MAFEX

Marburger Institut für Innovationsforschung
und Gründungsförderung

Philipps Universität Marburg

Entrepreneurial Challenge: Managing and Protecting Innovation

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Challenge of Managing and Protecting Innovation

1. **Introduction to Entrepreneurship I: Trends**
2. **Introduction to Entrepreneurship II: Basics and Processes**
3. **The Challenge of Managing Innovation**
4. **The Challenge of Protecting Innovation**

1. Introduction: Trends in Entrepreneurship

Famous Entrepreneurs

Famous Entrepreneurs

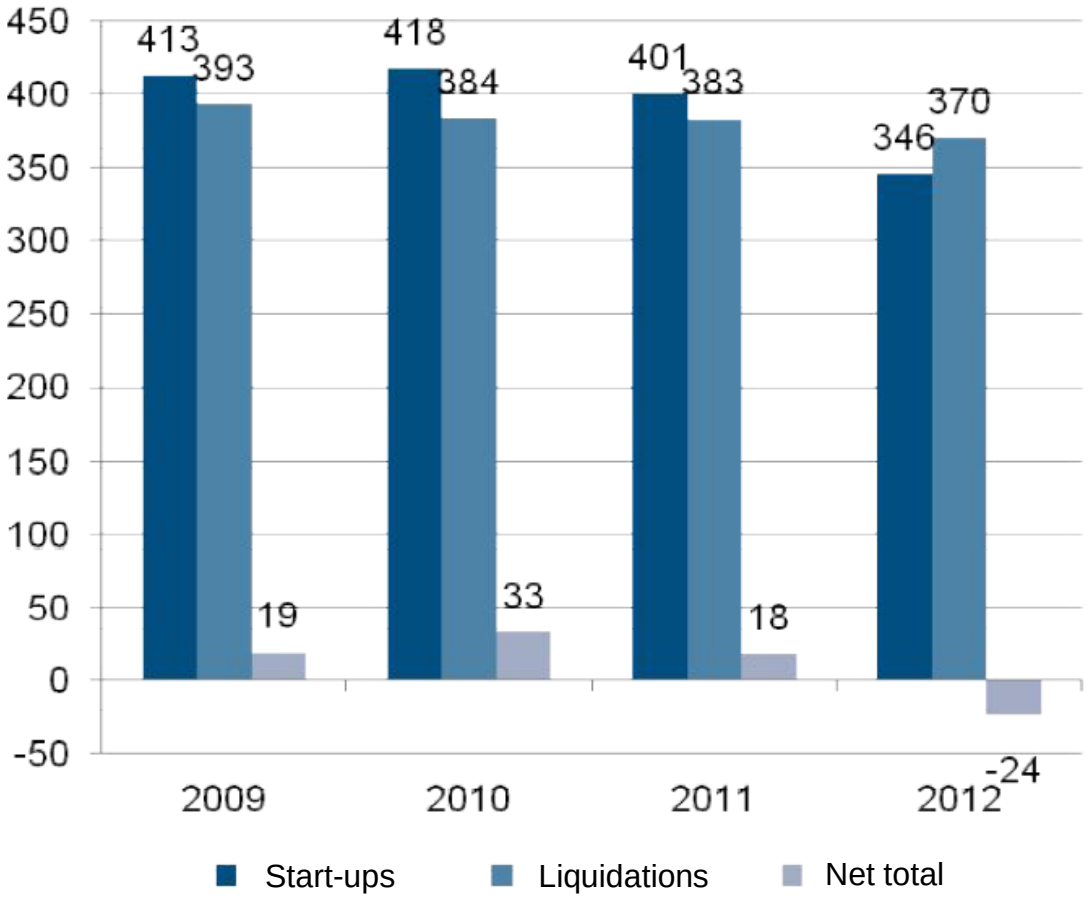
Bill Gates	Oliver Samwer	Richard Branson	Michael Dell
•Breaks his study of law at Harvard •1975 Foundation of Microsoft •1978 13 Employees, Microsoft earns his first $ million and doubles its revenues compared to the previous year •1990 Breakthrough with Windows 3.0 •2004 Richest man on earth for a decade then (Forbes)	•Finishes his studies of business administration •1999 Foundation of alando in analogy to ebay together with brothers and friends •1999 Sells alando to ebay after only 100 days •2000 Foundation of Jamba! •2004 sells Jamba! for a sum of $273 mio. to Verisign	•In school Branson has dyslexia and poor academic performance •His first venture was a student magazine at the age of 16 •In 1970 he sets up a mail-order record business •In 1972, he opened a chain of record stores •In the 1980s he sets up Virgin Atlantic…… •Today he is the 4th richest citizen of UK	•1984 Foundation of PCs Limited, that later on was renamed to Dell Computer Corp., with a sum of $1,000 of start-up capital •1985 Development of his first own PCs •1988 Dell goes public (initial public offering) •2004 Market capitalization of Dell summed up to 100 billion USD

1. Current Trends in Entrepreneurship

346.400 Start-ups
in Germany in 2012!

1. Current Trends in Entrepreneurship

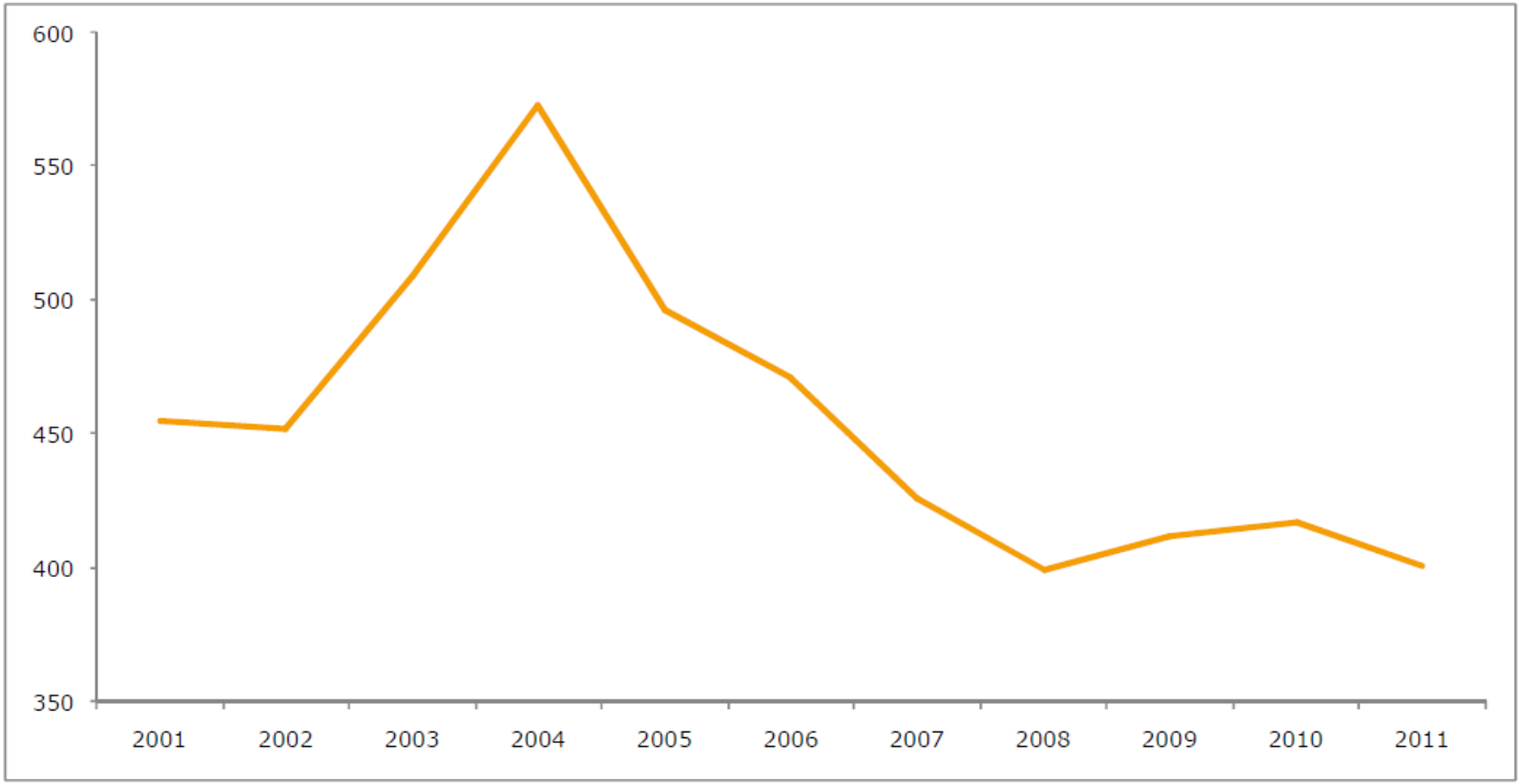
Balancing Start-ups and Liquidations (in thsd.)



Source: IfM Bonn

1. Current Trends in Entrepreneurship in GER

Declining number of start-ups since 2004



Source: IfM Bonn

1. Current Trends in Entrepreneurship in GER

Less Start-ups….but the entrepreneurs are better prepared

Start-up activities decreased…

by 14 per cent in 2012

Main reason: Positive developments in the German labor market

The number of entrepreneurs, who consider their start-up as an emergency-exit (start-ups „from necessity“) is decreasing. Qualified and skilled personnel has excellent job perspectives – German „Fachkräftemangel“ (skill shortages).

Reforms of Public Start-up support

Since 2012 government only gives start-up grants to people who have no chance in placement efforts

Quality of the start-up projects has increased

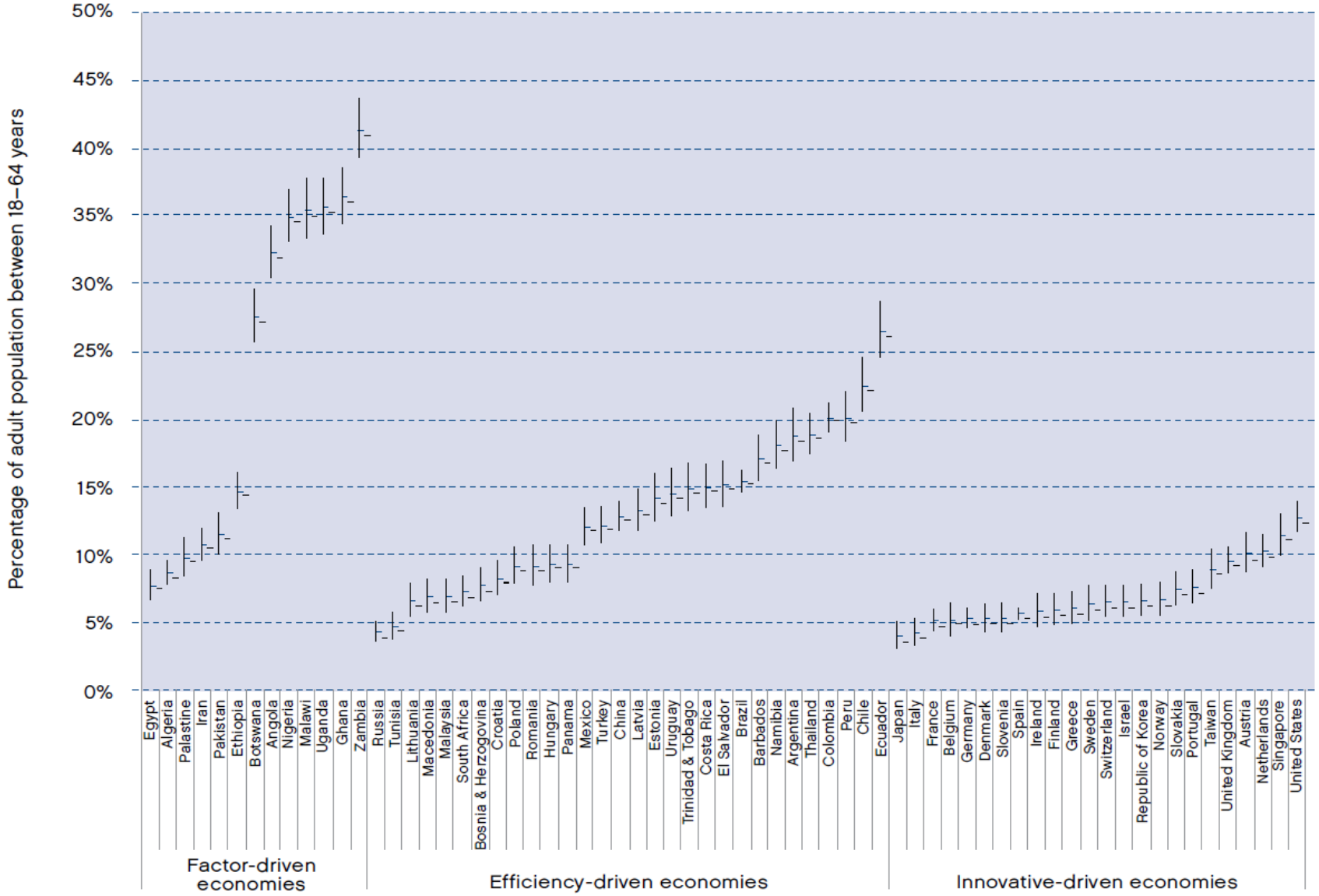
The quality of business and financing plans has increased significantly

1. Trends: The International View – Germany lags behind other countries in Start-up Dynamics

Global Entrepreneurship Monitor:
Measuring Entrepreneurial Activities

- The central measure of GEM is the Total Entrepreneurial Activity (TEA) rate, which consists of the percentage of individuals aged 18 – 64 years in an economy who are in the process of starting or are already running new businesses.
- The TEA rate therefore includes both nascent and new entrepreneurs.
- In Germany about 1.95 Mio. people indicated that they are planning to launch a Start-up or already have launched a Start-up → The TEA-rate in Germany is 5% of the working population.
- 5% is a low level in international comparison!

1. Trends: Early-Stage Entrepreneurship (TEA)



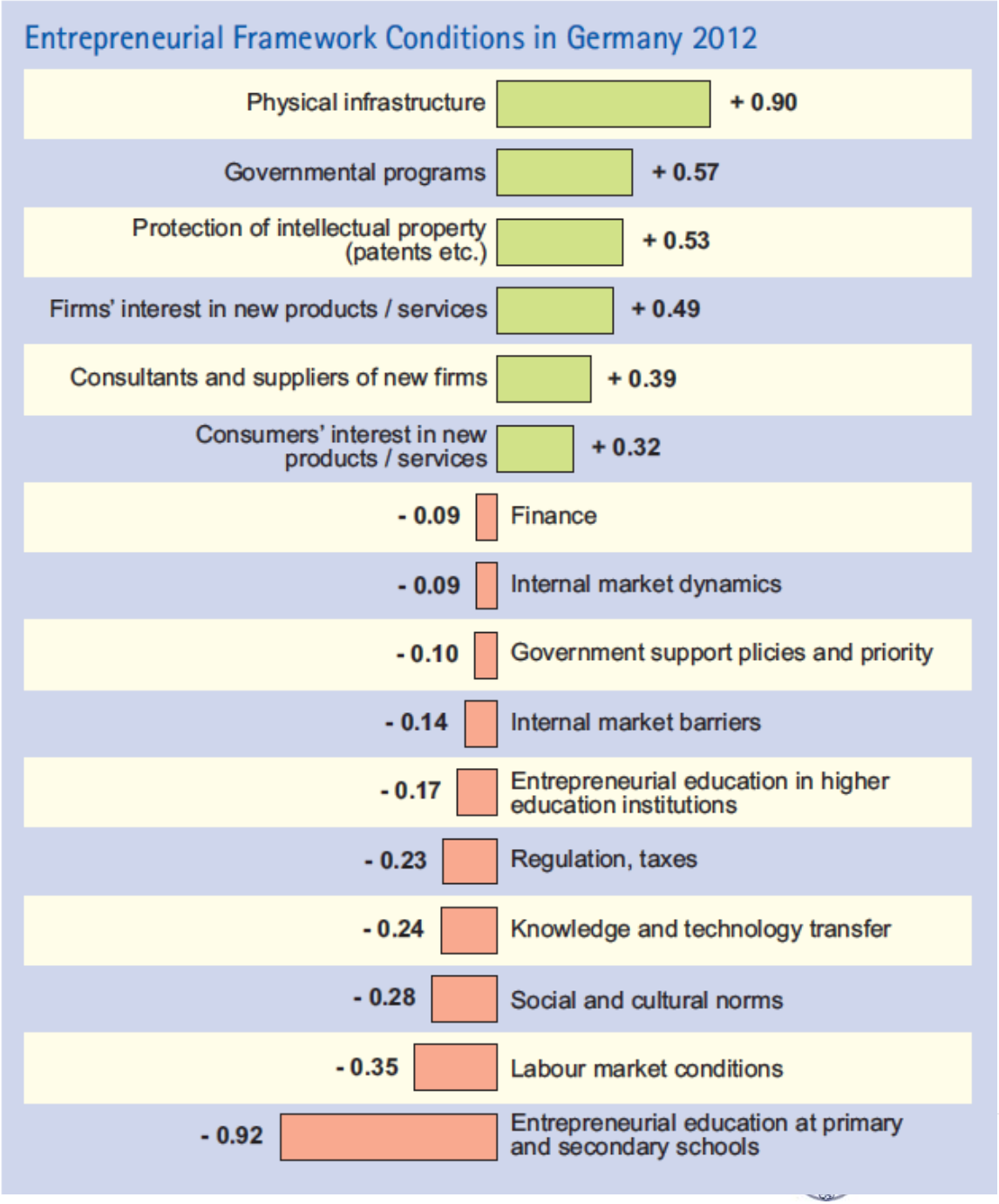
1. Trends: Entrepreneurship in Global Perspective

	Factor-Driven Economies	Efficiency-Driven Economies	Innovation-Driven Economies
Latin-America & Caribbean		Argentina, Barbados, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Mexico, Panama, Peru, Trinidad & Tobago, Uruguay	
Middle East & North Africa	Algeria, Egypt, Iran, Palestine	Tunisia	Israel
Sub-Saharan Africa	Angola, Botswana, Ethiopia, Ghana, Malawi, Nigeria, Uganda, Zambia	Namibia, South Africa	
Asia Pacific & South Asia	Pakistan	China, Malaysia, Thailand	Japan, Republic of Korea, Singapore, Taiwan
European Union		Estonia, Hungary, Latvia, Lithuania, Poland, Romania	Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Slovakia, Slovenia, Spain, Sweden, United Kingdom
Non-European Union		Bosnia and Herzegovina, Croatia, Macedonia, Russia, Turkey	Norway, Switzerland
United States			United States

1. Trends in GER

General Climate for entrepreneurs in GER

Source:
Global Entrepreneurship Monitor 2012



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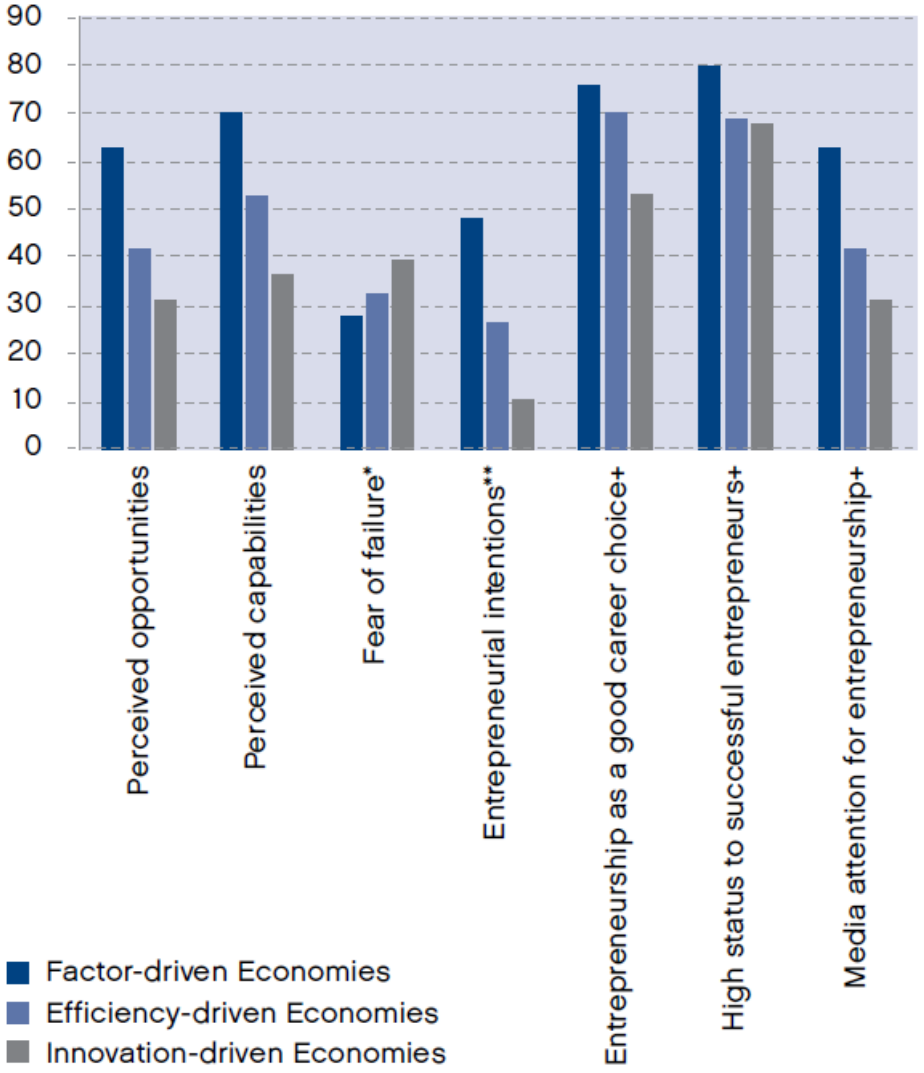
1. Trends: Entrepreneurial Climate in Comparison

SCALE: FROM (–) TO (+)					1 Finance, 2a Nat. Policy – General Policy, 2b Nat. Policy – Regulation, 3 Government Programs, 4a Education – Prim. And Second., 4b Education – Post-School, 5 R&D Transfer, 6 Commercial Infrastructure, 7a Internal Market – Dynamics, 7b Internal Market – Openness, 8 Physical Infrastructure, 9 Cultural and Social Norms
1	2	3	4	5	

	1	2a	2b	3	4a	4b	5	6	7a	7b	8	9
MIDDLE EAST AND NORTH AFRICA												
Algeria		-			-	+	-		+		+	
Egypt					-	-	-	+	+		+	
Iran			-	-	-			+	+		+	
Israel		-	-		-			+			+	+
Palestine				-	-			+	+	-	+	
Tunisia		+		-					+	-	+	-
EUROPEAN UNION												
Austria				+	-			+	-		+	-
Belgium			-		-			+		+	+	-
Denmark	-	-		+			-	+			+	
Estonia		-	+		-	-			+		+	
Finland	-		+		-		-		+		+	
France		+		+	-		-				+	-
Germany				+	-		-	+			+	-

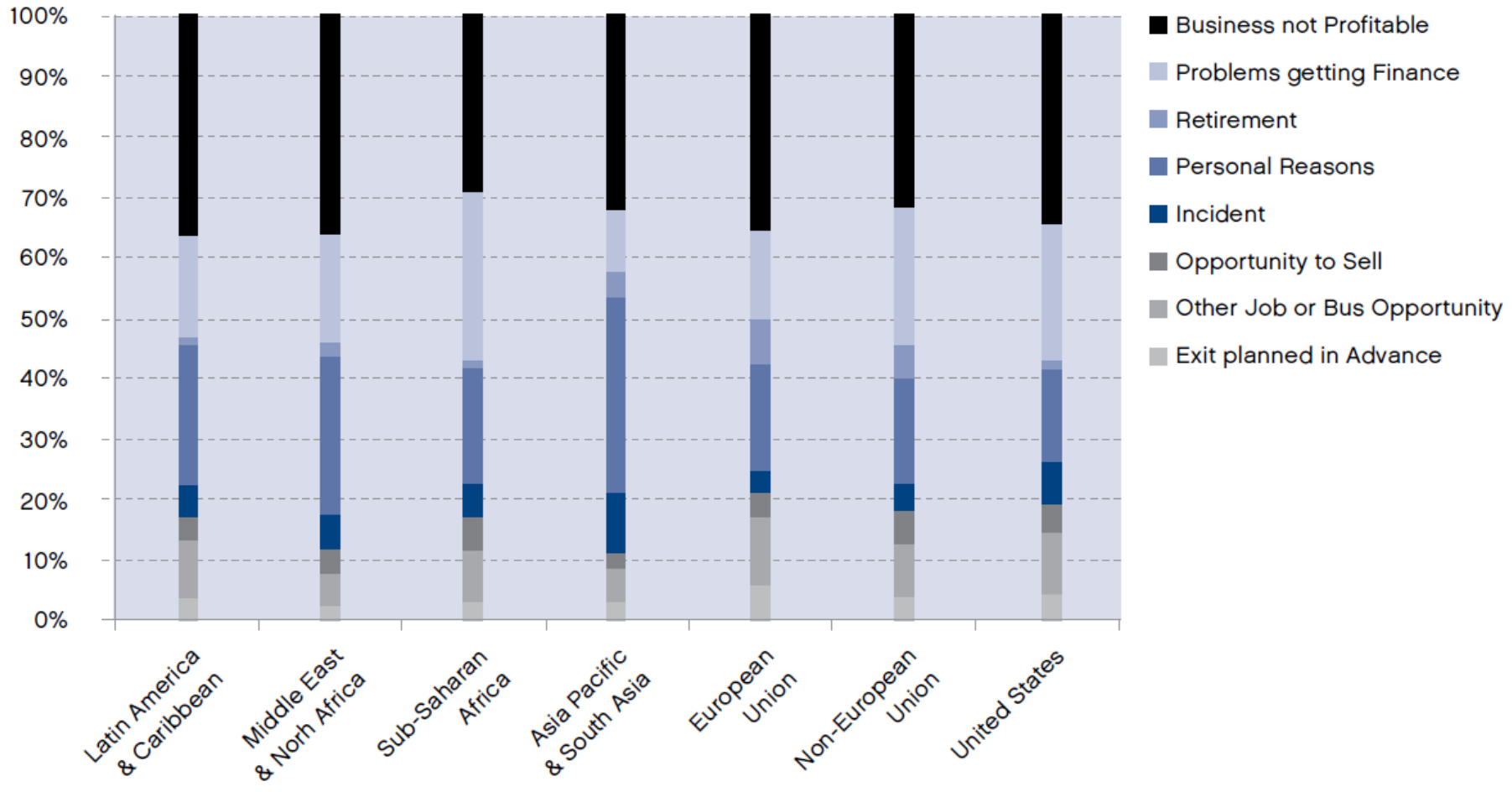
1. Trends: Entrepreneurial Attitudes (by Economic Development Level)



1. Trends: Entrepreneurial Attitudes (by Economic Development Level)

Economy	Perceived opportunities	Perceived capabilities	Fear of failure*	Entrepreneurial intentions **	Entrepreneurship as a good career choice+	High status to successful entrepreneurs+	Media attention for entrepreneurship+
MIDDLE EAST & NORTH AFRICA							
Algeria	46	54	35	21	79	81	47
Egypt	54	59	33	42	83	87	64
Iran	39	54	41	23	60	73	61
Israel	31	29	47	13	59	72	47
Palestine	46	59	40	36	85	80	71
Tunisia	33	62	15	22	88	94	48
Average (unweighted)	41	53	35	26	76	81	56
EUROPEAN UNION							
Austria	49	50	36	9	46	76	
Belgium	33	37	41	9	62	57	54
Denmark	44	31	39	7	-	-	-
Estonia	45	43	34	16	55	63	41
Finland	55	34	37	8	45	83	68
France	38	36	43	17	65	77	41
Germany	36	37	42	6	49	76	49

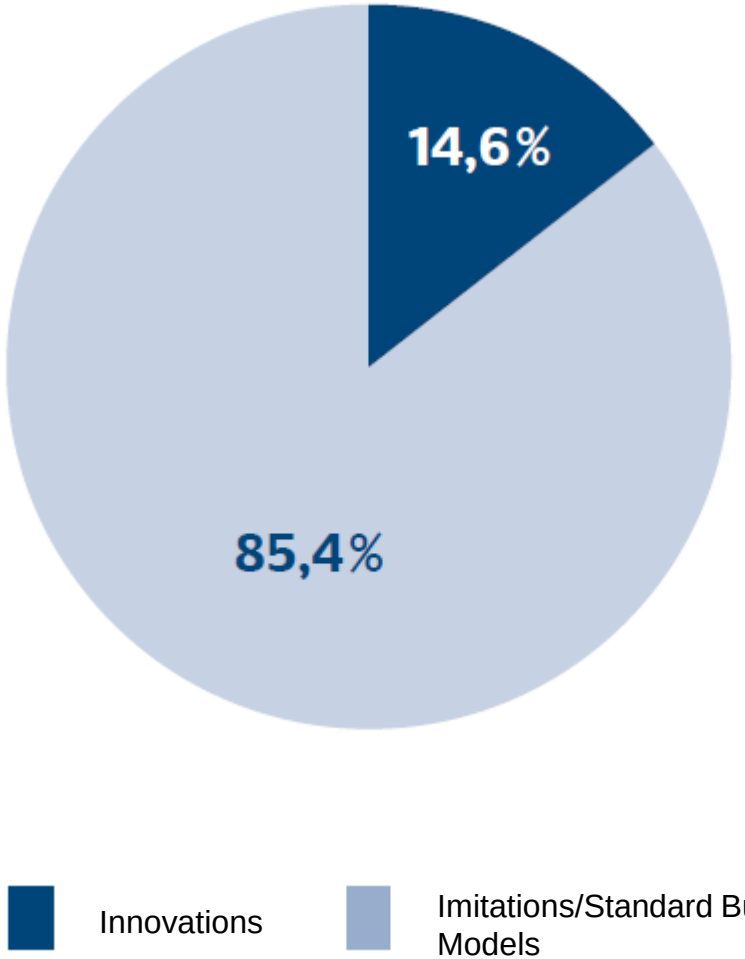
1. Trends: Reasons for Business Discontinuance



1. Trends: Start-ups with Innovative Ideas in GER

How many start-ups are innovators?

Source: KfW Gründungsmonitor



1. Trends: “Hot Topics“

A. Opportunities for start-ups as a Consequence of the Demographic Change:

- Good perspectives for start-ups in the health care sector:
  - Nursing services and geriatric care;
  - Sport, fitness, wellness
  - innovative services in combination with medical products
- Services close to home for the elderly
- Specialized travel and leisure services for elderly people
- etc.

1. Trends: “Hot Topics“

B. Ongoing good perspectives for innovative start-ups in the IT and internet industry

- Examples:
  - Customized E-Commerce Services
  - Social Media Offerings
  - Firm-focused Internet- und Communication services (B2B)
  - etc.
- IT Outsourcing by big firms creates markets for innovative offerings.
- Good news: Many IT start-up projects can be realized with a low initial budget.

1. Trends: “Hot Topics“

C. Good opportunities for green start-ups in the „Green Economy“

- 13,6 % of all start-ups in 30 Technology- and Start-up Centers (Incubators) are green ventures (Source: Borderstep Institute 2013)
- The „Energiewende“ (energy turnaround) as a Chance for entrepreneurs in Germany (including green IT)
- Green start-ups cover all industries (General Purpose Technology)
- Examples:
  - Products and Services in the field of renewable energies (e.g. ISIS from Marburg);
  - Products & technologies to increase energy efficiency;
  - Products & technologies to avoid or lower pollution;
  - Products & services to support biodiversity and eco systems.

1. Trends: “Hot Topics“

D. Your Insider Tips?

- …
- …
- …
- …
- …

1. Trends: “Hot Topics“

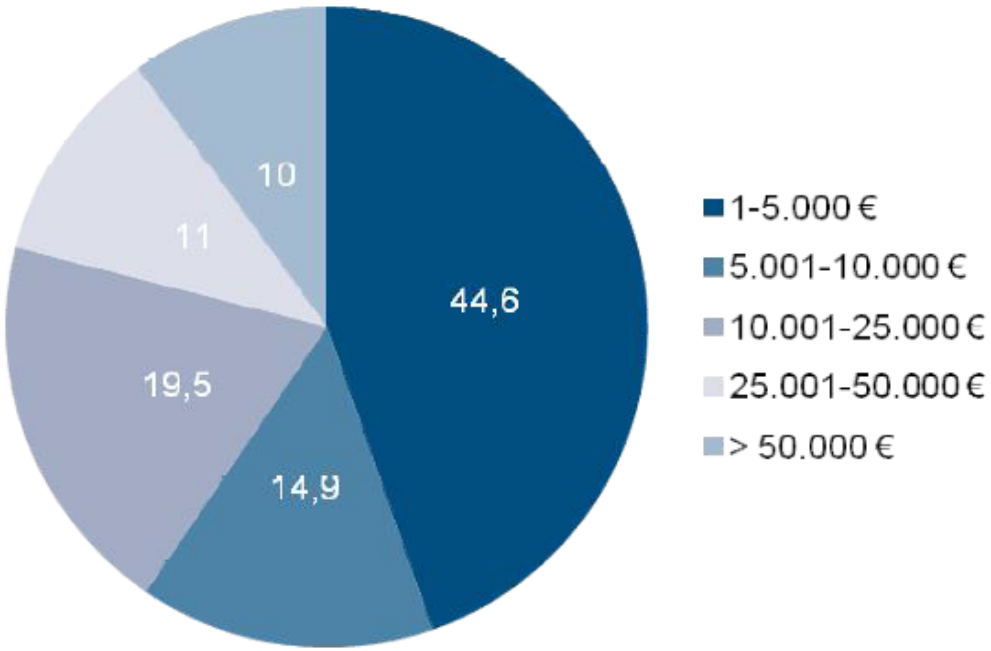
Always a hot Topic: The money!

1. Trends: Insights from the financial side

Financial needs of start-ups: Small amounts dominate!

Source: KfW Gründungsmonitor 2013

Budgets needs of start-ups (in percent)



- Nearly 50% of all new ventures start with 5,000 Euros and less….
- Only 10% of the entre-preneurs need more than 50,000 Euro
- 6.3 % > 100,000 Euro

1. Trends: Insights from the financial side

A new trend in financing: Crowdfunding

Source: KfW Gründungsmonitor 2013

Crowdfunding (und Crowdlending)

- External financial support with many little contributions
- Popular in the IT sector and in creative industries (fashion, culture….)
- Crowdfunding is based on the promotion of the start project via the internet, e.g. in Social Media or specialized crowfinancing platforms
- Popular crowdfunding platforms in Germany:
  inkubato, pling, Startnext
- Variants of Crowdfunding (CF):
  - Donation-based CF
  - Reward-based CF
  - Lending-based CF
  - Equity-based CF

1. Trends: Insights from the financial side

A new trend in financing: Crowdfunding

189.186,03 € (158%) finanziert

Am Borsigplatz geboren - Franz Jacobi und die Wiege des BVB

Kategorie: Film / Video

Unser Ziel ist es, eine filmische Dokumentation über Franz Jacobi, den Gründer des BVB, und seine Mitstreiter zu erschaffen - mit der Leidenschaft echter BVB-Fans!

1379 Fans | 2573 Supporter | Noch 15 Tage

11.049,64 € (55%) finanziert

Festsaal Kreuzberg - Wiederaufbau

Kategorie: Kulturelle Bildung

Nach 9 Jahren Musikgeschichte am Kottbusser Tor, dem einzig wahren Herzen von Berlin, wurde der Festsaal Kreuzberg Opfer der Flammen, ihn wiederaufzubauen ist das Ziel dieses Projekts.

482 Fans | 379 Supporter | Noch 70 Tage

90.801,80 € (182%) finanziert

C3S: Die faire GEMA-Alternative.

Kategorie: Musik

Die Initiative der Cultural Commons Collecting Society (C3S) möchte eine faire und flexible Alternative zur GEMA gründen. Die C3S will mit Kreativen und Musikliebenden gemeinsam Musikern zu einem besseren Auskommen

1521 Fans | 1431 Supporter | Noch 11 Tage

4.461,00 € (45%) finanziert

Yunikue Fitted Bag

Kategorie: Design

Wir möchten mit euch eine besondere Laptoptasche produzieren, die die von einer Tasche erwarteten Möglichkeiten, in Bezug auf Design und Funktionalität neu definiert. Eine perfekte Tasche, in der du nicht nur deinen

178 Fans | 37 Supporter | Noch 11 Tage

4.185,00 € (42%) finanziert

FLASH - Die nächste Generation (Web, TV, App & Community)

Kategorie: Journalismus

FLASH ist das schwul-lesbische Stadtmagazin für Köln und wir wollen es jetzt mit Eurer Hilfe in ein richtiges "Community- und Mitmach-Projekt" verwandeln. Mit unserem Crowdfunding bei Startnext.de sammeln wir Geld für d...

272 Fans | 53 Supporter | Noch 6 Tage

13.609,70 € (91%) finanziert

KANCHA - Design Accessoires für Urbane Nomaden

Kategorie: Design

KANCHA stellt Hüllen für Laptops, Tablets und Smartphones aus Filz und Leder in Kirgistan her. Im Mittelpunkt steht dabei der Mensch - so achten wir auf Fairrness und soziale Verantwortung entlang der Wertkette und auf

247 Fans | 145 Supporter | Noch 3 Tage

2. Basics in Entrepreneurship

2. Basics in Entrepreneurship

Four Core Issues/Problems in Entrepreneurship Management (and Research):

a. What is the Subject Matter?
b. Appropriate Entrepreneurship Theories?
c. Management Deficiencies of Entrepreneurs
d. The Challenge of Innovation Management

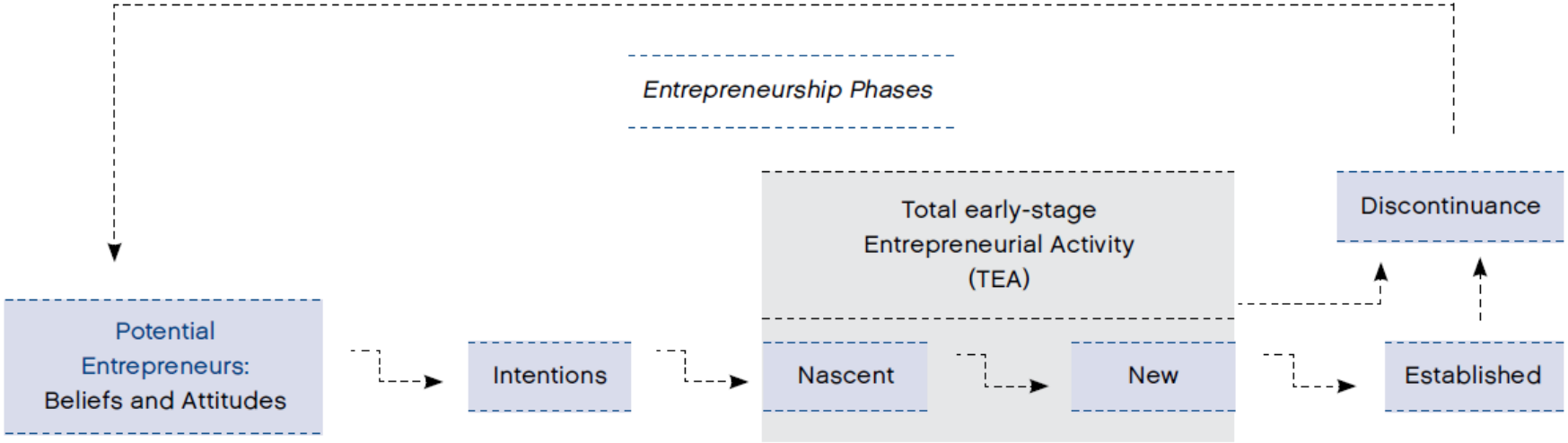
2. Basics in Entrepreneurship: The Subject Matter

Definitions of Bygrave und Hofer (1991):

- The ***Entrepreneurial Event*** „… involves the creation of an new organization to pursue an opportunity“;
- The ***Entrepreneurial Process*** „… involves all functions, activities, and actions associated with the percieving of opportunities and the creation of organizations to pursue them“;
- The ***Entrepreneur*** „… is someone who percieves an opportunity and creates an organization to pursue it“

2. Basics in Entrepreneurship: The Subject Matter

Entrepreneurship is a Process



Source: GEM Global Report, 2011

2. Basics in Entrepreneurship: The Subject Matter

The Nascent Entrepreneur:

2. Basics in Entrepreneurship: The Subject Matter

Entrepreneurship versus New Venture Management

- The definition of the subject matter is important to identify typical problems and challenges (success factors and factors of failure)

- Definition of the subject matter:
  - **New Venture Management** is focusing on the establishment of new firms (including the foundation of subsidiaries/affiliates of existing companies),
  - **Entrepreneurship** addresses the specific problems and solutions in the management of new start-up companies

Our focus is on Entrepreneurship

2. Basics in Entrepreneurship: An Appropriate Theory? Unfortunately not, so far….!

Four theoretical approaches to Entrepreneurship

- Economic theories - Role of the entrepreneur in economic development.
- Psychological trait approach - Personality characteristics of the entrepreneur.
- Social behaviour approach - Influence of the social environment.
- Management Theories: What factors determine the success and failure of start-ups?

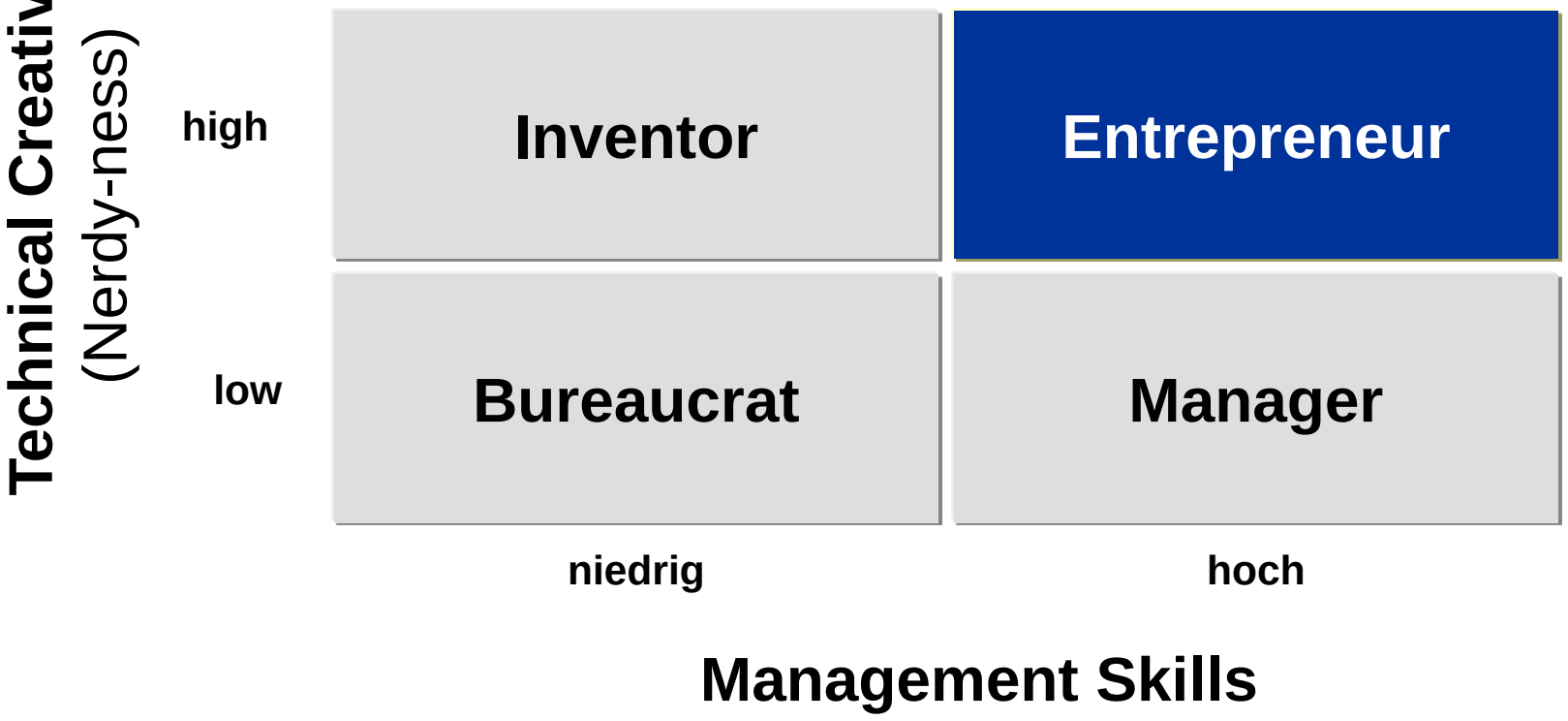
2. Basics in Entrepreneurship: An Appropriate Theory? Unfortunately not, so far….!

An appropriate theory on Start-up Management and Entrepreneurship

- should be able to explain, under which circumstances and conditions and with which measures and actions start-ups are successful
- A „good“ entrepreneurship theory should be valid for all kinds of start-ups and branches / industries → numerous variations of the theory would be required
- Unfortunately: Up to date there exists no universal theory of entrepreneurship that integrates all universal success factors and factors of failure, the problem area is too complex
- However, there are numerous empirical studies that explore individual success factors and factors of failure of start-ups

2. Basics in Entrepreneurship: Management Deficiencies

The ideal Entrepreneur combines (technical) Creatvitiy und Management Skills



2. Basics in Entrepreneurship: Management Deficiencies

How to overcome **Management Deficiencies of Entrepreneurs?**

- In many cases, entrepreneurs are technical experts in their respective technological domain, like in engineering, natural science, software and computer technologies, medicine etc.
- Unfortunately, many entrepreneurs suffer from a lack of management and marketing know-how
- However, management and marketing know-how is necessary to ensure the survival and profitable growth of the start-up business
- This gap with regard to management knowledge and expertise has to be closed!
- Management mistakes increase the probability of start-up failure

1 . Management education of entrepreneurs & business plan coaching!
2. The most successful start-ups are team-based start-ups!

2. Basics in Entrepreneurship: Management Deficiencies

Reflections on Team Formation

- Analogy of marriage and family
- No team starts perfectly
- No team stays perfect
- Some teams are built, some are born
- Roommates sometimes get more review
- Turnover exceeds the divorce rate
- Grade A team with grade B idea beats the reverse

2. Basics in Entrepreneurship: Management Deficiencies

Mistakes in Team Formation

- Forming team by chance
- Forming team casually
- Team members with different/incompatible personal goals
- Family members as professional advisors
- Shares or options without buy-sell agreement
- “Management by friends” is a bad management style

2. Basics in Entrepreneurship: Innovation Management Challenge

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3. Challenge of Innovation Management

3. Challenge Innovation Management: In a Nutshell

AIWA

Philips

F&E

Sony
Walkman
1979

F&E

Sony Walkman II
1984

F&E

Sony
Walkman
2000

Jensen
Cassette Player

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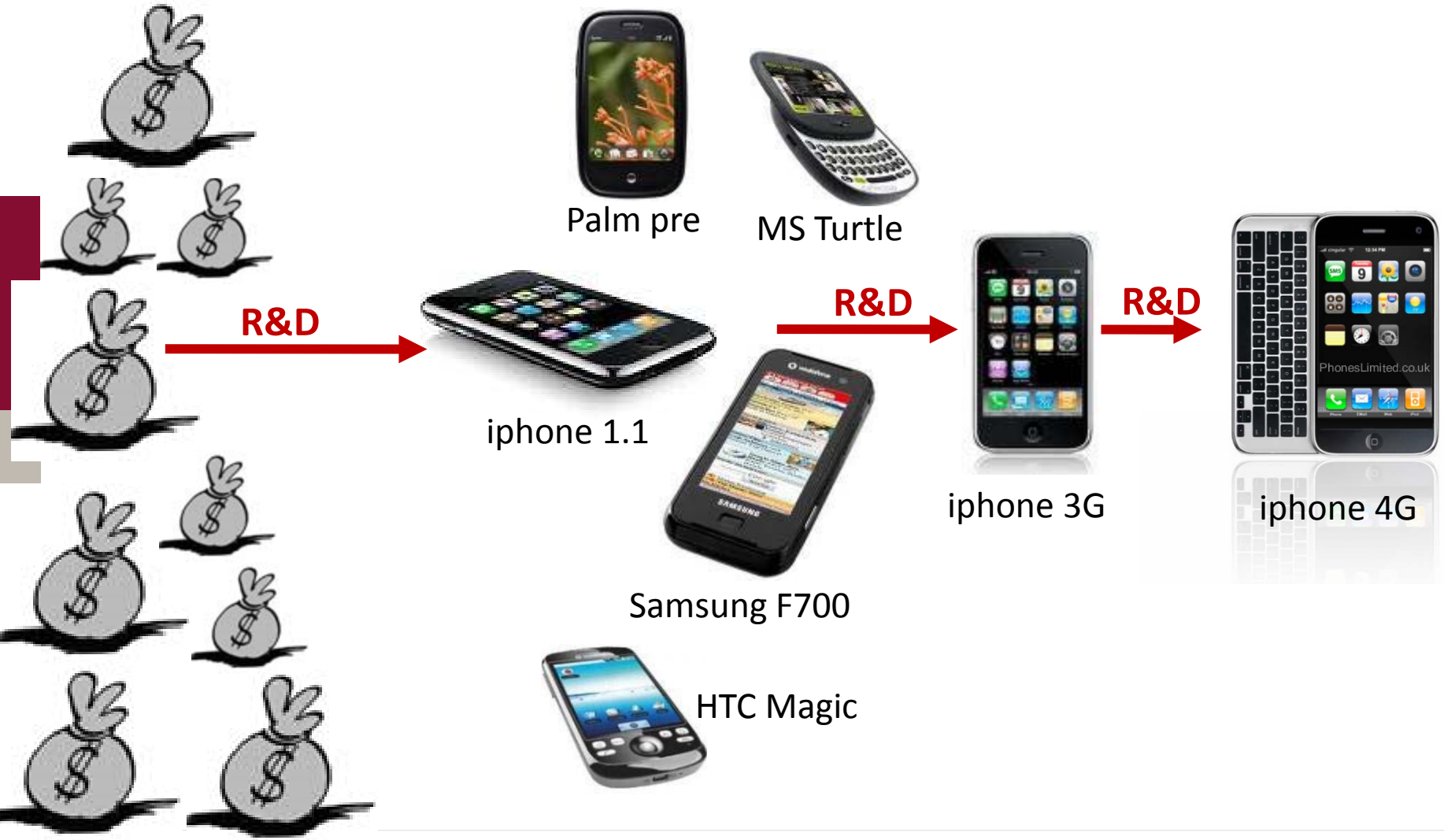
3. Challenge Innovation Management: In a Nutshell



3. Challenge Innovation Management: In a Nutshell

&

Scarce resources require efficiency…

- Cut budgets and streamline innovation processes
- Implement planning and management control systems
- Create transparent structures

Creativity requires Freedom…

- …to operate
- …to take risks
- …to make mistakes
- …to experiment
- …for accidents and luck!

3. Challenge Innovation Management: In a Nutshell

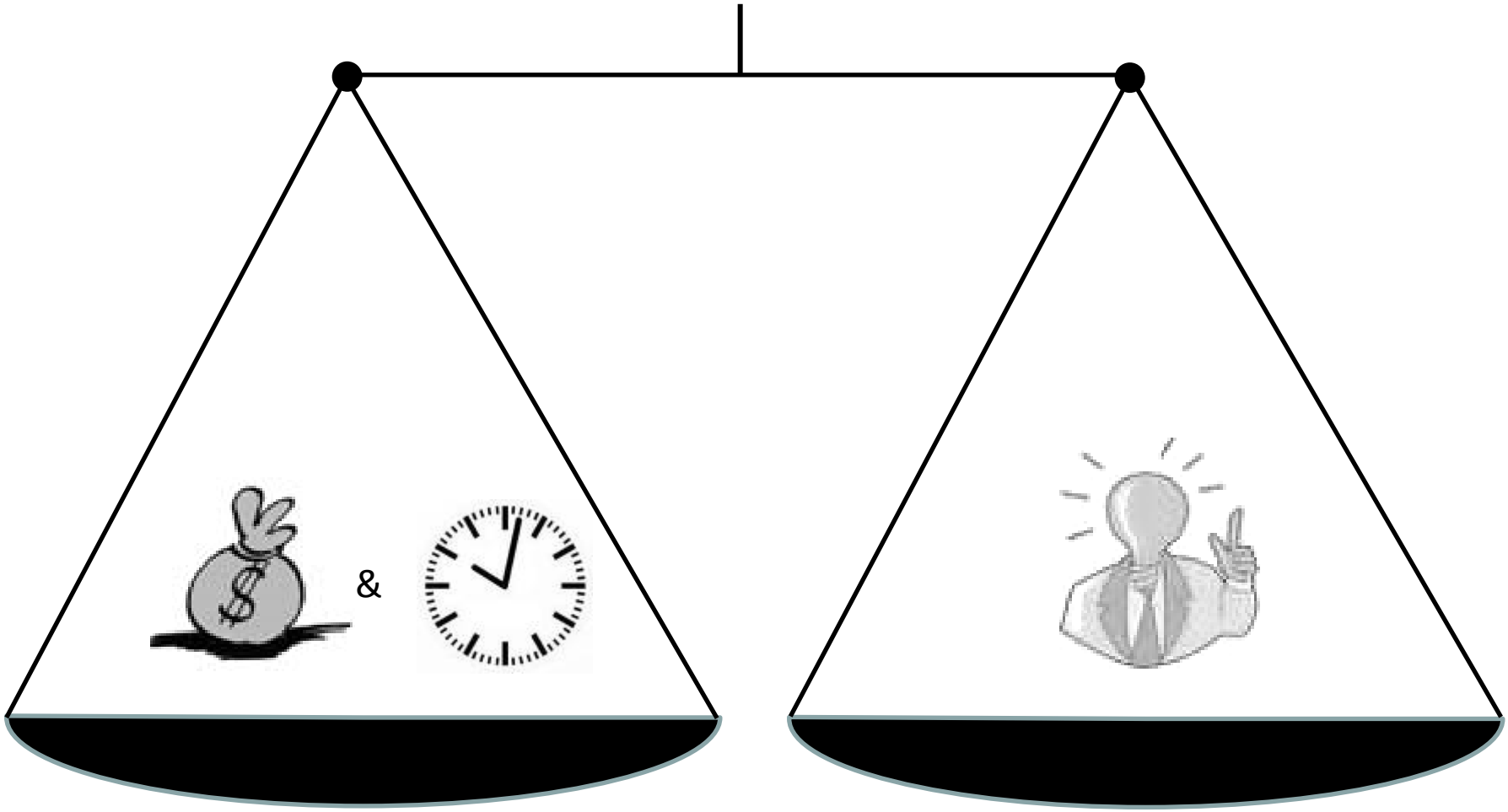
Formal structures and too much bureaucracy block creativity and innovation

3. Challenge Innovation Management: In a Nutshell

Too much freedom (to operate) bears risk – “Over Engineering”

„The model is not really cheap, but the performance is excellent – You can fill the bathtub within twelve seconds…“

3. Challenge Innovation Management: In a Nutshell

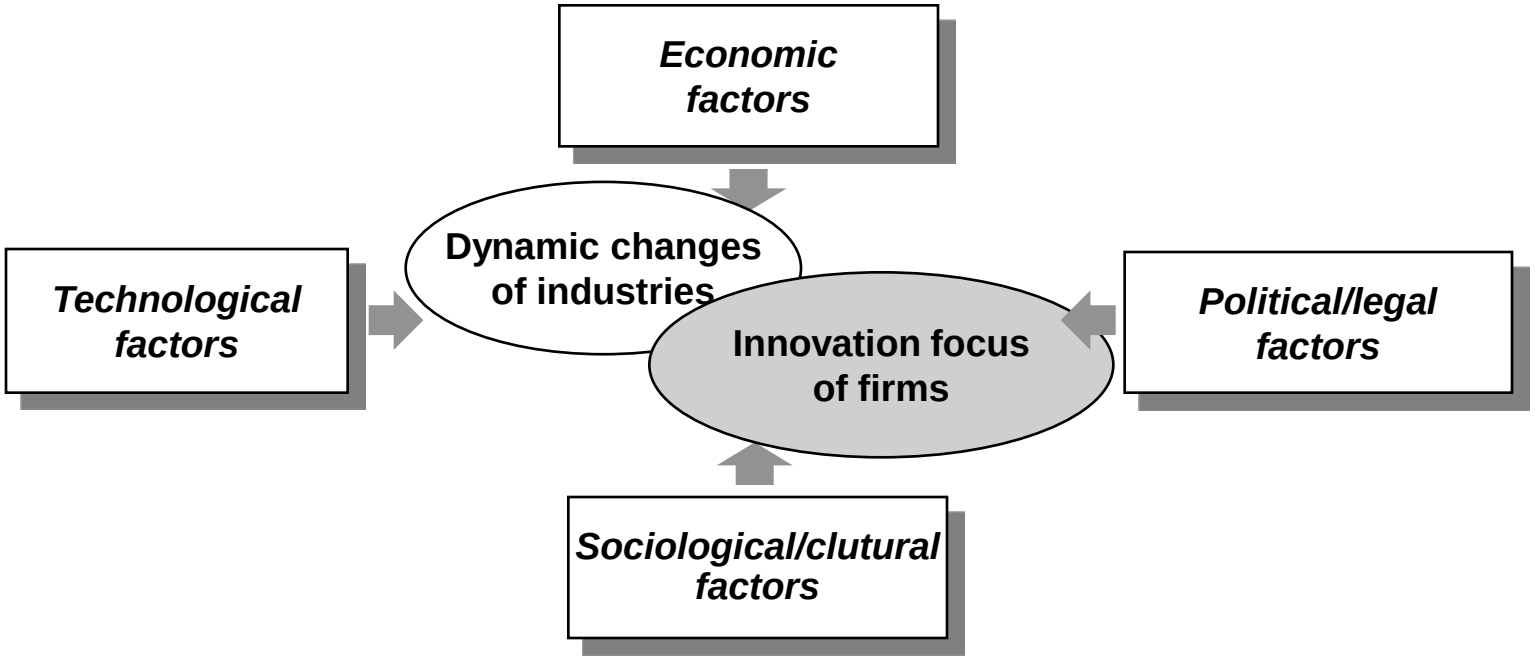


Finding the right balance is the Core Core Challenge in Innovation Management

3. Challenge Innovation Management: In a Nutshell

New competitive situation for firms/companies: Focus on innovation!

- Innovations are a prerequisite for most start-ups & companies to survive.
- Firms can stand and maintain their market position only with permanent product and service improvements (→ Innovation !).
- Innovation-based competition (innovating ahead) today is the most prominent business model for firms (in contrast to traditional cost leadership strategies).



3. Challenge Innovation Management: In a Nutshell

Technology & Innovation Leadership as Dominant Competition Strategy

Technological innovation is now the single most important driver of competitive success in many industries AND for Start-ups

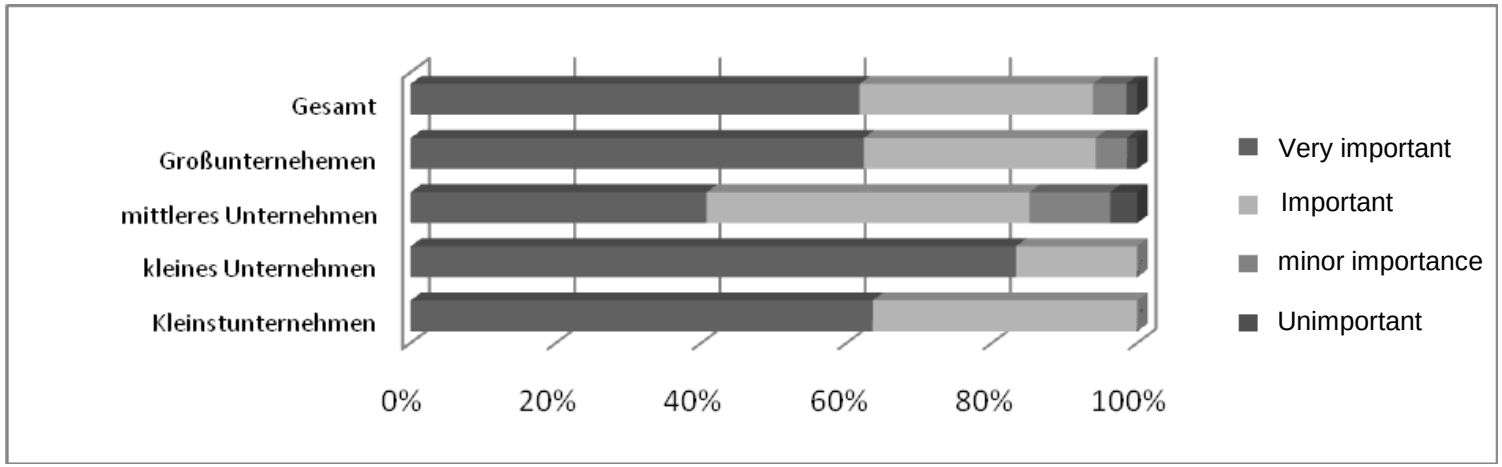
- An important consequence of the shift towards competition in innovation leadership: Product and technology life cycles are getting shorter and shorter
- Firms introduce an increasing number of new products to the market in much shorter time spans / intervals → rising time pressure in innovation management.
- Exploding R&D costs: Products are getting more and more complex; in most industries R&D costs „explode“ (Pharma: 7.5 Mio. US-$ versus 400 Mio. U.S.$).

Specific implications for product innovation management in companies (globally)

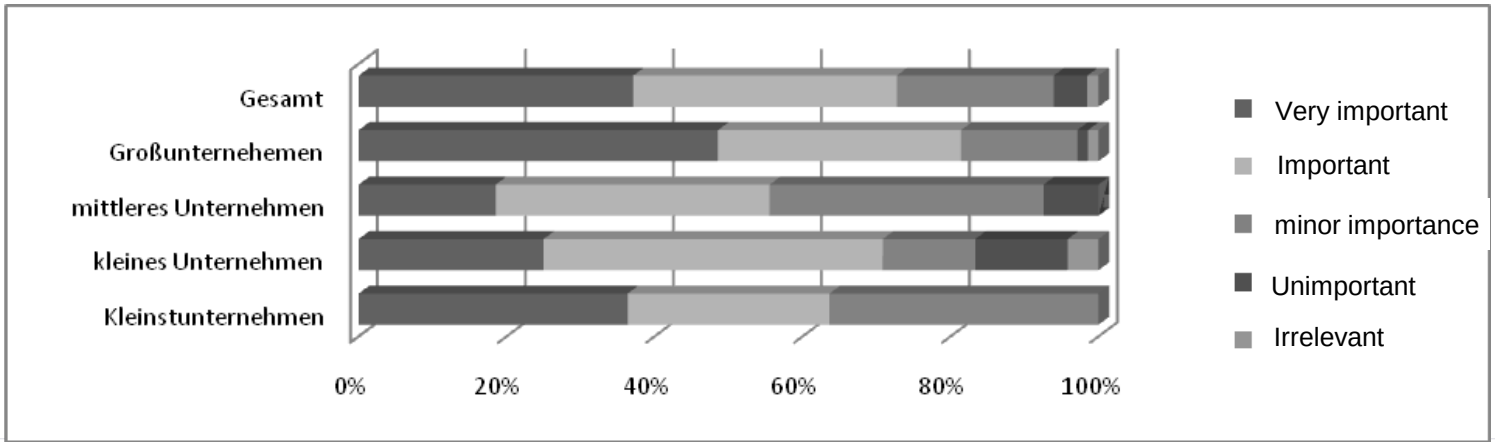
- Imitation or small innovations (incremental changes) are not enough to sustain the competitive advantage.
- Firms must differentiate themselves with superior product performance or a better cost/quality ratio in the eye of the customer.
- „Happy Engineering“ is not adequate any more! Innovation should be planned carefully, innovation must be a core subject/focus in strategic management.
- “Technology and Innovation Management” is a new subject at the intersection of Strategic Management, Marketing, Finance, Controlling, Engineering etc.

3. Challenge Innovation Management: In a Nutshell

Survey on the Importance of Innovation in European Firms & Start-ups



Relevance of Implementation of Innovation Management in Firms & Start-ups



3. Challenge Innovation Management: In a Nutshell

Innovation and Firm Performance – General Empirical Evidence

Results of the PIMS-Study

- Innovation activities have a positive impact on firm performance
- Background: The PIMS-study has identified the 18 prime drivers (out of 37) of corporate success (Return-on-Investment)
- Innovation success can be traced back to the positive correlation of product innovations and R&D expenditures on ROI.

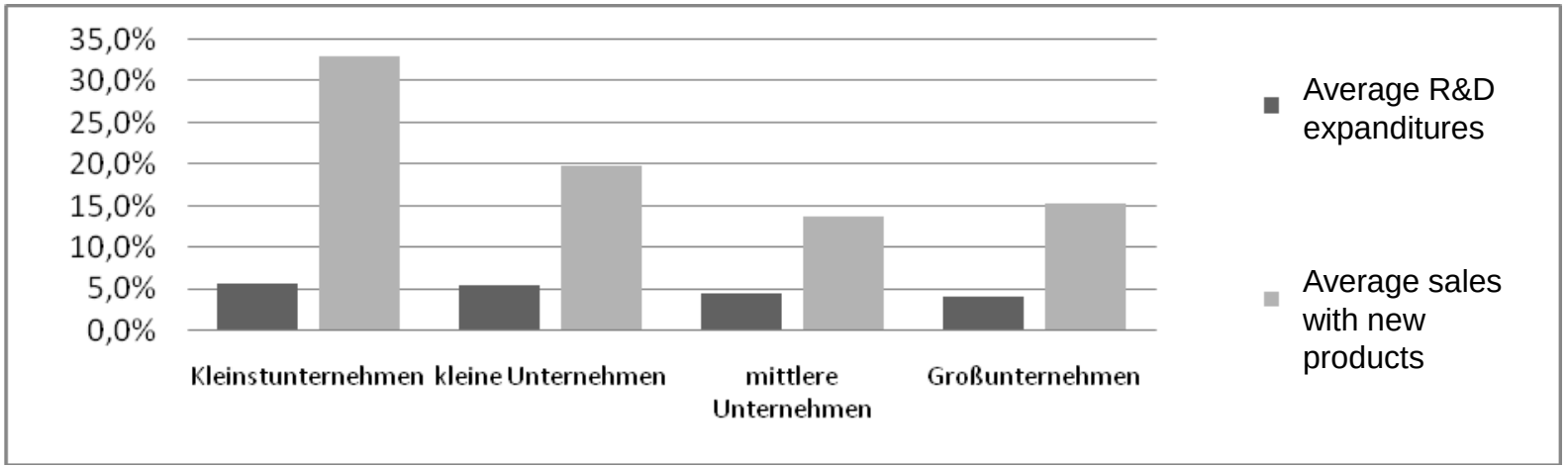
Results of the ZEW-Study (Center for European Economic Research)

- *What is the impact of innovation on the firm level?*
- *Result I: Improvement of* product quality, increasing market share and diversification/ exploration of new market segments (Blue Ocean Strategy)
- *Result II: Process improvements, cost savings (both material and staff costs), quality improvements → increases in efficiency („*Rationalisierungseffekte“)
- *Result III: Improvements in ecological and social performance of firms („Greening“ the corporation“); firms meet regulatory standards etc.*

Prerequisite: Permanent investments in R&D and corporate implementation of innovation management

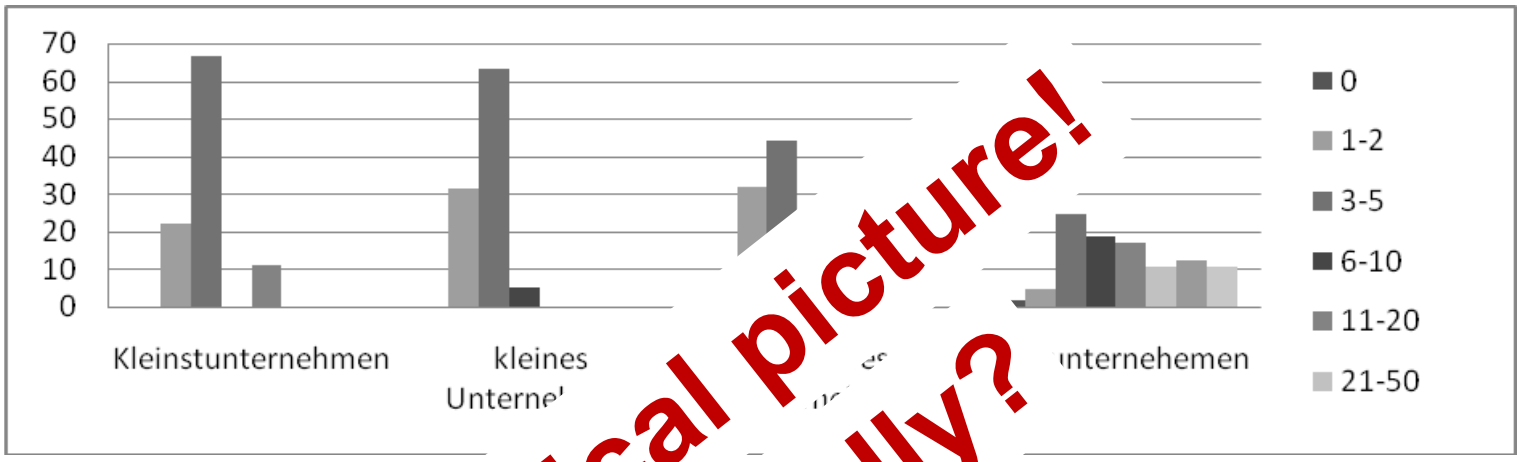
3. Challenge Innovation Management: In a Nutshell

R&D Expenditures and Sales with New Products in 2009 in European Companies & Start-ups: A nice picture!

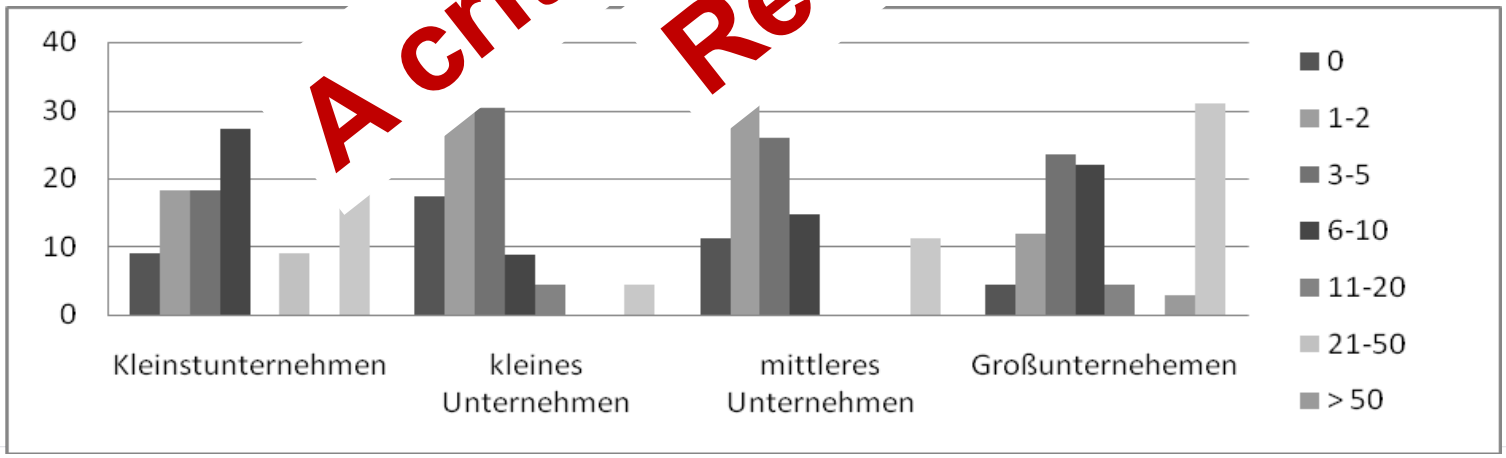


3. Challenge Innovation Management: In a Nutshell

Number of successfully completed innovation projects



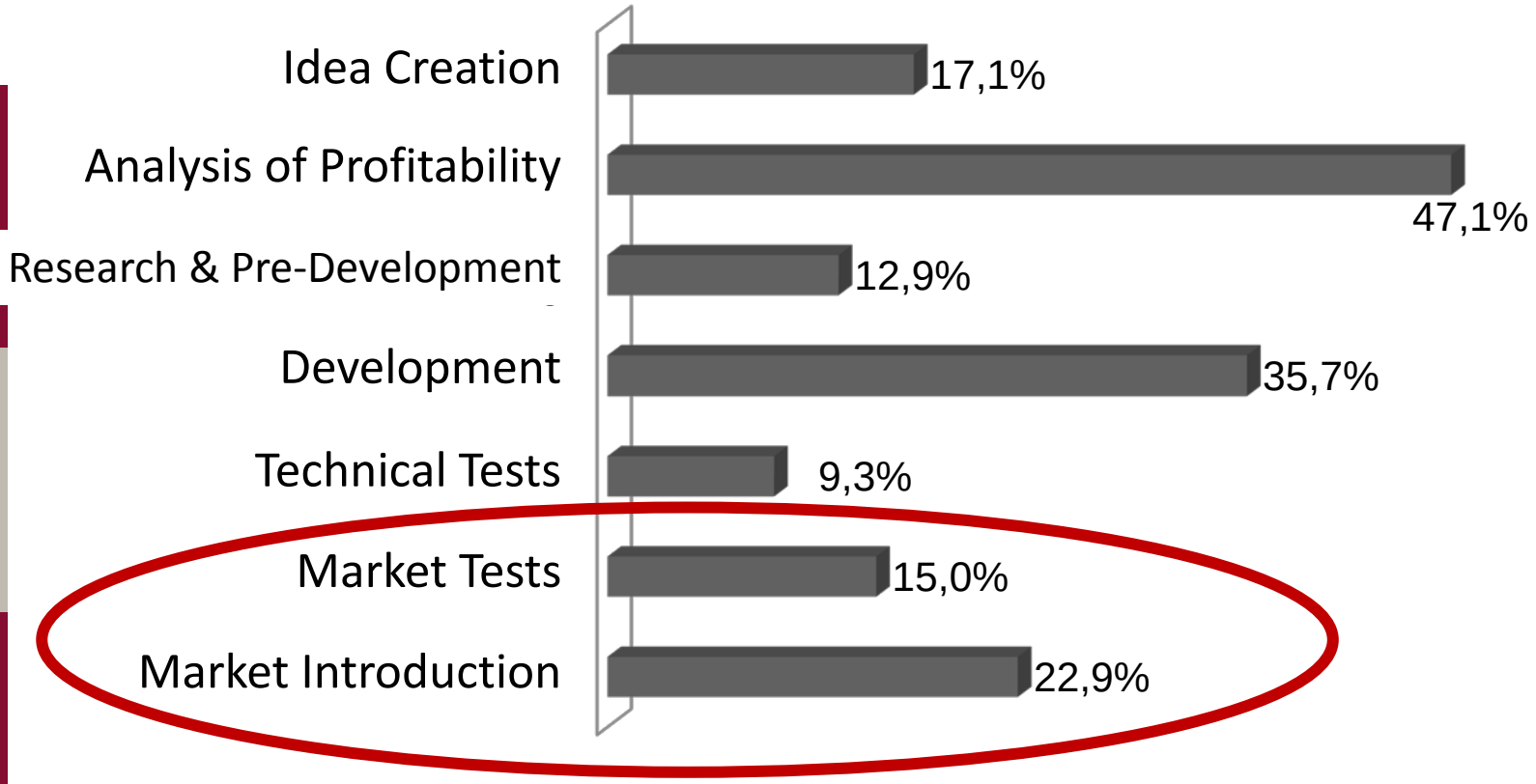
Number of non-fin… …cts



A critical picture! Really?

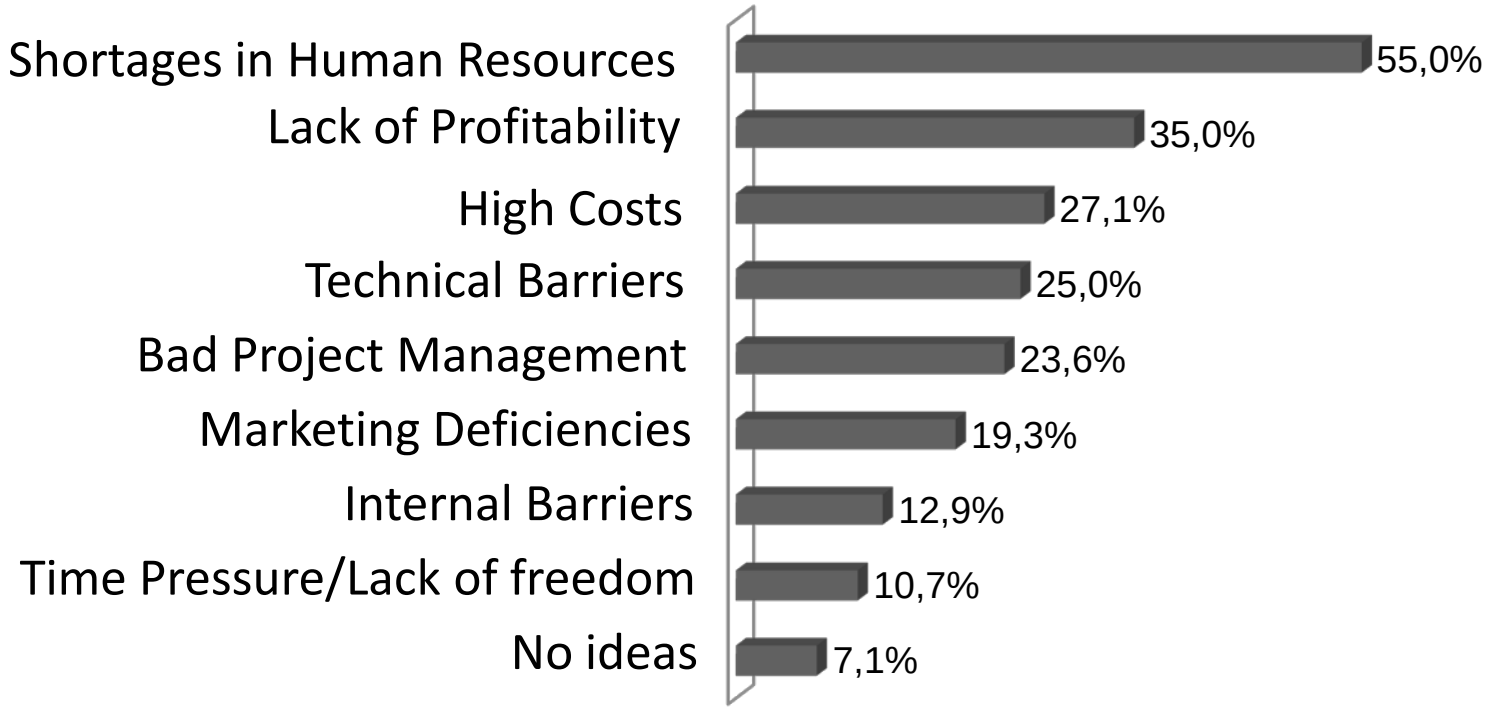
3. Challenge Innovation Management: In a Nutshell

When do innovation projects fail ? (in phase of the innovation process)



3. Challenge Innovation Management: In a Nutshell

Why do innovation projects fail? (Primary factors of failure)



3. Challenge Innovation Management: In a Nutshell

Basics in Terminology: What exactly is / means „INNOVATION“?

Innovation versus Invention

- The word „Innovation“ is of Latin origin and incorporates „NEW“ (Nova): A new idea that has not existed before.
- What is the difference between innovation and invention (or discovery)?
- Invention is a prerequiste for Innovation.
- Innovation is the first commercial use of an invention / technical discovery.
- Schumpeter was the pioneer who distinguished „Invention“ from „Innovation“ („Innovation means successful market introduction of inventions“).
- Innovations are either new products or new production processes (business methods).
- Innovation i.n.s. versus Innovation i.b.s.
  - Innovation i.n.s. is the first market introduction of a new product or production process.
  - Innovation i.b.s. means the wide diffusion of an invention (like the iPhone or the iPod).

Quelle: Burr/Stephan/Werkmeister (2011), S. 353 f.

3. Challenge Innovation Management: In a Nutshell

Types of Innovation (1): Product- versus Process Innovation

Process Innovations:

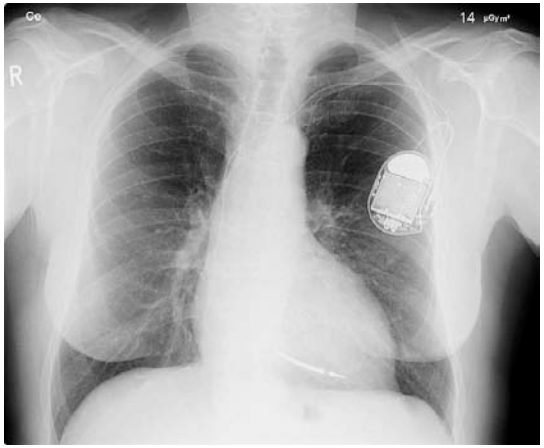
- Process innovations are innovations in the way an organization conducts its business, such as in techniques of producing or marketing goods or services.
- Product innovations aim at an increase in efficiency.

Product Innovations:

- Product innovations are embodied in the outputs of an organization – its goods or services.
- Product innovations aim at an increase in effectiveness
- Product innovations can enable process innovations and vice versa.
- What is a product innovation for one organization might be a process innovation for another:
  E.g., UPS creates a new distribution service (product innovation) that enables its customers to distribute their goods more widely or more easily (process innovation)

3. Challenge Innovation Management: In a Nutshell

Popular Product Innovations: The cardiac pacemaker

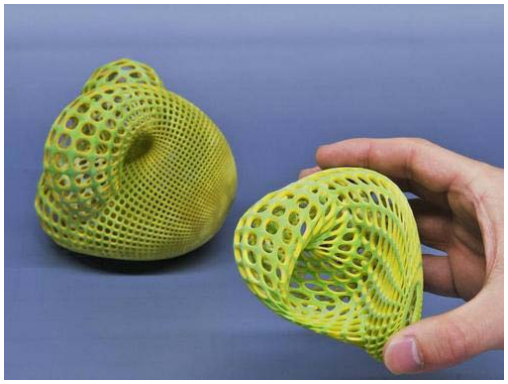


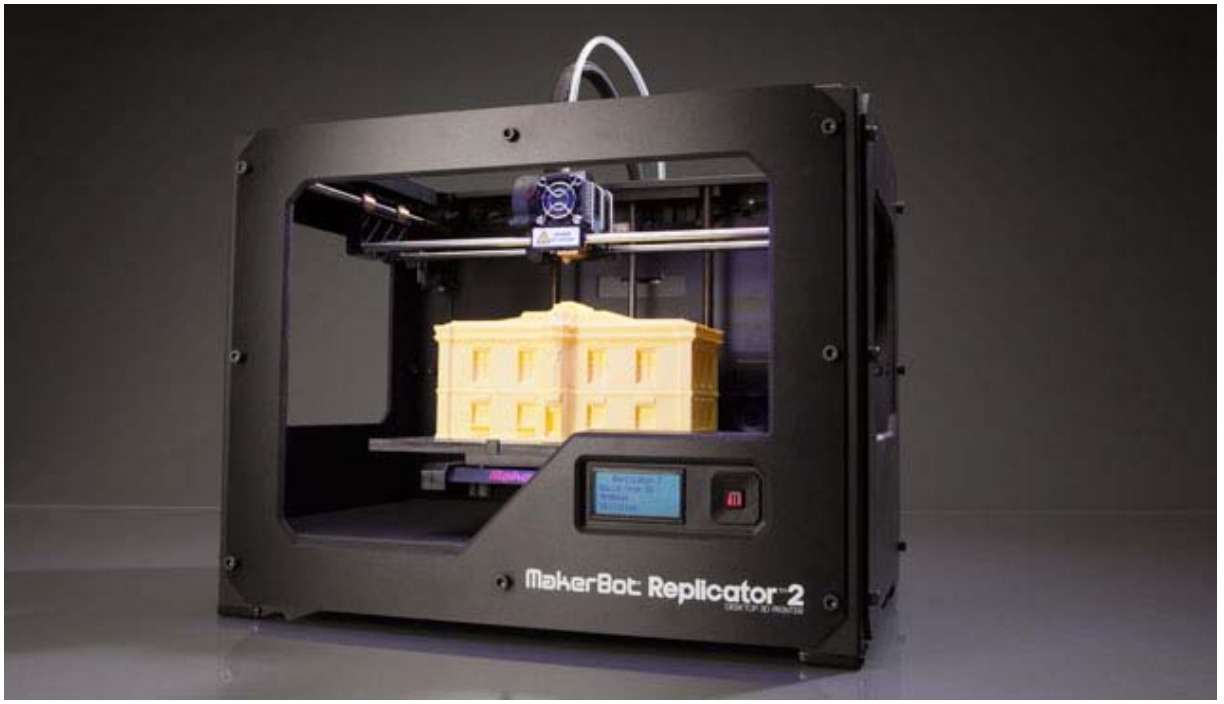
Inventor: Dr. Paul Zoll, Boston

1850	Surgeons discover, that the human heart can be stimulated electrically
1887	Discovery: Electrical impulses can be measured with scientific apparatus - „Electrocardiogram“
1952	First cardiac pacemaker is put into practice – the first pacemaker was a bulky machine with the size of a fridge, the patient has to carry the pacemaker on a trolley
1958	First implantation of a cardiac pacemaker by Siemens (a device with the size of a cigarette box)
Today	Micro-invasive implants, pacemakers have the size of microchips, patients can live with a pacemaker now more than 12 years

3. Challenge Innovation Management: In a Nutshell

Popular Process Innovations: 3D Printers





3. Challenge Innovation Management: In a Nutshell

Beyond Traditional Product Innovation: Social and Ecological Innovation

3. Challenge Innovation Management: In a Nutshell

Types of Innovation (2): Radical versus incremental Innovations

Incremental Innovation

- Evolutionary changes, product differentiation with new product features or quality improvements
- Examples?

Radical Innovation:

- Dramatic changes, new ideas that make up new markets and industries
- Examples?

Criticism:

- Critical arguments against this dichotomous classification!

3. Challenge Innovation Management: In a Nutshell

Types of Innovation (3): Market-pull versus Technology-push

What is the impulse for Innovation?

- Market-pull Innovation
  - Market-pull is Customer-driven
  - Customer-needs are the driving force
  - Customers play a crucial role in innovation management
  - Innovation is „pulled“ by the market

- Technology-push-Innovation
  - Technology-push comes from the R&D department, „Laboratory-driven“
  - Technology-push is „pushed“ by the firm

- Examples?

3. Challenge Innovation Management: In a Nutshell

Different Types of Technology and Innovation Strategies

The Crucial Question: Timing of the market entry

- Pioneering strategy (First-to-Market)
- Early adopter strategy (Second-to-Market)
- Late follower strategy (Me-too-Market)

Which one is the best?

3. Challenge Innovation Management: In a Nutshell

Types of Innovation Strategies: Pioneering- vs. Fast-Follower Strategies

PRODUCT	INNOVATOR	FOLLOWER	WINNER
Jet Airliners	De Havilland (Comet)	Boeing (707)	Follower
Float glass	Pilkington	Corning	Leader
X-Ray Scanner	EMI	General Electric	Follower
Office P.C.	Xerox	IBM	Follower
VCRs	Ampex/Sony	Matsushita	Follower
Diet Cola	R.C. Cola	Coca Cola	Follower
Instant Cameras	Polaroid	Kodak	Leader
Pocket Calculator	Bowmar	Texas Instruments	Follower
Microwave Oven	Raytheon	Samsung	Follower
Plain Paper Copiers	Xerox	Canon	Not clear
Fiber Optic Cable	Corning	many companies	Leader
Video Games Players	Atari	Nintendo/Sega/Sony	Followers
Disposable Diapers	Proctor & Gamble	Kimberly-Clark	Leader
Web browser	Netscape	Microsoft	Follower
PDA	Psion, Apple	Palm	Follower
MP3 music players	Diamond Multimedia	Apple	Followers

3. Challenge Innovation Management: In a Nutshell

First Mover = Pioneer

Advantages

- Above-average returns until other competitors respond effectively
- Start down the learning curve earlier
- Opportunity to gain customer loyalty
- Opportunity to set standards
- …..

Disadvantages

- Uncertainty about demand
- High development costs / trial and error R&D
- Risk of adopting a losing standard
- ……

3. Challenge Innovation Management: In a Nutshell

Fast Follower = Moving Second: Imitate and counter

Advantages

- Reduction in demand uncertainty
- Market research to improve satisfying customer needs
- Learn from the first mover's successes and shortcomings
- Gaining time for R&D to develop a superior product
- Don't have to educate consumers
- …..

Disadvantages

- Switching costs may make taking customers difficult
  - Brand loyalty/customer familiarity
  - Standards
- Initial cost disadvantage: May not survive until learning curve advantages have leveled out
- ……

4. Challenge of Protecting Innovation

(Protecting your Ideas While Pitching your Business)

4. Instruments for Intellectual Property Protection

Mechanisms and instruments that firms can use to appropriate the rents from their innovative activities

Formal / Legal Instruments

Industrial Property Rights

- Patents
- Trademarks
- Utility Patent (Petty Patent)
- Design Patent

Copyrights

Informal Instruments

Factual Instruments

- Trade secrets
- Confidentiality Agreements
- Provisions in Product Design

Instruments in Competition

- Moving Rapidly Down the Learning Curve
- Lead Time Exploitation
- First Mover Strategy
- Inventing Ahead
- Product Differentiation/ Complement. Services

4. Instruments for Intellectual Property Protection

Patents are Granted as a Temporary Monopoly Right with two Major Economic Functions:

(1) Incentives for Innovators:

Intellectual property rights (IPR) provide incentives for innovators to invest in new products and processes by guaranteeing them a period where they can recoup a return from their investment unchallenged by competitors

(2) Diffusion of Technology:

Patents help diffuse technology since they force innovators to disclose information regarding the underlying technology

But IPR are not without social cost (risk of deadweight losses).....

4. Instruments for Intellectual Property Protection

Patents

Definition:
A patent provides an inventor with exclusive rights to a new and useful *product, process, substance or design* (including *improvements* on existing products, processes and substances)

Term of rights:
20 years from date of application (“filing”)

Issuance:
2-5 years, usually

Infringement
“…whoever without authority makes, uses or sells any patented invention within the [geographic extent of the patent] during the term of the patent infringes the patent.”

4. Instruments for Intellectual Property Protection

Patents (cont.)

Characteristics:

Description must enable someone “skilled in the art” to practice the “best mode” of the invention.

Claims define rights to technology and the basis of prosecution.

The underlying idea is not protected.

Conditions for Patentability:

Novelty (for no more than one year prior to application can invention be known or used by others)

Non-obviousness (not patentable if a person of “ordinary skill in the art” finds the invention obvious…this is the toughest requirement)

Usefulness (weakest link)

4. Instruments for Intellectual Property Protection

Patents (cont.)

Patenting Activity By Industry (OECD)

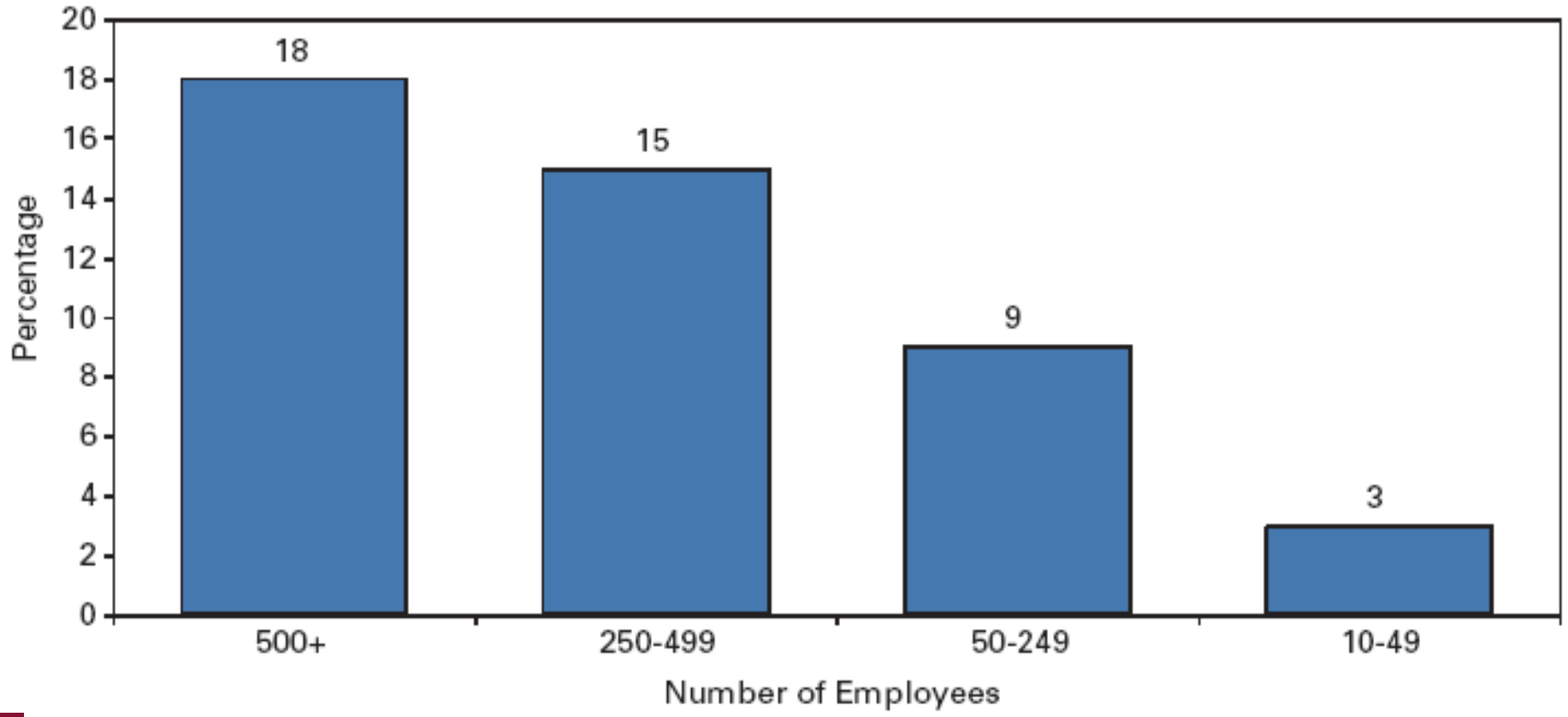
Industry	% R&D Units Applying in Last 3 Years	
Food	52.9	
Textiles	43.5	
Printing/Publishing	41.7	
Petroleum	73.3	
Misc. Chemicals	72.4	
Glass	50.0	
Machine Tools	72.7	
Computers	80.0	
Medical Equipment	89.4	**2.**
Car/Truck	89.0	**3.**
Auto Parts	77.4	
Special Purpose Machinery	92.1	**1.**
All	69.8	

Source: Cohen, Nelson ,Walsh (2000)

4. Instruments for Intellectual Property Protection

Patents (cont.)

Patenting Activity By Firm Size: Proportion of Firms taking out Patents by Size



Source: DTI (2005)

4. Instruments for Intellectual Property Protection

Utility Patents

Overview:

Like the patent, it can protect all technical inventions, including also chemical substances, food and medicinal products, except for processes (manufacturing and working processes, measuring processes, etc.)

Issuance:

The examination and grant of a patent usually takes several years. The utility model, in contrast, will be registered within a few weeks after filing the application

Differences to Patents

The IP right becomes effective upon registration and it gives the same rights as a patent. However, the utility model is an unexamined IP right. The registration procedure does not examine novelty, inventive step and industrial applicability. The applicant should conduct thorough searches to make sure that the application actually meets these requirements applying to effective IP rights. Otherwise he may not invoke any rights based on the utility model registration

Term of rights:

10 years from date of application (“filing”)

4. Instruments for Intellectual Property Protection

Copyrights

Definition:
A copyright gives to its creator the exclusive production, publication, or sales rights to artistic, dramatic, literary, or musical works

Term of rights:
Immediate protection upon creation. For individuals, life + 70 years. For "works for hire", minimum of 95 years from publication or 120 years from creation

Coverage:
Works of authorship, including writings, music, works of art, computer programs and the like, that have been reduced to a tangible medium of protection (artistic expression)…"In no case does copyright…extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery. […]hard work rather than originality or creativity…is not protectable."

4. Instruments for Intellectual Property Protection

Design Patent

Definition:
An industrial design is the ornamental or aesthetic aspect of an article. The design may consist of three-dimensional features, such as the shape or surface of an article, or of two-dimensional features, such as patterns, lines or color

Term of rights:
The term of protection is generally five years, with the possibility of further periods of renewal up to, in most cases, 15 years

Conditions:
An industrial design is primarily of an aesthetic nature, and does not protect any technical features of the article to which it is applied. As a general rule, to be registrable, the design must be "new" or "original"

Coverage:
Industrial designs are applied to a wide variety of products of industry and handicraft: from technical products to consumer goods

4. Instruments for Intellectual Property Protection

Trademarks

Definition:
Trademarks are words, symbols or other marks used to distinguish a good or service provided by one firm from those provided by other firms

Term of rights:
EU Trademark protection lasts 10 years (renewable) as long as used within at least one country within 5 years. In US, no formal expiration date. In either area, a firm may lose its right if mark becomes generic rather than brand specific (e.g. Yo-yo, Trampoline, thermos…)

Four General Functions for the consumer:
1. Inform the customers and structure the offer
2. Represent a guarantee of quality and continuity
3. Have a signalling effect; and/or
4. Guarantee the use of a particular recipe or procedure

4. Instruments for Intellectual Property Protection

Trademarks (cont.)

Which kind of signs may be registered as trademark?

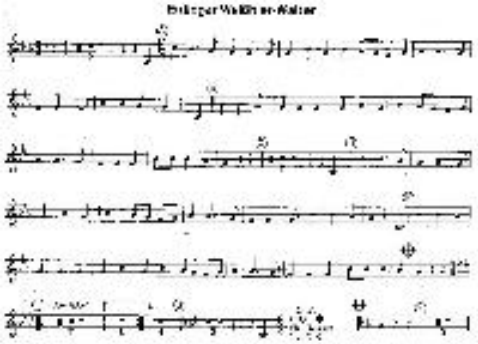
Word, symbol, or other signs used to identify a good or a service can be trademarked. A descriptive word cannot be trademarked (e.g., carboxymethylcellulose sodium – no – Celluvisc – yes)

Signs include:

- word marks including letters, numbers or combination of letters, numbers and words;
- figurative marks, whether or not including words;
- figurative marks in colour;
- colours or combinations of colours;
- three-dimensional marks;
- sound marks;
- trademark for aroma

4. Instruments for Intellectual Property Protection

Types of acoustic trademarks

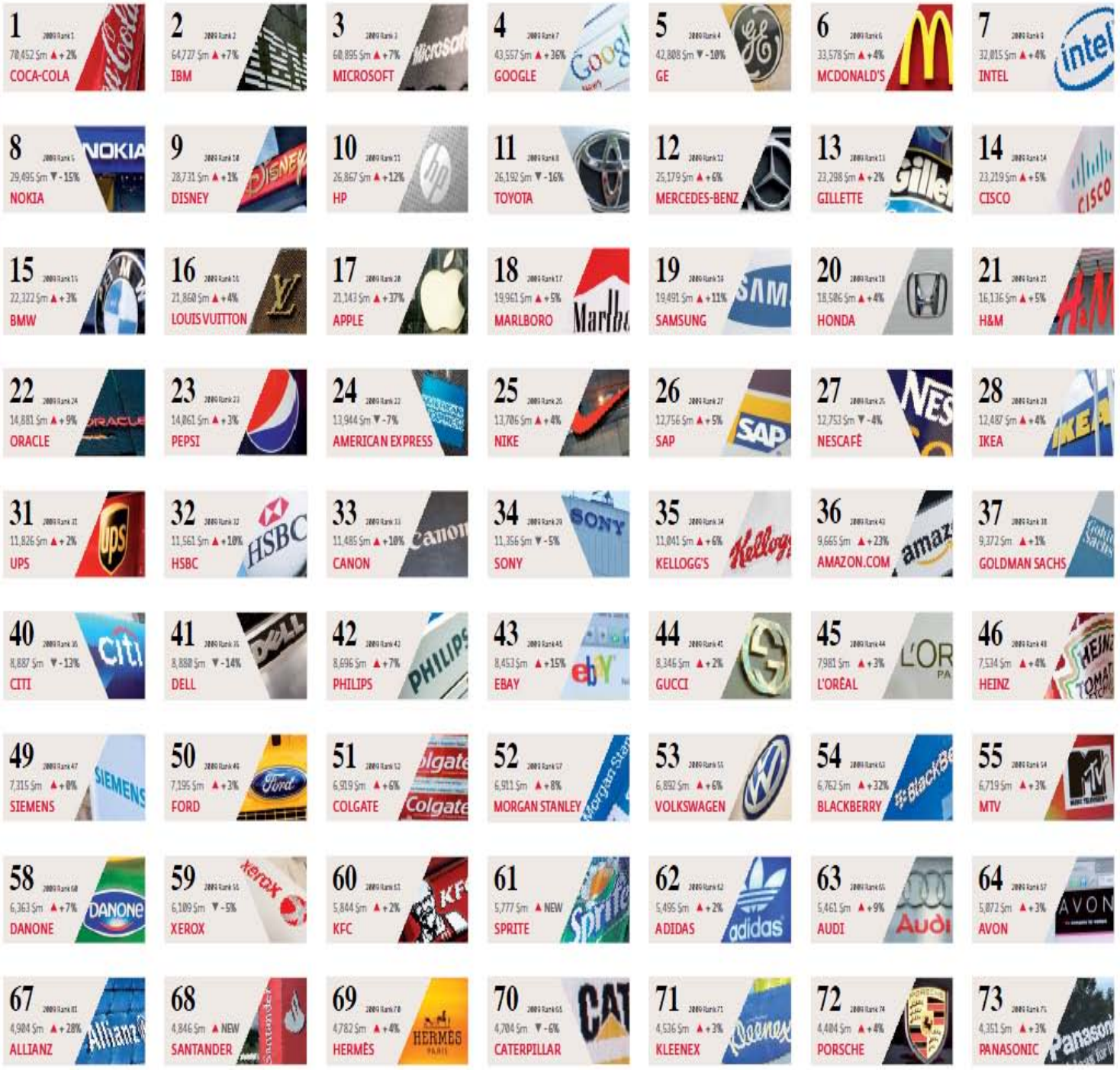
DE	39940591		38	Deutsche Telekom	1999
DE	30004649		38	ProSiebenSat. 1	2000
DE	30022635		32	Erdinger Weißbräu	2003

BEST GLOBAL BRANDS 2010

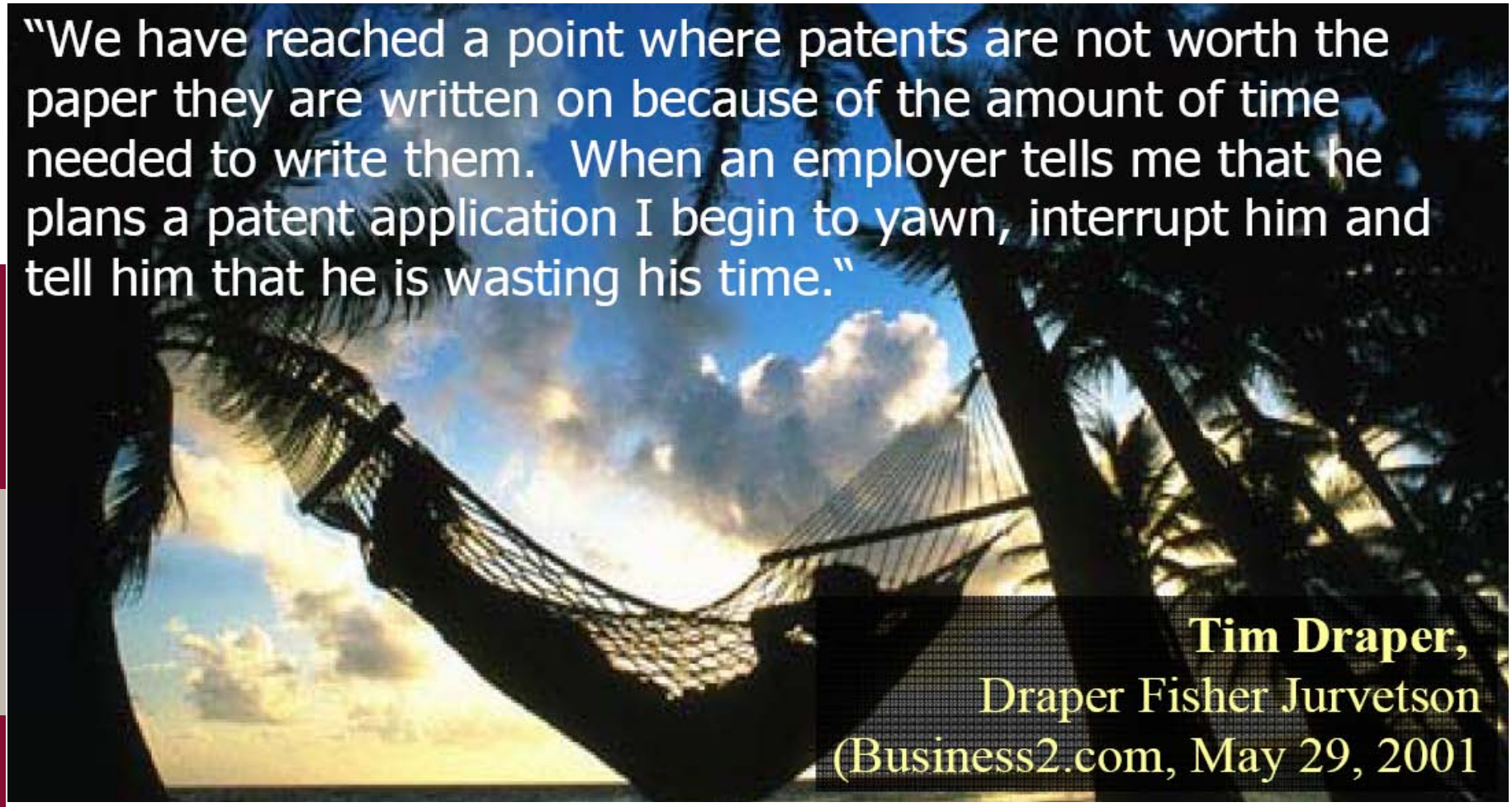
The Definitive Ranking of the World's Most Valuable Brands

Creating and managing brand value™

Interbrand



4. A Strategic View on Legal Protection Instruments



* Draper Fisher Jurvetson is a global VC firm with offices in more than 33 cities around the world and over $5.5 billion in capital commitments. DFJ has backed more than 300 companies across many sectors including Hotmail (acquired by MSFT), Baidu (BIDU), Skype (acquired by EBAY), United Online (UNTD), Overture (acquired by YAHOO) etc.

Source: Fabry (2006)

4. A Strategic View on Legal Protection Instruments

Excerpt from Audi's A6 Campaign:

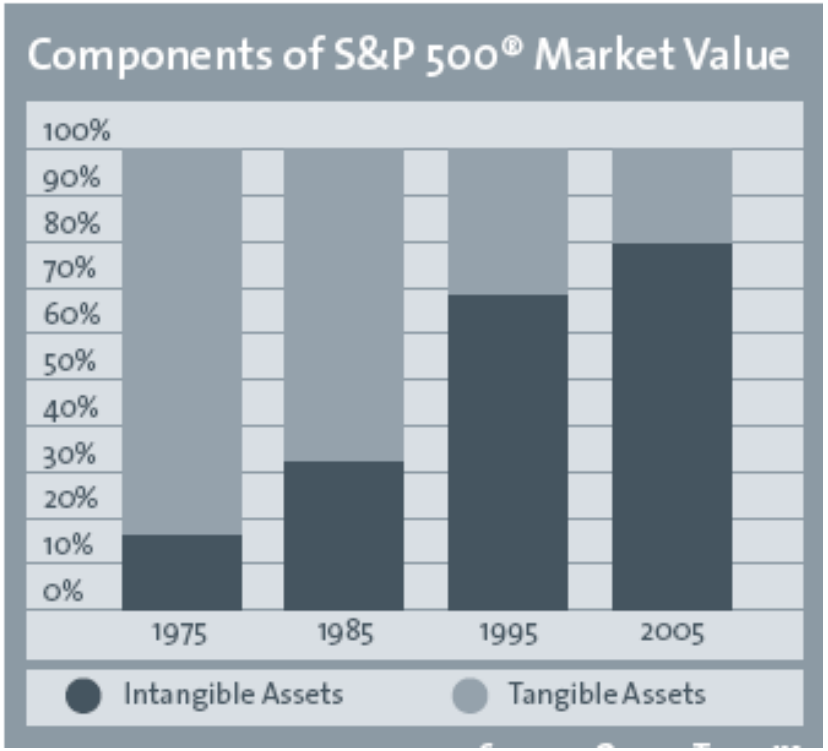
"To date, NASA has filed 6,509 patents. In developing the A6, Audi filed 9,621."

Source: EPO (2007)

4. A Strategic View on Legal Protection Instruments

Strategic Challenges for Firms and the IPR System

- The role of IPRs and Patents has changed since the last decades of the 20th century
- Once, the value of a firm laid in physical assets – land, plants and raw materials.
- Today, intangible assets – often protected by IPRs – make up an increasingly large percentage of the value of publicly traded companies (see the subsequent slides).
- Moreover, unlike physical assets, they are usually highly scalable – they can be reproduced or exploited at little or no cost to the owner.



Which factors have detemined and catalyzed this change ?

4. A Strategic View on Legal Protection Instruments

The growing interest in IPRs/patents has been fuelled by a number of factors

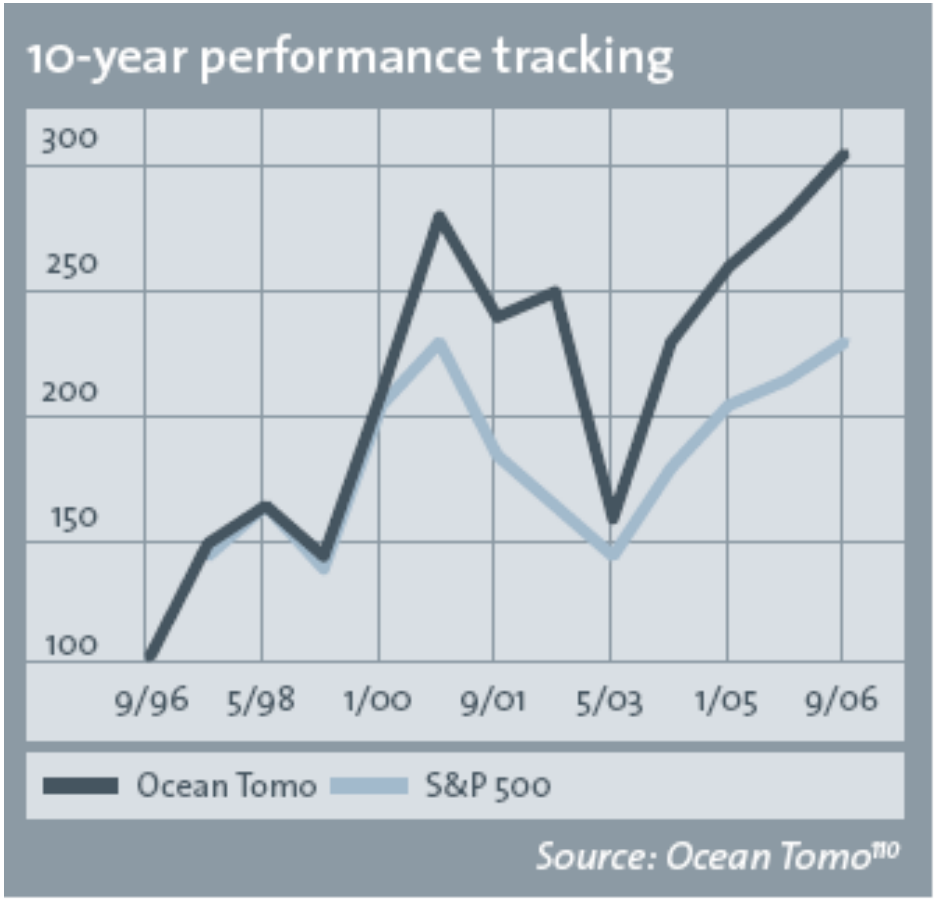
- Globalization that brought many more players into the system (India, China etc.);
- Increased ability to enforce IPR and win big damages in key jurisdictions like US;
- New technologies that have wider uses than traditional industrial applications;
- Rising prominence of business models that utilize non-core IPRs as a source of revenue (e.g., technology licensing generated an estimated volume of U.S. $100 billion).
- As the quantity of patents has increased, phenomena like patent thickets have emerged, that are expensive to negotiate and may block firms.

Patents and IPRs have evolved to Strategic Weapons

- For many firms, a patent registration is now no longer an expensive way to placate engineers – it is a primary means to generate value.
- What was once the preserve of a small legal and technical department now often forms an integral part of the boardroom strategy.
- Patents and other IPRs are no longer simply a defensive shield, but a key weapon of corporate strategy.
- The constant threat of potential litigation by patent holders puts pressure on others to enter into patenting – described by some as an ‘arms race’.

Source: EPO (2007)

4. A Strategic View on Legal Protection Instruments

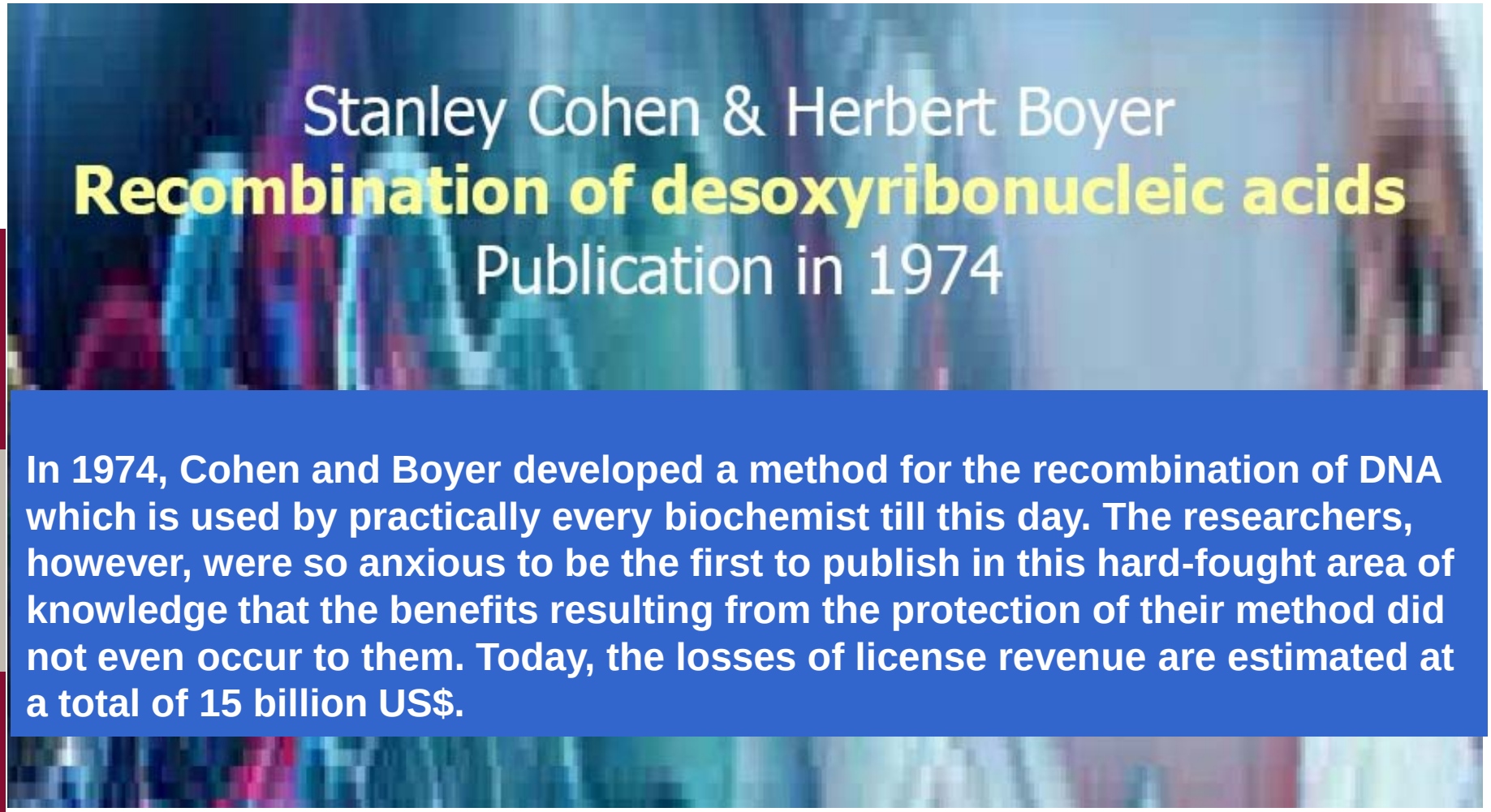


Ocean Tomo 300-Index

- The index represents a diversified portfolio of 300 stock corporations that own valuable patents.
- The Index would have outperformed the S&P® 500 by 310 basis points annualized for the ten years ended September 2006

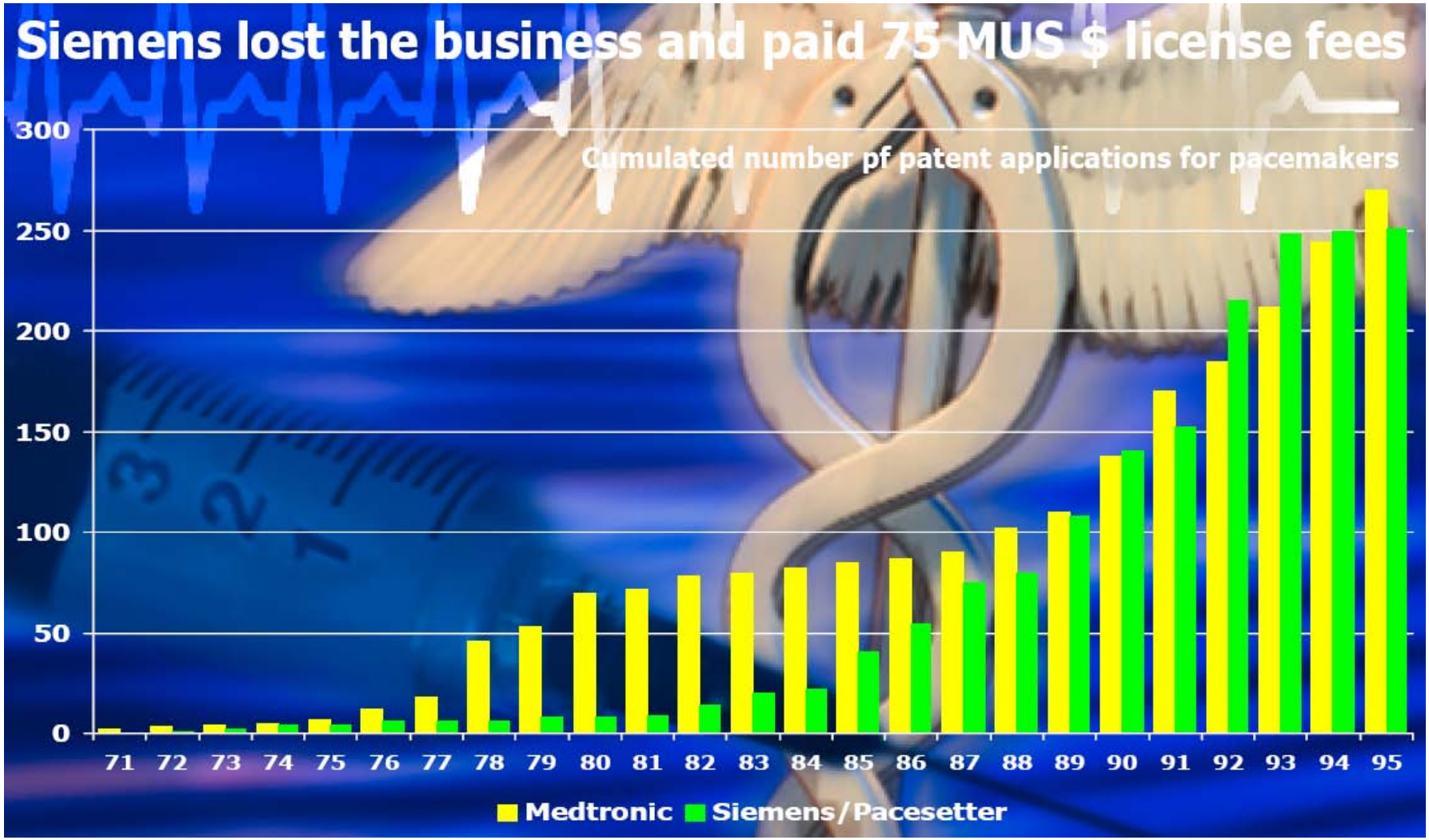
Source: EPO (2007)

4. A Strategic View on Legal Protection Instruments



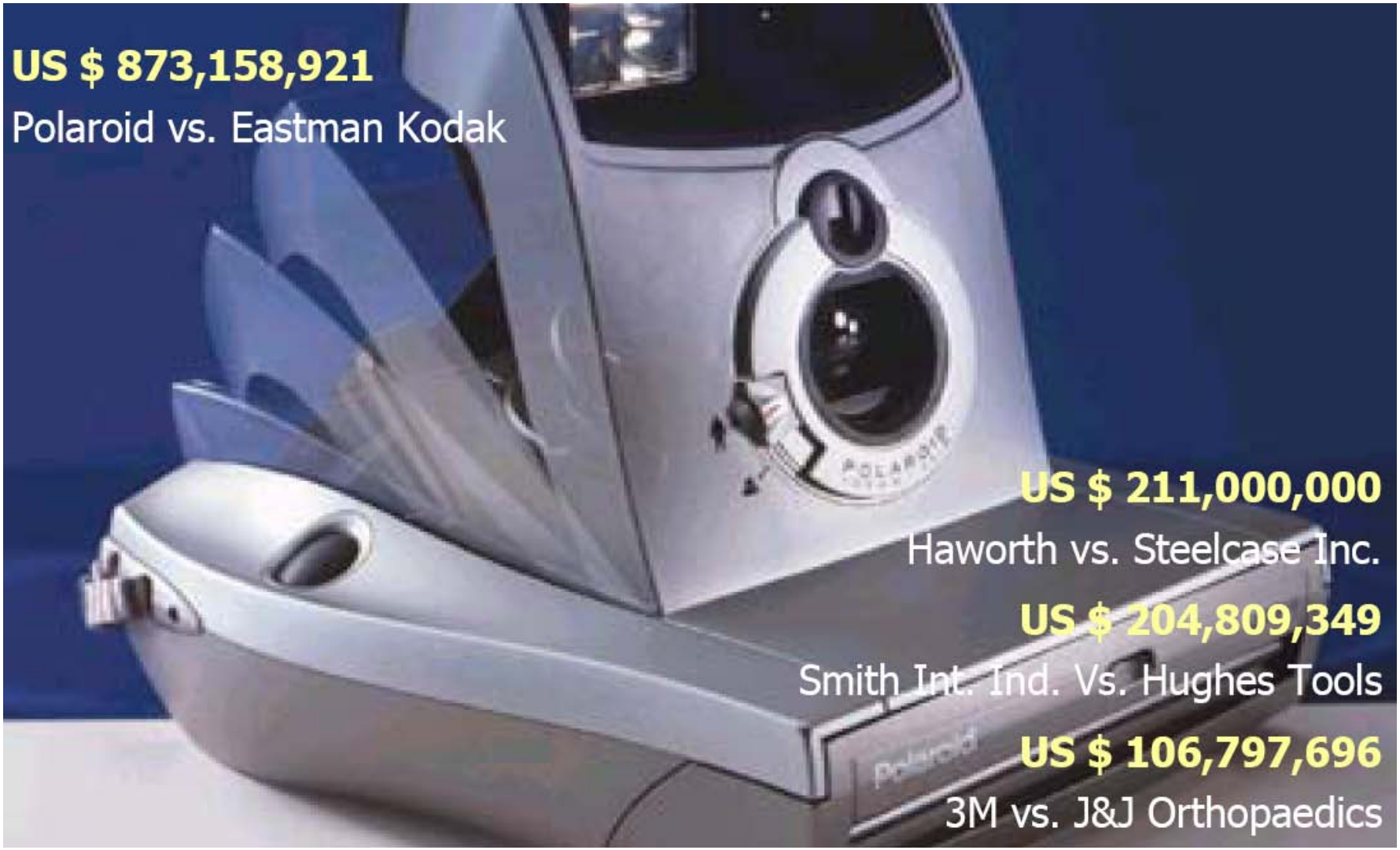
In 1974, Cohen and Boyer developed a method for the recombination of DNA which is used by practically every biochemist till this day. The researchers, however, were so anxious to be the first to publish in this hard-fought area of knowledge that the benefits resulting from the protection of their method did not even occur to them. Today, the losses of license revenue are estimated at a total of 15 billion US$.

4. A Strategic View on Legal Protection Instruments



Source: Fabry (2006)

4. A Strategic View on Legal Protection Instruments



Source: Fabry (2006)

4. A Strategic View on Legal Protection Instruments

Background: The threat of generics in the pharma industry

Number of months after expiration of patent	Number of generics in market	Market share of generics producers	Price decline (in %)
1	10	44.6	69.6
3	12	67.3	70.7
6	13	78.8	76.9
12	15	86	73.4

Source: Rehwald (2002), p. 11

4. A Strategic View on Legal Protection Instruments

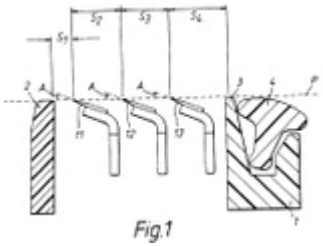


Fig.1

An example for a Patent Thicket: Gillette Sensor 3

- **An example for a patent thicket is the Sensor razor from Gillette**
- **Out of seven different versions they realized the one for which the best patent protection could be achieved.**
- **Today, 22 patents protect this product, starting with the central construction features…**
- **…via the angle of inclination of the blades….**
- **…to the packaging that is said to produce a particularly „masculine“ sound when torn open.**
- **By the way: The successor of the Sensor 3 – the Mach 3 Turbo – is protected by 35 Patents**

Thanks a lot for your attention.

Have success and fun
in creating your own start-up!