

Global Innovation Management and Strategies

Sep.28, 2009

Competitiveness and R&D (= Research & Development) Capabilities

- The importance of new product development, success (failure) rates of new products, and R&D intensity –

The Importance of R&D Strategies

In today's global economic game,
technology strategies have become critical.

(L.C.Thurow[1996],*The Future of Capitalism*, NY., William Morrow & Com, P.78)

レスター サロー 『資本主義の未来』(TBSブリタニカ)

**The main corporate resource
in the industrial society**



**The main corporate resource
in the age of knowledge capitalism.**

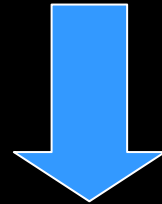
The means of production,
- the basic economic (corporate) resource-
is no longer capital,
nor natural resources (the economist's land),
nor "Labor".

It is and will be "Knowledge".

"Knowledge" is the basic economic (corporate) resource.

P. Drucker (1991), *Post capitalist Society*, NY, Harper Business, p.8

**The age of the industrial society,
in search of
cheap labor, natural resources (land)**



**The age
“in search of excellent brains”,
who create “knowledge”.**

Jim CLARK

established NetScape Communications Corp. in 1994.

When J.Clark started up NetScape C.Corp., he headhunted Marc Andreessen.

He was a student of Univ. of Illinois.

He developed a prototype of Internet browser *:mozaic*

How much did Jim offered to Mark?

The Number of Researchers per 10,000 (population/people)

	1965	1971	1981	1991	2001	2006
Japan	12.0	18.5	33.5	48.6	59.0	64.2 (53.0)
USA	25.5	25.2	29.7	38.7	45.2 (2000)	46.3 (2005)
UK	—	13.8('72)	22.5	22.3	27.0	27.0
Germany	10.8 (‘68)	16.8('75)	20.8	30.2	32.2	32.5
France	9.7 (‘66)	11.7	15.4	22.2	29.1	32.1
Korea	1.0 (‘66)	1.7	5.4	17.6	37.8	

CEO : COO : CFO

+

CTO



Chief Technology Officer

The fundamental role of CTO: is
To devise new product development strategies,
by grasping basic techno-trend, technological
infra-structure in the company, and R&D
behavior of competitors.

Microsoft: CTO was newly created in 1996
(**Dr. Nathan Myhrvold**), who used to study
under **Dr. S. Hawkins** (in Astronomy)

AOL: newly created in 1998
(**Marc Andreessen**)

Ciscosystems
Merrill Lynch

INTEL: Jan. in 2002 (CTO=
Patrick P. Gelsinger)

INTEL: Why Now CTO???

- “G.Moore and R.Noyce virtually used to play the role of CTO. Nowadays, our operations become expanded and complex, extending from computers, wireless networks, and to mobile phones and devices. The company has newly got to establish CTO, in order to explore our common strategies and synergy effects, by grasping the overall technology trend”.
 - “The job of the CTO is also to play some roles of CSO (Chief Strategic Officer) and CRO (Chief Research Officer)”.
- : Patrick P. Gelsinger (CTO)

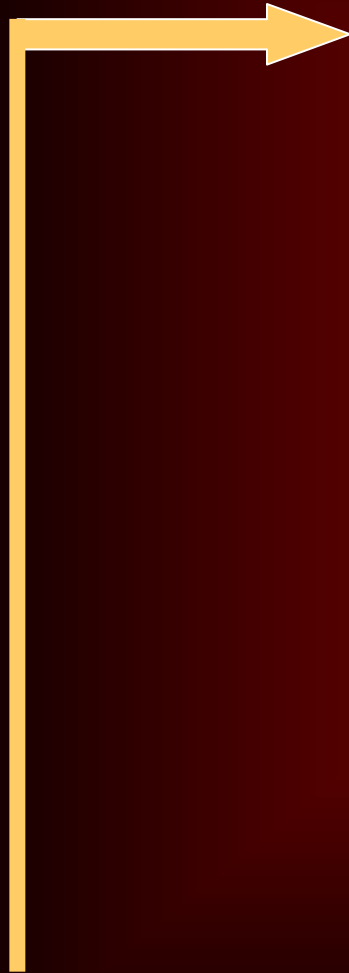
Virtuous Cycle of R&D

R&D Activities

Develop New Technologies

Develop New Products

**Launch New Product into
the Market**



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graph TD; A[Allocate for R&D Expenditures] --> B[High Market Share]; B --> C[Premium Price]; C --> D[High Profit Rate];
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High Market Share

Premium Price

High Profit Rate

Allocate for R&D Expenditures

Market Share/ Profit Rates /R&D Expenditures to Sales Revenue

Market Share	10 - 20%	20 - 30%	30 - 40%	40% -
Profit Rates	3.4%	4.8%	7.6%	13.2%
R&D Exp./Sales	2.4%	2.8%	3.2%	3.6%

Success Rates of New Products

Failure Rates : about 35 %

Industrial Goods : 20% – 25%

Consumer Goods : 30% – 35%

(USA)

G.L.Urban, J.R.Hauser, N.Dholakia, Essentials of New Product Managemnt,
Prentice Hall, 1987. P.4.

Failure Rates of New Products

Extension of existing product lines
: 27%

New brands of the existing product category
: 31%

Completely New Products
: 46%

Success Rates of New Products

**1,000 new products were launched
by 77 US companies in 1980's.**

**, of which ? % still survived in the
market after 5 years.**

(Business Week, Aug.16,1993)

PDMA (Product Development Association)

Claims that

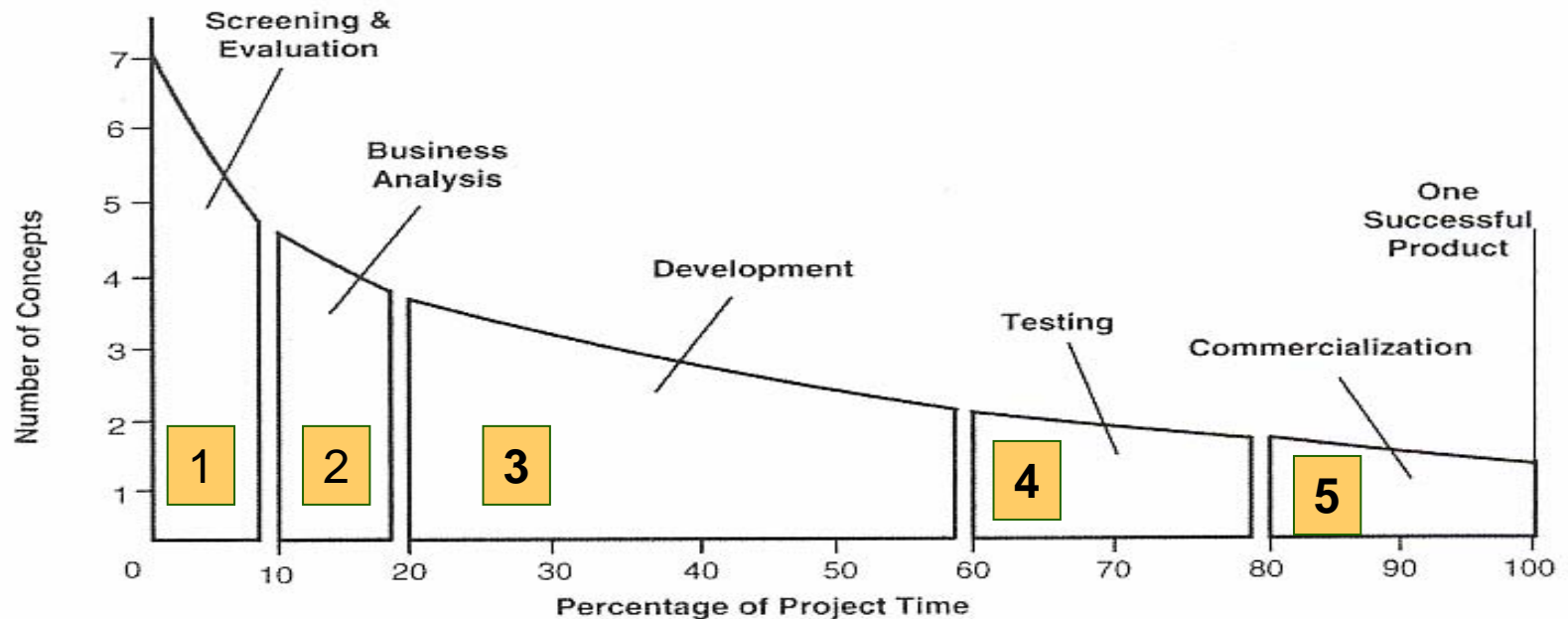
new products currently have a success rate of only ? percent at launch. (in the late 1990's in the US)

R.G.Cooper, *ibid.*, p.11

The Attrition Rate of New Product Projects

FIGURE 1.3 The Attrition Rate of New-Product Projects

For every 7 concepts,
one succeeds
For every 4 development projects,
one becomes a commercial winner!



SOURCE: A. L. Page, "PDMA new product development survey: Performance and best practices," paper presented at PDMA Conference, Chicago, Nov. 13, 1991.

For every seven product ideas, about four enter development, 1.5 are launches, and only 1 succeeds.

The Success Rate is $1/7*100=14.3\%$

Every 11 new product ideas, 3 enter the development phase, 1.3 are launched and only one is a commercial success in the market place.

$1/11*100=9.1\%$

The number of new products that were launched in the US(+Canada) market place in 2003 was 34,000.
(Foods, cigarettes, beverages, healthcare, etc.)

- **Definition of success**

More than US\$100million in the first year of the launch.

The success rate was ? %

Shortening trend of the period when the revenue is secured.

Globalization and Intensification of the market and competition

ICT → Internet Capitalism



- **The frequent emergence of new products ?**
- **Entry threat from other sectors/industries?**
- **PLC ?**

Companies that fail in successfully launching
new products disappear from the market.

The PLC of hit selling products

	less than 1 year	1- 2 Years	2-3 Years	3-5 Years	more than 5 Years	Total
before 1979	1.6	6.3	5.1	27.7	59.4	100
1980's	1.7	9.8	12.4	29.6	46.5	100
1990's	4.8	16.4	19.6	32.5	26.8	100
2000's	18.9	32.9	23.1	19.6	5.6	100

Source: SME Agency(2005), Chushokigyō Hakusho.
GIManagement

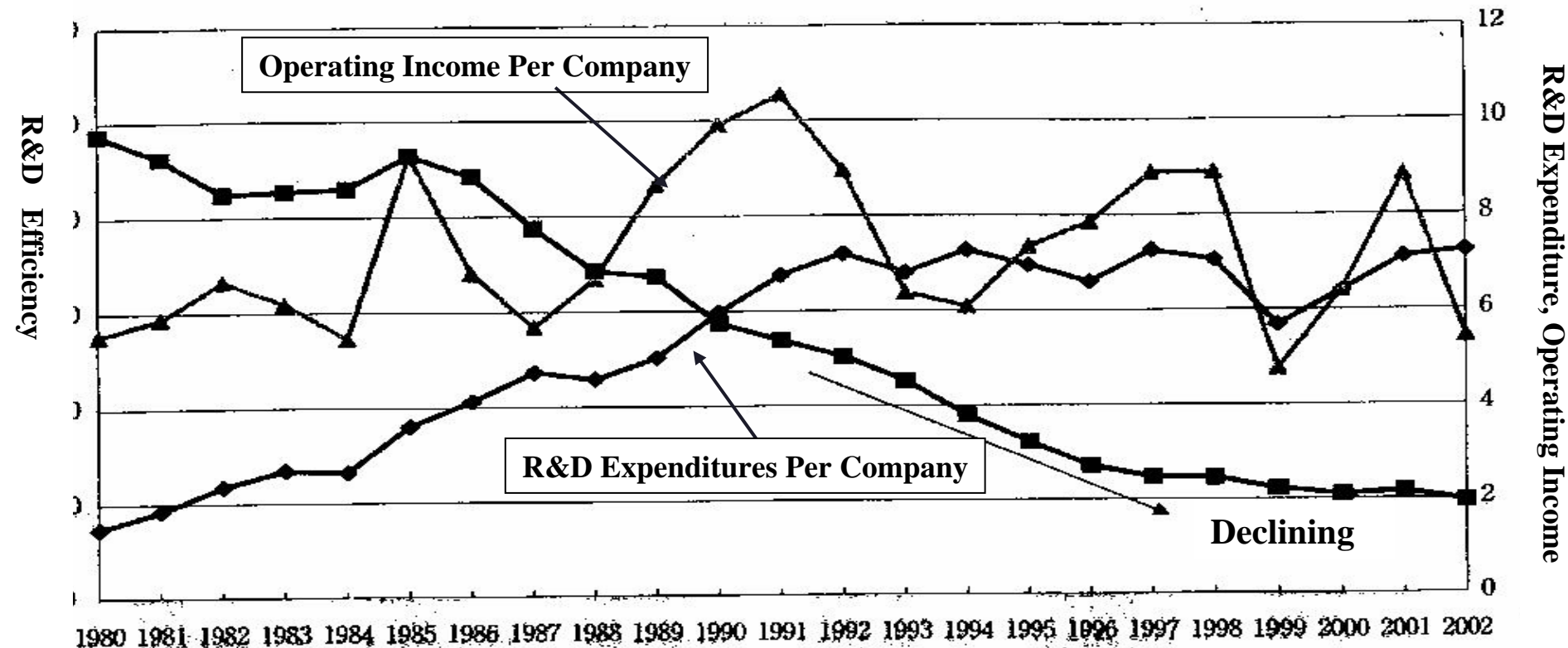
R&D Intensity of JPN Manufacturing Industries

	(R&D Expenses / Sales)	Nr of R&D employees / 10,000 employees (Person)	Nr of R&D employees to all employees (Person)
1960	0.88%	149	1 /67
1970	1.38	180	1/56
1980	1.63	323	1/31
1990	3.36	517	1/19
2000	3.70	776	1/13
2005	3.89*(6.02%)*	955(1,564)	1/10.5 (1/6.4)

Source: Ministry of Public Managmnt, Report on the Survey of R&D

Declining Tendency of R&D Efficiency of Japanese Manufacturing Industries

1980 - 2002 (in Million Yen)



Note: On the assumption that the lead time of R&D before commercialization is 5 years. R&D efficiency is defined as the ratio of operating profit to R&D expenditure. R&D efficiency is calculated in the following equation.

Nominal values are used in the calculation.

R&D efficiency in the year concerned = (Per-company operating income in the past 5 years counting backward from the year concerned) / (Per-company internally used R&D expenditure in the past 5 years counting backward from the 5th year before the year concerned)

E.g.: R&D efficiency in 1995 = avg. operating income between 1991-1995 / avg. R&D expenditures between 1986-1990

Source; Ministry of S&T(2003), White Paper on Science & Technology

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1: Why are innovations and the new product development critically important?

2: JPN companies have increased R&D intensities in these years. Why have R&D efficiencies of JPN companies been declined in these years?

takabumi@rikkyo.ac.jp

<http://www.rikkyo.ne.jp/~takabumi/GIM.html>