

# ON THE ROAD AGAIN, CHINA!

## the portability and ubiquity of mobile

### 2005 Summit on the Development of China's Communications Industry

7-8 July 2005 (Beijing, China)

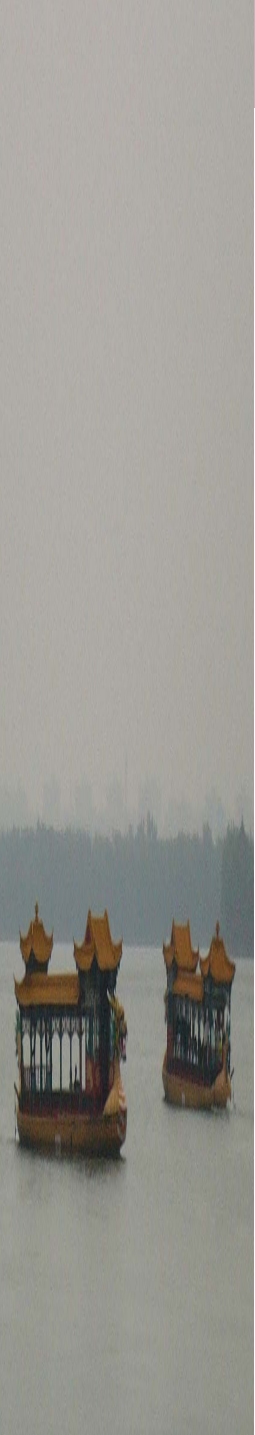
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Note: The views expressed in this presentation are those of the author and do not necessarily reflect the opinions of the ITU or its membership. Lara Srivastava can be contacted at [lara.srivastava@itu.int](mailto:lara.srivastava@itu.int)

# introduction



## the dawn of the information age...

- the creation of a World Wide Web of information, a revolution in itself
- growth of high-speed broadband infrastructure
- global proliferation of those small mobile devices that can be used to communicate and gather information anywhere/anytime
- an emphasis on “always-on” communications and information access
- advances in computing to render information even more “ubiquitous”

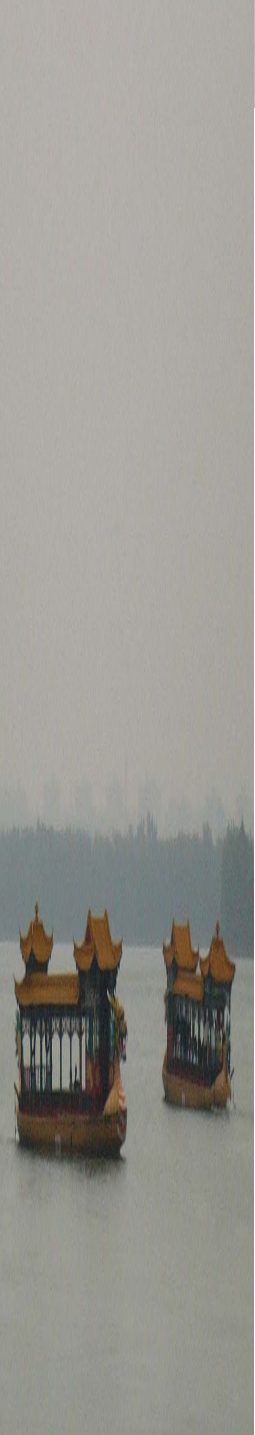


## ...has brought with it a number of market “transitions”

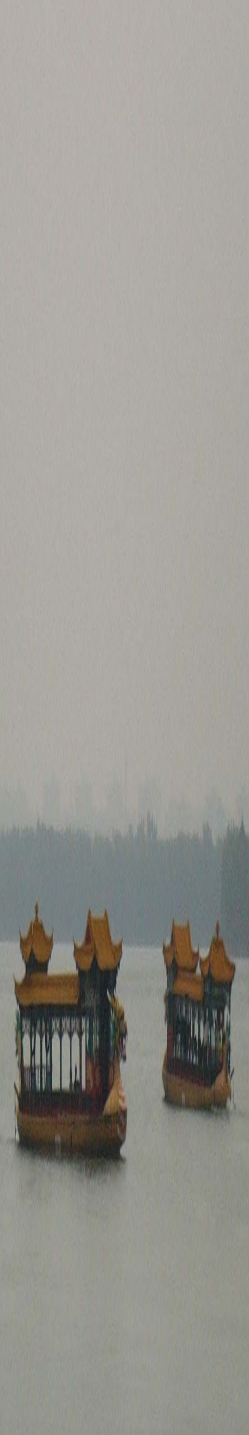
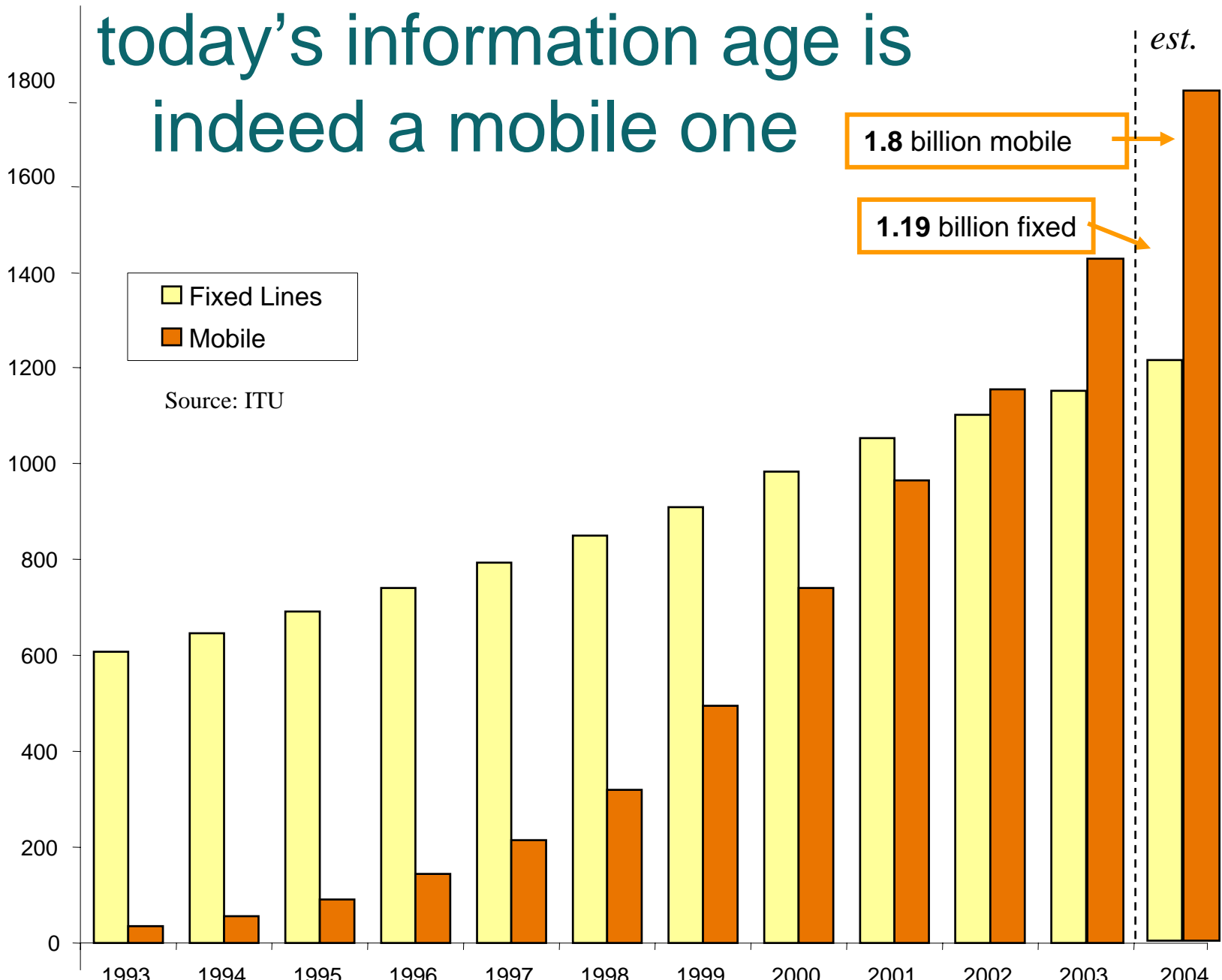
- from relatively static market environments to dynamic fast-paced innovation
- from heavy-handed regulation to increasing forbearance
- from “divergence” to “convergence”
- from local to global
- from low-speed to high-speed
- from sometimes-on to always-on
- from fixed to mobile



# a mobile information age



# today's information age is indeed a mobile one

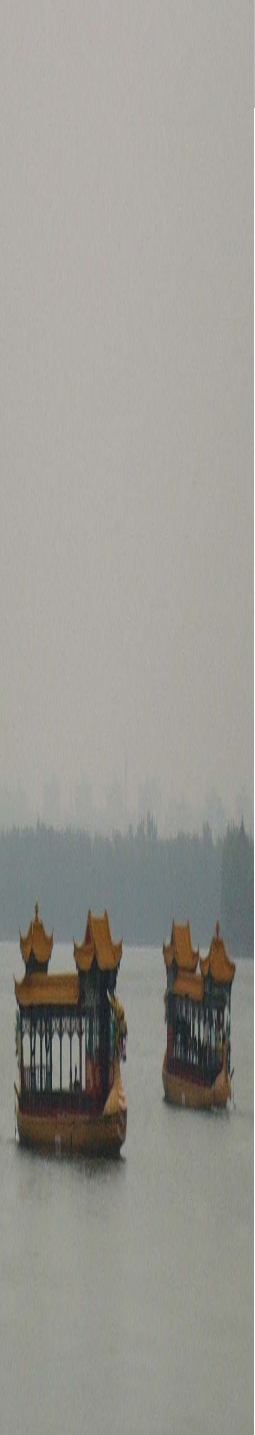


# some key trends of this rapid mobile phone adoption

- mobile growth has not only shot past fixed but also the other industry giant, the Internet
- adoption of mobile phones is strong across genders and income levels
- mobile technologies have provided invaluable access to information and communication in underserved, developing areas
- mobiles have become the most personalized & private ICT device we have ever known
- as some markets approach saturation, future will depend on the marriage of mobility and speed



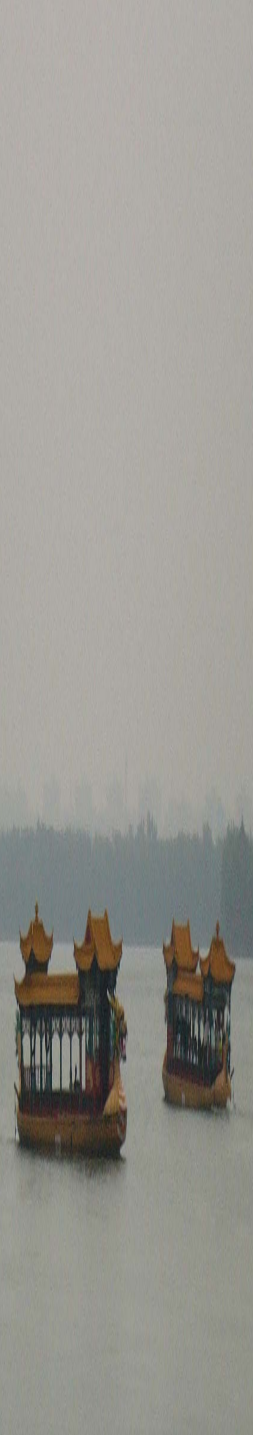
# a brief look at the world's biggest mobile market



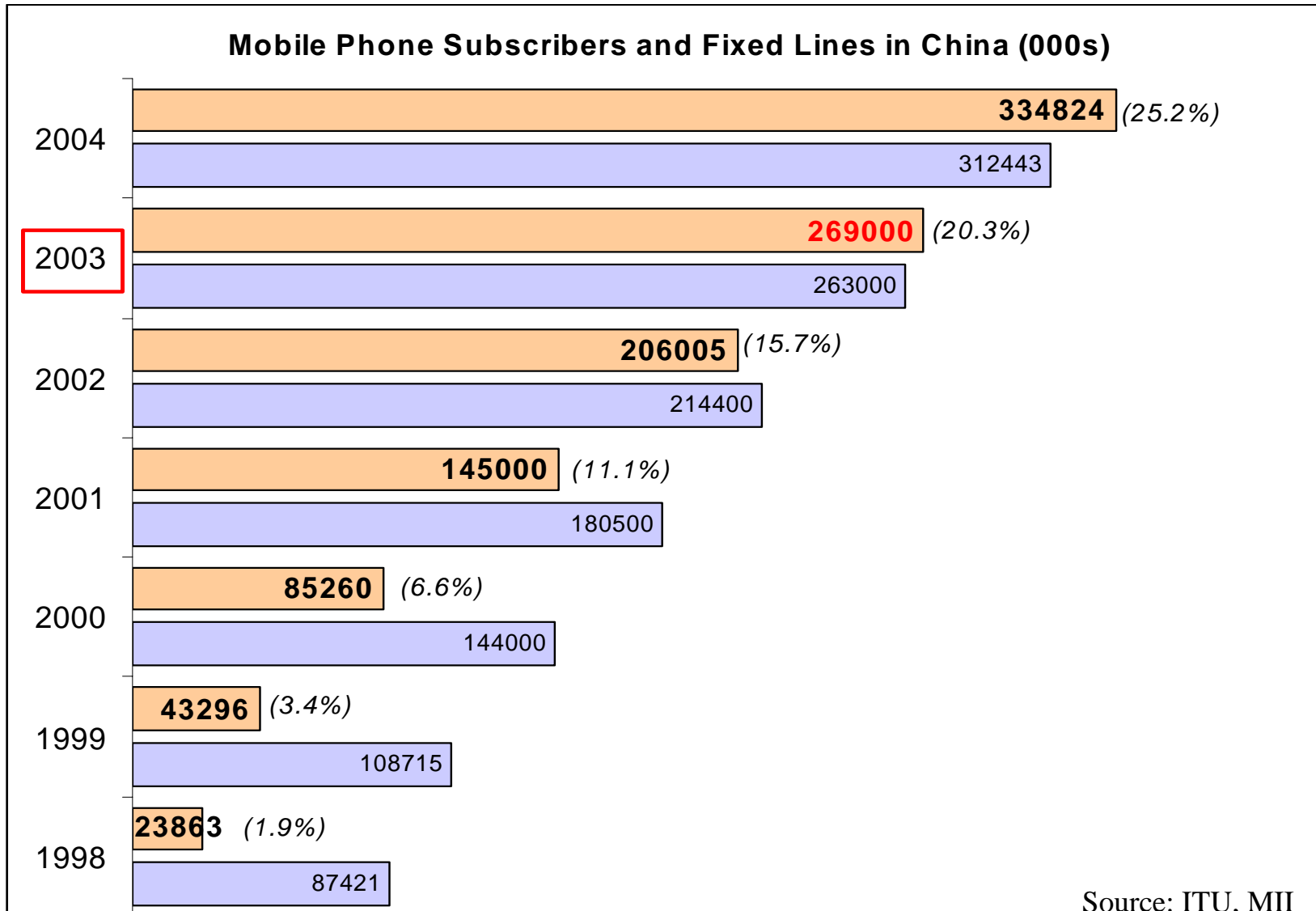


# China's ICT leadership

- world's largest mobile market, though penetration levels still relatively low
- Internet penetration (94m in 2004) much lower than mobile, but broadband market growing at 146% (42.8m in 2004)
- strong growth in equipment market



# a vast mobile market ...



# ...which is gaining in speed&variety

- **Mobile networks:**

- China Mobile launched GPRS in 05/2002
- China Unicom skipped 2.5G to deploy GSM1x (a version of **CDMA 2000 1x** 03/2003, based on GSM-MAP)
- Testing of TD-SCDMA, W-CDMA continues
- Decision on licensing expected in 2005

- **Mobile services:**

- tremendous popularity of SMS, with Chinese users sending 217.76 billion SMS messages in 2004, up 58.8 per cent from 2003.
- innovative content creation , e.g. “out of the fortress”, mobile music services

- **Fixed-wireless networks:**

- 1'800 hotspots in 2004, and growing, but use currently scarce due to low penetration of laptops

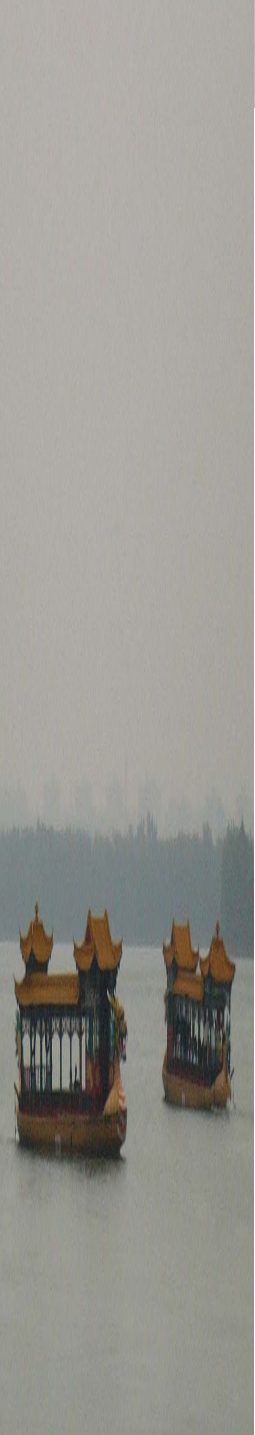


# some characteristics of the Chinese mobile market

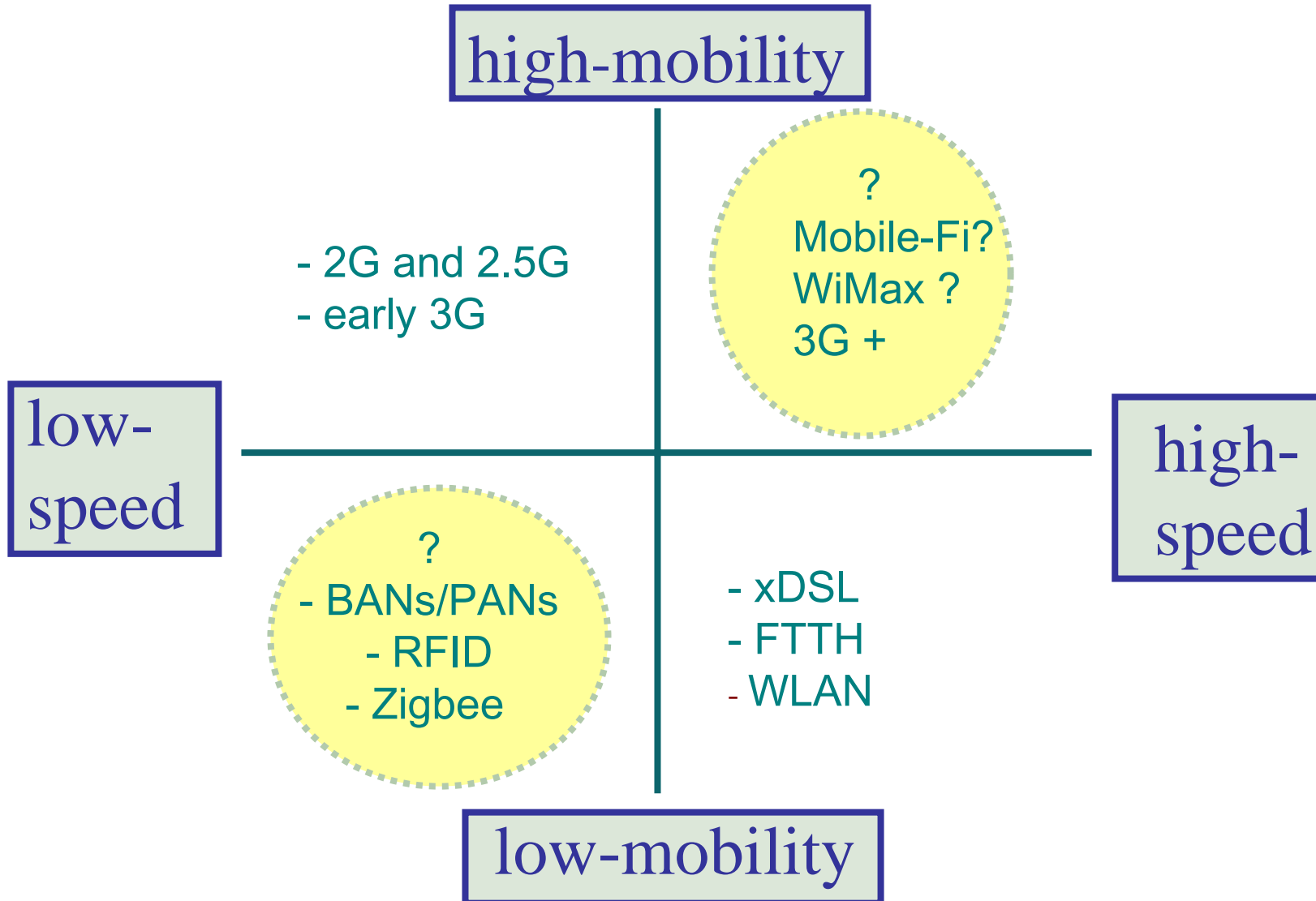
- currently market structure is a duopoly
- vast population of low-income (low ARPU) subscribers, typically using pre-paid
- influx of mobile phones from Japan/Korea has made Chinese users more demanding, and made flip phones more popular
- recently, competition has been stimulated between limited mobility (“little smart”) services of fixed-line operators and traditional mobile services



# mobility vs. speed



# mapping mobility and speed:



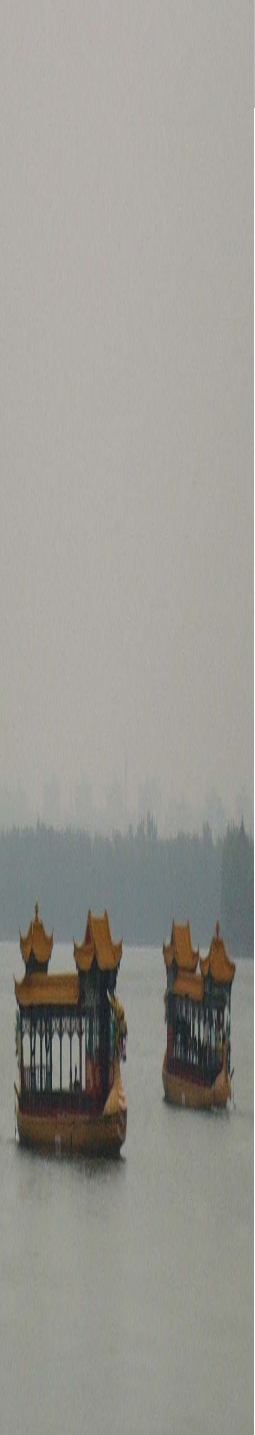
## higher speed, higher mobility:

- enhanced 3G
  - HSPDA
  - CDMA 2000 1x EV-DV, EV-DO
- 802.16 or WiMax
  - Worldwide Interoperability for Microwave access
  - Capacity: max 70 Mbit/s over 50 km
  - Type of WMAN
- 802.20 also known as “Mobile-Fi”
  - Optimized for high-mobility environments



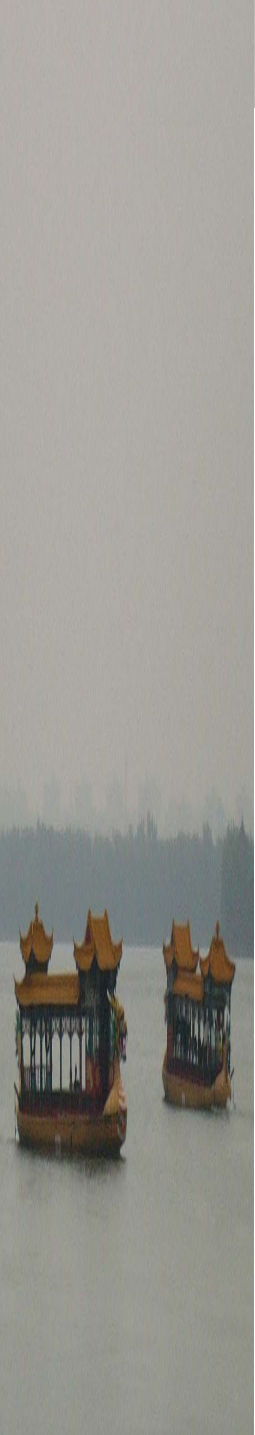
## lower speed, lower mobility:

- often used at the edges of the network, e.g. as wire replacements
- take the next step in “always-on” connections anywhere and anytime...
  - to anyone and “anything”
- enable a ‘ubiquitous communication environment’
- key area to watch:
  - **RFID**, key enabler of an “Internet of Things”





# zooming in on RFID



# RFID technology

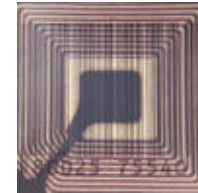
- what is RFID?
  - short-range wireless technology
  - Seen as a means of identifying a person or object using electromagnetic radiation
- simply put, RFID consists of:
  - transponder (e.g. tag): holds data
  - interrogator (or reader): reads data
  - middleware (interface): forwards data
- RFID tags can be read-only, read/write, read/re-write. They can also be passive or active (with or without battery)



# what it looks like

- tags are currently the size of a grain of rice & are getting rapidly getting smaller and cheaper

Tag/Transponder



Interrogator  
(...waiting back  
stage)

# fragmented RFID standards

- RFID currently hindered by fragmented efforts towards standardization
  - With exception of development of standardization of identifiers/codes
- 2 main areas for RFID standardization
  - RFID frequency and protocols for communication of readers & tags/labels
  - Standardization of data formats placed on tags and labels (“more than a bar code”)
- Main international players include ISO, ETSI, EPCglobal, and ITU



# RFID Applications

- **Business Applications, e.g.**

- Transport and Logistics.
- Access control
- Supply-chain Management
- Medical/Pharmaceutical Applications
- Manufacturing



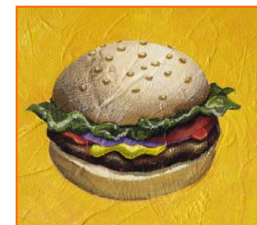
- **Public Sector Applications, e.g.**

- E-government
- Defence/Security
- Library systems



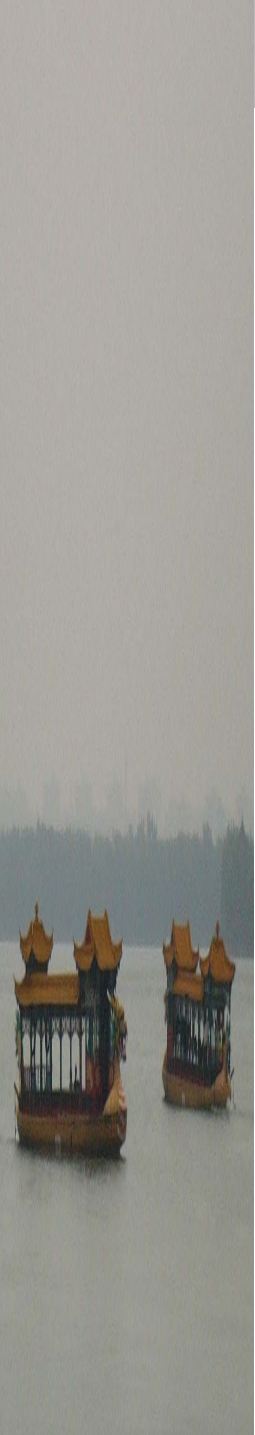
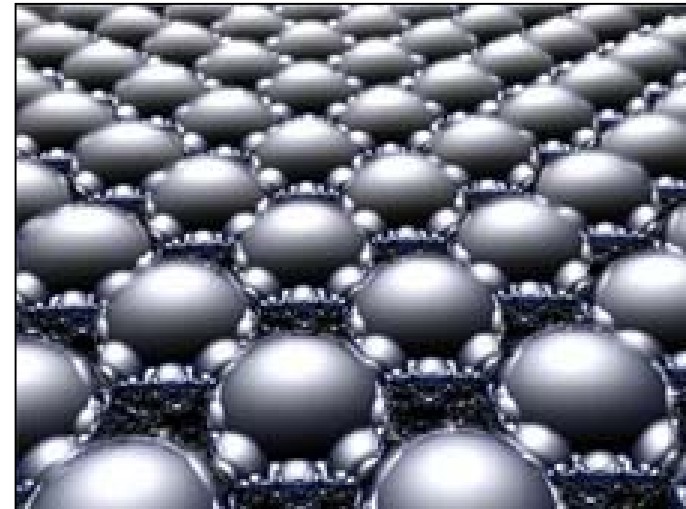
- **Consumer Applications, e.g.**

- Personal welfare and safety
- Sports/leisure
- Shopping
- Smart Lifestyles

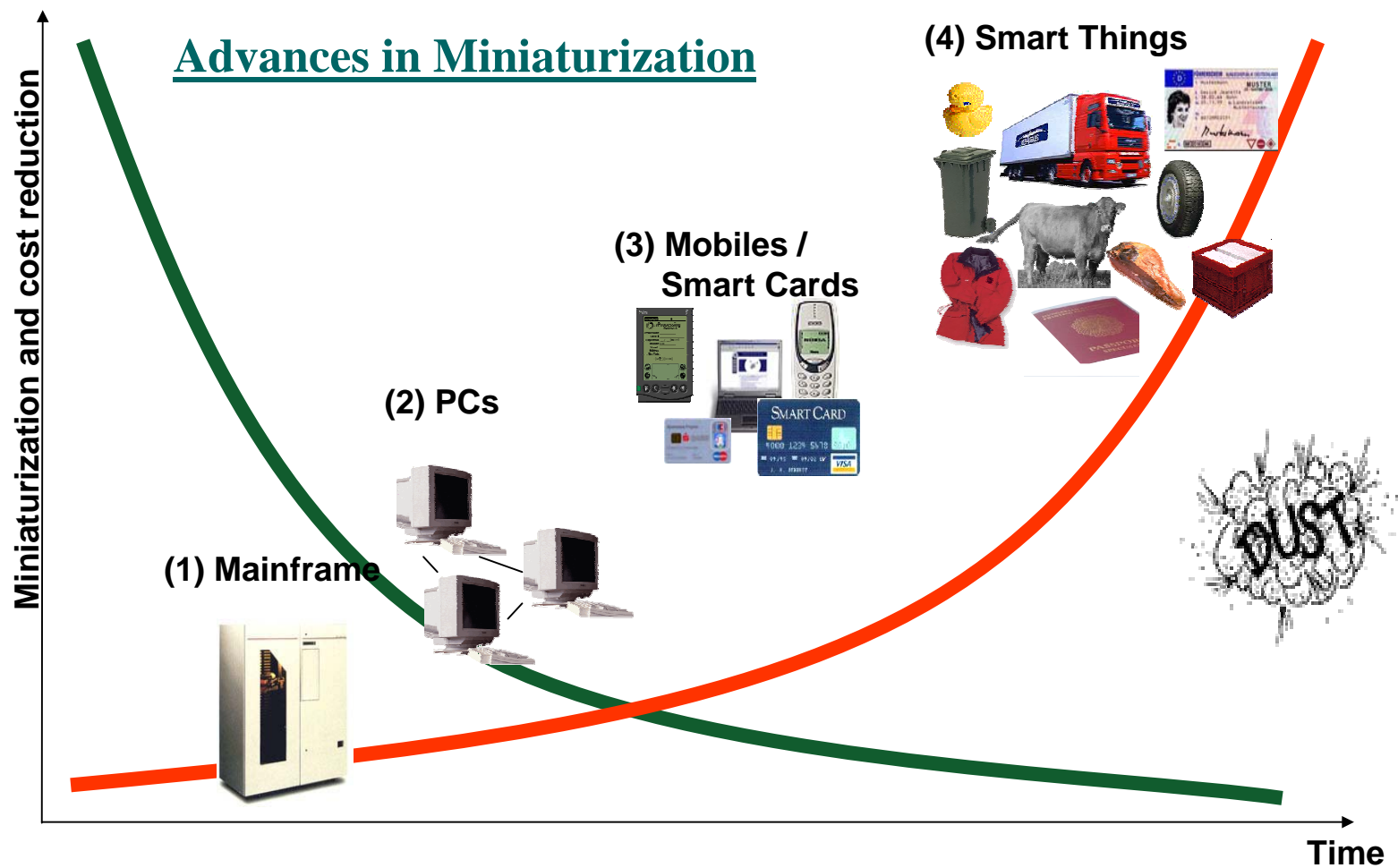


# the future of RFID...

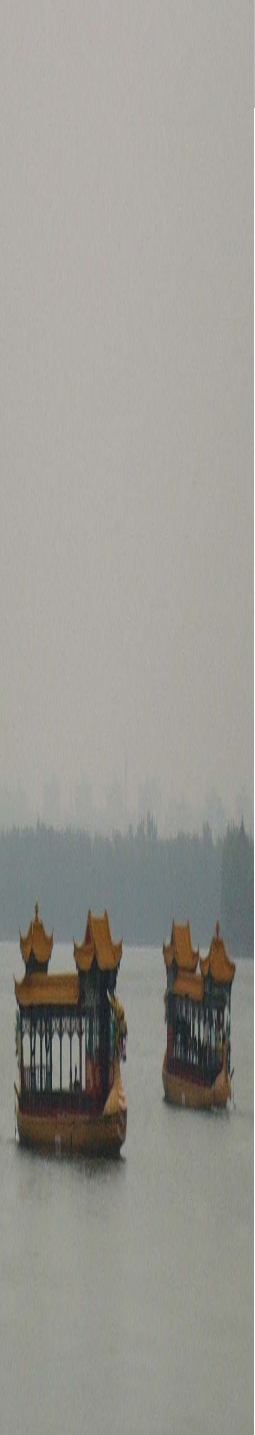
- sensor technologies
  - for remote measuring of specific phenomena
- the “ubiquitous” mobile phone and RFID (e.g. NFC)
- from tagging items to to tagging people?
- from smart chips, to smart materials to “smart dust”?
  - Getting nano



# ...takes us on the road to a world of "smart things"

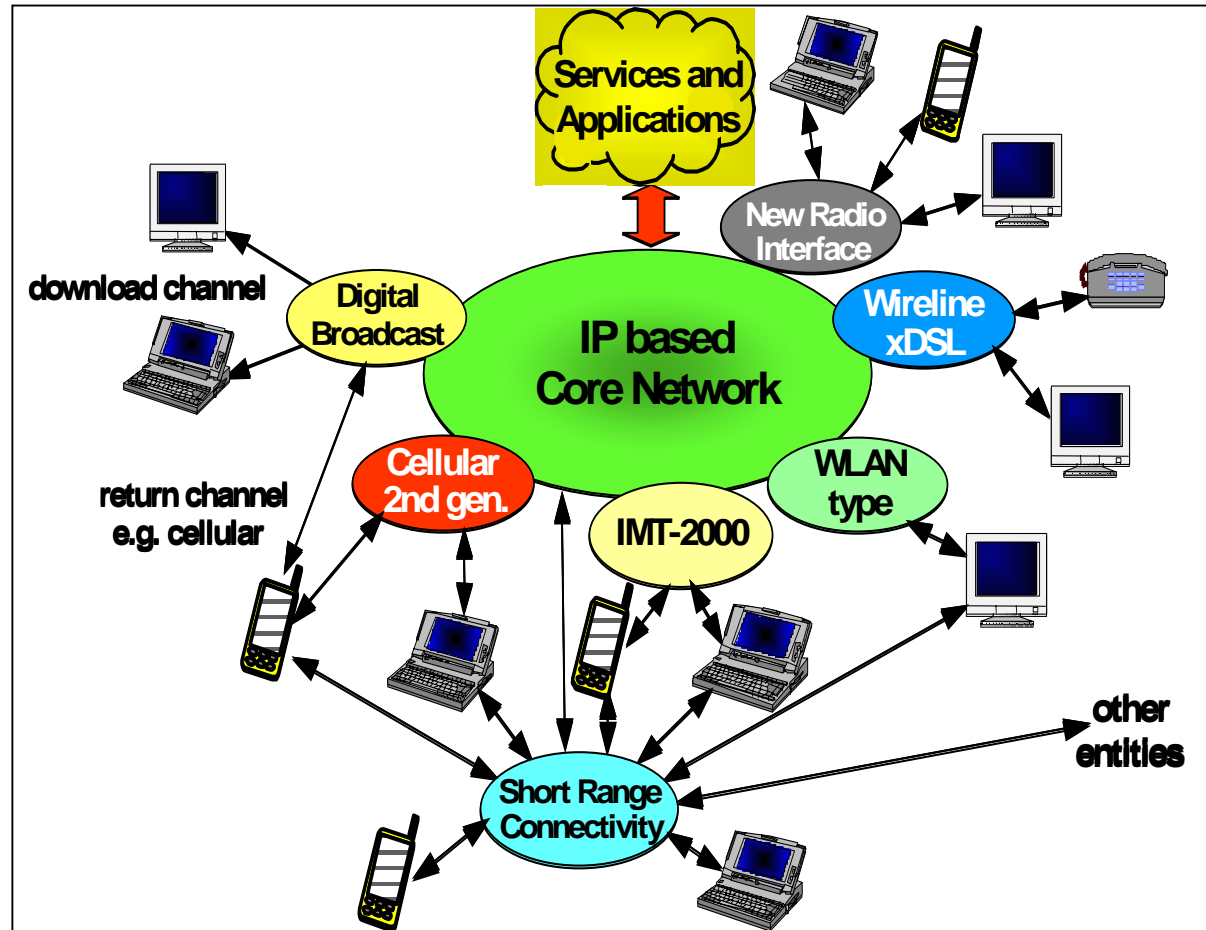


# opportunities for China





# in the context of a global complementary vision...



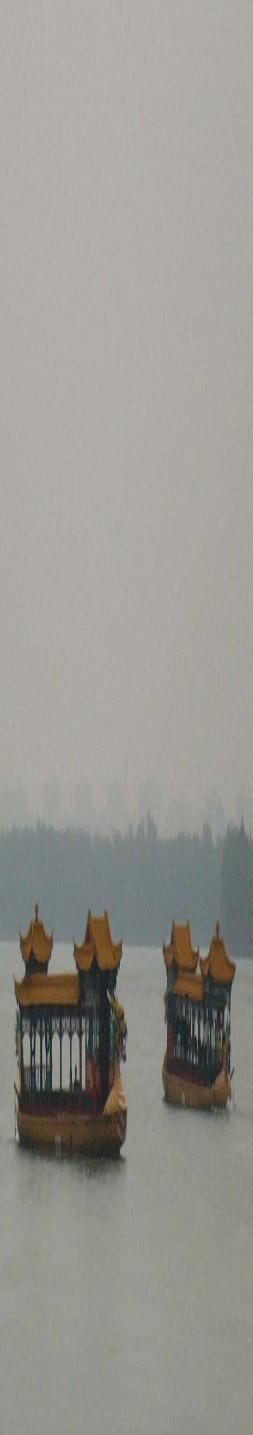
# a similar approach on the national level may be suitable:

- industry collaboration focused on service integration and convergence, as well as the sharing of resources
- focus on user-centric innovation
- exploration of the complementarities between fixed-wireless, mobile and short-range wireless technologies
  - how to best combine future 3G technologies with new WWAN technologies, e.g. WiMax or Mobile-Fi, and how to best reap benefits of new short-range technologies through standardization and promotion
- examination of potential of fixed-wireless & 3G as means to connect underserved areas

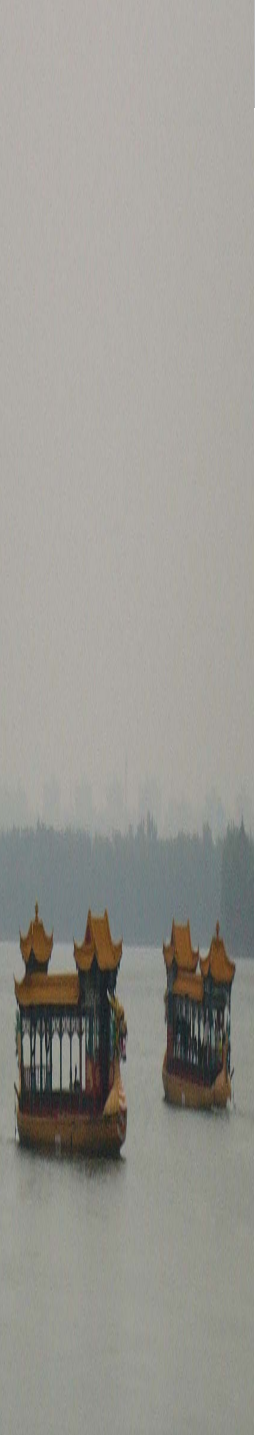


# regulatory opportunities for the Chinese market:

- consideration of pro's and con's of a **CPP** system (especially in light of the Little Smart service) to stimulate market
- final decision on licensing of 3G
- examination of the advantages of relaxing **pricing** controls on services, in addition to availability of low-end cheap handsets
- continued stimulation and promotion of **local digital content** market to increase take-up of mobile data services
  - key strategic advantages: low PC penetration.  
linguistic/cultural homogeneity



# mobile ubiquity: social and public policy impacts



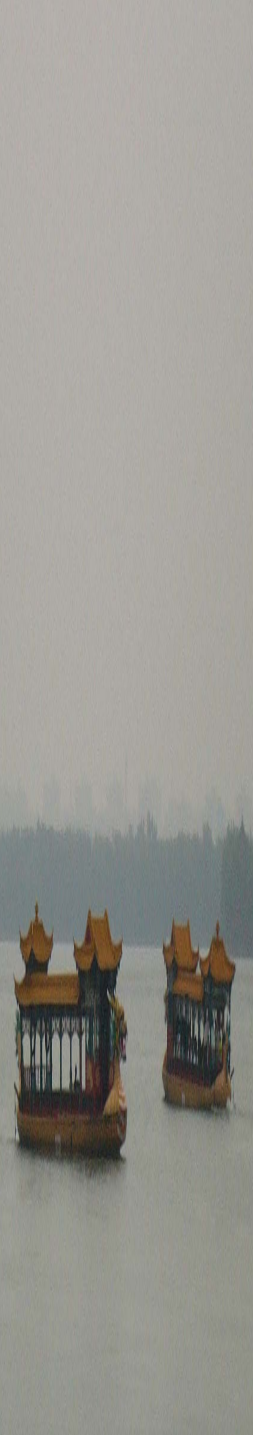
# new technologies, new languages

- plain old telephones required us to learn to communicate without visual clues
- e-mail required us to be less formal in written communication, and to speed up our “response time”
- mobile phones have taken communication to a different level yet again...
  - contactable at all times?
  - when to end an “SMS” conversation?
  - the future of spelling (the 160-character world)



# changing social norms?

- changing notions of space:
  - public vs. private
  - Forced eavesdropping
  - Loud speak
- changing notions of time
  - punctuality
- keeping options open
- protecting our “tech-savvy” youth
- *always on always there  
always on, **never here?***



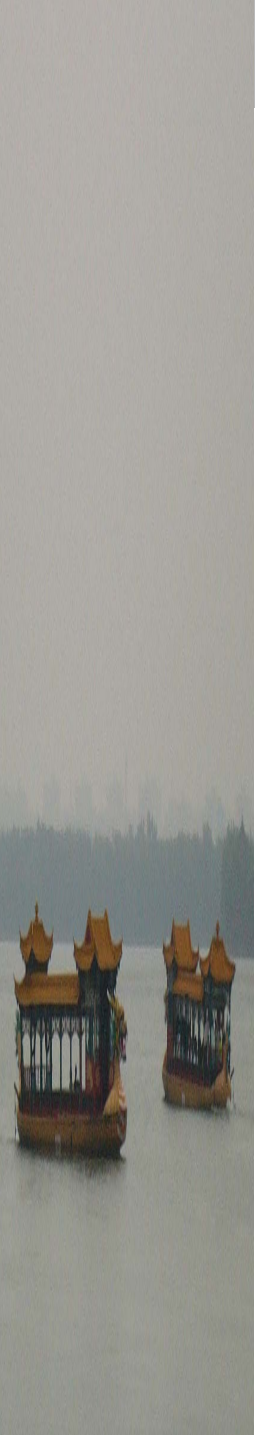
# as mobility becomes ubiquitous, what happens to privacy rights?

- Right to protect private information
  - At the *device end*, little use made of PIN; new developments are more hi-tech e.g. fingerprints, biometric sensors
  - At the *network end*, privacy guidelines are not clearly defined
- Right to freedom from interference
  - Unsolicited messaging over mobiles (mobile spam) is a growing concern



# RFID raises further concerns about protection of private info

- Based on uncertainty of status of tag information after purchase
  - strong opposition, e.g. by CASPIAN, EPIC, EFF
  - led to Benetton cancelling its RFID plans
- public sector organizations now becoming more aware of problem, e.g. EU Data Protection WP
- however, there are differing notions of privacy across cultures





# Right to freedom from interference: *mobile* spam

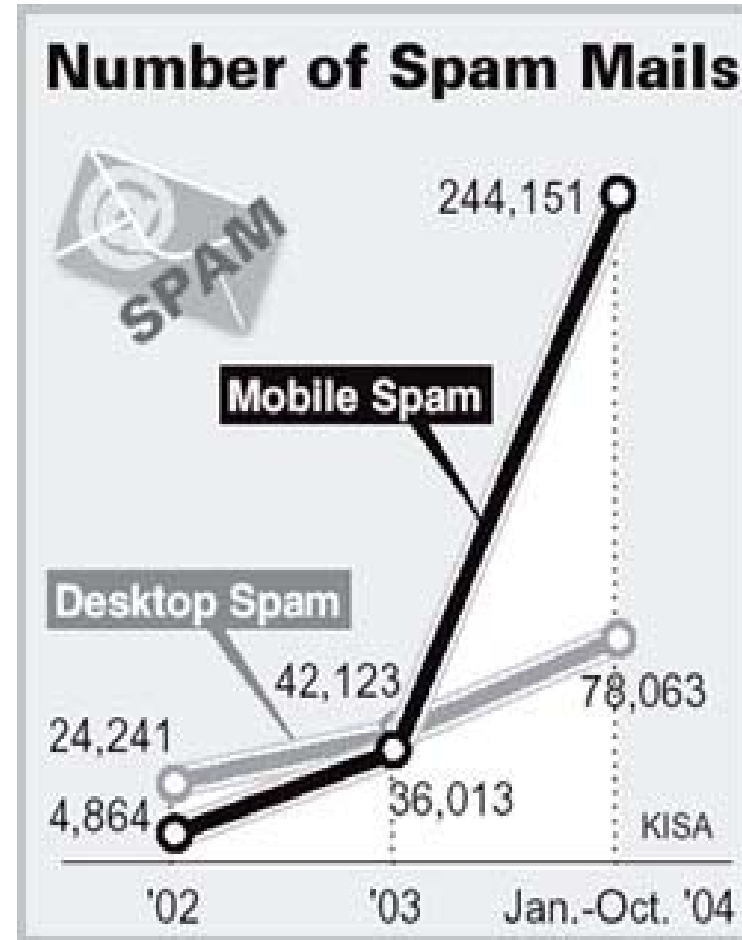
- can be defined as messages of an unsolicited nature delivered to mobile handsets, which:
  - try to sell something to the user;
  - ask the user to call a phone number , which may be a premium-rate service
  - destroy or change handset settings
  - are simply messages of a commercial nature that intrude upon a user's right to privacy and/or carry harmful content
- Mobile spam is potentially more threatening than fixed-line spam



# is *mobile* spam a reality”?

- yes
- advanced mobile economies are more affected
  - e.g. Korea, where mobile spam overtook fixed e-mail spam in 2003
- but m-spam is already becoming a nuisance in a wider range of countries

## Korean situation



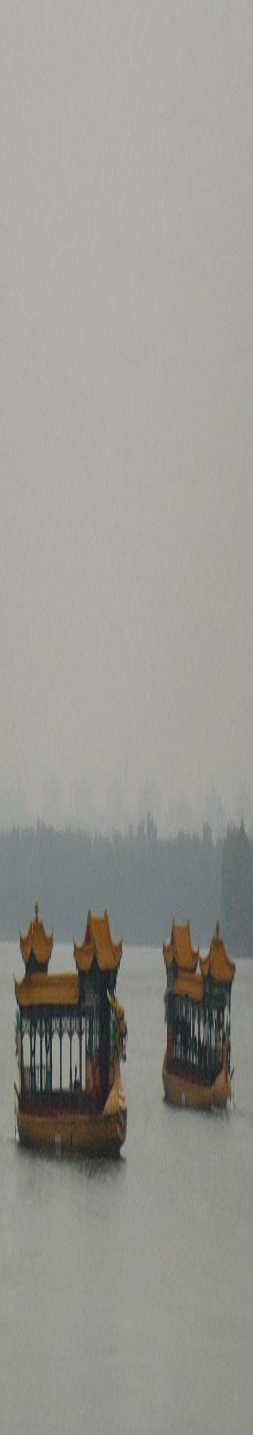
Source: KISA

# ubiquity and social norms: a balancing act

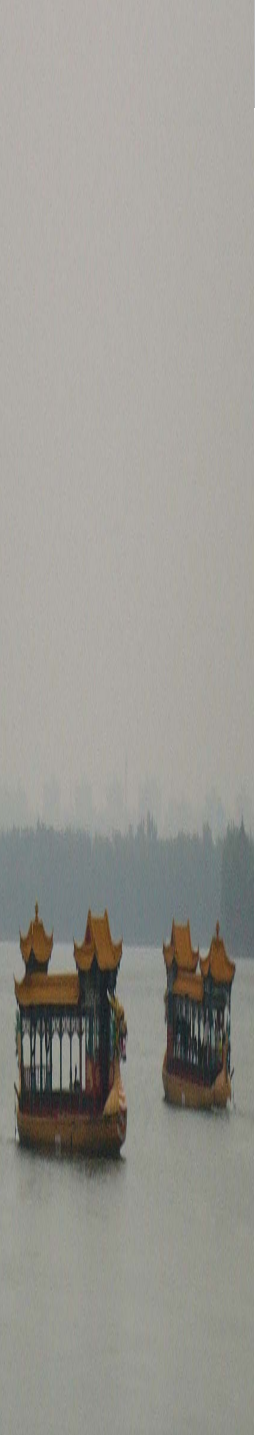
- increase in quality of life
- better personal security
- more streamlined business processes

... but also:

- implications for privacy
- potential for information overload?
- (perceived) societal/individual surveillance
- impact of technology on human relationships and intimacy



# concluding points



# The road to true ICT 'ubiquity' holds many challenges ahead...

- technical challenges
  - harmonization, standardization
  - efficient use of spectrum
- economic challenges
  - creating economies of scale
  - stimulating competition
- public policy challenges
  - how to allocate/license spectrum & govern resources
  - how to protect data and limit harmful content
- social challenges
  - privacy protection (also a regulatory challenge)
  - impact on human behaviour and social interaction



## but it is a road with countless possibilities too:

- the benefits of ICTs could be extended to a growing population of the world, to reach “the last billion”, increasing info access and prosperity
- the health of the aged or infirm could be easily monitored through use of wireless sensors
- tiny tags on everyday items and money could reduce level of fraud/theft of cash and goods
- mobiles could scan any medication (or food) in order to avoid contra-indications and allergies
- shoppers would no longer stand in line at the store as payment would be automatic as they exit
- intelligent homes turn your A/C on & cook the evening’s meal before you come home from work!



*road is made by people walking on the ground*

路是人踏出來的



# *Xie Xie !*

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