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Mobile access to libraries: librarians and users experience for "i-mode" applications in libraries

Masamitsu NEGISHI
National Institute of Informatics (NII)
Tokyo, Japan

Abstract:

Recent penetration of the internet to every aspect of the society is remarkable. Along with various types of access methods being developed, information contents and services provided through them have also become to have a broad variety. The mobile phone systems capable of accessing the internet have got a high popularity in Japan in these three years, and the services dedicated to mobile internet accesses show a rapid increase. Now library services appear to be within the scope of the mobile internet. The paper summarizes the development of mobile internet represented by "i-mode" in Japan, making it the number one country in the world in this scene, and introduces the typical library applications. Statistics are shown to indicate the trend of usage for "i-mode OPACs" or mobile access services to library catalogs. The expectation for the future expansion of library applications it the area is considered to formulate the innovative library services in the new century.

1. Telecommunication and mobile internet access

According to the latest Communication White Paper released in July 2002 by the Japanese government, internet penetration among Japanese people is showing a remarkable advance in these years.[1] Japan is now the second biggest country after USA in terms of the internet population. However, in terms of per capita popularization, Japan is still at the 16th with some 44% of people accessible to the internet. However the white paper appears to be proud to state that Japan is the most advanced country in the world in "mobile internet," the internet access through cellar phones.

The mobile internet, started in February 1999, now gets more than 50 million users in these 3 years, and has 51,930,000 contracts as of April 2002. The rate of internet capability in mobile phones has reached 72.3%,

which is the top of the world with Korea of 59.1% as the 2nd, followed by Finland of 16.5%. The USA is ranked at the 6th with that of 7.9%. In this telecommunication environment, various types of services and businesses are being developed in Japan including ticketing, banking, image downloading, positional information service, etc. The white paper itself is publicized through mobile internet in a specially formatted version as well as the normal version for PCs. As is described later, libraries are now going to enter the world of mobile internet by developing systems fitted to it.

2. Overview of the "i-mode"

The i-mode, the first mobile internet service, is a method to access the internet from mobile phones developed and operated by NTT DoCoMo since February 1999.[2] NTT DoCoMo is a subsidiary of NTT (Nippon Telegraph and Telephone Corporation) specialized in mobile phone communications. The "i" of i-mode stands for internet, information, interaction and I, myself. On a i-mode phone you can access to the internet by just pushing the i-mode button on it (or the icon on the display) and you will see the i-mode menu prepared by NTT DoCoMo. The menu includes e-mail and various information providing sites, and you will be able to e-mail or exchange information by selecting those menu items. The information accessible through the i-mode menu is provided by the companies and banks (information providers) in association with NTT and those sites are called the "Official Sites." The official sites can operate fee based services where the fees are collected by NTT DoCoMo together with usual phone charges.

Ordinary web sites are also accessible by specifying URLs. But due to the small screen of mobile phones, customized web pages are needed for their practical use. NTT DoCoMo announces that the number of the official sites is 3,018 while the number of general sites dedicated to i-mode is 53,736 as of April 2002. 48% of accesses are for the official sites and the rest goes to general sites. The typical profile of a user shows that he or she receives 5.1 mail messages, sends 3.9 of them and looks 8.9 web pages a day.

When the i-mode first appeared in 1999, information specialists were quite skeptical of its future because the screen on the phone was so small as to display only 48 Japanese characters (96 alphabets) and the ten-key system is considered so poor for input Japanese characters. However, contrary to the predictions, the i-mode has very rapidly become popular mainly among young people. Some reasons are assumed to its success. NTT DoCoMo set a comparably low price level to communication charges and also for information charges for information providers of the official sites, which was fairly affordable by young people. Here the i-mode has realized a micro-payment system and has proved its practicality in information services.

Concerning the ten-key pad operation on mobile phones, young people had already got the skill in their high school age, when they were using low cost pagers for communication among friends. At that period mobile phones are so expensive that they could not afford them, and business use was the main stream. The pagers can display characters sent by callers who input them using a ten-key pad on public phones. Young people have acquired the fast inputting skill on ten-key pads while they were exchanging messages through pagers. The i-mode phones are usually operated only by a thumb. Now the youth adapted to i-mode operation are called *Thumbelina* or *Le Petit Poucet* (Little Thumb) by older people after fairy tales by H. C. Andersen and Charles Perrault, because they show very fast keying with a thumb on the phone.

3. Bowser phone and mobile internet access

3.1 Browser phone functions and services

The mobile phones capable of internet access are now generally called browser phones, because there appeared the other two systems operated by new common carriers than i-mode, that is, EZweb by "au" (KDDI) and J-sky by J-PHONE (now owned by vodafone).[3,4] The browser phones are equipped with a larger display screen, a ten-key pad and a versatile curser key. As is mentioned earlier, in the first i-mode phone, the screen was small as to display 8 (16 for alphabets) x 6 characters and was monochrome. The newest model of 2002 has become to have a 10 (20) characters x 10 lines 64k color display so as to be more comparable to PDAs. Table 1 depicts a comparison among browser phones, PDAs and mobile PCs.

Table 1. Comparison of Browser Phones with PDAs and Mobile PCs

Terminal type	Screen (dots/chars)	Input device	Telecom interface	Weight
Browser phone	120 x 160 (10 x 10)	ten-key pad	built-in telephone	100g
PDA	240 x 320 (16 x 20)	touch screen / hand writing recognition	PC-card interface for modem / Ethernet	200g
Mobile PC	1024 x 768	full keyboard	modem / Ethernet	1kg

We can see here that browser phones have the advantage in built-in telecommunication function where the users do not have to worry about preparation for internet accesses. They will be provided with the internet and a e-mail address by just buying a mobile phone. Contents / access fees are automatically charged to the telephone account. Recently in the market there appeared some PDAs and small PCs with built-in PHS accesses functions. However they are not capable of usual telephone function, and you would have to carry both a mobile phone and a PC. Thus browser phones have become quite popular and now simple mobile phones with only telephone function are disappearing in the market. Mobile phones are now synonymous to browser phones capable of internet access.

In this trend, many companies are establishing information services specialized to browser phone accesses. The interesting one among them is the download services of melodic ringing tones which notify telephone calls. Users can download their favorite song for their ringing tone, and change it periodically. The browser phones are competing with their capability of playing polyphony to make the rings more musical. Same type of services includes the services of wall papers for the display on the phone which entertain users with animation characters of weekly changes. In a service, short cartoons like ones on newspapers are dispatched to browser phones on a daily basis, and people are enjoying them on commuter trains.

The photo transmission function is another function which makes browser phones very popular. It is realized by the browser phone equipped with a small digital camera. With these phones, you can take a photo and send it immediately with your voice or mail message to your friends. Now the function is being enhanced so as to send semi-motion pictures, realizing something like a TV telephone system on mobile phone. Besides those entertainment oriented services, some business types of services were also developed like latest new dispatching.

A topical new service is that of purchasing canned drinks on vending machines by browser phones. You can buy drinks by showing your phone to a specialized vending machine, where charges are added to your telephone account. The machine is equipped with an optical reader, and it detects a bar-code displayed on your phone screen, identifying your account. Thus the applications of mobile phone appear to include a wide range of services, not only for information services but also for various types of commodity sales. The e-commerce via mobile internet and new business models would be the topical theme for a range of companies.

3.2 Markup languages and compatibility

Although the i-mode of NTT DoCoMo started the first internet access service through mobile phone and still is dominating the market, the other telephone companies followed DoCoMo with the other standards than i-mode's, and now there are three standards: i-mode, EZweb of "au" and J-SKY of J-PHONE. Their characteristics are compared in Table 2.

Table 2. Markup Languages Adopted by the Three Mobile Internet Systems

Service	Markup Language	Characteristics	Number of Users as of May 2002 [5]
i-mode	C-HTML (Compact HTML)	A simplified version of HTML designed by NTT	32,988,000
EZweb	HDML (Handheld Device ML) (now switching to XHTML-basic)	WAP (Wireless Application Protocol) based. Incompatible with HTML	10,251,100
J-SKY	MML (Mobile ML)	Similar to C-HTML	10,475,500

As the standards are incompatible with each other, the server sites have to establish the three kinds of homepages fitted to each of them. This forces some troubles to those who wish to open a mobile service site, but the labor to cope with them do not seem to be so big. Now most of the sites are compatible with any of the three mobile phone systems. As W3C has formulated a simplified version of XHTML suitable for mobile phones (XHTML-basic), the above three services might adopt XHTML-basic as their standards in the future.

4. Library applications for mobile internet

4.1 "i-mode OPAC" or mobile access to library catalog databases

The first application of i-mode to OPAC (Open Public Access Catalog) services is developed at TOYAMA University Library in September 2000.[6] One of the conditions for the development is the high popularity of mobile phones among students. A survey by the university for its students in 1999 showed that more than 90% of them owned mobile phones, most of which are browser phones. Thus the mobile phone was considered an effective communication tool between the university and the students.

By that time, some universities had begun news services of administrative affairs like cancellation of classes, where students could know the news in their home before coming to the campus. Those news services could be realized fairly easier that library applications, because they only include a small amount of short messages, which could easily be accessed by a simple menu system with straightforward curser movements. In library applications, database retrieval like OPACs should naturally be included, and this requires special developments to cope with the small screen and input process with the ten-key pad on browser phones. Thus many of the libraries who service mobile accesses still providing only news and guides for libraries excluding catalog related information services.

4.2 Toyama University Library I-BOOK SERIVICE

The followings are the menu and sample screens of Toyama University Library's I-Book Service.

```
富山大学図書館          TOYAMAUnivLibrary
I-BOOKサービス          I-BOOK Serivice

1.利用案内              1.Users Guide
2.図書館総合目録         2.Library Catalogs
3.新着図書案内           3.New Arrivals
4.ご意見をどうぞ         4.Your        Commens
                      Welcome
```

(1) Main Menu
 Select a service by pushing a numeric button. (Tentative English translation is given by the author on the right for explanation)

```
富山大学図書館          TOYAMA Univ Library
# 利用案内 #            # Users Guide #

開館時間                Opening Hours
平日 9:00〜22:00        Weekdays 9:00-22:00
土日 10:00〜17:00       Sat, Sun 10:00-17:00
(夏季、冬季及び春季      (Summer, Winterand Spring
休業期間の平日は、       Holidays: Weekdays 9:00-
9:00〜17:00 まで、土    17:00Sat, Sun Closed)
日は休館日です)
                      Closed on National Holidays, the
休館日:祝日,年末年始     beginning and the end of the year

図書館総合目録          Please check the library catalog
 (OPAC) で資料の所      (OPAC) to locate materials when
在を調べてからご利       you use the library
用ください。
                      Loan periods and limits on the
貸出し冊数              number of books
学部学生  5 冊以内       Undergraduates: 5 volumes up to
2週間以内               2 weeks
大学院生  10 冊以内      Graduates: 10 volumes up to 1
1ケ月以内               month
(期限内に返さない        (Overdue penalty is loan
と、遅れた日数分貸出      prohibition for the same period as
禁止)                  the overdue)

お問い合わせ:           For Inquiries
お電話はこちら           Our telephone numbers
メールはこちら           Our mail address

メニュー                Menu
```

(2) Users Guide
 The guide gives opening hours, lending policy, etc. The long text can be seen by scrolling down the display window on the browser phone.

```
富山大学図書館          TOYAMA Univ
図書検索条件            Library
                      Search Terms
1.タイトル:
2.著者名:              1.Title:
3.出版者:              2.Author:
4.キーワード:          3.Publisher:
5.出版年:              4.Keywords:
6.ファイル種別:全て     5.Year of Publication:
7.ISBN:               6.File Type: ALL
8.ISSN:               7.ISBN:
9.ソートキー:タイトル   8.ISSN:
0.ソート順:昇順        9.Sort key: TITLE
                      0.Sort order: ASC
検索
メニュー                Search
ヘルプ                  Menu
                      Help
```

(3) Catalog Search
 Selecting Item 2 (Library Catalogs) on the menu gives this screen, where you can select a search field like title, author, etc.

```
著者名              Author
根岸正光            根岸正光

<送信>             <Submit>
```

(4) Input a Search Term (Author)
 Selecting Item 2 in the (3) screen gives the above input screen. In this case the author name (M Negishi) was input. Inputting Japanese characters with a ten-key pad requires some skill as a Thumbelina or Little Thumb.
 Clicking <Submit> activates search process.

富山大学図書館

該当図書一覧
該当は5件ありました。

1.SGMLの活用 / 根岸正光，石塚英弘共編． -- オーム社，1994.12． -- （総合マルチメディア選書）．

2.研究評価 ： 研究者・研究機関・大学におけるガイドライン / 根岸正光，山崎茂明編著． -- 丸善，2001.5．

3.大学図書館のシステム化 ： 大学図書館における情報処理トータルシステムの開発 / 根岸正光[ほか] 共編． -- 紀伊国屋書店，1981.10．

4.大学図書館のシステム化 ： 大学図書館における情報処理トータルシステムの開発 / 根岸正光[ほか]共編． -- 紀伊国屋書店，1981.10．

5.図書館システムの将来像 ： 密結合型図書館ネットワークと電子図書館 / 根岸正光，猪瀬博編． -- 紀伊國屋書店，1991.12．

戻る

TOYAMA Univ Library

List of Books Searched
You have got 5 hits.

1.Applicaions of SGML / M. Negishi, H. Ishizuka, eds, -- Ohm-Sha, 1994.12. -- (Comprehensive Multimedia Series).

2.Research Evaluarion: Guidelines for Researchers, Research Institutes and Universities / M. Negishi, S. Yamazaki. -- Maruzen, 2001.5.

3.大学図書館のシステム化 ： 大学図書館における情報処理トータルシステムの開発 / 根岸正光[ほか] 共編． -- 紀伊国屋書店，1981.10．

4.大学図書館のシステム化 ： 大学図書館における情報処理トータルシステムの開発 / 根岸正光[ほか]共編． -- 紀伊国屋書店，1981.10．

5.図書館システムの将来像 ： 密結合型図書館ネットワークと電子図書館 / 根岸正光，猪瀬博編． -- 紀伊國屋書店，1991.12．

戻る

(5) Search Results
 Bibliographic information on searched items is listed.

富山大学図書館
所蔵一覧

1.
所蔵館:本館
配置場所:本館１階
請求記号:
002||N31||Ke

2.
所蔵館:本館
配置場所:本館南４階
請求記号:
002||N31||Ke
研究室貸出中

戻る

TOYAMA Univ Library
List of Holdings

1.
Holding at: Main Lib
Location: Main 1st fl
Call No:
002||N31||Ke

2.
Holding at: Main Lib
Location: Main South 4th fl
Call No:
002||N31||Ke
On loan for researcher's office

Return

(6) List of Holdings
 Selecting an item in the (5) screen gives the locations with their call numbers. The above sample shows the holdings for the item 2 in (5).

---

(7) Detailed information display on an ordinary web browser for the item 2 in (5). Techniques are required to make data fitted to the small screen on browser phones. (cf. (5), (6))

4.3 Utilization of i-mode OPACs

Statistics of mobile accesses to Toyama University Library are shown in Table 3. Regrettably, they do not seem to show a distinct growth. The other statistics are for Tokyo University Library shown in Table 4 and Figure 1.[7] Here, we see a steady growth of mobile access after its inauguration in May 2001, though the counts are quite small compared to those of ordinary internet access of hundreds of thousand. Moreover we observe that the percentage of mobile accesses to usual accesses is increasing. This makes us to expect further growth of mobile accesses to library information. Because the spread of mobile phones among students is already adequate, the future developments are depending mainly on the improvement of functionality of browser phones including the size of screen and transmission speed.

Table 3. Statistics of mobile access to Toyama University Library (Apr 2001 - Mar 2002)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Total
OPAC	205	143	134	202	55	76	82	79	87	119	84	13	1279
New Arrivals	144	89	51	44	32	45	51	61	24	48	29	14	632
Total	349	232	185	246	87	121	133	140	111	167	113	27	1991

Table 4. Statistics of mobile and wired access to Tokyo University Library Catalog (May 2001 - Jun 2002)
(%= i-mode / Wired)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
i-mode	-	124	381	405	292	318	462	894	437	715	783	586	1274	1296	1148
Wired	170368	250201	262151	306251	381999	364135	518832	527155	430552	480037	441878	341940	530567	620656	612040
%	-	0.05	0.15	0.13	0.08	0.09	0.09	0.17	0.10	0.15	0.18	0.17	0.24	0.21	0.19

Figure 1. Trends of mobile and wired access to Tokyo University Library Catalog (cf. Table 4)
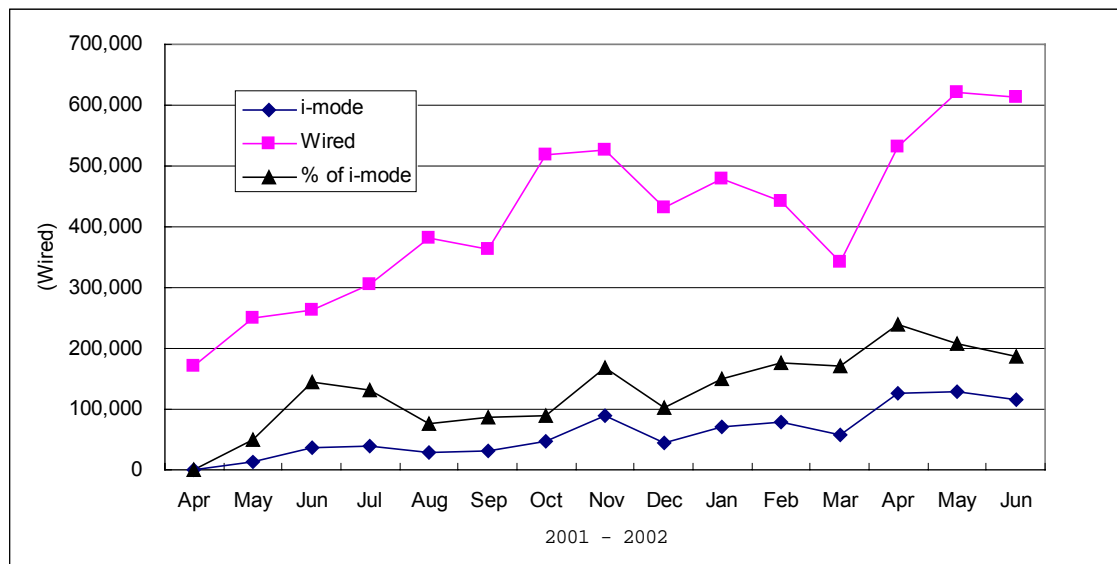
4.4 Future developments of mobile access in library applications

Mobile access to library services currently includes general guides, news and OPACs. For the moment, the mobile services are expected to include reservations and overdue notices. Many libraries have already become to accept reservations of material by clients via e-mail. However, the overdue notices of lending are still put on notice boards and/or sent via conventional mail. Now almost all universities give e-mail addresses to their students upon their entrance, and it makes the notices via e-mail quite practical. When the students set forwarding of e-mails at university servers to their mobile phones, they would receive the notice

on mobile scenes. Thus mobile applications to library services are to be developed to include various types of services. Same framework could be applied to public libraries because people increasingly get e-mail addresses and also mobile phones.

4.5 Mobile ASP services, a type of solutions for libraries

In view of this situation, several software companies have begun the services of mobile access systems for libraries as ASPs (Application Service Providers). They provide specialized gateways which connects libraries' databases and users' browser phones. In this type of services, no additional work is required at the library sides, as all of the data conversions from catalog databases to mobile compliant data are done at the gateways. Thus libraries are being encouraged to have mobile internet services together with the continuing increase in mobile internet users.

5. Libraries in a mobile internet society

The Japanese government established the "e-Japan Program" in 2001, in which the society with the ubiquitous information network was put in the agenda.[8] The program aims to make Japan the most IT advanced country in the world within 5 years. Although realization of ubiquitous network includes types of networking systems like FTTH (Fiber To The Home) and wireless LAN, internet access through high speed mobile phones is considered to one of the most important systems, because Japan is leading the area from view points of technology and business.

Library services are facing a dramatic change in the digital age, which is typically represented by the rapid progress of electronic journals. In the network environment we could expect popularization of high speed wireless connections as well as wired network. As mobile access to library services just started, we should formulate an ambitious service plan to attract users in the digital age by utilizing evolving mobile internet systems. Libraries should redraw their future image in view of upcoming developments in the contents side and the network side.

[1] "2002 WHITE PAPER: Information and Communications in Japan,"
   The Ministry of Public Management, Home Affairs, Posts and Telecommunications [in Japanese]
   http://www.johotsusintokei.soumu.go.jp/whitepaper/ja/cover/index.htm
[2] NTT DoCoMo http://www.nttdocomo.com http://www.nttdocomo.co.jp/english/
[3] au (KDDI): http://www.au.kddi.com/ezweb/index_i.html
[4] J-PHONE: http://www.j-phone.com/h-e/index.html
[5] TCA: the Telecommunications Carriers Association:
   http://www.tca.or.jp/   http://www.tca.or.jp/index-e.html
[6] Toyama University Library: http://www.toyama-u.ac.jp/tya/library/
   i-mode: http://www.lib.toyama-u.ac.jp/i/
   J-SKY: http://www.lib.toyama-u.ac.jp/j/
   EZweb: http://www.lib.toyama-u.ac.jp/ez/
[7] Tokyo University Library: http://www.lib.u-tokyo.ac.jp/
   i-mode: http://mg.dl.itc.u-tokyo.ac.jp/opac/i/
   http://www.lib.u-tokyo.ac.jp/dl/toukei/index.html
[8] "e-Japan Strategy," IT Strategy Headquarters, The Cabinet, January 22, 2001
   http://www.kantei.go.jp/foreign/it/network/0122full_e.html

Mobile Access to Libraries:
Librarians and Users Experience for
i-mode Applications in Libraries

Masamitsu NEGISHI
NII: National Institute of Informatics
Tokyo, Japan
68th IFLA General Conference and Council, Aug 18-24, 2002, Glasgow, UK
Meeting No. 95 / Code No. 105-095-E
Information Technology "Technologies for extending the reach of library solutions
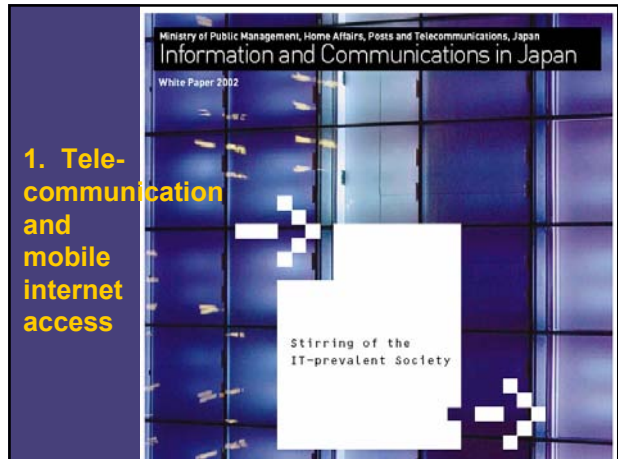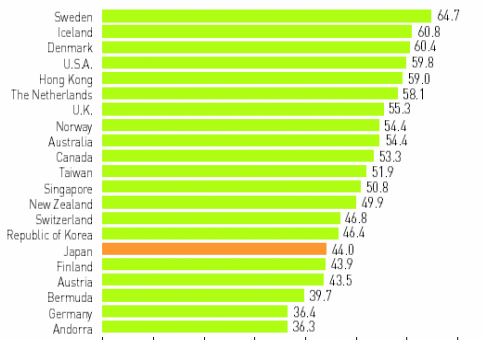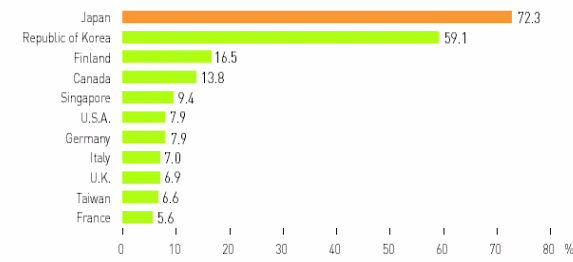
1

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1. Tele-communication and mobile internet access

Ministry of Public Management, Home Affairs, Posts and Telecommunications, Japan
Information and Communications in Japan
White Paper 2002

Stirring of the IT-prevalent Society

Exhibit 1-3 Countries and Regions with an Internet Penetration Rate of 35% or More

Sweden	64.7
Iceland	60.8
Denmark	60.4
U.S.A.	59.8
Hong Kong	59.0
The Netherlands	58.1
U.K.	55.3
Norway	54.4
Australia	54.4
Canada	53.3
Taiwan	51.9
Singapore	50.8
New Zealand	49.9
Switzerland	46.8
Republic of Korea	46.4
Japan	44.0
Finland	43.9
Austria	43.5
Bermuda	39.7
Germany	36.4
Andorra	36.3

Source: *Communications Usage Trend Survey*, MPHPT, Survey by Nua.com (as of March 2002)

Exhibit 1-9 Cell Phone Internet Compatibility Rate (Ratio of the Number of Subscribers to the Mobile Internet to the Number of Subscribers to Cell Phones) in the Major Countries and Regions (as of 2001)

Japan	72.3
Republic of Korea	59.1
Finland	16.5
Canada	13.8
Singapore	9.4
U.S.A.	7.9
Germany	7.9
Italy	7.0
U.K.	6.9
Taiwan	6.6
France	5.6

4

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2. Overview of the "i-mode"

NTT DoCoMo, Feb 1999-
E-mail, Web Browser, Java VM *(i-appli)*
3,018 Official Sites
53,736 General Sites
33 million Users
Thumbelina / Le Petit Poucet (Little Thumb)

5

---

i-mode menu (Official Sites)

1

3. Bowser phone and mobile internet access
3.1 Browser phone functions and services

- *i-mode* by NTT DoCoMo
- *EZweb* by *au* (KDDI)
- *J-SKY* by J-PHONE (vodafone)

7

3.1 Browser phone functions and services

Terminal type	Screen dots / (chars)	Input device	Telecom interface	Weight
Browser Phone	120 x 160 (10 x 10)	ten-key pad	built-in telephone	100g
PDA	240 x 320 (16 x 20)	touch screen / hand writing recognition	PC-card interface for modem / Ethernet	200g
Mobile PC	1024 x 768	full keyboard	modem / Ethernet	1kg

8

Browser Phone Handset

9

Ten-key Pad

10

Browser Phone Display

11

Built-in Digital Camera

12

2

Still / Motion Picture

Built-in GPS

Cmode
Buy drinks with a phone

2-dimensional bar code
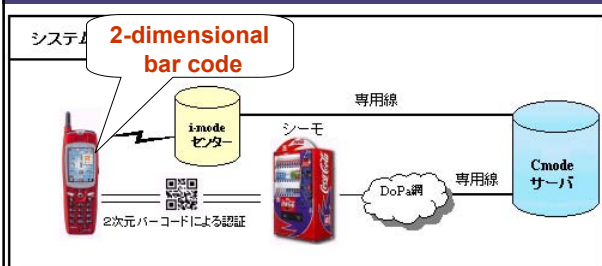
3.2 Markup languages and compatibility

Service	Markup Language	Characteristics	Number of Users as of May 2002 [5]
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J-SKY	MML (Mobile ML)	Similar to C-HTML	10,475,500

4. Library applications for mobile internet
4.1 "i-mode OPAC" or mobile access to library catalog databases

TOYAMA Univ 2000-
TOKYO Univ   2001-
HOKKAIDO Univ 2001-
Public libraries 2001-

4.2 Toyama University Library I-BOOK SERIVICE

富山大学図書館
I-BOOKサービス

1.利用案内
2.図書館総合目録
3.新着図書案内
4.ご意見をどうぞ

TOYAMA Univ Library
 I-BOOK Service

1.Users Guide
2.Library Catalogs
3.New Arrivals
4.Your Comments
  Welcome

(1) Main Menu

(2) Users Guide

富山大学図書館
利用案内

開館時間
平日 9:00～22:00
土日 10:00～17:00
(夏季、冬季及び春季
休業期間の平日は、
9:00～17:00まで、土
日は休館日です)

休館日:祝日,年末年始

図書館総合目録
（OPAC）で資料の所
在を調べてからご利
用ください。

貸出し冊数
学部学生 5 冊以内
2 週間以内
大学院生 10 冊以内
1ケ月以内
(期限内に返さない
と、遅れた日数分等は

TOYAMA Univ Library
 # Users Guide #

Opening Hours
Weekdays 9:00-22:00
Sat, Sun 10:00-17:00
(Summer, Winterand
Spring Holidays:
Weekdays 9:00-17:00Sat,
Sun Closed)

Closed on National
Holidays, the beginning
and the end of the year

Please check the library
catalog (OPAC) to locate
materials when you use
the library

Loan periods and limits
on the number of books
Undergraduates: 5
volumes up to 2 weeks

(3) Catalog Search

富山大学図書館
図書検索条件

1.タイトル:
2.著者名:
3.出版者:
4.キーワード:
5.出版年:
6.ファイル種別:全て
7.ISBN:
8.ISSN:
9.ソートキー:タイトル
0.ソート順:昇順

検索
メニュー
ヘルプ

TOYAMA Univ
Library
Search Terms

1.Title:
2.Author:
3.Publisher:
4.Keywords:
5.Year of Publication:
6.File Type: ALL
7.ISBN:
8.ISSN:
9.Sort key: TITLE
0.Sort order: ASC

Search
Menu
Help

(4) Input a Search Term

著者名	AUTHOR
根岸正光	根岸正光
<送信>	<SUBMIT>

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(5)

富山大学図書館
該当図書一覧
該当は5件ありまし
た。

1.SGMLの活用 / 根
岸正光, 石塚英弘共
編. -- オーム社,
1994.12. -- (総合
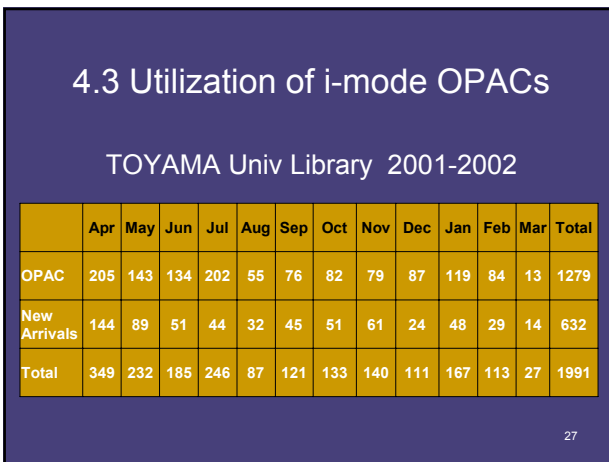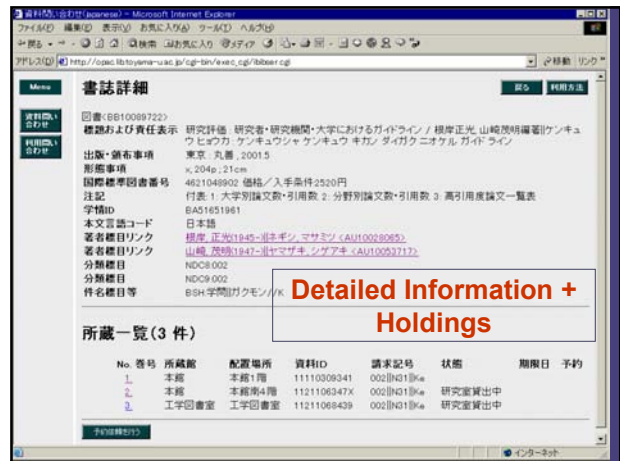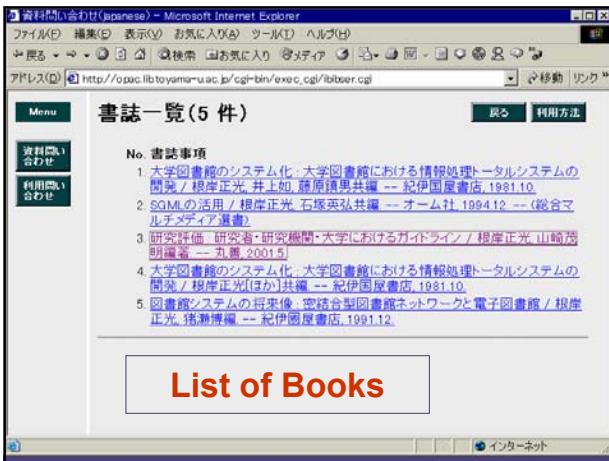マルチメディア選
書).

2.研究評価 : 研究
者・研究機関・大学
におけるガイドライ
ン / 根岸正光, 山
崎茂明編著. -- 丸
善, 2001.5.

3.大学図書館のシス
テム化 : 大学図書
館における情報処理

[ほか] 共編. --
紀伊国屋書店.
1981.10.

4.大学図書館のシス
テム化 : 大学図書
館における情報処理
トータルシステムの
開発 / 根岸正光
[ほか]共編. -- 紀
伊国屋書店.
1981.10.

5.図書館システムの
将来像 : 密結合型
図書館ネットワーク
と電子図書館 / 根
岸正光, 猪瀬博編.
-- 紀伊国屋書店,
1991.12.

戻る

TOYAMA Univ Library

List of Books Searched
You have got 5 hits.

1.Applicaions of SGML /
M. Negishi, H. Ishizuka,
eds, -- Ohm-Sha, 1994.12.
-- (Comprehensive
Multimedia Series).

2.Research Evaluarion:
Guidelines for
Researchers, Research
Institutes and
Universities / M. Negishi,
S. Yamazaki. -- Maruzen,
2001.5.

3. Systematization of
University Libraries:
Development of
Totalized Information
Processing Systems at
University Libraries

(6) List of Holdings

富山大学図書館
所蔵一覧

1.
所蔵館:本館
配置場所:本館1階
請求記号:
002||N31||Ke

2.
所蔵館:本館
配置場所:本館南4
階
請求記号:
002||N31||Ke
研究室貸出中

戻る

TOYAMA Univ Library
List of Holdings

1.
Holding at: Main Lib
Location: Main 1st fl
Call No:
002||N31||Ke

2.
Holding at: Main Lib
Location: Main South 4th
fl
Call No:
002||N31||Ke
On loan for researcher's
office

Return

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(7) Search by browsers

List of Books

Detailed Information + Holdings

4.3 Utilization of i-mode OPACs

TOYAMA Univ Library 2001-2002

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Total
OPAC	205	143	134	202	55	76	82	79	87	119	84	13	1279
New Arrivals	144	89	51	44	32	45	51	61	24	48	29	14	632
Total	349	232	185	246	87	121	133	140	111	167	113	27	1991

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Utilization of i-mode OPACs
TOKYO Univ Library 2001-2002

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
i-mode	-	124	381	405	292	318	462	894	437
Wired	170368	250201	262151	306251	381999	364135	518832	527155	430552
%	-	0.05	0.15	0.13	0.08	0.09	0.09	0.17	0.10

	Jan	Feb	Mar	Apr	May	Jun
i-mode	715	783	586	1274	1296	1148
Wired	480037	441878	341940	530567	620656	612040
%	0.15	0.18	0.17	0.24	0.21	0.19

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Utilization of i-mode OPACs
TOKYO Univ Library 2001-2002

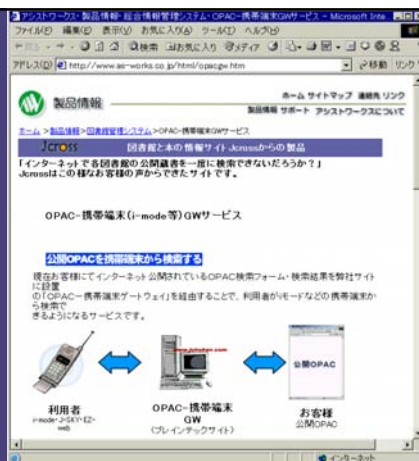

Advertising Leaflet

(TOKYO Univ)

5

4.4 Future developments of mobile access in library applications

- Reservation
- Overdue Notice
- Library-Student Communication Tool

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4.5
Mobile ASP services,

a type of solutions for libraries

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5. Libraries in a mobile internet society

e-Japan Program 2001-
Ubiquitous Network

FTTH (100 Mbps)
Wireless LAN (11 / 54 Mbps)
3rd Generation Mobile Phone
    (384 kbps, NTT *FOMA*: Oct 2001-)
  (2nd gen.: 9.6-28.8 kbps)
  (PHS: 64 kbps)

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Thank You

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