

Welcome to our presentation of WAP and i-Mode

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Wireless Application Protocol



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WAP Introduction

History

December 1997
WAP FORUM
was created by Ericsson,
Motorola, Nokia and the
start-up Co. Unwired Planet

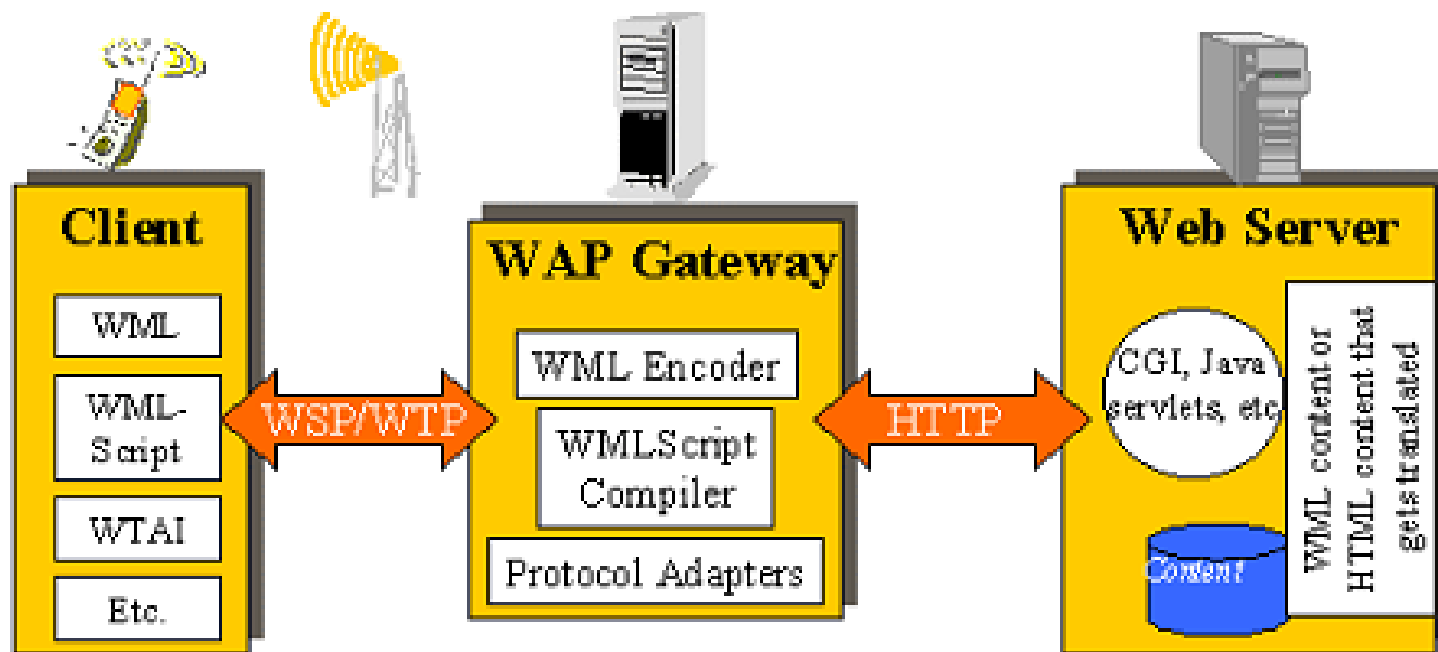
Wireless Data

Telephony

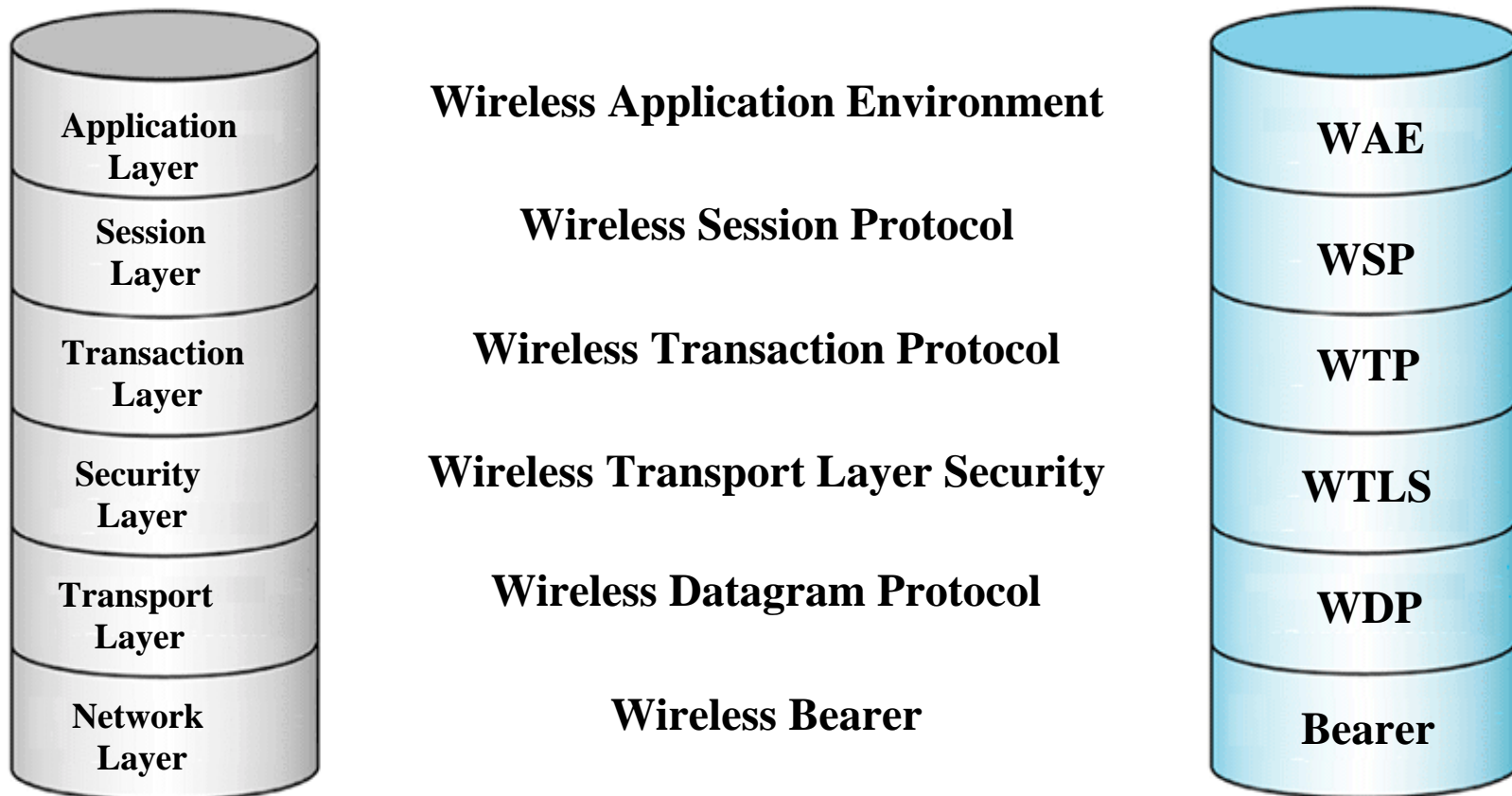
Internet



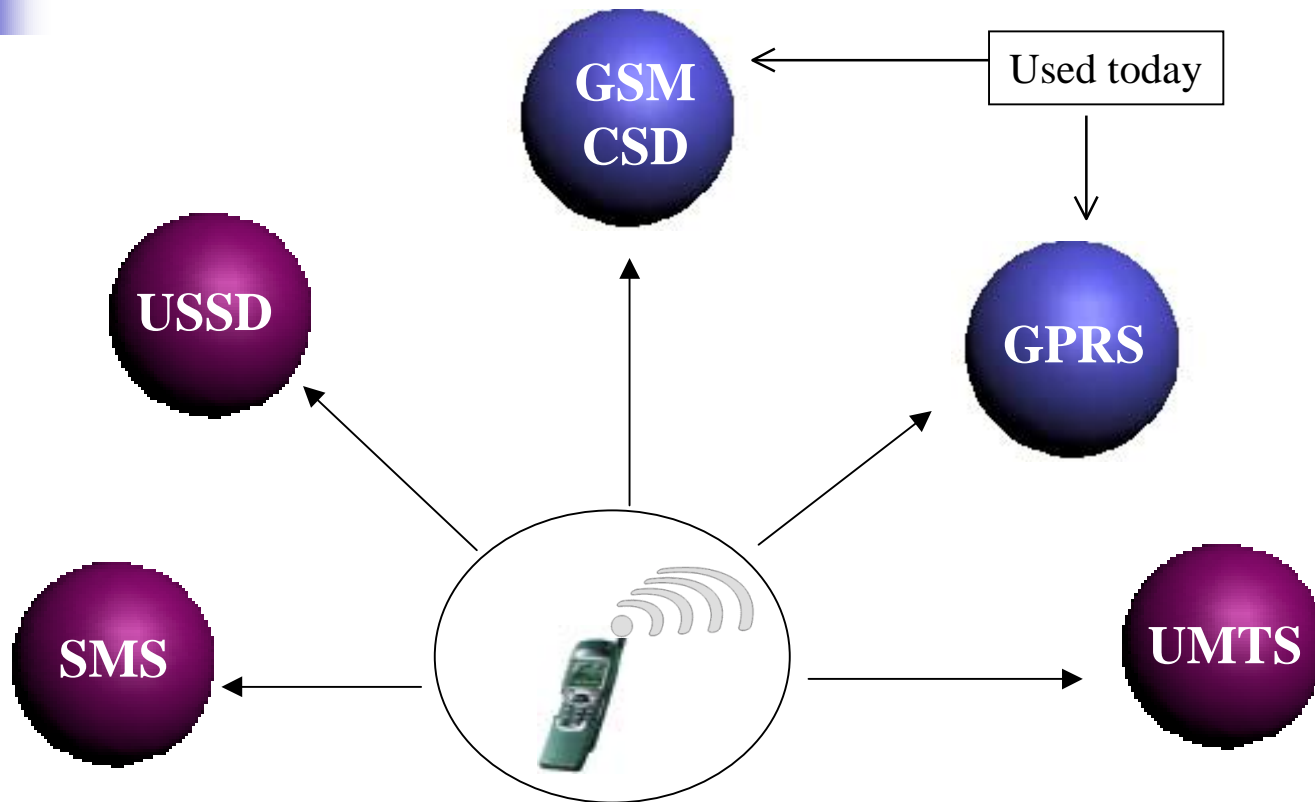
WAP Architecture Overview



WAP Protocols



WAP Bearers



Wireless Application Environment

WML and WML Script

WIRELESS TELEPHONY APPLICATIONS (WTA)

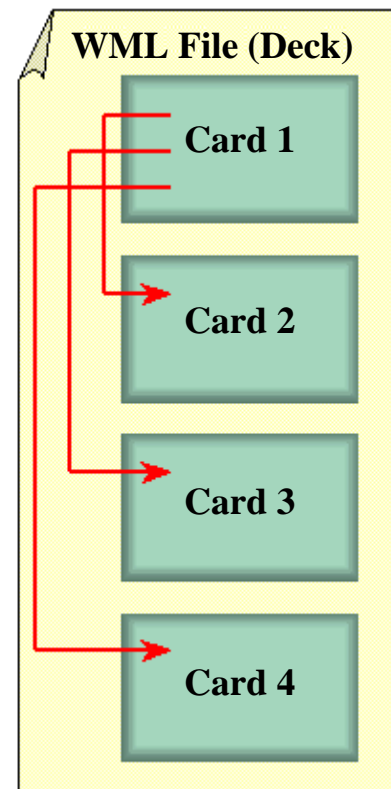
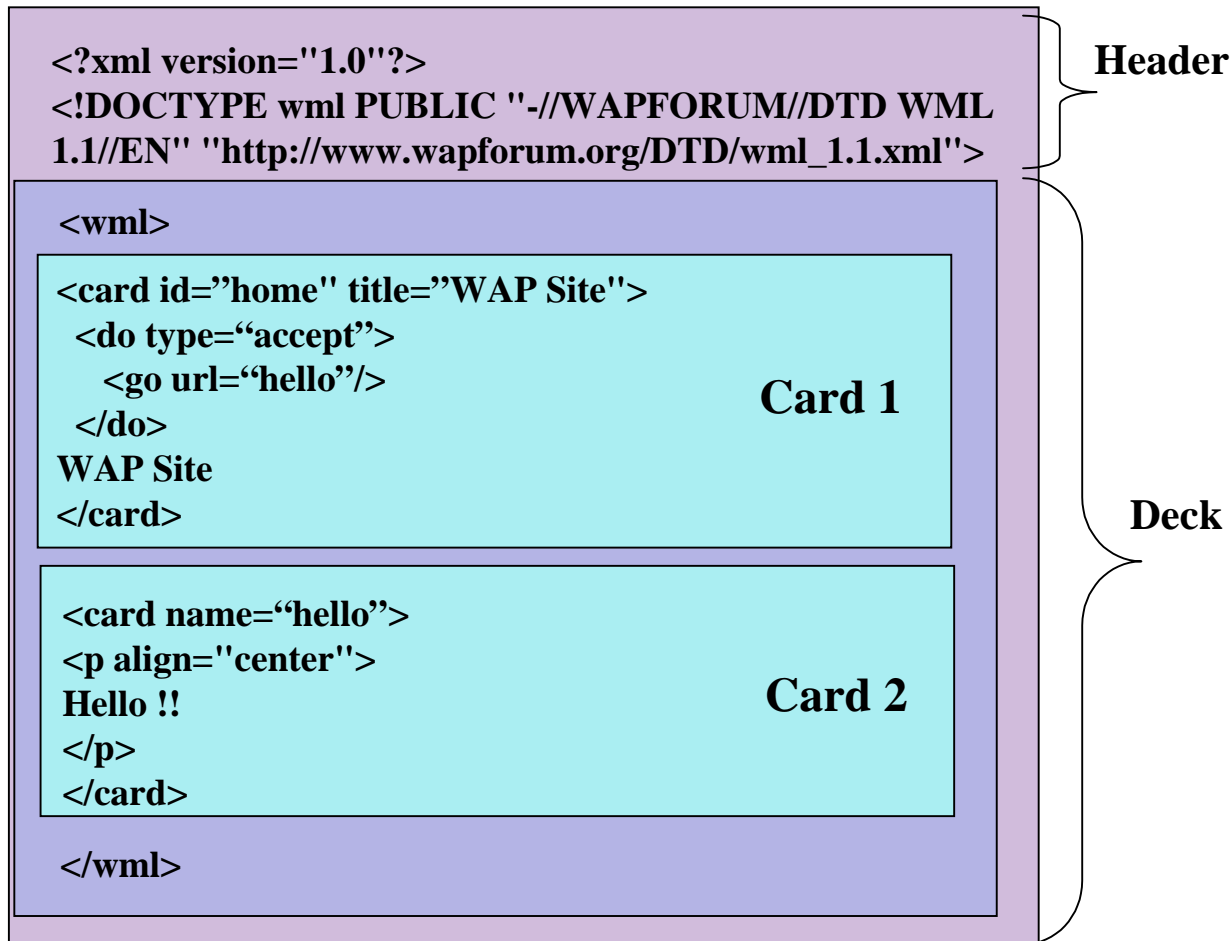
USER AGENT PROFILING (UAProf)

- **Capability of client device hardware and software**
 - **Screen, Language, Characters Set**
 - **Images and Sounds support**
 - **WAP version etc.**
- **Preferred settings of user**
 - **Browser personalisation**

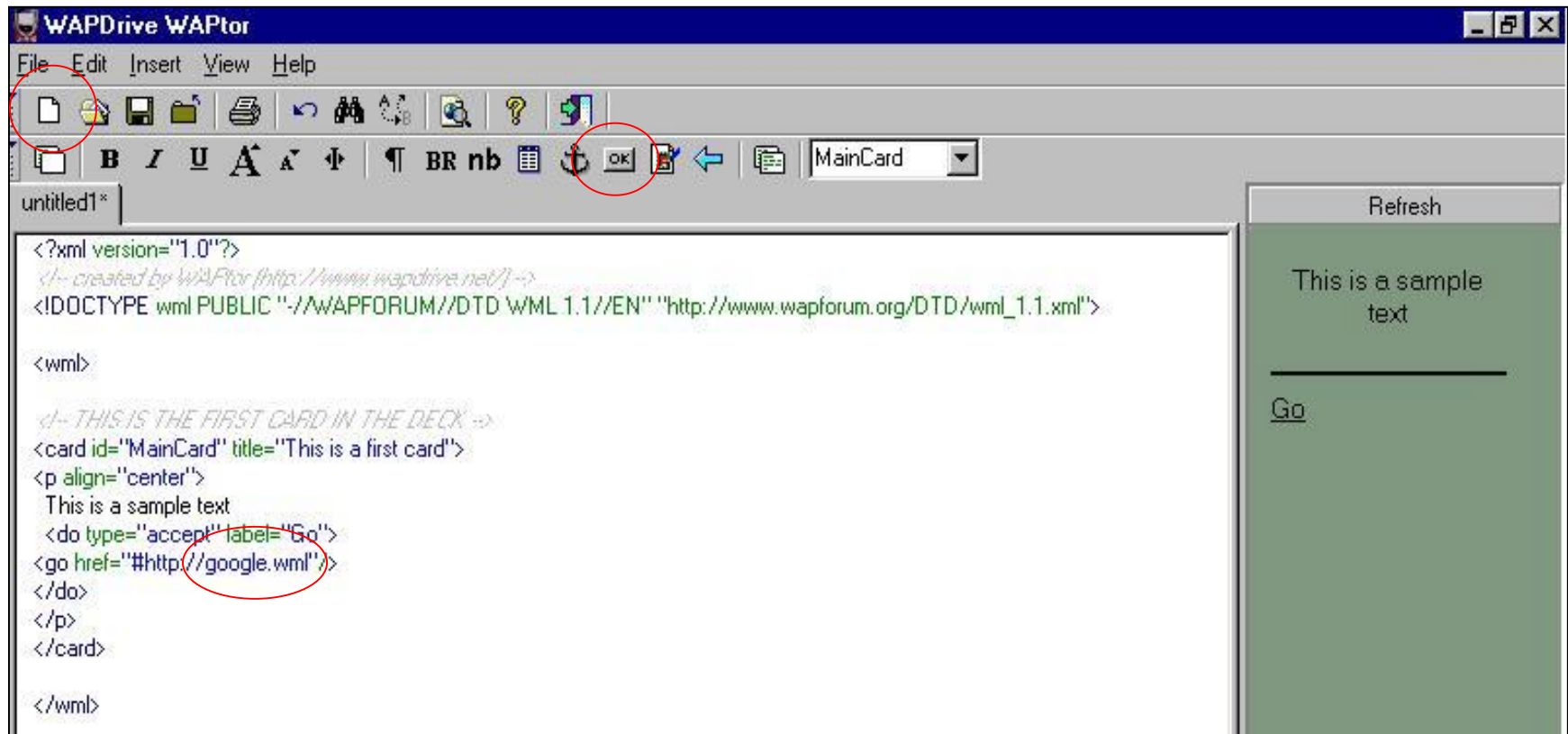
WAP Versions

	WTA	UAP	Service Push	Security (WIM)	Content	Service Localisation
<u>WAP 1.1</u>	✓				WML WBXML	
<u>WAP 1.2</u>	✓	✓	✓		WML WBXML	✓
<u>WAP 2.0</u>	✓	✓	✓	✓	WML XML XHTML	✓

WML Language



WAP Site



The screenshot shows the WAPDrive WAPtor editor interface. The title bar reads "WAPDrive WAPtor". The menu bar includes "File", "Edit", "Insert", "View", and "Help". The toolbar contains various icons for file operations and editing. The main text area displays the following WML code:

```
<?xml version="1.0"?>
<!-- created by WAPtor (http://www.wapdrive.net/) -->
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN" "http://www.wapforum.org/DTD/wml_1.1.xml">

<wml>

  <!-- THIS IS THE FIRST CARD IN THE DECK -->
  <card id="MainCard" title="This is a first card">
    <p align="center">
      This is a sample text
      <do type="accept" label="Go">
        <go href="#http://google.wml">
      </do>
    </p>
  </card>

</wml>
```

The preview pane on the right shows the rendered WAP page. It features a "Refresh" button at the top, followed by the text "This is a sample text". Below the text is a horizontal line, and at the bottom is a "Go" button. Two red circles in the original image highlight the "OK" button in the toolbar and the "Go" button in the preview pane.

WAP Simulators



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WAP Mobile Phones



Siemens M35i



Nokia 6210



Siemens SL45



Nokia 7110



Nokia 9110 / Communicator



Motorola V2288



Mitsubishi Trium Geo

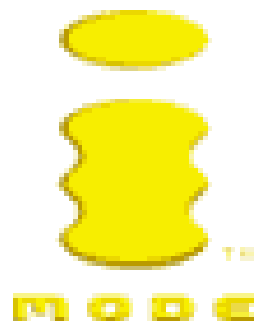
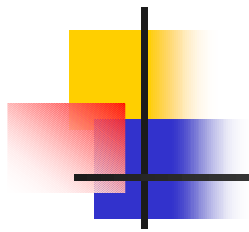
WAP Services

News, Weather Forecasts, Map services, Sports, Ticketing, Banking, E-mail...



SIM TOOLKIT - direct access to WAP services

Mobile Station Application Execution Environment (MexE)



i-Mode

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Summary

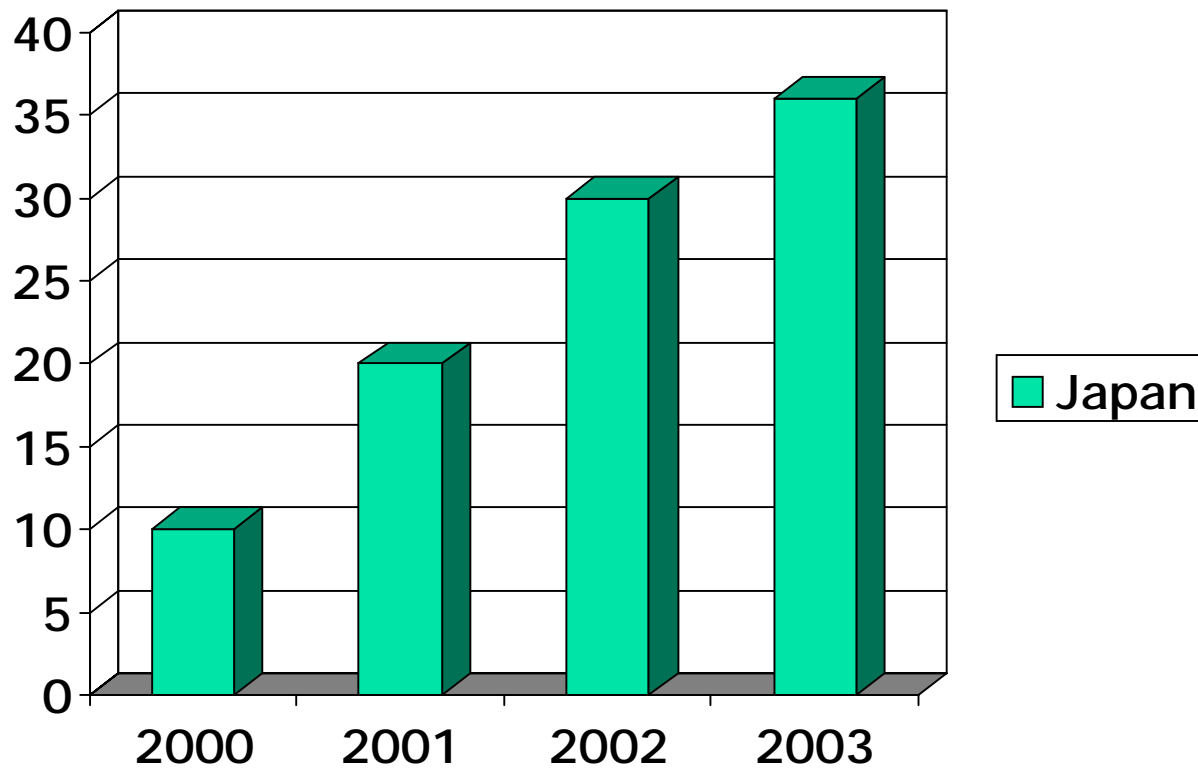
- History
- Subscribers
- Services
- Cost
- Network
- Language
- Terminals

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History

- Japan on 22/02/1999
- Germany
- Netherlands
- Taiwan
- Belgium
- France on 15/11/2002
- Spain soon

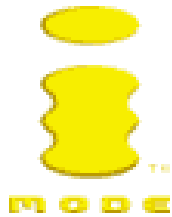
Subscribers



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Subscribers

- Japan : 36.6 million
- Germany : 100,000
- Netherlands : 100,000
- Taiwan : 50,000
- **France : 100,000**



Services

- Entertainment
- Financial transaction
- Data bases
- News

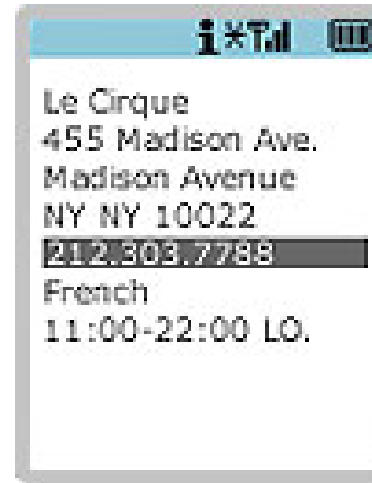
Services



Entertainment



Financial transaction



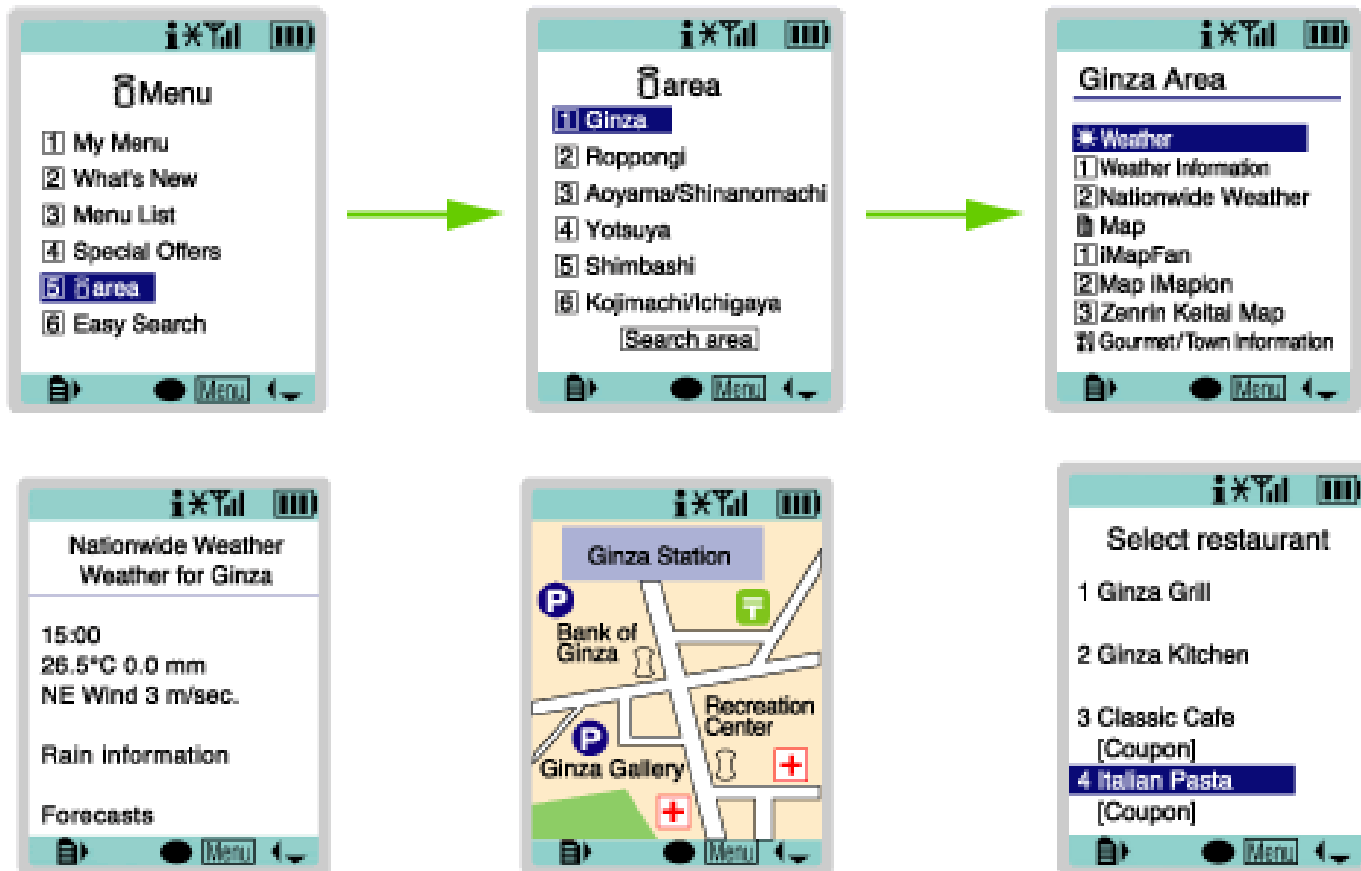
Data bases



News

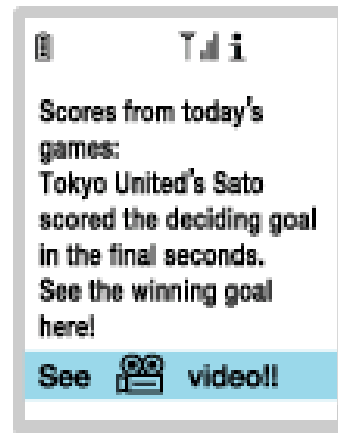
Services

Location Based Services



Services

Movies on i-Mode



Services

Mail menu



select menu



choose mail
composition



compose mail



send mail

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Cost

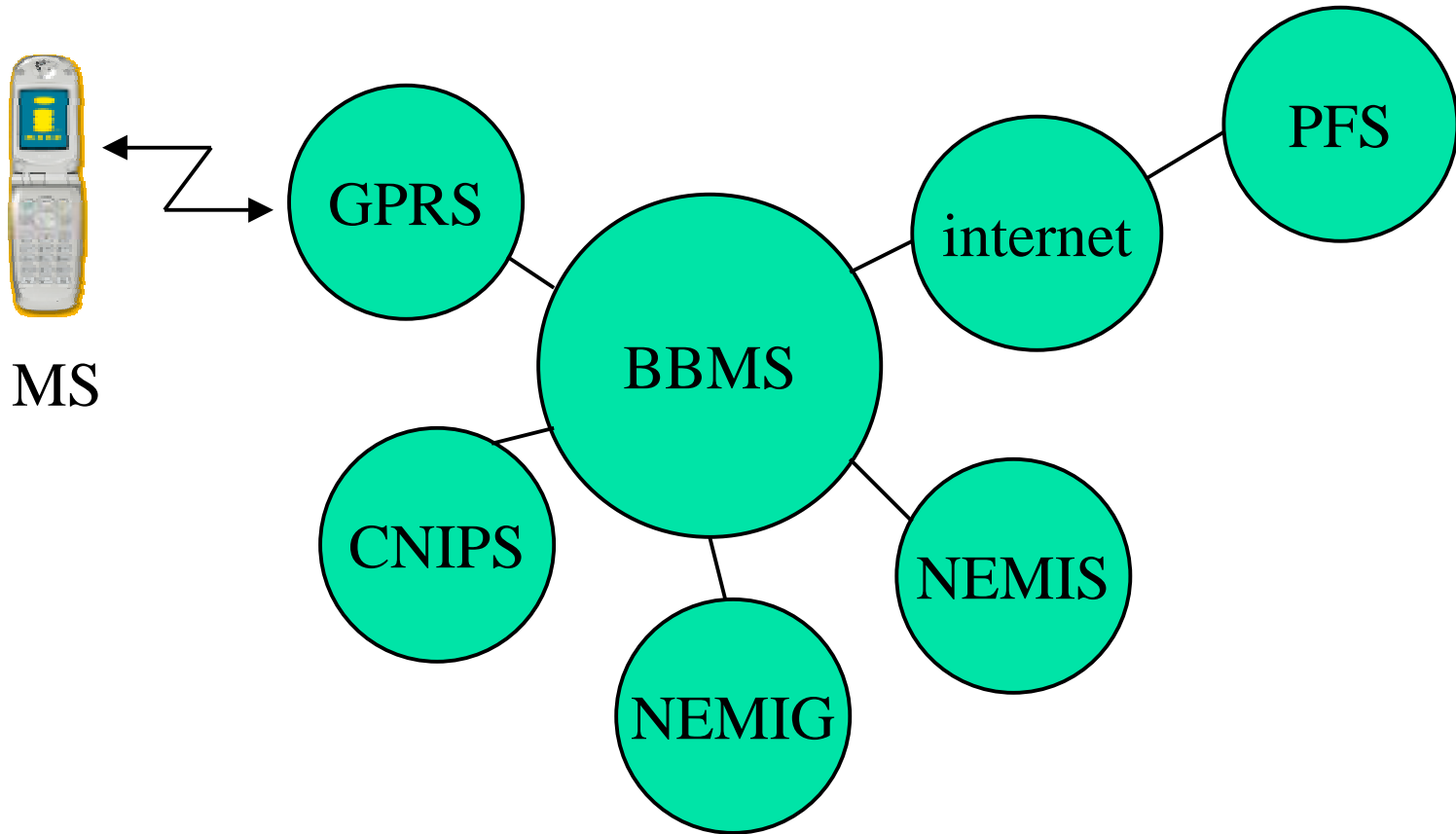
- Subscription of 3 euros per month
- GPRS : data volume billing
- Free or billed services
- 1 cent per kilo-byte
- 1 mail → 3 cents

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Network

- Packet mode
- PDC-P in Japan
- GPRS in Europe
- Data rate of 30 kbits/s

Network



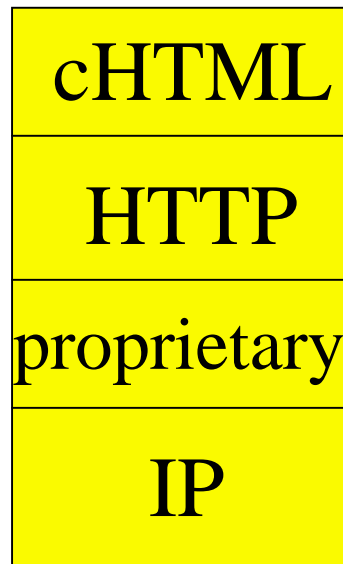
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Network

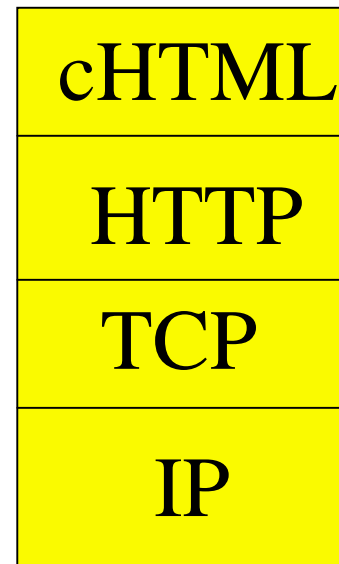
- MS : Mobile Station
- GPRS : General Packet Radio Service
- BBMS : BackBone MultiServices
- CNIPS : Common Network for Internet Protocol Services
- NEMIG : i-Mode gateway
- NEMIS : i-Mode servers
- PFS : PlatForm of Services

Network

Protocols



MS



PFS



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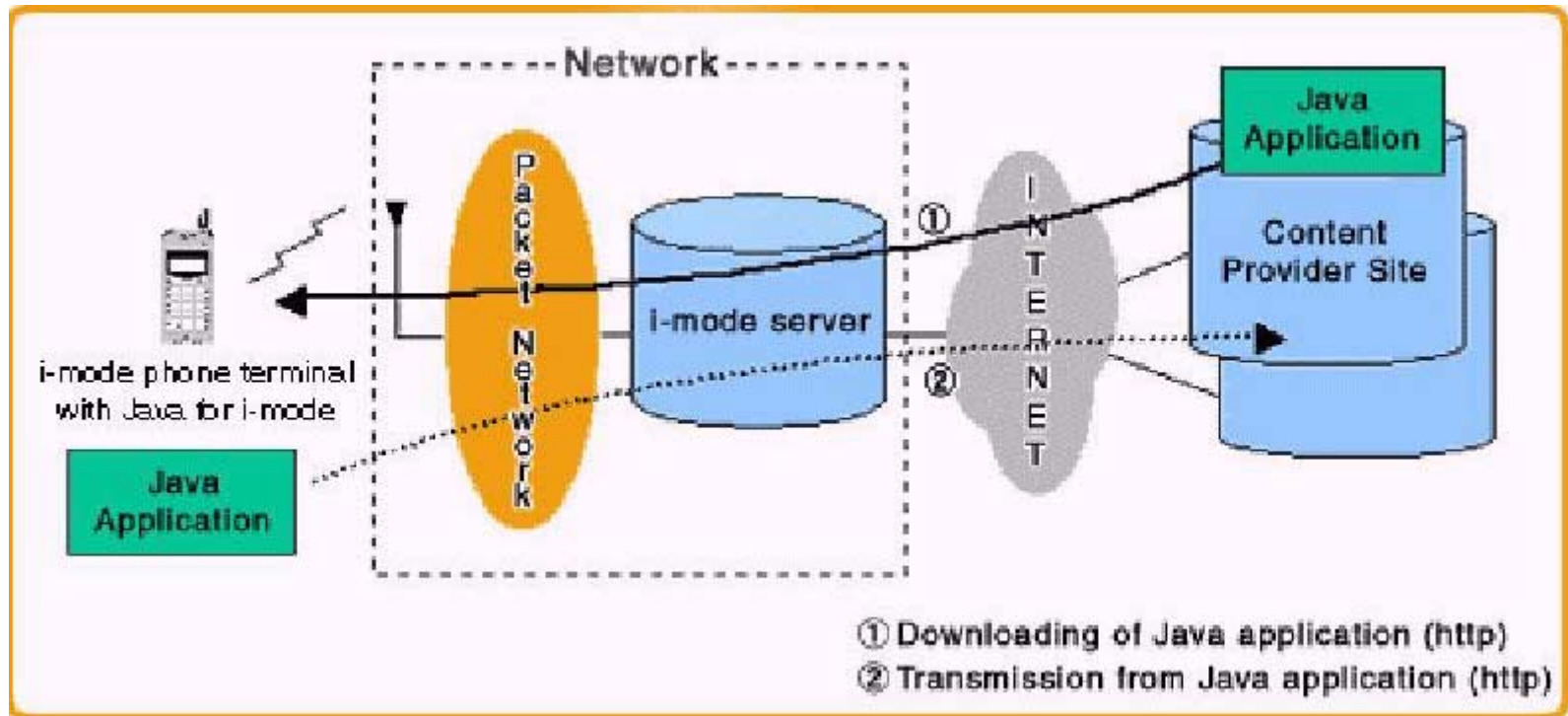
Network

- cHTML : compact Hyper Text Mark-up Language
- HTTP : Hyper Text Transfer Protocol
- TCP : Transmission Control Protocol
- IP : Internet Protocol



Network

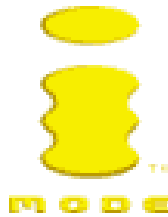
i-Mode with JAVA



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Language

- cHTML
- Based on HTML
- Simple
- GIF pictures (less than 10 kbytes)
- JPEG pictures for Nec N22i
- SMF and Mfi sounds
- Small pages (less than 5 kbytes)

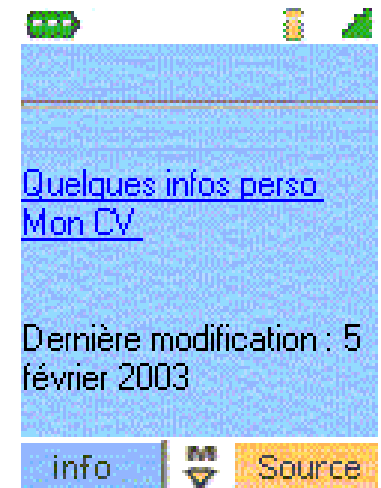
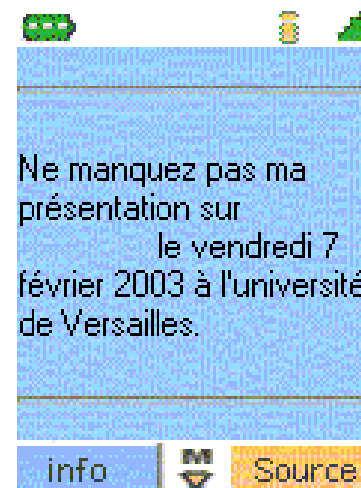
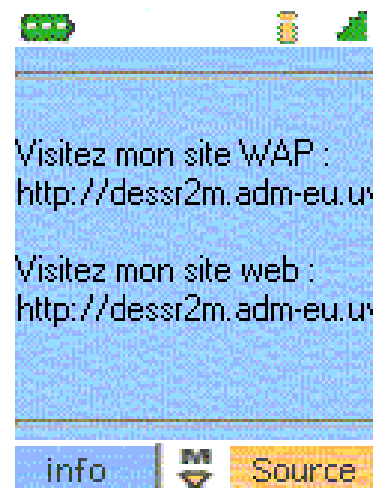


Language

```
<html>
<body text="#000000" bgcolor="#99CCFF" link="#0000FF" vlink="#551A8B"
alink="#0000FF">
<div align="center">
<font size=+3>
Bienvenue
<br>
sur la page
<br>

<br>
de
<br>
Julien MONTEL
</font>
</div>
```

Language



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Terminals

- More efficient
- Big color screen : 256 colors
4096 colors
- Sounds : 16 tones
40 tones
- Java

Terminals



NEC n21i



NEC n22i



TOSHIBA TS21i

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Conclusion

- Simple
- Pleasant
- Accessible
- Attractive
- Many services

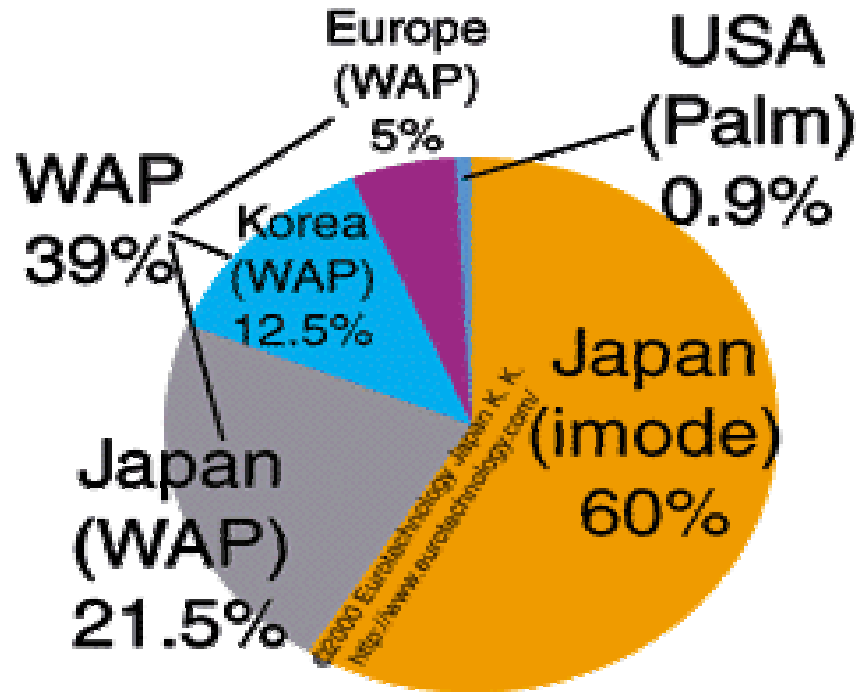
Comparison between

WAP and i-Mode



Wireless market

81% of the world's wireless internet users are in Japan...



Eurotechnology.com

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WAP i-mode

⇒ **Main distinguishing factors :**

- Marketing Factors
- Technical Factors
- Billing Factors
- Security Factors

Marketing Factors

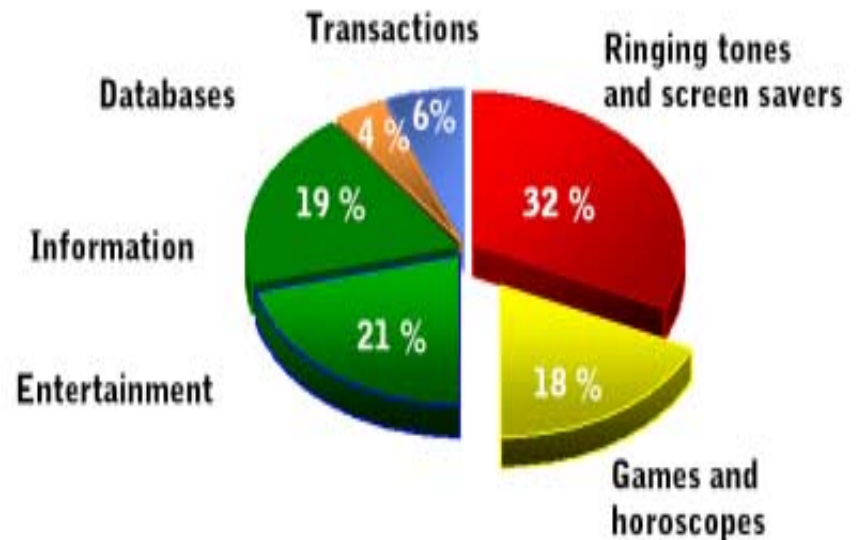
NTTDOCOMO have proved highly skilled marketing wise

- i-Mode : i → information

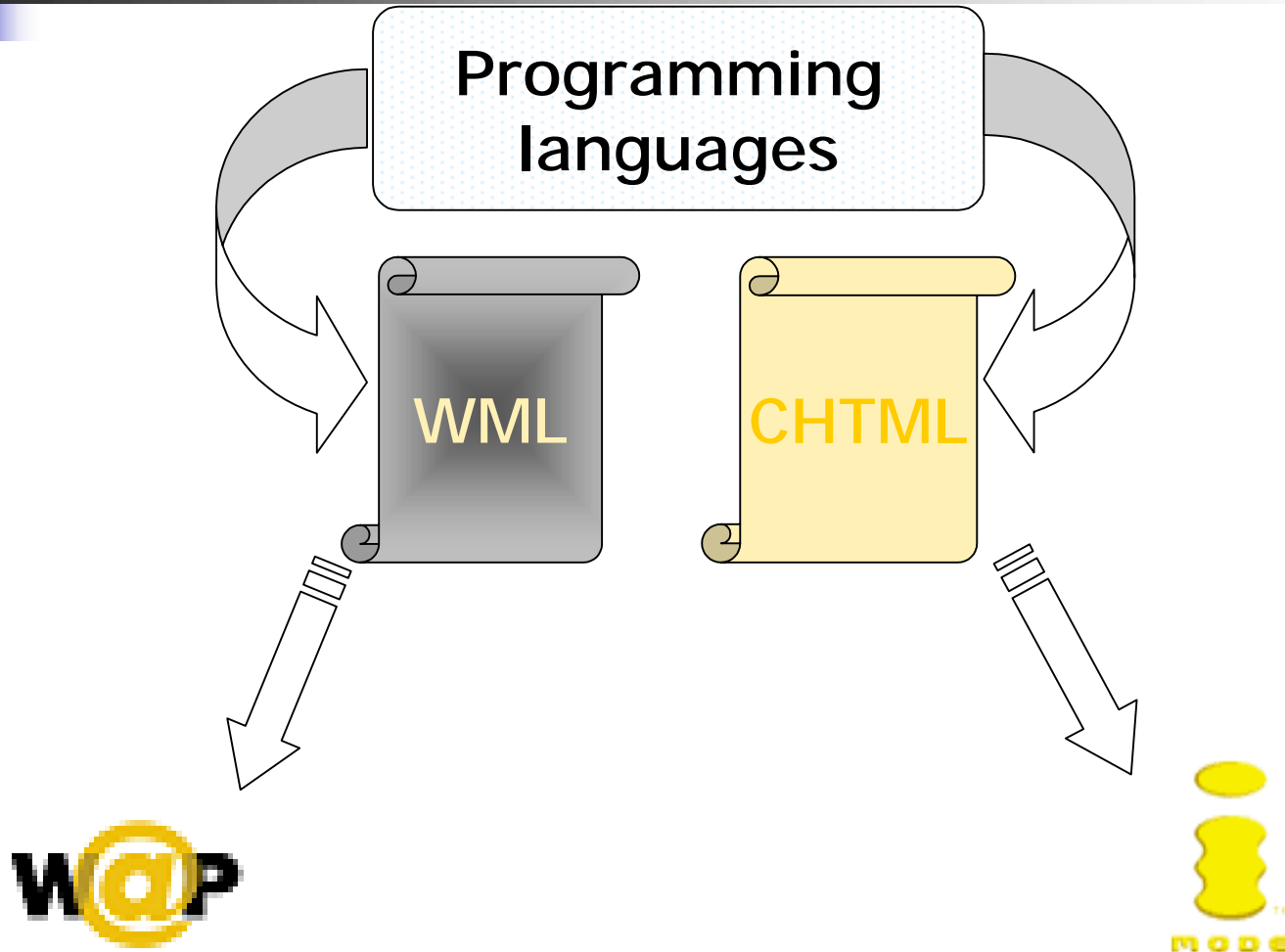
Something everyone understands and wants

- WAP : service independent technological concept

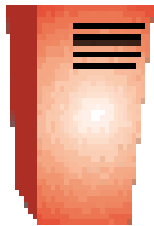
Current services are not attractive nor developed enough to gain clients



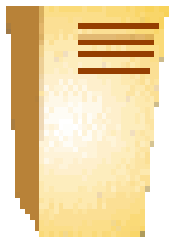
Technical Factors (1)



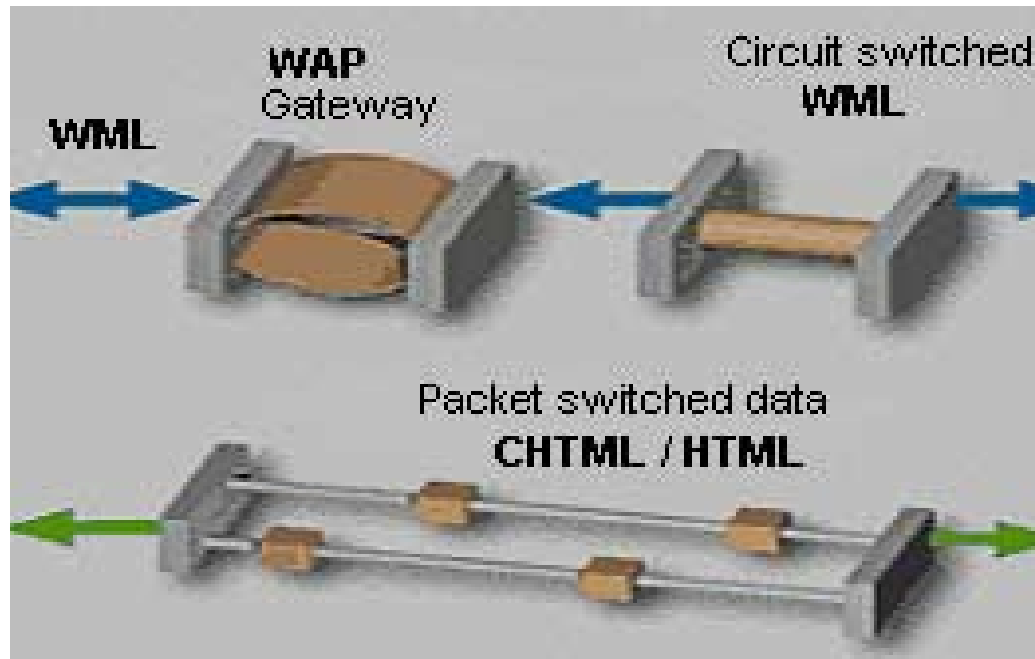
Technical Factors (2)



**HTTP
Server**



**HTTP
Server**



**WAP
Terminal**



**i-Mode
Terminal**



Billing Factor

- In Japan : mobile billing < fixed telephone
- In Europe : mobile billing > fixed telephone
- The objective of DoCoMo was to provide the Japanese with an Internet access at competitive cost → volume billing.



Billing Factor

Services

WAP :
time Billing

WAP :
volume Billing

i-Mode :
volume billing

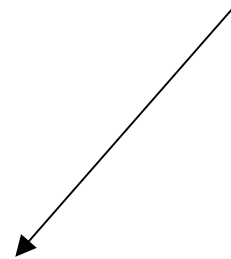
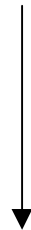
2G

2.5G

Data Transfer
System

GSM
9.6kb/s

GPRS
171kb/s



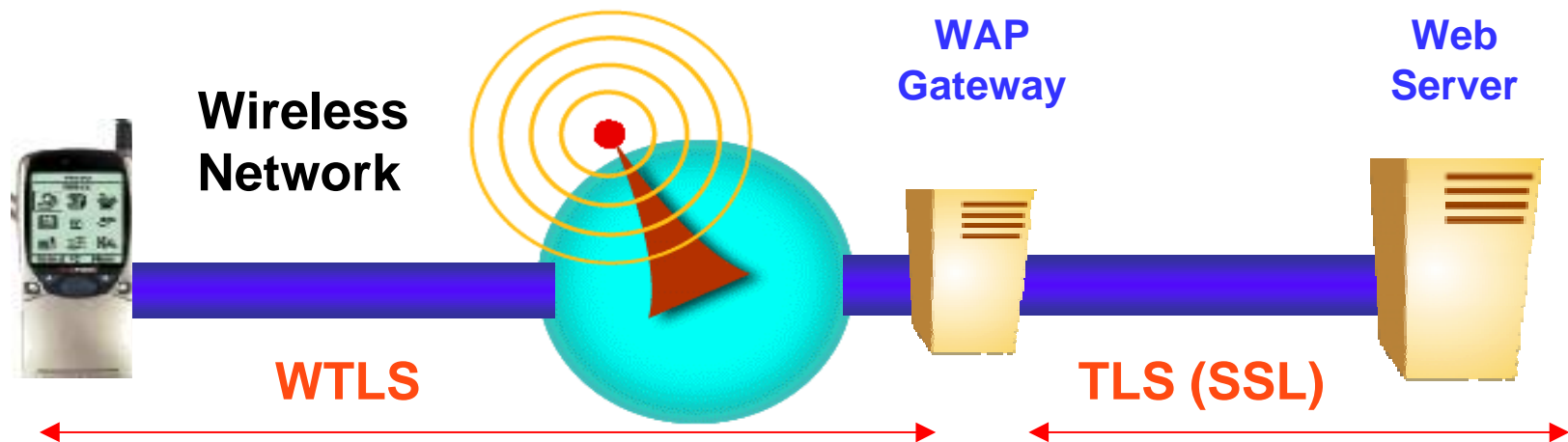
Security factors

- Authentication
- Data Integrity
- Data Privacy
- Interoperability
- Seamless
- Efficient



WAP Security

- WTLS protects handset ↔ gateway connection.
- Communication between gateway and Web server must be protected outside WAP (via SSL).
- All communications between phone and Web server appear unencrypted to the gateway.
- The gateway must be trusted





i-Mode Security

Security Layer	“End-to-end Security” between content provider server and terminal	TLS/SSL
Application Layer	Uses existing Internet content	HTML
Session Layer	Multipurpose applications	HTTP

Are WAP and i-Mode Secure?

- **The answer is Yes**
- WAP includes WTLS that implements options for authentication and encryption.
- Current WAP specification offers end-to-end security from the WAP device to the WAP gateway.
- i-Mode includes a security layer TLS / SSL
« end-to-end security »





Conclusion

- Five layer structure : WDP, WTLS, WTP, WSP, WAE
- Perfectly integrated to an IP environment
- Several modes of communication
- Security mechanisms
- Possible integration to different plat-forms
- Use of WAP gateway to access Internet services
- Low data rate on mobile frequencies
- High cost
- Size of screen
- WAP evolution parallel to that of Internet



Conclusion

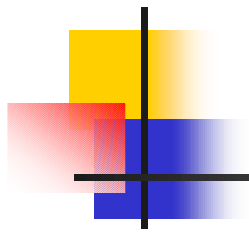
- Launched in February 1999 in Japan
- 55,000 new subscribers per day
- 15,5 million subscribers to NTTDoCoMo i-Mode service
- An open system
- Packet switched data
- cHTML



References

www.wapforum.org
www.ericsson.com
www.rsasecurity.com

www.imode.fr
www.nttdocomo.com
www.journaldelimode.com



Thanks