



## **Innovation Excellence 2005**

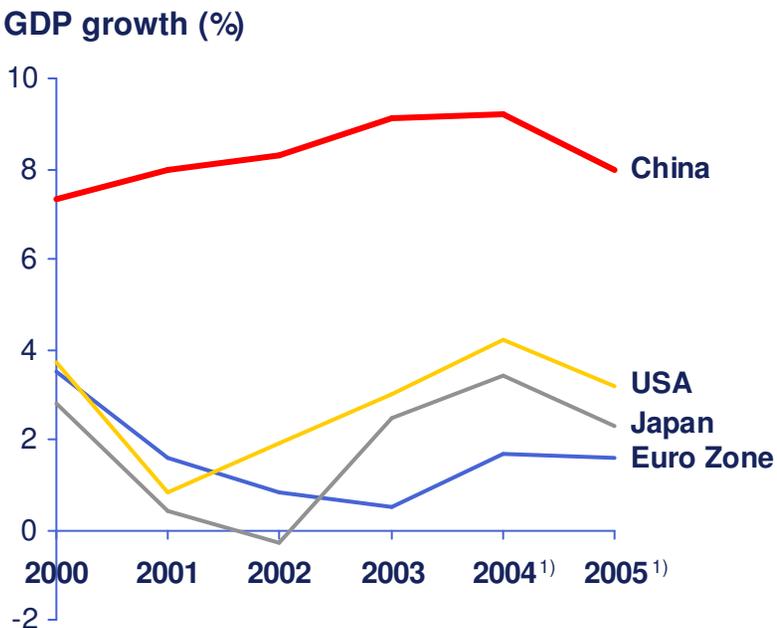
How companies use innovation to improve profitability and growth

**Presentation to  
Respondents**

**February 2005**

**Arthur D Little**

## After a difficult economic period, last year has shown high GDP growth, but innovation will be crucial for further growth

Annual GDP growth	Innovation is crucial																																			
 <p><b>GDP growth (%)</b></p> <table border="1"><thead><tr><th>Year</th><th>China</th><th>USA</th><th>Japan</th><th>Euro Zone</th></tr></thead><tbody><tr><td>2000</td><td>7.5</td><td>3.5</td><td>2.5</td><td>3.5</td></tr><tr><td>2001</td><td>8.0</td><td>1.0</td><td>0.5</td><td>1.5</td></tr><tr><td>2002</td><td>8.5</td><td>2.0</td><td>-0.5</td><td>0.5</td></tr><tr><td>2003</td><td>9.0</td><td>3.0</td><td>2.5</td><td>0.5</td></tr><tr><td>2004<sup>1)</sup></td><td>9.0</td><td>4.0</td><td>3.5</td><td>1.5</td></tr><tr><td>2005<sup>1)</sup></td><td>8.0</td><td>3.0</td><td>2.5</td><td>1.5</td></tr></tbody></table>	Year	China	USA	Japan	Euro Zone	2000	7.5	3.5	2.5	3.5	2001	8.0	1.0	0.5	1.5	2002	8.5	2.0	-0.5	0.5	2003	9.0	3.0	2.5	0.5	2004 <sup>1)</sup>	9.0	4.0	3.5	1.5	2005 <sup>1)</sup>	8.0	3.0	2.5	1.5	<ul style="list-style-type: none"><li>■ World economy has gone through difficult time with low economic growth</li><li>■ In the past few years, companies and governments have strongly focused on restructuring</li><li>■ Economic outlook for 2005 is poor: GDP growth is expected to decline in the USA, Japan and China and to stagnate at a low level in the Euro zone</li><li>■ Many industries increasingly focus on innovation for further growth after recent focus on cost cutting and efficiency gains have been largely exhausted</li></ul>
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1) Forecast  
Sources: Eurostat July 2004, Worldbank, European Commission, The Economist

## There are important differences in regional innovation strength, but everywhere it is high on the public and corporate agenda

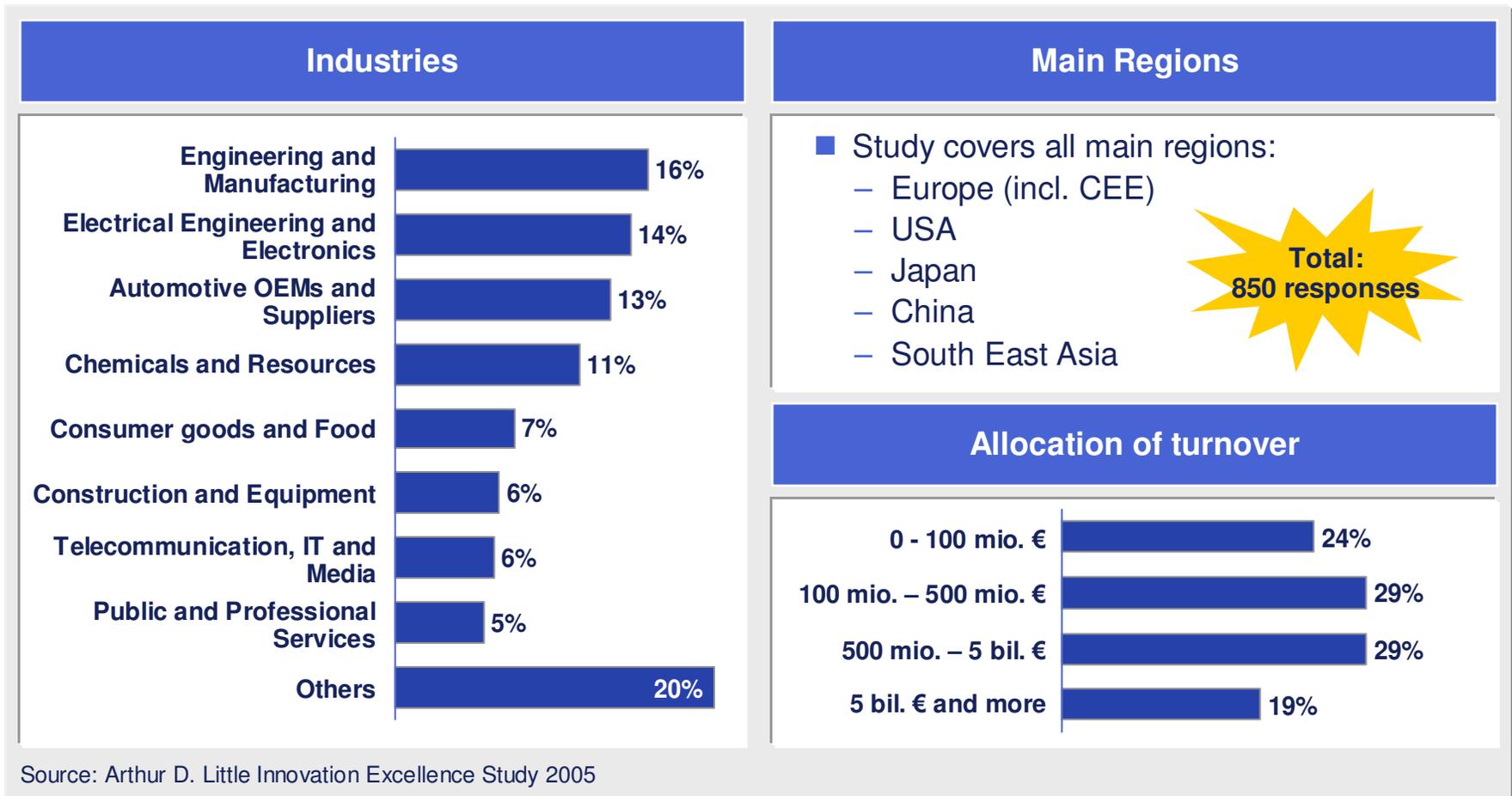
Innovation Strength	Innovation is high on the agenda								
<p><b>Country Innovation Index<sup>1)</sup> (Strength)</b></p> <table border="1"><thead><tr><th>Country</th><th>Index Value</th></tr></thead><tbody><tr><td>Japan</td><td>0,77</td></tr><tr><td>USA</td><td>0,70</td></tr><tr><td>Euro Zone</td><td>0,44</td></tr></tbody></table>	Country	Index Value	Japan	0,77	USA	0,70	Euro Zone	0,44	<ul style="list-style-type: none"><li>■ Innovation is of paramount importance to implement the ‘Lisbon agenda’ to make Europe the world’s most competitive region</li><li>■ Governments try to boost innovation in order to stimulate economic growth<ul style="list-style-type: none"><li>– Mr. Schröder declared 2004 as the ‘year of innovation’ and set-up a dedicated innovation office</li><li>– In France, the ‘Beffa report’ advises a € 1 billion annual public/private investment to improve innovation capabilities</li><li>– In the USA, the government is investing significantly in nanotechnology</li></ul></li><li>■ New emerging markets yield new opportunities and challenges to globalise the innovation process</li></ul>
Country	Index Value								
Japan	0,77								
USA	0,70								
Euro Zone	0,44								
<p>1) Weighted average of various indicators concerning innovation Source: European Innovation Scoreboard 2004</p>	<p>Sources: European commission, Bundeskanzleramt, LeMonde, Nature Biotechnology</p>								

## Arthur D. Little used its Third Global Innovation Survey to evaluate the untapped potential of innovation and what excellent companies do

Analysed types of innovation	Key Questions
<ul style="list-style-type: none"><li>■ <b>Product and Service innovations:</b> Development and commercialisation of new products or services – often in association with new technologies – to fulfil new customer demands</li> <li>■ <b>Process innovations:</b> New ways of manufacturing products or to generate services leading to advantages concerning cost, quality or logistics</li></ul>	<ul style="list-style-type: none"><li>■ What is the potential of Innovation Excellence?</li><li>■ Which strategic levers are used to increase growth and profitability?</li><li>■ What are the most important innovation goals?</li><li>■ How to achieve Innovation Excellence and what are the Key Success Factors?</li><li>■ What are the main barriers in the innovation process?</li><li>■ What are the trends and best practices in innovation management?</li></ul>

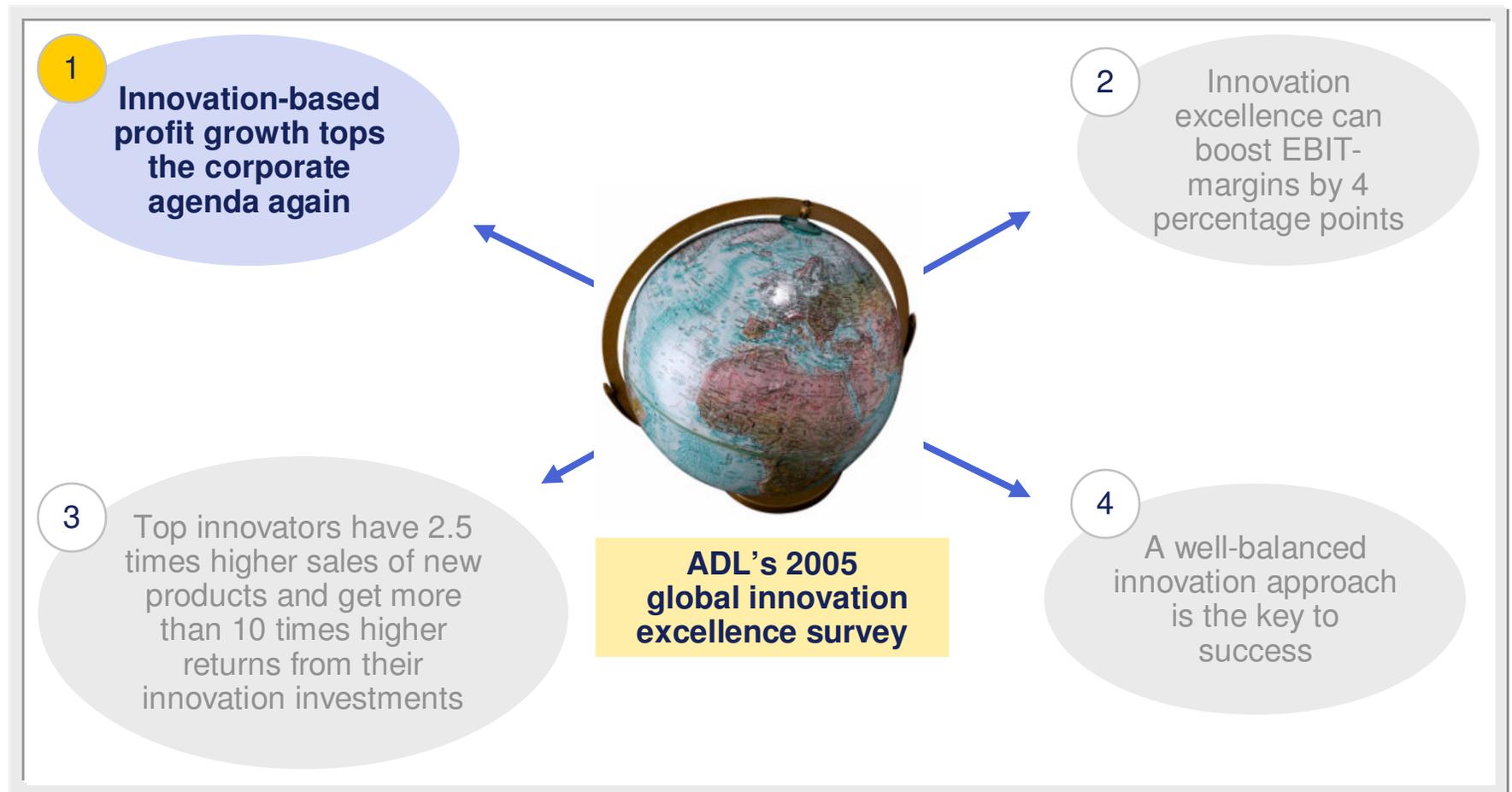
➔ **Analysis is focused on the most innovative companies (best 25% in each industry sector) to identify best practice in Innovation Excellence**

## More than 800 companies from across the globe provided their insights on Innovation Excellence

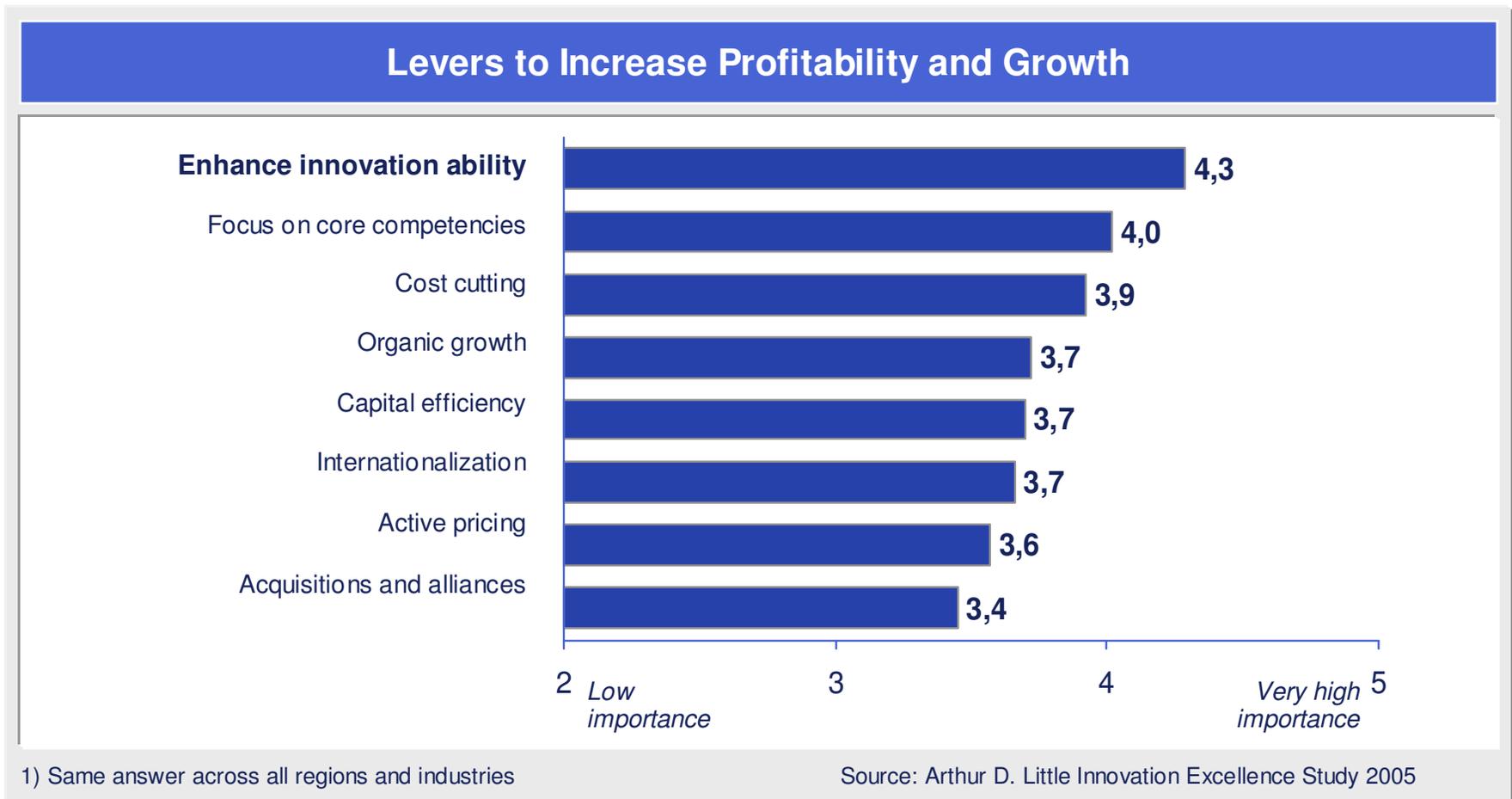


Source: Arthur D. Little Innovation Excellence Study 2005

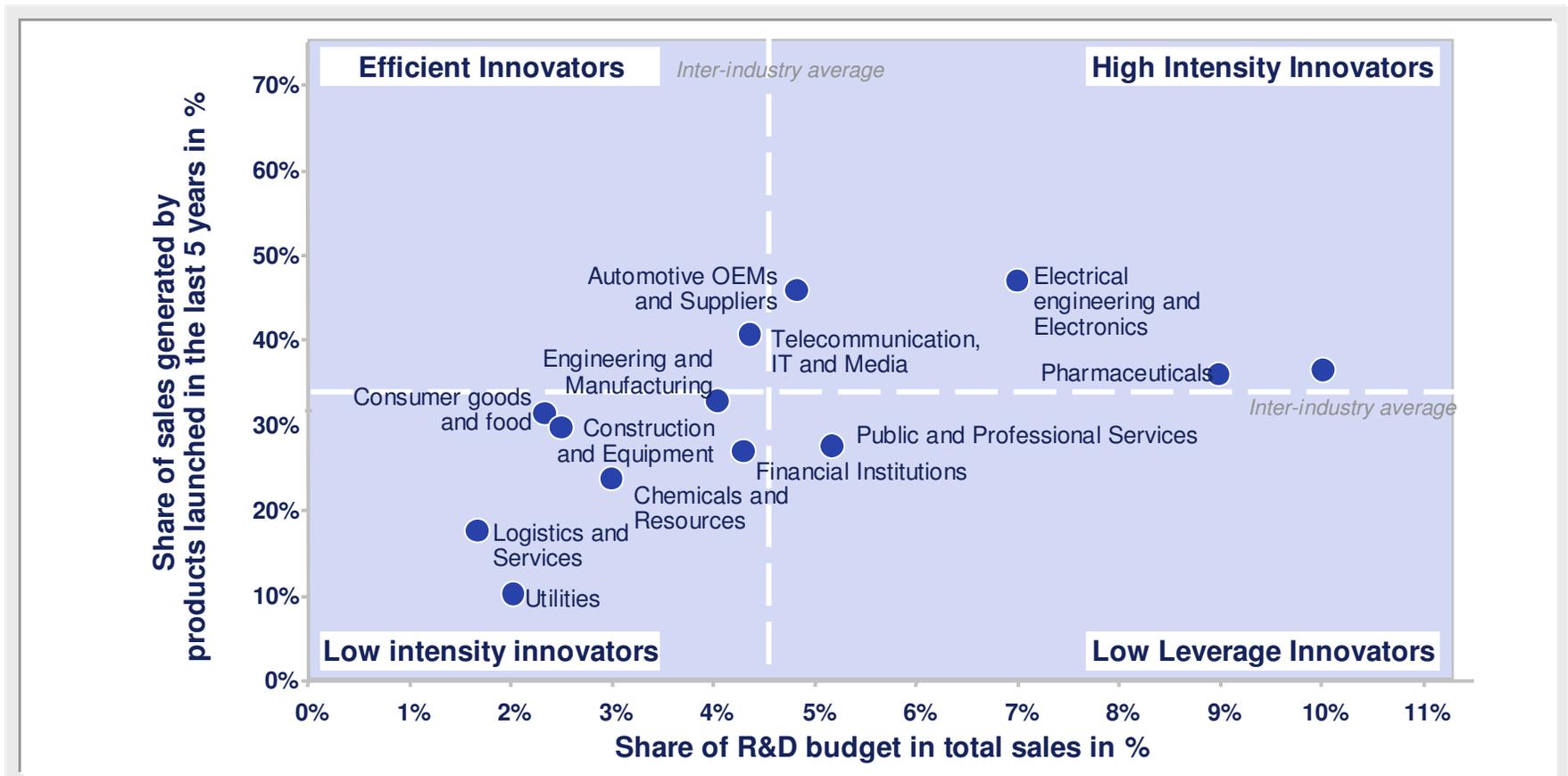
**Worldwide, companies target with number one priority the huge untapped potential to improve profit growth through better innovation management**



## Companies believe that enhancing innovative ability is today the most important lever to increase profitability and growth<sup>1</sup>



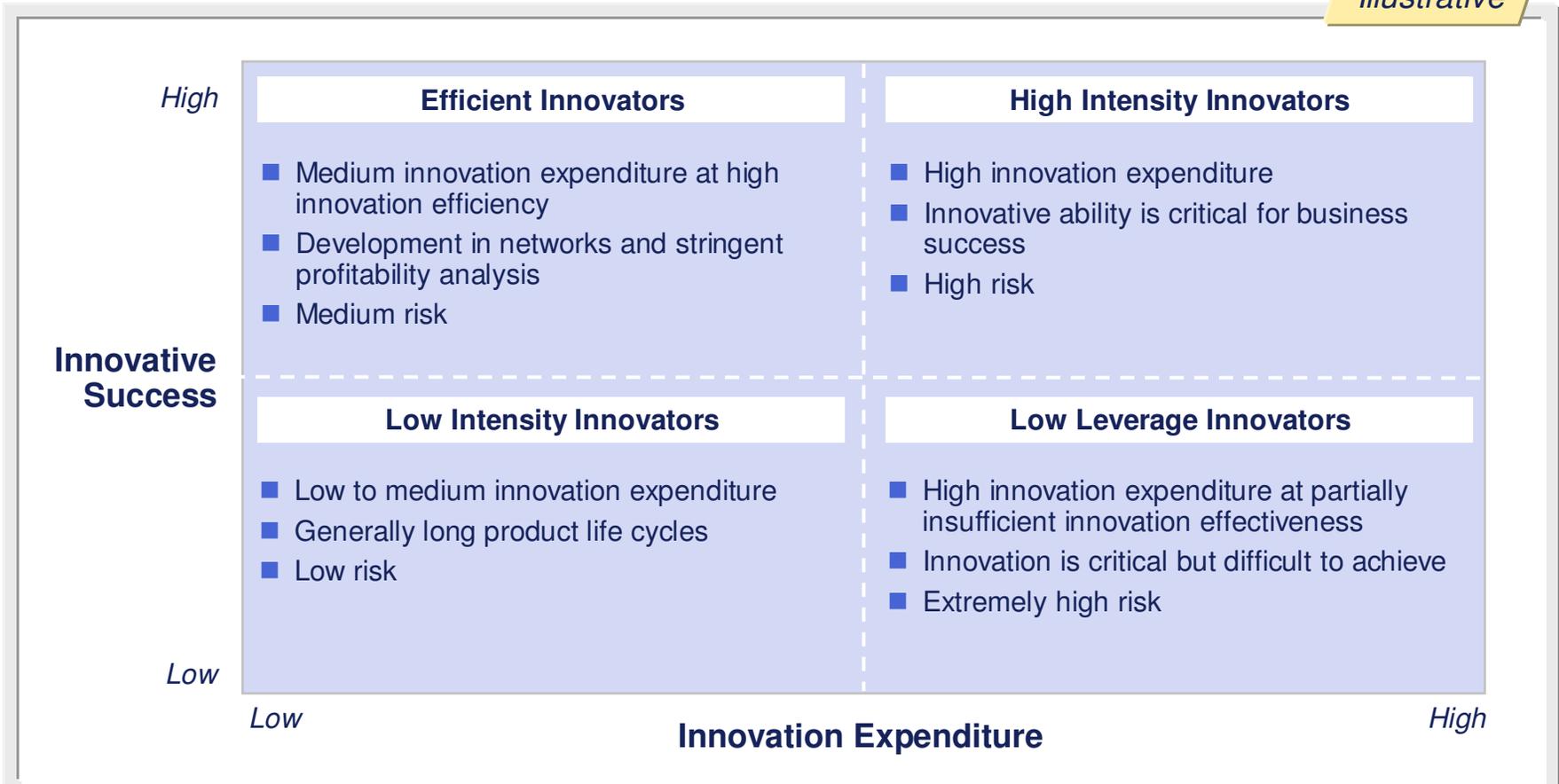
There are fundamental differences between industries with regard to innovation investments and efficiency



Source: Arthur D. Little Innovation Excellence Study 2005

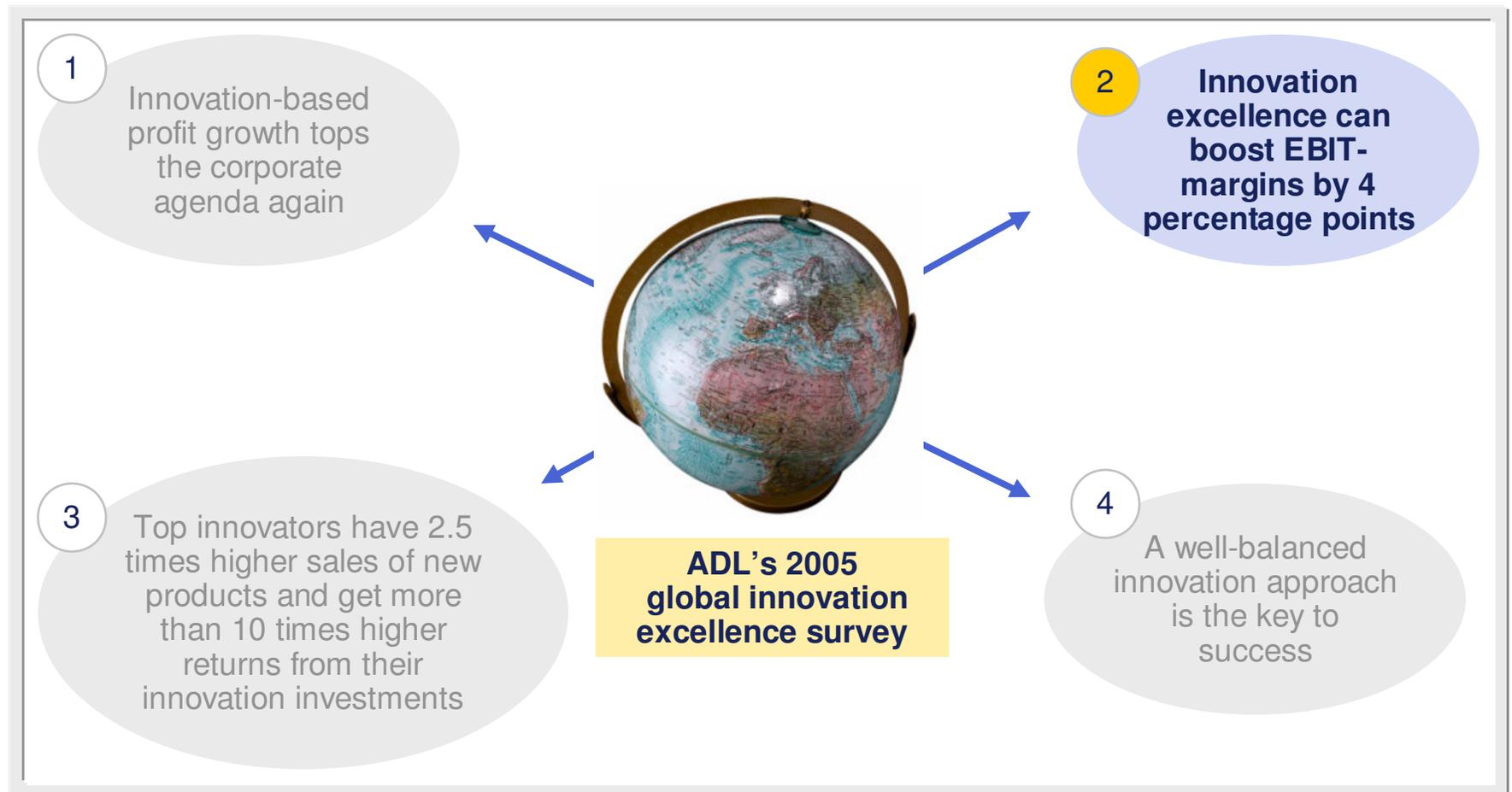
## Industry segments can be classified in four clusters describing the differences in innovation dynamics

Illustrative

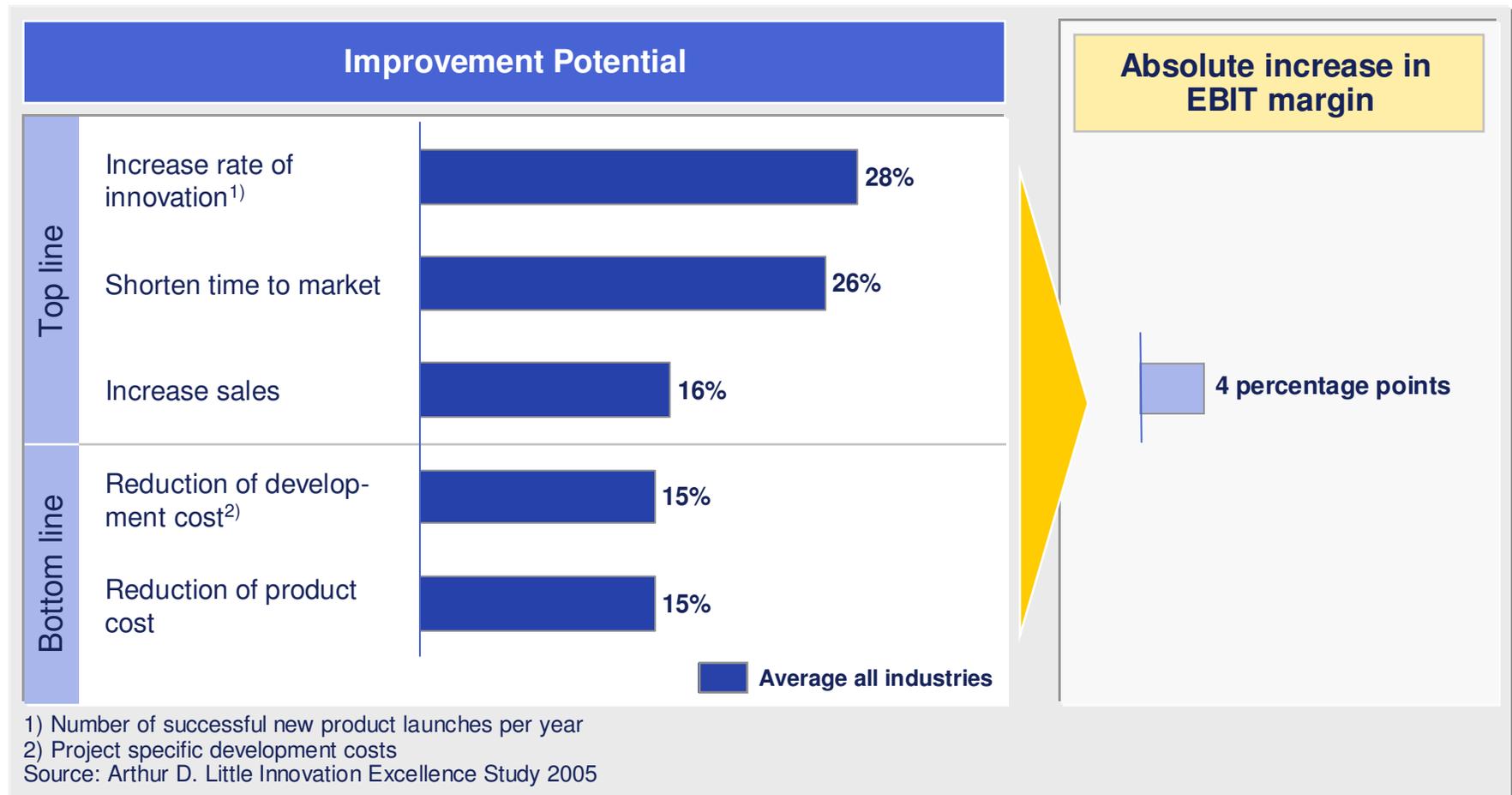


Source: Arthur D. Little Innovation Excellence Study 2005

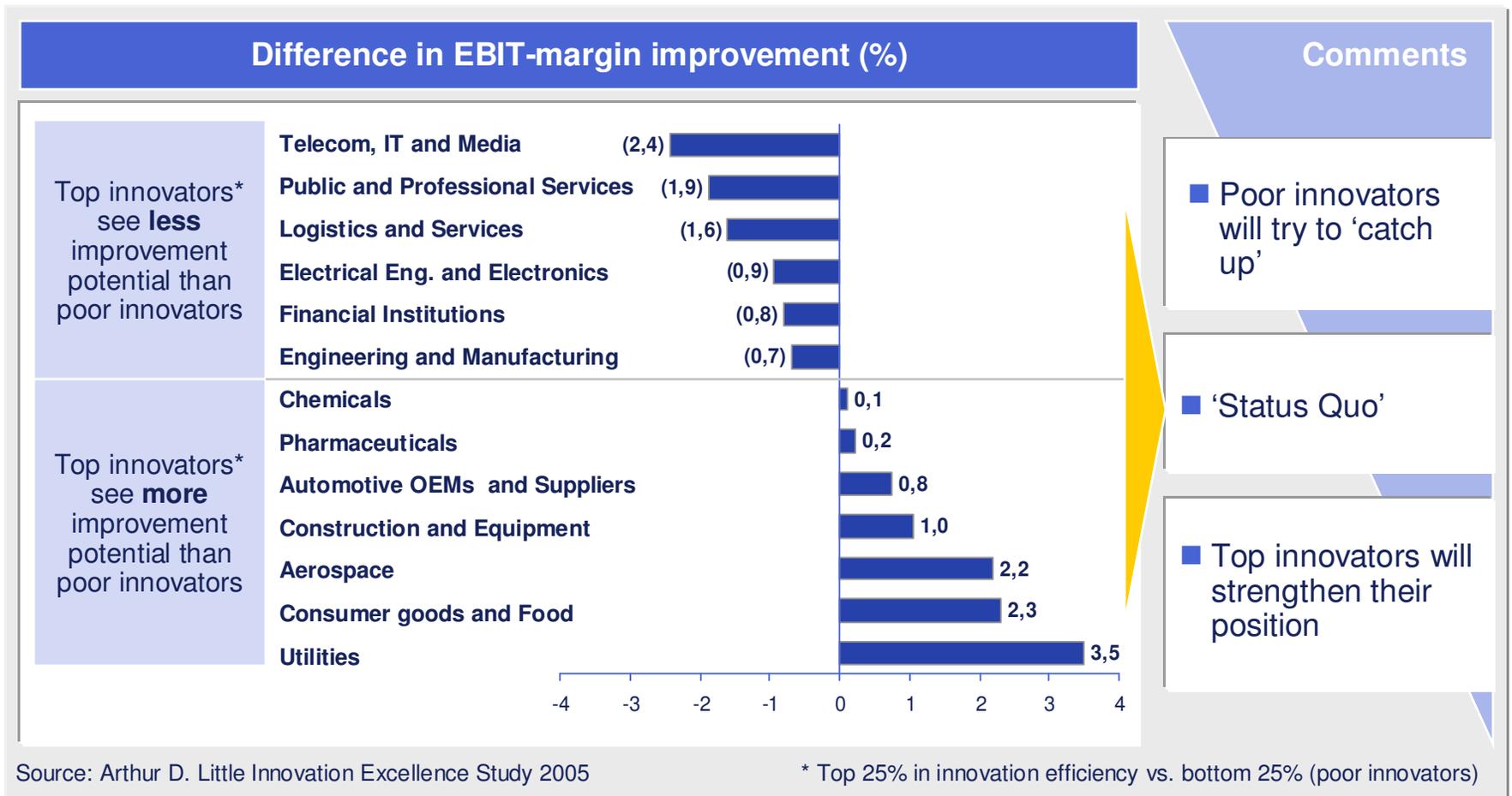
**As a number one priority, companies worldwide are targeting the huge untapped potential to improve profit growth through innovation management**



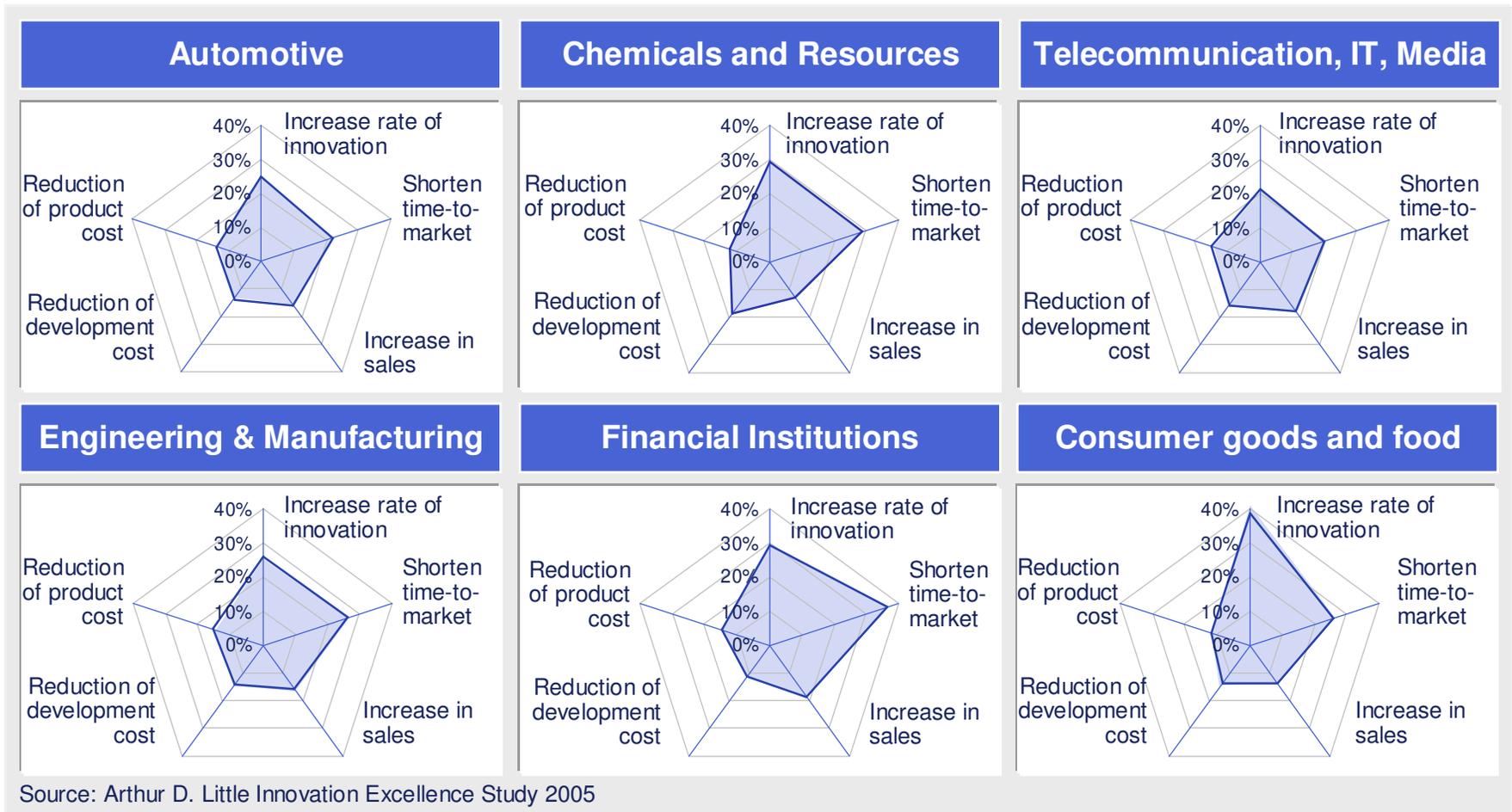
# Achieving Innovation Excellence can boost the EBIT-margin by 4 percentage points through both top line growth and bottom line improvements



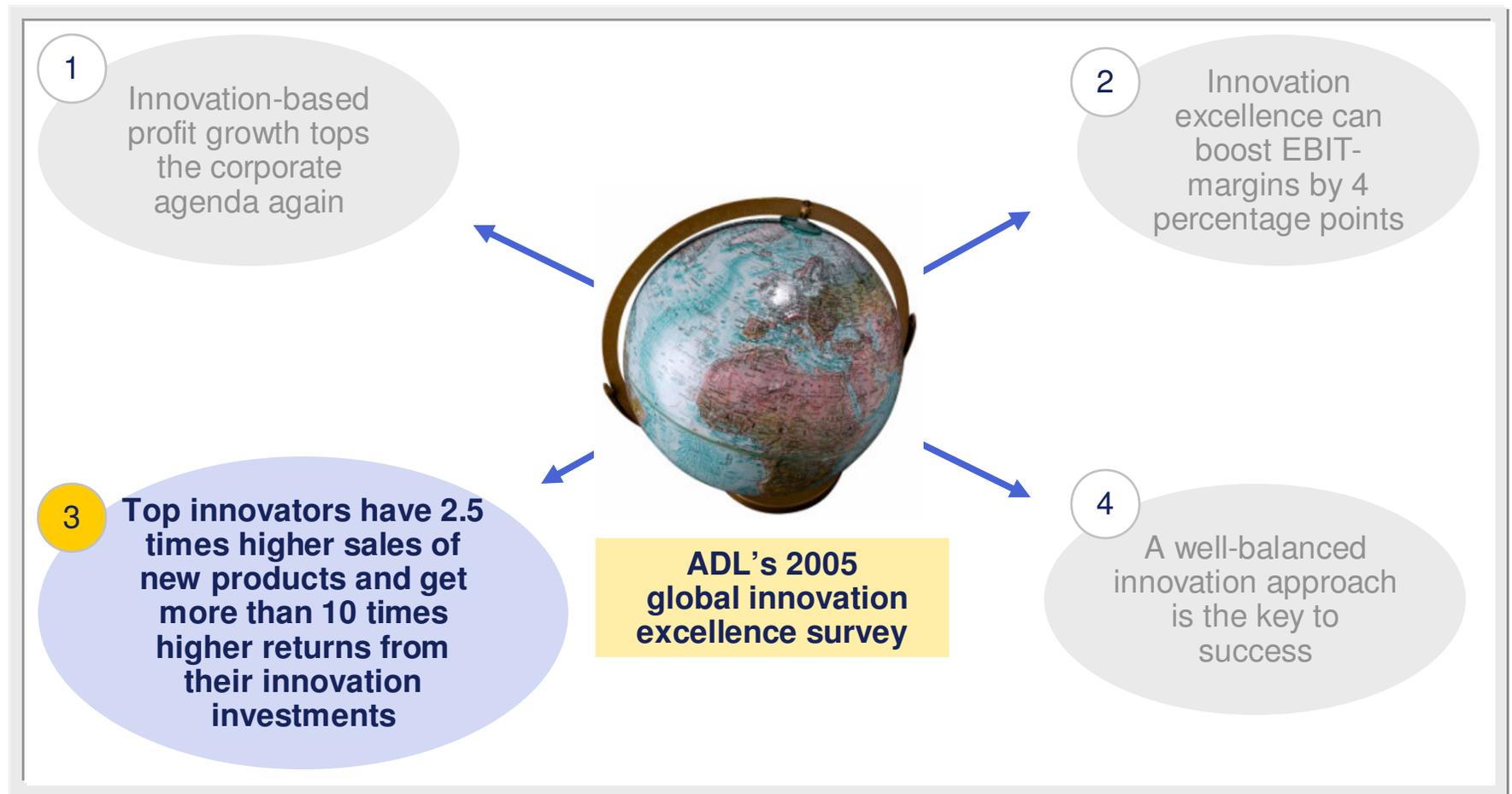
In some industries poor innovators are expected to catch up, while in other industries top innovators believe they will strengthen their position



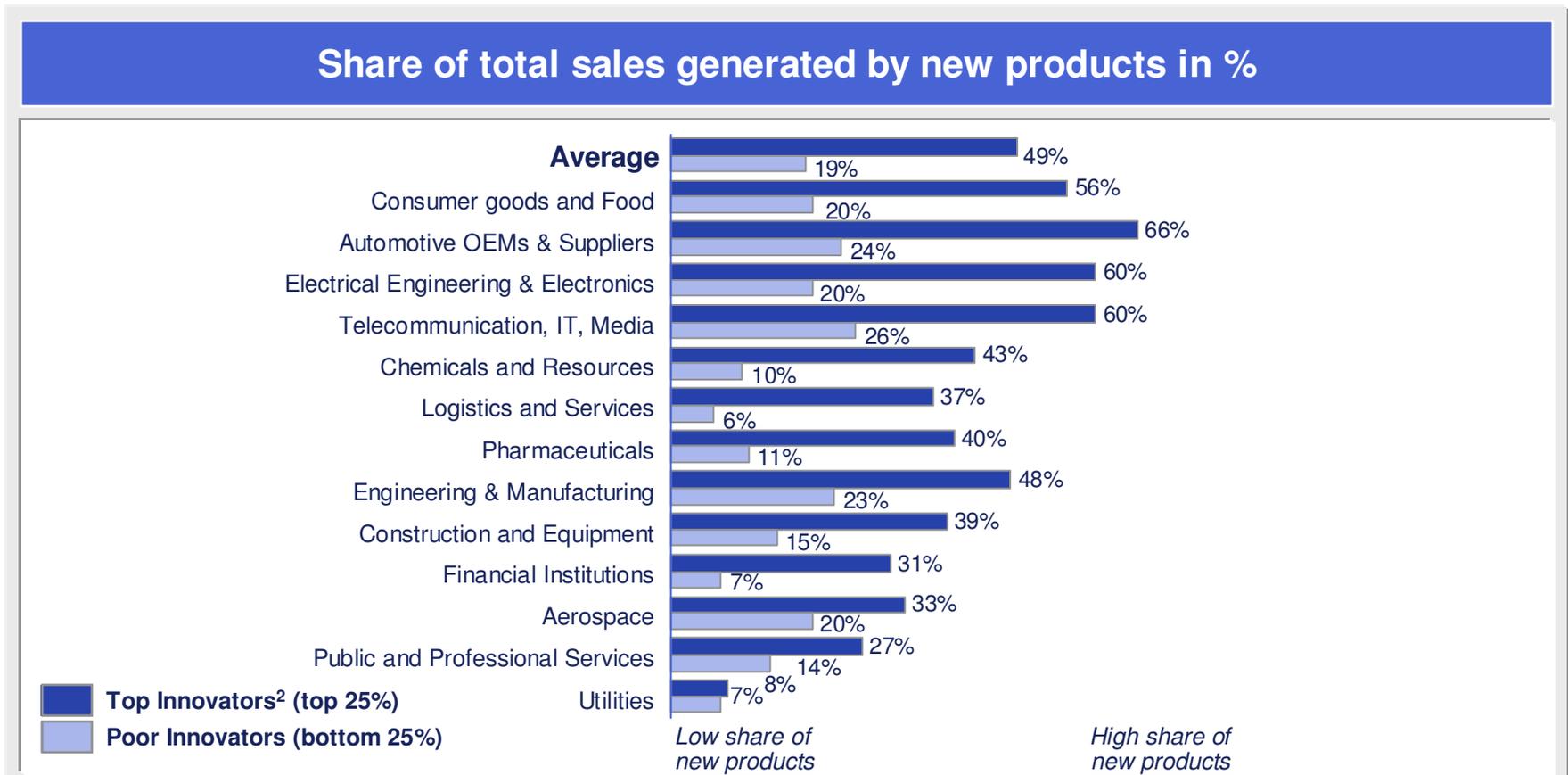
## The innovation improvement potential and focus differ per industry



**As a number one priority, companies worldwide are targeting the huge untapped potential to improve profit growth through innovation management**



On average, Top Quartile Innovators have 2.5 times higher sales of new<sup>1</sup> products than companies in the bottom quartile

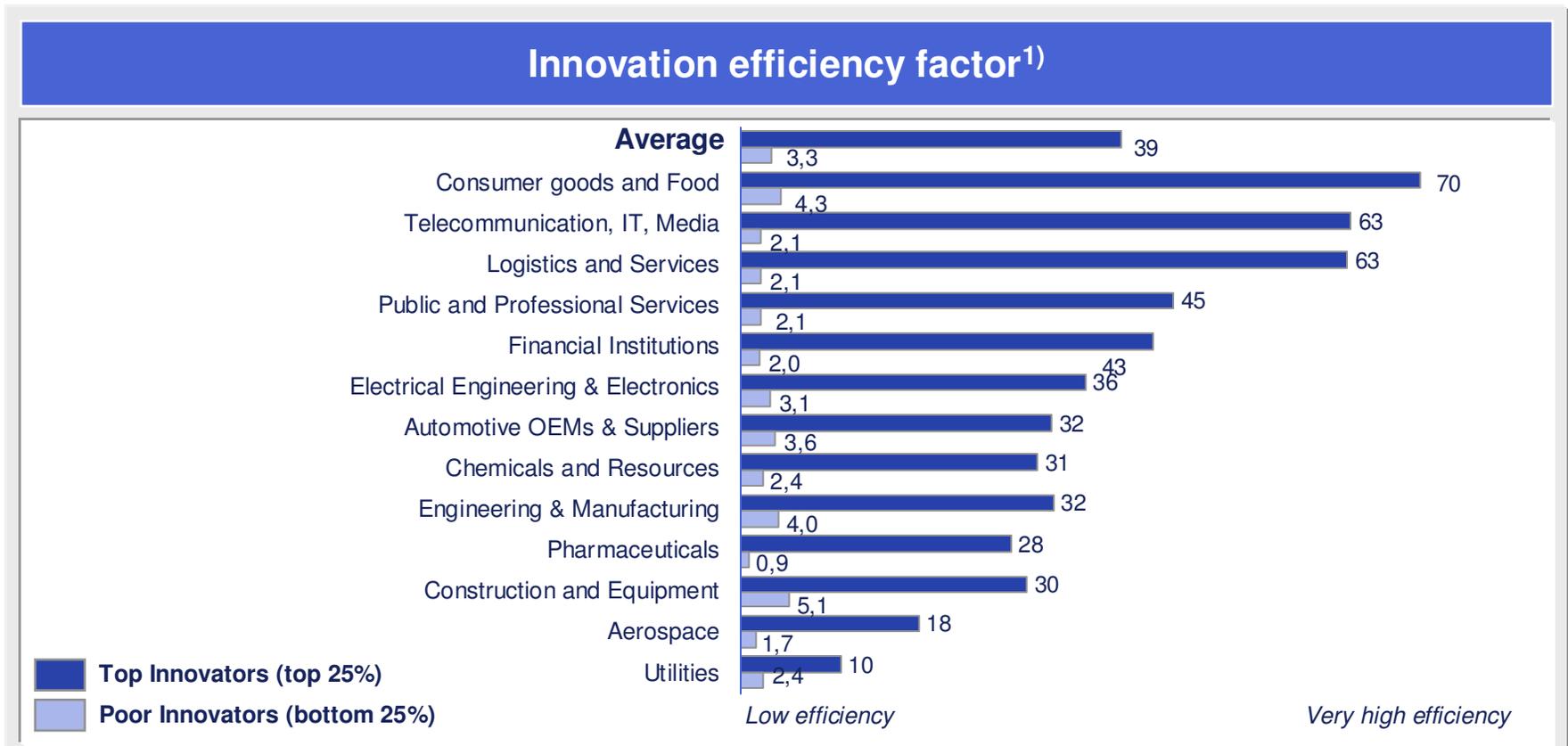


1) Products less than 5 years old

2) Top innovators are defined as the 25% best performing companies in each industry in terms of innovation efficiency

Source: Arthur D. Little Innovation Excellence Study 2005

## The Top Quartile Innovators get more than 10 times higher returns from their innovation investment

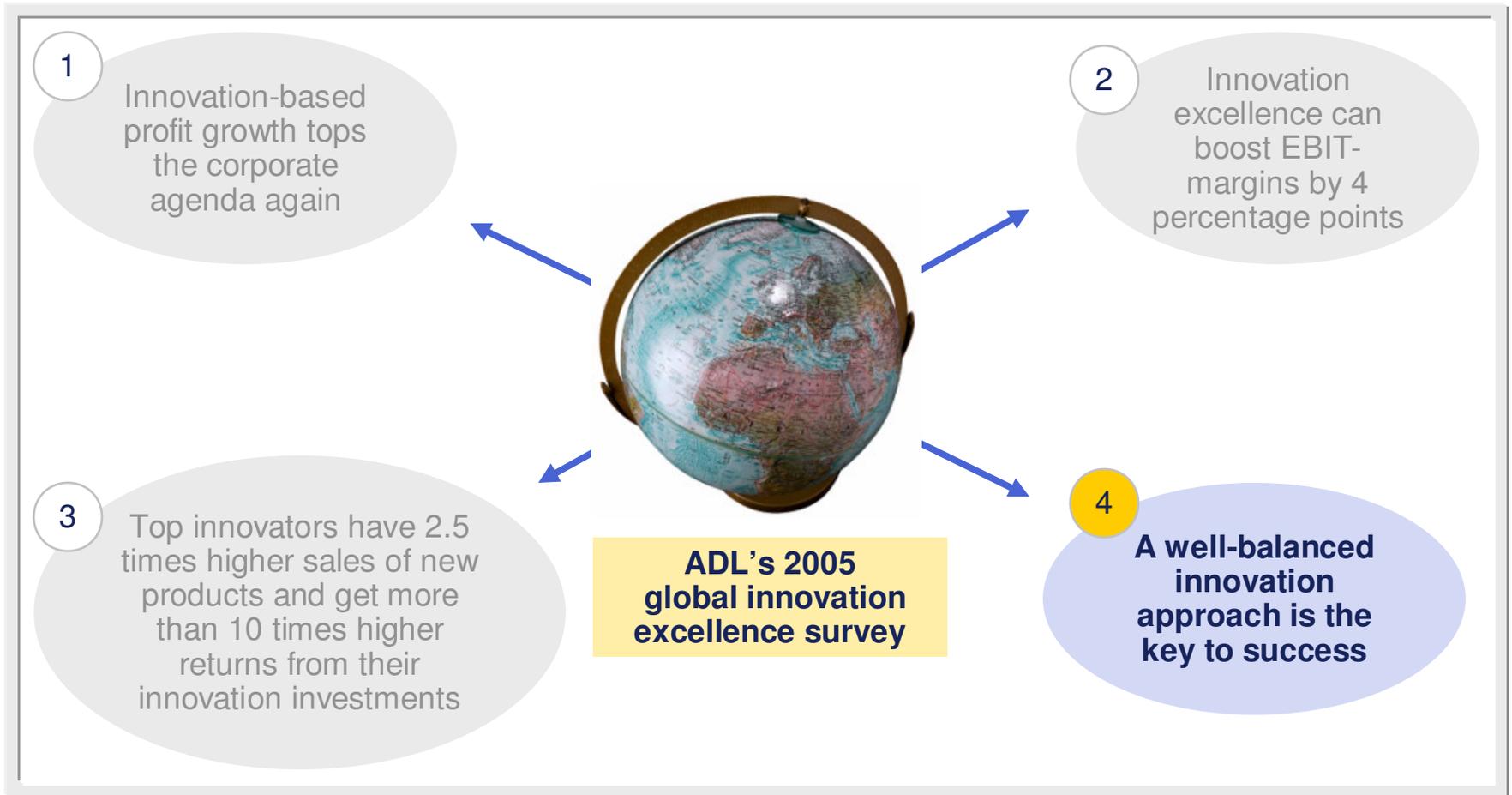


1) Share of total sales generated by new products / Share of total sales spent on R&D (higher value means higher efficiency)  
 Source: Arthur D. Little Innovation Excellence Study 2005

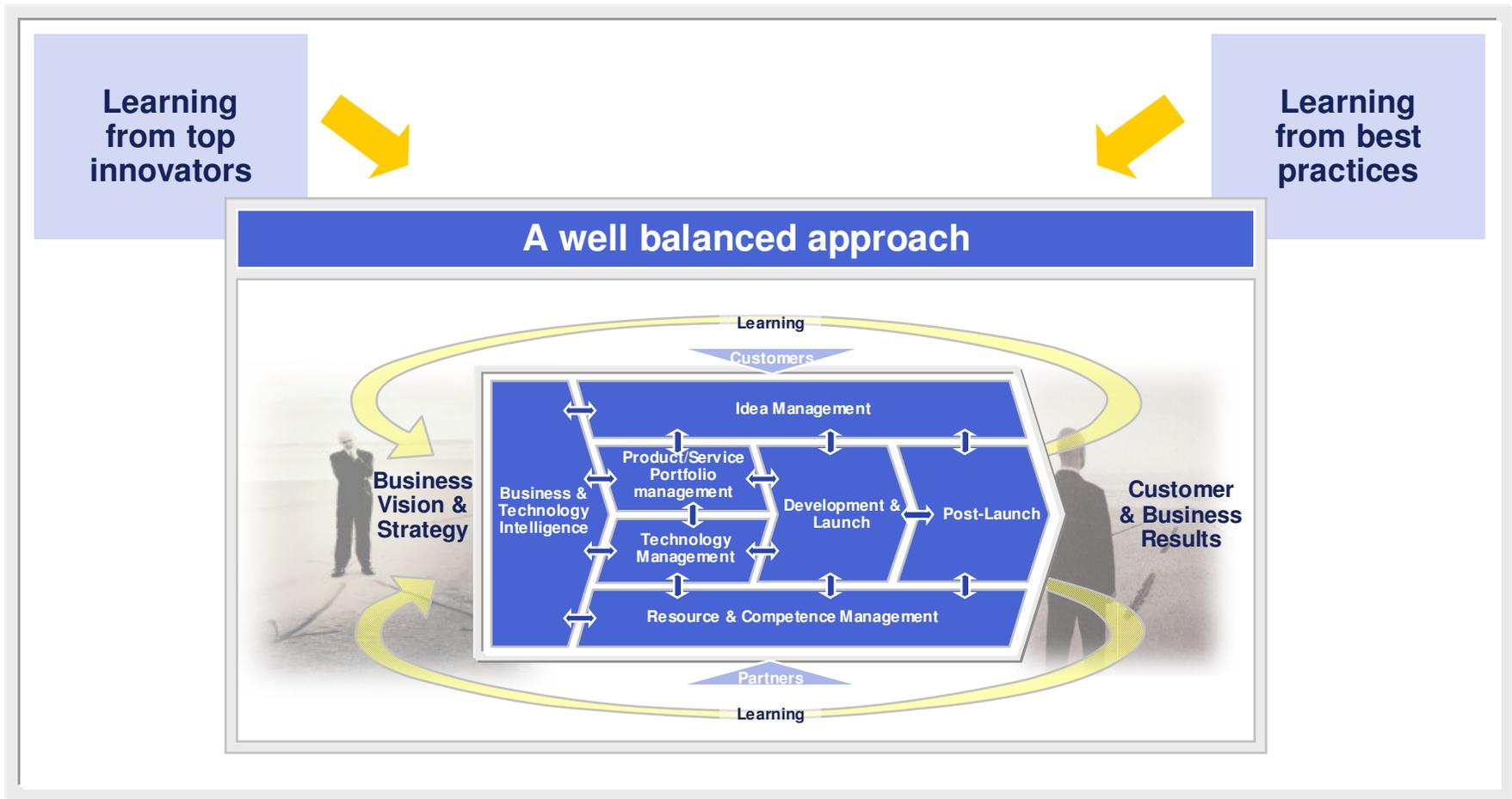
## What are the barriers that stand in the way of better innovation performance?

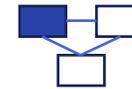


**As a number one priority, companies worldwide are targeting the huge untapped potential to improve profit growth through innovation management**

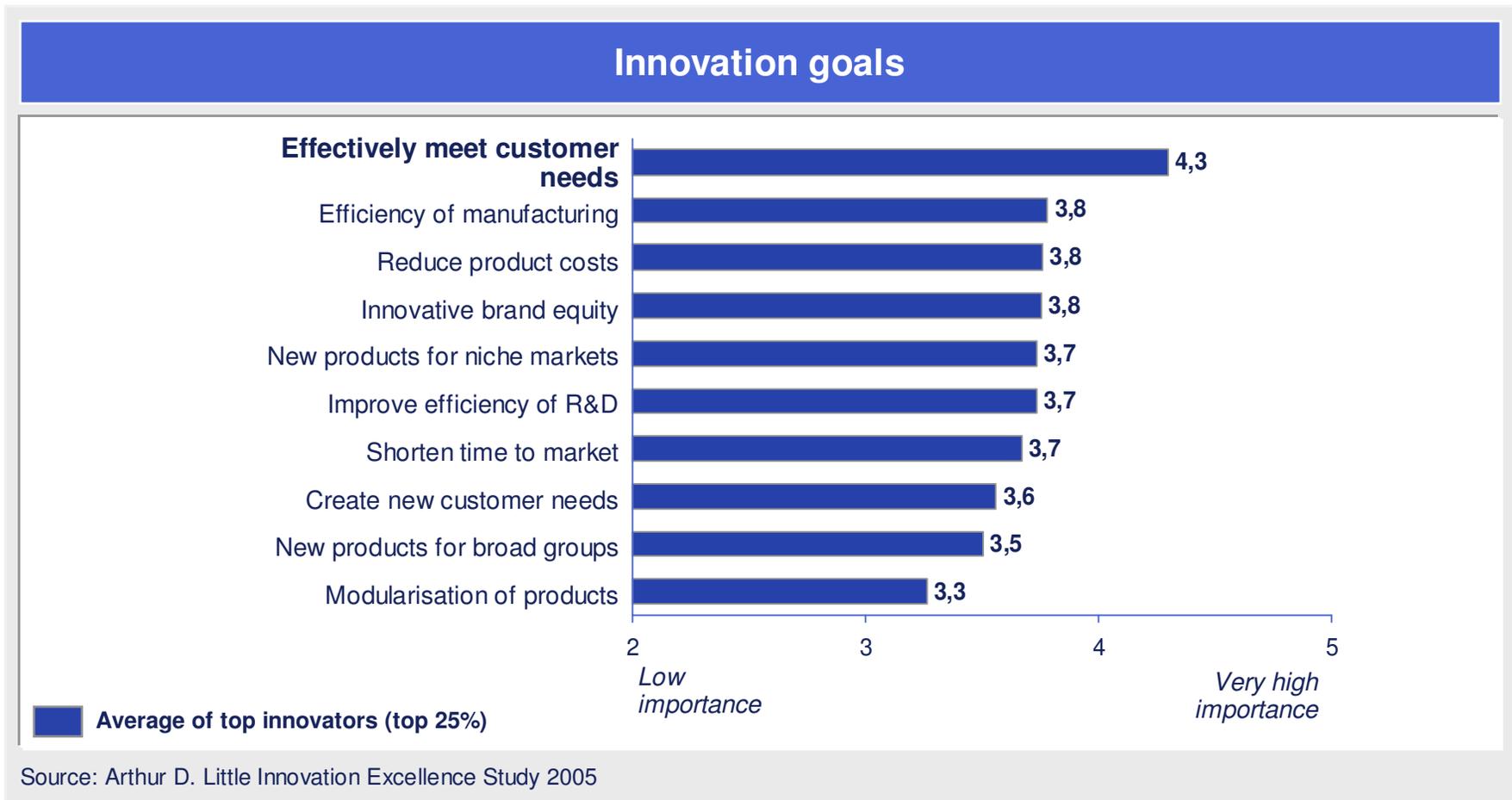


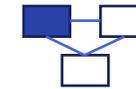
# A well-balanced innovation approach is the key to success



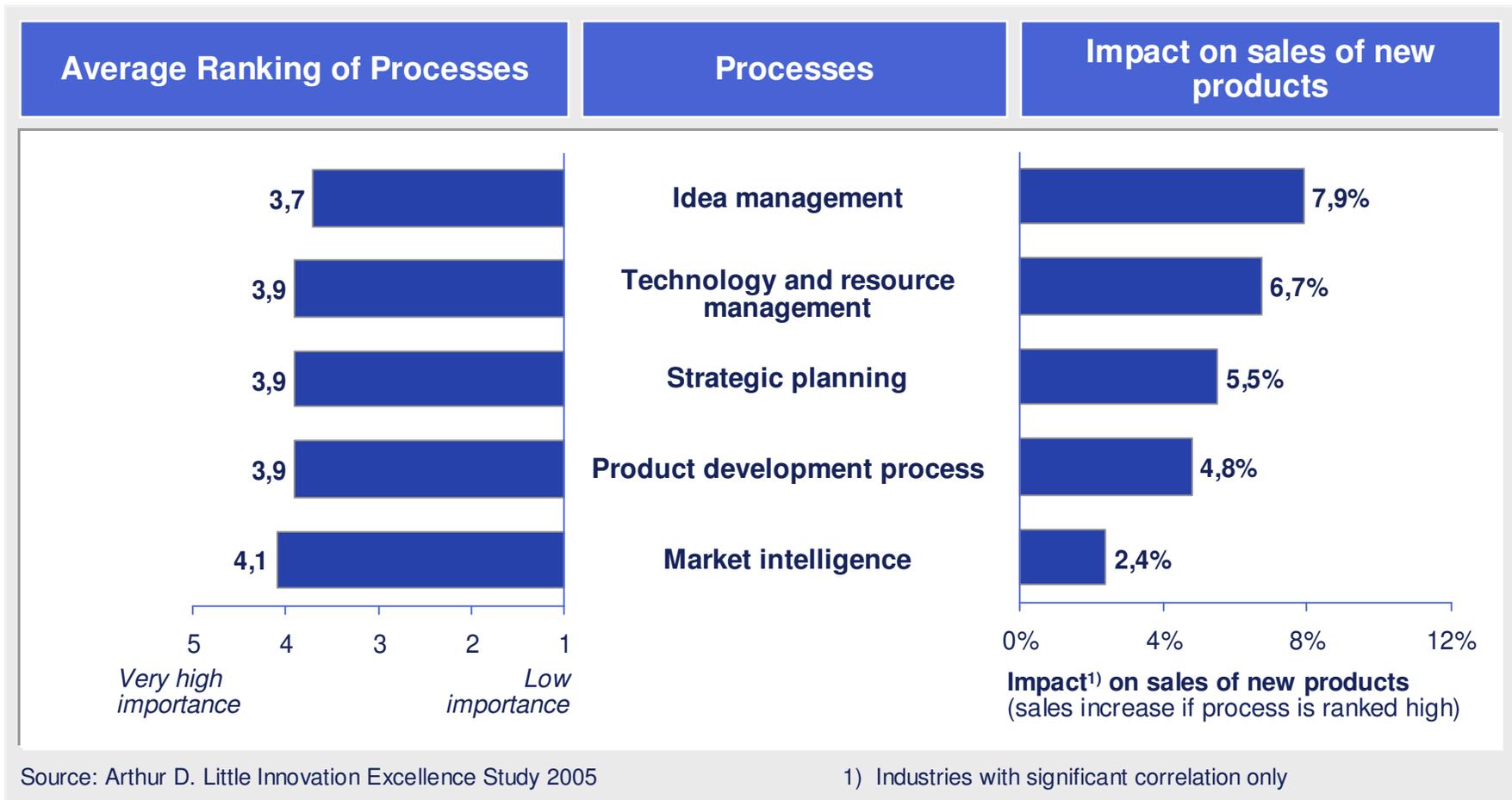


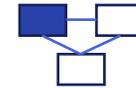
## The best innovators expect a range of returns from innovation, but see effectively meeting customer needs as the most important goal



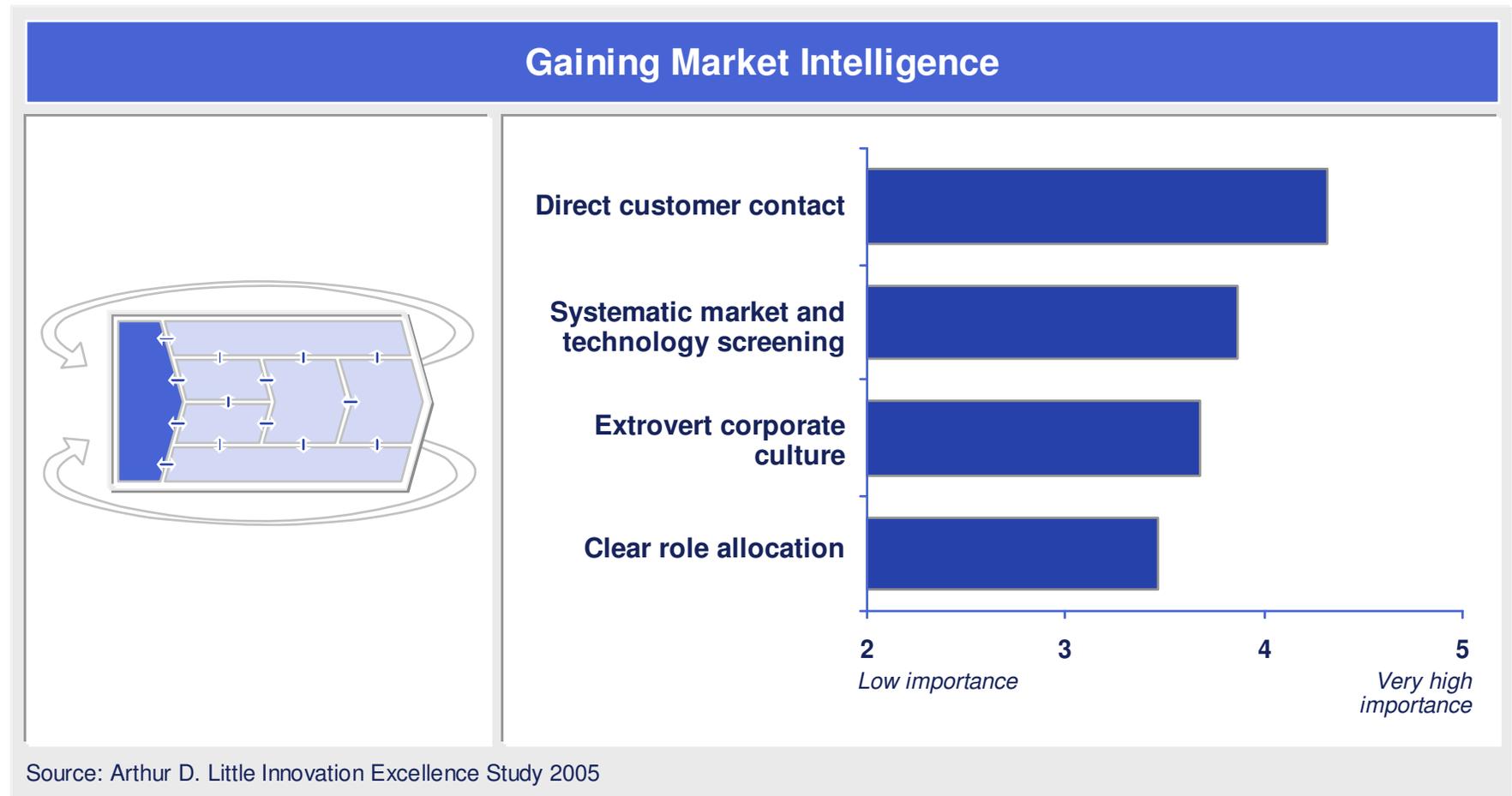


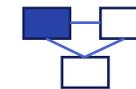
## Top innovators address all elements of innovation capability in a balanced way, despite some elements appearing to have a higher impact



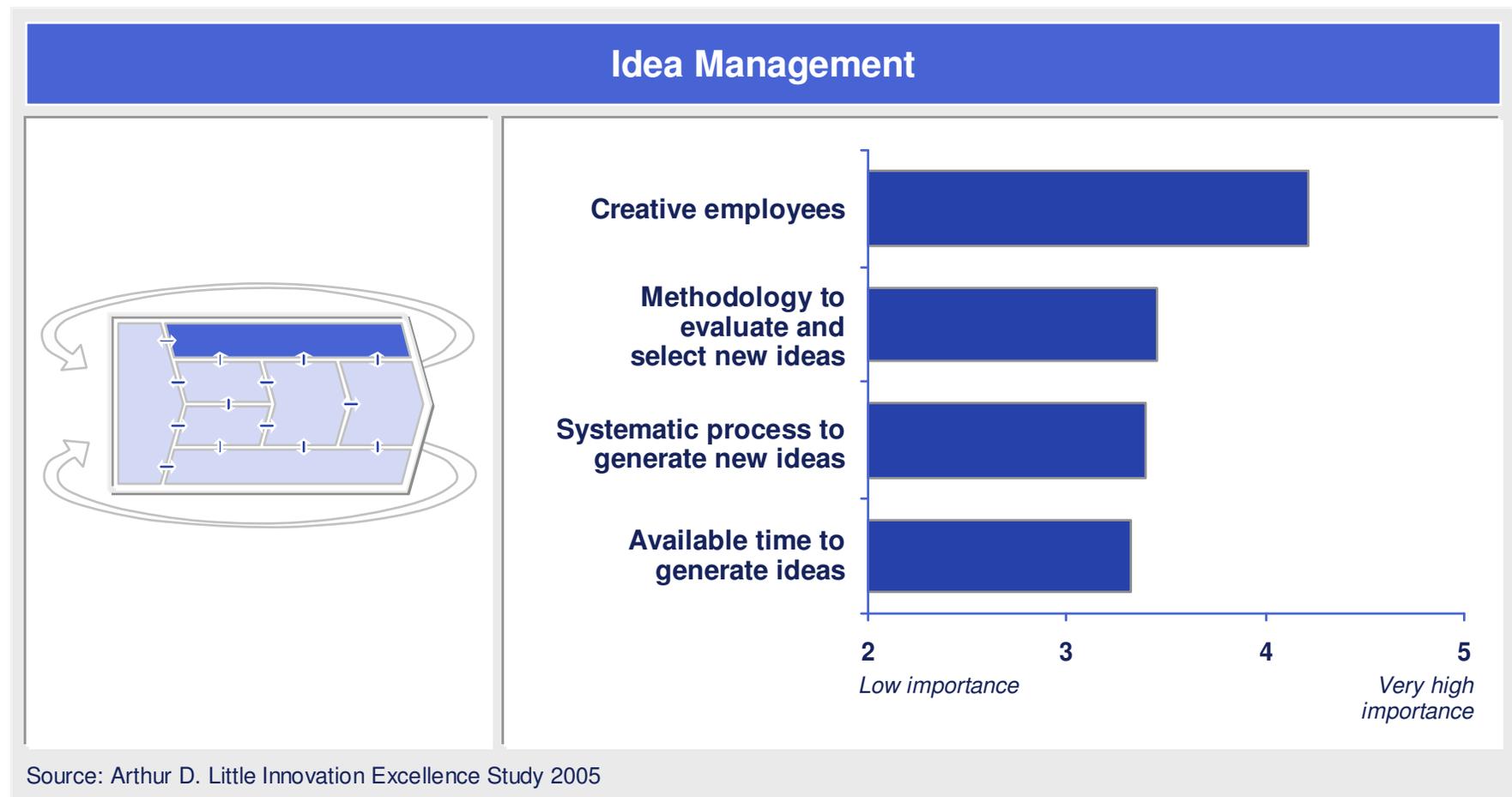


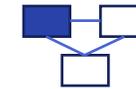
## Customer contact and excellent business intelligence form essential components of Innovation Excellence



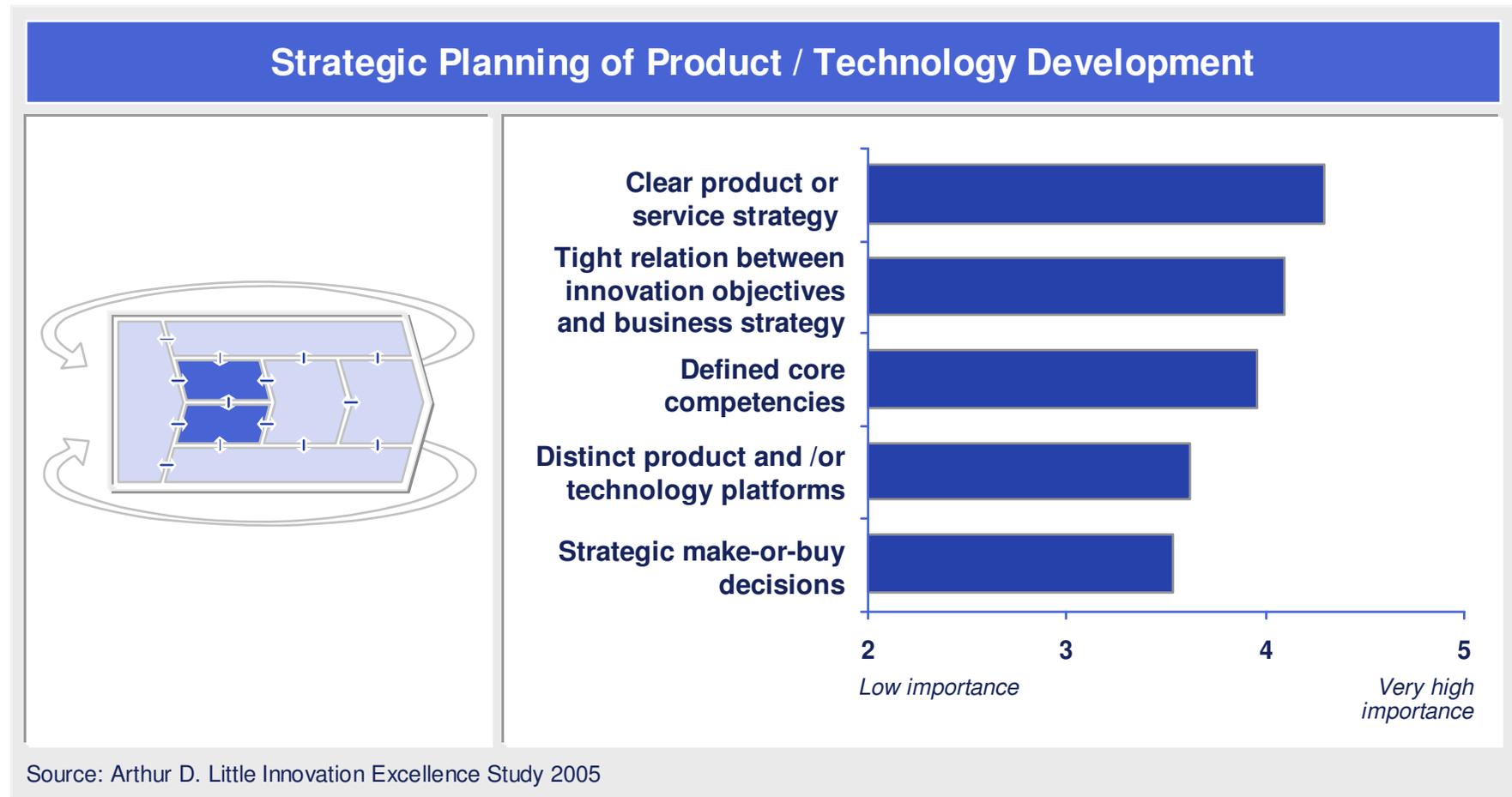


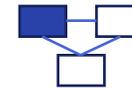
## Pivotal factors in idea management include creative employees and a systematic process to generate new ideas



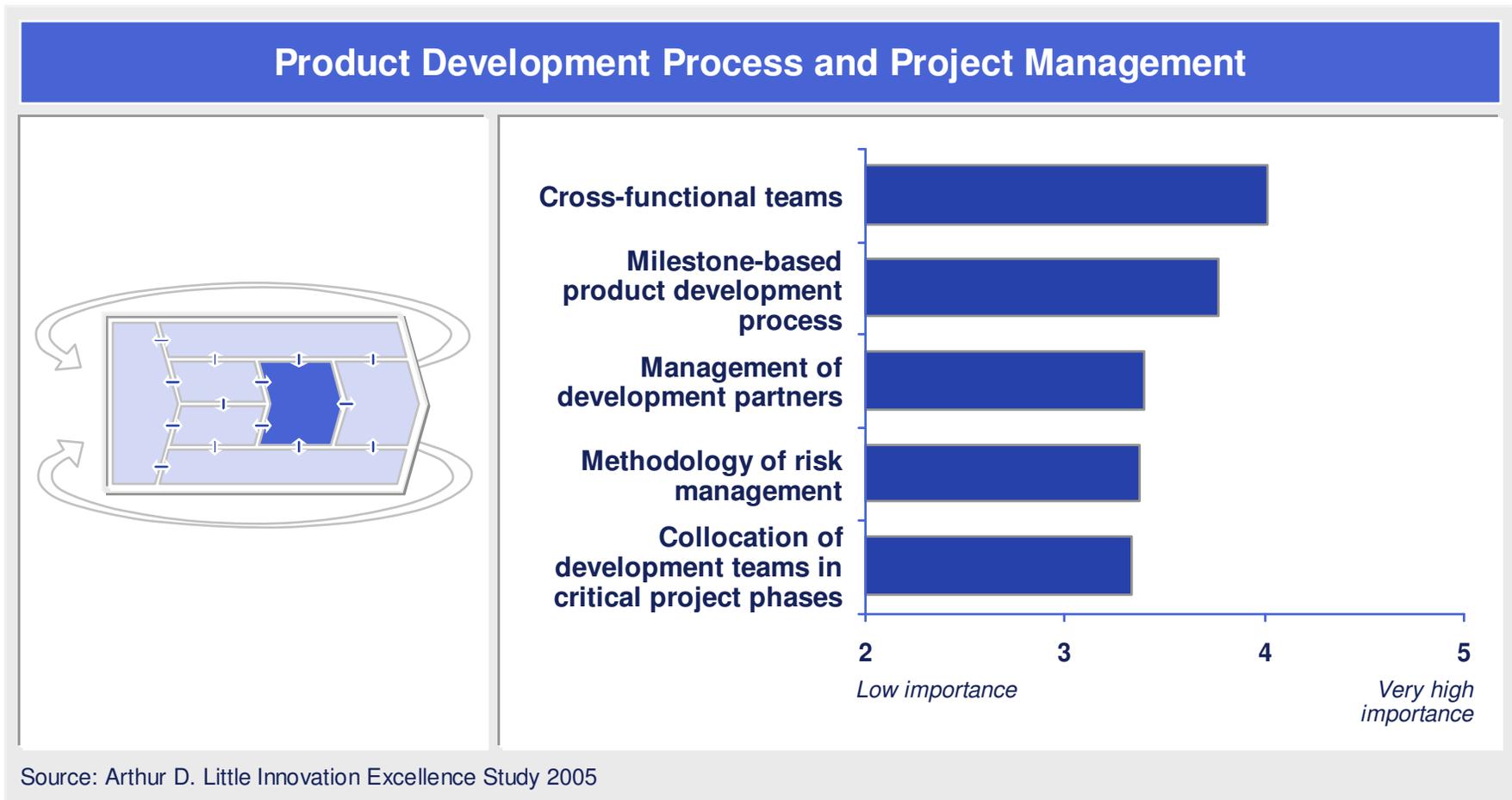


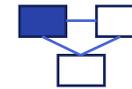
## Top innovators explicitly link strategy and clear innovation objectives



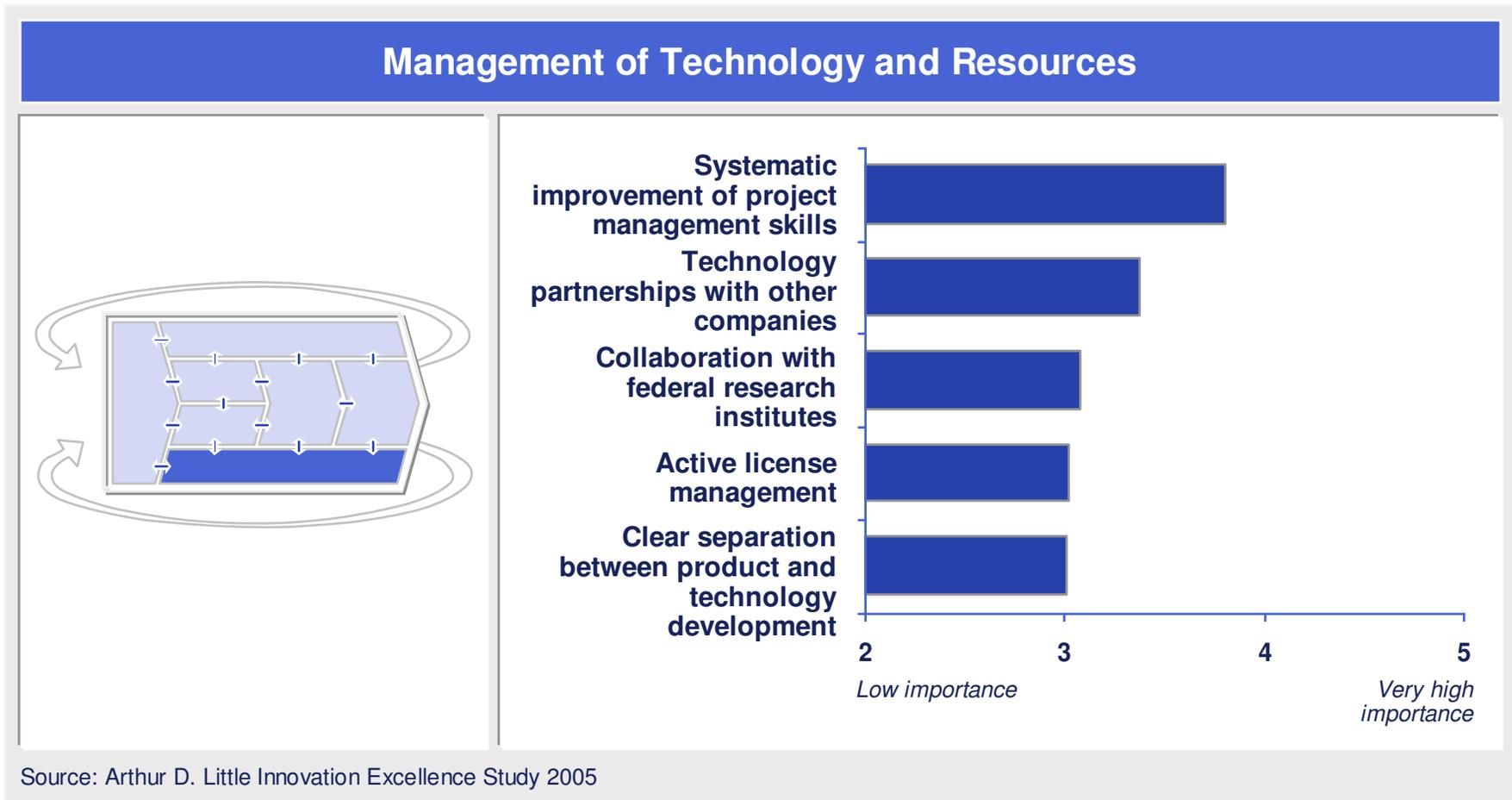


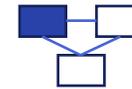
## Top Innovators focus on good cross-functional teams and a milestone-based development process



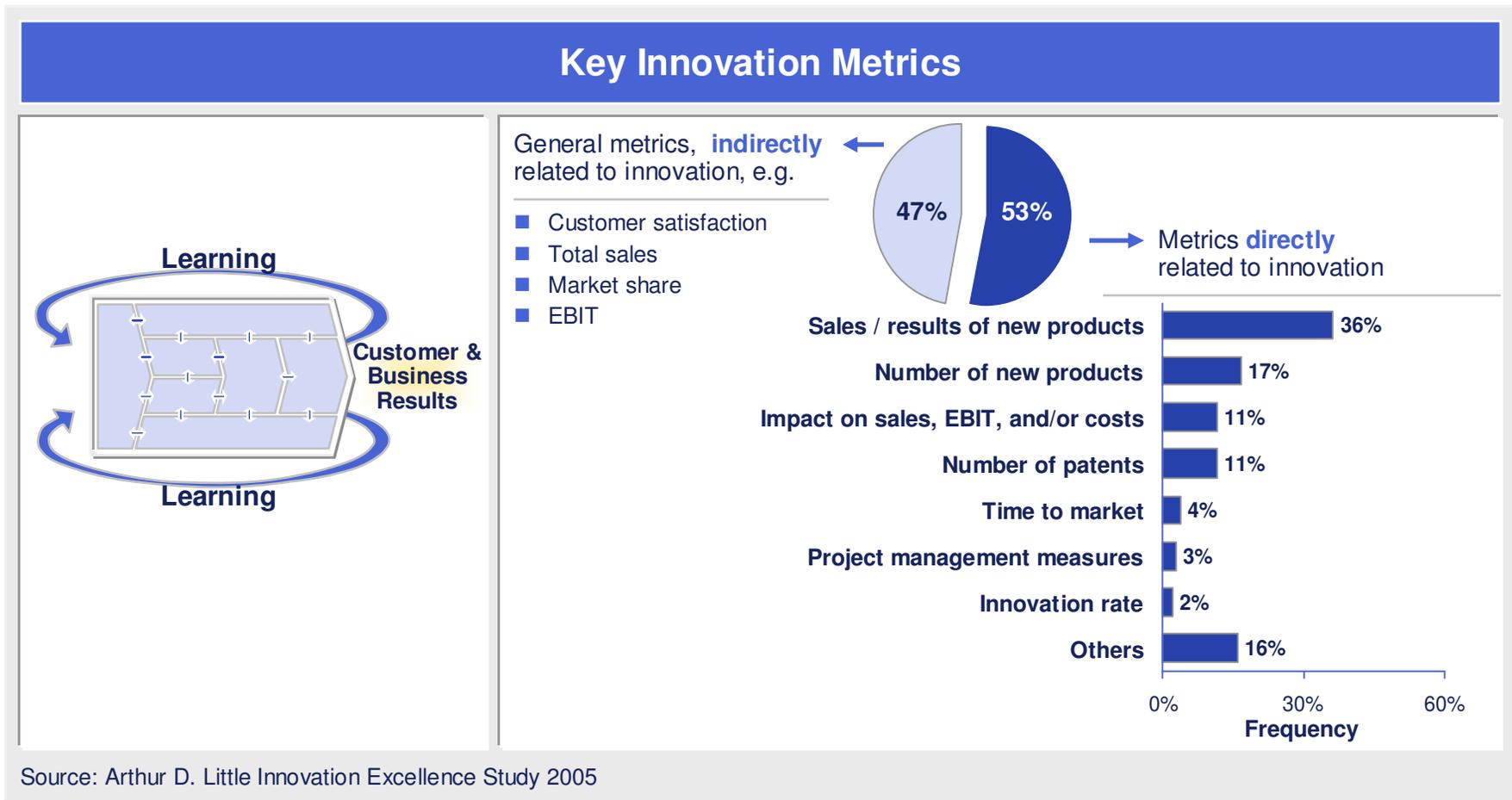


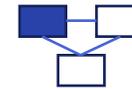
## The secrets of success are good project management and technology partnerships



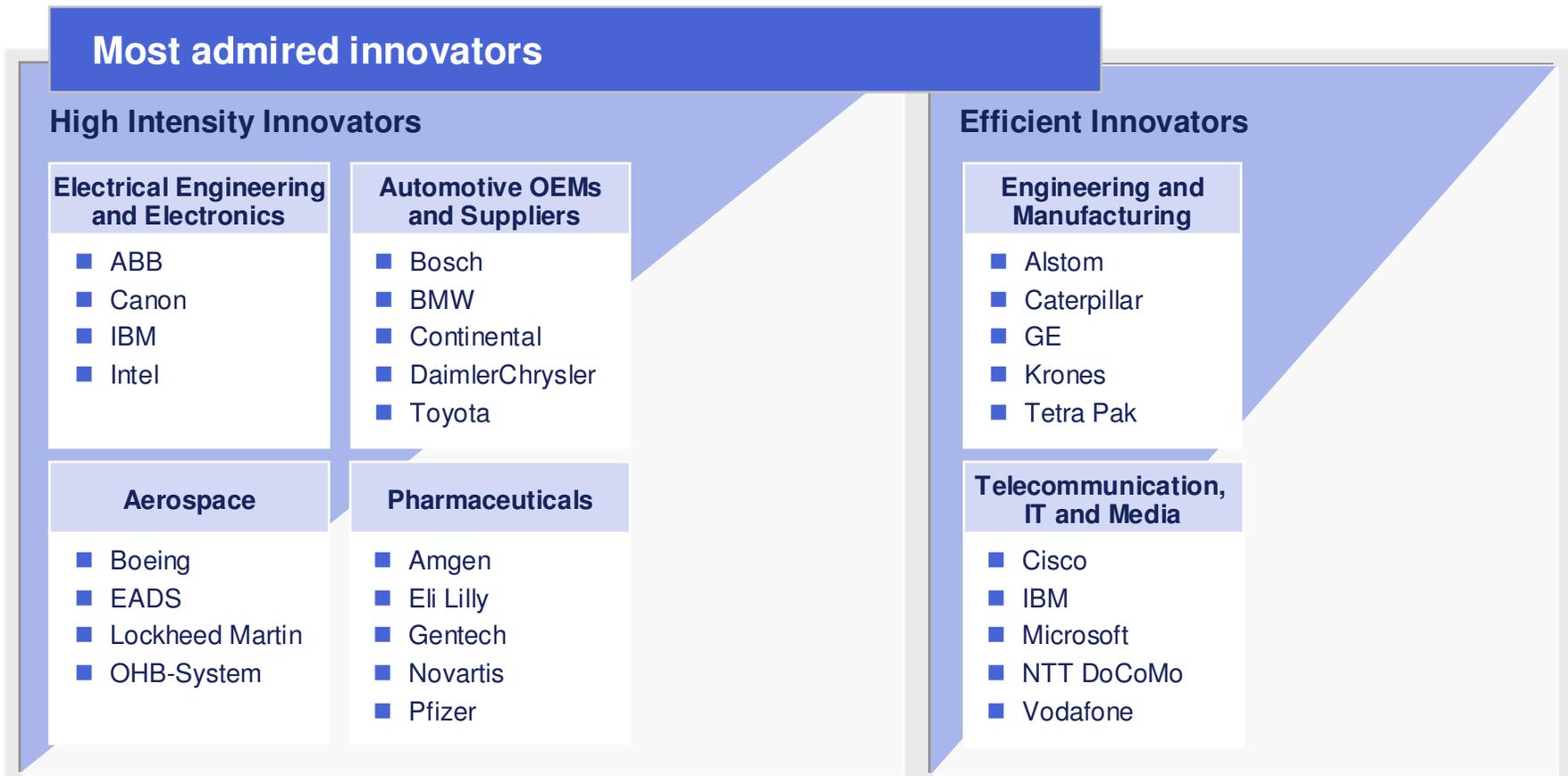


## Good performance indicators help companies to set the baseline and support improvement in innovation excellence



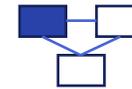


**Both large multinationals and small companies can be the innovation leaders in their industries (1/2)**

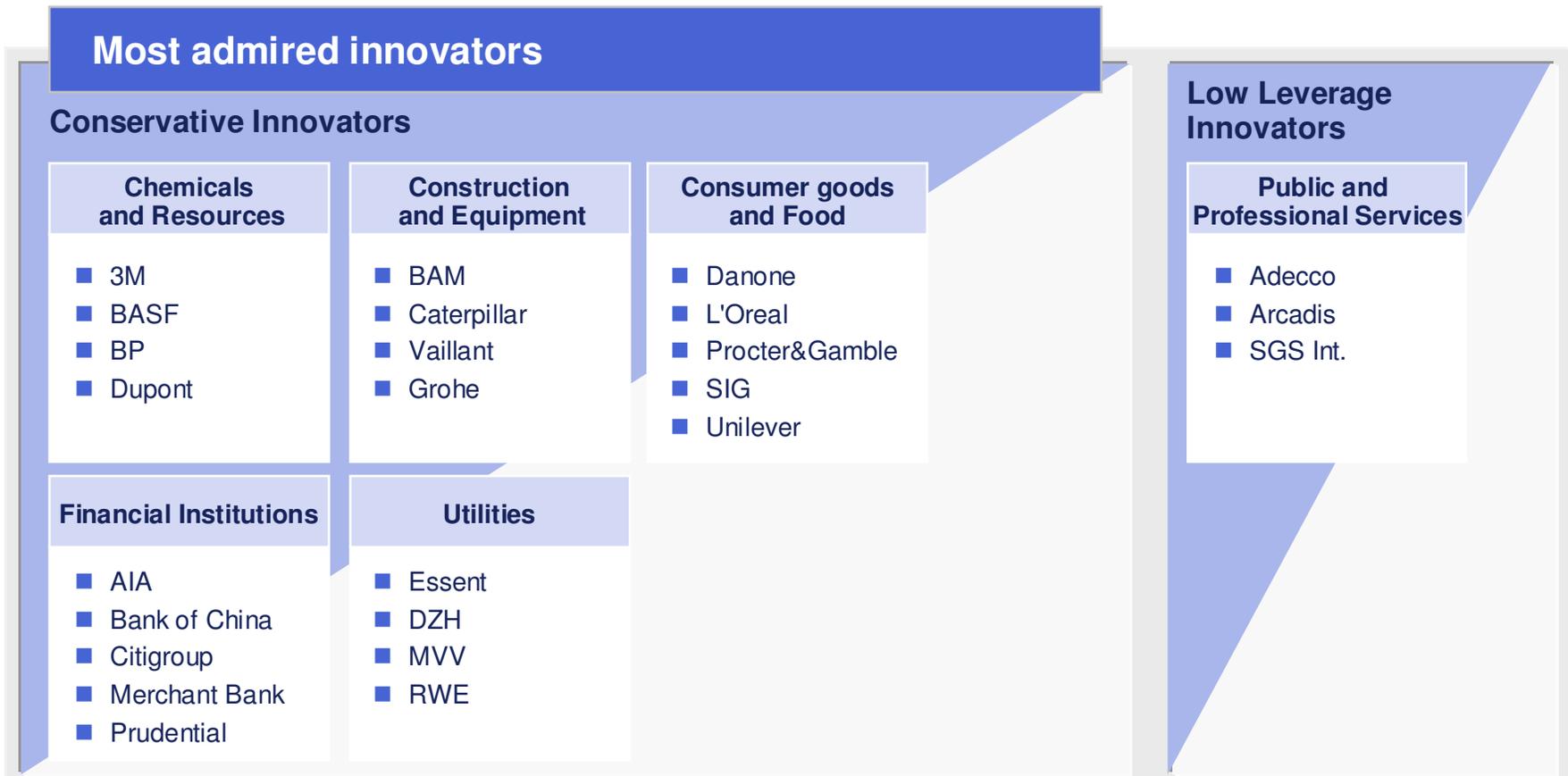


Source: Arthur D. Little Innovation Excellence Study 2005

Remark: Companies in alphabetical order

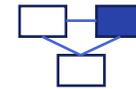


**Both large multinationals and small companies can be the innovation leaders in their industries (2/2)**



Source: Arthur D. Little Innovation Excellence Study 2005

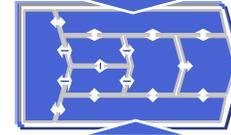
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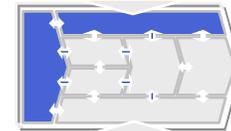
## Four real life examples illustrate different approaches to innovation excellence

### Best Practice in Innovation Management

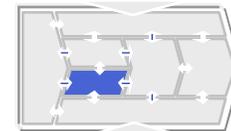
1 Improve overall Innovation Management capability: **Tetra Pak**



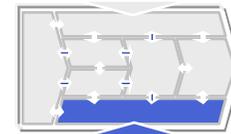
2 Collaboration with lead users: **3M Medical**

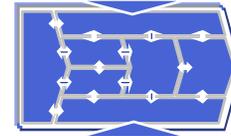


3 Building platforms: **Toyota**



4 Use of partnerships: **BMW and ZF Lenksysteme**



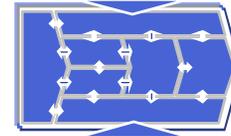


## Tetra Pak, a world leading packaging company, faced tougher market situations and used a balanced improvement approach to innovation to regain their leadership

### Challenge



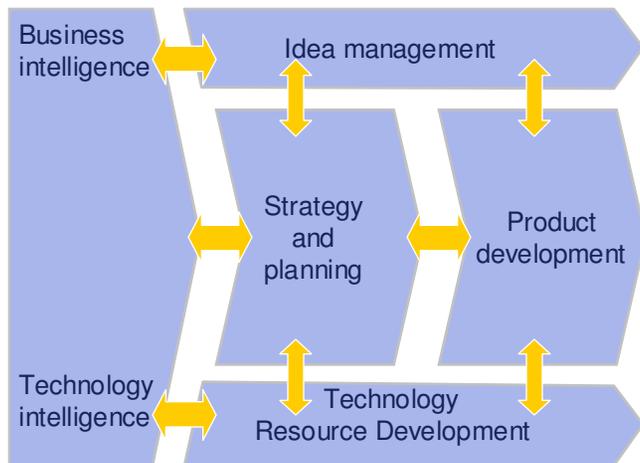
- Tetra Pak faced slower growth in the developed markets
- Competition was getting tougher
- And Tetra Pak realized that it had lost its innovation leadership and decided to rebuild its innovation capability
- They decided to take a holistic view on the Innovation Process and started on a systematic journey to regain their leadership in innovation



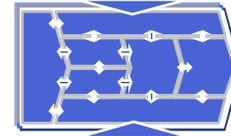
## Tetra Pak took a holistic approach to innovation by working on three priority initiatives; structure, process and measurements & tools

### Approach

#### Innovation Process



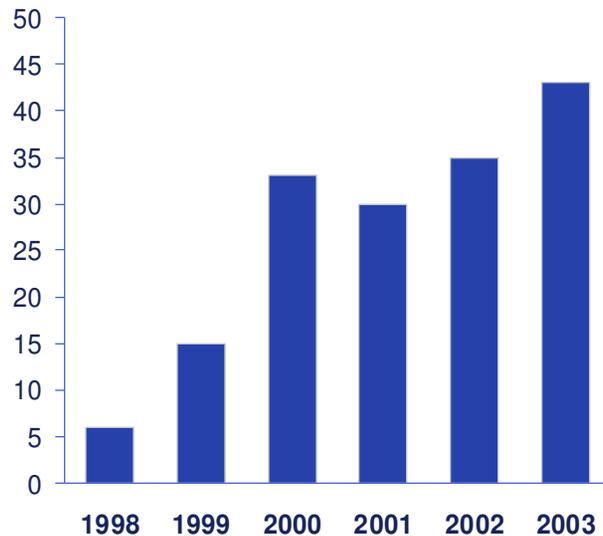
- Structure
  - Appoint corporate CTO and an Innovation Process Board to lead the improvement activities
  - Introduced a number of other organizational bodies, e.g. technology strategy council, centers of expertise
- Process
  - Worked to refine and implement processes for all the sub-processes of the Innovation Process, e.g. product development, idea management, business intelligence
- Measurements & tools
  - Introduced a balanced scorecard including innovation measurements in managers scorecards
  - Introduced a web based interactive tool to support implementation of processes and execution of projects



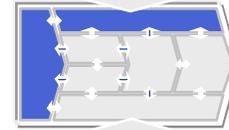
**Very impressive results have been reached so far, but Tetra Pak considers these changes part of a never ending journey of improvements**

### Results

**Number of product launches**

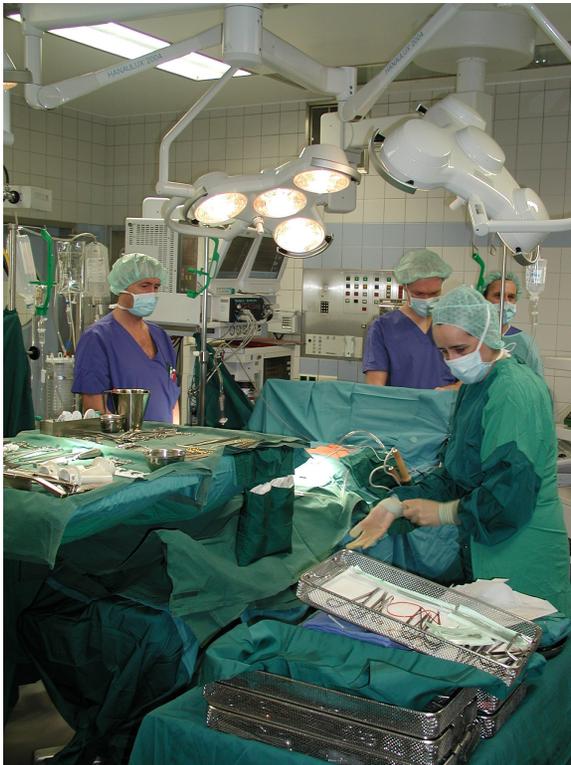


- Drastically improved number of product launches, up to three times more than in the past
- Alignment throughout company towards the same innovation objectives
- Dramatic increase in number of products launched on time
- Transparency and alignment via Product Cycle Plans (PCP) has increased internal customer satisfaction & confidence considerably



## The medical division of 3M utilized the Lead User concept as a "innovation generator" for new solutions in the field of infection prevention

### Challenge



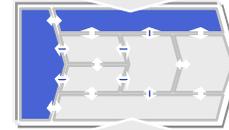
#### Who can develop radically new solutions

- The medical division of 3M looked for new solutions in the field of operation room infection prevention and control
- Normal customers only asking for incremental improvements
- Studies show that users rather than manufacturers are often the initial developers of break-through products and processes
- Ongoing studies prove that those innovative users really exist. They have higher and more advanced needs and will benefit the most from a new product. They are called: Lead users (LU)

#### Complication

- LUs are very hard to find

➔ **Find LUs and integrate them into the product development process**



**Lead User teams explore the periphery of a particular market and similar markets to develop new products for their own area of focus**

**Approach**



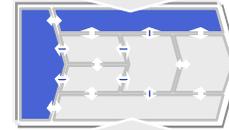
**Identification of Lead Users**

- Use of the networking approach to identify users with different levels of expertise in the target- and in analogue markets
- In the target market 3M identified and analyzed surgeons working under complicated conditions (e.g. battlefield)
- Microbiologists as well as make-up artists were identified as users from analogue markets

**Learning's from Lead Users**

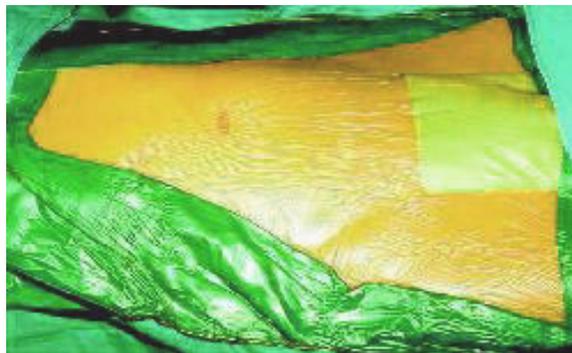
- Speed is the main issue (less dependence on antibiotics)
- Make up artists had developed solutions to attach things to the skin

**➔ Develop radically new products by combining LU knowledge from different areas**



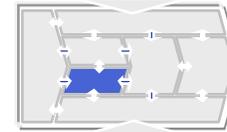
## The 3M example and other studies show that early integration of Lead Users increases the probability of successful products, hence growth!

### Results



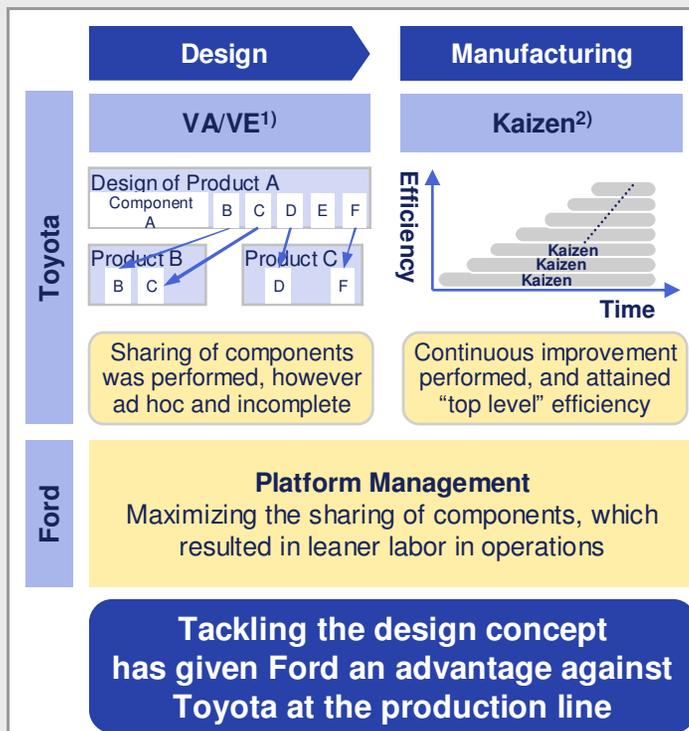
- Development of new antimicrobial draping products
- Radically new approach for patient-individual infection control
- Major new long-term growth strategy for the Medical-Surgical Department
- 3M was a pioneer using the LU-concept. Due to the positive experiences the company now works closely with Academics and Psychologists to create a training program and other materials for the correct use of the lead user concept
- All LU-projects at 3M so far, resulted in completely new product lines

➔ **Average annual sales of LU projects: 146 mil. \$ (18 mil. \$ non-LU projects)**



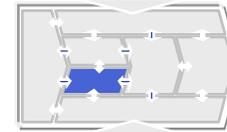
## Top line growth through innovation: Toyota realized that despite its reputation for efficiency, it needed a new innovative platform strategy

### Challenge



- **Situation:**  
Through the 1980's, Toyota had already proved "top level" efficiency by means of allocating human resources at the production line
- **Complication:**  
However in 1994, Cho, then president of TMM<sup>3)</sup>, witnessed fewer components on the floor and leaner labor in operation at Ford's Atlanta plant, and feared Toyota would not survive the competition against Ford. He realized that Ford's operation was rooted to the concept of platform design
- **Challenge:**  
Cho acknowledged<sup>4)</sup>; "Design and Production must work seamlessly. We must install a new platform strategy that would fit Toyota"

1) VA/VE: Value Analysis, Value Engineering; 2) Kaizen: Improvement, Betterment; 3) TMM: Toyota Motor Manufacturing, Toyota's Manufacturing subsidiary in the USA; 4) Source: Satoshi Hino, "Study of Toyota's Management System", Diamond Publishing



## In 1998, Toyota installed a new platform strategy to manage the trade-off between component sharing and product uniqueness

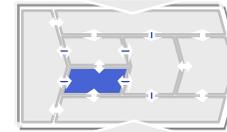
### Approach

Concept

- Toyota decided not to simply follow Ford, and installed "C21<sup>1)</sup>", the new platform strategy.
- C21 was geared for the challenge of managing the trade-off;
  - Maximize component sharing across models
  - Emphasize product uniqueness
- Toyota formed "C21 Platform Committee" with Chief Engineers<sup>2)</sup> working seamlessly across product planning, and design. The committee plans the product mix that optimizes the trade-off.
  - *In the past before C21*, the output of the product division was simply handed over to the design division downstream.
  - The product planning division usually emphasizes the product uniqueness while the design division usually tries to maximize the component sharing, and both divisions were merely islands to each other.
  - *The implementation of C21* however, brought in the system, which some people call "Lean Design", to check the optimization between them.
  - The committee first listens to both opinions of the product planning and design divisions, and then, the committee makes a decision on where to place a point of optimization, considering the whole picture of the product mix.
  - *As a result of C21*, shorter development lead time was actualized by the year 2001

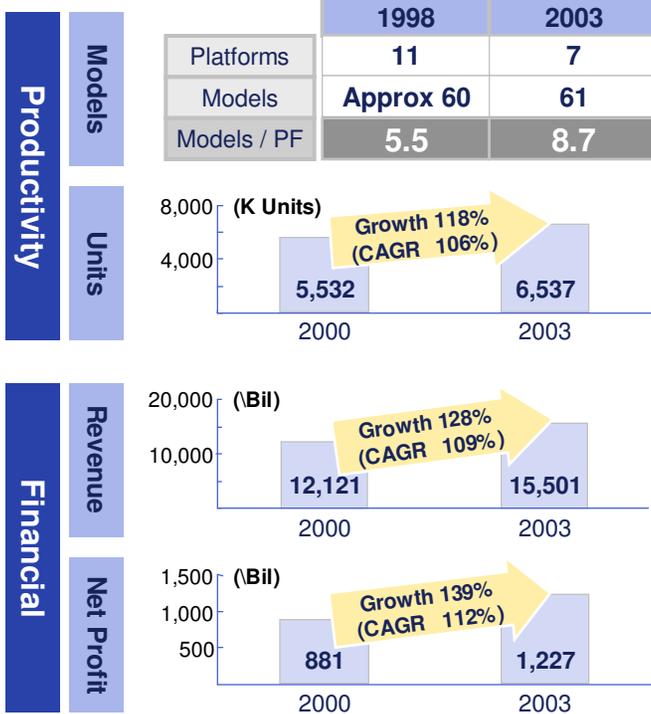
Process & Organization

1) C21: Century 21, Project for Platform Integration; 2) Chief Engineer (CE) = The project leader of a model development



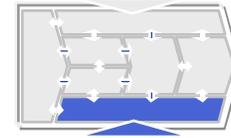
## Toyota’s focus on innovation led to profit increase by 39% since 2000 following the higher production efficiency of their platform strategy

### Results



- The number of models per platform rose from 5.5 to 8.7 over the 5 years from 1998 to 2003<sup>1)</sup>
- Toyota’s production increased 18% in units from 2000 to 2003<sup>2)</sup>
- Toyota’s financial statistics also show significant growth from 2000 to 2003. Revenue rose 28%, net profit shot up 39%<sup>2)</sup>

Source: 1) Takanori Maema, "Toyota vs. Benz vs. Honda", Kodansha Publishing; 2) Toyota, Annual Report 2000 – 2003



## A successful example of using strategic partnerships is the development of the active steering system by BMW and ZF Lenksysteme

### Challenge



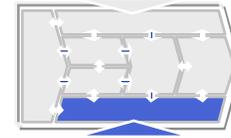
#### Trends in Power Steering

- Highly supported power steering is convenient at low speeds but dangerous at high speeds and vice versa
- Fully electronic "steer-by-wire" systems are far away from production readiness
- Moreover mechanical connection from the steering column to wheels has to be maintained for safety- and image reasons and for a realistic drive feeling

#### BMW Challenge

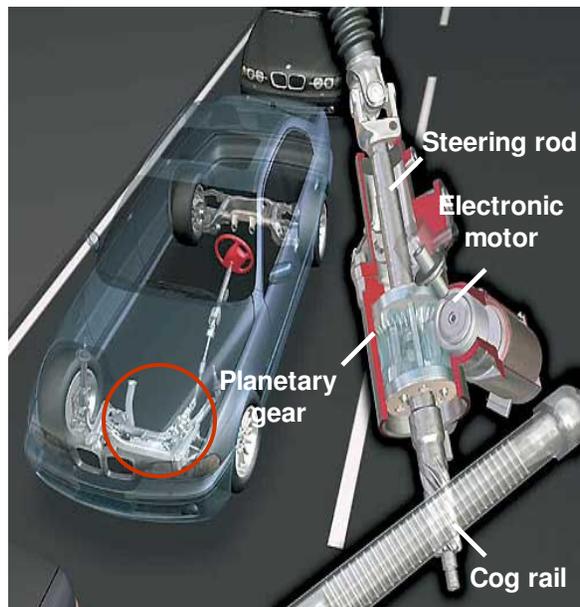
- BMW's image as a high-tech manufacturer of sportive cars demand a solution for enhanced fun of driving

➔ **Intelligent steering combining agility, track stability, comfort and safety to be developed**



## Using the tight German network of metal- and electrical companies, a feasible solution was found

### Approach



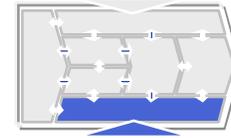
#### Development approach

- Combination of knowledge from different areas:
  - BMW: Value added functions for the customer
  - ZF Lenksysteme (Joint Venture of ZF and Bosch): Mechanical- and electrical Know-How
  - Small electrical company: Sound insulation
- Excessive use of simulation possibilities for virtual verification to ensure efficiency of development process

#### Technological approach

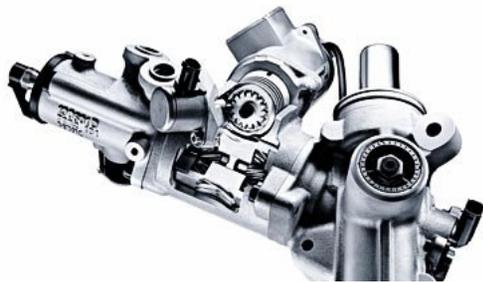
- Planetary gear and connected electronic motor increase or decrease the steering angle according to driving situation, maintaining mechanical connection
- Existing power steering controls the steering wheel moment

➔ **Abolish the fixed proportion between steering wheel turning and wheel turning**



## Innovative development approach and technical solution enhanced the partners' innovative image and is highly demanded by customers

### Results



**Innovationspreis der Deutschen Wirtschaft**

Winner in category:  
Large companies

#### Results

- Higher power steering support at low speeds (parking) and lower power steering support at high speeds (highway), higher safety through connection to the ESP system
- Accessing "steer-by-wire" advantages and also maintaining safety standards through an electro-mechanical solution
- Many positive test reports and customer reactions

#### Awards

- Innovationspreis der Deutschen Wirtschaft (2004)
- Technology Award of the Year (2004)

➔ **40% of all new 5 and 6 series BMW's are ordered with the new active steering as an accessory**



### Worldwide, companies target with number one priority the huge untapped potential to improve profit growth through better innovation management

- 1 Innovation-based profit growth tops the corporate agenda again
- 2 Innovation excellence can boost EBIT-margins by 4%
- 3 Top innovators have 2.5 times higher sales of new products and get more than 10 times higher returns from their innovation investments
- 4 A well-balanced innovation approach is the key to success:
  - Good business intelligence
  - Clear innovation objectives linked to strategy
  - Milestone-based idea generation and implementation process
  - Use of resource platform and modularization
  - Measurement of/feedback on innovation performance
  - Wise use of partnerships