“Ubiquitous e-Japan”

- Industrial & Technological Foresight
in the Information & Communication Area -

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Outline

(I) Introduction

(II) Review of industrial impact & technological trend

- II-1) Semiconductor
- II-2) Broadband & Mobile
- II-3) Internet

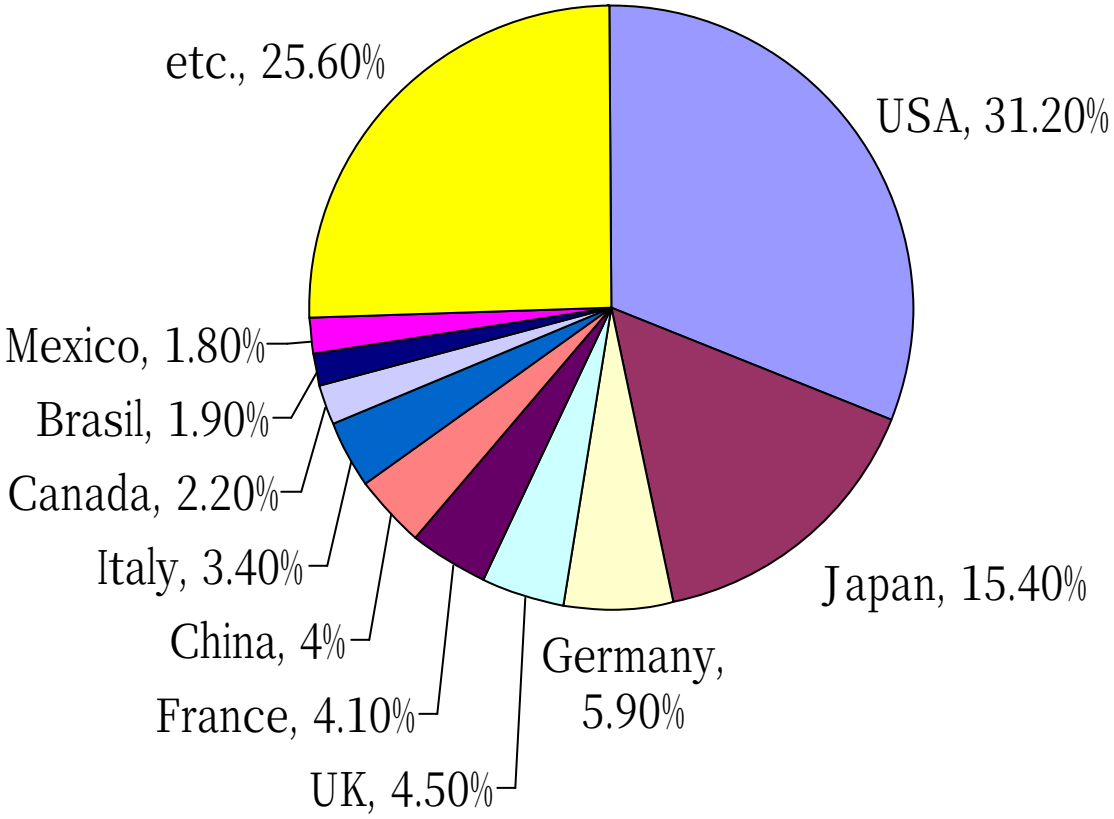
(III) Future perspective

- Ubiquitous network

(IV) Concluding remarks

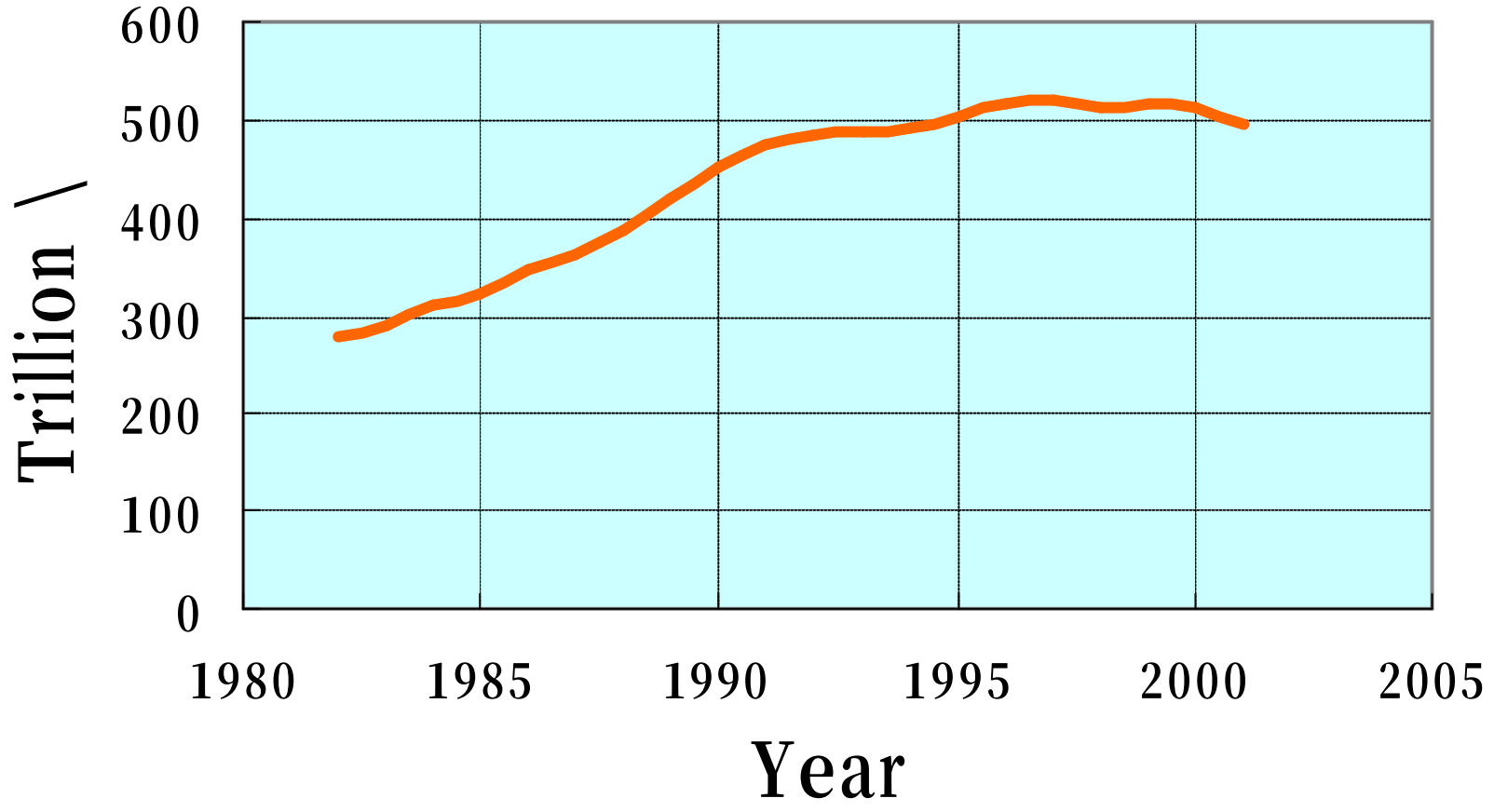
Worldwide GDP

31.5 Trillion $ (2000)



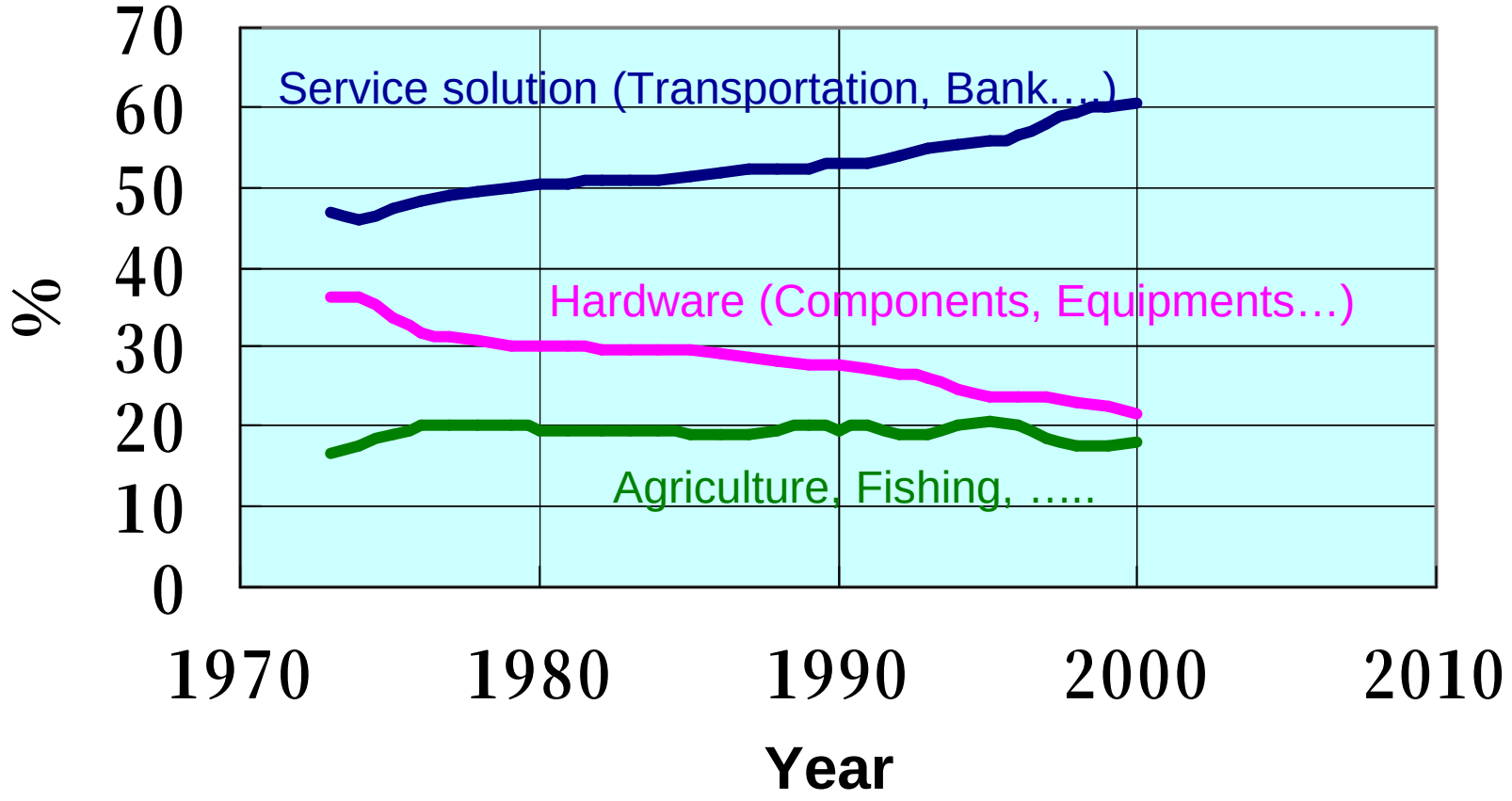
Source: MPHPT

GDP in Japan



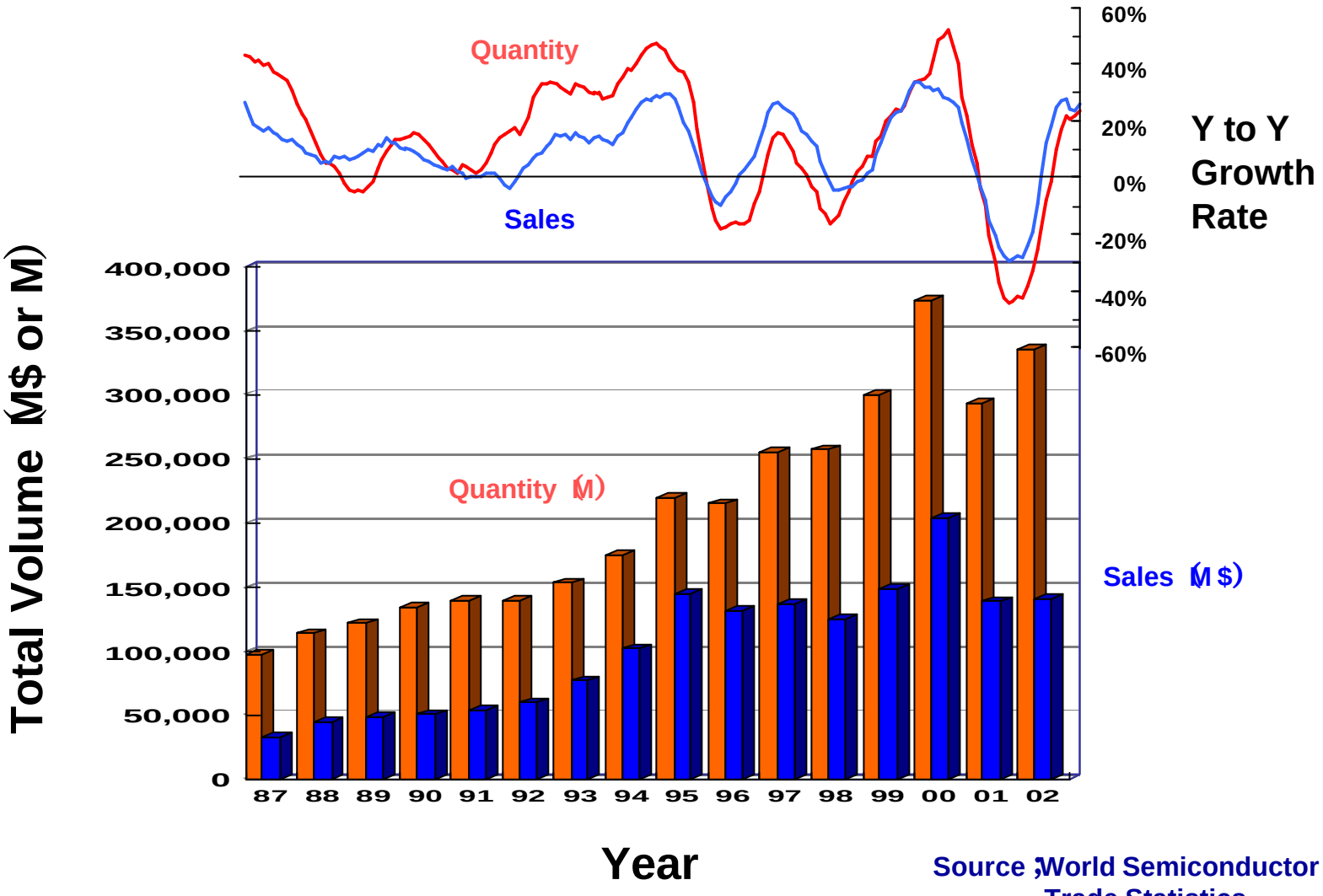
Source: MPHPT

Changing from Hardware to Service Solution



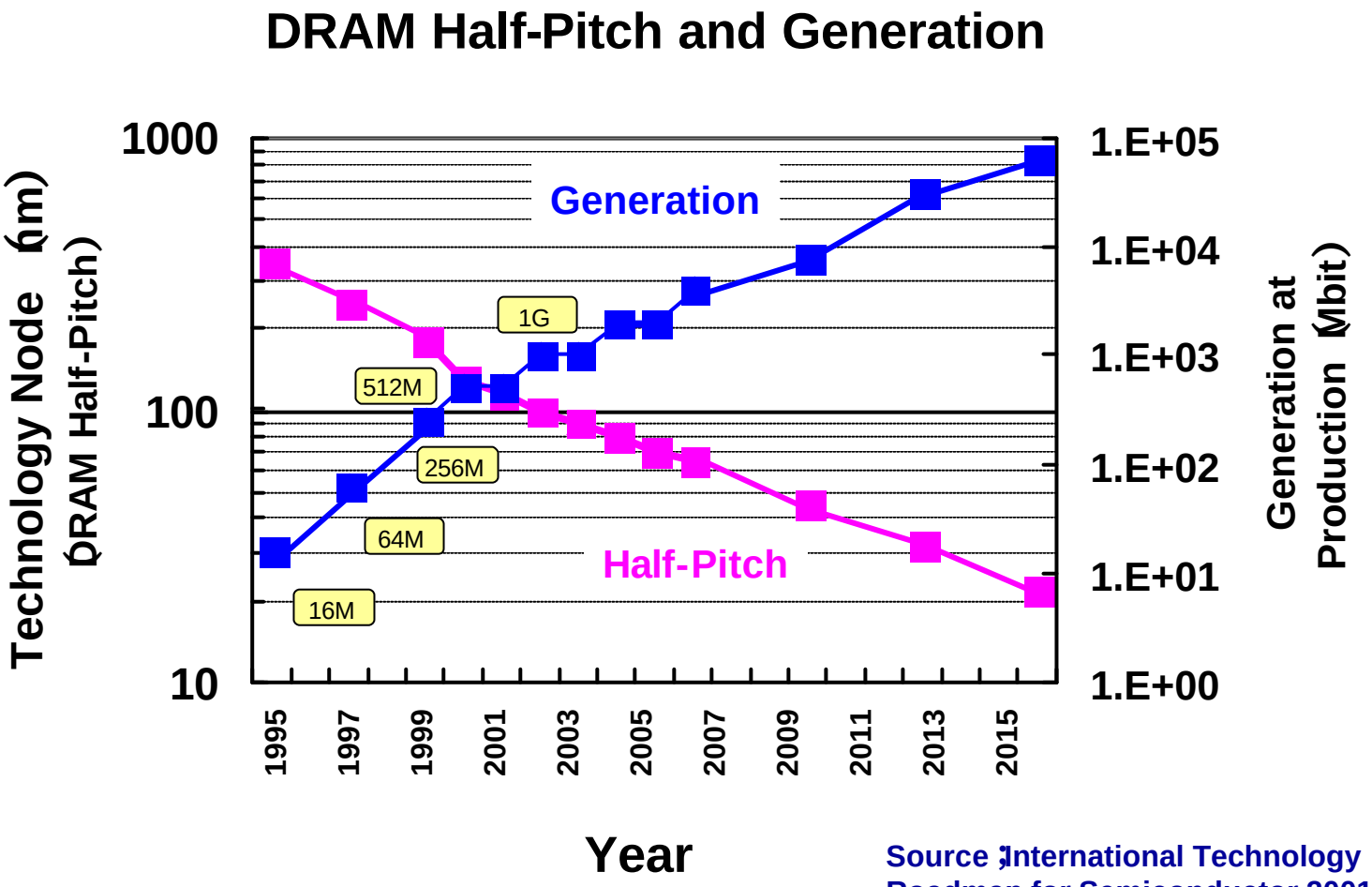
Source: MPHPT

Worldwide Semiconductor Production



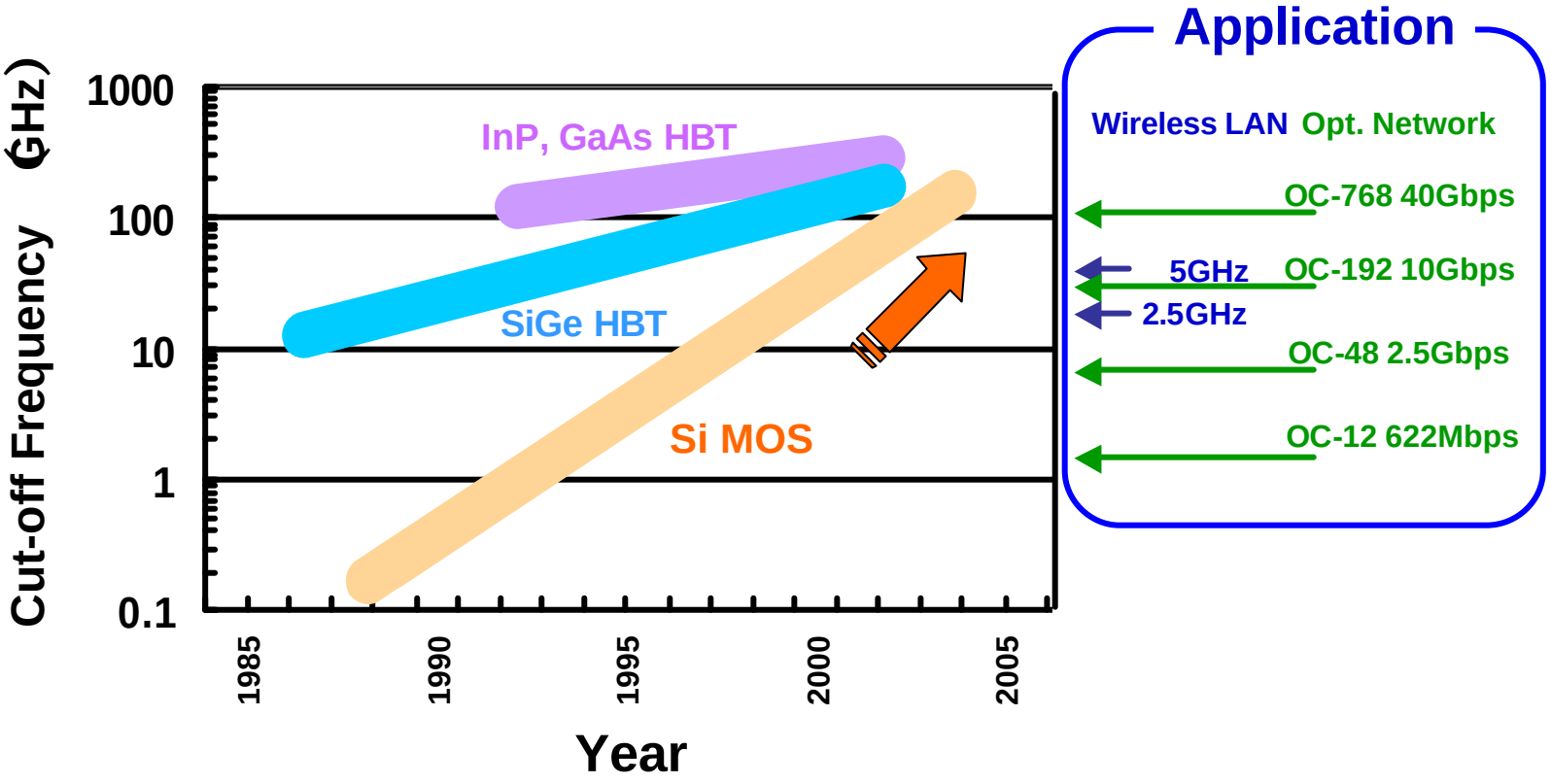
Source ; World Semiconductor Trade Statistics

Technological Challenges Continue



Source ; International Technology Roadmap for Semiconductor 2001

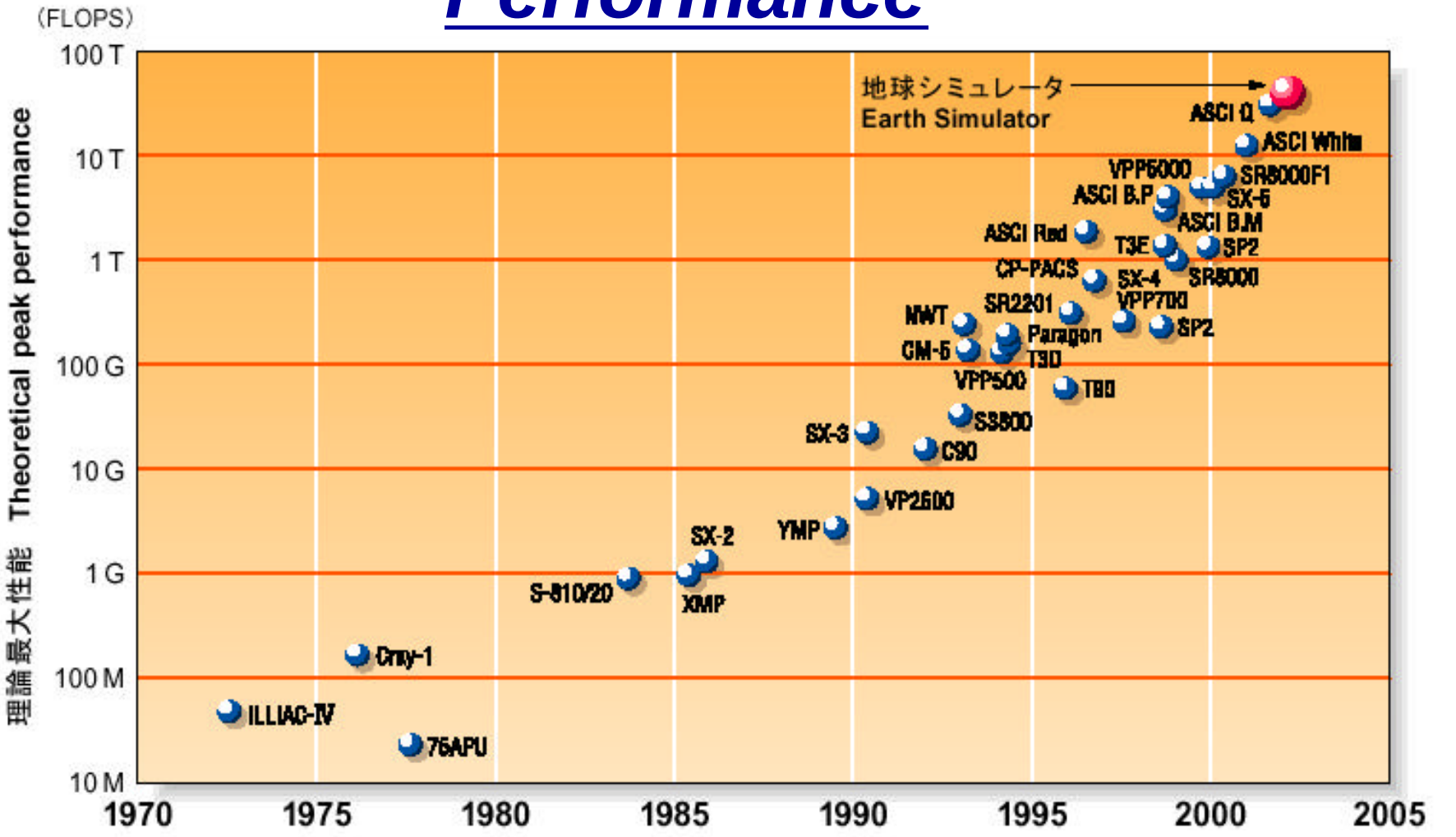
High Frequency Devices



Si MOS is rapidly extending its high freq. performance

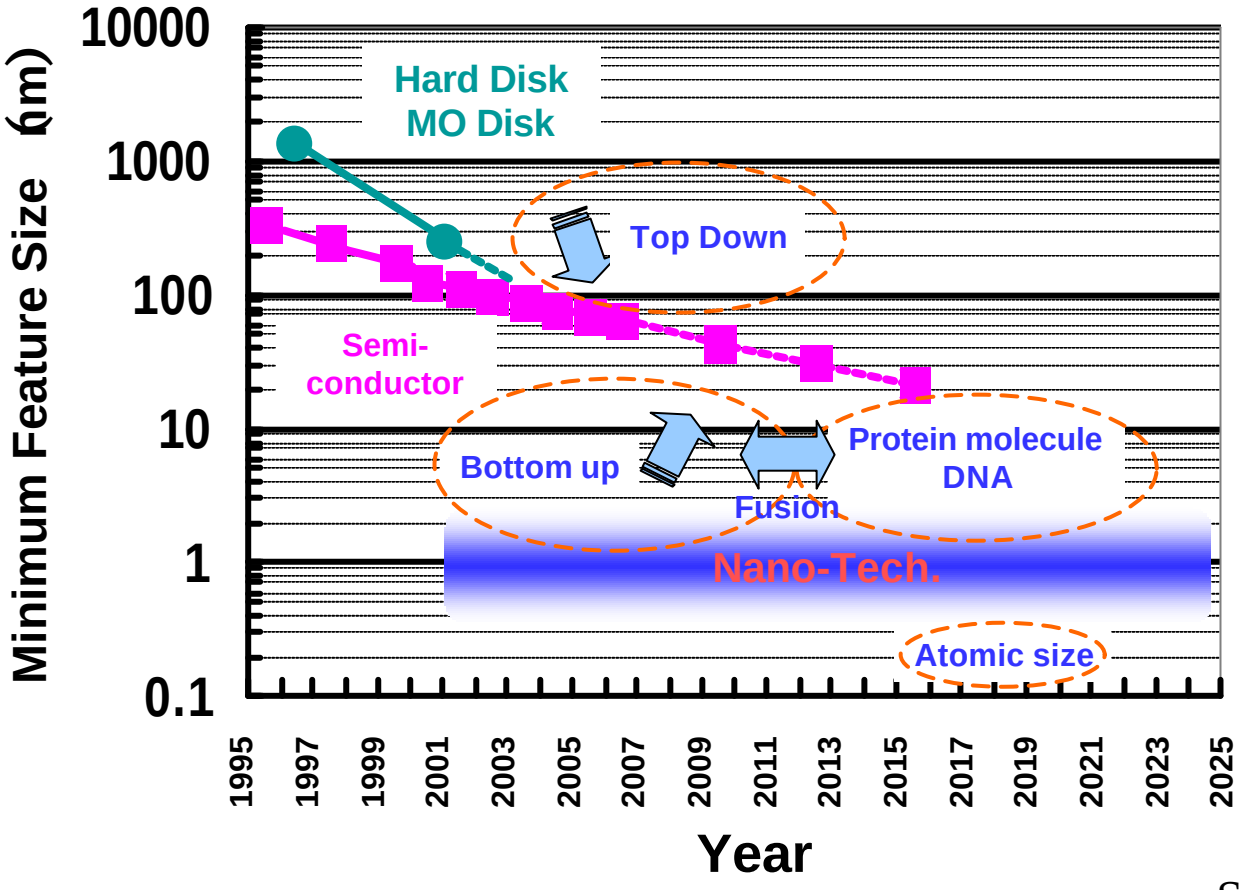
Source: NISTEP

Evolution of High Speed Computer Performance



(Source: Earth Simulator Research and Development Center)

Nano-Technology will give a Break-Through But be Selective



Source: NISTEP

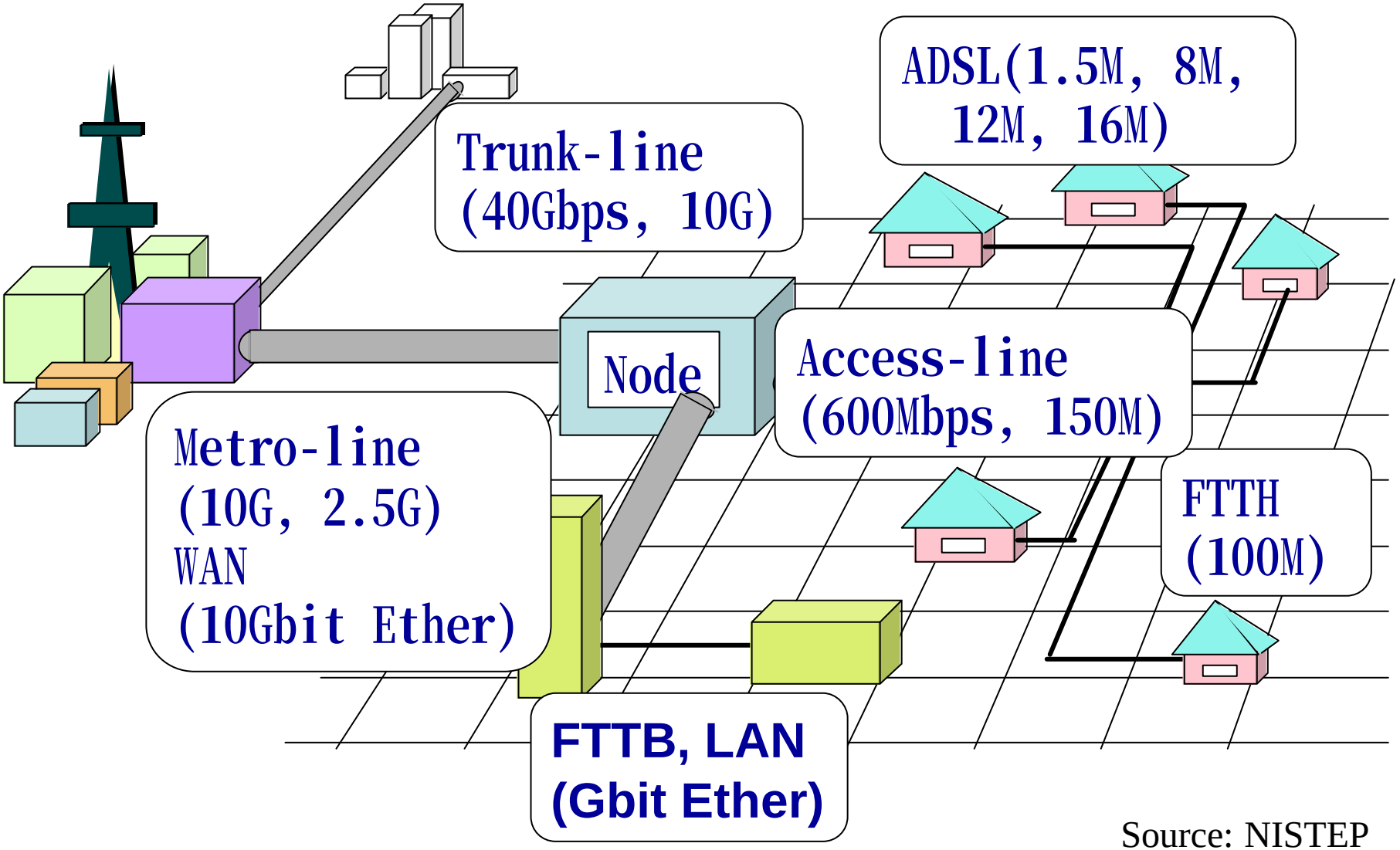
Semiconductor

1. Semiconductor will continue to lead the technology.

2. But will not be the strongest driving force for the industry.

3. Nano-technology is expected to generate a technological break through.

Broadband layers



Source: NISTEP

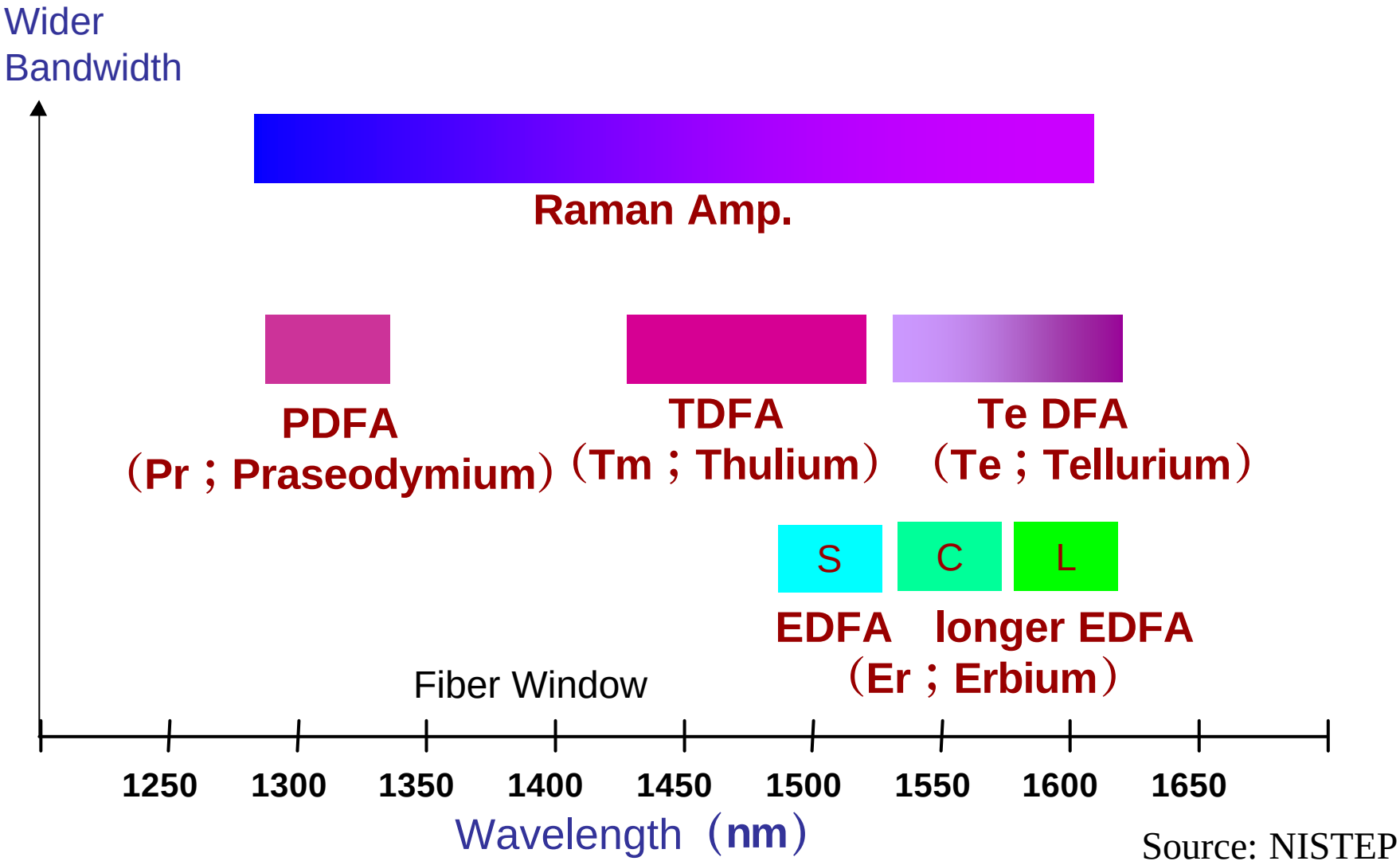
DWDM Jump

Item \ Year	1995-1997	1997-2000	2000-2005	2005-2010
DWDM	4~16 ch	32~176 ch	176~700 ch	~1000 ch
DWDM ch Spacing	400G, 200GHz	100G, 50GHz	50G, 25GHz	25GHz
Bit rate /channel	2.5 Gbps 600M, 150Mbps	10G, 2.5Gbps 600M, 150Mbps	40G, 10G, 2.5Gbps 600M, 150Mbps Gigabit Ethernet	40G, 10G, 2.5Gbps 600M, 150Mbps Gigabit Ethernet
Capacity /fiber	~40 Gbps	320G~ 1.76Tbps	1.76T~ 6.8Tbps	~10Tbps

DWDM: Dense Wavelength Division Multiplexing

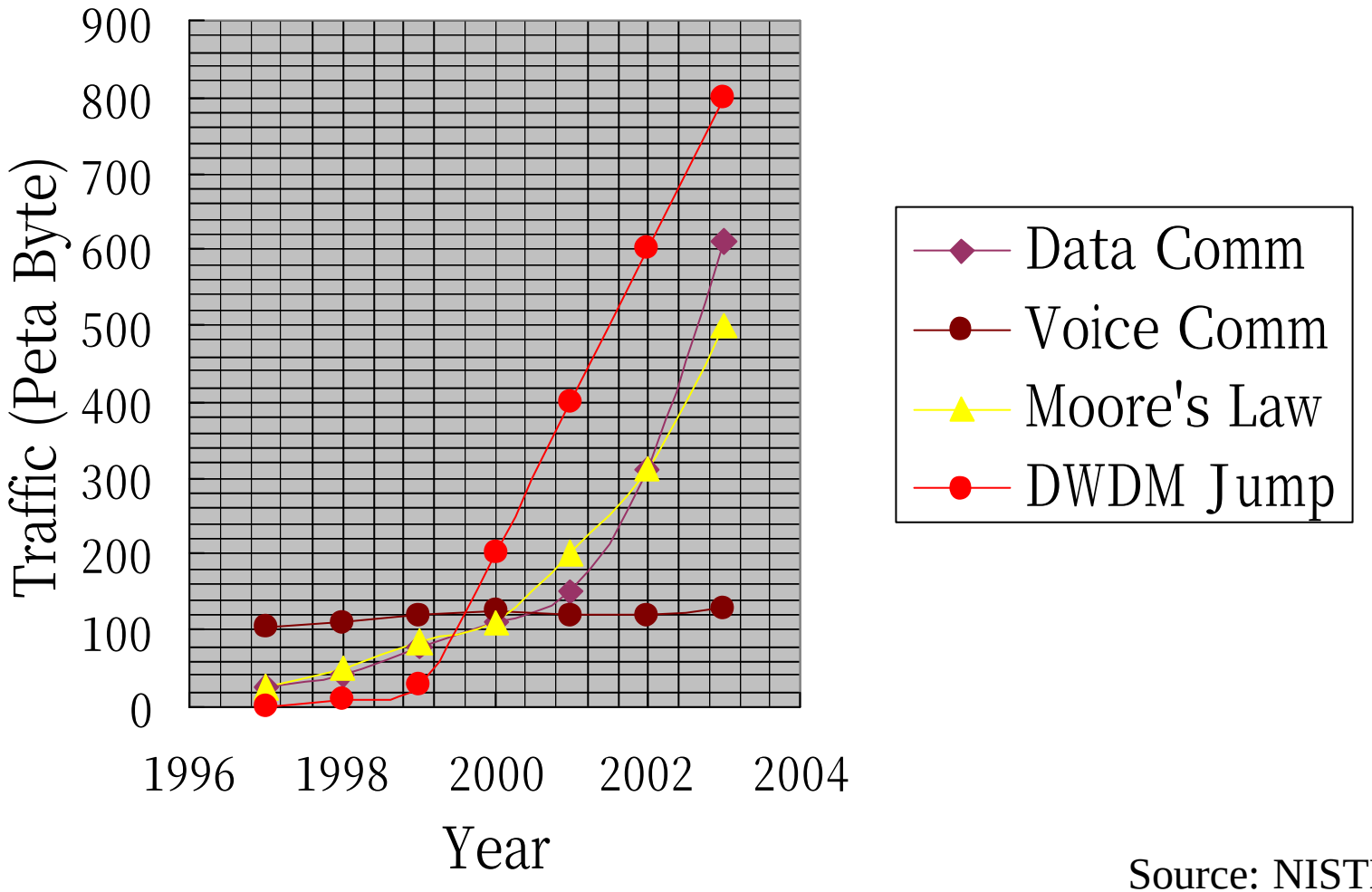
Source: NISTEP

Progress of Optical Fiber Amplifier



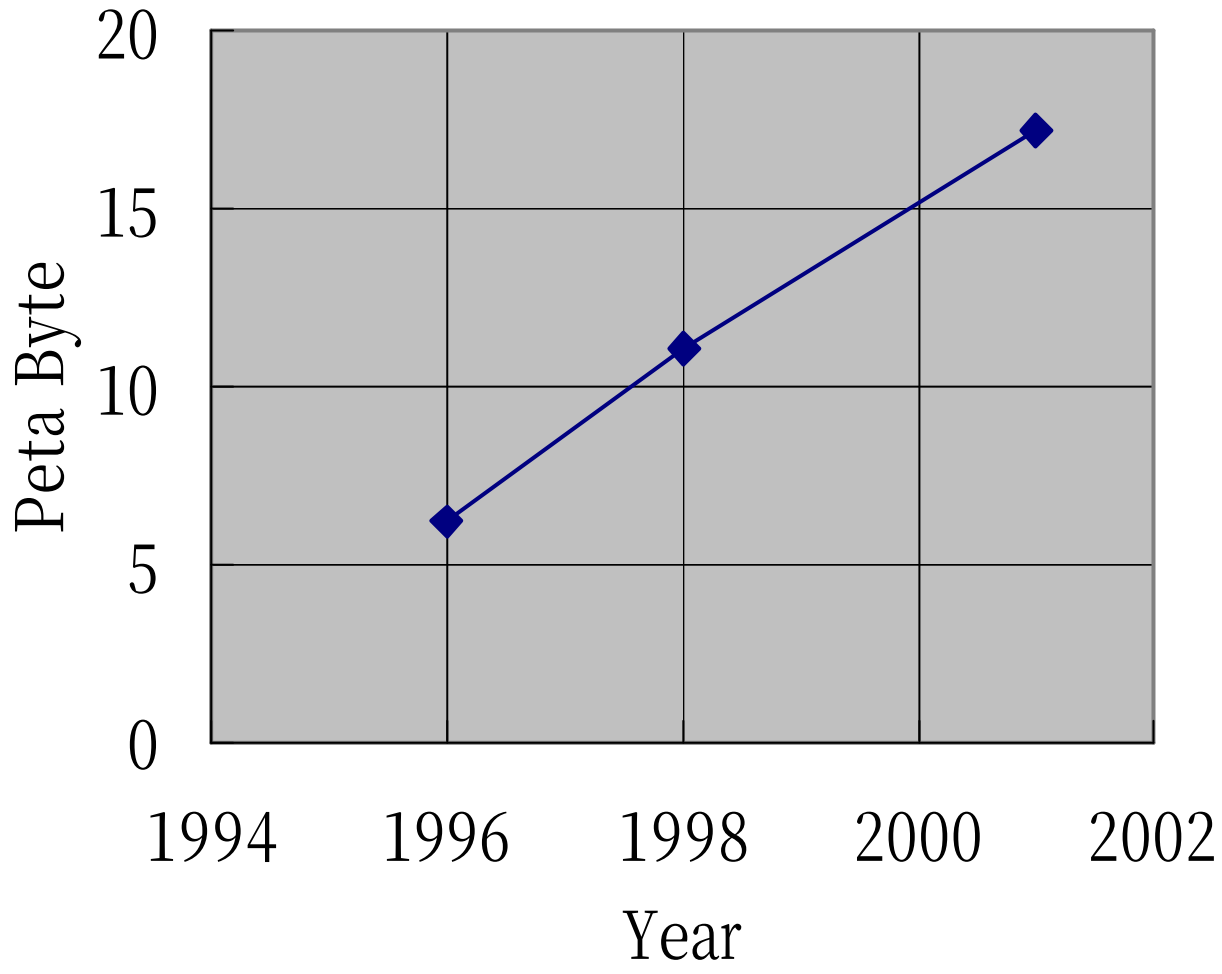
Source: NISTEP

Traffic explosion; More than Moor's Law



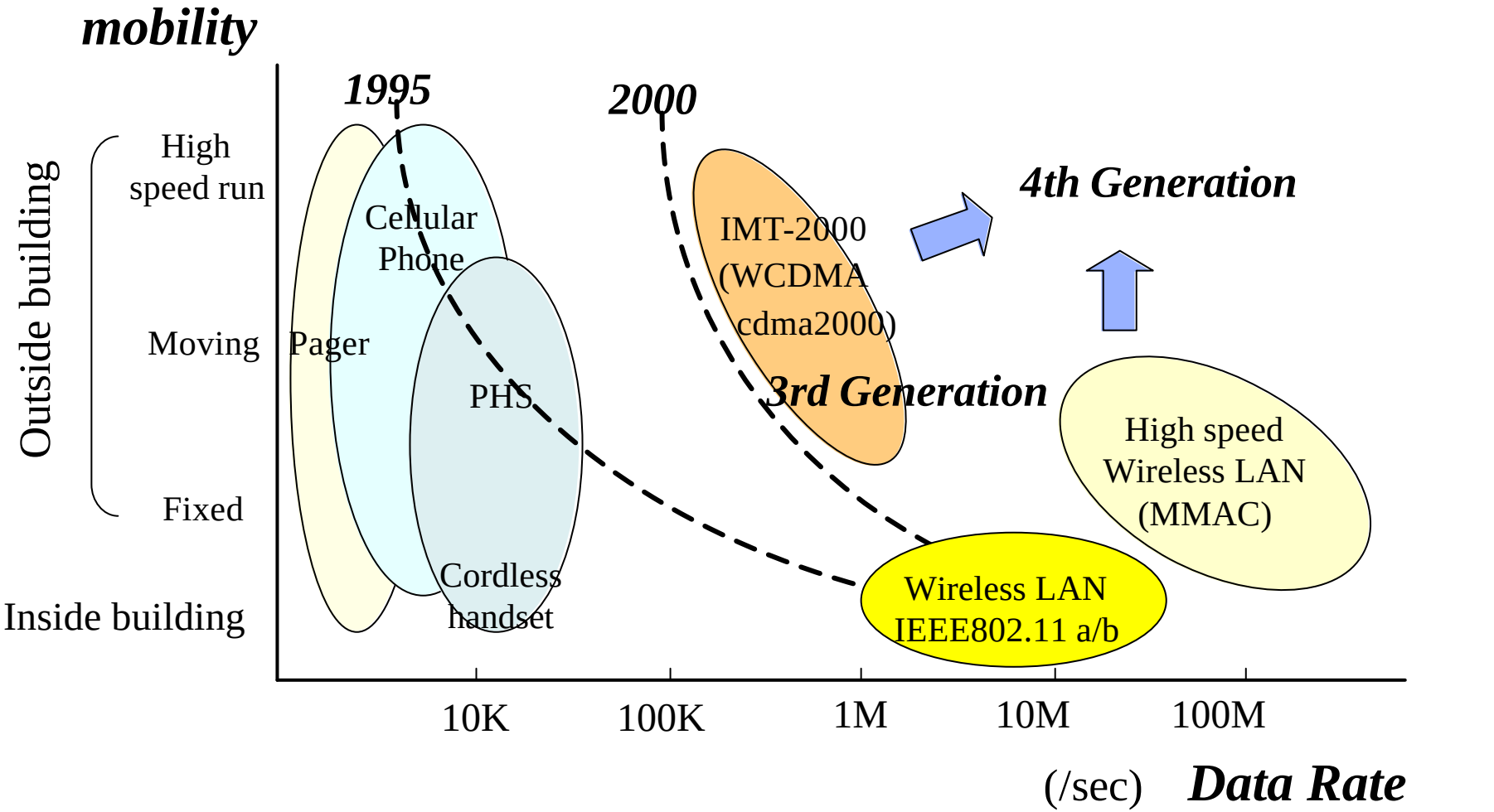
Source: NISTEP

Explosion of Information storage



Source: MPHPT

Evolution of Mobile Communication



Source: Sakata,'Future of Mobile Internet', IPSJ Magazine, Dec.2001

Broadband & Mobile in Japan

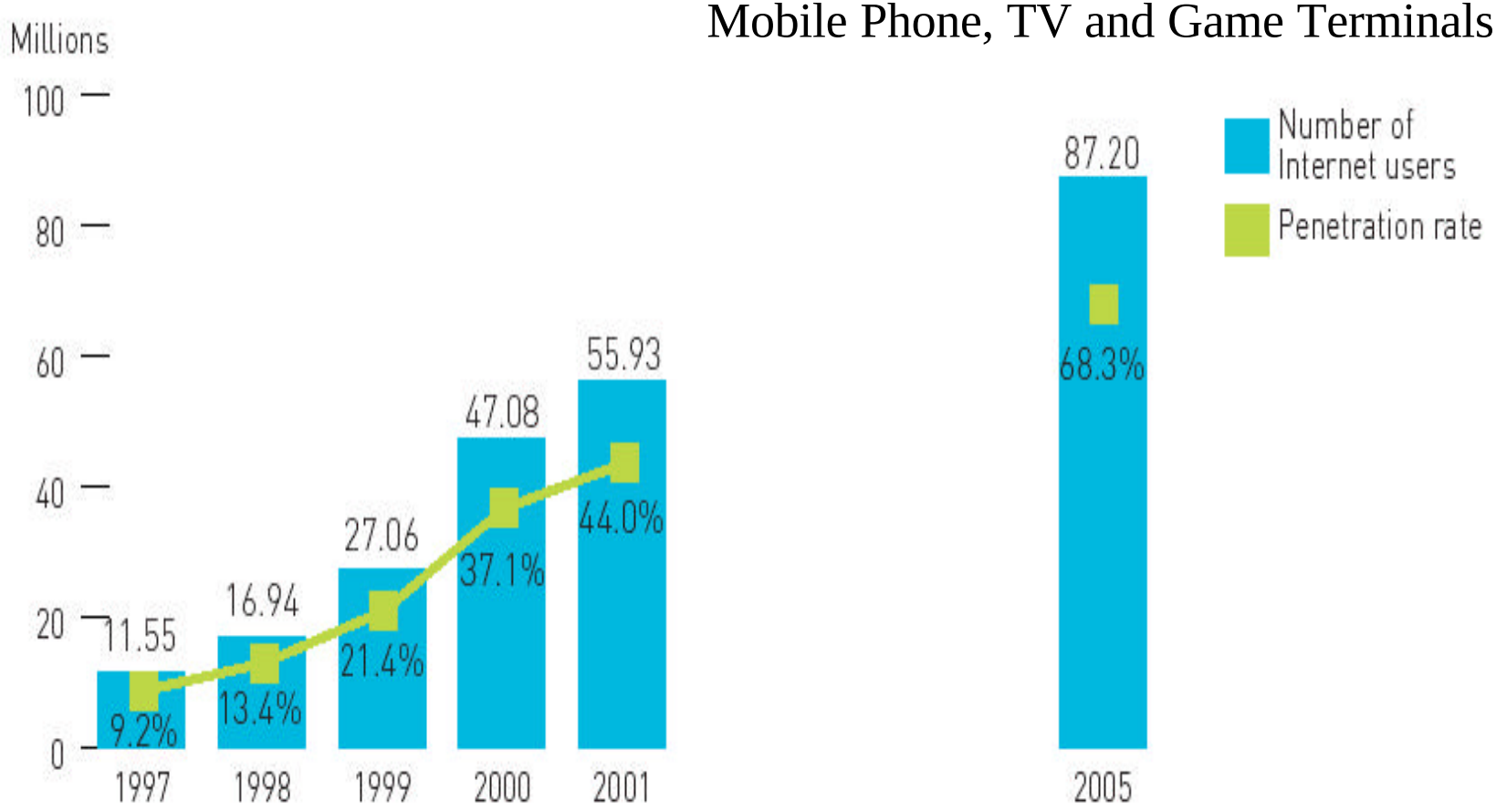
1. Broadband technology is ahead of existing amount of traffic.

2. But will be caught up by the traffic explosion in a few year.

3. Extension of the mobile subscriber requires wider bandwidth in the mobile technology.

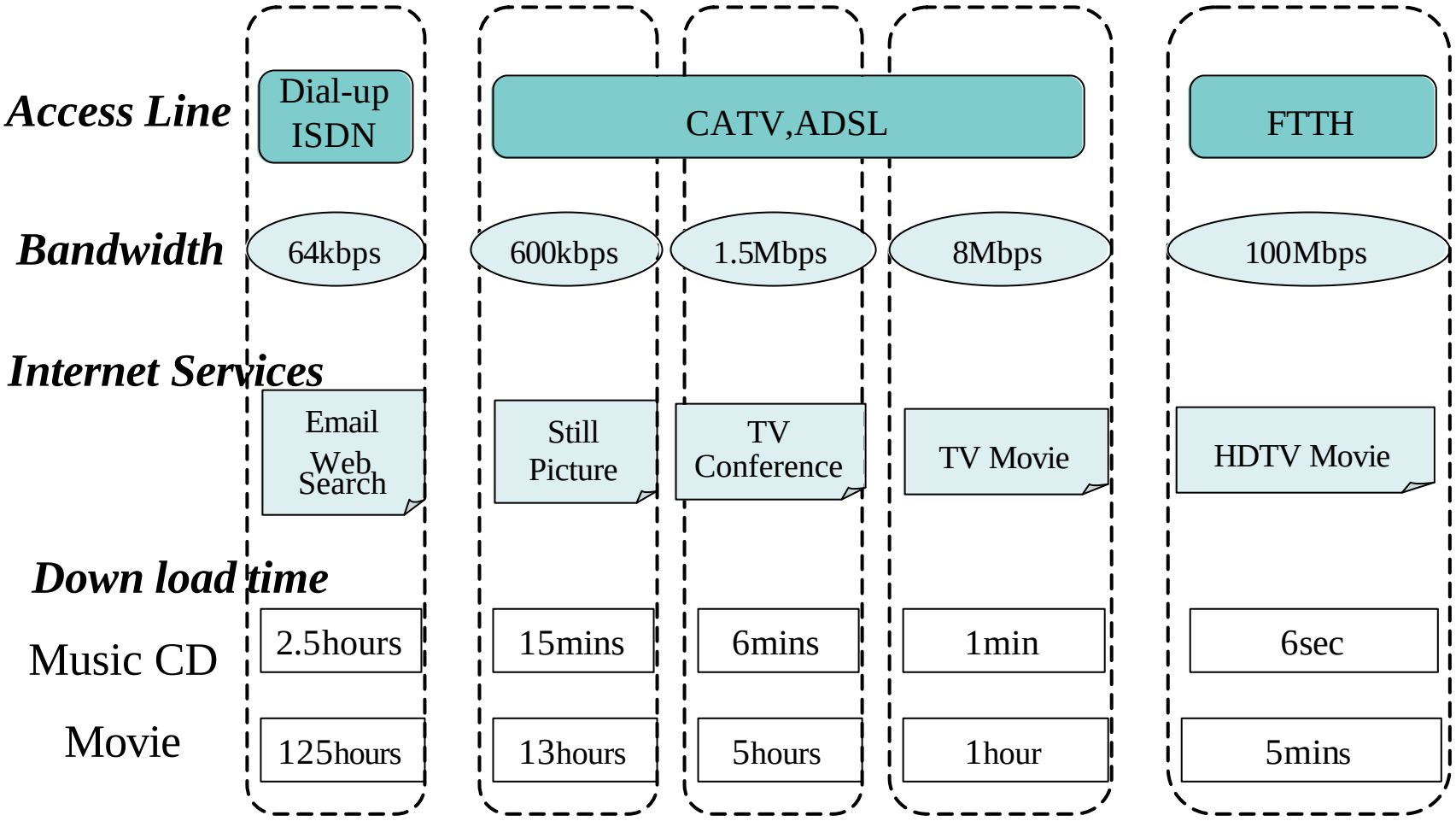
Trends in Internet Penetration in Japan

including internet capable terminals such as Mobile Phone, TV and Game Terminals



Note: The estimated figures for 2005 are based on the *Information and Communications in Japan White Paper 2001*.
Source: *Communications Usage Trend Survey*, MPHPT

Access Line Bandwidth and Internet Services

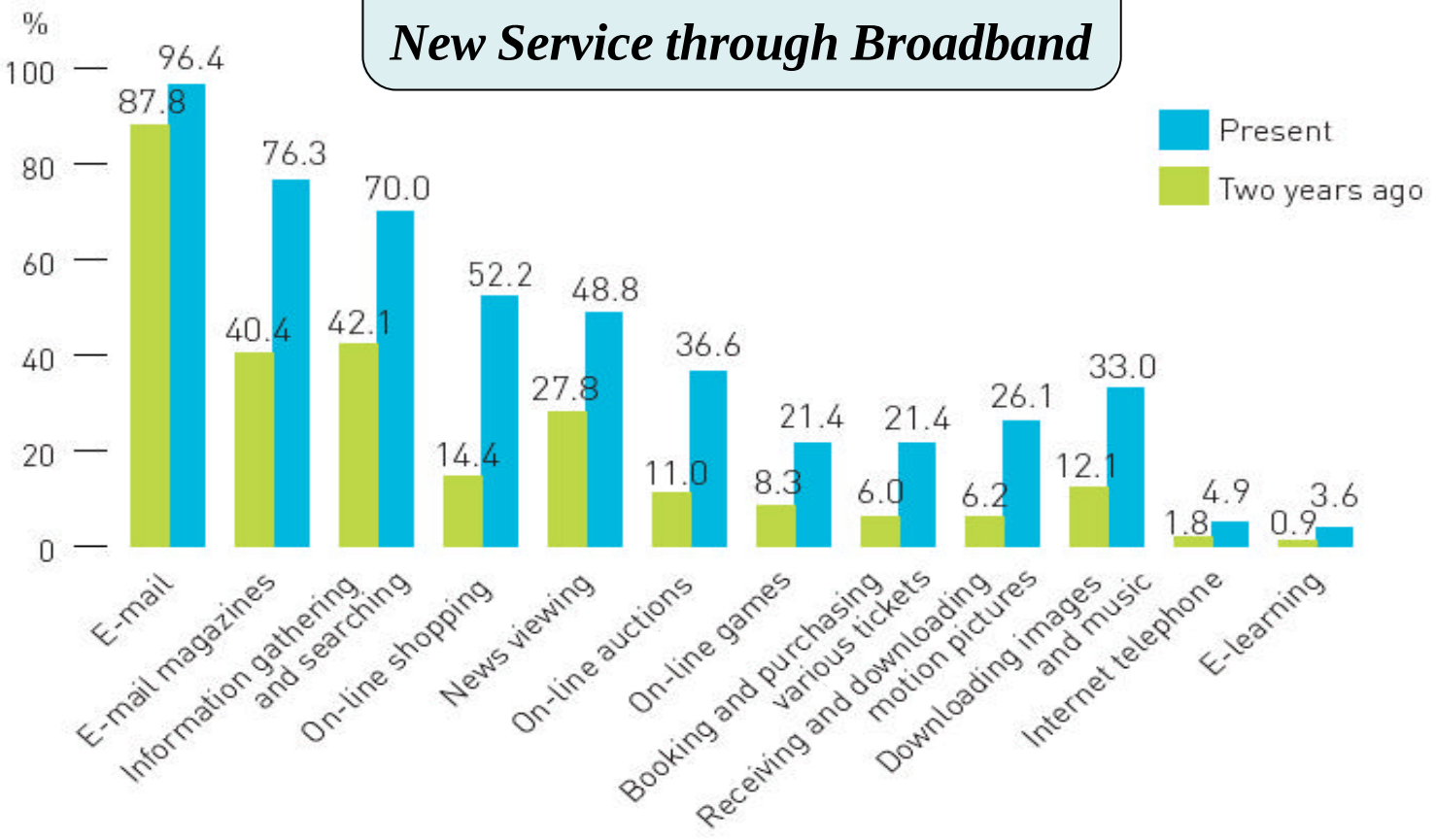


Source: 2002 WHITE PAPER Information and Communications in Japan

Trends in Internet Usage

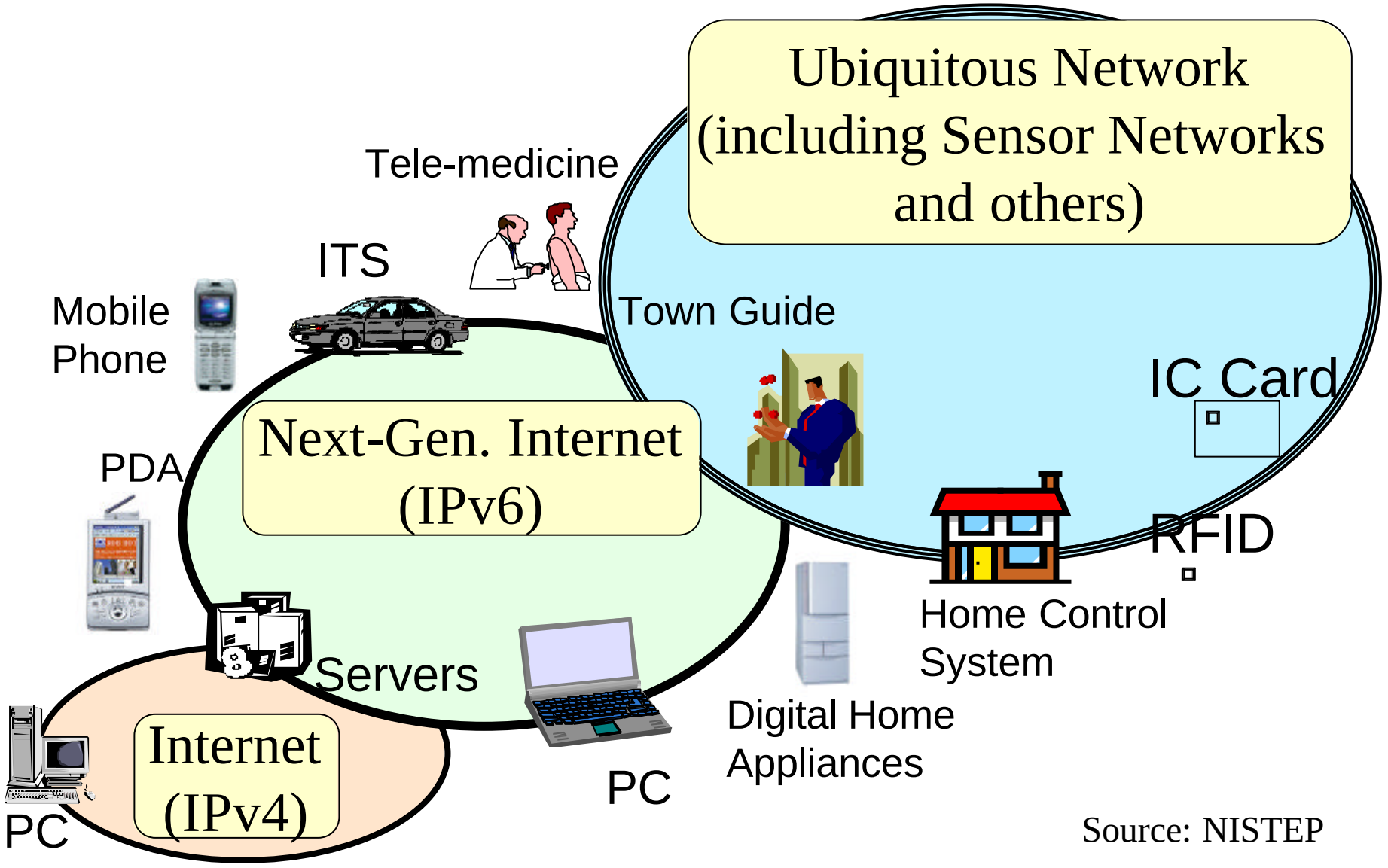
Internet into Everyday Life

New Service through Broadband



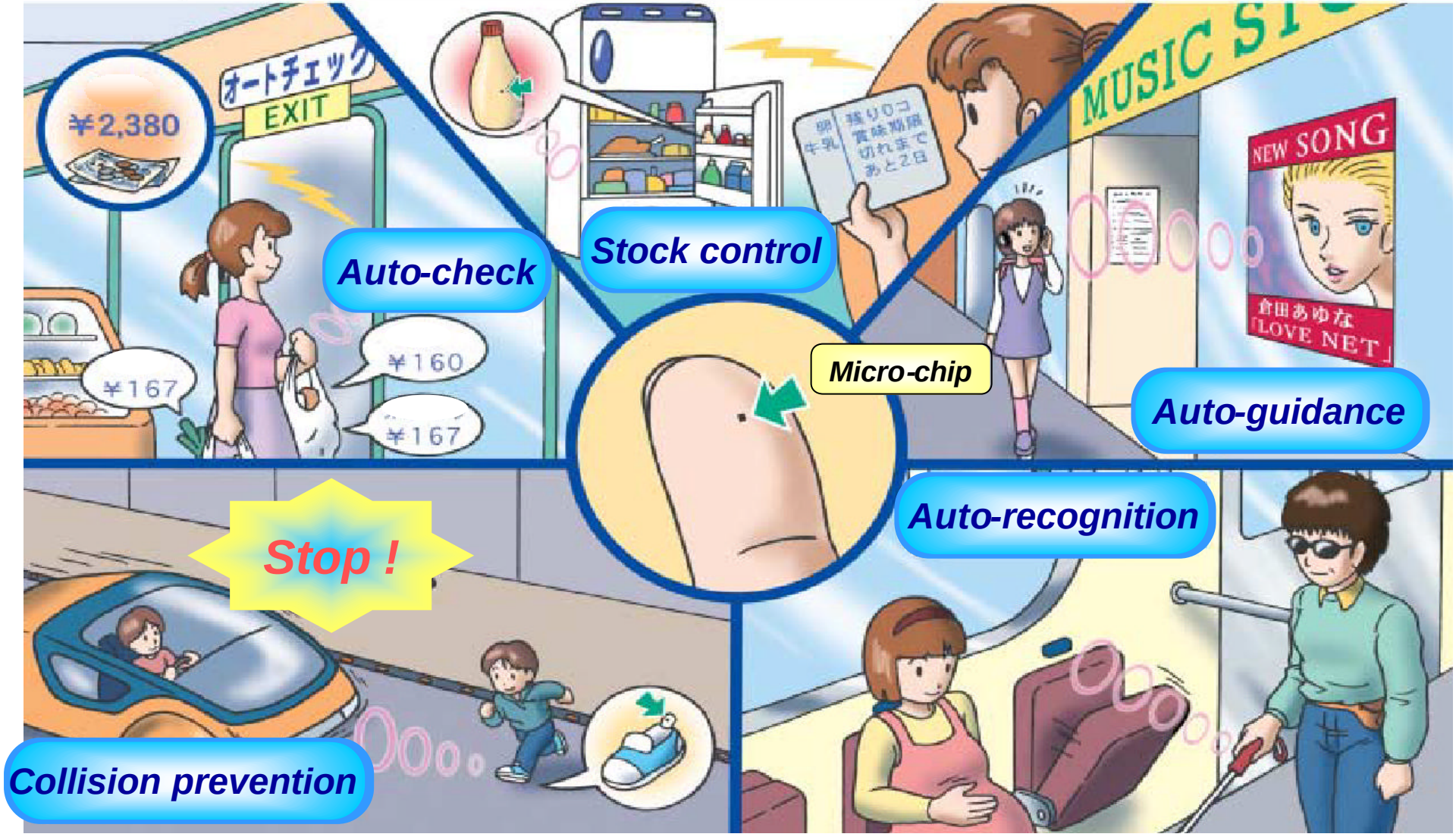
Source: *Survey and Analyses of IT and National Life* *In 2002 WHITE PAPER Information and Communications in Japan*

Ubiquitous Network



Source: NISTEP

Ubiquitous World is coming !

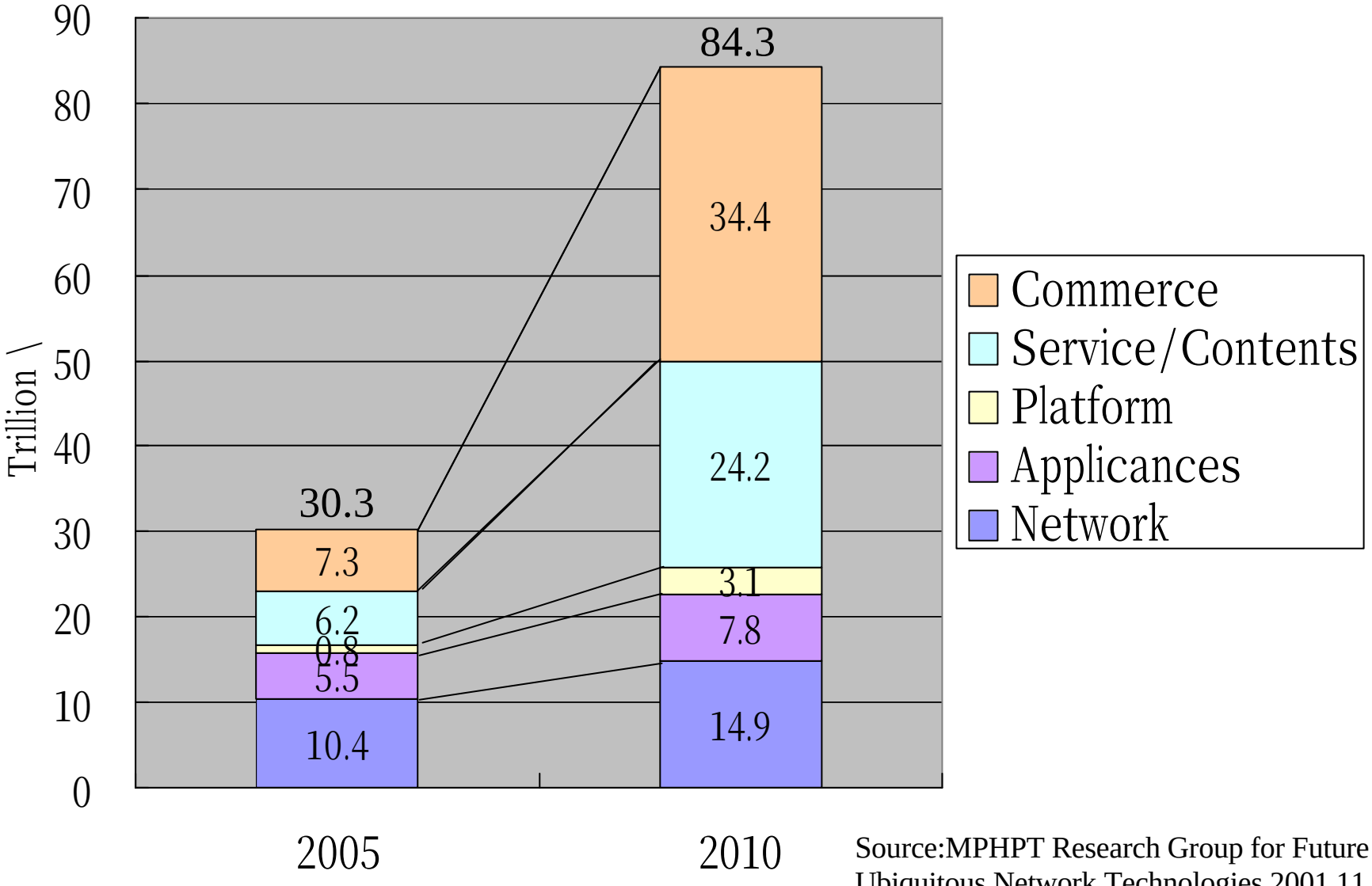


Source:MPHPT

Ubiquitous World

Source: Sony Homepage

Ubiquitous market size Prediction



Source:MPHPT Research Group for Future of Ubiquitous Network Technologies 2001.11

Issues on Technologies for Ubiquitous Network

Contents, Services	Personalized Services, Content Distribution Mgmnt, Streaming Data Distribution , Context Awareness
Appliances	New PDA for Ubiquitous Environment, Digital Home Appliances, Wearable Computer
Network	IPv6, Security, Seamless Network, QoS over Heterogeneous Network, Sensor Network
Infrastructure	Ultra-high-speed Photonic Network, High Performance Computing, Large-capacity Storage
Devices	Ultra-small One-chip Computer, RFID, Sensors

Concluding Remarks

1. **The second stage of the IT revolution is taking place in Japan.**

2. **It is from infrastructure construction to new value creation stage to realize more active, safe, hearty and convenient lifestyles.**

3. **The main Driving Force will be the creative contents development for**

Ubiquitous e-Japan !

Acknowledgment to the visiting research experts in NISTEP; H. Komatsu (Sony), M. Watari (NEC) & K. Tatsuno (Hitachi)