services that drove its domestic success—the jingles, the messaging, the pop-show quizzes—will be as enticing to consumers globally." [9]

Many of the features that proved so prominent and successful in Japan did not translate well to other countries. In the United States, for example, automobile commuting differs greatly from the subway and train transportation used by millions of Japanese workers every day. The availability of maps and Geographical Position Services, so crucial in navigating the complex Japanese cities, are of marginal utility in more carefully designed cities in North America, Australia and other industrialized countries. The enthusiasm of Japanese teenagers, in particular, for downloadable screensavers, dial tones, and cartoon characters has not been matched in other countries. The mobile Internet has, in most countries, remained an adult phenomenon and has not attracted as substantial a teenager market as in Japan. The Japanese's fascination with gadgets such as the *keitai* camera has not been replicated in other nations, thus slowing the adoption of both the core service and the expensive new handsets which enhance the profitability of the Japanese mobile Internet. Added to all of this is the fact that the *keitai* is better suited to Japanese characters than the Roman alphabet (the Japanese alphabet requires fewer key strokes), making it easier for Japanese users to navigate the mobile Internet. In sum, the cultural, geographical and nation-specific conditions which fueled DoCoMo's rise have not appeared in other countries, thus limiting the size of the market and the enthusiasm of users for i-mode services.

Problems signing up subscribers and the collapse of the [dot.com](#) economy in 2001-2002 took a great toll on DoCoMo's international investments. The firm wrote off almost \$15 billion in international share value in 2001-2002 and by the spring of 2002 had frozen international expansion. Despite continued profitable operations in Japan (\$7 billion from sales of \$39 billion), DoCoMo nonetheless posted a three-quarters of a billion dollar loss for 2001-2002, a victim of the techno-enthusiasms of the telecom era. [10] Vodafone, a competitor of DoCoMo's in the rush for international domination, suffered comparable losses, including a staggering \$19.7 billion in 2001-2002. [11] Like many companies in the overheated days of the [dot.com](#) boom, DoCoMo had grown too fast and without sufficient attention to the sustainability of their international business.

This stood, of course, in stark contrast to the solidity of its Japanese operations, which provided a sound fiscal base for overseas operations. But the problems went beyond the unsustainable investment culture of the [dot.com](#) era. AT&T's operation rolled out slowly and poorly, offering patchy and uneven service. The more crowded European markets likewise proved difficult, as competing mobile Internet services vied for an as yet underdeveloped market. Moreover, DoCoMo's customer-friendly, market-driven Japanese model did not always sit well with the overseas utilities and technology-based telecom firms. The company was left with a thinly connected string of international alliances and a major fiscal challenge arising from the write-down of overseas investments.

DoCoMo's launch of its 3G (third generation) mobile phones also got off to a rocky start both inside and outside Japan. The 3-G service called FOMA (for "freedom of multimedia access") by DoCoMo has enormous promise for it adds voice and video to existing mobile Internet delivery systems.

Throughout 2002, DoCoMo and its global partners promoted the potential of the new system, bidding up prices for the bandwidth and licenses necessary to carry the service. Promised as a revolutionary improvement in mobile Internet, the 3-G fizzled initially, even in Japan. The effort continued, despite

the problems, with AT&T and DoCoMo announcing plans to introduce 3G to San Francisco, Seattle, San Diego and Dallas. [12] In Europe, the telecoms invested so heavily in the licenses that they often lacked the resources to bring the services to market effectively. Asian countries moved even more slowly in adopting a single system, frustrating DoCoMo's efforts to launch their services in the region. There was, as well, the inevitable and difficult debate about technological standards, with DoCoMo's W-CDMA losing ground to CDMA2000, a system introduced successfully into Japan from KDDI.

Uneven performance, slow expansion outside the major cities, and an array of technical difficulties resulted in postponements of the initial start-up, unwelcome service interruptions and, most distressingly for DoCoMo, damage to the firm's reputation for innovative and implementation. The 3-G initiative left a series of financial calamities in its wake, particularly in Europe, where the expenditure of half a trillion dollars on licenses eroded the viability of some of the continent's strongest telecoms. [13] DoCoMo refocused its energies on its core services and returned to the laboratory to refine its 3-G products.

It is important to note that there was always more at stake in the expansion of i-mode than DoCoMo's financial well-being. Other Japanese firms hoped to join DoCoMo's international expansion. NEC and Matsushita launched a major investment in handset development and production, specifically tied to the emergence of 3-G outside of Japan. They hoped, in particular, to overtake rival Nokia's leadership and to establish new markets for the Internet-enabled telephones. [14] For its part, DoCoMo never abandoned its international activities, even as it wrote off millions of yen in investment and lowered its expectations. In addition to maintaining its overseas affiliates, DoCoMo maintained operating companies and communication laboratories in the United States, Europe and Brazil. [15] By 2005, however, many of the start-up challenges appear to have been overcome and subscriber numbers within Japan are skyrocketing. Between May and October 2005, the number of FOMA subscribers in Japan went from 12.9 million to 17.6 million. In 2005, DoCoMo is actively working with overseas operators in Hong Kong, the United Kingdom, Spain and Singapore. [16]

Even though the global expansion did not proceed as DoCoMo initially expected, DoCoMo remained bullish about its international opportunities. As the firm declared in its 2003 annual report:

"Globalization" is a concept that goes hand-in-hand with "multimedia." We want to continue the trend of providing highly sophisticated multimedia services with the "globalization" trend of being able to access mobile communications services anywhere in the world. By doing so, we will greatly improve the value of both concepts. In other words, being able to use the same services in the same environment without having to think about national borders is very important for our users' convenience. Based on this idea, we are promoting a common platform for mobile communication networks through "globalization." In addition, making platforms compatible with each other is an important way of increasing the competitiveness of the operators. Global competition is already begun in the mobile communications market in Japan, and we are moving ahead with "globalization: to ensure that we will come out ahead in this competition. [17]

DoCoMo has also had considerable success. Its partnership with Nokia Corporation of Finland, the leading handset maker, and connections with most of the leading mobile telecommunications firms in Europe means that DoCoMo has established somewhat of a global presence if not a global branding.

The firm's overseas investment and commitments did not produce the immediate returns expected in the halcyon days of the dot.com revolution, but they have the potential to keep DoCoMo at the forefront of the international mobile communications market. The more careful effort to draw on the Japanese market-based innovation culture to provide products and services of broader international interest has become entrenched within the DoCoMo corporate environment. Examples of the kinds of products DoCoMo is developing include a cell phone which works by reading lips (capturing facial muscle activity as electrical signals and converting them into voice allowing telephone users to carry on a conversations without speaking out loud), and the FingerWhisper, a wearable telephone handset that uses the human hand as part of the receiver. The FingerWhisper is worn on the wrist and converts voice to vibration and then, by inserting the index finger in the ear, back to voice.

The most important lesson from the DoCoMo experience, which continues to have a major impact on Japan and influences developments around the world, is that technology is not as automatically global as has long been assumed. The DoCoMo phenomenon was ultimately rooted in Japan. What set DoCoMo and its competitors apart from firms and services in other countries was the

manner in which they identified and responded to the specific cultural, social and economic characteristics of Japan. The emphasis on high quality sites, secure, urban-based services, hiragana keyboards, and partnerships with leading national manufactures able to produce attractive handsets addressed specific Japanese concerns and needs about the Internet and meshed with a portable, reliable and inexpensive technology to provide the country with a truly revolutionary Internet implementation.

In a wide variety of ways, the Internet has not been the technological agent of globalization that many critics, advocates and alarmists anticipated in the late 1990s. English has not overwhelmed the Internet; Chinese will likely emerge as the dominant language within a decade. The development of character-based URLs will ensure that countries like South Korea and Japan will be able to sustain nation-specific Internets into the future. The DoCoMo model that worked so well in Japan has not been readily transplanted into countries like the United States where a variety of demographic, geographic and technological factors have favoured wire-based Internet services. Massive investments in Internet infrastructure proved unsustainable and contributed to the [dot.com](#) meltdown of the early 21st century; the world is not as wired as it was anticipated to be. Numerous barriers remain in the effort to create a truly ubiquitous Internet environment. DoCoMo's Internet-enabled telephones still work only in Japan, just as most other mobile Internet systems work only within the boundaries of one or two countries.

Technological globalization has proven to be complex and multidirectional. Finnish cellular telephones, Japanese industrial robots, American web-sites, Taiwanese laptop monitors, Chinese assembled computers and a wide variety of other devices, services and technologies have entered the global marketplace. Indian programmers compete with Silicon Valley companies for international contracts, and nations as diverse as New Zealand and Malaysia have invested substantially in Internet development and high tech corporate expansion. All industrial nations have indicated that the ability to compete successfully in the high technology economy will be crucial to economic viability and growth in the 21st century, but there is as yet no clear indication of which country or countries are destined to emerge as clear winners in the technological free-for-all sparked by the digital revolution.

The next stage of the communications revolution at which NTT DoCoMo stands at the forefront is the development of a ubiquitous world in which communication is possible anytime, anywhere and with anyone and sometimes anything! DoCoMo through what it has dubbed i-mode Felica envisions, and is constructing, a world where wallets and keys are obsolete and all that people carry is their cell phone. With that cell phone, people will be able to pay for goods and services, lock and unlock their homes and cars, monitor the security of their homes and turn on and off household appliances from a distance and track packages, pets and children. Many of these activities are already possible in Japan and appear to be being embraced enthusiastically. Whether or not they will be as popular elsewhere on the globe remains to be seen.

As DoCoMo's operations indicate, the very concept of globalization has changed in recent years. When DoCoMo first undertook its international expansion, it had ambitions of establishing its technology as the cornerstone of the mobile Internet and 3G services in all major markets. That strategy stumbled in the wake of the [dot.com](#) and telecom busts. Faced with growing international competition within Japan, and realizing that national technological barriers make it challenging to sell mobile Internet services outside the country at least without adapting them, DoCoMo now must conceptualize globalization differently. DoCoMo now must work to ensure that its services are available in the leading industrial nations and that there is a technological "fit" with its partners in key countries. This concept is called "global roaming" and means that a subscriber can continue to receive messages from their domestic system even though they are traveling the world. Given that other companies, especially Vodaphone and J-Phone, are introducing this competitive option into Japan, DoCoMo has little choice but to match the global coverage and international ease of use that is promised by competitors.

The DoCoMo experience offers several salutary lessons. Picked by industry prognosticators from around the world as the single best mobile Internet implementation, DoCoMo found its rush into global expansion to be a serious disappointment. The emergence of major competitors, particularly in South Korea, the retention of national and regional regulatory and technological barriers, competition within Japan (J-Phone's first-to-market implementation of the camera phone and KDDI's market-leading work with global positioning systems as examples) and the nation-specific nature of the *keitai* revolution in Japan all must influence the shape of DoCoMo's future global initiatives. The made in and for

Japan technology and services which underlay the company's dramatic rise and market dominance proved not to be readily transportable to other countries. Several of the elements which were critical in Japan Japanese language sites, Global Positioning Systems, and on-line services designed for the unique Japanese urban market ?were not easily reproduced overseas.

The Internet boom pushed ?and defined ?the limits for wireless based technologies. Major international investments in 3G technologies, including DoCoMo's efforts in Japan, stalled and foundered at least initially. In only a handful of countries, most notably Japan and South Korea, were mobile firms able to generate sufficient business to make the portable Internet a major success. Burned by failed investments in DoCoMo-style wireless and 3G implementation, a growing list of companies and countries stayed on the sidelines as Japan and South Korea worked on viable business models of the new video and audio-rich Internet services.

The key message, one replicated in earlier generations through debates over railway track gauges, radio and television standards, safety and environmental specifications, is that the national orientation of most societies is difficult to dislodge. For reasons ranging from economic protectionism to cultural snobbery and paranoia, countries find ways to erect barriers to the rest of the world. The Internet and its attending technologies, DoCoMo's mobile Internet being a prime example, were expected to undermine national boundaries and be a critical part in the creation of a borderless world. Globalization is not a fait accompli. Many political, social and economic issues remain as significant roadblocks in the way of the interconnected world envisioned by the proponents of open borders, free trade, and the routine movement of goods, ideas, and services throughout the world.

As DoCoMo's experience with global expansion demonstrates, globalization is a difficult, expensive and often successful force, one that can both entice and defeat. The *keitai* revolution vaulted Japan to the forefront of the Internet world. The very elements of Japanese culture and society which underlay i -mode's success in Japan, however, did not exist elsewhere in the same combination. This technological revolution, much like numerous transformative ideas, political movements and values, proved not to be a readily exportable commodity.

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