



**Korea Industrial
Technology Foundation**

Development and Technology of Korea's IT Industry

2008. 4. 3.



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(KIET)**

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Profile of IT Industry

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V

Strategic Policies for the Future





Profile of IT Industry

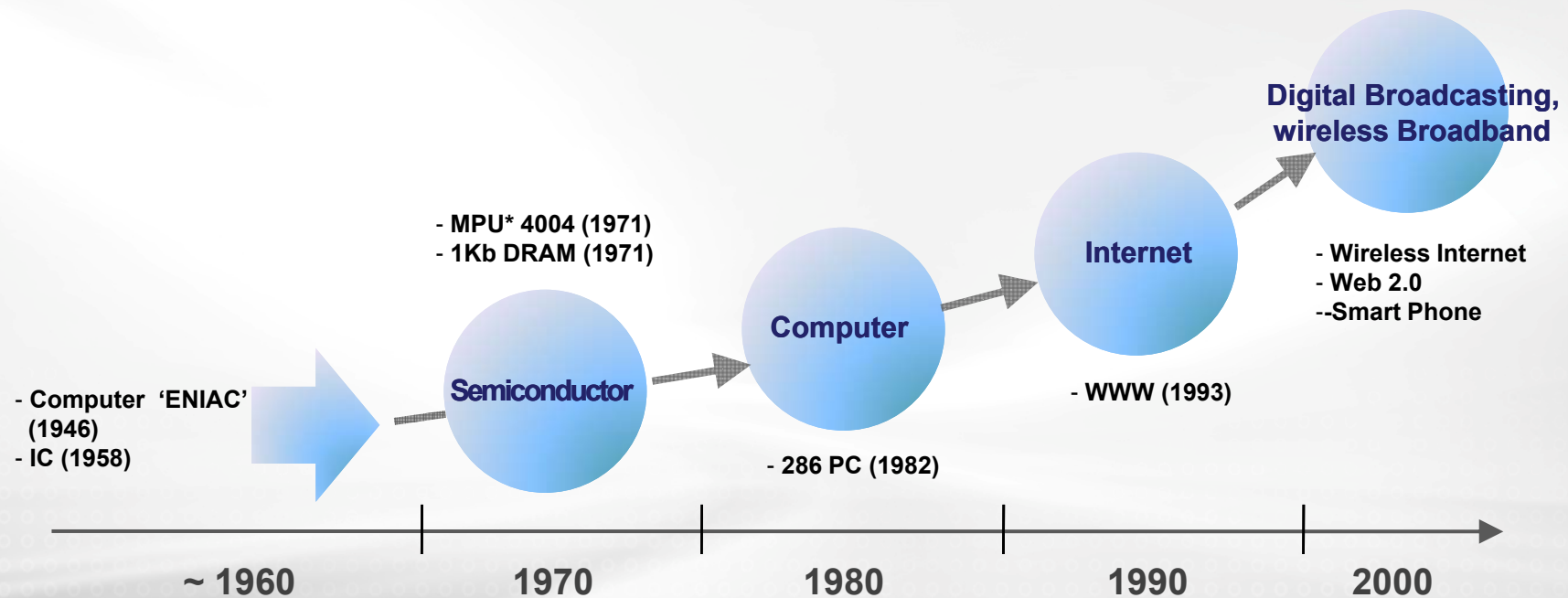


**Korea Industrial
Technology Foundation**

1. Expanding Path of the 'IT Revolution'

- Industrial Revolution : worldwide expansion through **more than 100 years**
- IT Revolution ? worldwide mainstream after **less than 30 years**

Evolution Power of Digital Technology

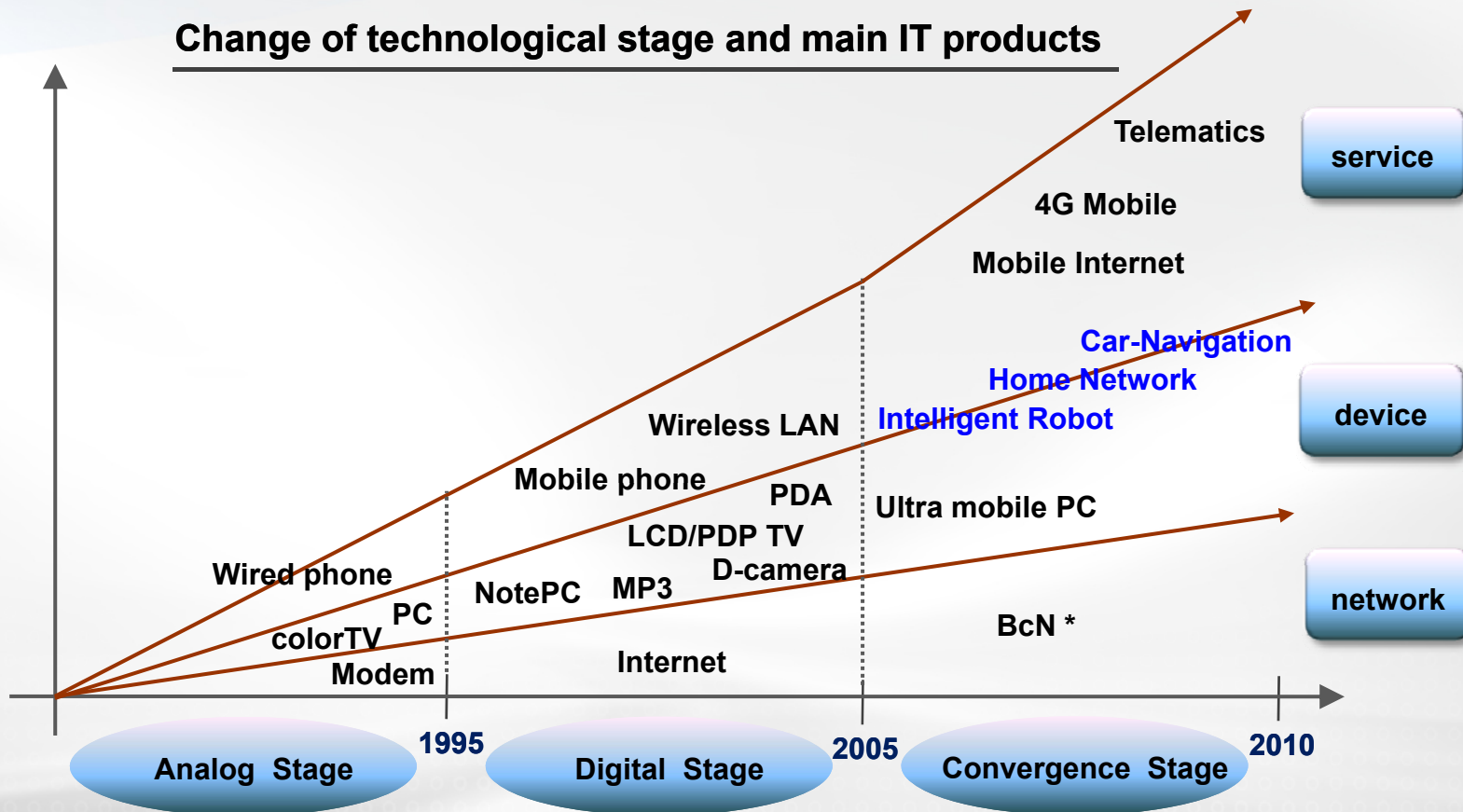


* MPU : Microprocessor Unit

2. Development of IT Industry

- Evolution of IT does not stop. Why? Two backgrounds !
- IT industry continues to expand its boundary “with innovation”.

Change of technological stage and main IT products



* BcN : Broadband convergence Network

Ubiquitous Society

3. Dominant laws of IT Industry

- A few special laws dominate world IT industry's trend.
- But, certain laws are giving way to other new laws.

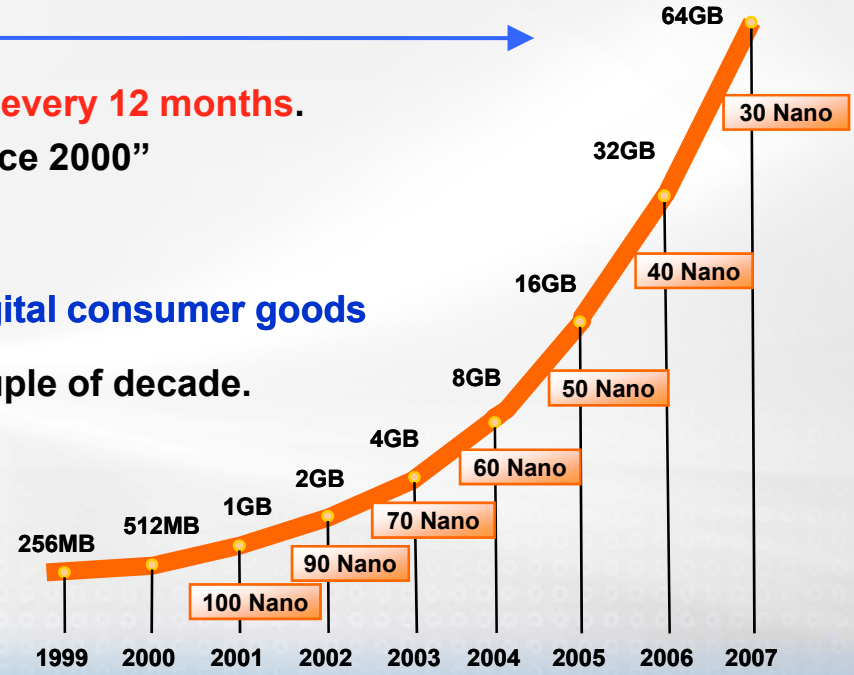
Moore's law

- Computing (micro-chip) power **doubles every 18 months**, but, the cost is constant. ✓ driving by PC
- Intel announced Moore's law would break within 20 years(2003)

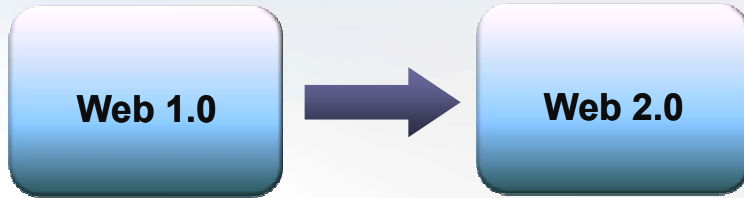
Mr.Hwang's law

- Memory power **doubles every 12 months**. "8 year's run since 2000"
✓ driving by mobile devices & digital consumer goods

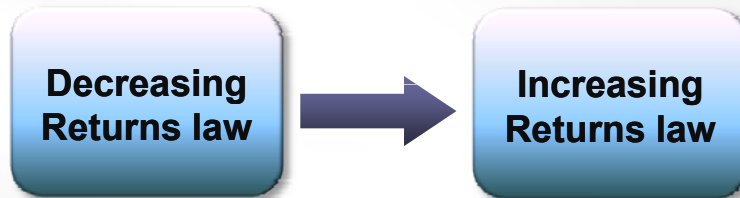
• He expects Hwang's law will last a couple of decade.



3. Dominant laws of IT Industry



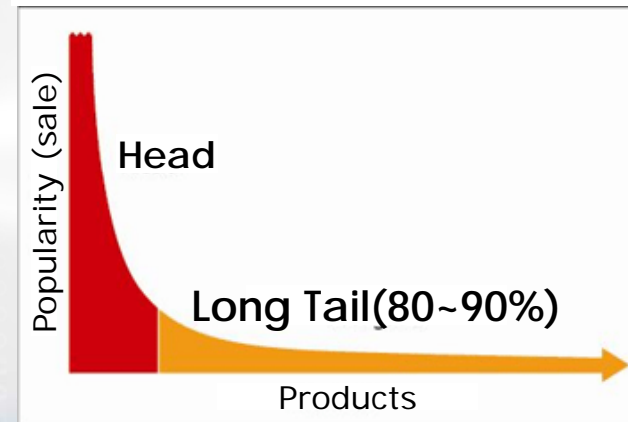
- reading only (one way) → reading & writing (interactive)
- Netizen (producer-driven) → Ubitizen (producer & consumer)
- Homepage(http//www) → Prosumer, UCC, Blog



- quantity decreasing (mass-production manuf'g) → quantity increasing (high-tech fields)
- stand-alone value → network effect (lock-in)
- Labor-intensive goods → MS Window, iPod, SW

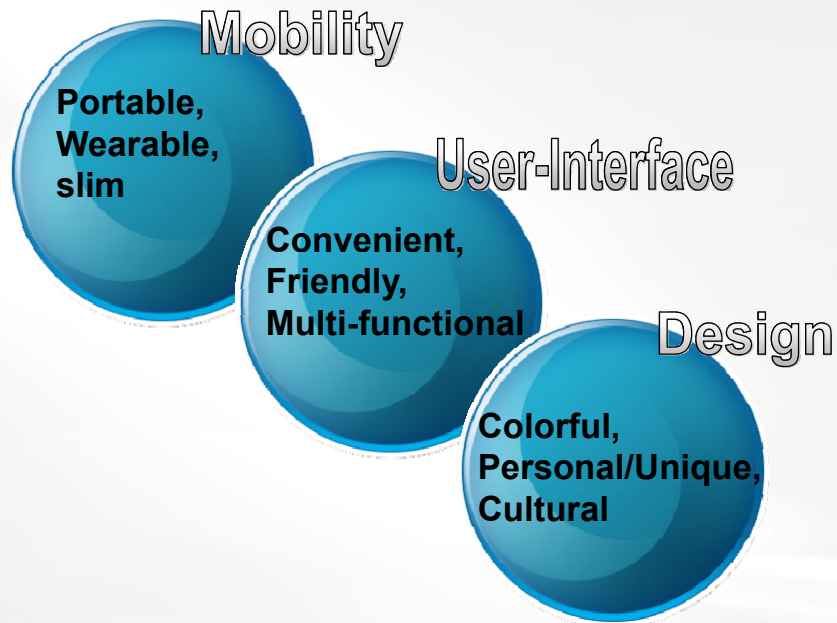


- Profit of 80% "Trivial many" is larger than that of 20% "Head".
- Amazon.com, eBay.com, Google



4. Megatrend of IT Industry

Personality / Identification

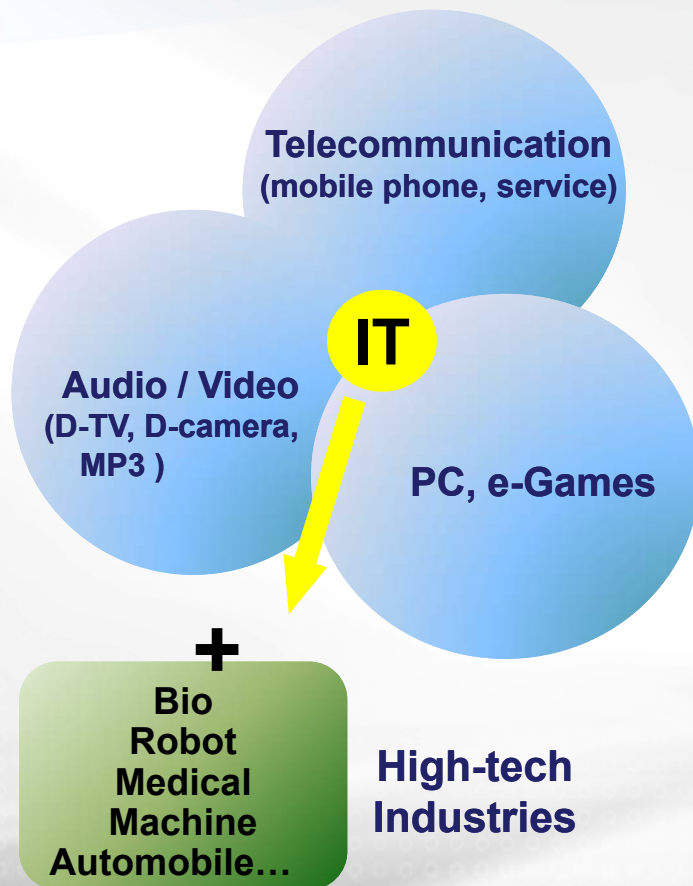


Emerging China

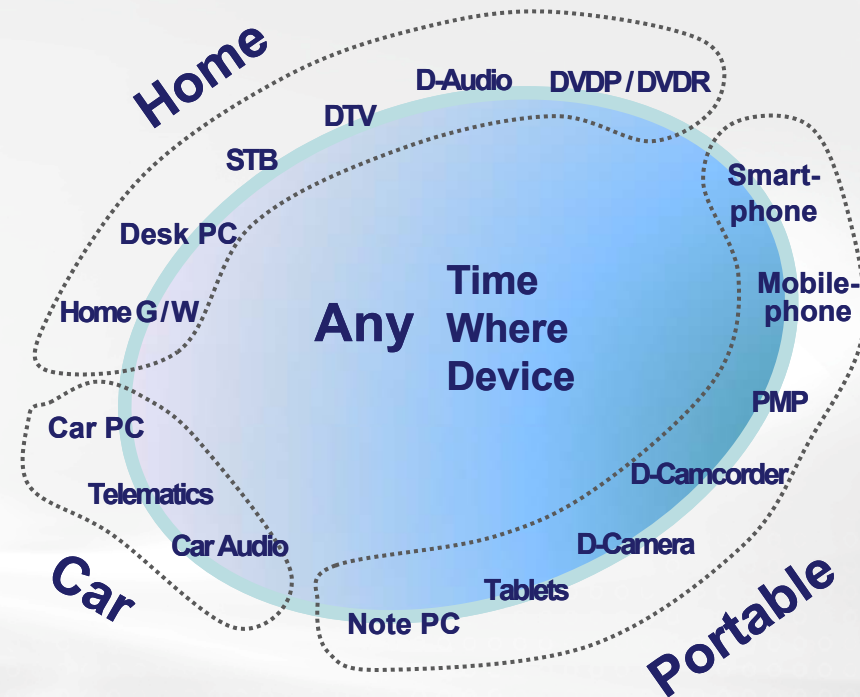


4. Megatrend of IT Industry

Digital / Industrial Convergence



Ubiquitous Networking





II

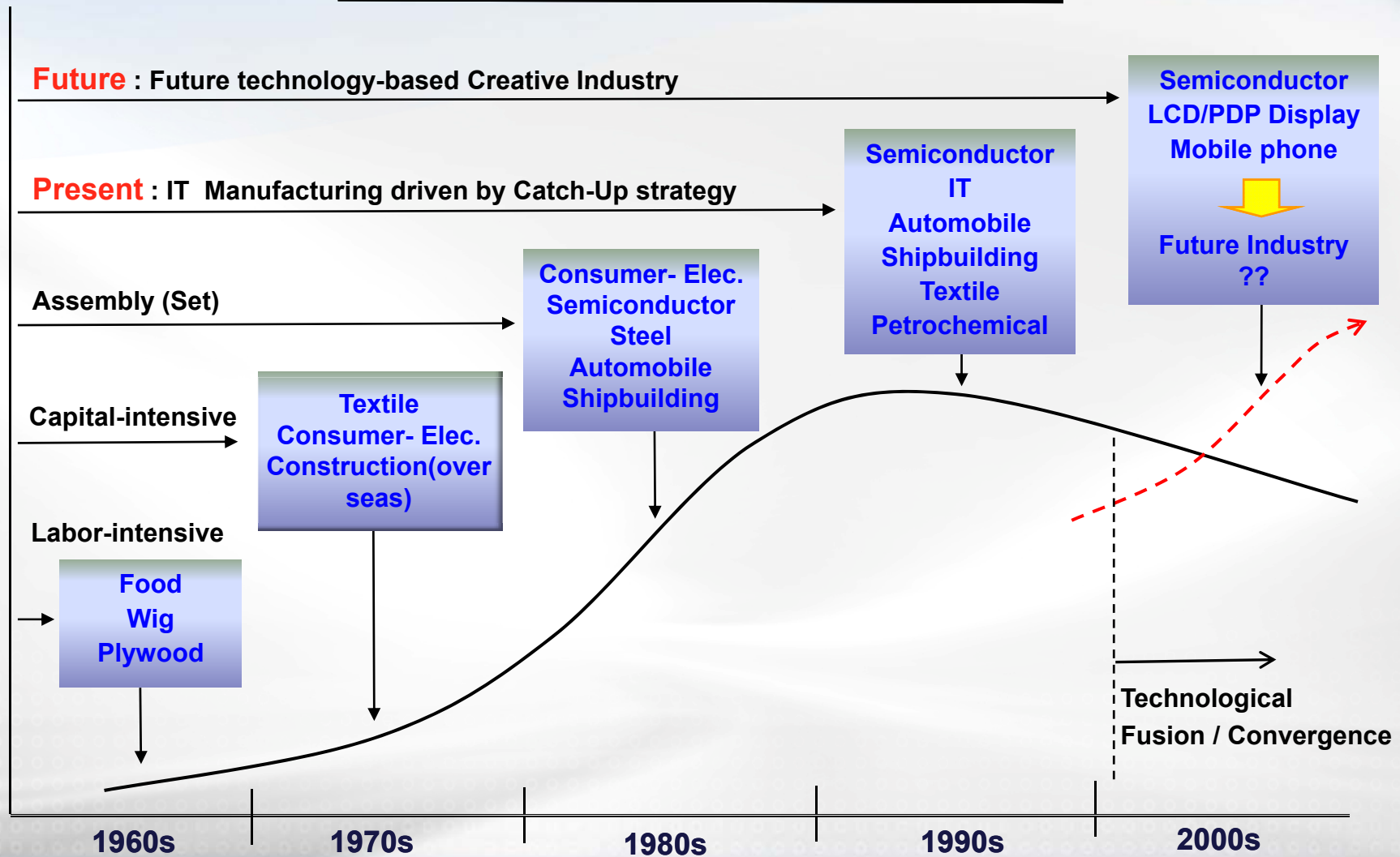
Status of Korea's IT Industry




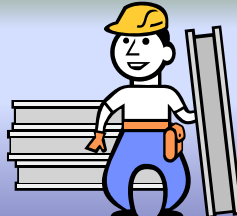






**Korea Industrial
Technology Foundation**

1. History of Industrial Development

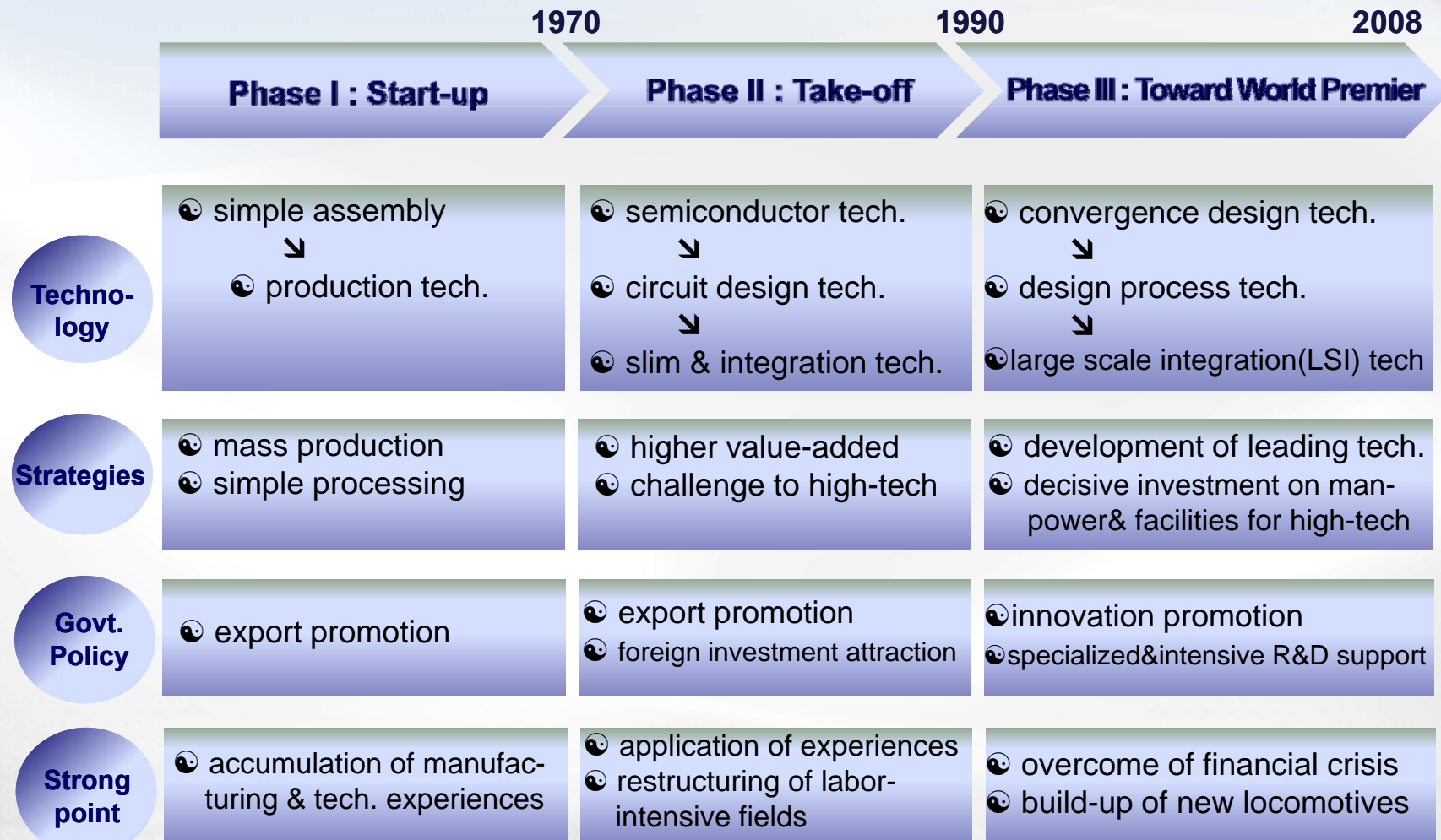
Position of Korean IT Manufacturing



1. History of Industrial Development

	1960s	1970s	1980s	1990s	2000~
Analog Types	-Radio -Passive Parts -Black-and-white TV	-Color TV -Passive Parts -Radio Cassette -Electronic Ex-changer	-Color TV(CRT) -Monitor -VCR -Audio -MicrowaveOven -Refrigerator	-Large Color TV -VCR -Microwave Oven	-Convergence-type White Goods
Digital Types				-LCD Monitor -CD/DVD player -PC -CD-ROM -PDA	-Digital TV -MP3P -Navigation -Settop Box(STB) -Disk drive (HDD, ODD)
High-tech Types				-Memory(DRAM) -IC -CDMA Equip-ment	-Ultra Mobile PC -Mobile phone -Flat Display (LCD,PDP,OLED) -Memory(flash) -LED
					

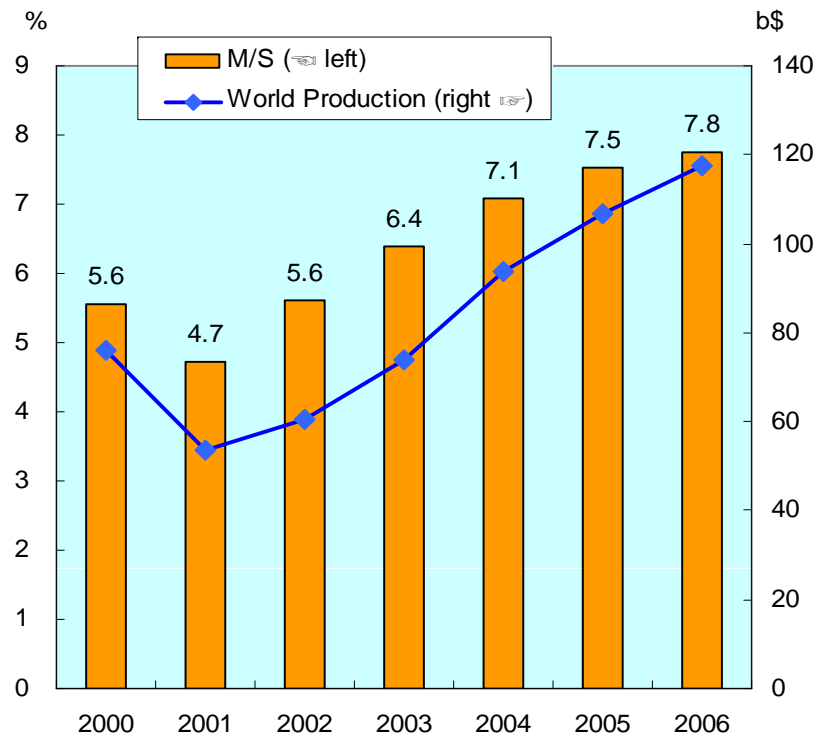
1. History of Industrial Development



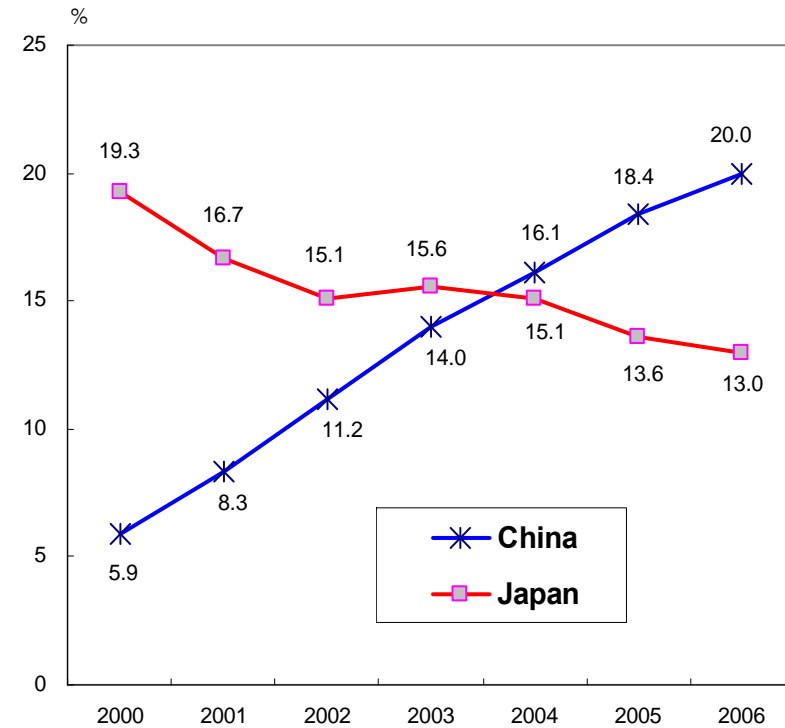
2. Performance in the Global Market : M/S

- Global market share of Korea's IT goods is increasing steadily since 2002.
- China, new face, is world no.1 producer in 2006, going ahead of USA .

World Market Share of IT Goods* : Korea



Japan, China

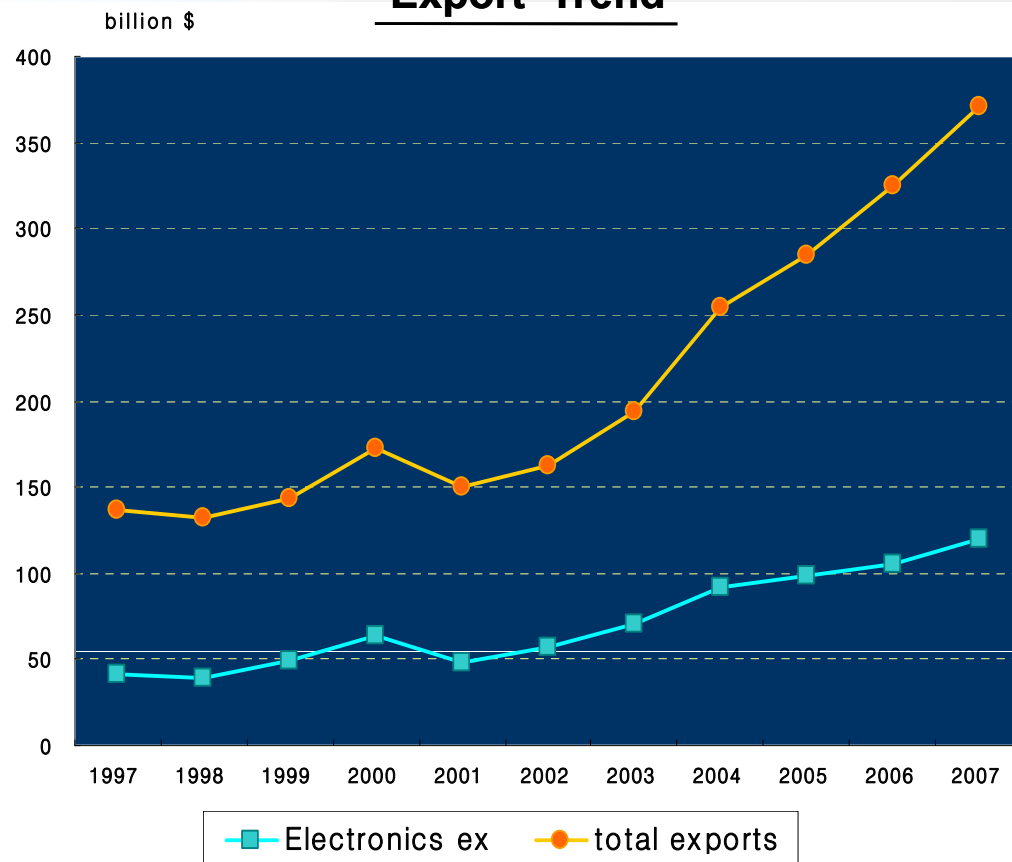


Source : Reed, The Yearbook of World Electronics Data.
* excluding white goods

2. Performance in the Global Market : Exports

- 2005, IT exports 100 billion \$, **the first performance in Korea**
- 2007, its exports 124.8 billion \$ (33.6% of Korean total exports)

Export Trend

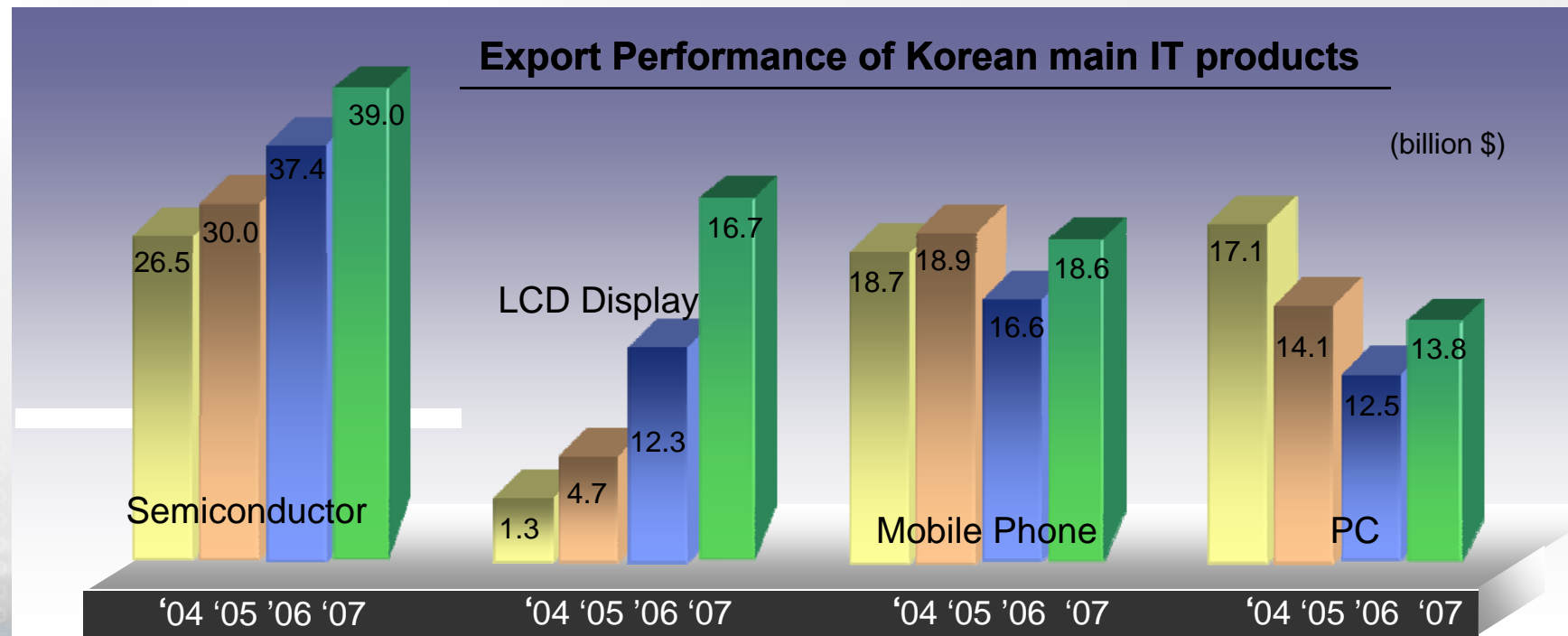


IT industry in Korea

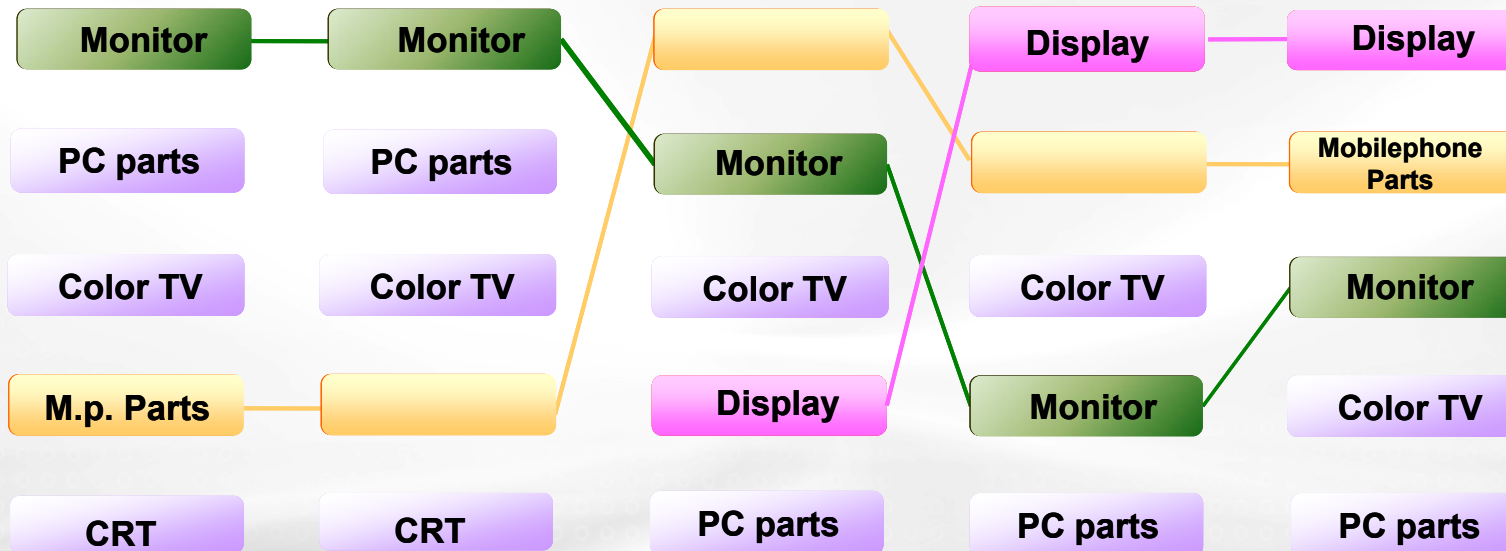
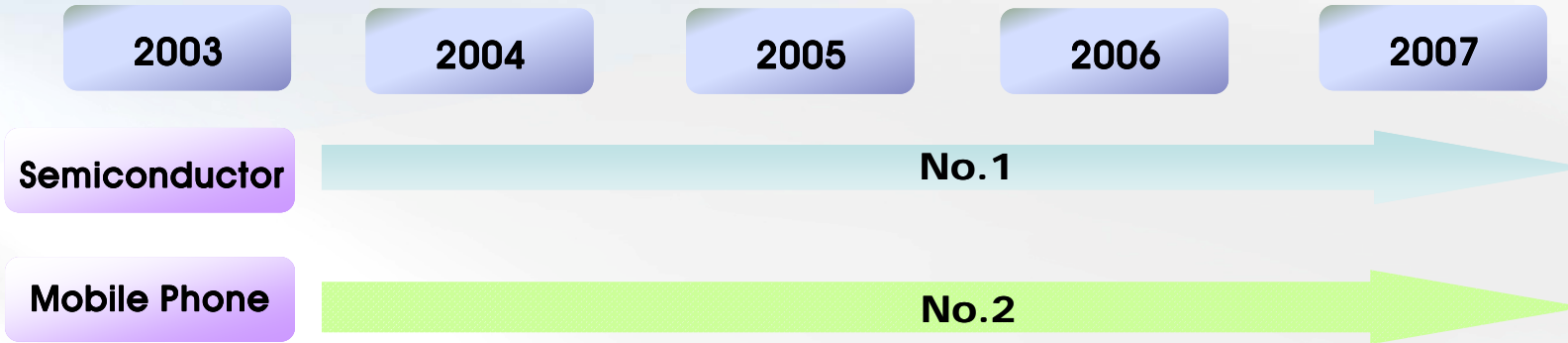
- Exports CAGR
 - 11.6% (1999~2007)
 - **13.7%** (2003~2007)
- Stable, Strong Role
 - IT's export accounts for about **32~37%** of Korean total exports.
 - **20%** of Korean domestic manufacturing production flows from IT industry.

2. Performance in the Global Market : Exports

- Big 2 items are **semiconductor, mobile phone** in Korea's exports.
 - They are showing the strong position of top rankers after 2000 in IT exports.
- Memory(DRAM, Nand flash), CDMA phone, LCD Panel are world first runners in global M/S.
 - IT export in 2007 jumped 16% annually, totalling 125 billion \$.



3. Top 7 Items in Korean IT Exports



4. Korean Firms' Performance over World Players

World "Big 3" Makers in 2007



(DRAM)
World No.1

SAMSUNG

27.0%

hynix

21.0%

Qimonda ~ ELPIDA

13~12%



(Nand Flash Memory)
World No.2

SAMSUNG

40.0%

TOSHIBA
Leading Innovation >>>

25.7%

hynix

20.5%



(Mobile phone)
World No.2

NOKIA
CONNECTING PEOPLE

38.2%

SAMSUNG

14.1%



MOTOROLA

13.9%



(LCD TV)
World No.2

SAMSUNG

18.7%

SONY

17.1%

SHARP

11.7%



LG Electronics

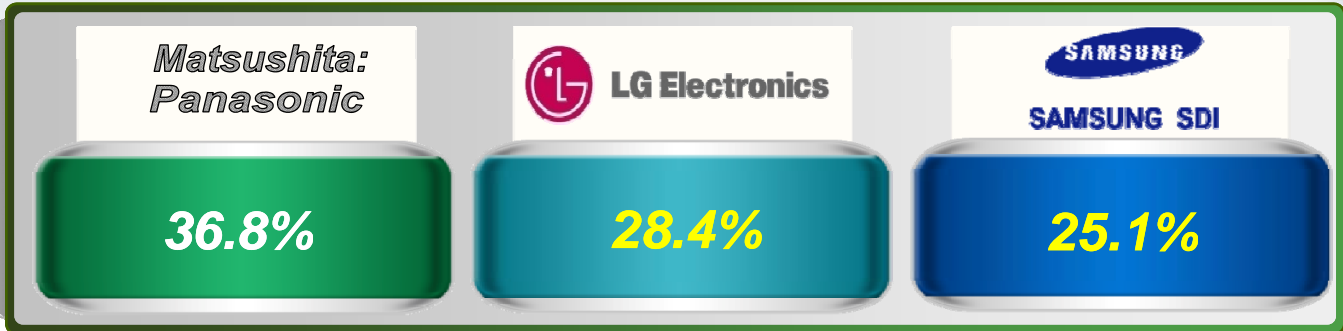
8.0%

4. Korean Firms' Performance against World Players

World "Big 3" Makers in 2007



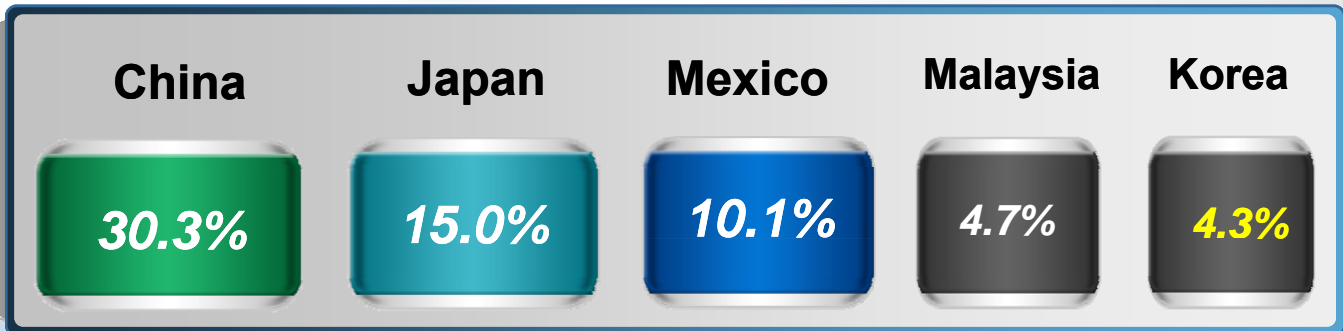
(PDP Panel)
World No.2~3
(2007.4Q)



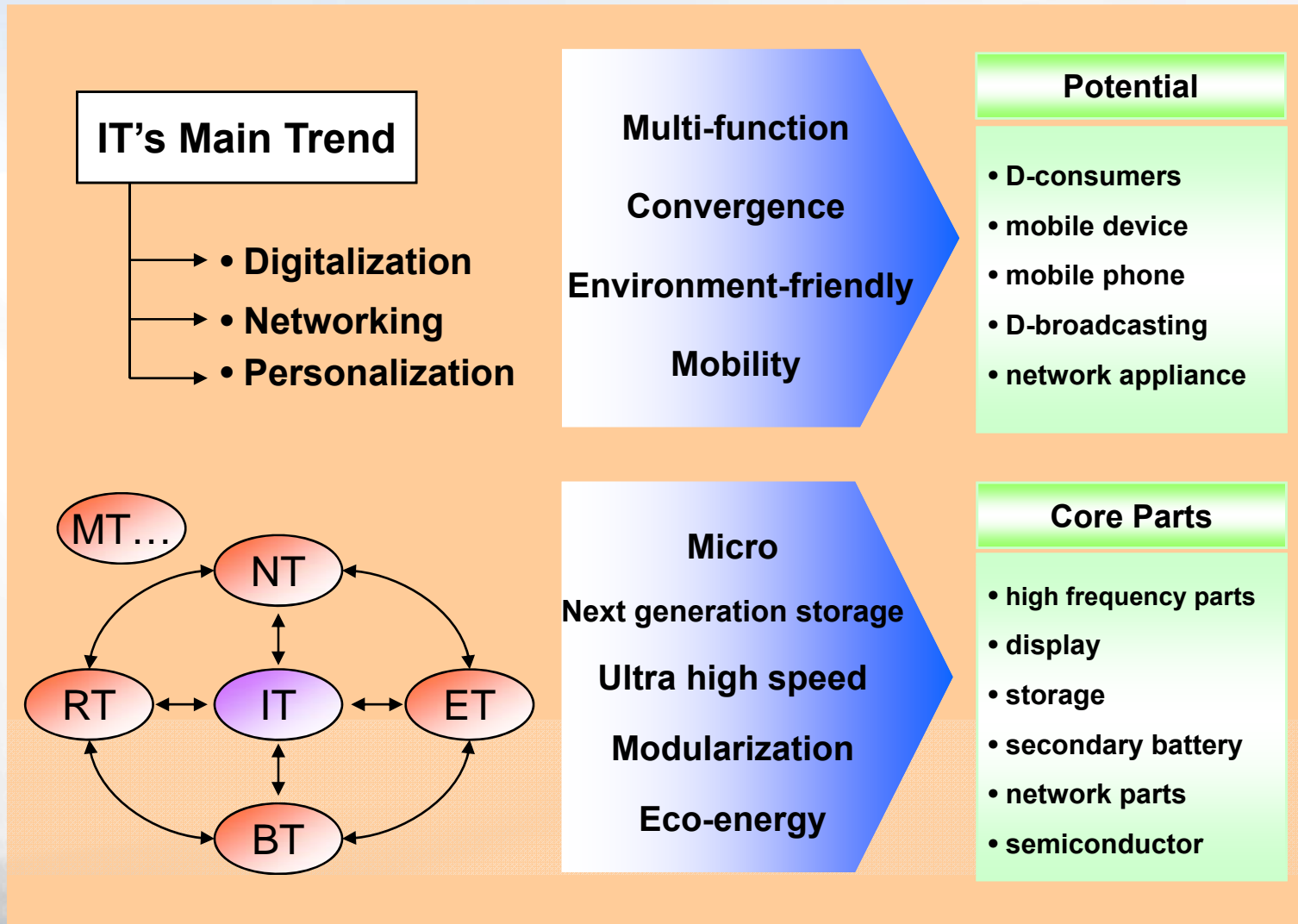
(LCD Panel)
World No.1



(Consumer)
World No.6 Producer
*excluding white goods



5. Technological New Direction of IT





III

Key Success Factors of the Korea's IT Industry

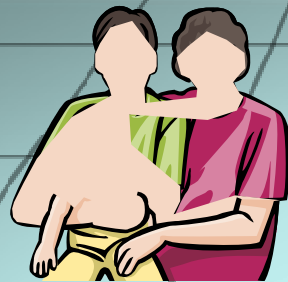
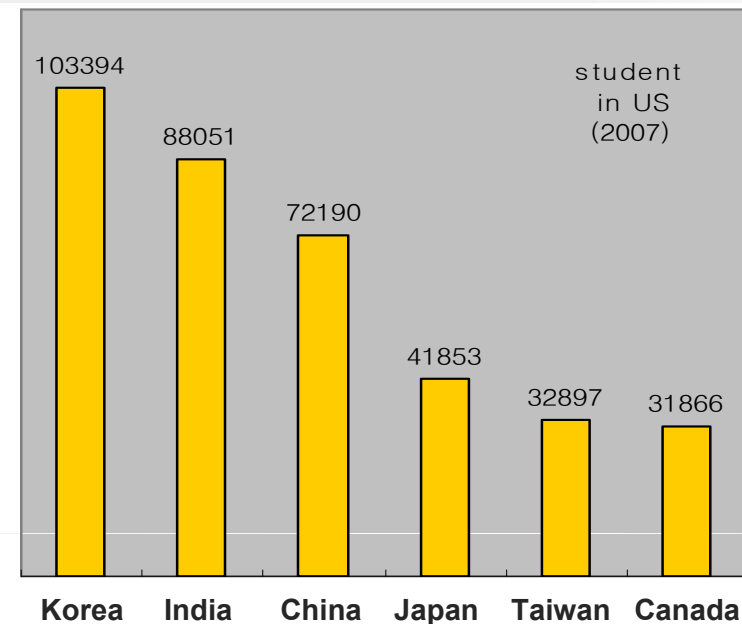


1. Key Factors for Success : Environments

National Background

Excellent Labor Forces

- High desire for education
 - ⇒ highly educated labor forces
 - ⇒ advance rate from middle school to **high school** : 99.6%(2007)
 - ⇒ advance rate from high school to **college& university** : 82.8%(2007)
- Promoting studying abroad
 - ⇒ high accessibility to advanced technology
 - ⇒ Korean students in USA
 - 103,394(14% of total foreign students)



1. Key Factors for Success : Environments

National Background

High productivity in Skills

- Excellent hand-skills traditionally
 - ⇒ highly suitable for electronics industry
 - ⇒ **speedy learning** of experience and know-how
- Low wages, High productivity
 - ⇒ inborn **diligence** and **hard-work**



Cultural Feature

- Willing to accept new technologies / goods in young people
 - ⇒ qualified global **'test market'**, **'test bed'** for new IT products
 - ⇒ a lot of **early adaptors** around
- High value or attraction on superiority or high-ranking
 - ⇒ **'newest'**, **'first'**, **'biggest'**, **'largest'**, **'best'**



2.Key Factors for Success : Industrial Points

Industrial Background

1. Effective Policies by Gov't

- According to development stage, timely support policies
 - ⇒ export, import substitution, investment promotion, core-tech R&D roadmap etc.

✓ Continuous export promotion

- Recognition of export importance, originally
- Assignment as a strategic industry for export

✓ Vitalization of Domestic Market

- Enlargement of early domestic market size
- Introduction of broadcasting of color TV, service of mobile telecommunication, digital broadcasting

✓ Leading role for Industry

- Consistent intention to nourish IT industry
- Establishment of various laws for doing it
- Large R&D investment

✓ Establishment of Industrial Complex

- Construction of production infrastructure

2.Key Factors for Success : Industrial Points

Industrial Background

2. Firm's Active R&D Efforts

- Leading firms' concerns on new tech.
 - ⇒ absorption and transfer of high-tech. from foreign advanced companies

4. Large Companies' Leadership

- Speedy decision of strategies
 - ⇒ high risk investment, new business entry
- World market-oriented targeting
 - ⇒ early globalization
 - ⇒ competition with Japanese

3. Firm's Mass Investment of Facility

- Aggressive investment on equipment
 - ⇒ strengthening of mass production system
- Accumulation of manufacturing tech.

5. Advanced Internet/Mobile Telecommunication Networking

- Competition in internet service
 - ⇒ acceleration of internet tech.
- Competition & investment in mobile telecommunication
 - ⇒ foreign advanced companies



IV

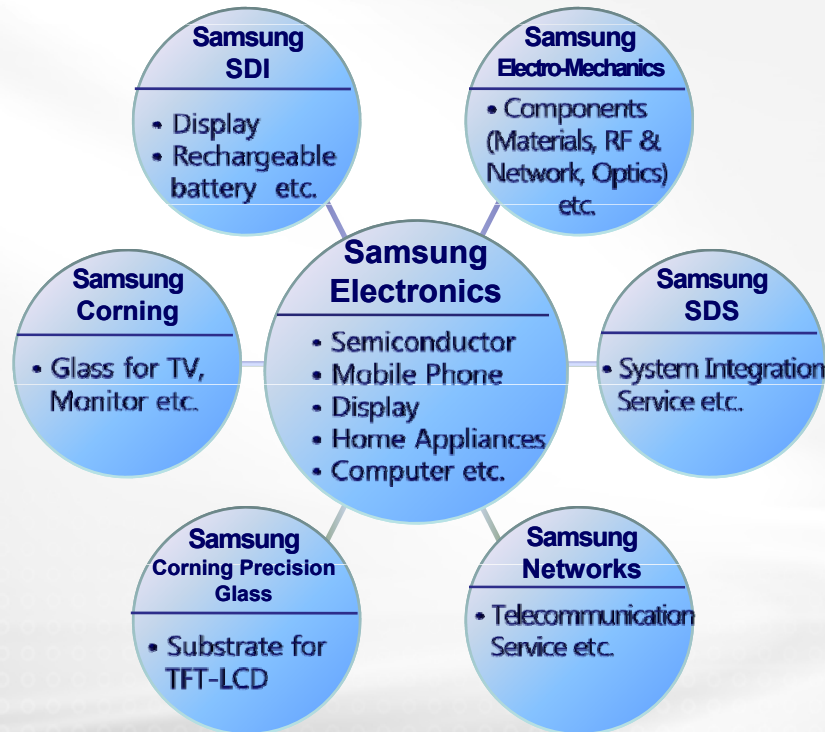
Leading Companies and Competitiveness



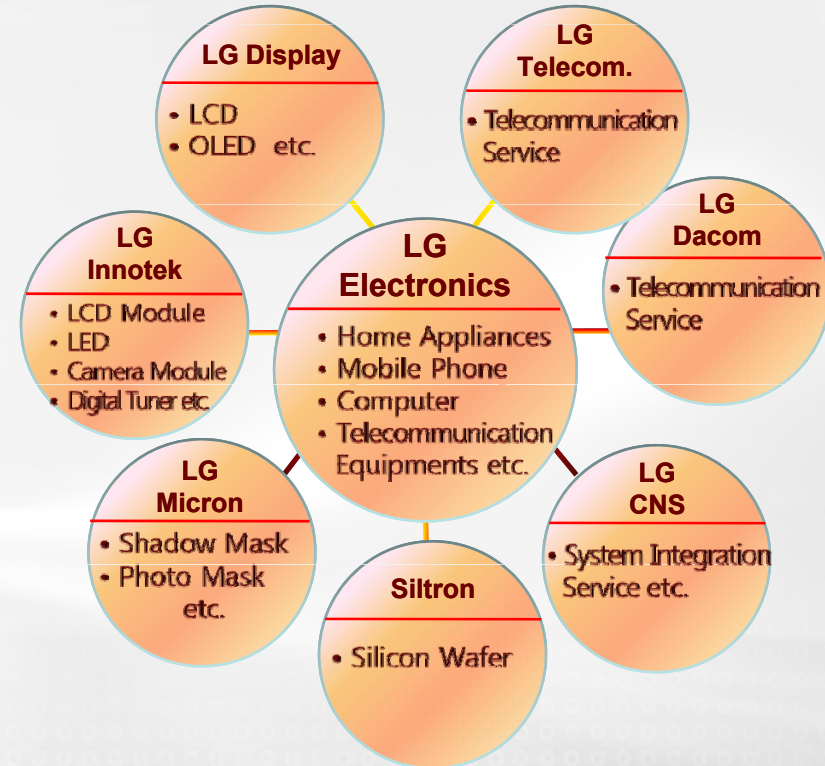
1. Leading Companies in Korea

- **Samsung & LG** are the two sparkling leaders in Korean IT industry.
- Their affiliates dominate almost all of Korea's IT industry

Samsung Group (affiliates)



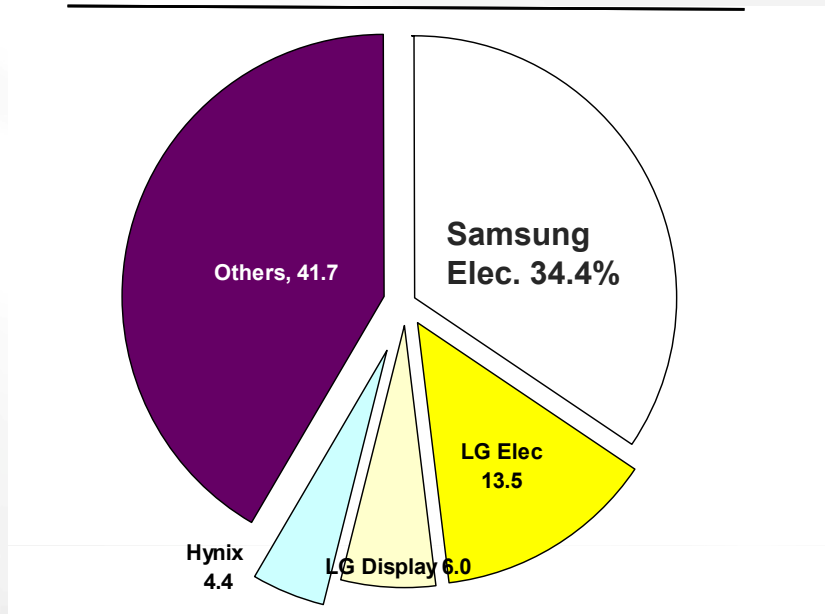
LG Group (affiliates)



1. Leading Companies in Korea

- Samsung Elec. & LG Elec. account for 48% of **Korean IT industry's total sales.**
- World ranking of **Samsung Elec.** was No.3 in terms of sales, accompanied by **LG Elec.** , No. 9.

Leaders' weight in Korean IT Industry (2006 Sales)



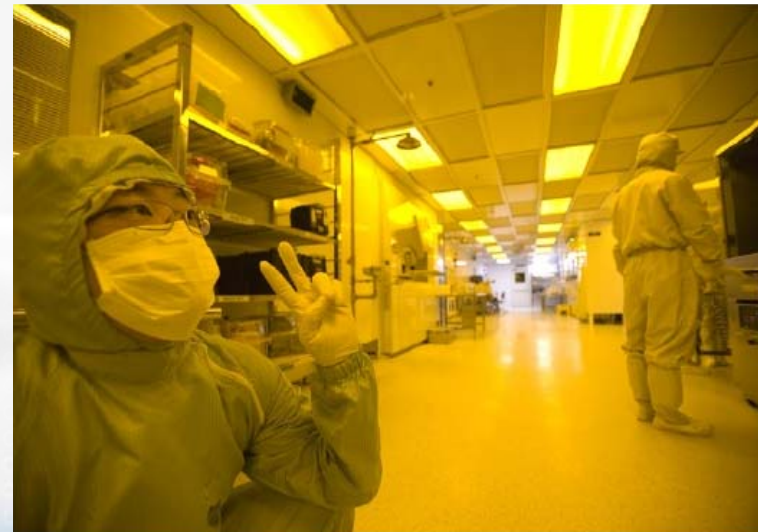
**Little Giants
in Korea**

Hynix Semiconductor, Daewoo Electronics,
Pantech, Hyundai Autonet, Humax etc.

2. Leading Companies in Korea: Samsung Elec.



Samsung Electronics Semiconductor Factory



2. Leading Companies in Korea : LG Display



LG Display Cluster



3. Revolution of New Products

Design, Size, Not Function, matter !!



Navigation



LCD-TV, PDP-TV,
MP3P, PMP

3. Revolution of New products

Mobile Phone, Consumer Products



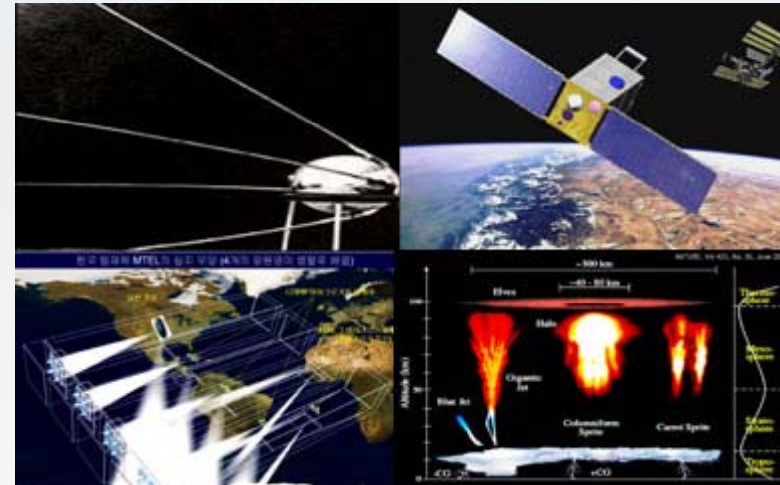
3. Revolution of New products



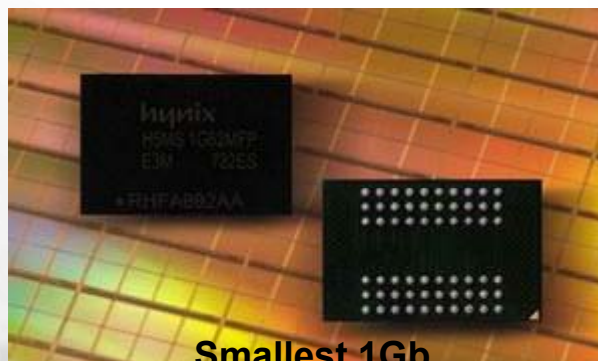
Computer & Printer

Samsung Monochrome Laser Printer ML2250 series leads you to the new experience of the speed and network expandability.

3. Revolution of New products



Semiconductor



**Smallest 1Gb
Mobile DRAM (2007.8, Hynix)**



**60 nano-class
2Gb DDR2 DRAM(2007.9, Samsung)**

4. Competitiveness : Korea, China, Japan

Korea

Strong Point

- power in memory semiconductor
- most advanced IT Infrastructure
- mass production tech.
- challenge, risk-taking, agility

Weak Point

- weak resources tech.
- severe gap between large-small firms
- weak system design tech.
- weak materials tech
- import of core parts

China

- domestic market & labor
- aggressive supports of Gov't
- potential of SW
- network of overseas Chinese

- low global brand
- weak IT infrastructure
- dependence on foreign firms
- insufficient IPR
- low value-added assembly

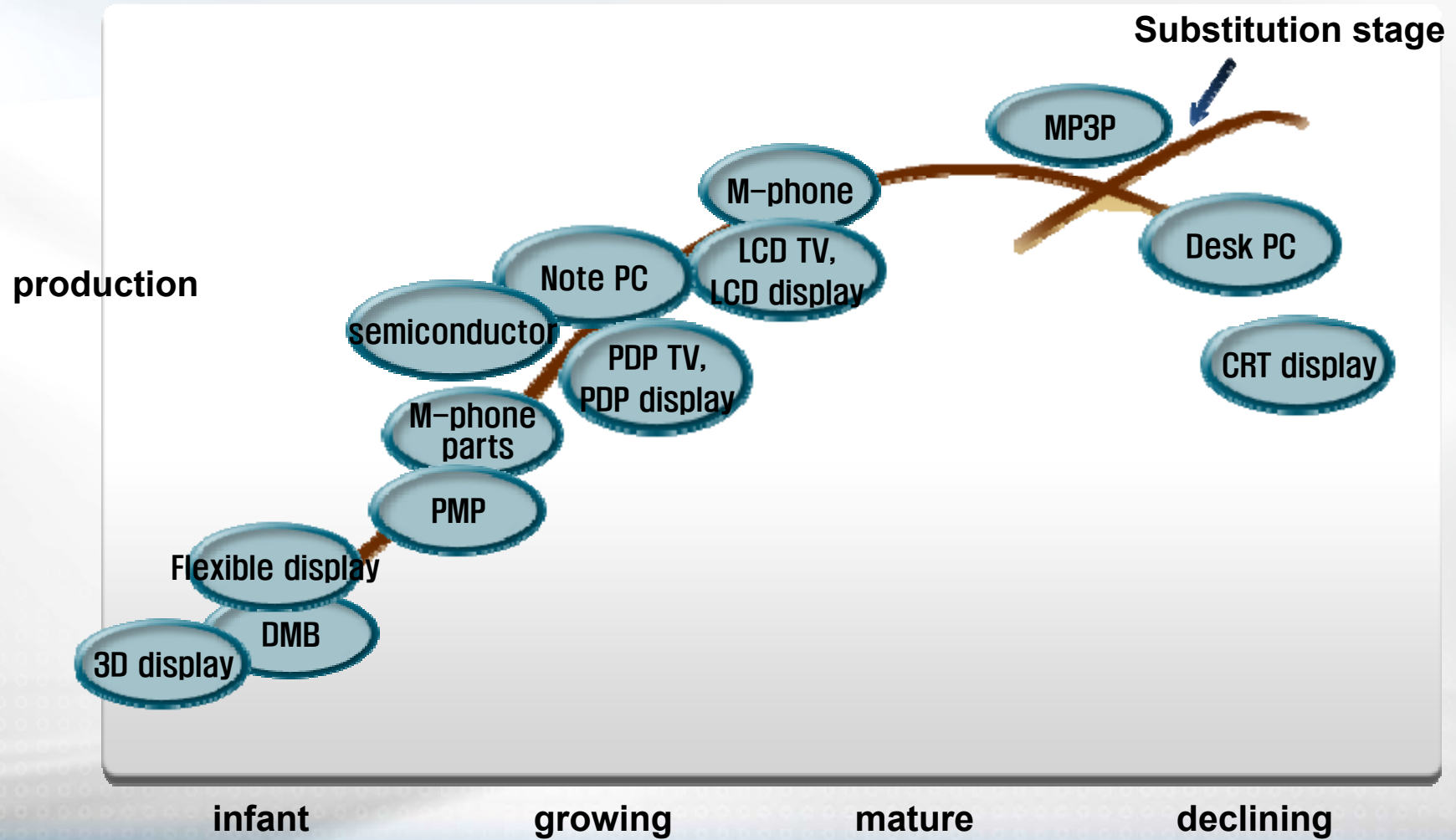
Japan

- production /design tech.
- parts & materials tech.
- Patents & resources (basic) tech.
- strong small & middle firms
- global brand

- high wages
- preferred its own standard
- delay of decision-making
- closed hierarchic integration production

4. Competitiveness : Life Cycle

Development Stage of IT Products



4. Competitiveness : Product Matrix

Competitiveness Portfolio of Main IT Products

Market Mature- ness	high	<p><i>mature group</i></p> <p>PC general parts white goods</p>	<p><i>cash cow (leading) group</i></p> <p>mobile phone memory semiconductor display(LCD / PDP / PM-OLED)</p>
	low	<p>SoC(LSI) next display (AM-OLED, Flexible) bio chip & sensor intelligent robot high-tech. convergence device</p> <p><i>new growing group</i></p>	<p>digital TV digital convergence device -PMP(MP3) / DMB -home network -telematics secondary battery Medical equipment</p> <p><i>growing group</i></p>
		low	high
Superiority of Competition			

- ✓ Memory : **Korea(100)**, Japan(80), China(25), Taiwan(65), USA(75)
- ✓ System LSI : **Korea(15)**, Japan(55), China(25), Taiwan(50), **USA(100)**

5. Technology Level

- Technologies of Korea's IT goods continue to improve **in general.**
- Technological level of Robot, secondary battery, LCD, Note PC, Bio-sensor still lags behind developed countries'

item	Technology level (world best=100)		Localization rate
	2005	2007	2005 → 2007
LCD TV	90	99	81 → 92
PDP TV	90	98	86 → 92
DVD Recorder	-	98	67 → 66
D-STB	90	96	31 → 48
High-end M-Phone	-	100	- → 65
PMP	100	100	42 → 58
MP3P (flash)	-	85	69 → 70
Note PC	-	82	47 → 42
IPTV	-	91	- → 42
Home Robot	-	83	- → 71
TFT-LCD	-	79	87 → 84
PDP	70	87	46 → 57
D-Camera Module	55	86	33 → 90
Small Motor	-	85	- → 51
RFID	-	68	- → 61
Bio Sensor	-	71	- → 60
Rechargeable Battery (lithium-ion)	-	78	25~30 → 34

Source : Ministry of Knowledge and Economy, 2008.1.



V

Strategic Policies for the Future



Korea Industrial
Technology Foundation

1. IT 839 Policy

- “IT 839” designed by the value chain of “IT Service → Infrastructure → Next Generation Growth Engine”
- IT 839 → u-IT 839 evolution

Growth Engines of Korea's IT Industry

8 Engines in Service

- HSDPA/W-CDMA S.
- WiBro* S.
- Broadband Convergence S.
- DMB/DTV S.
- u-Home S.
- Telematics/GPS S.
- RFID/USN* application S.
- IT Service

3 Engines in Infrastructure

- Broadband Convergence Networking (BcN)
- U-Sensor Network (USN)
- Soft Infracore

9 Engines in Device & SW

- Mobile telecommunication/ Telematics appliance
- Broadband/ Home Network appliance
- Digital TV/ Broadcasting appl.
- Next G Computing/ Components
- Intelligent Robot
- RFID/USN device
- IT SoC/ Convergence Parts
- Embedded SW
- Contents /SW Solution

* Wibro: Wireless Broadband Internet

* USN : Ubiquitous Sensor Network

2. 2015 Industrial Vision & Strategies : Overall IT

Vision

Global No. 3 in IT Industry in 2015

Goal

	2004	2015
World M/S	7.1% (No. 4)	14% (No. 3)
Production	212 tril.Won	590 tril.Won
Exports	96.7 b \$	300 b \$
Employment	610,000	700,000

Strategic
Initiatives

**Securing
Global
Technology
Leadership**

- Preoccupation of resource tech.
- Convergence leader
- Promotion of future industry

**Strengthening
Global
Competitiveness
of Parts & Materials**

- Intensive support of future parts & materials

**Expanding
Infrastructure
for
Innovation**

- Higher value-added
- Investment on infrastructure

**Strengthening
Global
Networking**


- Increase of world-best goods
- Patent & environment, int'l co-work

3. 2015 Industrial Vision & Strategies : Digital Home Appliances

Vision

Global Leader in Digital Home Appliances

Goal



	2005	2015
World M/S	4.8%	5.1%
Number of firms in 'Fortune 100'	4	6
No. of Core firms	10	20

Strategic Initiatives

Pursuing Front-runner Strategy

- Development of resources tech.
- Int'l standard initiative

Vitalizing Cooperation Between Large Firms and SMEs

- Co-work between institutions
- Development of convergence parts

Strengthening R&D for Convergence Tech.

- Effective system
- IT/BT/NT co-work
- well organized R&D control

4. 2015 Industrial Vision & Strategies : Semiconductor

Vision

Global No. 2 in Production



Goal

Exports : 30 b \$ (2005) → 76 b \$ (2015)

Global M/S : 10% (2005) → 20% (2015), **totally**

2.1%(2005) → 12%(2015), **SoC(system LSI)**

Localization Rate of Equipments / Materials : 50% / 75% (2015)



Strategic
Initiatives

Bringing up
system LSI

Strengthening global
leadership of memory

Promoting localization
of equipment &
materials

5. 2015 Industrial Vision & Strategies : Display

Vision

Global Champion in Display



Goal

Exports : 18.3 b \$ (2005) → 50.0 b \$ (2015)
Global M/S : 37% (2005) → 45% (2015)
Localization Rate of Equipments & Materials : 90% (2015)



Strategic Initiatives

Consolidating global competitiveness	Strengthening infrastructure of R&D	Fostering customized high-level manpower	Improving the efficiency of support system
-Resource tech. -Joint development by consortium	-Expansion of Joint R&D system - -win-win projects between large and small firms	-Strategic Human Resources education program -Re-training	-Improvement of system(tax...) -Deepening of system for commercialization

I love Cambodia

Thank you!



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