



# **i-mode - technology and content**

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# Structure

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- i-mode as a business model
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- Extensive Multimedia Support
- Wealth of Services
- Development for i-mode - iHTML
- Development for i-mode - i-appli
- Resources

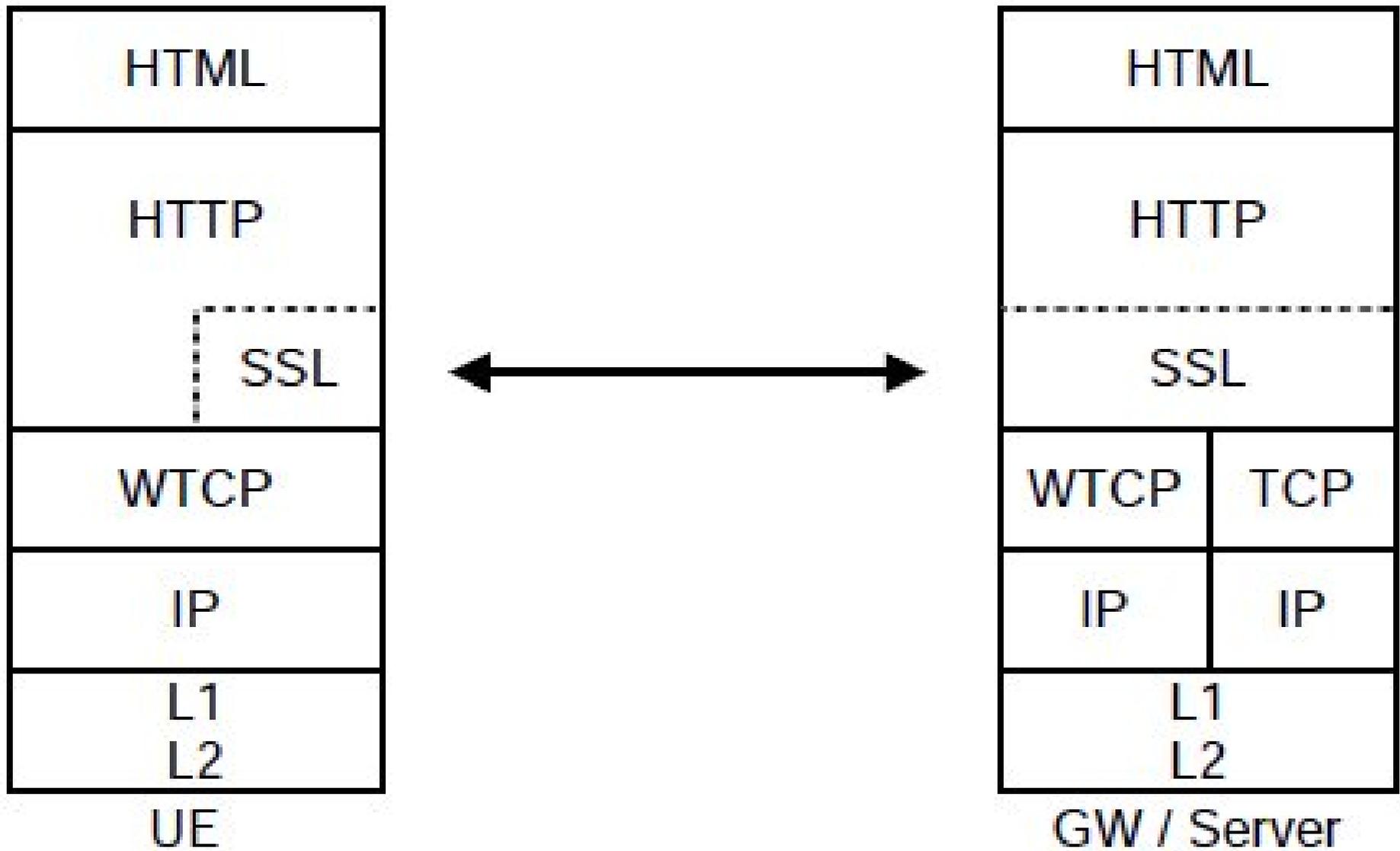
# What is i-mode?

- introduced 1999
- multimedia and messaging services ("AOL for mobile phones")
- user pays for data transfer and premium content
- based on WWW standards (TCP/IP, HTTP, HTML)
- Limited Availability
  - only for customers of Japanese mobile phone provider NTT DoCoMo
  - technology licensed by European providers (e.g. E-Plus)
  - 42 million subscribers in Japan, 4 million worldwide (stagnating)
- Bandwidth: 9.6 - 28.8 kbit/s (2G), 64/384 kbit/s (3G)
- new features added continually

# i-mode as a business model

- NTT DoCoMo has full control over terminals and Official sites
- Official sites (~ 4.000)
  - accessible via menu
  - partnership with NTT DoCoMo
  - have to agree to follow certain guidelines
  - can use i-mode's micro-billing
- Unofficial sites
  - accessible via URL
  - can be provided by everyone
- Micro-billing system (mcommerce)
  - payment via mobile phone bill
  - 9% fee goes to NTT DoCoMo
- Simple DRM

# Standards-based Infrastructure (1)



i-mode protocol stack

## Standards-based Infrastructure (2)

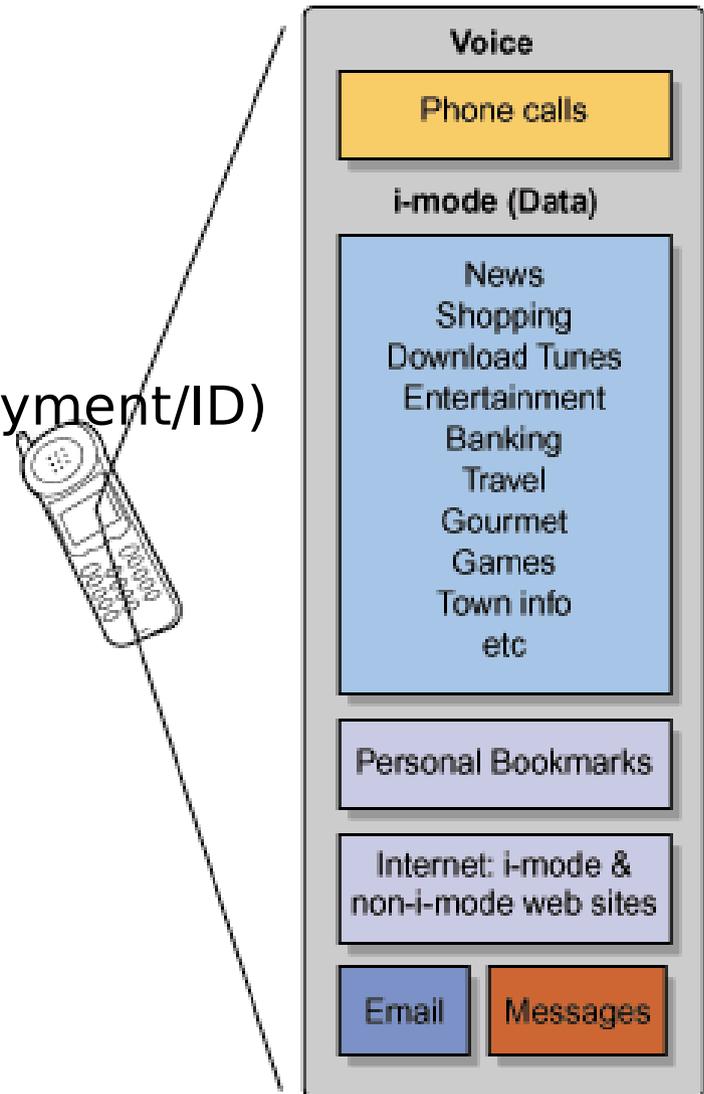
- packet-switched data transfer
- for better performance: wireless-profiled TCP (WTCP, included in WAP 2.0)
- WTCP is translated to TCP by internet gateways
- content access and e-mail via HTTP
- i-mode compatible HTML (iHTML, extended subset of HTML) for content
- optional encryption via 40/128 bit SSL

# Extensive Multimedia Support

- Initially:
  - i-mode compatible HTML (extended cHTML)
  - GIF (interlaced, animated, transparent)
  - SMF ringtones (MIDI)
  - emojis 🏠 👨‍👦 🎧
- Now:
  - XHTML-MP (as proposed for WAP 2.0)
  - JPEG
  - MPEG4 (Japan) (176 x 144 pixels @ 15fps) with styled subtitles (e.g. Karaoke)
  - RealVideo (Germany)
  - Macromedia Flash Lite
  - PDF
- Many media only viewable on certain terminals

# Wealth of Services

- E-mail and SMS equivalents
- Micro-Billing
- i-appli (Java applications)
- i-area (location based services)
- i-mode FeliCa (active RFID chip for payment/ID)
- i-motion (video-on-demand)
- i-shot (upload/send photos)
- Bar code scanning
- IR communication / remote control
- ... many more



# Development for i-mode - iHTML

- i-mode compatible HTML extends cHTML (subset of HTML)
- many HTML features not supported in cHTML
  - JPEG images
  - tables
  - Image maps
  - Multiple character fonts and styles
  - background colors and images
  - Frames
  - CSS & JavaScript
- some iHTML additions
  - accesskey attribute `<a href="..." accesskey="1">1</a>`
  - tel protocol `<a href="tel:5315551234">Call Me!</a>`
  - emojis (= pictograms, written as decimal HTML entities)
- now being superceded by XHTML-MP



# Development for i-mode - i-appli

- special Java applications
- downloaded via special link in iHTML
- uses J2ME/CLDC device configuration
- incompatible with MIDP 1.0
- additional packages (com.nttdocomo.\*) provide
  - low-level graphics
  - UI components
  - HTTP/S
  - Scratchpad (freely available application memory)
- must extend com.nttdocomo.ui.iApplication
- different application descriptor (.jam instead of .jad)
- some competition from Flash Lite

# Resources

- **Let's make i-mode contents (very detailed technical info)**  
[http://www.nttdocomo.co.jp/english/p\\_s/i/make/index.html](http://www.nttdocomo.co.jp/english/p_s/i/make/index.html)
- **cHTML proposal**  
<http://www.w3.org/TR/1998/NOTE-compactHTML-19980209/>
- **international i-mode developer site**  
<http://www.nttdocomo.com/corebiz/services/imode/develop/index.html>
- **i-mode site of E-Plus**  
[http://imode.eplus.de/imode/iv\\_imode\\_program/index.jsp](http://imode.eplus.de/imode/iv_imode_program/index.jsp)
- **inofficial i-mode FAQ (outdated)**  
<http://www.eurotechnology.com/imode/faq.html>
- **IBM Developerworks i-mode tutorial (outdated)**  
<http://www-128.ibm.com/developerworks/wireless/library/wi-imode/?open&l=803,t=grwi,p=imode>