



The road to the mobile Internet



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Some noticeable trends...

- Growing importance and value of information
- Popularity of Internet, popularity of mobile
- Internet Protocol (“IP”) technologies as strategic element in design, development and use of telecoms networks
- Integration/convergence of voice and data
- “Post-PC” growth in personal “communicator appliances” (PDAs etc...)
- Jeff Hawkins: inventor of the Palm Pilot:
 - “The future of Internet access is mobile Internet access”
- High-speed 2.5/3G will enable this revolution...



From generation to generation

- Development of mobile communications described in terms of “generations”
 - 1G : analog cellular systems (1970s and early 1980s), mostly IMTS (Improved Mobile Telephone Service)
 - 2G : today’s digital cellular systems (end 1980s), such as GSM and PDC. Number of regional & proprietary standards
 - 3G : refers to standards developed at a global level under the IMT-2000 banner and under the leadership of the ITU

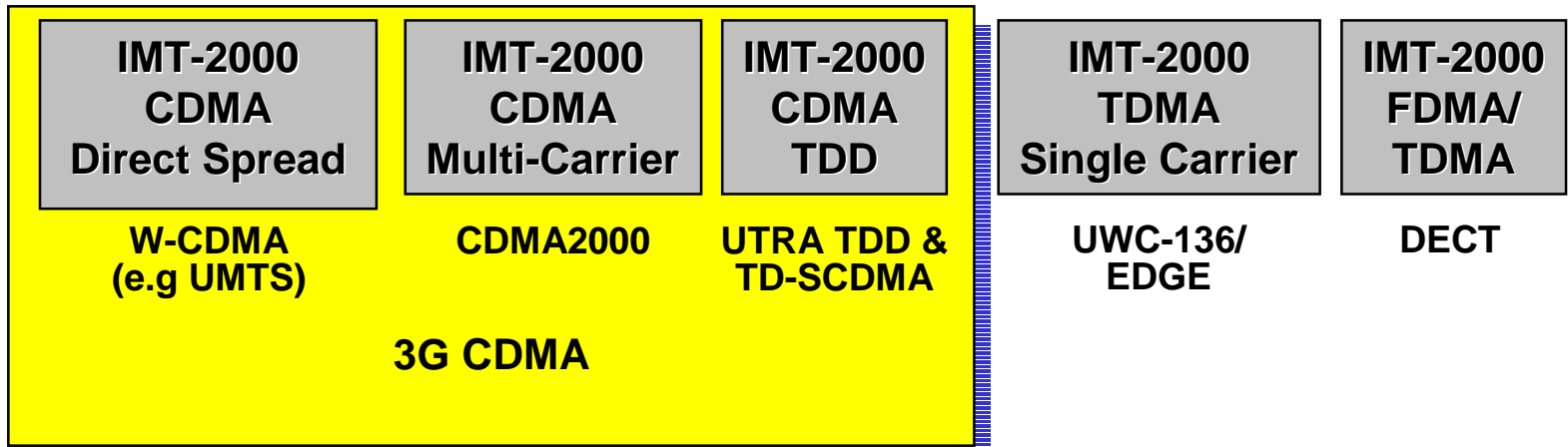


History of 3G or IMT-2000

- ITU-developed concept in mid-1980s
- Stands for “International Mobile Telecommunications”
 - Known as “3rd” generation systems (3G)
 - in Europe, often referred to as UMTS
- Unanimous approval resulting from collaboration of many entities, both inside and outside the ITU (ITU-R and ITU-T, and 3GPP, 3GPP2, UWCC, etc.)
- Promise of full interoperability and interworking of mobile systems on the basis of a single standard (without the fragmentation that had characterized the 2G mobile market)
- However, there were strong proponents of different approaches to 3G technology, resulting in



... 5 Terrestrial Radio Interfaces



Although there are five terrestrial standards, most of the attention and energy in the industry has been toward the CDMA standards



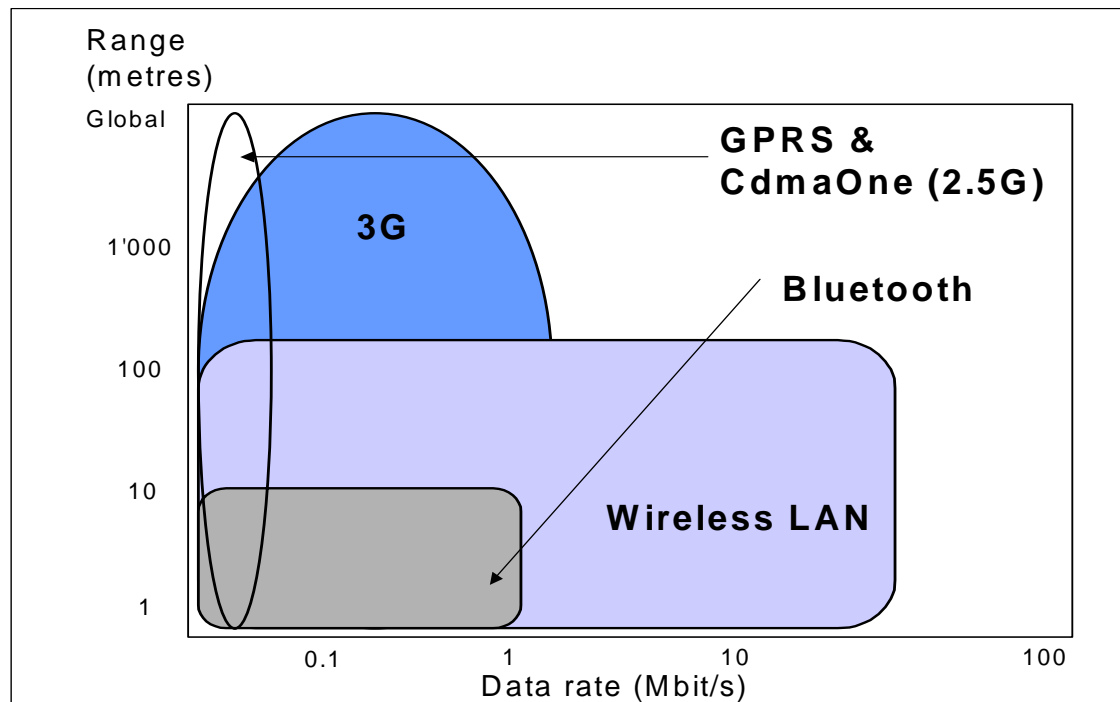
IMT-2000 or 3G characteristics

- high data rates at a minimum of 144 kbit/s in motion and 2 Mbit/s in low-mobility and indoor environments;
- circuit-switched and packet-switched services, such as Internet Protocol (IP) traffic, enabling multimedia services such as real-time video;
- greater capacity & improved spectrum efficiency;
- global roaming between different 3G operational environments;
- an open international standard



But 3G not the only radio access system for mobile data/Internet...

- Other network technologies for the transmission of mobile data exist [e.g. Wireless LANs (e.g. 802.11b or Wi-Fi) & Bluetooth] and are currently viewed as complementary rather than competitive.



...any evolution towards higher transmission speeds...

Kbit/s

2,000

384

144

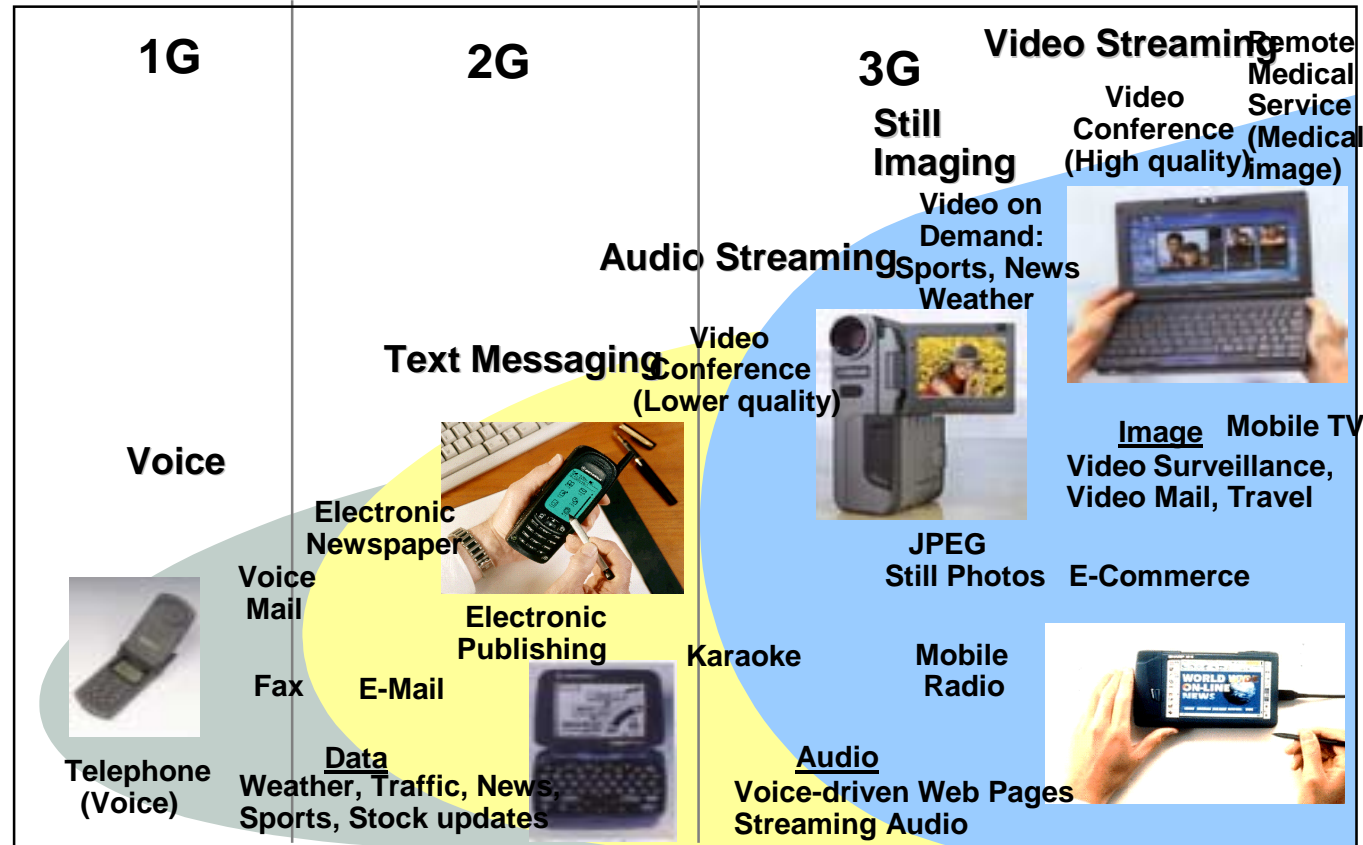
128

64

32

9.6

0



Source: Adapted from Motorola.

.... is music to the ears

e.g. approx. transfer times for a 3 minute MP3 song

Data Rate

9.6 kbps

14.4 kbps

45 kbps

56 kbps

307 kbps

306 kbps

2-5 Mbps

Download Time

41 minutes

31 minutes

8.8 minutes

7 minutes

1.3 minutes

1.3 minutes

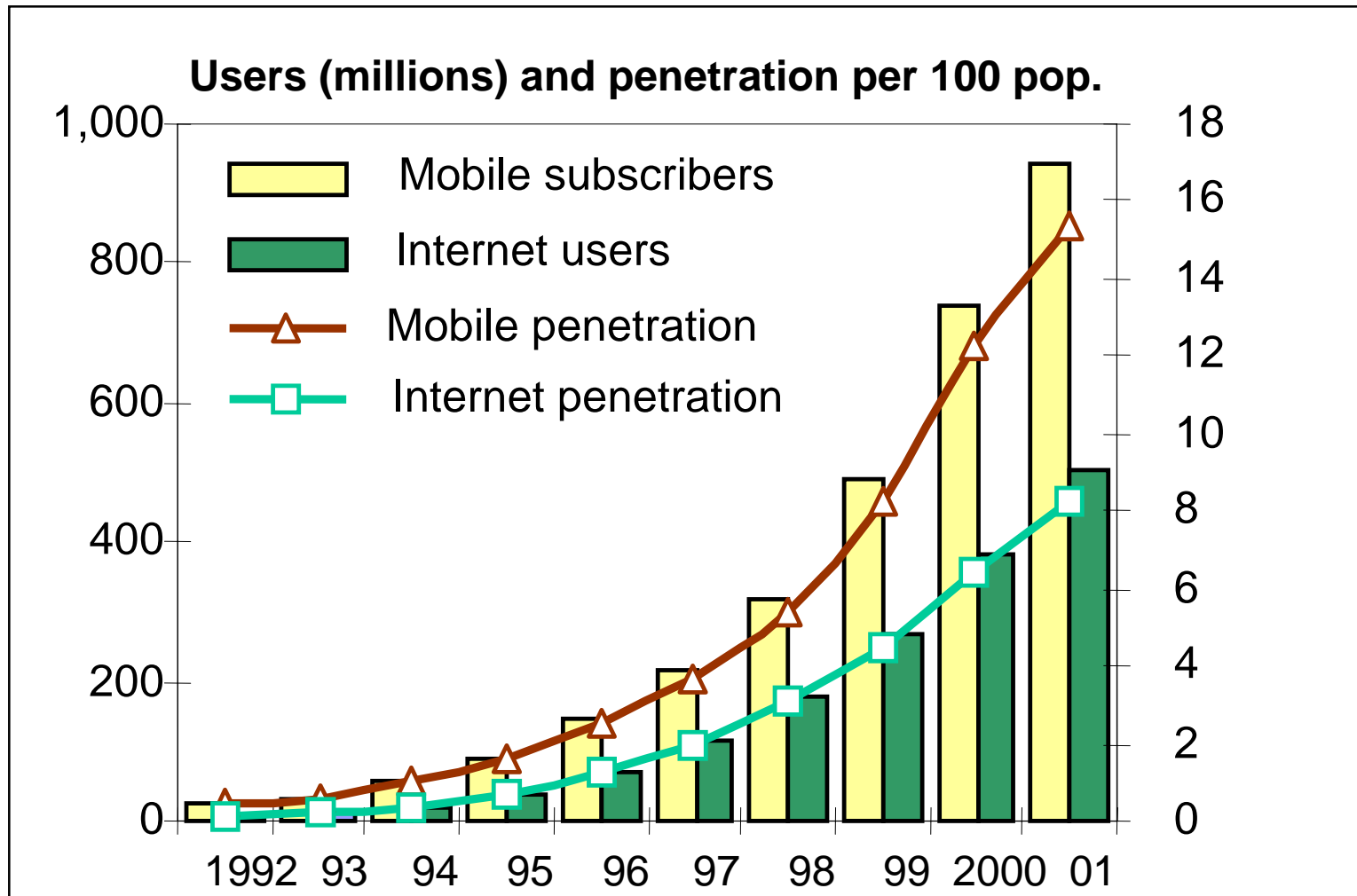
6-12 seconds



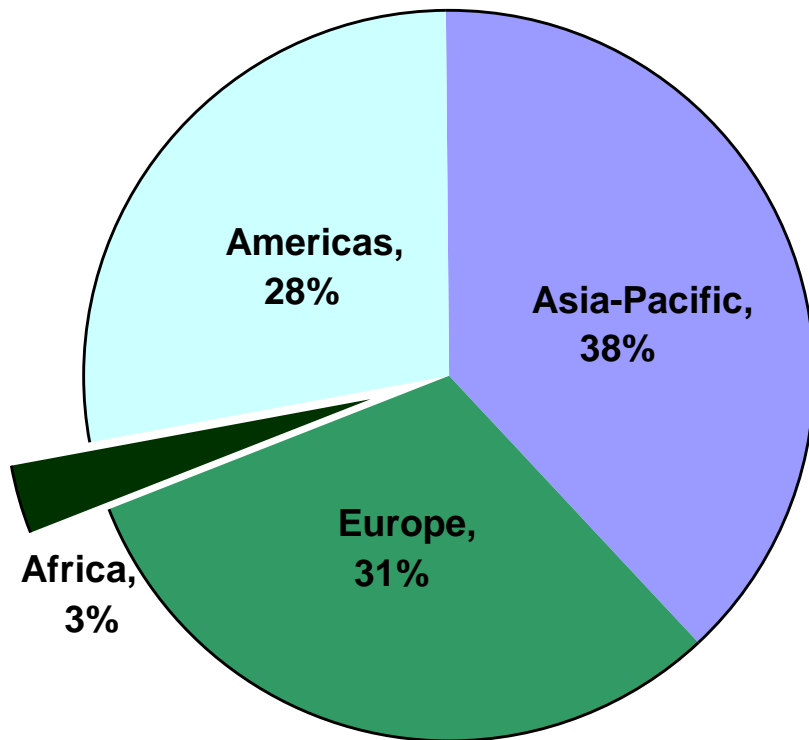
The “Mobile Internet”



Mobile and Internet: Identical twins born two years apart?

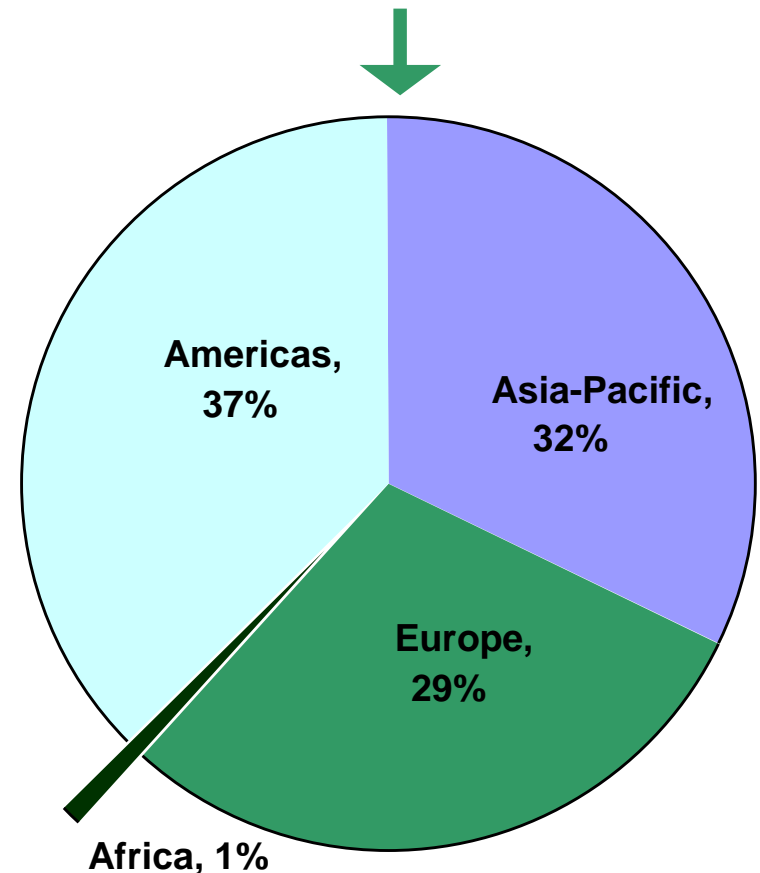


Distribution of mobile and Internet users by region, 2001



Mobile phone users
948 million

Estimated Internet users,
500 million

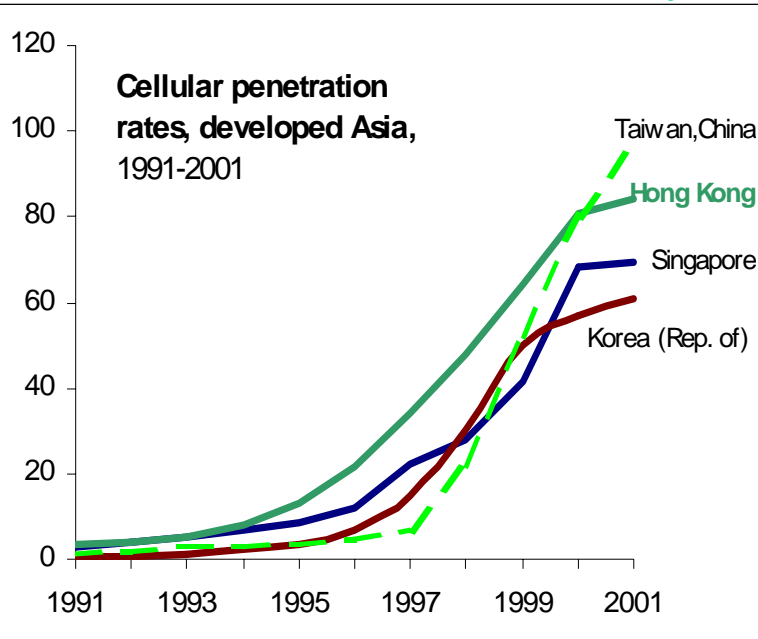


Africa, 1%



Upwardly mobile in Asia

Asian leaders in mobile teledensity



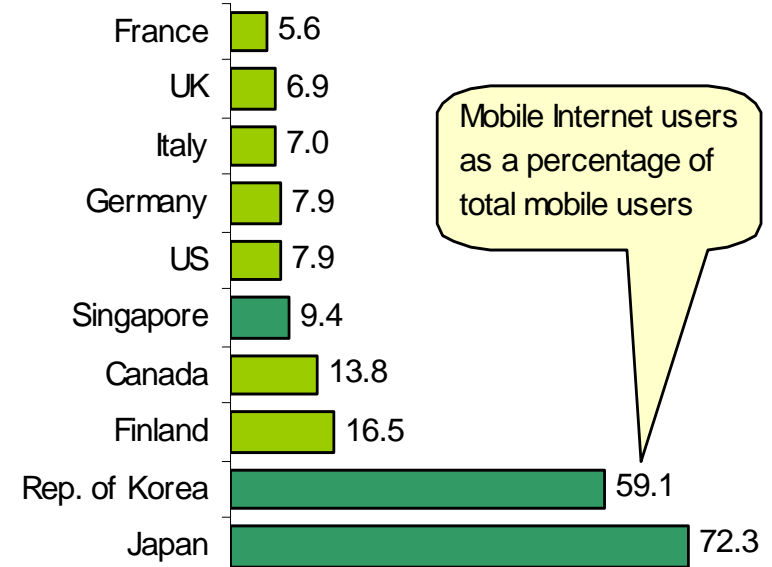
Source: ITU World Telecommunications Indicators Database



e.g. Japan:
3G FOMA phones
with i-mode
(NTT DoCoMo)

Asian leaders in mobile Internet penetration

Mobile Internet penetration, 2001



Source: MPHPT (Japan)

What is the “Mobile Internet”?

- It is a combination of:
 - mobile (wireless) technologies
 - and information and data communications services
 - ...with, eventually, the flexibility of IP networks?
- It implies a convergence of:
 - terminals
 - networks
 - services and applications
 - corporate structures

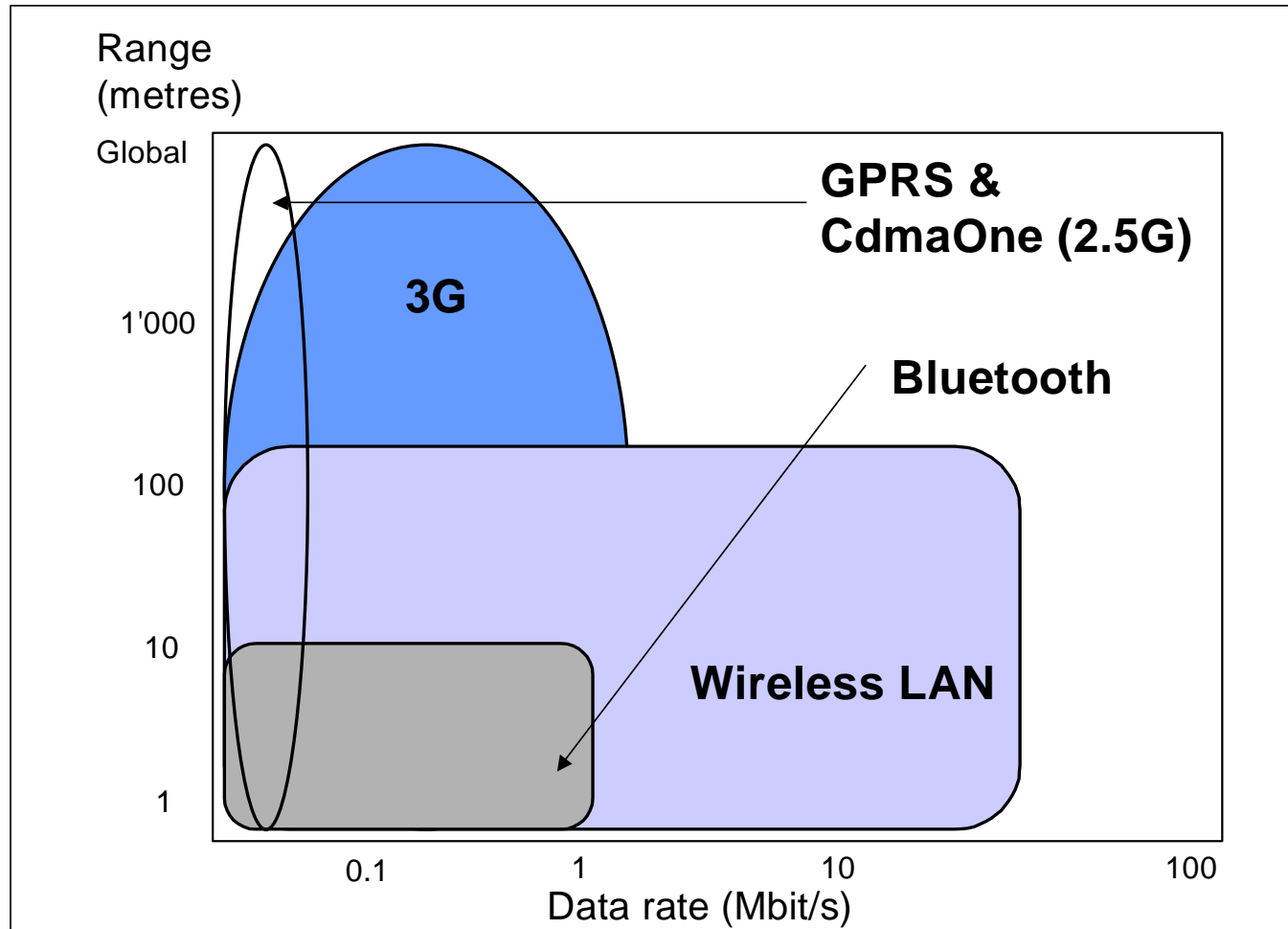


Mobile Internet – enabling technologies and applications

- Network evolution: from 2G to 3G –higher speeds, increased bandwidth efficiency
- “Alternative networks”: e.g wireless LANs – 802.11 series
- Mobile User interface: i-mode, WAP
- Messaging (SMS, EMS, MMS)
- Evolution of digital content, e.g. location-based services (LBS)
- Growing importance of security (WEP, WPKI)



High-speed 3G is only *part* of the overall picture



Mobile Internet market development

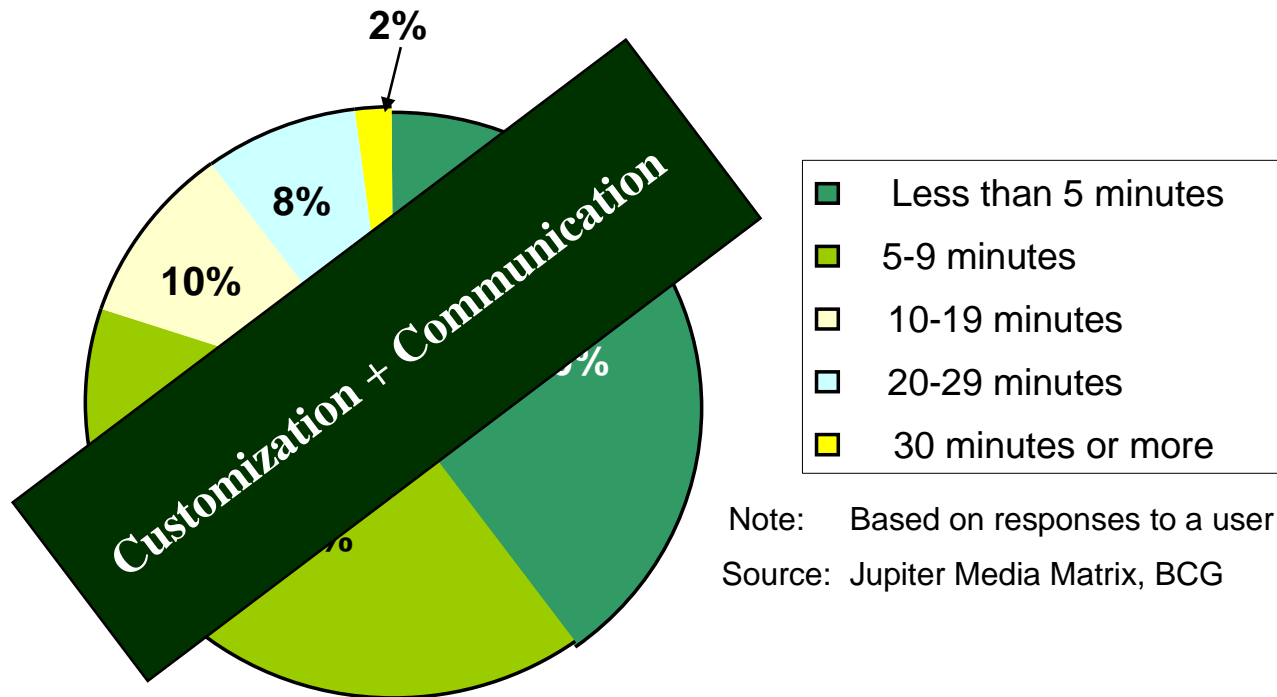
- High-demand regions
 - The ‘first-movers’: HK, Japan and Korea
- Evolution of corporate strategies
- Factors hindering market development
 - Low availability of adequate handsets
 - Plethora of standards/formats
 - Lack of evolved billing models
- The economics of success
 - Avoiding pure tech-push plays
 - Increase partnerships and industry collaboration
 - Encourage revenue-sharing
 - Ensure tariff transparency



What of digital content?

- User sessions tend to be short (unlike the “browsing” behaviour of the fixed-line Internet)
- Thus, “killer app” cannot be pure content

Average length of mobile data sessions, 2001



Note: Based on responses to a user survey

Source: Jupiter Media Matrix, BCG

Towards a mobile information society:

“Pardon me, ma’am, but is that your tooth ringing?”

- The advent of “pervasive” miniaturized mobile devices will transform our lifestyles
 - Can you swallow a mobile phone?
- Implications of location-based services (LBS)
 - Can you easily be found in an emergency (e911)?
 - Can wireless implants track your every move?
- Consumer protection, e.g. health, SPAM,
 - How to re-assure the end-user while fostering development?



Highlights of ITU Report on the Mobile Internet

- 180 pages of information and analysis
- Table of contents includes: technologies, market trends, regulatory/policy aspects, mobile information society
- Analysis supported by country-specific case studies
- Over 70 pages of statistical tables presenting latest available data
- The ITU Mobile/Internet Index**



The ITU Mobile / Internet Index

What it is:

- A measure of current information and communication technologies (ICT) development, with a focus on mobile and Internet
- A measure of an economy's ability to take advantage of these technologies in the future

What it is not:

- A measure of the “mobile Internet” in an economy
- Limited to mobile and Internet development only



Index Parameters

50%

The infrastructure cluster measures the development of information and communication technology infrastructure, with a special focus on mobile networks and Internet development

Infrastructure

The usage cluster attempts to gauge how users are taking advantage of the existing network by examining e.g. network cost, components, revenue etc...

25%

Usage


The market structure cluster assigns an overall value for an economy by examining the level of competition in its different markets

25%

Market Structure



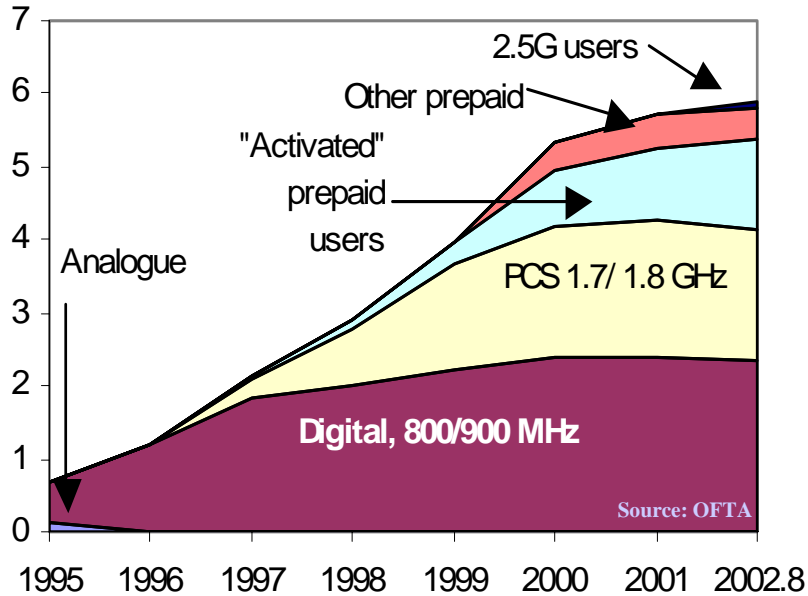
Are you 'm-ready'?: HK tops Index

	Economy	Score	Rank	GDP
	Hong Kong, China	65.88	1	\$24'249
	Denmark	65.61	2	\$30'902
	Sweden	65.42	3	\$25'654
	Switzerland	65.10	4	\$33'522
	United States	65.04	5	\$37'769
	Norway	64.67	6	\$35'265
	Korea (Rep.)	63.42	7	\$8'828
	United Kingdom	63.00	8	\$24'607
	Netherlands	62.25	9	\$23'995
	Iceland	62.03	10	\$32'069
	Canada	61.97	11	\$23'256
	Finland	61.22	12	\$23'883
	Singapore	60.58	13	\$21'188
	Luxembourg	58.58	14	\$44'664
	Belgium	57.80	15	\$22'498
	Austria	57.72	16	\$23'286
	Germany	55.53	17	\$22'675
	Australia	55.40	18	\$19'474
	Portugal	55.13	19	\$11'014
	Japan	54.94	20	\$34'337
	France	52.45	21	\$21'862
	Greece	51.44	22	\$10'707
	Italy	51.13	23	\$18'788
	Czech Republic	50.95	24	\$4'963
	New Zealand	50.47	25	\$11'847



Hong Kong - a 'networked' society

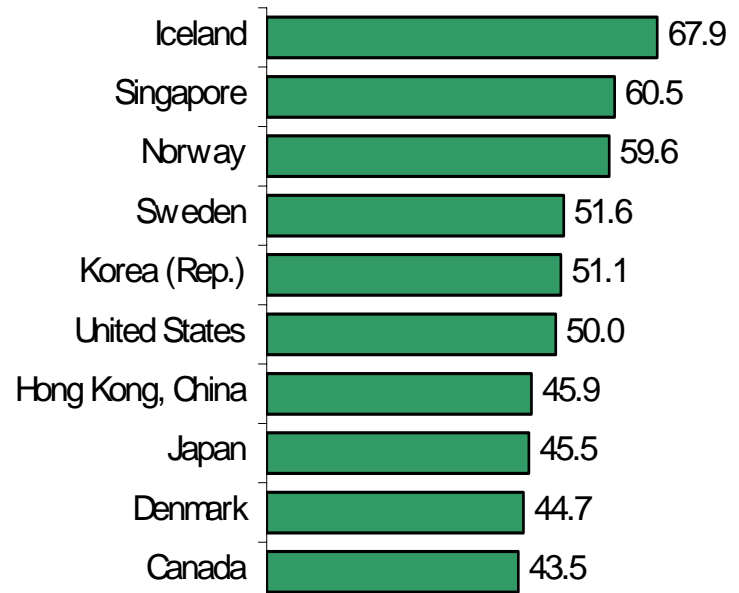
Mobile users, Hong Kong, China (million)



85.5 % mobile penetration

45.9 % Internet penetration

Internet users, top 10 by density, per 100, 2001



Where HK won points on the Index

- **Infrastructure** (ranked # 8)
 - High mobile and Internet penetration
 - 3G licensed and 2.5G deployed
- **Usage** (ranked # 4)
 - Large number of roaming agreements
 - Large number of servers using SSL encryption
 - Cost of Internet and mobile relative to GDP
- **Market Structure** (ranked # 3) **
 - Early privatization of incumbent
 - Early establishment of a separate regulator, OFTA
 - Competitive or fully competitive market segments

Still...

- Other countries are ahead in:
 - Internet usage
 - Services cost
- And catching up fast in:
 - Broadband roll-out
 - Mobile penetration

SO...



... how can Hong Kong maintain its lead?

- Continued efforts at allowing access to MVNOs and alternative service providers
- Regulatory mechanisms focused on tariff reduction and transparency
 - ...while retaining an environment conducive to investment and innovation
- Encouraging interoperability and complementary development of alternative wireless networks such as WLANs. Promotion of high-speed 2.5 and 3G
- Promoting content development “out of the vacuum”
 - Building first upon successes of person-to-person communications, and not attempting to emulate digital content over fixed networks



For more information: www.itu.int/mobileinternet



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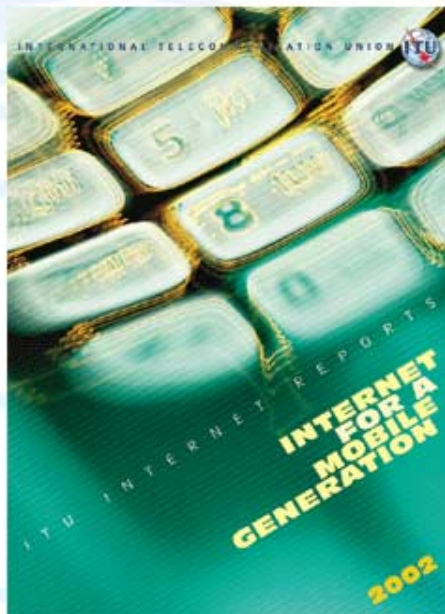
Statistics and Analysis

ITU Strategic Plan

Country Case Studies

Telecom and Internet Policy

Other SPU Activities



ITU Internet Reports 2002: Internet for a Mobile Generation

Number of pages: text 140, statistical tables 80

4th edition, price: 100 Swiss Francs

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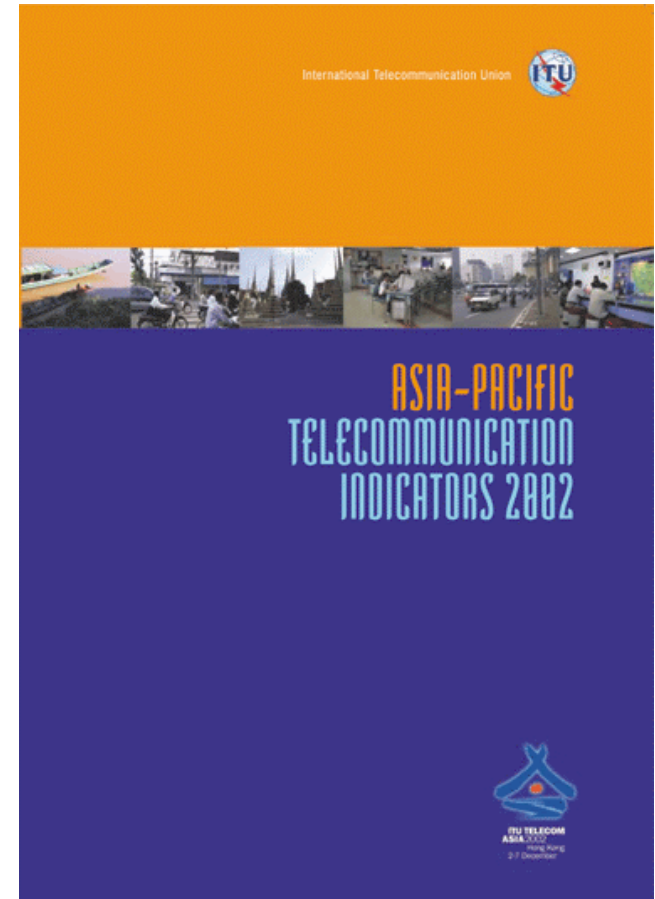
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Previous Reports in the ITU Internet Reports series (previously known as "Challenges to the Network")

- Third report (December 2000)
["ITU Internet Reports 2001: IP Telephony"](#)
- Second report (February 1999, updated October 1999)
["ITU Internet Reports 1999: The Internet and the World"](#)

Forthcoming ITU Report: Asia-Pacific Telecom Indicators '02

- Featuring chapter titles:
 1. Asia revisited
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 4. The great equalizers: Internet and Education
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- Plus a statistical annex
- Available Dec 2002 (in time for Asia Telecom)





多謝

Thank you!

