

Special Issue on i-mode Service

Concept of i-mode Service

— New Communication Infrastructure in the 21st Century —

“i-mode service”, which DoCoMo launched on Feb 22nd 1999, is planned under the concept of “Evolution from “TALKING” to “USING”” and it took two years to start it. We planned this service so those customers use the cellular phone conveniently and pleasantly. To realize that we decided to provide contents ranging from mobile banking, ticket booking, weather forecast, to network game and horoscope. We are proud of our i-mode service as a big rookie we have never seen like baseball pitcher Mr. Matsuzaka of Seibu Lions (famous baseball rookie in Japan).

This article describes the outline of i-mode service. We have already gotten 1,000,000 subscribers by the 8th of August since launching and now approximately over 80,000 new subscribers are added every week.

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Introduction

It is obvious that the Internet is the foundation of multimedia.

The Internet Ocean is filled with digital contents, and both individuals and companies are doing business or enjoying services like advertisements through this ocean. The advantage of Internet for companies is to get direct access to the individual end users. We can use it as an order reception channel or reduction of several costs. To enjoy these merits, more companies start to provide services through the Internet and their number is growing every day.

However, unfortunately in Japan, there has been no significant result as it was expected.

Because the individual consumers (general consumers), who are the biggest consumption layer, don't use Internet service very much despite its high expectation. The number of Internet user in Japan could be around 17 million people, but the number of individual user might be just about 2 to 3 million. To enjoy Internet service, you need to have the equipment called as “computer”, and this is the big obstacle to increase the number of individual user.

On the other hand, what is growing in Japan more rapidly and greatly than Internet user is cellular phone user.

The severe market competition is enhanced, and price competition is accelerated further. So subscriber's number takes sudden leap. Current number of subscriber is about 44 mil-

lion. But it is highly possible this figure jumps to 60 to 70 million in the near future.

If you can enjoy the Internet service with cellular phone terminal easily, it means that the user can receive the Internet service without using computer, which is complicated machine (many people believe so). Also business entities can provide their services to wide range users who have mobile terminal. This is tremendous advantage for both parties.

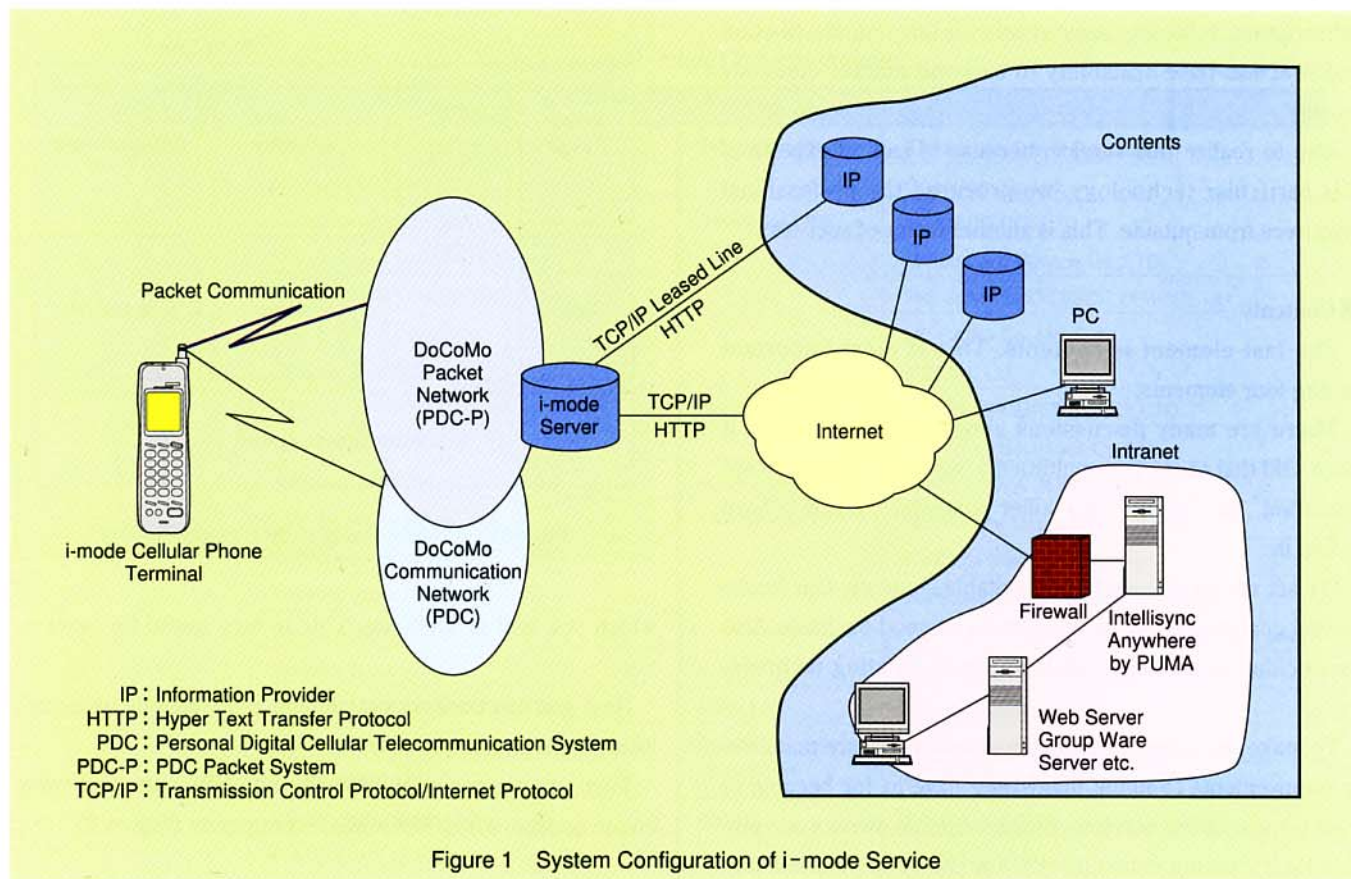
To realize the fusion of Internet and cellular phone, i-mode was introduced.

Four Elements to Support i-mode Service

i-mode service is configured with 4 major elements (Figure 1).

■ i-mode Cellular Phone Terminal

The first element is i-mode cellular phone terminal (501i series). In addition to the latest DoCoMo's cellular terminal 207 series functions, 9,600bit/s packet communication and browser (browsing software) are installed. This browser can read HTML text since 99% of digital contents of the world is written with HTML, which is the Internet global standard. The reason of text oriented browser is because transmission speed is limited to 9.6 kbit/s and the terminal has a small liquid crystal display. Another reason is more than half of the



digital contents can provide sufficient information with text only.

There was a lot of discussion about shape of the terminal. The biggest issue was that the display size. To read text easily the liquid crystal display should be bigger. However i-mode cellular phone terminal stick with the conventional cellular phone style, which doesn't require remote microphone or speaker. So its display size become 8 to 10 letters with full size font and 6 to 10 lines. Why? Japanese market accepts only small and cute cellular phones. If terminals are not sold well, i-mode business will fail. Together with terminal manufactures we repeated the discussion about design, color, font etc. as long as time allows us.

As of writing this article, there are 4 types, F501i, N501i, D501i, P501i, in the market.

■ Packet Network

The second element is the packet network. i-mode uses the same packet network as DoCoMo's packet communication service (DoPa). However, from the viewpoint of smaller and lighter terminal and text oriented service, low transmission rate is enough to fulfill requirements. So it was decided to use single slot type (9.6kbit/s). The area covered by packet network is the same as 800MHz band PDC with some

exceptions.

By using packet communication system, response speed to get an access to the Web server becomes faster. So user can transact information smoothly, far better than circuit switch type communication.

The i-mode service is available with 300yen monthly fee and packet communication fee. The communication fee is not charged based on air time but transferred data amount (0.3yen per 1 packet (128byte)). So even though the user is not familiar with operation or when the user has to enter data, you do not have to hurry. You can take your time and do not have to worry about charge because of slow operation. (In case of circuit switch communication fee is proportional to charging period). So it is consumer friendly service.

■ i-mode Server

The third element is i-mode server. The i-mode server functions as gateway between DoCoMo network and Internet. In detail its functionality is information distribution, e-mail transaction and storage, i-mode subscriber's customer management and IP (Information Provider) management and information charging. To build up i-mode server, attentions were paid for following three points; good response capability to keep high throughput after more than 10 million

subscription, reliability assurance with function distribution and function base scalability to respond market demands quickly.

Also to realize this service, because of lack of experts of this particular technology, we procured the professional resources from outside. This is another factor of success.

■ Contents

The last element is contents. This is most important among four elements.

There are many discussions about multimedia. And it often said that to start up multimedia business "Contents are important" or "What is the killer contents?" But it is hard to find it.

We set up our criteria to find suitable contents. Our fundamental goal is to make i-mode service as good business. Also we decided to utilize "widely available existing technology".

To make this service as good business, there are mandatory requirements to fulfill; many user have to (or become to want to) use online services, digital contents owners can provide their existing contents with low cost, and business participants can receive suitable reward against their effort. Therefore we decided to use HTML/HTTP format to let information provider (Companies) can provide their existing digital contents, which are given through internet, without any modification.

We paid greater attention to the highly personal usage feature of cellular phone. Since interactive type contents are the most suitable to emphasize this feature, we have explored contents from this perspective. As a result, we come up with 67 various contents when the service was launched. Now we have more than 120 contents.

About human resource, same as i-mode server, we don't have any professional about contents, so we procured experts from outside and also internally we solicited young personnel for this project.

i-mode uses Internet mechanism, but this service is only realized with cellular phone terminal. 501i series represent the 100% true cellular phone terminal. They are neither PDA nor PC. When the user tries to use i-mode service and receives incoming call, telephony mode is prioritized to i-mode. After dialog is done, the mode switches to i-mode service automatically.

What you can do with i-mode is firstly, telephone. Not only normal telephone communication but also with Phone To function, you can have a direct call to the phone number,

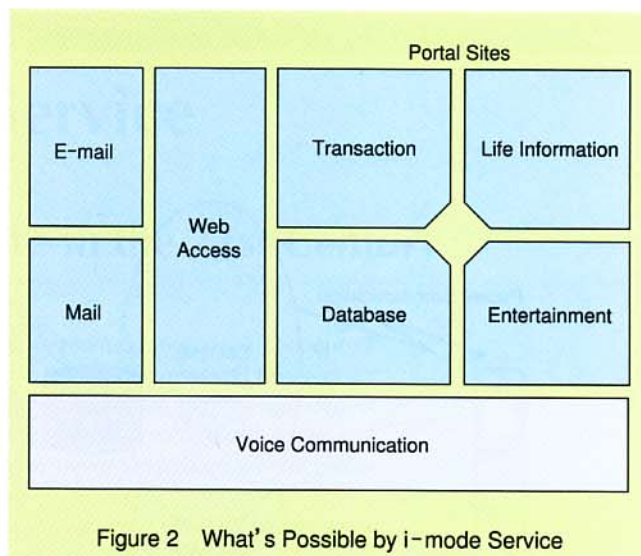


Figure 2 What's Possible by i-mode Service

which you find at Web site. This is very useful for reservation.

Next you can transact simple mail and e-mail by using cellular phone number as address.

Then you can access to Web site with URL entry and enjoy online service, which DoCoMo recommends (Figure 2).

■ Online Service

Online service provides various services with simple key entry.

The user can do banking or reserve ticket of airplane or concert by looking at LCD of the terminal. It is also possible to get information such as stock market, weather forecast, recipe and so on (Table 1).

Since it enables the user to transact information with cellular phone, which people carry always for 24 hours, Information Providers can also send needed information efficiently. Since Web site uses HTML/HTTP, Internet global standard, IP can utilize existing digital content resource. This would be big advantage for IP because they can provide their contents with low cost.

■ Mail Function

The maximum size of each mail is limited to 500 bytes, however, exchanging e-mail between i-mode phones is very easy by using simple address (either phone number or nickname), as well as to/from the Internet by using @docomo.ne.jp addresses.

As a result, it becomes available for the user to have e-mail or short message communication with any kind of mailing tools including PC, mobile terminal with e-mail function, or PHS, without paying any attention to the operator which the

Table 1 List of i-mode Contents Provider

(As of Aug.8 1999)

Menu	Company	Menu	Company
Mobile Banking	THE SAKURA BANK,LIMITED	Travel Service	JTB (Japan Travel Bureau,Inc.)
	The Sanwa Bank Limited		OpenDoor Co.Ltd.
	The Sumitomo Bank,Limited	Credit Card Bill Inquiry	DC CARD CO.,LTD.
	The Ogaki Kyoritsu Bank,Ltd.		Million Card Service Co.,LTD.
	THE BANK OF FUKUOKA,LTD.		THE SUMITOMO CREDIT SERVICE CO.,LTD.
	The Aichi Bank,Ltd.		UC CARD Co.,Ltd.
	The Awa Bank,Ltd.		JCB Co.,Ltd.
	THE IYO BANK,LTD.	Mobile Trading	DAIWA SECURITIES CO.,LTD.
	THE BANK OF IWATE,LTD.		The Nikko Securities Co.,Ltd.
	THE EHIME BANK,LTD.	Purchasing Books	KINOKUNIYA COMPANY LTD.
	THE KAGAWA BANK,Ltd.	Life Insurance	Nippon Life Insurance Company
	Kita Nippon Bank		Meiji Life Insurance Company
	The Kiyo Bank,Ltd.		Sumitomo Life Insurance Company
	The Bank of Kyoto		The Dai-ichi Mutual Life Insurance Company
	Sapporo Bank		Yasuda Mutual Life Insurance Co.,Ltd.
	THE SAN-IN GODO BANK,LTD.	Karaoke	Daiichi Kosho CO.,Ltd.
	THE SHIGA BANK,LTD.	FM On-air Information	FM-Japan Ltd.
	Shikoku Bank,Ltd.		TOKYO FM BROADCASTING CO.,LTD.
	The Shizuoka Bank,Ltd.	Game	BANDAI CO.,LTD.
	The SHONAI BANK,Ltd.		Photo Net Japan,Inc.
	The Suruga Bank,Ltd.	Fortune-telling	ANIMO LIMITED
	The Daiwa Bank,Limited		Telsys Network Co.,Ltd.
	THE Chukyo Bank,Limited		INDEX Corporation
	Tokyo Sowa Bank,Limited		CAVE Co.,Ltd.
	THE TOCHIGI BANK,LTD.	Restaurant Guide	ZAGATSURVEY
	The Bank of Nagoya,Ltd.	Mobile Telephone Directory	NTT DIRECTORY SERVICES CO.
	THE NISHI-NIPPONN BANK,LTD.	Mobile Recipes	AJINOMOTO CO.,INC.
	The Higo Bank,Ltd.		Osaka Gas Co.,Ltd.
	The Hyakujushi Bank,Ltd.	Dictionary Search	Sanseido Co.,Ltd.
	THE HIROSHIMA BANK,LTD.	Transportation Information	TOSHIBA CORPORATION
	Hiroshima-Sogo Bank		EAST JAPAN MARKETING&COMMUNICATIONS,INC.
	THE FUKUI BANK,LTD.	Rental/Housing Information	ABLE INC.
	THE FUKUOKA CITY BANK,LTD.	News	Asahi Shimbun
	The Michinoku Bank,Ltd.		The Mainichi Newspapers Co.,Ltd.
	The Yamaguchi Bank,Ltd.		THE YOMIURI SHIMBUN
	The Asahi Bank,Ltd.		The Sankei Shimbun
	THE DAI-ICHI KANGYO BANK,LIMITED		Nihon Keizai Shimbun,inc.
	THE TOKAI BANK,LTD.		Jiji Press,Ltd.
	THE FUJI BANK,LIMITED		NHK JOHO NETWORK INC.
	Bank of Tokyo-Mitsubishi		Nikkei Business Publications,Inc.
Concert Ticket Booking	LAWSON TICKET Co.LTD.		The Sanyo Shimbun
	S S Communications Inc.		The Chugoku Shimbun
	PIA CORPORATION		The Hokkaido Shimbun Press
Travel Service	Japan Airlines		The Niigata Nippo
	ALL NIPPON AIRWAYS CO.,LTD.		Morningstar Japan K.K.
	JAPAN AIR SYSTEM CO.,LTD.	Weatherforecast	Weathernews Inc.

receiver uses. So far, short message service was closed service available only among the subscribers of the same operator. However with i-mode, this hurdle is removed and mail culture which is one main pillar of mobile multimedia market will be flourished further.

■ URL Connection

Since HTML browser is installed in i-mode cellular phone terminal, it is possible to browse regular text oriented Web site. However, there is tag limitation, so we recommend you to rewrite the information into i-mode style to let the viewer read the site with less stress. This Web specification is available at DoCoMo home page.

You do not have to use any special language. It is quite simple to create i-mode oriented Web site. After the 5 months since service launch, more than 1,200 i-mode oriented Web site are generated. This is more than DoCoMo recommending 120 online services (portal site). Also 5 search engines are born and some engines are soliciting advertisement. There are various pages such as skiing ground or lodge guide, taxi information, company information, TV personalities schedule, personal home page etc. This is also effect of HTML browser.

There is a huge potential to develop usage without limitation. We expect new communication style would be emerged like everyone exchanges i-mode corresponding Web URL each other.

■ Anytime Access to In-house Information With Cellular Phone Only

If i-mode support Web is established in your Intranet, employee can access to in-house information only with 501i terminal from outside. With cellular phone display, business people can check their schedule or e-mail even though they are outside of their office.

When you want to provide information by having synchronization with groupware, and also you have to ask IT manager for control, only you have to use is Intellisync Anywhere^{*1} (PUMA made, service launch is planned from autumn 1999), which is the server software to synchronize with groupware.

Mobile multimedia is easily realized in business field, too.

■ Future of i-mode

What will happen in the end if i-mode develops further from online service (portal type), URL direct entry, Intranet connection?

It is planned to apply i-mode to communication car naviga-

tion system. But further demands are presented from i-mode users and IP by saying "We want to do something more. Can you make it possible?"

For example, some user wants to play simple video game on the i-mode terminal. Some bank wants to use its confident security application and provide more attractive financial services. Some IP wants to execute its own content charging system. There are so many requests. And to realize these market demands is indispensable for mobile multimedia prosperity.

However, it is not realistic to create new cellular phone one after another according to IP's demand. Then what becomes necessary is to have common platform. To realize the establishment of common platform, DoCoMo made technical cooperation MoU agreement with Sun Microsystems of U.S. in March 1999. Then we started to study Java^{*2} implementation into i-mode cellular phone terminal.

Current i-mode service is provided through the PDC-P network, therefore expression style of information is mainly text. On the other hand, in the spring of year 2001, IMT-2000 will be launched and transmission speed will be far accelerated. Around that time, it would be possible for i-mode user to enjoy rich contents with their terminal. Rich contents mean color moving picture or high quality music. The current i-mode contents would be more attractive when rich contents support technology becomes available. Current recipe and News would be more interesting when they become rich contents. Also video or music for concert promotion will be delivered to the terminal and scene of trip destination can be seen with i-mode display (Figure 3).

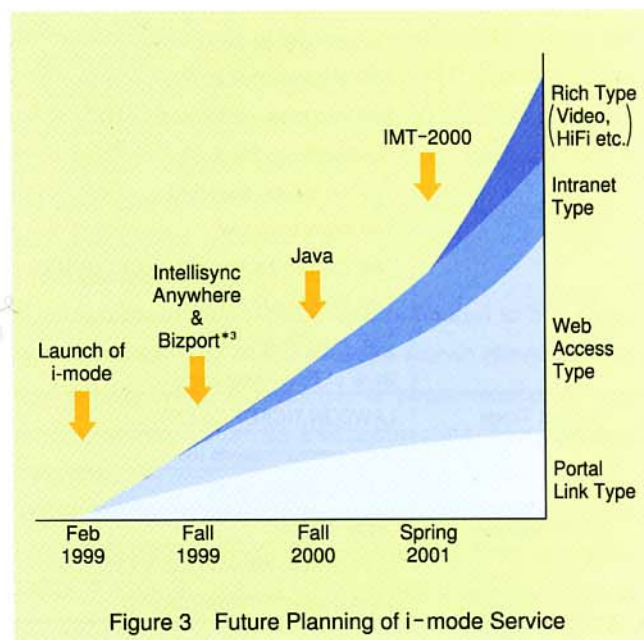


Figure 3 Future Planning of i-mode Service

Conclusion

Conventional cellular phone was “a tool of talking” . But from now on it will be evolved into “a tool of using” . Since cellular phone is a medium to get direct access to the individual instead of company or family, and since people always carry their own terminal, cellular phone is a very attractive medium for the business entity to provide services toward individual people.

By using i-mode, more and more people would get familiar with “@” or “URL” .

* 1 : Intellisync Anywhere is a trademark of Puma Technology Co. in U.S.

* 2 : Java is a trademark of Sun Microsystems Co. in U.S.

* 3 : Bizport is a trademark of Compaq Computer k.k .

In the very near future, there would be many people who want to use Internet with PC more intensively after they experienced Internet with i-mode.

There would be big leap from consumer market to professional/business market.

We believe wide spreading of i-mode would accelerate not only DoCoMo's multimedia business development but also Japanese multimedia market and Internet market expansion.