

Network Paradigm Shift

(From “Telephone era” to “Broadband/IP era”)
~Realization of ubiquitous network society~

Keiichiro Seki
Director, International Economic Affairs Division
Ministry of Internal Affairs and Communications

1. Introduction

Advancement of Information & Communications Infrastructure

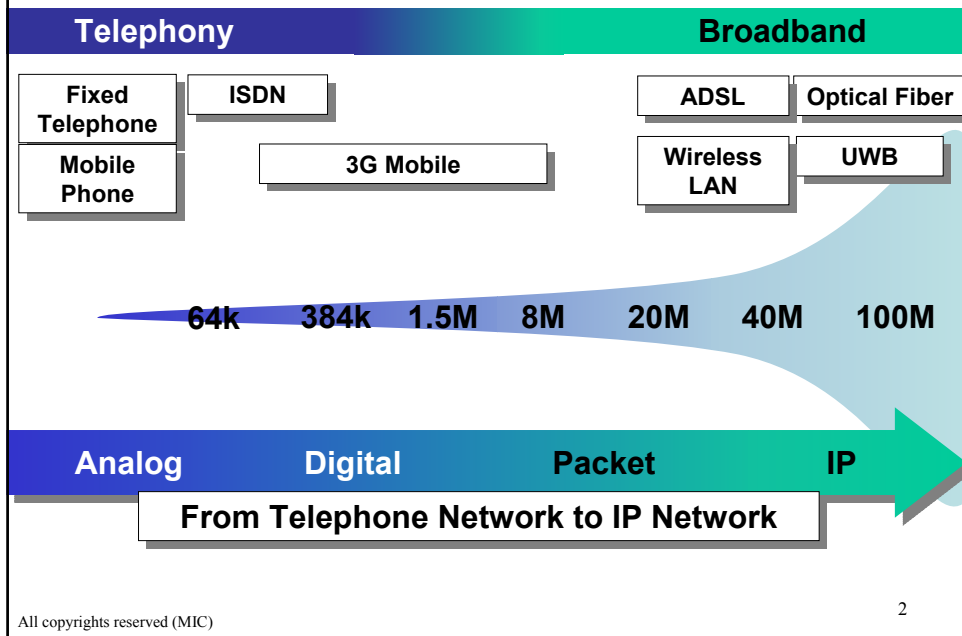


Image of Paradigm Shift

Transformation of Market Structure Accompanied by the Development of Competition and Technological Innovation

From Telephony to Broadband

- Together DSL, cable and FTTH, 16.9 million broadband subscribers (1.6 million for FTTH)
- Due to the thorough open network policy (including unbundling of optical fiber), a broad range of services competition has developed
- From metered rate to flat rate

From Fixed to Mobile

- In Nov. 2000, subscribers of mobile services exceeded those of fixed telephone services
- Out of 82 million mobile subscribers, 86% can use mobile Internet and 20% use 3G mobile
- Mobile phone evolves as "multifunction location-free terminal."

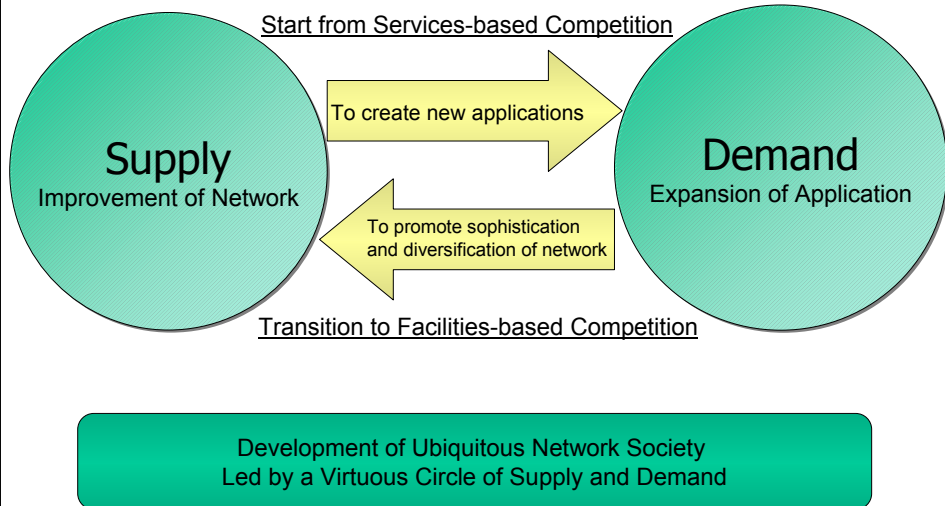
Convergence of fixed and mobile network

Ubiquitous network society

Wire/Wireless seamless broadband is realized.
Network access is available anytime, anywhere, with anything and by anyone.

Drivers for network development

Relationship between Supply and Demand



Players in Network Paradigm Shift

- Make rules to make competitive market - **government**
Interconnection, unbundling, collocations, etc
- Stimulate demands by setting reasonable prices
— **carriers/operators**
- Discover new demands and ways of using new network
— **private/corporate users and suppliers**
- Prepare applications corresponding to the new demands
— **suppliers of applications and contents**
- Develop more advanced network
— **carriers/operators**
- Take policy measures adequate to newly emerging issues
— **government**
privacy, security, intellectual property, unfair enclosure, etc

2. Current Status of Market in Japan

6

Broadband & Mobile Internet in Japan

Figure 1. International Comparison of Broadband Fees per 100 kbps (July 2004)

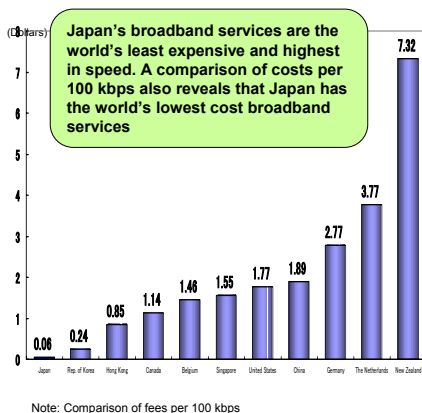
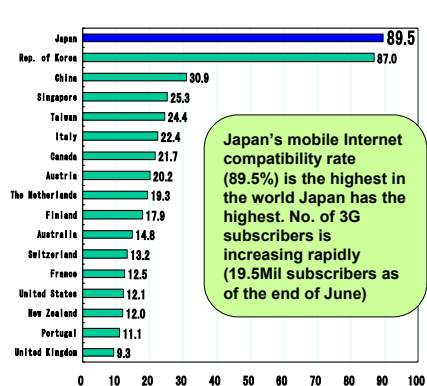
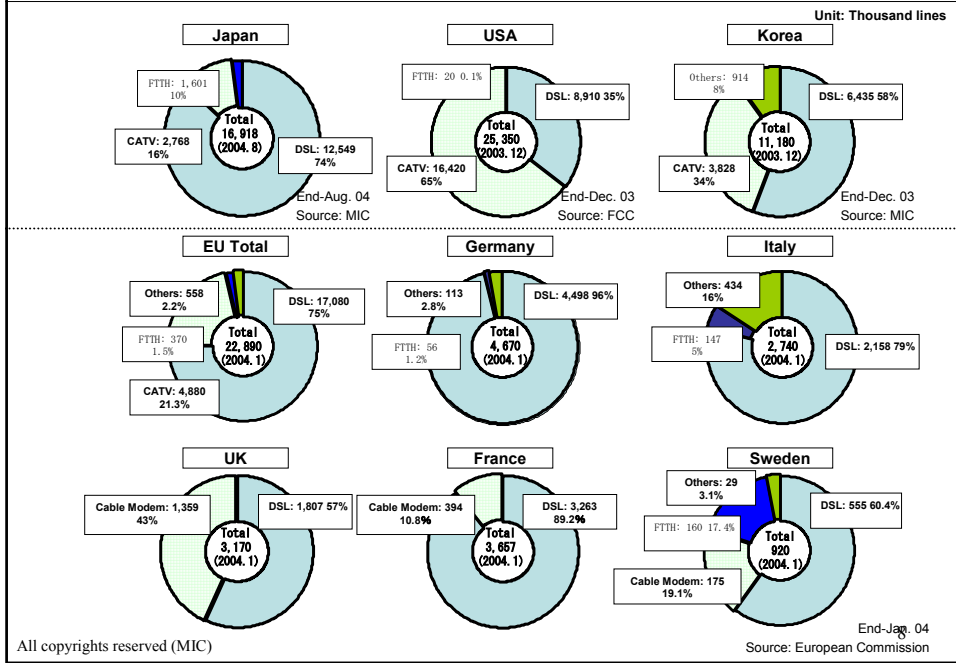


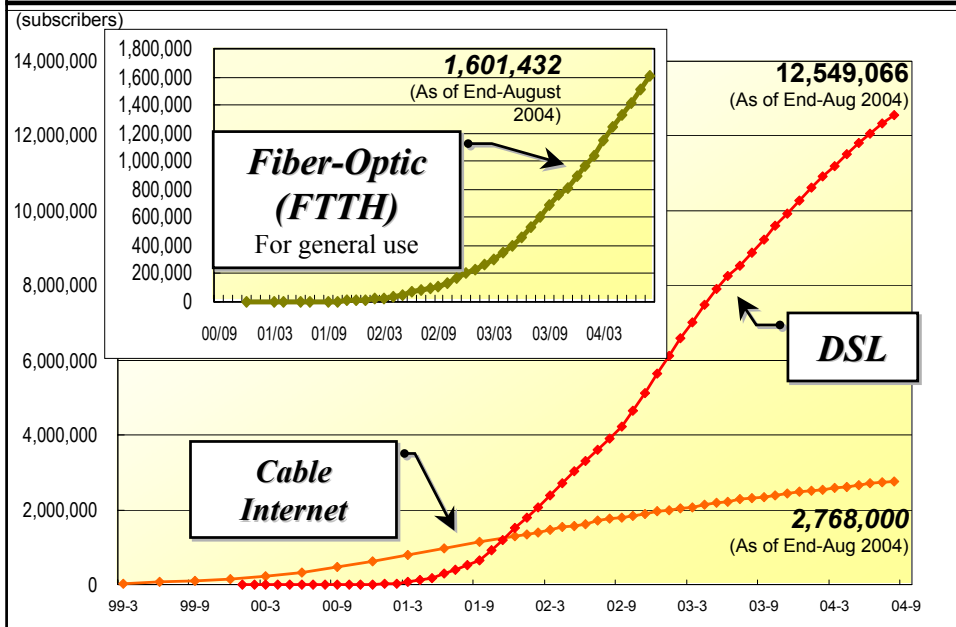
Figure 2. Mobile Phone Internet Compatibility Rates* in Leading Countries (September 2003)



Broadband Market

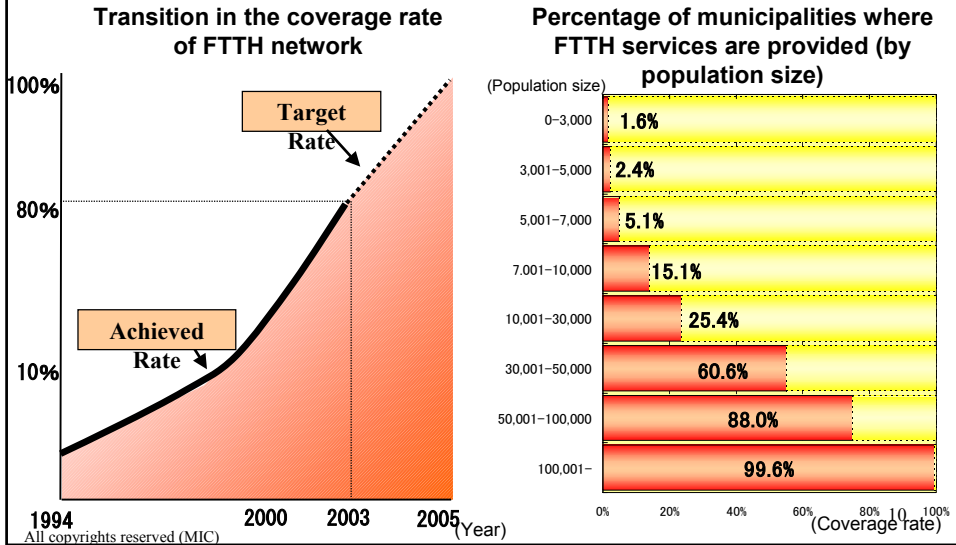


Increase in the Number of Broadband Subscribers in Japan

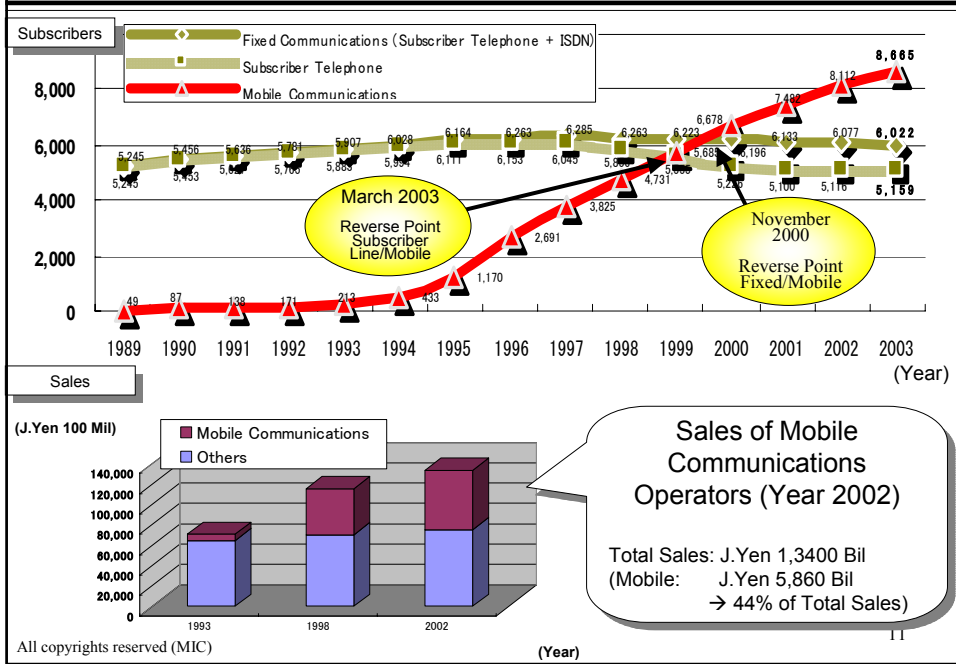


Present Status of the Deployment of Optical Fiber in Japan

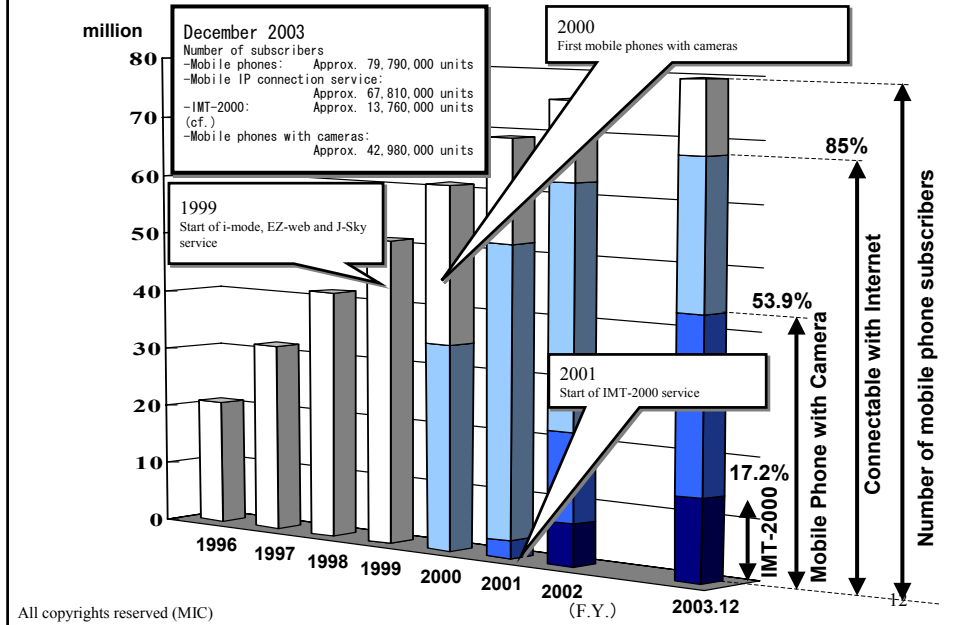
National average of coverage rate of FTTH network is 80% and FTTH services are widely provided especially among urban areas.



Rapid Diffusion of Mobile Communications

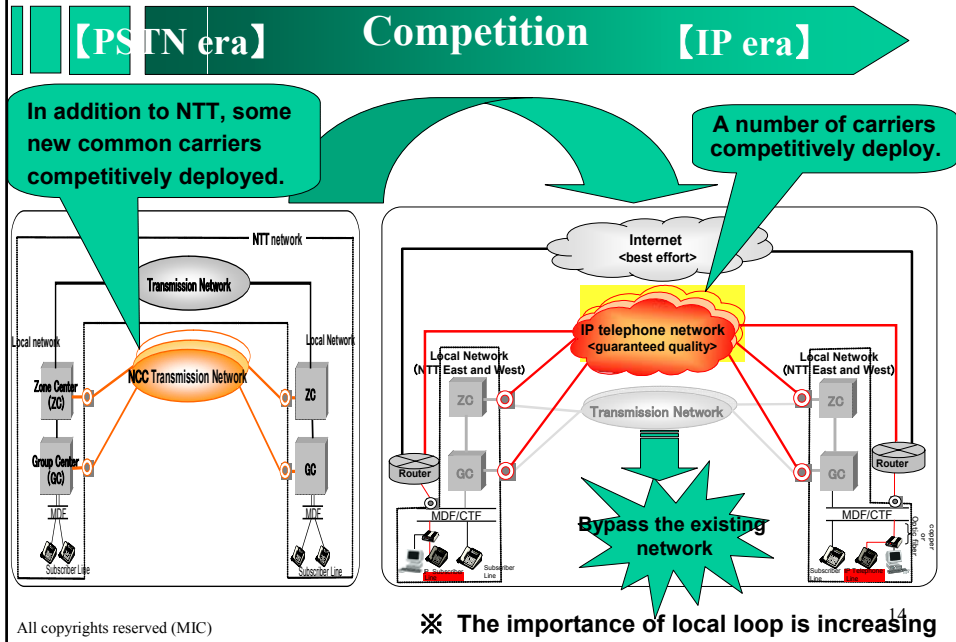


Changes in the number of mobile phone subscribers



3. Withering PSTN and expanding IP Network

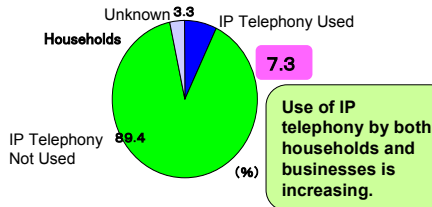
Shift of network structure (Telephone · Public corporation → IP · Competition)



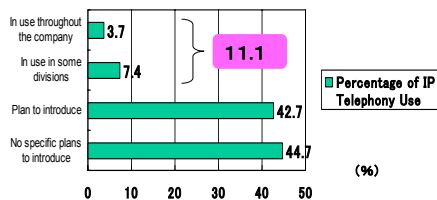
Diffusion of VoIP

◇ IP telephony has been introduced in 7.3% of households (total: 47.1 million in 2000) and 11.1% of businesses (as of the end of 2003).

Introduction of IP Telephony



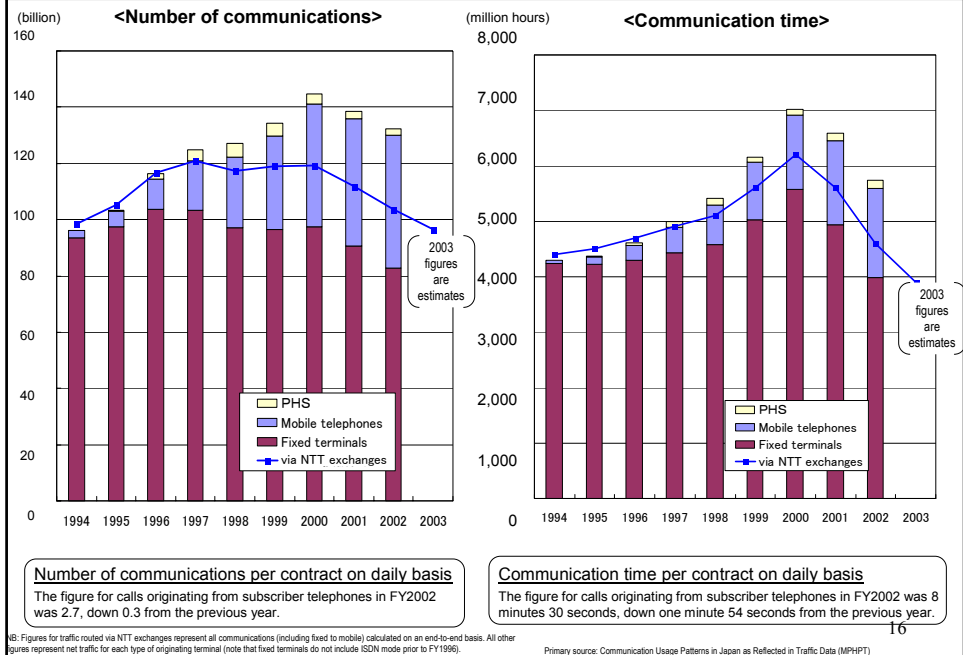
Businesses



Source: Survey of Communications Usage Trend Survey in 2003, MIC

◇ Business use categories are 1) VoIP connection between branches, 2) integration between voice and data services through LAN, 3) VoIP connection with outside lines and 4) introduction of IP Centrex services.

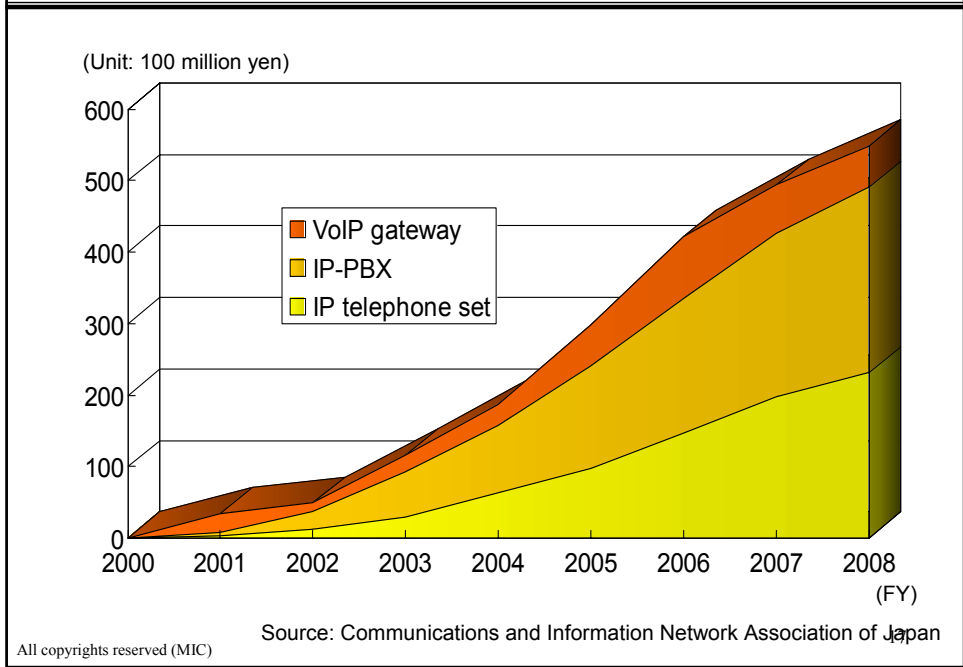
Reduction of PSTN traffic



NB: Figures for traffic routed via NTT exchanges represent all communications (including fixed to mobile) calculated on an end-to-end basis. All other figures represent net traffic for each type of originating terminal (note that fixed terminals do not include ISDN mode prior to FY1996).

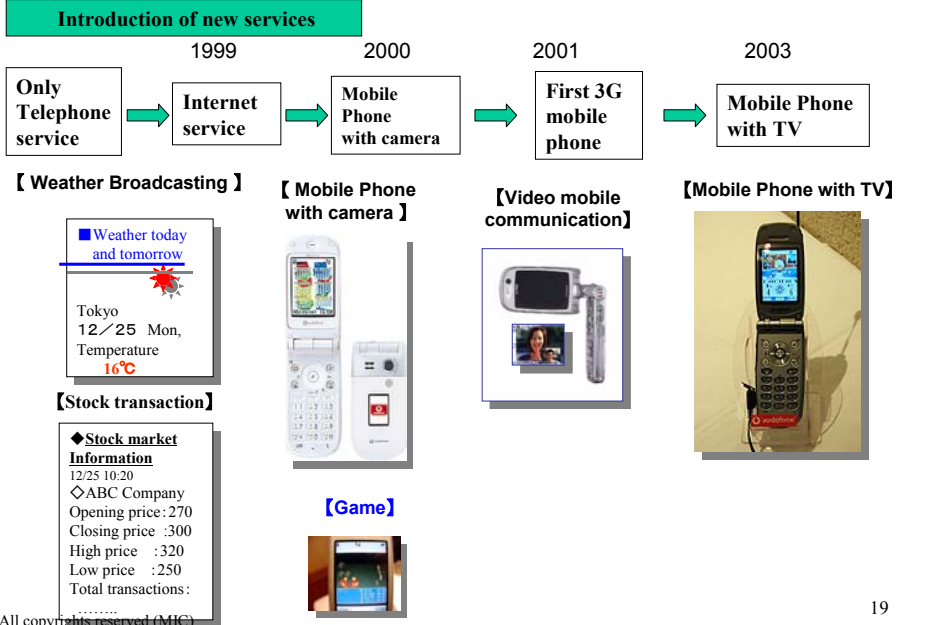
Primary source: Communication Usage Patterns in Japan as Reflected in Traffic Data (MPHPT)

Transition in the Market of VoIP Equipment for Corporate Use



4. Developments of Mobile and Wireless Communications/ Fixed-Mobile Convergence

Development of mobile communication



Future Services Using Mobile Phones

E-cash



Take your shopping item to the cash register



Insert money into the machine in the store. Deposit e-cash into your mobile phone

Hold your mobile phone in front of the reader at the cash register to pay by e-cash.

Key



Press the button while holding your mobile phone in front of the lock to open and close the door.

Train pass and tickets



Deposit e-cash at the ticket machine or through the Internet. Hold your mobile phone in front of the automatic ticket machine to pay automatically.

All copyrights reserved (MIC)

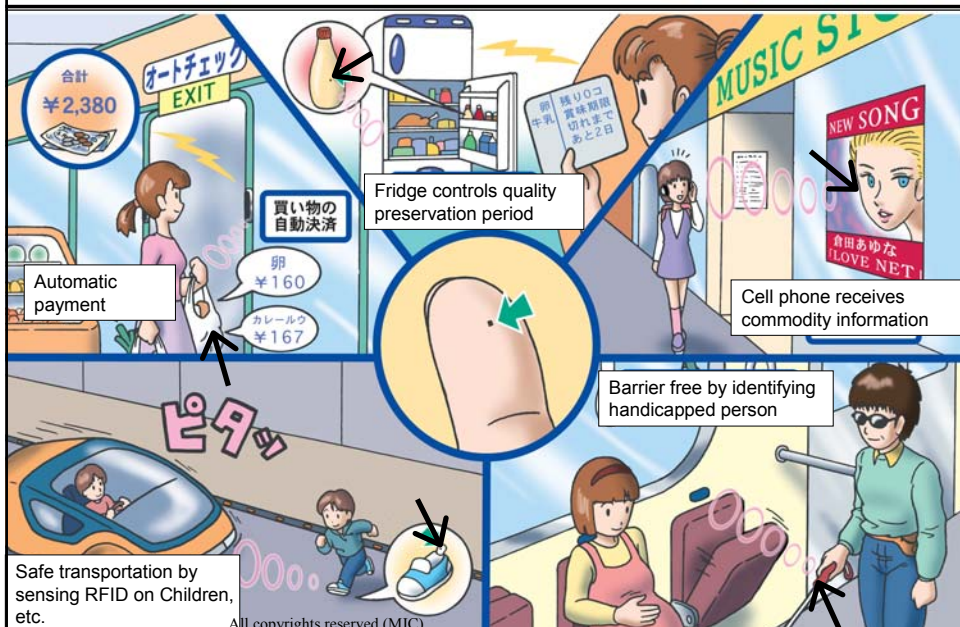
Concert tickets



Receive movie tickets through your mobile phone and hold it over the machine at the theater.

Ref: Mobile Watch

RFIDs in ubiquitous network



Impact on Competition and Business caused by Move to IP

Characteristics of IP Technology

- “Everything on IP” – Various contents and applications are developed on IP
- “IP on Everything” – Various infrastructure is deployed based on IP
- Distributed, not centralized, network architecture and multi-proliferation

Great Impact on the State of Competition and Businesses

Positive Impact

- Inexpensive network facilities compared with PSTN and Market entry without huge capital
- Cheaper/Flat fees
- Expanded business opportunities by advanced services utilizing IP

Negative Impact

- Dramatic decline in sales and traffic of traditional fixed telephone service
- Difficult maintenance of PSTN and crisis in ensuring universal service
- Unstable quality and reliability
- Vulnerable security

New ICT Policy is necessary to respond to new situation affected by the move to IP.

All copyrights reserved (MIC)

Development of VoIP and Policies to be Considered

	First Stage	Second Stage	Third Stage
Development of VoIP	Alternatives at lower price	Integrated services with text, video, image, business applications, etc.	
Main Goals	Diffusion of VoIP	Replacement of PSTN	Integrated and further advanced service → Ubiquitous network
Relation to PSTN	<p>[Profitable area] Dual contract with PSTN and VoIP (dependent on PSTN to make emergency)</p> <p>[Rural Area] Only PSTN → Increase burden to maintain PSTN</p>	<p>[Profitable area] Only PSTN VoIP+PSTN } Coexistence</p> <p>[Rural Area] → How to maintain PSTN?</p>	<p>[Profitable area] VoIP</p> <p>[Rural Area] Transition to VoIP ? “Universal service” → Secure “Access line”</p>
Policies to be considered	Allocation of the designated number for VoIP (050)	<p>1) Same numbering as PSTN</p> <p>2) One-way number portability from PSTN</p>	<p>Policies to promote</p> <p>1) VoIP via wireless LAN</p> <p>2) VoIP via mobile phone</p> <p>3) Convergence of 1) and 2)</p> <p>Dual mode terminal → Full VoIP, etc.</p>
	To ensure emergency calls	To dissolve geographical divide	
	Interconnections between IP networks, quality of service, security, etc. Possible change of competition policy from PSTN era to IP network era		

All copyrights reserved (MIC)

[REF] Universal Service and Digital Divide

Ensuring Universal Service Reflecting Diffusion of IP Telephony

- For the time being, the prospect is that the number of users of IP telephony will keep growing within the number of broadband subscribers and traffic passed by switches will be decreasing.
- However, it is also expected that the number of fixed-telephone subscribers will not fall rapidly.
- Therefore, for at least a few years, IP telephony cannot be a viable alternative for fixed-telephony and it is anticipated that fixed-telephony keep will bearing the role of the "last resort."

In the midst of decreasing investment on PSTN, how to view universal service regarding fixed-telephony?

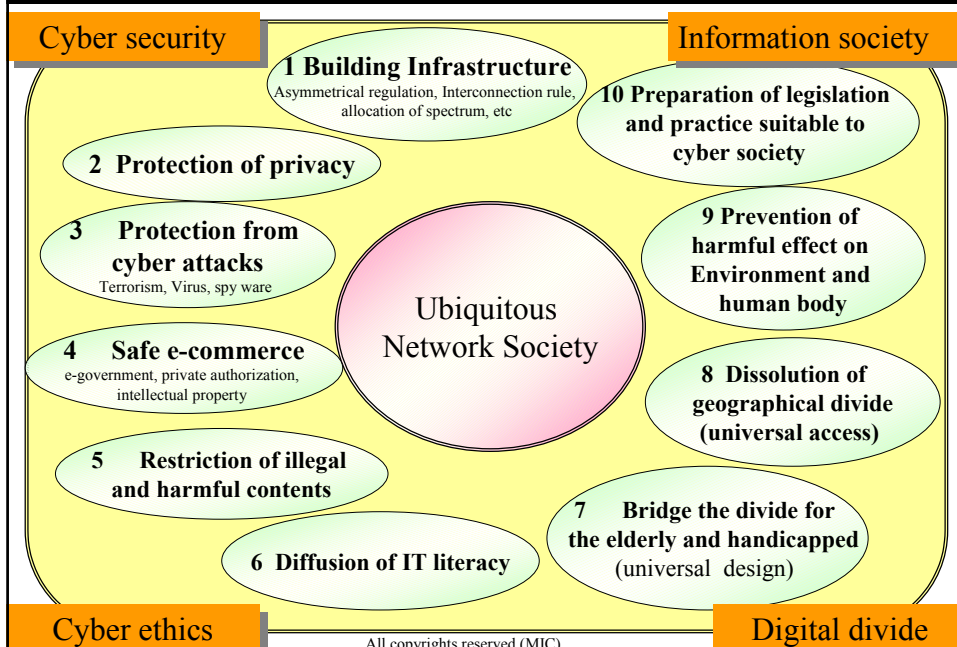
Digital Divide Issues Regarding Broadband and Mobile

- Japan achieved success to some degree regarding diffusion of broadband and mobile based on the principle of private initiatives.
- However, there is the reality that these services have not been sufficiently provided among non-profitable areas, e.g. depopulated areas and remote islands.

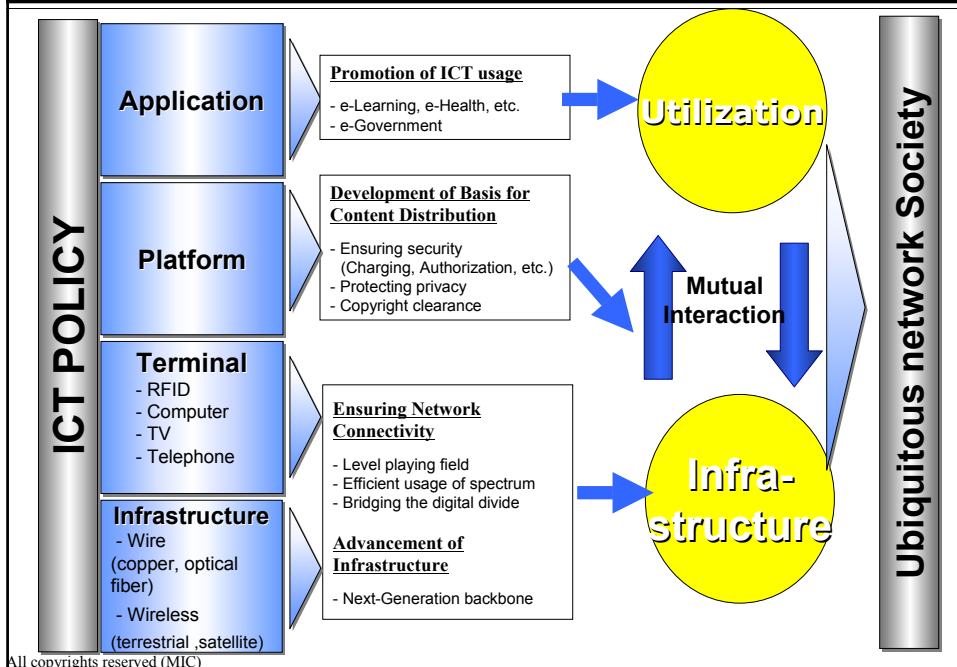
It is necessary to correctly identify the limit of principle of private initiatives and to play the role required of the public sector

All copyrights reserved (MIC)

Problems to be solved for realizing Ubiquitous network society



Cross-Layered and Comprehensive Policy Development



Examples of policy viewpoints in IP era (1)

Ex. 1 Review of telephone-oriented competition policy

- Collapse of long distance business model with emergence of IP network and reconsideration of competition policy presupposing distance-based fire-wall.
- Shift from switch-based interconnections policy to new framework that can smoothly connect different IP networks

Ex. 2 Continuing importance of local loops

- Access lines as a basis for all services
- Shift of goal from 'the scope of Universal *Services*' to 'Securing of Universal *Access*' (Cost burden of physical access lines as a measure of service provision)
- Foresight of interaction between service-based competition and incentives to invest in new infrastructure (including the relation between unbundling regulation and FTTH deployment)

Examples of policy viewpoints in IP era (2)

Ex. 3 Appearance of flat rate business model

- Disincentives to expand communication traffic
- Incentives to enter into markets in other layers in seeking more revenue

Ex. 4 Interactive influence among the markets in each layer

- Appearance of new market structure to promote content and applications by penetration of broadband services
- Desirable interactive stimulation between the provision of content and applications and the deployment of advanced infrastructure
- Distinction between fair business activities and unfair deprivation of users' right of choice
- Careful watch over status of interfaces between each layer, vertical integration, moves to enclose end users, ability to choose and provide content, control of portal or charging system, etc.

Thank you!

Keiichiro Seki

k-seki@soumu.go.jp