

The Mobile Internet Market: Lessons from Japan's i-mode System

by

To be presented at
The E-Business Transformation:
Sector Developments
and Policy Implications

Jeffrey L. Funk
Associate Professor
Kobe University
Graduate School of Business
2-1 Rokkodai, Nada, Kobe 657 Japan
telephone and fax: 81-78-803-6913
e-mail: funk@rose.rokkodai.kobe-u.ac.jp

1. Introduction

The simultaneously rapid and relatively parallel growth of both the Internet and mobile phones has caused many people to believe there will be a convergence between the Internet and mobile phones. It is expected that mobile phones will become a major tool for accessing the Internet and some people predict mobile phones will soon be used more than PCs to access the Internet.

Many questions remain as to how different the mobile Internet is from the fixed-line

Internet. First, what kind of applications/contents will succeed in the mobile Internet and how are they different from the successful applications in the fixed-line Internet? In the fixed-line Internet, shopping for PCs, cars, books, and other products, making hotel, airline and other reservations, and searching for general information on a variety of subjects are major applications in the business-to consumer market. In the business-to business market, the Internet supports on-line purchasing and other business-to business activities. In the consumer-to consumer market, on-line chat groups along with the auctioning of products are popular applications. Will these also be the most successful applications in the mobile Internet?

Second, how should service providers manage their service menus? In the fixed-line Internet, service providers such as AOL have adopted a very liberal policy towards contents. As opposed to trying to control or even restrict the number of sites that can be accessed from its menu, AOL and other service providers or portals have attempted to maximize the amount of contents that can be accessed from their service menus. But in the mobile Internet, should service providers control or even restrict the number of sites that can be accessed from their service menu? Should they restrict the types of links that can be made between different web sites?

Third, what kind of business models will be successful in the mobile Internet and how are they different from the successful business models in the fixed-line Internet? For sites that sell products on the fixed-line Internet, greater economies of scale, lower inventories, and more efficient sales processing are key components of the business models used by successful on-line shopping sites. However, it is generally perceived that advertising revenues play an equally large role in these business models, particularly the models used by portals, search engines and other web sites that do not sell products. Further, many successful Internet shopping sites are trying to become Internet portals and thus reap the advertising revenues that come with portals. Will shopping and advertising play as large a role in the mobile Internet as the fixed-line Internet?

This paper uses the Japanese mobile Internet market to address these issues. Japan is the first country in the world to experience rapid growth in the mobile Internet market and thus provides the rest of the world with a number of data points concerning the appropriate Contents/Applications, Service Menus, and Business Models for the mobile Internet. This report finds that different applications are driving the mobile Internet in Japan than are driving the fixed-line Internet in Japan and elsewhere. Different approaches to service menus are being used in Japan's mobile Internet market since a slightly different set of issues are important in the mobile Internet than in the fixed-line Internet. Further, different business models are also being used in the Japanese mobile Internet than in the fixed-line Internet both in Japan and elsewhere.

This paper first summarizes the growth in the Japanese mobile Internet market followed by a discussion of fixed-line vs. mobile-Internet applications, and managing the service menu. It then summarizes mobile Internet traffic in the Japanese market and discusses business models for service and content providers, future trends, and summarizes the implications and recommendations for US and European service providers.

2. The status of the Japanese mobile Internet market

There were more than 15 million mobile Internet subscribers in Japan as of mid-August up from 2.2 million at the end of October 1999. This is a growth rate of about 9% a month. There are now more mobile Internet subscribers than there are subscribers to the top 15 fixed-line Internet subscribers in Japan.

2.1 A comparison of services

DoCoMo's i-mode service had the largest number of subscribers in mid-August (10.4 million) followed by EZ web (offered by DDI, IDO, and Tsuka) and Sky Message (J-Phone). EZ Web had about 3 million and J-Phone had about 1.6 million subscribers. As shown in Table 1, NTT DoCoMo started i-mode in February 1999 followed by EZ Web (DDI and IDO) in April 1999 (both of which are based on WAP), and Tsuka Cellular's EZ Web and J-Sky (J-Phone) in December 1999. NTT Docomo's i-mode service has succeeded far more than the other mobile Internet services because it has moved faster than the other service providers in introducing the appropriate handsets, packet services, clearinghouses, and contents. In DoCoMo's clearinghouse service, it collects information/content charges through the monthly bills sent to subscribers and it takes a small percentage of these monies as a handling charge.

NTT DoCoMo has also created an advantage in contents. Initially, this was through its choice of c-HTML, its large share of the Japanese mobile phone market (57%), and its faster introduction of handsets, packet services, and clearinghouse services. NTT DoCoMo's early advantage in contents and subscribers has created a positive feedback loop between the number of subscribers and the number of contents. Content providers want to create contents for i-mode before they create them for the other service providers since i-mode has more subscribers than the other services and users want to subscribe to i-mode since it has more contents than the other services.

Table 1. Comparison of Internet Micro-Browser Services as of August 1, 2000

Company	DoCoMo	Cellular/ IDO	Tsuka Cel- lular	J-Phone
Name	i-mode	EZ web	EZ web	J-Sky Web
Start Date	2/99	4/99	11/99	12/99
Monthly Charge	300	200 – 400	200 – 300	Free
Access Charge	0.3 Yen per packet	.27 Yen per packet	3 -10 Yen per minute	2 Yen per download
Markup Lan- guage	C-HTML	WAP	WAP	MML

2.2 The short-term effect of mobile Internet services on revenues: the case of i-mode

Table 2 summarizes i-mode's positive effect on monthly revenues. The per-person i-mode revenues per month include a 300 Yen monthly charge, packet charges of between 1500 and 2000 Yen a month, and about 27 Yen in handling charges for the paid informa-

tion services (110 Yen/US\$). As discussed in the section on business models, DoCoMo collects the fees for the paid content services and extracts a 9% handling charge. Thus, DoCoMo makes about 2000 yen a month in additional revenues from i-mode on top of its approximate 8000 Yen a month in voice revenues (monthly and airtime charges) for about a 25% increase in revenues.

Table 2. i-mode-related revenues (Yen) per subscriber per month

Item	Revenues for DoCoMo	Revenues for Content Providers	Total Revenues
Monthly charge	300		300
Packet charges	1500 – 2000		1500-2000
Paid Services	27	273	300
Total	1827 – 2327	273	2100 – 2600

3. Fixed-line vs. mobile-Internet applications/contents

3.1 The traditional tradeoff between reach and richness

This paper argues that this basic tradeoff between fixed-line and mobile-Internet access can best be understood by using and analyzing the tradeoff between “richness” and “reach.” This tradeoff, which is shown in Figure 1 is described by Thomas Wurster and Philip Evans in their book *Blown to Bits* (Harvard University Press, 2000). “Richness” refers to the quality of information, as defined by the user. This includes a number of factors of which the depth and bandwidth of the information is probably the most important aspect of the tradeoff between fixed-line and mobile-Internet applications. “Reach” refers to the number of people who participate in the sharing of that information.

There is a strong tradeoff between richness and reach both in the “traditional” and “new” economies. For example, general-interest newspapers reach a large number of people and thus enable a large number of people to share in that experience. However, the information contained in newspapers is clearly not as “rich” as the information contained in special-purpose magazines or journals that do not have as large a “reach” as the general-purpose newspapers. Many of these special-purpose magazines have not only been traditionally difficult to obtain; it has often been difficult to even identify them due to their limited circulation. Traditionally, only specialists are familiar with these special-purpose magazines and journals and the identifying and contacting of the relevant specialists has also been difficult to do. Thus, traditionally there has been a strong tradeoff between richness and reach.

3.2. The new tradeoff between reach and richness

Wurster and Evans argue that the Internet enables firms to provide both more reach and more richness thus causing the tradeoff between reach and richness to change. As the number of Internet users increase, the “reach” of information provided over the Internet also increases. The “reach” of the Internet will probably soon surpass the “reach” of

general-purpose newspapers within a few years since the number of Internet users will soon exceed the number of newspaper readers in the US and elsewhere. Further, the links between home pages make it possible for users to simultaneously and to easily obtain rich information on the Internet often from the very same sites, which have a large reach. For example, many general-purpose newspapers that operate on the Internet provide links to related articles, corporate home pages, and other sites thus providing the easy access of both rich and high reach information. Thus, the Internet is creating new tradeoffs between reach and richness.

One of the new tradeoffs between reach and richness involves the tradeoff between fixed-line and mobile-Internet applications. As shown in Figure 2, mobile devices provide lower richness but have higher reach than desktop computers. Mobile phones have smaller screens and keyboards and thus cannot access the level of rich information that can be accessed with a desktop computer. The larger reach of mobile phones comes from their greater diffusion, greater mobility, and faster power-up as compared to desktop computers. There are more mobile phones being used than desktop computers in many countries in the world including Japan and it is expected that the number of mobile phone subscribers will exceed the number of installed desktop computers within a few years. Naturally, mobile phones are easier to carry than desktop computers and PDAs. Further, mobile phones can be used within seconds of turning them on versus several minutes for desktop computers.

Figure 2 suggests that desktop-computers, mobile phones, and PDAs will co-exist with each device occupying a different place in the tradeoff between reach and richness. Many people will use these devices as complements where rich information will be handled on desktop computers and less rich information will be handled on PDAs and mobile phones. Content providers and other firms will provide services that make it easier to use these devices as complements.

However, there will also be competition between these devices. Mobile phones will always have a larger reach than desktop computers and even PDAs due to their lighter weight and lower costs. The challenge for the phone manufacturers is to increase the capability of phones to access rich information. Manufacturers of mobile phones and even PDAs are attempting to do this by reducing costs, increasing display size, and improving input methods either through larger keyboards or new technologies like voice recognition. Further, successful content providers are making rich information more accessible to mobile phones through search capabilities and the storage of user characteristics and other information.

3.3 Location-dependent services are part of the reach-richness tradeoff

There are two other critical implications of Figure 2. First, contents that are location-dependent will be major applications for the mobile Internet due to the large reach provided by mobile phones. These location-dependent services include navigation services, travel services, and information on local stores, restaurants, and bars. Although these types of services do not as of yet represent a large market in Japan, there are a large number of efforts underway to create these services. The challenge is to create the standards

necessary to integrate the location and information services.

The tradeoff between “reach” and “richness” is a critical aspect of location-dependent services. Location-specific information can be just as easily acquired from the fixed-line Internet as from the mobile Internet. Airline tickets, hotels, and rental cars can be reserved using a desktop computer and information on local bars, restaurants, stores, and trains can be obtained from a desktop computer. The difference between these types of reservations and information and other types of information is that your plans often change while you are in the specific location. Therefore, a high reach device such as a mobile phone is needed to acquire new information or make new reservations. Thus, the unique aspect of location location-specific information is that it requires high reach.

3.4 Young People

A second implication of the tradeoff between reach and richness is that it is a function of age. This is why than 35% of i-mode users are less than 25 and almost 70% of them are less than 35. Further, the people who run up the biggest bills are under 25.

The reason that this tradeoff is a function of age is that in most countries, young people place a greater importance on reach and a lower importance on richness than older people do. Younger people are more mobile than older people are and due to their less experience place less value on rich information than older people do. People under 25 generally spend a much larger amount of their time away from home and the office (if they have one) and use public transportation (buses and trains) more than older people. Young people also place less emphasis on richness than older people do due to their less experience and thus lower specialization.

4. Managing the Service Menu

The term “managing the service menu” refers to a broad set of issues concerning the way in which information is presented on the mobile Internet’s service menu and who is allowed on this service menu. For example, AOL’s home page contains an e-mail entry area, links to various shopping and information categories, a search function, links to information about AOL, and of course advertisements. The choice of these particular items is of course a critical decision for AOL and the choices involve a large variety of issues that are not covered in this report.

This section addresses a few issues that are considered to be important in understanding the key differences between the mobile and fixed-line Internet. Clearly, the smaller screen presents a challenge and it is not just a matter of copying contents that were created for the fixed-line Internet into a WAP or C-HTML environment. Service providers must reduce the amount of information that is shown on a single page. They can do this by placing the information on multiple pages or by not including some of the information that is ordinarily on a home page that was created for the fixed-line Internet. The number of advertisements that can or should be placed on the service menus is of course an important issue.

A key issue is a service provider’s policy towards who can present information on its service menu. NTT DoCoMo has adopted a very restrictive service menu in two ways.

First, DoCoMo uses a very detailed screening process to determine whether firms are allowed onto its official menu. DoCoMo only allows firm who they believe have a new and interesting service and will maintain high quality. This is of course quite different from most fixed-line Internet service providers, who have attempted to distance themselves from the content providers for legal reasons. DoCoMo's decision reflects its desire to control the activities that are related to its business and its desire to limit pornography and other socially unpopular content sites from being associated with NTT DoCoMo.

On the positive side, DoCoMo's restrictive policy may enable its content providers to make more money than they would be able to make with a less restrictive policy. This is certainly important in order to attract content providers. Without content providers, any mobile Internet service will fail. And the low incomes being generated by the paid services as compared to DoCoMo's packet income suggests that the content providers are not making windfall profits even with this restrictive policy. Thus, in the short run, DoCoMo's restrictive policy may be contributing to its success.

In the long run, however, it is not clear whether this restrictive policy will be beneficial to Japan or even to DoCoMo. DoCoMo's restrictive policy has created an additional barrier to entry to firms particularly those firms who are new firms who are trying to enter a new industry. This entry barrier is of course in addition to the multitude of entry barriers that already exist in Japanese industry and which are a significant reason for Japan's current economic problems. Just as Japan's Ministry of International Trade and Industry (MITI) has not been very successful in choosing winners, it is doubtful that DoCoMo will be much better.

Further, it is not clear whether its restrictive policy will be beneficial to DoCoMo in the long run. DoCoMo's restrictive policy will encourage firms to create ways of accessing unofficial sites. As of early August, there were more than 18,700 independent i-mode compatible sites as of early August, which is up from 5000 in early 2000. Some of the most popular unofficial sites are chat groups and dating services that are not allowed on DoCoMo's official menu. If these sites and their search engines and portals become more popular than the official i-mode menu, this could be a major loss in advertising revenues to DoCoMo.

Second, DoCoMo does not allow its official content providers to create links with unofficial web sites. This is also done to control the activities that are related to its business and its desire to limit pornography and other socially unpopular content sites from being associated with NTT DoCoMo. In the long run however, this restrictive policy will make it difficult for i-mode to provide rich information. As mentioned earlier, one of the strong aspects of the fixed-line Internet is the large number of linkages between web sites. These types of links should be beginning to appear if DoCoMo is to provide truly rich information.

5. Mobile Internet traffic in the Japanese market

The greater reach and lower richness of young people is reflected in the market for i-mode services. A different set of applications is driving the Japanese mobile Internet

market than the fixed-line Internet both in Japan and elsewhere partly due to the large number of young users. The Japanese mobile Internet is driven by e-mail and simple entertainment sites. As shown in Table 3, e-mail represented 27% of the traffic in December 1999 and DoCoMo officials claim that this data hasn't changed much since then. As discussed later, entertainment represents more than half of the traffic to official sites and an even higher percentage of the traffic to unofficial sites and with automatic messages. Automatic messages refer to messages that are sent automatically by the contents provider to users and primarily include the daily sending of characters and cartoons.

Table 3. Breakdown of i-mode Traffic

Item	Percent
Menu	9%
Mail	27%
Official sites	34%
Unofficial sites	14%
Automatic messages	16%

Source: DoCoMo

5.1 E-mail

The difference between the fixed-line and mobile Internet e-mail contents is even more interesting than e-mail's current large representation in i-mode traffic. E-mail with mobile phones tends to concern what people are doing at the immediate moment or what they did the night before because the higher *reach* of mobile phones enables them to do this. Messages such as "it's pretty hot today, how's work, when do you get off, how was your date last night, what are you doing tomorrow night" are common messages during the day. At night, "what are you doing right now, where are you, who are you with" are common messages. These types of message are less common in fixed-line e-mail messages since by the time people receive a response to such an e-mail message, the message has lost a lot of its relevance.

5.2 Mobile Internet traffic

Mobile Internet traffic also demonstrates the importance of young people and entertainment. Table 4 shows the percentage of accesses to the main categories in DoCoMo's official sites. As shown in Table 4, 55% of the accesses as of early 2000 was for entertainment related areas. It should be pointed out that the percentage of accesses is somewhat different from the percentage of traffic in that automatic messages are not counted as accesses. As discussed earlier, 16% of the overall traffic was accounted for by these automatic messages and most of these are for entertainment-related sites. Thus, Table 4 underestimates the importance of entertainment. The most popular entertainment categories in terms of number of accesses are the downloading of ringing melodies, playing games, the downloading of characters and other pictures, horoscopes, and information about music. News is second to entertainment followed by tickets/living, financial, local

information, dictionaries/tools and travel.

Table 4. Breakdown of i-mode Accesses to Official Sites

Category	Percent
Entertainment	55%
News	14%
Tickets/Living	11%
Financial	6%
Town Information	5%
Business Tools	5%
Travel	3%
Restaurants/Recipes	1%

Source: DoCoMo

5.3 The low richness of contents

Entertainment is the most successful i-mode category and the entertainment services clearly tend toward high reach and low richness. They require fairly few clicks to obtain the desired information and mistakes are not lethal in terms of time or money. Further, the most successful sites have created effective search routines and other functions that enable users to minimize the ease of obtaining the desired information. As expected, the users of the entertainment services are primarily young people.

News is the second most popular category. These services also tend towards high reach and low richness. There is far less information available in these mobile phone services than there is in newspapers and it will be a long time before there are links to other home pages where more detailed information can be found. But for people who are commuting by train or bus, this type of simple news information is very useful. It is much easier to read the news on a small mobile phone screen than on a newspaper while standing on a crowded train or bus. In Japan, it is often difficult to find a seat on trains and buses or while waiting for them and there is typically also insufficient space to open a newspaper while standing on or waiting for trains and buses.

The information provided in the tickets and living category are similar in that the contents do not contain rich information and the most successful services are those in which rich information is not needed. For example, tickets are the largest source of traffic in the tickets/living area, rich information is not needed in this service, and the major users of this service are young people who favor reach over richness. Young people are also more likely to use the other information services in this category such as information on rentals, part-time employment, games, CDs, used cars, and education than people over the age of 25.

Although the current financial services are clearly not aimed at young people, they are aimed at the low richness and high reach applications. The most popular i-mode financial transactions are relatively simple transactions such as balance checks and money transfers (mobile banking). While these transactions can clearly be done on the fixed-

line Internet, many people have a tendency to remember the need to them when they are not at home. And even if you are at home, their simplicity may make it faster to do them on a mobile phone than on desktop computer where it takes longer to power-up a computer. Although these transaction represent less than 6% of total traffic on i-mode's official sites, they have probably played an even more important role in generating interest in i-mode than the 6% figure suggests. By convincing some of Japan's most conservative institutions to participate in i-mode, DoCoMo was able to convince the media and the public that i-mode was going to succeed.

In the long run, however, richer information is needed before the market for news, tickets/living, and finance will grow to the levels seen in the US for fixed-line Internet services. And it is not just the small screens and other technical limitations that can eventually be improved, the richer information will require changes in DoCoMo's policies. Without DoCoMo changing its restrictive policy towards linkages, it will be difficult for news services to provide links with corporate and other home pages and for mega-sites to appear that allow the easy comparison and purchasing of hotels, airfares, rentals, new and used cars, books, CDs, and financial services. This is because DoCoMo cannot screen applications from every firm that has a home page. This suggests that the US and Europe may be able to move much faster in these areas of the mobile Internet than Japan.

6. Business models and mobile billing methods in the mobile Internet

This section discusses the types of business models that can and are being used in the mobile Internet. It first summarizes the overall business model that is used by Japanese service providers followed by discussions of several types of business models that are being used in the Japanese mobile Internet.

6.1 Overall Business Model Used by Japanese Service Providers

Figure 3 summarizes the basic business model used by Japanese service providers. Like most non-Japanese service providers, the Japanese service providers pay activation commissions to the retail outlets in return for the acquisition of subscribers. The Japanese service providers are currently paying activation commissions of about 35,000 Yen per subscriber. The retail outlets use this money to subsidize the price of phones and advertise the phones and accessories. The service providers make their money in monthly and airtime charges.

The major difference between this and the overall business models used by non-Japanese service providers is the large amount of activation commissions and high monthly- and airtime charges. Further, unlike other countries, the Japanese service providers pay these activation commissions not only to sign-up new subscribers but also for exchanges of phones. Depending on the length of the subscription and the age of the phone, many subscribers can obtain a new phone for less than 10,000 Yen without even changing service providers or phone numbers. For new subscribers, the price of a phone is typically less than 5000 Yen.

These high activation commissions are one reason why Japanese use the smallest phones in the world. Until recently, there has been basically one mobile phone segment

in Japan where the mobile phone manufacturers compete primarily on the basis of weight. With voice only phones now weighing less than 50 grams and most phones now containing a micro-browser, the competition is changing to display size and probably keyboard size (or another input method) since larger displays and better input methods enable users to obtain richer information. And the large activation commissions have caused the prices of the i-mode and other browser phones to be similar to the prices of the regular phones.

These high activation commissions also help the service providers move subscribers to new services such as i-mode. DoCoMo is attracting more than one-million new subscribers per month to its i-mode service and only about half that many overall new subscribers. Thus, roughly half of its new i-mode subscribers are current voice subscribers who have traded in their old phone for a new i-mode phone (for less than 10,000 Yen).

The adoption of such a business model would clearly be a major change for many US and European service providers. The higher activation commissions would require much higher monthly and airtime charges and these higher charges would probably be unacceptable to most US and European users. Nevertheless, the lower activation commissions in the US and Europe will slow down their move to the mobile Internet and to phones that can most easily access the Internet (i.e., phones that have large screens and thus can access richer information).

6.2. General billing and business models used in Japan's mobile Internet market

Figure 4 summarizes a number of billing methods/business models that can and are being used by Japanese service and content providers in Japan's mobile Internet market. Currently, the most widely used billing method in terms of revenues is the "clearing-house" model where the service providers collect the information charges for the content providers. For example, when a NTT DoCoMo user subscribes to a content service that is on the NTT DoCoMo official menu, NTT DoCoMo includes these fees on the subscriber's monthly bill. NTT DoCoMo takes 9% of these fees as a handling charge and the remaining monies are delivered to the content providers. Most of the entertainment and news services use this business model.

A second business model is the "pay to have contents loaded" business model. Many web sites/content providers that provide information in the tickets/living and town information category use this business model. This is partly a carryover from the traditional print media in Japan where firms also pay to have information about their bars, restaurants, employment needs, rentals, and cars described in positive terms in magazines or newspapers. These payments are probably less common in the US or Europe where a stronger distinction is made between advertising and analysis. The fact that this business model is partly a carryover from the traditional print media in Japan also suggests that these firms are using a form of third business model, which is called the "support the existing business" business model.

This third business model is used heavily by financial firms, concert ticket providers, airlines, government offices, rental car agencies, TV and radio stations and manufacturers. These firms provide free information or purchasing services to their customers in

order to support their existing businesses. A variation on this model is the “shopping” business model. Shopping is still in its infancy on the mobile and also the fixed-line Internet in Japan. A common factor here is the lack of and high cost of credit cards and confidence in using them on the Internet, although this will be solved in the near future. It is estimated that there were about 100 million yen in sales over the mobile Internet in July 2000.

A fourth business model, which is just beginning to take off in Japan. This model is both similar and different to the advertising model used on the fixed-line Internet. It is similar in that it includes firms paying to have their banner advertisements loaded on to service provider and content provider menus. It is different in that the small screens are actually causing higher viewer and click rates than are seen on the Japanese fixed-line Internet. Further, many firms are paying users to view advertisements typically in the form of discount coupons.

7. Future Trends in Japan and elsewhere

It was argued earlier that the tradeoff between reach and richness is an important concept for understanding the tradeoff between fixed-line and mobile-Internet access. Several trends in Japan and elsewhere will have a large effect on this tradeoff. Java-based phones and phones with larger and better displays (most displays are already color) and better-input methods will enable mobile phones to access richer information. Faster data services such as those available in third-generation services will also enable phones to acquire richer information. Bluetooth and the subsidization of personal digital assistants (PDAs) will provide another method of obtaining richer information through the mobile Internet. All of these factors will move the “mobile Internet” towards the top of Figure 2.

8. Implications/Recommendations for European and US firms

This section summarizes several implications of the i-mode experience and recommendations for European and US service and content providers and manufacturers. The first implication is obvious. The potential market for the mobile Internet is huge and it can be realized if firms realize the critical differences between the fixed-line and mobile Internet.

Second, the mobile Internet is more important than third-generation services and third generation services will only succeed if the mobile Internet is in place to some extent when the third generation services are started. Third generation services will build off of the mobile Internet.

Third, packet communication is necessary for the success of the mobile Internet. People will not be willing to pay the high connection charges associated with circuit-based switching. This has been seen in the US, Europe and also in Japan where EZ Web and Sky Message had very slow growth before the packet services were available.

Fourth, content and service providers need to focus on high reach and low rich applications. These firms should not try to replicate the fixed-line Internet on the mobile Internet. Instead, they should take advantage of the high reach of mobile phones and design applications/contents that do not require high richness. Fifth, these content and

service providers need to focus on young people since they favor reach over reachness.

The fourth and fifth implications will be the hardest lessons for US and European service and content providers to learn. The problem is that most of the people discussing the mobile Internet in the US and Europe are heavy users of the fixed-line Internet. Heavy-users of the fixed-line Internet will not be the initial heavy users of the mobile Internet since they have high expectations for richness and low needs for reach.

Sixth, young people want entertainment and entertainment related information. Service and content providers need to create interesting contents that young people will use when they are killing time waiting for classes, in classes, or riding or waiting for public transportation or hanging out with friends. Reading horoscopes, downloading ringing tones, customizing screens with cute characters (or not so cute characters), studying foreign languages, reading entertainment and sports related information, and other such applications for young people will probably be the early drivers of the mobile Internet in the US and Europe.

Seventh, service providers need to offer a clearinghouse/micro-payment scheme in order to encourage contents to be developed for the mobile Internet. Many of the applications mentioned in the last recommendation/implication either do not exist or do not exist in the appropriate form on the fixed-line Internet. Thus, new contents need to be developed for the mobile Internet and firms need an incentive to create those contents. It will be easy for service providers to be seduced by the large numbers of fixed-line Internet content providers that they are signing up on their service menus. But many of these contents are either inappropriate for the early users of the mobile Internet or they need to be substantially revised.

9. References

- (1) Thomas Wurster and Philip Evans, Blown to Bits, Harvard University Press, 2000