

**WorldSkills Leaders Forum 2007**

# **New Technology Transforms Skilled Work**



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Samsung Electronics**

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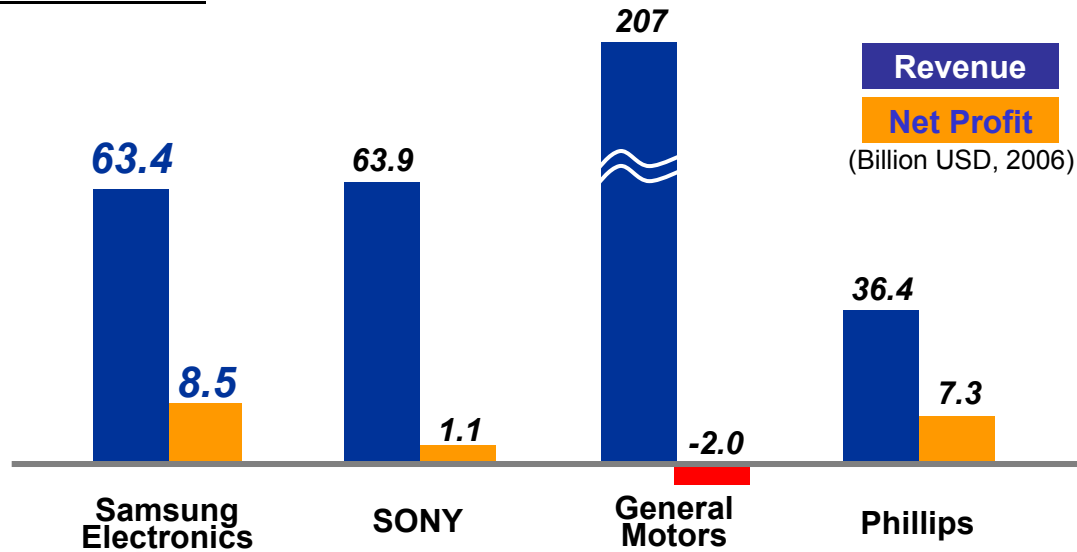
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# 1. Samsung Electronics

## Overview



(Brand Value, Billion USD)

Rank	Brand	Value
1	Coca-Cola	65.3
2	Microsoft	58.7
3	IBM	57.0
4	GE	51.5
5	Nokia	33.6
21	Samsung Electronics	16.8
22	Martini Lyncii	14.5
25	Sony	12.9
42	Phillips	7.7

\* Source: *BusinessWeek* / Interbrand (Jul. 2007)

**Memory Chips**

32% of World M/S(1<sup>st</sup>)  
Increasing Overseas Manufacturing

**Cell Phone**

14% of World M/S  
Overseas Manufacturing : 50%

**Digital TV**

11% of World M/S  
Overseas Manufacturing : 96%

(As of Q1 2007)

# 1. Samsung Electronics

## Global Manufacturing

- Headquarters : Seoul, South Korea**
- Production Bases : 27 Locations in 13 Countries**
- Number of Employees : 152,000 Worldwide (66,000 Abroad)**  
**Manufacturing Related Employees : 75,000 Worldwide (35,000 Abroad)**

(As of Q1 2007)

### The Americas

- USA (Texas), Mexico, Brazil
  - Semiconductor, TV, Monitor, Home appliance

### SE/SW Asia

- Thailand, Malaysia, India...
  - Home appliance, AV equipment, ODD, TV, Monitor, Cell phone

### Europe

- Slovakia, Hungary
  - TV, Monitor

### China

- Suzhou, Tianjin...
  - Home appliance, Semiconductor, LCD, Cell phone, Laptop PC, Printer

# 1. Samsung Electronics

## Electronics Industries

- Samsung Electronics Co., Ltd
- Samsung SDI Co., Ltd
- Samsung Electro-Mechanics Co., Ltd
- Samsung Corning Co., Ltd
- Samsung Corning Precision Glass Inc
- Samsung SDS Co., Ltd
- Samsung Techwin Co., Ltd
- Samsung Networks Inc

## Trade & Services

- Samsung Corporation
- Cheil Industries Inc
- Samsung Everland Inc
- The Shilla Hotels and Resorts Co., Ltd
- Cheil Communications Inc
- S1 Company
- Samsung Engineering



## Samsung Group

## Machinery & Chemical

- Samsung Heavy Industries Co., Ltd
- Samsung Techwin
- Samsung Total Petrochemicals
- Samsung Petrochemical Co., Ltd
- Samsung Fine Chemicals Co., Ltd
- Samsung BP Chemicals Co., Ltd

Revenue 158.9 Billion USD

Net Profit 12.9 Billion USD

Employees 261,000

(As of 2006)

## Financial Services

- Samsung Life Insurance Co., Ltd
- Samsung Fire & Marine Insurance
- Samsung Card Co., Ltd
- Samsung Securities Co., Ltd
- Samsung Investment Trust Management Co., Ltd
- Samsung Venture Investment Corp.

## Social Responsibility

- Samsung Community Relations
- Samsung Legal Aid Service
- Samsung Foundation of Culture
- Samsung Welfare Foundation
- Samsung Scholarship
- Hoam Foundation

# 1. Samsung Electronics

## Our Philosophy

Corporate Mission

**Contribute to a Better Global Society**

**Create Superior  
Products and Services**

**Human  
Resources**

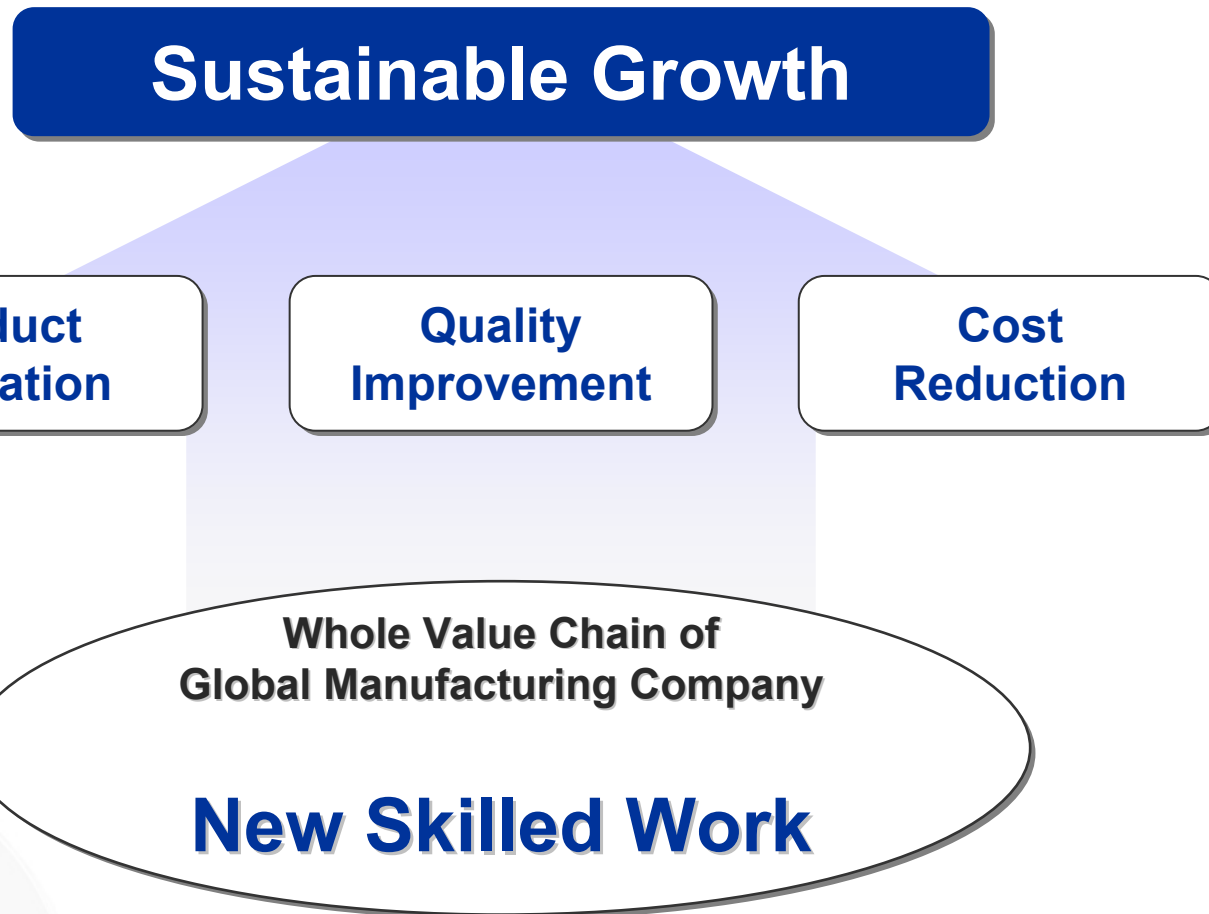


**Technology**

Key Management  
Resources

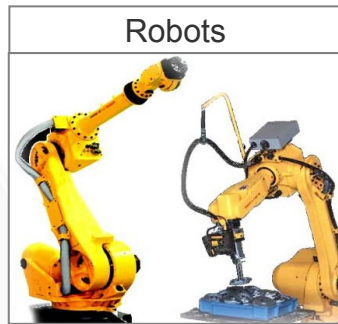
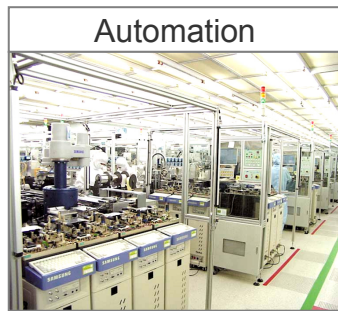
## 2. Global Manufacturing

To achieve sustainable growth, new skilled work should be developed throughout the whole value chain



## 2. Global Manufacturing

Advent of new manufacturing technologies reduced need for traditional skilled workers



Lessen  
Need for Skilled Workers  
and  
the Number of Skilled Workers



**Do they really eliminate skilled workers?**



# 3. Tech Innovations and Manufacturing

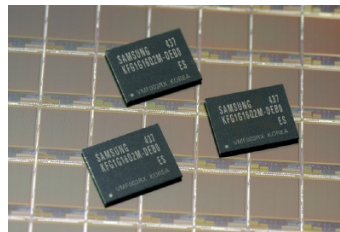
## Innovative products need creative skilled workers

### Traditional Products



Daily Objectives  
Speed & Quantity  
Personal Performance  
Diligence & Concentration

### Innovative Products



1)



2)

### Creative Skilled Workers



Long Term Objectives  
Speed & Quality  
Team Performance  
Intelligence & Communication

**Innovative products are opening a huge market**

**→ Skill is becoming crucial for innovation**

# 3. Tech Innovations and Manufacturing

## Global Companies with Human Centered Management

### Matsushita



*“We make a human, and we also make electronic products.”*

- Lifetime Employment
- Employees as the Basis of Management

**Encourage Creativity by Educating Employees**

**Creativity**

### Toyota



*“Implicit knowledge into explicit standardized knowledge”*

- Toyota Production System
- Quantify and Systemize Best Practices and Spread them

**Drive Kaizen by Systemizing Employees' Knowledge and Experience**

**Human + System**

### IBM



*“The most important value of IBM is the way we think.”*

- Knowledge Management System
- Recycle Existing Knowledge and Capitalize It
- Successfully Transfer to a Knowledge Based Company

**Capitalize Ideas Using Knowledge Management System**

**Knowledge Management**

# 4. SEC- A Manufacturing Company

## ***Semiconductor & LCD Manufacturing***

- Huge Capital Investment : 3~5 Billion USD per a 300mm Wafer FAB
- Key Success Factors : Equipment Efficiency, Yield, Cost Reduction

## **Hardware Oriented Manufacturing**

- Limited Roles to Technicians : Less Chance to Learn Useful Technology
- Harsh Working Environment : Physically Demanding, Repetitive

Automated Operation Helps to Concentrate on Quality and Productivity Issues



**Daily Equipment Operation**

Shop Floor Control → MES

MES : Manufacturing Execution System



**Fully Automated FAB**

Wafer Transfer → OHT

OHT : Overhead Hoist Transportation



**Workers Discuss on How to Improve yield of a wafer**

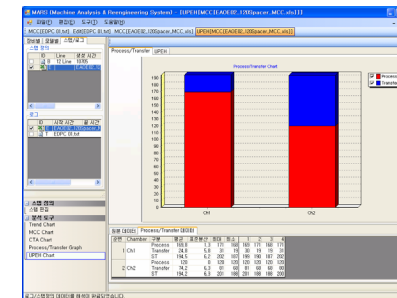
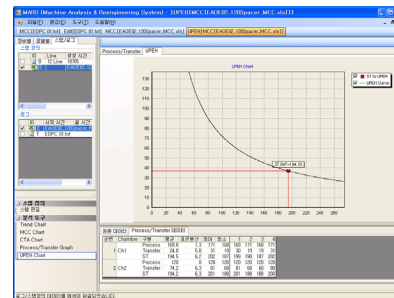
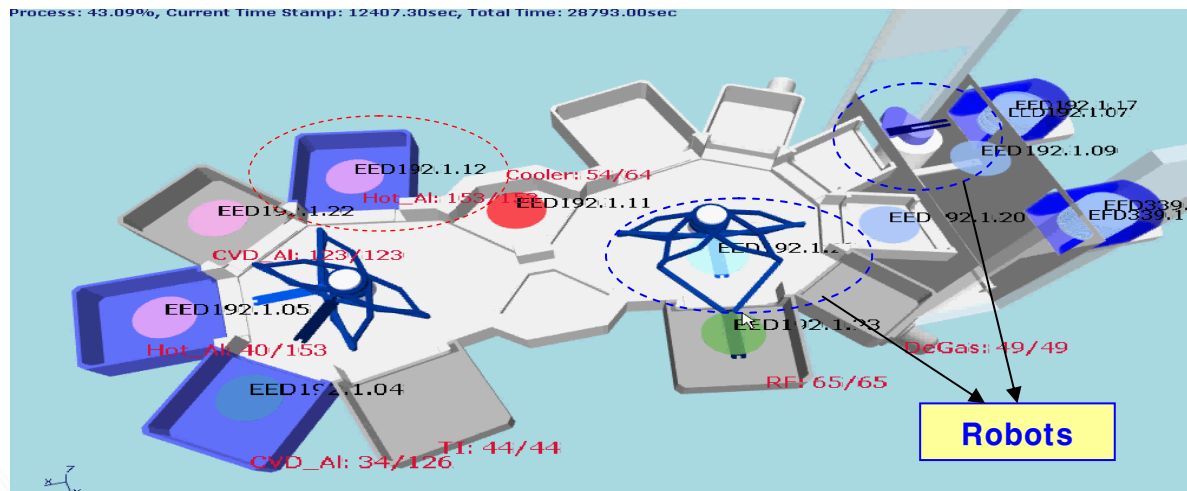
Monitoring → FDC

FDC : Fault Detection & Classification

# 4. SEC- A Manufacturing Company

New Roles Lead to Productivity and Pride

- Quality Analysis, Process Analysis, Equipment Optimization
- : Use of In-house Developed Computer S/W Tool for FAB Technicians



MCC tool helps to visualize whole manufacturing process

Technicians gain insight into complex semiconductor manufacturing process

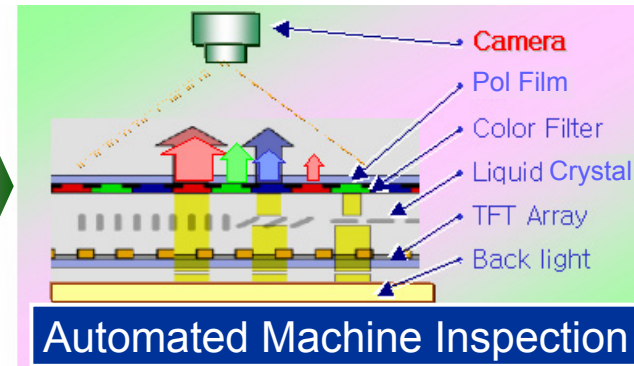
MCC : Machine Cycle Chart

# 4. SEC- A Manufacturing Company

## Hazardous and Health Breaching Environment

- Working in a Clean Class 100~10000 Environment  
(Heavy Payload and Repetitive Work, Exhaustion)
- LCD Inspection by Naked Eye Requires High Level of Training → Eye Sight Problems

### Automated Machine Inspection



- Inspection Equipment Detects Flaws and Defects : Missing TRs, Shorts, Bad Pixels
- **Skilled Workers Analyze the Source of Defect : Process, Equipment, Material (Knowledge Based)**
- Inspection such as Mura Detection is a Technically Challenging Topic  
: Human Knowledge + Experience → Machine Intelligence

# 4. SEC- A Manufacturing Company

## *Home Appliances and Cell Phone Manufacturing*

- Assembly Industry : Requires Economic Workforce, Low Capital Investment
- Productivity and Cost Efficiency : Low Level of Automation, Low Margin Business

### **Fast Changing Market**

- Lower Batch Manufacturing System
- Flexible Manufacturing Line, Low Cost Automation
- Global Manufacturing (96% of Production)

Introduction of Cell Manufacturing System (Self-completion, 2-men, 3-men ...)



Samsung Slovakia  
Galanta Factory

- Better Productivity (90→130 Laptops/Person/Day), Better Job Satisfaction, Better Salary for Best Workers
- **Multi-capability Training Essential**

# 4. SEC- A Manufacturing Company

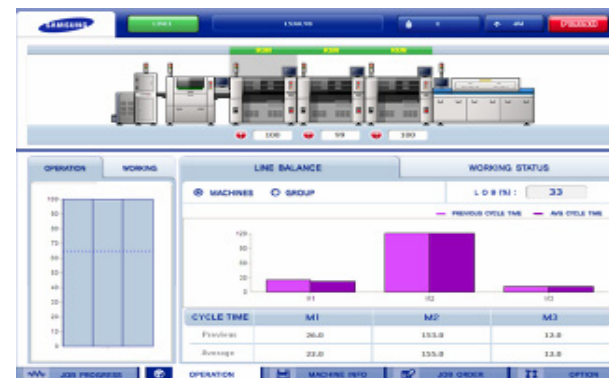
## Quality and Productivity

- Personal Level of Skills : Fluctuation after a Shift / Turnover
- Equipment Reliability and Maintenance : Experience/Skill, Dedication

### SMT (Surface Mount Technology) Machine – A Fundamental Quality Issue

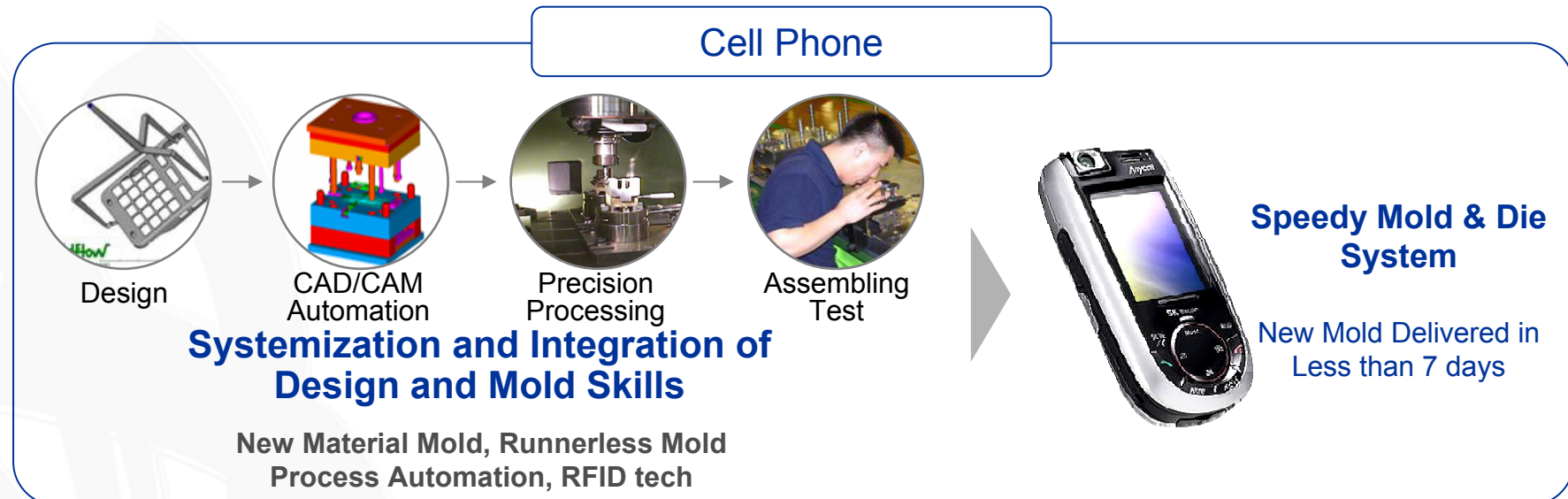
Experience and Know-how of SMT is Embedded in a Knowledge Based System

- Monitoring and Diagnosis : Preventive or Fast Recovery from Fault
- Intuitive System : Easy to Learn (Fast Training of Newly Recruits)
- **Engineers can concentrate on more fundamental quality issues**



# 4. SEC- A Manufacturing Company

## Traditional skills evolve for creative products





# 4. SEC- A Manufacturing Company

## Skills Education/Training System

- Training Video for Shop Floor Workers (In-House, Movie Clip 1)
- Year Round Education System (a la carte) : From Low-level to High-level Skills

## Skills Competition

- Holding **Global Mfg. Technology Olympics** and **Global Ace Cell Competition** within the Company (Movie Clip 2)
- Supporting **WorldSkills Korea** and **WorldSkills International**
  - . Encouraging Employees / Hiring 32 Winners and 9 National Representatives



Movie Clip 1



Movie Clip 2

# 5. Conclusions – Skills for the Future

## WSI and Future

Samsung Electronics selected new growth engines for the future including **Bio/Health, Energy** and **Robot.**



Traditional Skilled Worker

**Motivation**  
**Education**  
**Environment**  
**Tools**

**Global Issue**



Creative Skilled Worker  
for New Technology

- **Multi-skilled**
- **Knowledge-based**
- **Teamwork-oriented**



**Excavate and Share**

**Standards of the World Class Competency of**  
**Creative Skilled Workers**

**All Over the World**

# 5. Conclusions – Skills for the Future

## **Young technicians should be trained now for the future.**

- Foresee at Least 10 Years : Skills now will be obsolete soon
- Transform Common Technicians into Multifunctional Workforce
- Share Long-term Vision with Them : Stimulate Their Creative Power

## **Develop Consistent and Integrated Education Programs**

- Use State-of-the-art Technology for Training and Education
- Provide Good Tools for Innovation

## **Re-create Human Resources together with WSI**

- Share Global Experience : Culture, Language
- Cross-industrial Experience : Best Practice, New Ideas
- Better International Cooperation and Relations

# Thank you!

