Beyond 2G

what comes after GSM?

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Contents

- Introduction
- Beyond simple voice telephony and SMS
- Data services
- Value-added services
- Payment services
- Value chains in competitive markets
- Convergence
- Conclusions
- Issues

Wireless generations

1. Analogue technology
   - TACS, AMPS, etc
2. Digital technology
   - PHS, GSM, CDMA
3. IP technology
   - IMT-2000: cdma2000, UMTS and TD-SCDMA
4. ????
   - faster data
   - non-line of sight

2.5 G

- Adding data to voice and SMS
- IP interface
- Requires upgrading of:
  - network infrastructure
  - handsets
- Requires development of new business models:
  - raw IP access
  - value-added services
- Extending the value chain to include:
  - service providers
  - content aggregators
  - Mobile Virtual Network Operators (MVNOs)

2.5 G

GPRS

- Data packages in very small quantities
- International roaming punitively expensive
- Unsuccessful efforts at “walled gardens” for value-added services
- Death from hype of WAP
- Vast majority of GPRS-enabled handsets are never used for that
- Some success with Blackberry over GPRS

cdma2000

- Offers of flat-rate data access:
  - Japan
  - USA
- Development of value-added services in some markets
- Content-based MVNOs in some markets

Recent handset features

- Camera
  (create video clips for YouTube and MySpace)
- Stored music and video
- Receiver for digital mobile radio and television
  - satellite and terrestrial
- RFID for identification:
  - access controls
  - payments

These can, but often do not, generate network traffic.

GSM Association

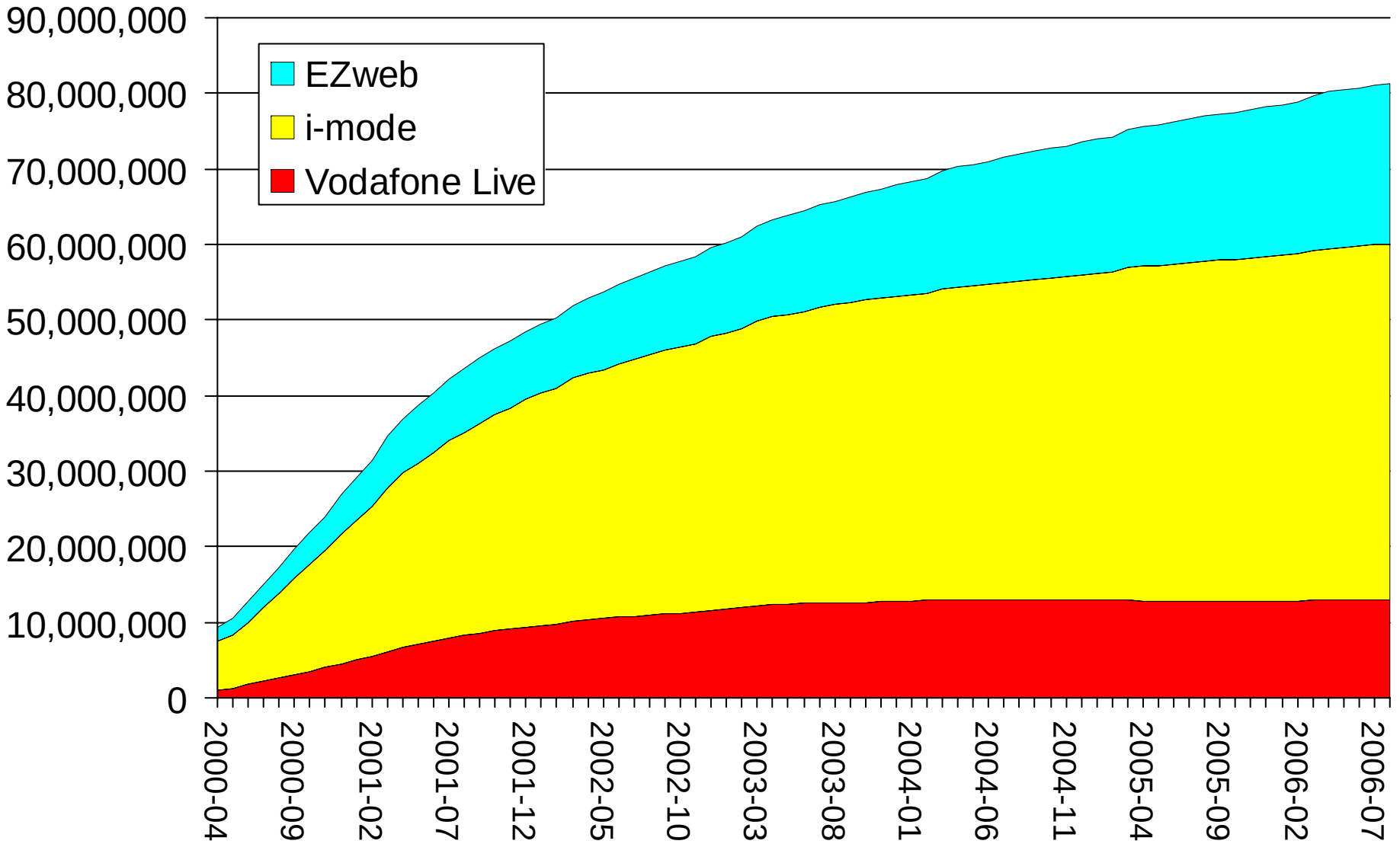
- m-commerce has particular benefits in emerging economies
- Capturing the unofficial cash float
- Eliminating the need to carry cash
- Reducing exposure to robbery
- Enabling the advancement of micro-loans
- Facilitating loan repayments
- Enabling the payment of utility bills
- Minimizing money-laundering opportunities

http://www.gsmworld.com/documents/services/micro_payment.pdf

Mobile payments

- Payment:
  - add to monthly bill
  - deduct from stored credit
  - link to a credit card
- By means of:
  - RFID tag
  - SMS
- The alternative is to use Internet payment systems
- India
  - Tata and ICICI
- Japan
  - DoCoMo and Sony
- South Korea
  - Moneta
- Malaysia
  - Nokia and Visa
- USA and UK
  - PayPal

The mobile Internet in Japan



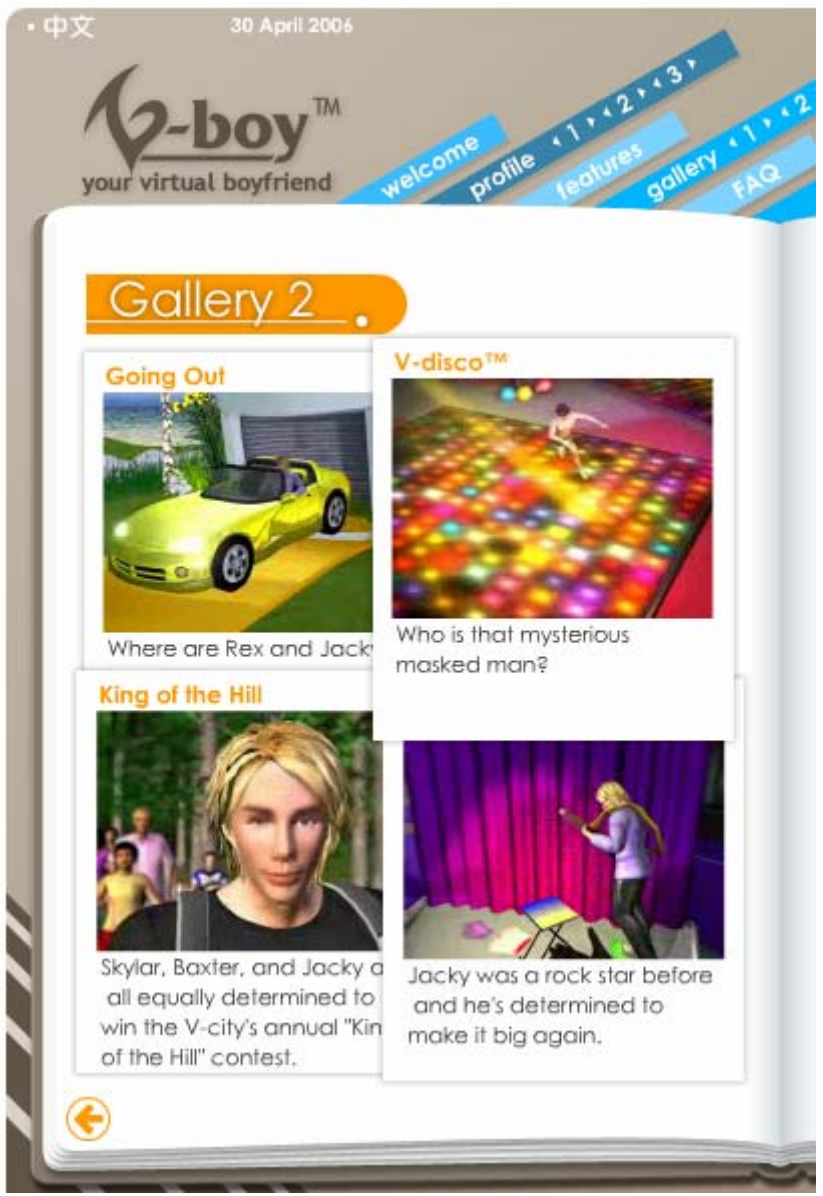
i-mode in Japan

- Developed very early for 2G, though at slow speeds
- At that time there was limited fixed Internet access
- NTT DoCoMo:
  - charged customers directly on behalf of third parties
  - took a modest margin
  - passed on revenues to content producers
- Created a positive environment for content creation (similar to French Minitel)
- Seamless migration 2G -> 2.5G -> 3G -> 3.5G
  - customers
  - content providers
- However, failed to translate to foreign markets, despite extensive efforts

Artificial Life

- Developer of games:
  - standalone
  - multi-user games
- Games within games
- Examples:
  - Virtual Girlfriend
  - Virtual Boyfriend
  - Virtual Emperor Penguin
- Launched with MNOs in:
  - Brunei
  - China
  - Hong Kong, SAR
  - Malaysia
  - Singapore
  - Taiwan

http://www.artificial-life.com/
http://mobileindustry.biz/

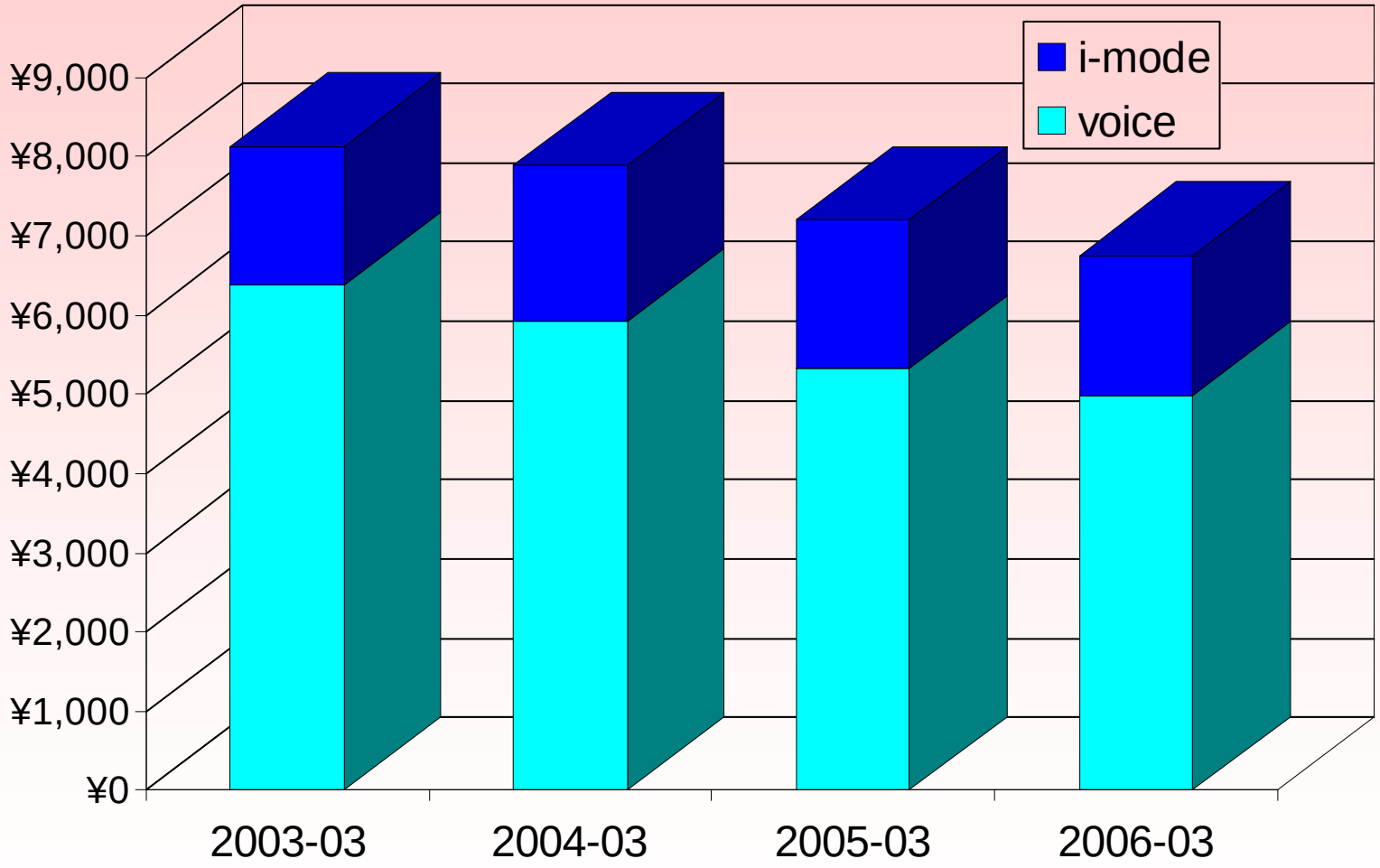


Mobile content

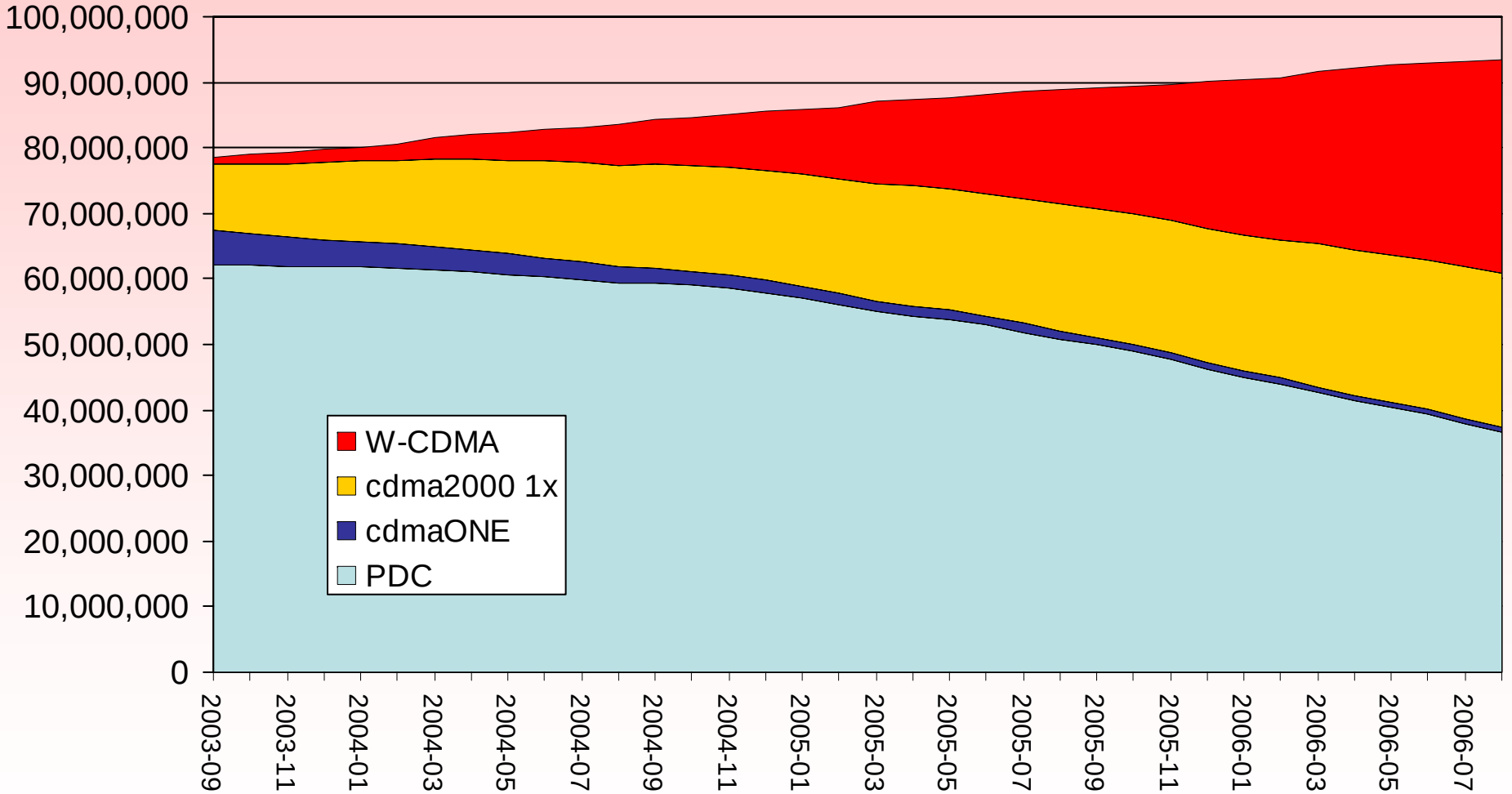
- Sport
- Games
- Betting
- News
- Music (downloads and streaming)
- Television (broadcasts and “mobisodes”)
- The content that nobody talks about

Is it one device or many? iPod or cellphone?

Japan - DoCoMo ARPU



Japan switches to 3G



http://www.tca.or.jp/

China

- Beijing Olympics opening on 08/08/08 will be a showcase for 3G
- Everyone is waiting for the licences
- Ministry of Information Industries (MII) seems undecided between:
  - technology neutrality
  - support for TD-SCDMA
- A lot of foreign and domestic lobbying
- Forecasts of 50 to 100 million customers by 2010
- Will drive the export market
- Many emerging and developing markets will copy

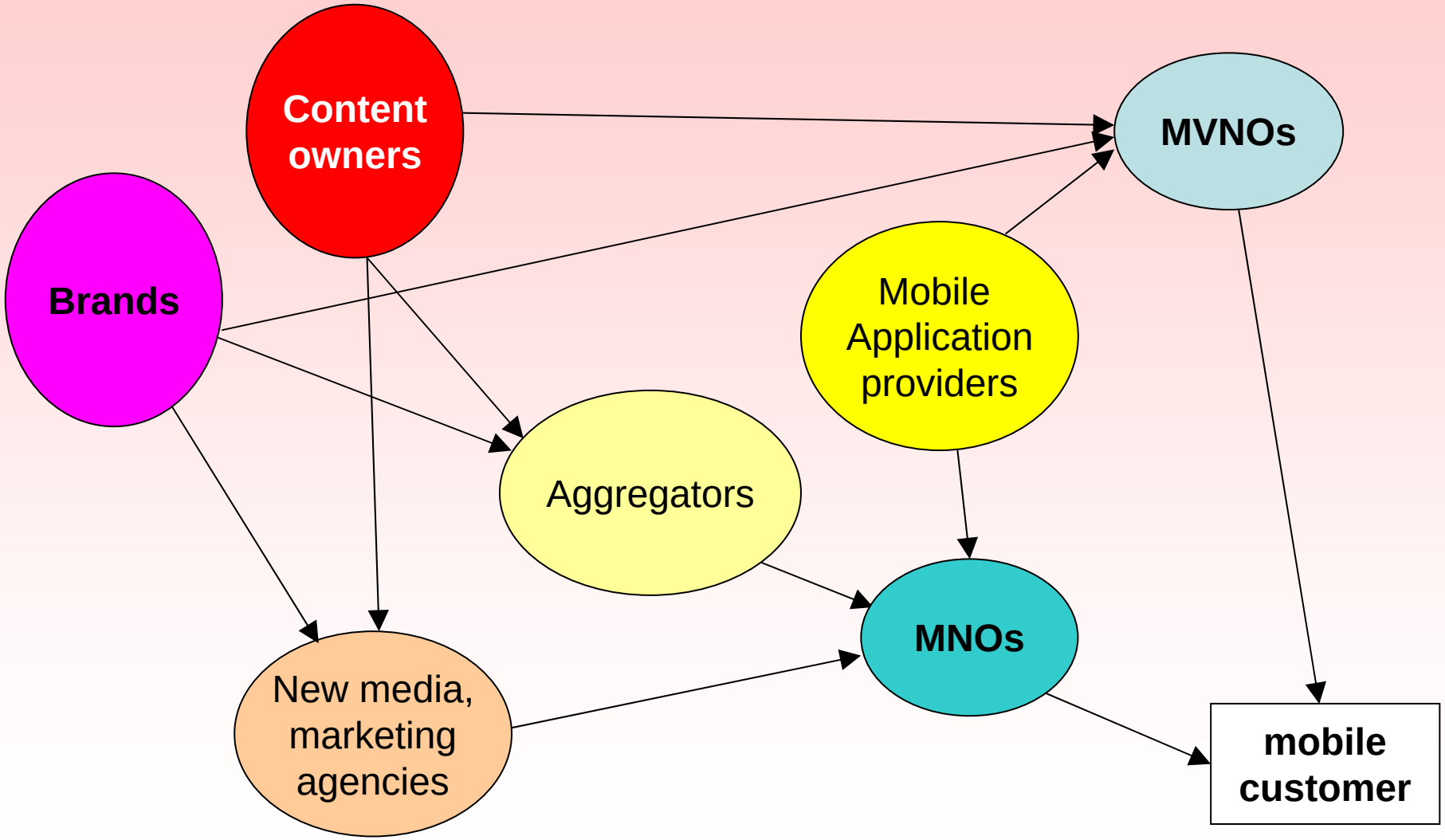
3G

- Games, Gambling and Girls
- Greed, Gullibility and Grief

- Location Based Services (LBS)
- Entertainment:
  - streamed audio
  - streamed video

Competition with mobile television?

Mobile value chain



What is the value of mobility?

- People expect “mobility” for text and voice
- Mobility for data and value-added services:
  - need?
  - want?
  - value?
  - is nomadicity enough?
  - will people pay more for ubiquity?
- What are the operators selling?

Location Based Services

- Originally the big hope for 3G revenues
- Adoption has been painfully slow
- Now there are many alternatives:
  - Global Positioning System (GPS)
  - Bluetooth
  - Ultra Wide Band (UWB)
  - Radio Frequency Identification (RFID) tags
  - Wi-Fi
  - identification of the mobile cell
  - embedded systems in cars

http://www.oecd.org/dataoecd/19/7/34884388.pdf

Audio and video streaming

- Some material is:
  - on-demand
  - interactive
- Broadcasting for news, sports and music:
  - satellite
  - terrestrial
- Wi-Fi and WiMAX where demand is not immediate:
  - residential
  - public hot-spot

Digital broadcasting

- Competing standards:
  - Digital Audio Broadcast (DAB)
  - Digital Multimedia Broadcast (DMB)
  - Digital Video Broadcast (DVB)
- Satellite and terrestrial
- Can carry vast amounts of entertainment and other services
- Very much cheaper than cellular for delivery to customers

Wireless VoIP

- Multiple possible devices:
  - lap-top computer
  - Personal Digital Assistant (PDA)
  - Skype phone
- Wi-Fi chips are cheap and easily added to consumer electronic devices (n.b., games consoles)
- New multimode handsets
- Dedicated Wi-Fi phones

Wireless VoIP

Nokia E-Series handsets

- Wi-Fi when in:
  - corporate offices worldwide
  - Home
  - Hotels, etc.
- SIP client
- Otherwise GSM
- Being combined with iPASS, a global Wi-Fi supplier

France Iliad “free.fr”

- Any Wi-Fi hotspot with “freebox”:
  - your home
  - your neighbours
  - people in the next street, village or town
- Free calls to fixed networks in France and 14 countries
- €29.99 per month

http://adsl.free.fr/

VoIP over 3G

- Theoretically possible, but questions of:
  - pricing
  - download limits
  - operators filtering out VoIP
- Some deals for Skype over 3G:
  - Hutchison Whampoa (a.k.a. Three)
  - E-Plus (KPN)
- Enormous reluctance of 3GSM operators:
  - but how long can they resist the pressure?
- For the present, roaming charges make VoIP very expensive to use over 3G

WiMAX

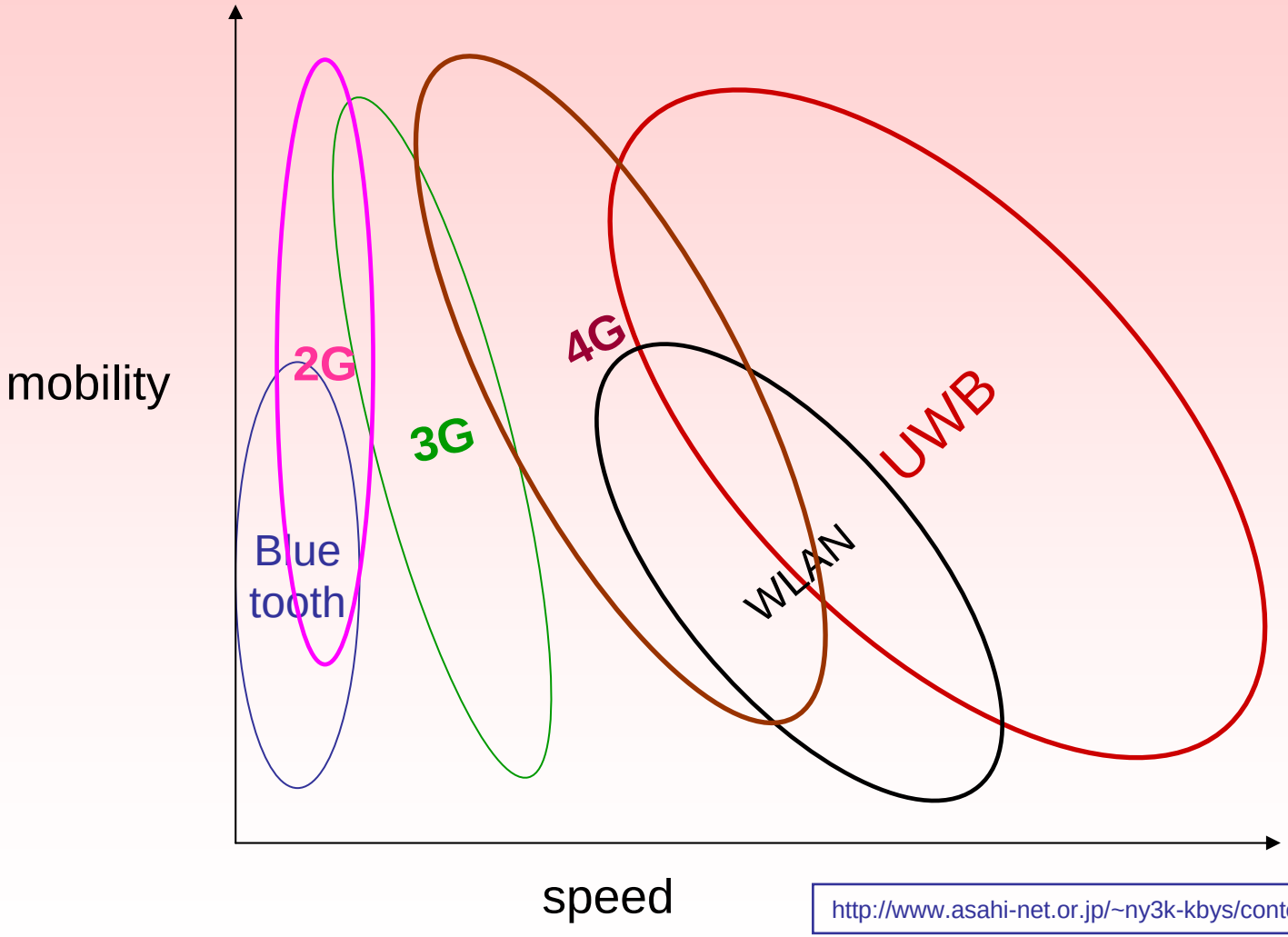
- Unlicensed bands:
  - often still not opened for use
  - 2.4 GHz and 5.8 GHz
- Licensed bands (e.g., 3.5 GHz):
  - very few issued so far
- Economies of scale not yet achieved
- A big push from Intel “World Ahead”

http://www.intel.com/go/worldahead

Not cellular mobile alone

- Fixed Network Operators told by financial markets to:
  - spin-off MNOs
  - re-absorb MNOs
- Quadruple play (telephony, television, Internet, mobile)
- Comcast Cable (USA) now offers a bundle with cellular voice and data
- Vodafone is looking to add broadband, using wholesale offers from TOs and ISPs

Speed and mobility



http://www.asahi-net.or.jp/~ny3k-kbys/contents/uwb_technology.html

Multiple networks

- Personal Area Networks (PANs)
- Car networks
- Residential networks
- Cellular
- Other wireless networks
- Fibre optic cables for high bandwidth

Ubiquitous Network Society

- The view from Japan and Korea
- Industry and government
- A focus on economic development
- A big push for manufacturing and services
- Multiple networks
- NGN plus RFID plus Ubiquitous Sensor Network (USN)

Classes of convergence

- Packets
- Devices
- Services:
  - servers
  - programming
- Offers to customers
- Companies

Devices

- Sony Mylo (my life online)
  - Wi-Fi, Keyboard, memory (music and video)
  - web browser, instant messaging and Skype
- Moneta:
  - stored credit
  - credit card
  - with RFID
  - all on a mobile phone
- Slingbox:
  - bridges your cable or satellite TV to Internet
  - remote access for fixed or mobile device
  - can be linked to Personal Video Recorder (PVR)

Conclusions

- Enormous uncertainty about demand for:
  - data services
  - value added services
- Enormous uncertainty about access to networks by value-added service providers
- There are non-cellular routes to markets
- The pre-paid business model worked well for voice, but does not look plausible for value-added services

Thank you

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