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


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## *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

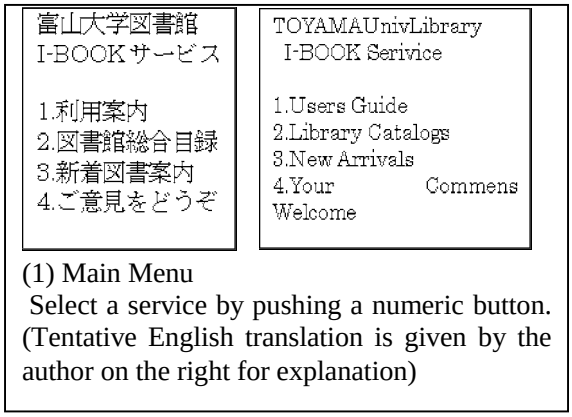
### 4.1 "i-mode OPAC" or mobile access to library catalog databases

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

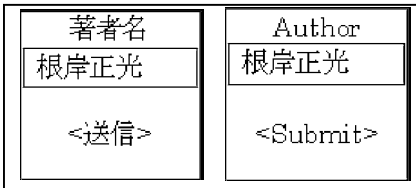
The followings are the menu and sample screens of Toyama University Library's I-Book Service.




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


(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.


(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.




(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

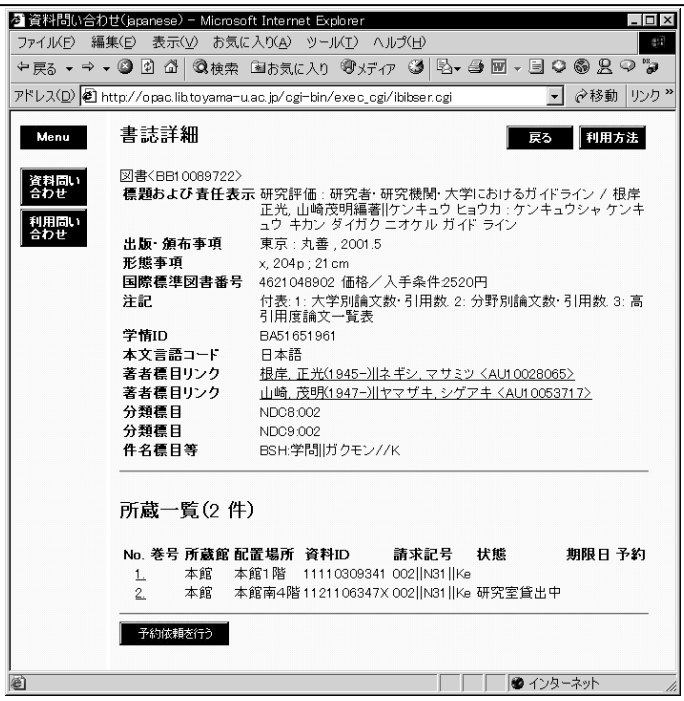
TOYAMA Univ Library
List of Holdings

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.

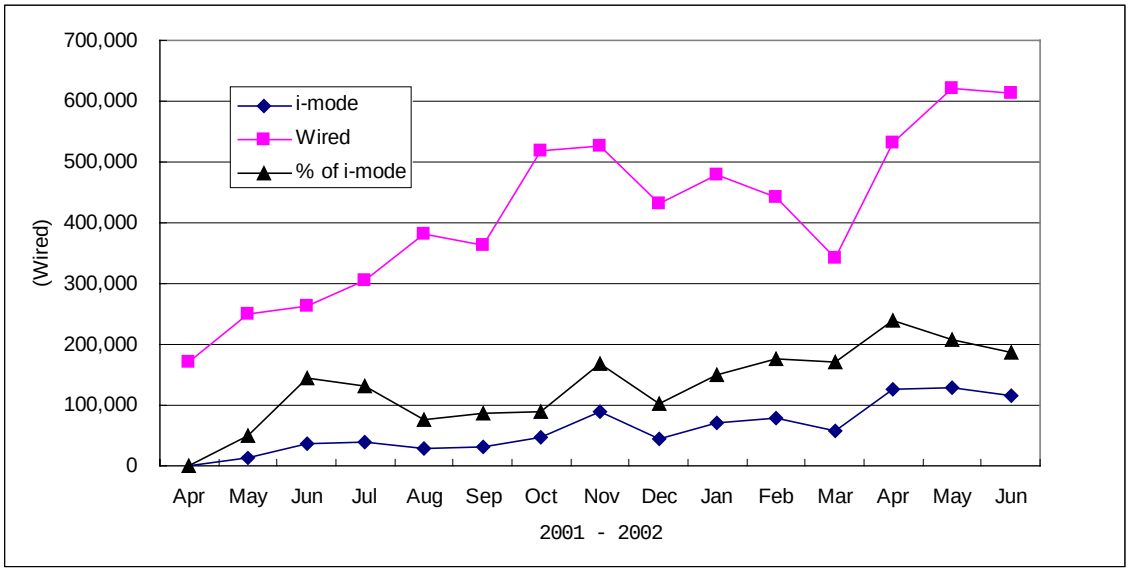
Table 3. Statistics of mobile access to Toyama University Library (Apr 2001 - Mar 2002)

| | 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.

**Acknowledgments:**

The author's sincere thanks go to Mr. Ikuo SASAKAWA (Associate Director, Tokyo Institute of Technology Library; Former Associate Director, Toyama University Library), Ms. Rio MODEKI (NII), Mr. Kiyoshi FUNATOGAWA (NII) and Ms. Michiyo YANASE (Mita Media Center, Keio University) who provided essential information for this paper.

[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

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68th IFLA General Conference and Council, Aug 18-24, 2002, G asgow, UK
Meeting No. 95 / Code No. 105-095-E
Information Technology Technologies for extend ng the reach of brary so ut ons



## 1. Tele-communication and mobile internet access

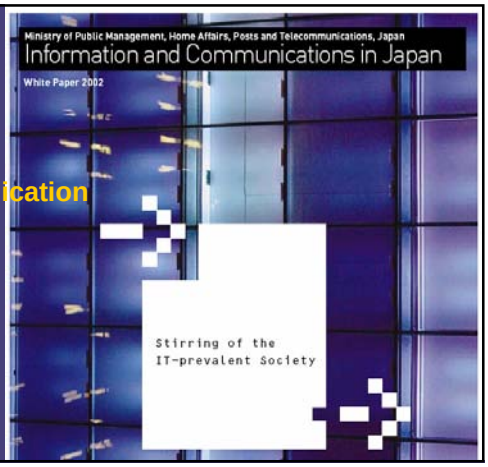
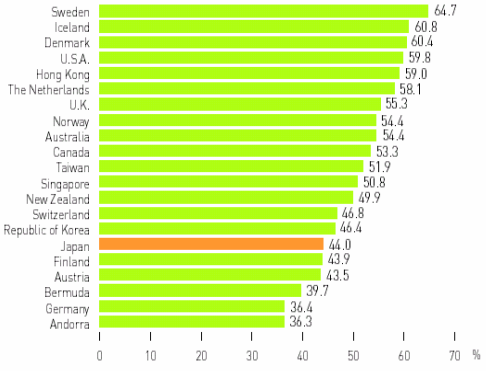
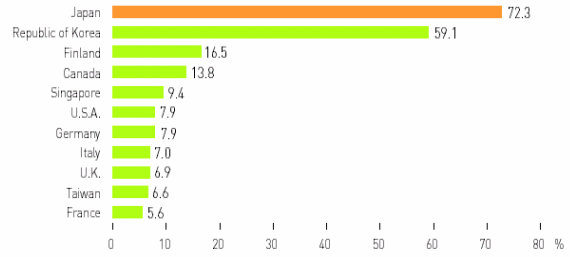



**Exhibit 1-3 Countries and Regions with an Internet Penetration Rate of 35% or More**




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)






## 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)



## *i-mode menu* (Official Sites)

## 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

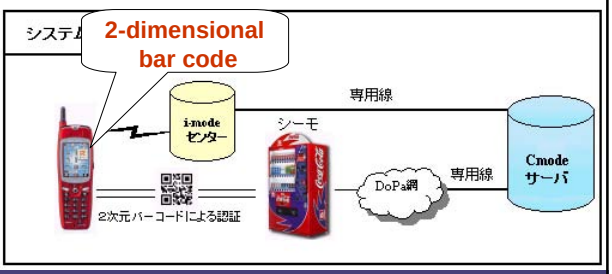

12

## Still / Motion Picture


13

## Built-in GPS

## *Cmode*
Buy drinks with a phone




15

## 3.2 Markup languages and compatibility

| 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 |
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## 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-

17

### 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

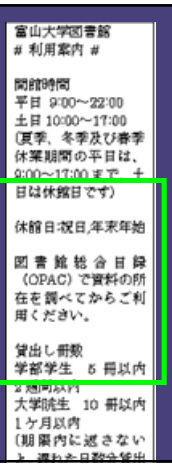
**TOYAMA Univ Library I-BOOK Service**

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

(1) Main Menu

18

(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ヶ月以内
(期限内に返さない

TOYAMA Univ Library
# Users Guide #

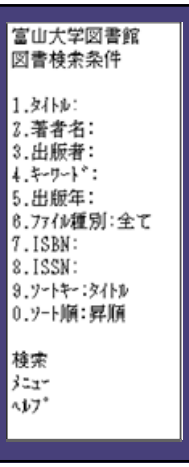
Opening Hours
Weekdays 9:00-22:00
Sat, Sun 10:00-17:00
(Summer, Winterand Spring Holidays:
Weekdays 9:00-17:00Sat, Sun Closed)

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

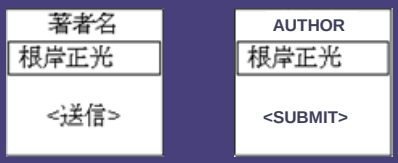
検索
メニュー
ヘルプ

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

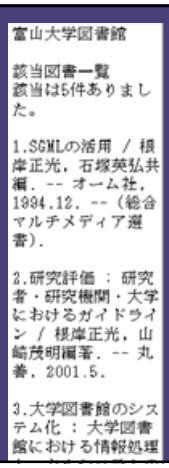
Search
Menu
Help

(4) Input a Search Term


著者名
根岸正光
<送信>

AUTHOR
根岸正光
<SUBMIT>

(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. -- 紀伊國屋書店, 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. -- 紀伊國屋書店, 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

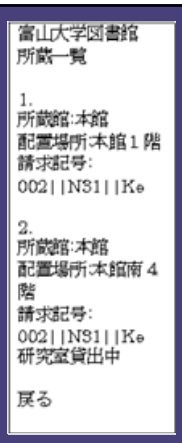
List of Books Searched
You have got 5 hits.

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. 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

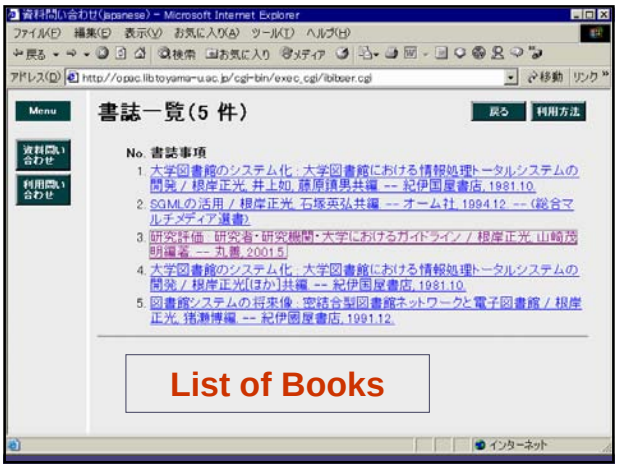
戻る

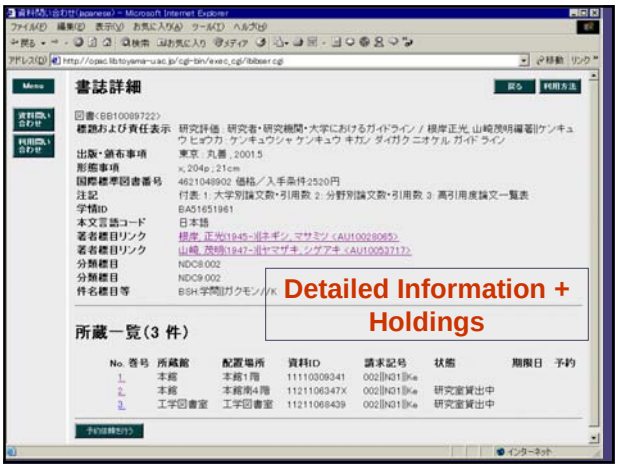
TOYAMA Univ Library
List of Holdings

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




## 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 | | | 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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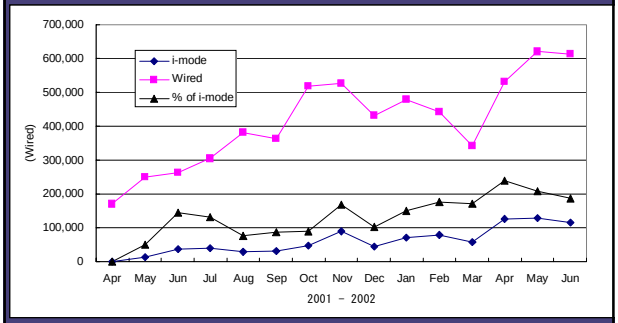
## Utilization of i-mode OPACs

TOKYO Univ Library 2001-2002




## Advertising Leaflet

(TOKYO Univ)

## 4.4 Future developments of mobile access in library applications

- Reservation
- Overdue Notice
- Library-Student Communication Tool

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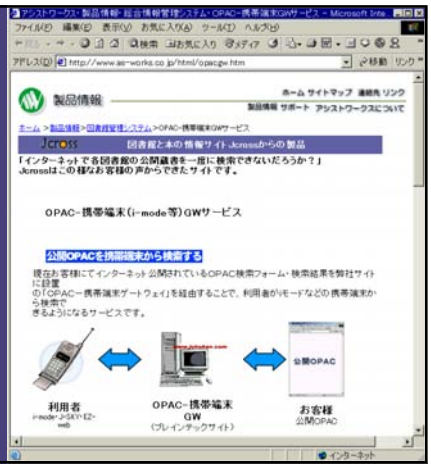
## 4.5 Mobile ASP services,

a type of solutions for libraries




## 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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