

# Trends in Business Enterprise R&D

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## 1992-2001

Steady refinement of industrial R&D and product development management processes

“Unambiguously business-driven R&D”, i.e. greater structure and focus

“Ten year spread between the best and the rest”

Diverse, networked ecologies for global R&D

R&D alliances; technology mergers and acquisitions

Issues of connectedness, trust and awareness within the network

Renewed growth in total R&D expenditures and in proportion funded by industry

Differences across sectors as well as between regions



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Sources: OECD Main Science/Technology Indicators; 2000 Global survey, IRI and sister organisations

## Shifting Approaches to Enterprise R&D

- Emphasis on building Corporate Value
- Growing importance of intangibles on balance sheet
- Partnerships and outsourcing; Start-ups and spin-outs
- More R&D allocated to New Business Growth
- Strategic emphasis on patent & licensing
- Willingness to operate R&D as a competitive business



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## Impact of Knowledge Economy

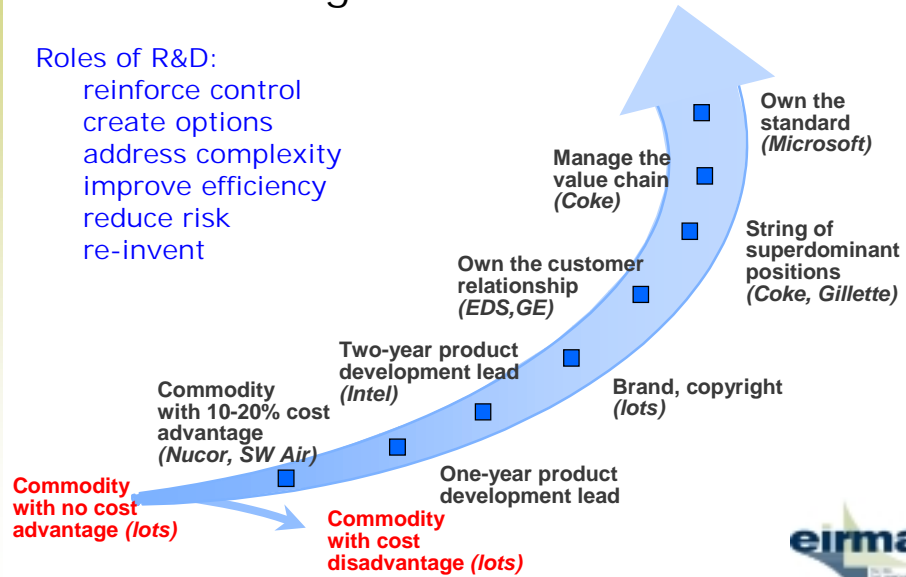
- Provided many new R&D capabilities as well as created new markets
- Provided a response to – but also created - complexity, expense and time pressures
- “The more these new capabilities warp time, the less relevant the linear model of R&D becomes”



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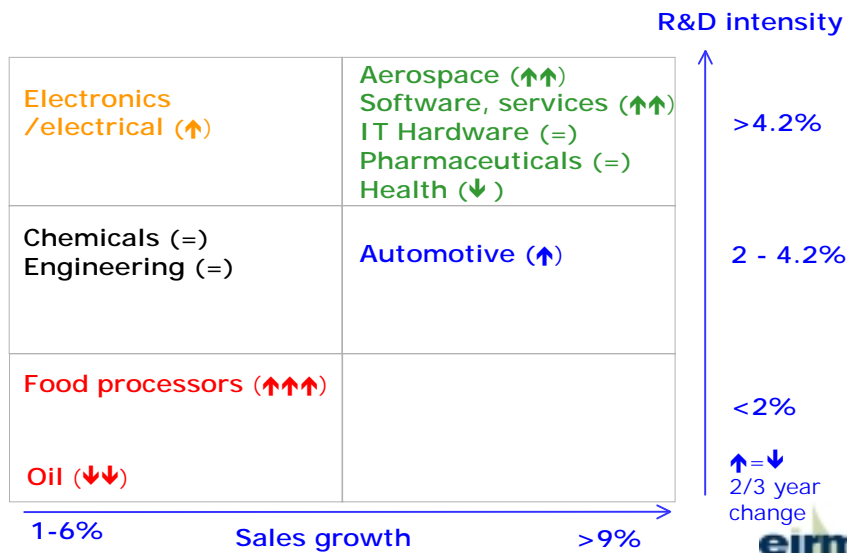
# Value Creation and Strategic Control Points

Roles of R&D:  
 reinforce control  
 create options  
 address complexity  
 improve efficiency  
 reduce risk  
 re-invent



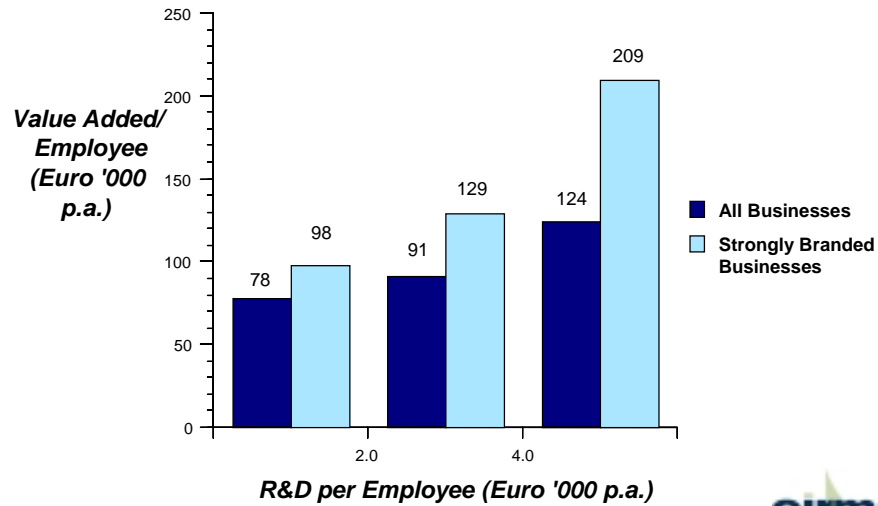
5 Source: Slywotzky & Morrison

# R&D Intensity and Sales Growth



6 Source: 2001 UK DTI R&D Scorecard

## Value Creation, R&D and Communication



7 Source: Brands, Innovation, Growth (AIM/PIMS 1998)

## R&D 2000 "Sea Change" Index

% companies predicting growth less % predicting a decline in ...

	US (109 firms)	EU (33)	Japan (67)
Total R&D	+5	+9	+2
R&D for existing business	-10	0	-6
Basic research	-21	-31	-39
R&D for new business	+44	+61	+31
R&D alliances	+40	+8	+27
University grants	+3	+18	-21
R&D personnel	-2	0	-17

8 Source: IRI R&D Trends Forecast for 2000

## R&D 2001 "Sea Change" Index

% companies predicting growth less % predicting a decline in ...

	EU (41)
Total R&D	+5
R&D for existing business	-7
Basic research	-34
R&D for new business	+41
R&D alliances	+41
University grants	0
R&D personnel	-5



9 Source: IRI R&D Trends Forecast for 2001 (preliminary)

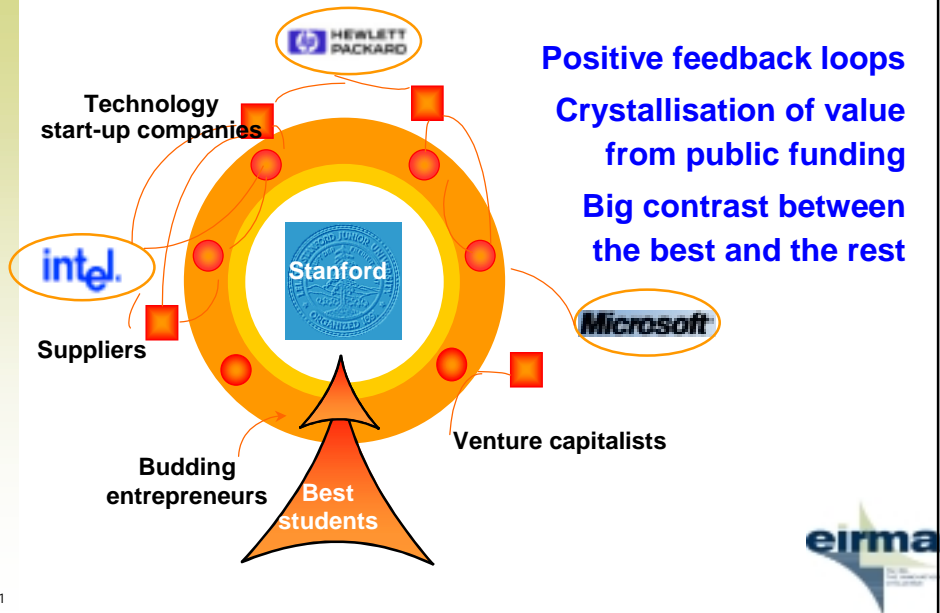
## Technology Leaders' "Biggest Problems"

	USA	Europe	Korea	Japan	Australia
R&D for Business Growth	20%	14%	25%	21%	10%
Accelerate innovation	23%	7%	3%	17%	10%
Business/technology linkage	7%	7%	17%	20%	30%
Manage global R&D	5%	7%	3%	5%	5%
Manage knowledge	1%	2%		2%	



10 Source: 2001 Global survey, IRI and sister organisations

# Innovation Systems and Technology Networks



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# Social Pressures



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## Lessons Looking Back

- Research essential for producing innovation and growth
  - Customers define innovation; technology creates options
  - Radical culture needed to support radical innovation
- Value of high quality science base and strong industry-institutional linkages
  - About connecting, fertilising, quality, flexibility, crystallising value
- Benefits of single markets in innovative ideas
  - Enabling flexible response and speed to market
  - Consistency of objectives across multiple policy goals and larger markets



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## Looking Forward

- Continued business emphasis on value creation
  - Response to business cycles and the potential of the "knowledge economy" are different issues
- Consequences of R&D re-profiling (corporate → business unit → outsourced)
  - Issues of managing quality and technology transfer (esp. for mature capital-intensive industries)
  - Properly rewarding the different inputs
- "Globalisation, Liberalisation, Technology"
  - R&D and reputation
  - Assurance processes; Triple bottom line; "Intellectual property rights" versus "rights of access"



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## Looking Forward

- Human skills and mobility remain fundamental
  - “Researchers as Business People; Research as a Business”
  - Adequate supply of young people
- Resilient innovation systems
  - Some sharp contrasts between countries' approaches
  - Emphasis on encouraging quality, variety, take-up
  - Rationale for public R&D in support of business interests:  
Which strengths and weaknesses receive priority? Where is innovation likely to strike? What is critical mass?

