

## Chapter IX

# Japan: Keitai Crazy, From the Web to the Wallet

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### Abstract

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*Japan is a world leader in the development and deployment of mobile communications and m-commerce. The country maintains this position by both staying on the cutting edge of technologies and catering to a user base eager to embrace new mobile technologies. Mobile commerce has developed beyond just data transmissions between the handset and the Web. The handsets can now serve as an “e-wallet” for conducting physical, real world transactions. In the course of this chapter, we will explain briefly the historical advances in mobile technologies which have enabled and engendered m-commerce applications of increasing complexity. Concurrently, we will present a series of micro-cases about m-commerce and give analysis of these cases from the CLIP framework. Finally, we will draw conclusions and lessons learned that might be applicable in other m-commerce markets.*

## Introduction: Mobile Communications in Japan

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Known as “Keitai,” mobile phones in Japan are ubiquitous. In a country of 120 million people, there are over 80 million users.<sup>1</sup> In order to understand the Japanese mobile commerce landscape, it is necessary to examine two of the key players in the industry. These firms are the two largest mobile carriers in Japan, NTT DoCoMo and KDDI, with over 60 percent and 20 percent market share respectively.<sup>2</sup> This understanding is crucial in comprehending this business arena because as new generations of technologies become available, so do new content and m-commerce applications. NTT DoCoMo and KDDI compete actively to launch innovative new mobile communications services and mobile commerce applications (see Box 1 “Manabi – Cramming for Tests on the Go”).

### *Box 1. Manabi – Cramming for Tests on the Go*

In the hectic urban life of Japan, even schoolchildren often have commutes of up to 45 minutes using public transit methods such as trains and city buses. In 2005, Japan’s second largest mobile operator launched the *Manabi* program under its AU mobile service label. Manabi literally means “to study.” Targeted at school students, Manabi allows subscribers to get access to study kits and test themselves using onscreen multiple-choice questions that flash on their mobile phones. Students can use Manabi to brush up on various academic subjects while commuting to and from schools and after-school tutorial centers. In addition to cramming for major academic tests such as college entrance exams, Manabi users can learn English idioms, hone their foreign language skills, improve knowledge of Japanese proverbs or just bolster their vocabulary. To promote this service, KDDI allowed the users to take practice versions of Japan’s equivalent of SAT tests for free for the first few months. KDDI partnered with textbook companies such as Shueisha and Nichinoken to offer a wide range of study programs. There was even a Manabi version for mothers of preschool children preparing for entrance exams into some of the country’s most exclusive and competitive elementary schools. In this toddler version, mothers read out questions to their children and feed them the right answers!

KDDI pointed out that its service not only allows users to get access to information but also test their own knowledge and see how they fare on the go. In a major city like Tokyo, where most commuters take the train and many have long rides, such a service can be particularly attractive.

Using the Manabi service, high school student Midori Kashiwagi found out that her approximate SAT-type score made her a borderline candidate for her college of first choice. She felt that if she kept using Manabi, she would improve her score enough to get into her top-choice college.

Source: News item at Physorg.com, KDDI Website and author’s research.

For purposes of our analysis, and to place the chapter in context, the narrative is broken into successive technological generations in mobile technology. As each level of technology arose, corresponding forms of m-commerce were deployed, each form becoming more sophisticated than the previous ones. This chapter is further separated into two major sections, entitled “The Web” and “The Wallet,” each representing m-commerce applications that transitioned from the virtual, Web-based implementations to the use of mobile handsets as a “Wallet,” enabling interactivity in the real, physical world to purchase goods and services.

To comprehend the current-day state of m-commerce in Japan, it is necessary to first examine the historic background that led to the creation and adoption of mobile technologies. The following section, adapted from Steinbock (2003), briefly summarizes these factors.

## **National Technology Policy**

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With the downfall of the luddite Tokugawa Shogunate and the restoration of the Emperor Meiji and his progressive government, telecommunications was targeted as an essential technology needed by Japan if it were to stave off the threat of economic domination or even colonization by the Western powers, as was occurring in other parts of Asia, most notably in China. In order to rapidly industrialize, efficient communication was deemed integral to these efforts and so the creation of a telecommunications industry was mandatory.

Applying the same practice of adoption of foreign technology through foreign direct investment and joint ventures as it had successfully done in other industries, as early as 1881 the United States-based Western Electric, the supply chain of the United States-based Bell system, began production of telecommunication equipment via a joint venture with NEC (Nippon Electric Company). Like its progress in other technologies, Japan sought to quickly shed the dependence on foreign sources of technology and finished products. The Japanese government was unwilling to trade access to their markets in exchange for foreign technologies. The challenge therefore was to produce all the necessary telecommunications equipment domestically.

In response to this challenge, reverse engineering of the equipment was attempted under the guidance of the Ministry of Industry (the forerunner of MITI – Ministry of Trade and Industry) with no success. This failure can best be attributed to the fact that the Japanese lacked the ancillary equipment and technical knowhow for production of equipment.

Realizing the futility of further reverse engineering attempts, the government sent experts to foreign nations to observe overseas production and acquire the needed skill sets and technology to develop domestically manufactured telecommunication equipment.

In 1885, the newly formed Ministry of Communication assumed the responsibility for telecommunications from the Ministry of Industry. The Ministry of Communications gave NEC a virtual monopoly for the development, creation and commercialization of telecommunication equipment in Japan.

Even with the monopolistic powers of NEC, by 1944 there were only approximately one million telephones in Japan. This was because of the destruction to infrastructure due to intense bombings by the Allies during the World War II, by the end of which the telephone user base dropped to 400,000.

Post World War II, the occupying Allied forces, recognized the imperative need for a reliable telecommunications system in order to successfully rebuild Japan. Modeled on the United States-based AT&T Bell system, a new public firm, NTT (Nippon Telephone & Telegraph), was established. Its mission was to create infrastructure and maintenance for domestic telephone calls. NEC was charged with the task of producing the necessary equipment (e.g., handsets, switches, etc.) to support this new network.

Concurrent to these actions, an additional public firm, KDD (Kokusai Denshin Denwa — the International Telegram & Telephone) was established to support overseas calling. To assure KDD's success, NTT was forbidden to enter the international telephone call market. This duopoly of domestic and foreign calls continued until the early 1980s, when the Japanese government heavily de-regulated and privatized the telecommunications sector.

## **Telecommunications Regulations**

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Through the passing of the NTT Corporation Act and the Telecommunications Business Act between 1982 and 1984, NTT was partially privatized in order to promote competition. One important result was that consumers were no longer required to lease their telephone equipment (e.g., the handsets). Instead, they could buy them outright, thereby reducing significantly the cost of having a phone. The demand for these phones promoted competition, driving down the prices and increasing the features.

## **1G and 2G: Analog and Digital Voice**

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In the first, or 1G, era of mobile communications (analog voice), NTT launched a cell-based service in 1979. It was a dismal failure, as by 1989 this service had attracted a mere 200,000 subscribers, which translated into a market penetration of 0.14 percent. There were several reasons for the failure, including high usage costs and the proprietary technology used which shut out competition. It was in response to this low rate of mobile penetration by global standards and other domestic consumer pressures that the aforementioned NTT Corporation Act was enabled.<sup>3</sup>

By the close of the 1980s, and with the development of 2nd generation (2G) digital mobile telecommunications technologies, NTT cast an eye on the proliferation of mobile telecom in Europe and the U.S. and realized the opportunity for profit. In 1991, NTT created a wireless division known as NTT DoCoMo, short for “Do Communications Over the Mobile Network.” It was the creation of this firm that created a mobile revolution in Japan: The DoCoMo subsidiary of NTT charged ahead to become the dominant mobile player in the Japanese 2G market.<sup>4</sup>

## **M-Commerce: The Web**

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### **2.5G: The Rise of i-Mode**

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The story of the development of NTT DoCoMo is a rich one, but can be summarized by recounting of the actions by NTT DoCoMo’s CEO and President, Mr. Kouji Ohboshi. In the early 1990s, a paging system was more popular than the analog voice services, and was the most profitable endeavor by NTT DoCoMo, with three million subscribers. With the worldwide rapid rise and growing use of available content on the Internet, Japanese consumers too had great pent up demand for Internet access. Mr. Ohboshi sought to fulfill this by creating the first Internet accessible mobile communications system.

In order to be first to market, he shrewdly decided to leverage off of NTT DoCoMo’s existing resources by deploying the pager network as the carrier for mobile traffic. While in theory this seemed like a good idea, there was a major potential problem. The network had a very limited bandwidth of a mere 9.6 Kbps. Rather than be stymied by this, Ohboshi embraced it (Kodama, 2001).

Given this constraint, a graphically rich Internet experience would not be possible. Rather, NTT DoCoMo created a simple menu-ing structure that could

be displayed on the small confines of the handsets' screens. The service was called "i-Mode," standing for "Internet Mode." Following the love of puns by the Japanese, the sound "i" was identical to the Japanese word "ai," meaning love (Kodama, 2001). This strategy was therefore emergent rather than deliberate (Mintzberg, 1985). A major characteristic that made i-Mode unique was its method to connect to the Internet. Unlike the U.S. system of needing to dial into a modem, i-Mode instead — like broadband — is always "on," which helped facilitate the development of m-commerce applications.

Not only was this revolutionary technology, it was also a unique business model. In lieu of selling airtime in minutes to consumers, NTT DoCoMo charged a nominal monthly fee, approximately 300 Yen (under \$3) a month and then charged for each data packet downloaded and uploaded from the handsets. These packets could be either voice or digital data from i-Mode compatible Websites, which can run from free to 10 to 100 Yen for a specified number of data packets, depending upon the content provider (Ratliff, 2002).

Launched in February 1999, the i-Mode service became an instant hit. Within 18 months of its launch, it had attracted over 10 million subscribers and 20,000 available sites. By October 2001, the number had increased threefold to over 30 million users<sup>5</sup>. Critical to the success of such a service was the rapid creation of m-content to attract consumers. The alacrity in m-content and m-commerce construction for the i-Mode platform can be attributed, though the use of the CLIP model, to two major factors: the ease of programming (thus, lots of "I" or information content) and a ready made billing system in the form of the monthly bill from NTT DoCoMo (thus, one-stop "P," or payment mode). These forces contributed to the widespread proliferation of the 2.5 G i-Mode Websites.

With the debut of i-Mode, there emerged new forms of C (Communication) and I (Information) systems. Developers could use a simple programming language, cHTML (compact HTML), that allowed regular e-commerce Websites to be readily converted to mobile accessible sites. This language was far easier to use than the standard WAP (Wireless Application Protocol) and WML (Wireless Markup Language) that had been the de facto world standard. From this developer-friendly communications platform, I (Information) from existing Websites was now made available to i-Mode users (Ratliff, 2002; Kodama, 2003; Lindmark, Bohlin, et al., 2004).

In the CLIP framework, another major factor in the i-Mode success was the P (Payment) method in the form of a ready made billing system. Through the menuing system of i-Mode, the Japanese users are able to access Internet-based content. Usage is encouraged through the pricing mechanism. In lieu of the "pay by the minute" system as found in the United States, with chances for large overage charges if the contracted number of minutes is exceeded, NTT DoCoMo instead has a metering system wherein the user is charged by the amount of data packets transmitted, be they voice or data.

The “Pay for Play” (Lennon & Dholakia, 2004) system has several advantages for both producers and the consumers. By centralizing the billing system, content providers need not go to the time and trouble of creating a billing system and ancillary support structure in their respective companies. Therefore, content providers can concentrate on their core competencies (Prahalad, 1990) of creation of content. In this manner, time to market is cut down and the rapid creation of product is enabled, thereby increasing the likelihood of gaining market share (Buzzell, 1975).

Consumers, too, benefit greatly from a convenient, centralized billing system. They are not confronted with myriad of bills from all the various Websites that they visit. Also, the charges for using the i-Mode system are better known, and the consumer can budget accordingly. From NTT DoCoMo’s perspective, this system is advantageous, as through its nine percent processing fee, a continuous revenue stream is created that can then subsidize future research and development of newer technologies, such as the 3G and 4G offerings discussed later in this chapter. This promotion of content development also serves NTT DoCoMo well, for it increases the overall worth of the i-Mode system. For as new services and data sources proliferate, the perceived value of the system increases, thereby promoting further adoption of the i-Mode technology by both consumers and producers (Schilling, 2003).

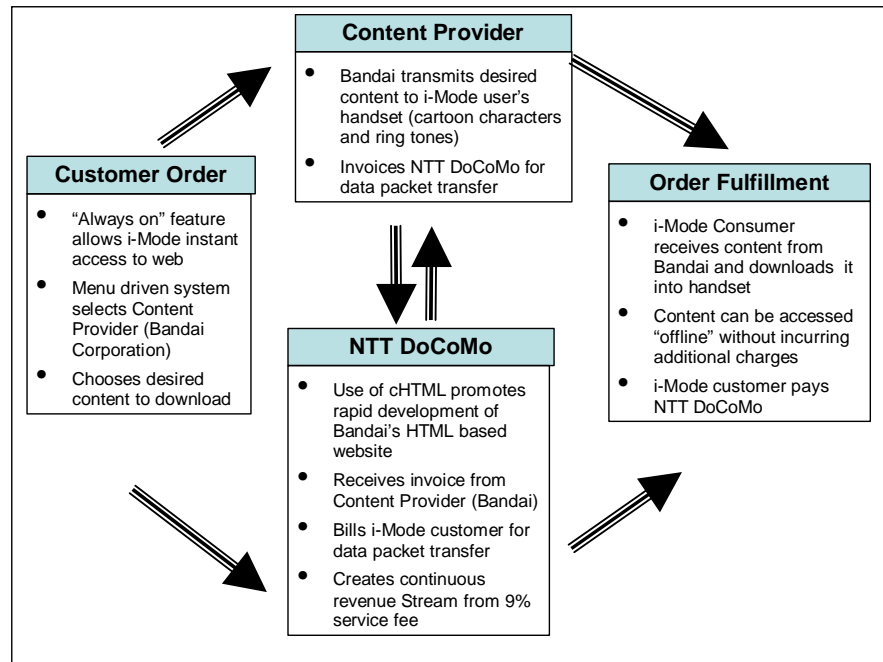
Figure 1 illustrates the “Pay for Play” business model. In the example shown in the illustration, the content provider is Bandai Corporation, which markets downloadable ringtones and pictures of popular “Manga” (cartoons).

One of the reasons for i-Mode’s widespread proliferation and adoption is an aspect of day-to-day living which is unique to Japan, as compared with Europe and North America. In Japan, the average worker uses public transportation (e.g., buses, trains, etc.) extensively, with an average commute time of 1.5 hours, often times changing modes of transportation. How this affects mobile usage is that voice calls are forbidden in these confined spaces. Rather, for distraction Japanese turn to i-Mode to download content and to send instant messages and e-mail. This has led to interesting impacts on society.

This communication back-and-forth, especially amongst the young, has created virtual communities. A group-dominated society, the Japanese are able to expand their circles of friends by increasing exponentially their number of personal contacts. So prevalent is this practice, that there is even a Japanese slang word—“oyayubi sedai,” or “thumb tribe”—referring to the rapid pressing of the thumb on the mobile phone’s keypad.

Another major contributory factor in the success of i-Mode is the lackluster Japanese economy. For the past ten years Japan has been wallowing in recession. Dubbed the “Gold Recession” due to the high rate of savings, these monies have ameliorated some of the recession’s negative effects. The savings

Figure 1. Pay-for-play model – A conceptual representation



form a discretionary account to purchase essential goods and services. Naturally, however, there is the desire by the Japanese (especially the young) to purchase luxury products. I-Mode, with its metering practice of charges for downloaded data packets, has proved to be a relatively inexpensive luxury item.

These 2.5G i-Mode sites also manifested another aspect of CLIP, Location, though in a more limited way than the other three. While the majority of the i-Mode applications were geographically nonspecific, some consumer-oriented services embraced the Location feature. A typical application was the sending of coupons for restaurants when the user was in the proximity.

These 2.5G Web sites proved immensely popular with the Japanese, and all types of m-commerce applications arose. From the personal (e.g., dating services) to the professional (e.g., stock brokerage), the ease of development and content creation created a boom in i-Mode-available m-commerce. These m-commerce sites concentrated on content providers. Table 1 summarizes some of the more heavily used applications.

These 2.5G i-Mode sites can be seen as the pioneers in m-commerce. I-Mode has grown so popular in Japan that it is a phenomenon unique to the world mobile



*Table 1. Popular 2.5G m-commerce sites*

Popular NTT DoCoMo i-Mode M-commerce Services
SMS (Short Messaging Service)
Banking
Stock Quotations
Games
Ringtones
Music snippets
Manga (cartoons)
Ticket purchasing
Travel Advisory

*Source: Authors' Research*

commerce market. The situation can be summarized by a quote from *Eurotechnology*, an online mobile e-zine:

*i-Mode is also a whole multi-billion dollar eco-system, and it is part of Japan's social and economic infrastructure. About 30% of Japan's population use i-mode about 10 times or more often per day, sending about 10 emails per person per day, booking train tickets, checking the weather or doing other daily routines via i-mode. Most businesses and individuals in Japan are affected in one way or another by i-mode. (quoted from <http://www.eurotechnology.com/imode/faq-gen.html>)*

NTT DoCoMo has strived hard to make i-Mode technology as friendly as possible to various user segments. For example, to make i-Mode appealing to the large and growing senior-citizen segment in Japan, even the i-Mode phones have been redesigned with features that make the phone use comfortable and appealing to the seniors (see Box 2 "Keitai for the Young at Heart").

## **M-Commerce: The Wallet**

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### **Advent of 3G**

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Japan is the first country to introduce widespread use of 3G (high speed digital) communications. Building upon its success with 2.5 G i-Mode service, in May

*Box 2. Keitai for the young at heart*

With an aging population, Japan has become one of the oldest countries in the world in demographic terms. Already, over a third of the Japanese population consists of senior citizens, and this proportion is expected to keep rising. For the senior segment, mobile phones have become quite popular. While the average ARPU for seniors at 3,000 Yen (US\$35) is in the low range of ARPUs in Japan's mobile markets, the senior segment is still a significant revenue producer.

Recognizing this market potential, NTT DoCoMo has released handsets that are designed specifically for use by seniors. To make operations easier, the display screens are larger and the menu choices simpler. Larger icons make it easier to select among i-Mode menu options. Other features include a pedometer and an emergency 90-decibel alarm.

Another unique feature is speed converter technology for incoming calls. For the benefit of the listening senior, the caller's voice speed is slowed down by about 30 percent, making the dialogue seem slower and more comprehensible.

Source: Based on news items from "WirelessWatch Japan" and "Ewireless News," and authors' research.

2001 NTT DoCoMo introduced in a limited testing area their 3G FOMA (Freedom of Multimedia Mobile Access) service. This was followed by the release of FOMA to the general public in October 2001. Unlike the paltry transmission rates of the original i-Mode system, 3G bandwidth increased to speeds rivaling ISDN, reaching as high as 384 Kbps in download transmissions (Lindmark, Bohlin, et al., 2004).

For NTT DoCoMo, the initial rollout of 3G service with FOMA enabled developers to create more robust and graphically rich applications. By using JAVA, content providers could also release many more interactive software applications to be used in conjunction with their downloadable content. An example of this was the popularity of games. With the addition of other enabling technologies, such as the introduction of Flash-Lite, a version of Macromedia's popular Flash technology in 2003, sophisticated information services have been developed. Early examples of this are the popular graphic-rich weather Websites, where real-time data (e.g., temperatures, storm patterns, etc.) are dynamically updated on zoomable maps.<sup>6</sup>

This is not to say that NTT DoCoMo was the only source of 3G content. Realizing the futility of entering the 2.5G market due to NTT DoCoMo's formidable market share with its i-Mode service, KDDI did a technological leapfrog and debuted its own 3G technology (Schilling, 2003). Dubbed "KDDI/au," this 3G service provides graphically rich access to the Internet. There are also very

popular built-in applications and value added services from KDDI. The “Chaku-Uta” (music and ringtones) downloads have proved to be especially popular.

Currently there are over 17 million subscribers to this 3G au service.<sup>7</sup> One of the causes of KDDI/au’s success has been the introduction of flat rate, “all you can use” data transmissions, instead of i-Mode’s data packet volume charges. Implementing the Location factor of CLIP, a major selling point for KDDI/au is its real time navigation application. By deploying the GPS capability of the mobile phone, real time locations and maps can be displayed on the handsets. A major difference between KDDI/au and NTT DoCoMo is that the former does not provide a ready-made payment system, which has retarded the growth of m-commerce applications.

### **i-Mode FeliCa and EZ Wallet: A Tool for Daily Living**

Five years after the debut of i-Mode, due to market saturation and declining revenues because of the introduction of a flat rate system in response to KDDI/au’s pricing plan, NTT DoCoMo mobile phone entered a period of even greater transformation. Rather than just offering a device capable of accessing Internet based m-commerce applications, NTT DoCoMo wanted their handsets and services to become a part of everyday life. To do this, they created a host of technical and business partnerships, most notably with SONY.<sup>8</sup>

Renowned as the pre-eminent Japanese electronics innovator, SONY was chosen to develop an IC (integrated circuit) chip that could be placed inside 3G NTT DoCoMo handsets. Known as i-Mode “FeliCa,” these new handsets could interact with real world infrared sensors to access and enjoy m-commerce goods and services. What was needed was some method of payment. Dubbed “EZ Wallet,” SONY and NTT DoCoMo created a cashless system of “Edy” e-cash, which could manage the financial outlays for the consumer.<sup>9</sup>

The Edy e-cash JAVA-based application is a prepaid IC card already installed on all FeliCa enabled phones. Through the creation of this prepaid card, whose value can easily be augmented at cash registers or Edy-specialized kiosks, the billing mechanism is again made transparent as far as the FeliCa goods and services vendors are concerned. Instead, these goods and services vendors merely provide infrared sensors to detect and then subtract monies from the handsets via the Edy e-cash chips.<sup>10</sup> The following part of the chapter presents mini-case studies on the more popular m-commerce EZ Wallet applications.

## **EZ Wallet Case Studies**

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### *Case 1 – Shopping: Am/Pm Japan Co., LTD.<sup>11</sup>*

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Am/Pm is a major nationwide convenience store in Japan, with over 1,400 outlets throughout the country. Each store's registers accepts the "Edy" e-cash payment system from 3G NTT DoCoMo FeliCa handsets. Shopping is made quite easy for the consumer, as all that is required at checkout is to wave their handset in front of the infrared reader/writer, and have the appropriate amounts deducted from their balance.

In addition to this service, similar to shopping cards used in the U.S., a record of purchases are tracked and stored on the handset's IC chip. With each purchase, award points are accumulated which the shopper can then use for other purchases. By tracking the products being bought, the chainstore is able to pinpoint purchasing patterns with greater accuracy, and can make specific product offers to targeted consumers.

### *Case 2 – Shopping: Coca-Cola Japan<sup>12</sup>*

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In September 2001, Coca-Cola (Japan) Company, NTT DoCoMo and Itochu Corp. jointly launched the Cmode service. This new prepaid membership-based consumer service links i-Mode mobile phones with Cmode information terminal vending machines from Coca-Cola with built-in computers, displays, speakers and printers. In addition to buying drinks with an i-Mode mobile phone, subscribers can make cashless purchases of standby screens, ringing melodies and other i-applications and i-Mode content. They can also print out hard copies of coupons and other items. From September 2004, i-Mode FeliCa-compatible Cmode machines even allow users to make purchases by simply waving their i-Mode FeliCa terminals in front of the machine.

With approximately one million machines in their Japan-wide network near pedestrian traffic spots (typically at travel points such as train or bus stations), these automated vending machines are particularly suited for communications with consumers. While vending machines are available 24 hours a day, 365 days a year, customer interaction is limited to just payment, product selection and then pushing a button to receive the drink. Through the intertwining of i-Mode FeliCa technology and the existing Coke machine network, a complementary platform and win-win situation is created for consumers, NTT DoCoMo and Coca-Cola Japan.

*Case Study 3 – Transportation: All Nippon Airways<sup>13</sup>*

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All Nippon Airways introduced i-Mode-based check-in services for international flights. By navigating to their Web site using the handset-based browser, passengers can reserve seats, purchase their air ticket and even go through “pre-check in” online. All the “e-Pre-Check” information is then stored on the IC chip on the i-Mode FeliCa handset. Upon arrival at the airport, a passenger can then receive a “boarding pass” by waving the handset across an automatic check-in machine. This generates a screen on the handset that can then be shown to the airline personal as the passenger boards the aircraft.

In addition to these features, All Nippon Airways offers new mileage services exclusively for i-Mode FeliCa users. Combined with the pre-installed Edy e-money transaction services, the new mileage service tallies card usage at restaurants, hotels, airport shops and other Edy-affiliated facilities. Therefore, the passenger can accumulate mileage points for each transaction, and All Nippon Airways collects valuable purchasing pattern data.

*Case Study 4 – Tickets: PIA Corporation<sup>14</sup>*

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PIA Corporation is a major ticketing agency, offering a diverse product line ranging from music concert tickets, golfing expeditions, hotel bookings and travel related services. PIA has recently started a FeliCa-based payment and entry system. By reserving tickets through the online Website, customers have the price for the products deducted from the EZ Wallet Edy account in the IC card in their handset. When customers actually attending the event, entrance can be gained by use of the handset. Additional features offered by PIA include coupons targeted to the consumer based on historic purchasing patterns.

*Case Study 5 – Tickets: TOHO Corporation<sup>15</sup>*

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TOHO Corporation is a premier nationwide cinema complex which has adopted the i-Mode FeliCa-based ticket issuance service. An early adopter of e-commerce technology, previously the cinema complex had offered ticket purchases on their Website, with a printable paper ticket to be shown at the theater. With the i-Mode system, purchase can be made using the Edy e-cash system, with ticket information then stored on the IC chip. Upon entering the cinema, the consumer simply waves the handset over an infrared reader/writer and gains entrance. Through this service, cinema ticket issuances and purchases are streamlined, thus simplifying the experience of moviegoers to something easier and more convenient.

*Case Study 6 – Membership Cards: DaiIchiKosho Co<sup>16</sup>*

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DaiIchiKoSho is the market leader in management of Karaoke rooms, and also operates a commercial karaoke equipment sales business. Through use of the i-Mode, FeliCa handsets and infrared readers in the Karaoke rooms, customers can pay for the rental time via the Edy e-cash system. At the same time, the selection of musical tunes is recorded on the IC chip. When visiting the next time, the infrared reader can access this list and pre-load the favorite songs.

*Case Study 7 – Membership Cards: GEO Corporation<sup>17</sup>*

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GEO, a major video rental chain, has instituted the Mobile GEO service, which allows i-Mode FeliCa mobile phones to authenticate membership by using infrared readers at the stores. Similar to the karaoke application, lists of rented titles and recommendations of suggested movies are available to the consumer. Similar to the airline application, reward points are also tracked, providing coupons for future purchases.

*Case Study 8 – Electronic Key: Hayakawa Estate Inc.<sup>18</sup>*

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Hayakawa Estate Inc., a major apartment complex firm, uses the 3G handset as an electronic key to open apartments, the complex's front door and other areas accessible only to residents. In addition to these abilities, further security information in the form of records of entrance and exit times, limited time uses on keys and the issuing of spare keys via e-mail are available.

In each of these eight mini-cases, the tenets of the CLIP framework hold true, but with differing emphasis than the 2.5G m-commerce applications. Whereas in the 2.5G i-Mode service, the "L" dimension (Location) was not a major contributory factor to the success of the service, in 3G, it is. The very concept of creating a "tool for daily living" is indicative that the m-commerce applications are geographically diverse and connected. As for Communication (C) and Information (I), the 3G system is radically different than the 2.5G system. In the case of 3G, the handset itself is used as a communications device to interact with real world infrared scanners.

The importance of Payment (P) is one aspect that is common throughout NTT DoCoMo's 2.5G and 3G offerings. In both cases there is a readymade payment system. In 3G FeliCa there is the electronic wallet, in 2.5G, the NTT DoCoMo billing management system. In both cases, in lieu of a billing system maintained by the m-commerce vendor, an enabling technology has instead been created. In 3G electronic Wallet, it is built directly into the handsets.

## **The Future of Mobile Commerce in Japan**

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Currently the Edy system has only been implemented in NTT DoCoMo 3G handsets. KDDI/au has not come out with an alternative electronic wallet service. To remain competitive, however, KDDI is bound to introduce its own version of the e-wallet. Greater competition will naturally lead to decrease in costs, increase in convenience and more widespread use of the electronic wallets.

As the strategies used thus far in the implementation of m-commerce have been successful, it is highly probable that the firms will stick to these tried and true courses of action. Both KDDI and NTT DoCoMo have followed a continuous strategy of improvement (in Japanese, “kaizen”) which is typical of Japanese corporations, but especially true in the high technology industry (Nonaka, 1988; Wolff, 2001). This has enabled them to avoid the mortality that is predicted for some high technology firms and allowed these Japanese mobile firms to gain the lion’s share of the market (Barnett, 1988). NTT DoCoMo and KDDI have been able to build upon the latest permutations of telecommunications technology (3G) to create new possibilities for m-commerce and m-content applications (Kim & Kogut, 1996).

In the case of NTT DoCoMo, by using the i-Mode platform, especially with its easy cHTML programming and ready made payment systems, NTT DoCoMo has been able to encourage a plethora of third parties to create m-commerce and m-content applications (Meyer, 1993). This has been a shrewd move by NTT DoCoMo, as it allows the firm to concentrate its resources and core competencies on research and development of newer telecommunication standards (such as 4G) and their concomitant commercial uses (Prahalad, 1990).

NTT DoCoMo illustrates Teece’s (1994) contention that a firm should focus on a resource-based strategy and should attempt to acquire valuable technology and intellectual property in order to take advantage of market opportunities. Through strategic partnerships, such as with SONY and Edy for the e-wallet, NTT DoCoMo has been able to deter competition, allowing it to enjoy continuous healthy streams of revenue (Gallini, 1984). Through such competitive dominance, NTT DoCoMo has been able to overcome the hazard of technological lockout as described by Schilling (1998) and has avoided the possibility of not developing other profitable technologies (Leonard-Barton, 1992).

The danger that NTT DoCoMo faces, however, is that users have become so accustomed and pleased with the performance of the earlier technology (the 2.5G i-Mode) that they will be unwilling to switch to the newer offerings. In this case, NTT DoCoMo will have to cannibalize its market share and, in the words

of Nault (1996), “eat its own lunch” in efforts to get consumers to switch over. Regardless of the potential drawbacks, however, it is imperative for NTT DoCoMo to continue to develop 3G technologies or face the problem of technology lockout (Schilling, 1998).

A major driver to continue the development of more sophisticated mobile phones and their corresponding mobile commerce applications is economic. Due to competition between KDDI and NTT DoCoMo, the average revenue per user (ARPU) for both firms has been declining. To counter this trend and to remain profitable, both firms will need to offer services that are enticing to the consumer and will encourage him or her to spend their yen. Masao Nakamura, president and CEO of NTT DoCoMo, is unequivocal in her views:

We will continue to offer and promote new services aggressively, such as video communication and i-Mode FeliCa [DoCoMo’s mobile wallet service]. I am optimistic that this will open up new sources of profit. (quoted in Wieland, 2005)

## **Conclusions**

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From the Japan experience, it is clear that it is possible for a major mobile operator to transition from one generation of technology to the next and still make profitable mobile commerce across generations. The success of earlier implementations, especially with the establishment of a consumer base, can be a launching point for the rollout of newer technologies and applications. To encourage the emergence of m-commerce in a mobile market, there are several critical factors:

1. Carriers should provide a user-friendly environment. NTT DoCoMo’s 2.5G and 3G services and KDDI/au services meet the criterion of user friendliness. In both cases, the use of the device is simple and straightforward. The technology adoption is therefore accelerated, as it is unnecessary to train the consumer in the use of the device.
2. Leverage off of existing resources. The use of a preexisting, limited bandwidth pager network greatly accelerated the birth of the 2.5G i-Mode system. By making the process of converting existing Websites to wireless sites uncomplicated, NTT DoCoMo could tap into an existing market and provide immediate goods and services to the nascent m-commerce consumer.
3. It is imperative to partner with third party software and hardware developers. 3G real world “wallet” applications have arisen through the coopera-



tion with electronic manufacturers and customers to create robust mobile applications.

4. Offer value added services, especially financial, to developers. A major factor for NTT DoCoMo's 2.5G and 3G successes has been the creation of ready-built payment systems. By providing these arrangements, it speeds the creation of mobile commerce as it allows developers to concentrate on the core competencies of development rather than on the hassles of financial and payment systems.
5. Encourage innovation by continuing the process of technology development. As new technology emerges, so, too, do more mobile commerce applications — NTT DoCoMo and KDDI have kept the treadmill of innovation going at a fast pace.

By following these strategies, Japan has become the preeminent mobile commerce market in the world. Their dominance will continue due to their head start versus other nations. A challenge to all players in the mobile commerce arena, however, is the potential saturation of the market. It remains to be seen whether consumers will actually desire or use the new features constantly being developed. But given Japan's long history of innovation, new technologies and attendant applications will inevitably continue to arise.

## **Questions for Discussion**

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1. Given the saturation of the market by Keitai mobile phones, what hurdles will Japanese mobile operators face to expand their market shares? What incentives can mobile operators offer to promote development of m-commerce applications and m-content?
2. Discuss the importance of factors in the CLIP framework for various generations of mobile communications: I (Information) in 2.5G applications to L (Location) and P (Payment) in the emerging 3G applications.
3. Identify some of the core competencies of Japanese mobile operators. What resources have they been able to leverage in migrating from one technological level to the next?

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## Endnotes

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<sup>17</sup> Source: <http://www.nttdocomo.com>