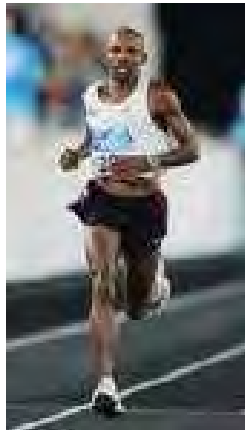


Breeding European Gazelles

The Role for Universities + Business Schools

Dr. Bert W.M.Twaalfhoven



**1st BEPART Conference
Aarhus, Denmark / November 4, 2005**



Copied to:

- The Private Equity Conference, Dublin March 9, 2005
- The European Commission: Enterprise Policy, Education and R+D
- European Deans & Directors General Insead, Fontainebleau January 21, 2005



Karen Wilson, EFER



European Foundation for Entrepreneurship Research, est. 1987

website: www.efer.nl

working with



EISB



The U.S. Russia Center for
Entrepreneurship

Agenda

Experience Bert Twaalfhoven

- § **Local → Global**
- § **Failures**
- § **Risk taking**
- § **Gazelles**
- § **Role of universities**

Bert Twaalfhoven's Entrepreneurial Experience of Failures + Successes

- **Started 54 companies in 40 years**
- **In 11 countries**
- **Focussed on 10 global niches**
- **Nationalities:**
 - 5 at board level**
 - 12 at management level**
 - 25 at operating level**
- **Works with 28 universities in 10 countries**

**Result: Lost \$55 million in start-phase
17 failures - 34 successes**

Agenda

§ Experience Bert Twaalfhoven

Local → Global

§ Failures

§ Risk taking

§ Gazelles

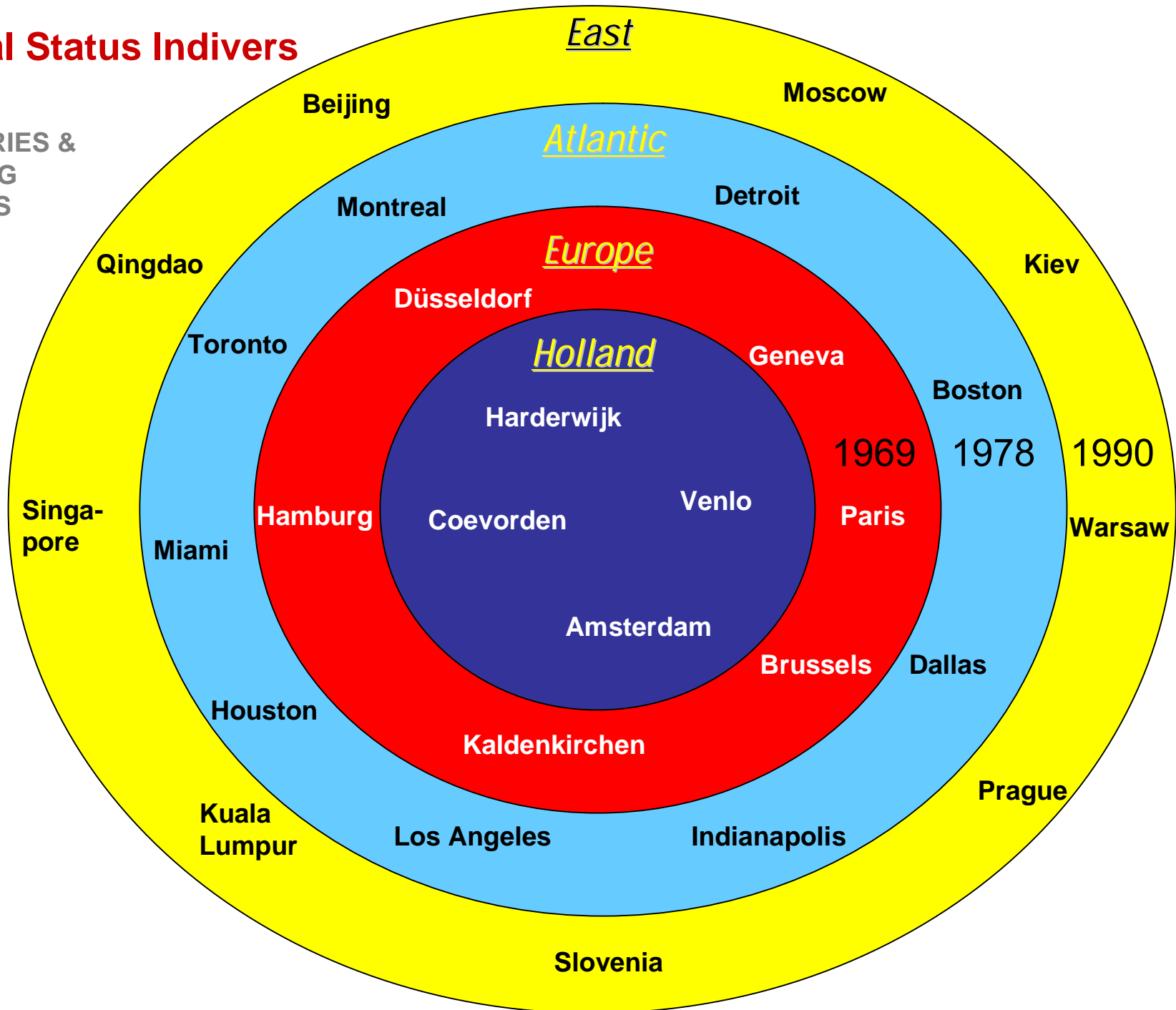
§ Role of universities

Start: Holland 1959 (Indivers)



Global Status Indivers 2002

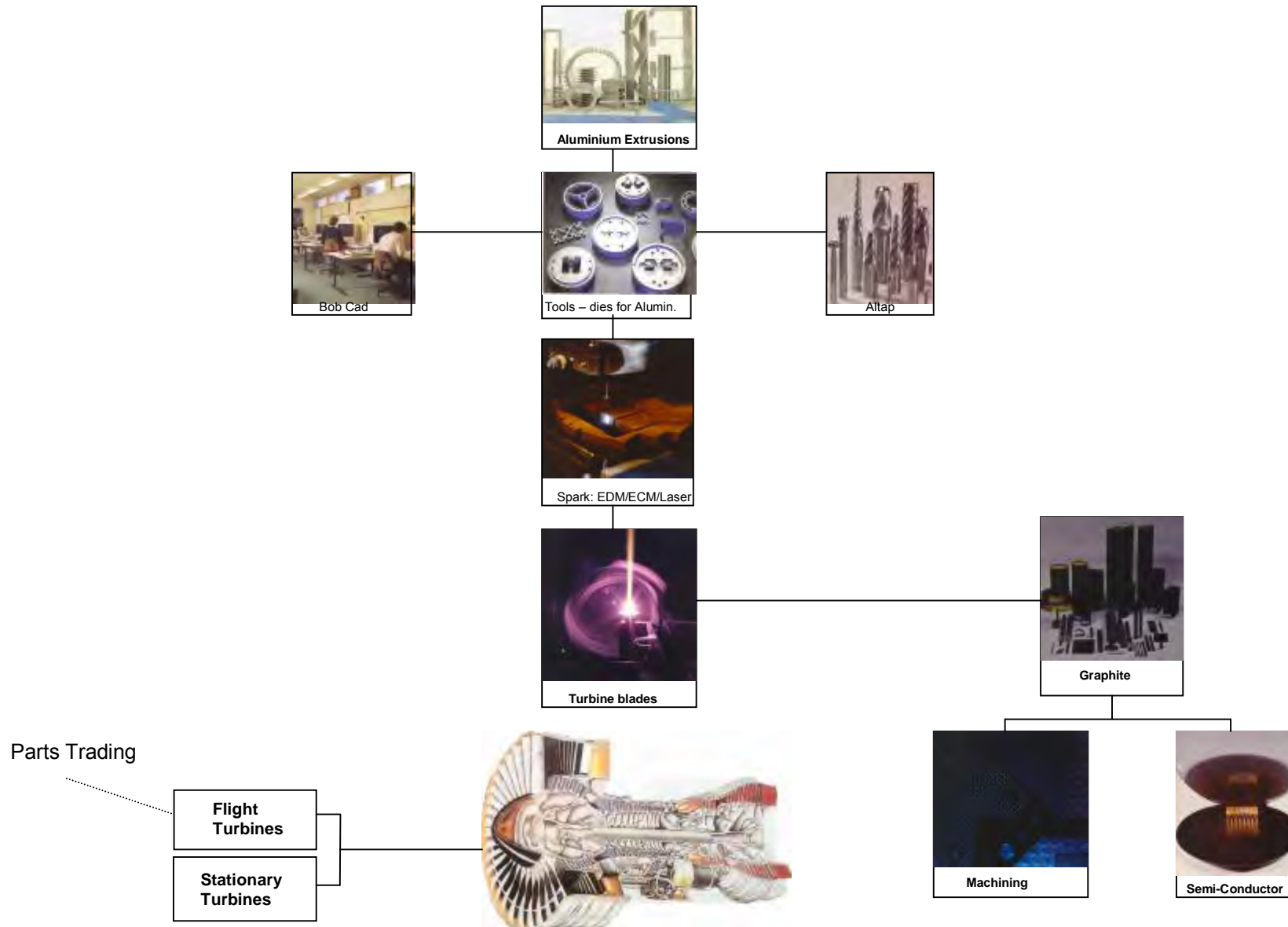
FACTORIES &
TRADING
OFFICES



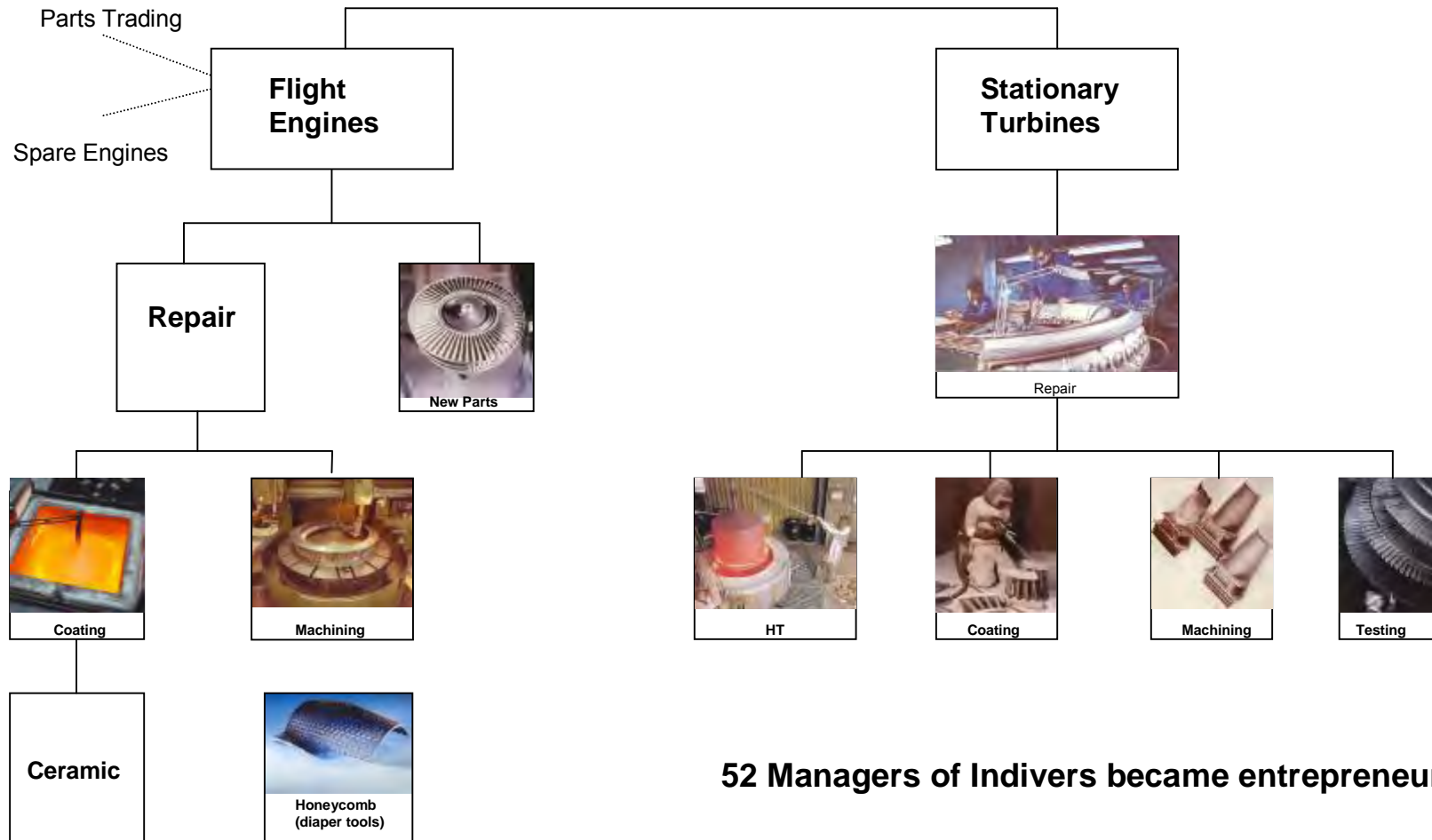
Indivers Focuses on Niches \$

	<u>Niches</u>	<u>Our Target</u>	<u>Global Market</u>
§	Coordinate measuring robots	30 million	400 million
§	IT Logistics - airlines	25 million	100 million
§	Turbine seals	50 million	400 million
§	I-beam Honeycomb - diapers	15 million	50 million
§	Chemical and laser hole drilling	30 million	100 million
§	Dayton cleaning process	4 million	10 million
§	Epolair	3 million	10 million
§	Turbine refurbishment - engines	200 million	2 billion
§	Ceramic coating - engines	50 million	350 million

Technology Spin-Offs -> New Opportunities



Technology Spin-Offs -> New Opportunities



52 Managers of Indivers became entrepreneur

Agenda

§ Experience Bert Twaalfhoven

§ Local → Gobal

Failures

§ Risk taking

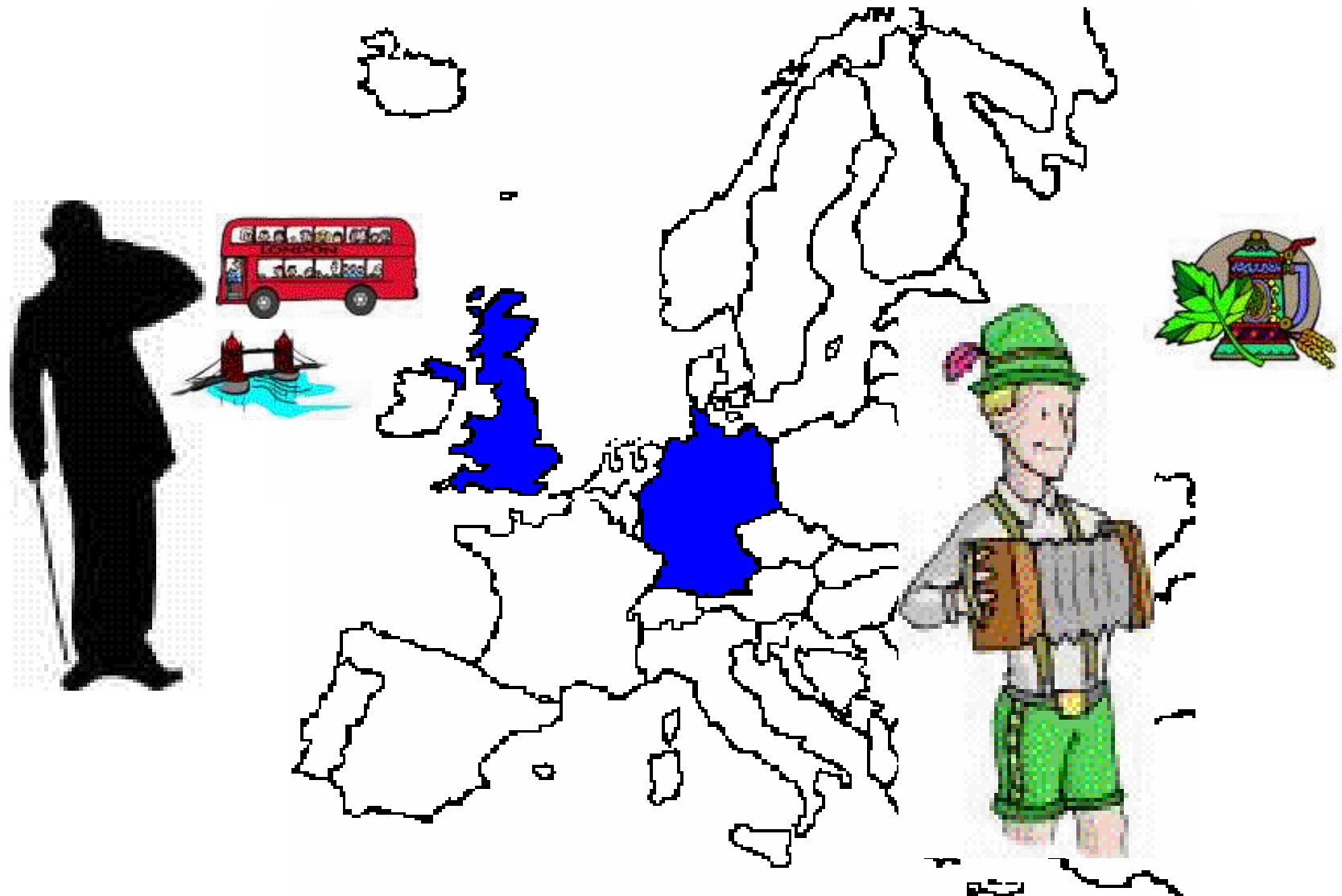
§ Gazelles

§ Role of universities

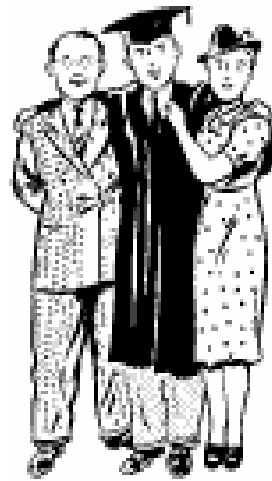
17 Failures - \$55 million loss

<u>Critical Year</u>	<u>Initiative</u>	<u>Cause of Crises</u>	<u>Today</u>
'59	Wasserettes - NL	Culture	Sold
'60	Aluminium Extruders - NL	Finance & Technology	Sold
'66	Almax - Italy	Culture & Management	Sold
'69	Almax - France	Culture	Closed
'79	Troika - Germany	Culture & Market	Closed
'81	NAA - NL / U.S.A.	Management	Closed
'82	Elbar - Singapore	Management	Closed
'85	Elbar - U.S.A.	Culture & Management	Closed
'86	PW 4000 - NL	Market & Finance	Renegotiated
'86	Danvers Seals - U.S.A.	Market & Finance	Closed
'88	Elbar Turbo - NL	Technology	Closed
'88	Fanamation - U.S.A.	Market	Relocated & JV, China
'90	Waterwall project	Pilot vs. FullScale	Closed
'92	Kemco - UK	Market	Closed
'92	Spartec - UK	Technology	Closed
'94	IT Airfoil - U.S.A.	Quality control	Renegotiated/sold
'96	Paton - Ukraine	Technology, Culture, Mgmt	Closed
'01	Amescor – Semiconductors	Market collapse	Open issue

Examples of Failures: Troika GmbH 1979



Examples of Failure: North Atlantic Associates 1981 MBA Students



Examples of Failures: Robots 1988 - 1994

U.S.A.----> China



United States of America



People's Republic of China

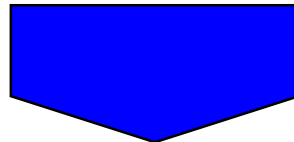
Example of Failures: Inspection Robot QI-Tech, China 1994



Product cost: \$ 150,000
Investments : \$ 3 million

Significant Problems

- § Chinese language and culture
- § Excess Staff (130 to do the work of 60) created resistance to change
- § Currency Devaluation of 30%
- § Unnecessarily costly supplier contracts “inherited” from Chinese partner
- § Resistance to change:
 - . Marketing
 - . Manufacturing
 - . Technology development
- § Poor product quality (fit & finish) limited export opportunities



Losses of \$500,000

- § Sold in 1998 when revenues were 4 million (2005: 50 million)

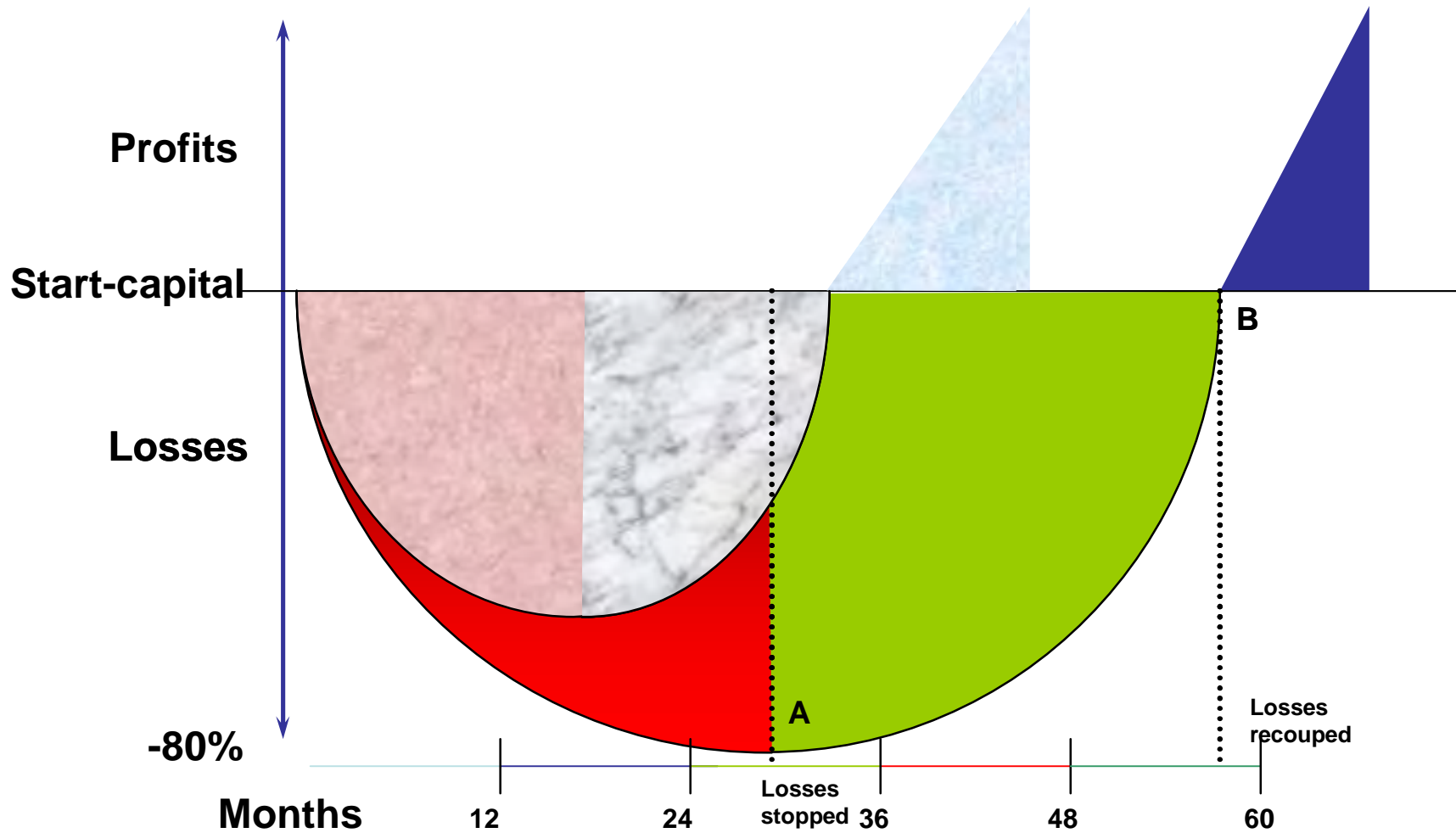
Example of Failures: MIG, Russian Fighter Jet – Ceramic Coating 1996



Betting On The Future: Interturbine Paton J.V. - Ceramic Coatings

<u>Milestones</u>	<u>Costs</u>	
1990	Technology identified in Moscow on “MIG” aircraft	\$ 0.100
Dec. 1993	Signing co-operation agreement with Ukraine	
June 1994	Research equipment transferred to Holland	\$ 1M
	Research teams established in Kiev & Holland	\$ 1M / annum
1995	Serious technical problems with Soviet equipment	
1997	Develop and buy East German equipment	\$ 20M
1999	Operational	\$ 5M
2000	Cumulative losses	\$ 12M
2001	But major order from G.E.	
 Oct. 2000	 Bid accepted from Sulzer, Switzerland for coating company and 2 others	

Average Experience 200 Start-Ups - including 54 of Bert Twaalfhoven



Successes and Failures of Bert Twaalfhoven's Businesses depending on proximity to cluster – 7 examples

Successes partly due to proximity to cluster

Company	Location/Industry	Cluster
Almax	Italy/ Tools	Presence of tool companies in Brescia, Bergamo, Milan
Interturbine	Singapore/ Aerospace	Focus of government of Singapore on aerospace
Interturbine Logistics	Hamburg/Logistics	Proximity of Airbus, Lufthansa repair, Airport
IT Air Foil	Dallas/ Turbine Parts	Proximity of American Airlines, General Dynamics (F16 Manufacturer)

Failures partly due to missing proximity to cluster

Company	Location/Industry	Missing Cluster
Troika	Germany/ Software	Not near software concentration; difficulties with technology adjustment
Elbar Turbo	Holland/ Power Stations	Missing technology close to location; should have been in Munich/Turin/Scotland
Waterwall	Holland/ Furnace	Missing supplier network that was present in British Midlands/Nothern Italy/Southern Germany

失败是成功之母。

Failure is the Mother of Success

Agenda

§ Experience Bert Twaalfhoven

§ Local → Global

§ Failures

Risk taking

§ Gazelles

§ Role of universities

Risks Starting a New Business

RESULTS

Depth of risks: 80% of start capital is lost

**Length of risks: 30 months of losses (A)
60 months before recovery of loss (B)**

In other words: New start-ups and new sustained growers are an issue for the next decades.

Risk Capital

Questions for European policymakers, bankers & academia:

- Who takes risks?
- Why take risk?
- Is long-term risk honored?
- What can Aunt Agatha contribute (tax incentives)?
- Is failure an asset?

Risk Capital is Provided by Family and Friends not by Banks, Venture Capitalists or Business Angels

Total annual start capital needed: 10 billion EUR
(1 million new companies x 10.000 Euro (3.000 per job))

5 sources:

1) Private Equity and Venture Capital*	2.7 billion EUR
2) IPO window : dead since 2001	0
3) Banks : only loans with interest	0
4) Business Angels : estimate is 125.000 with pool of 10 billion but only invest	1.0 billion EUR

5) Family and Friends : largest source of start capital in Europe 6.3 billion EUR

In addition, the GEM survey found that informal support for start-ups was five times that of domestic venture capital support with venture capital support declining significantly.

* Venture Capital lost in 1999 and 2000 15 billion starters capital in USA and Europe (Venture One Corp, September 2002)
Source: A.D.I. Report from EVCA June 20, 2002; The Green Paper on Entrepreneurship in Europe; Global Entrepreneurship Monitor; Dr. Bert W. M. Twaalfhoven; EFER

Agenda

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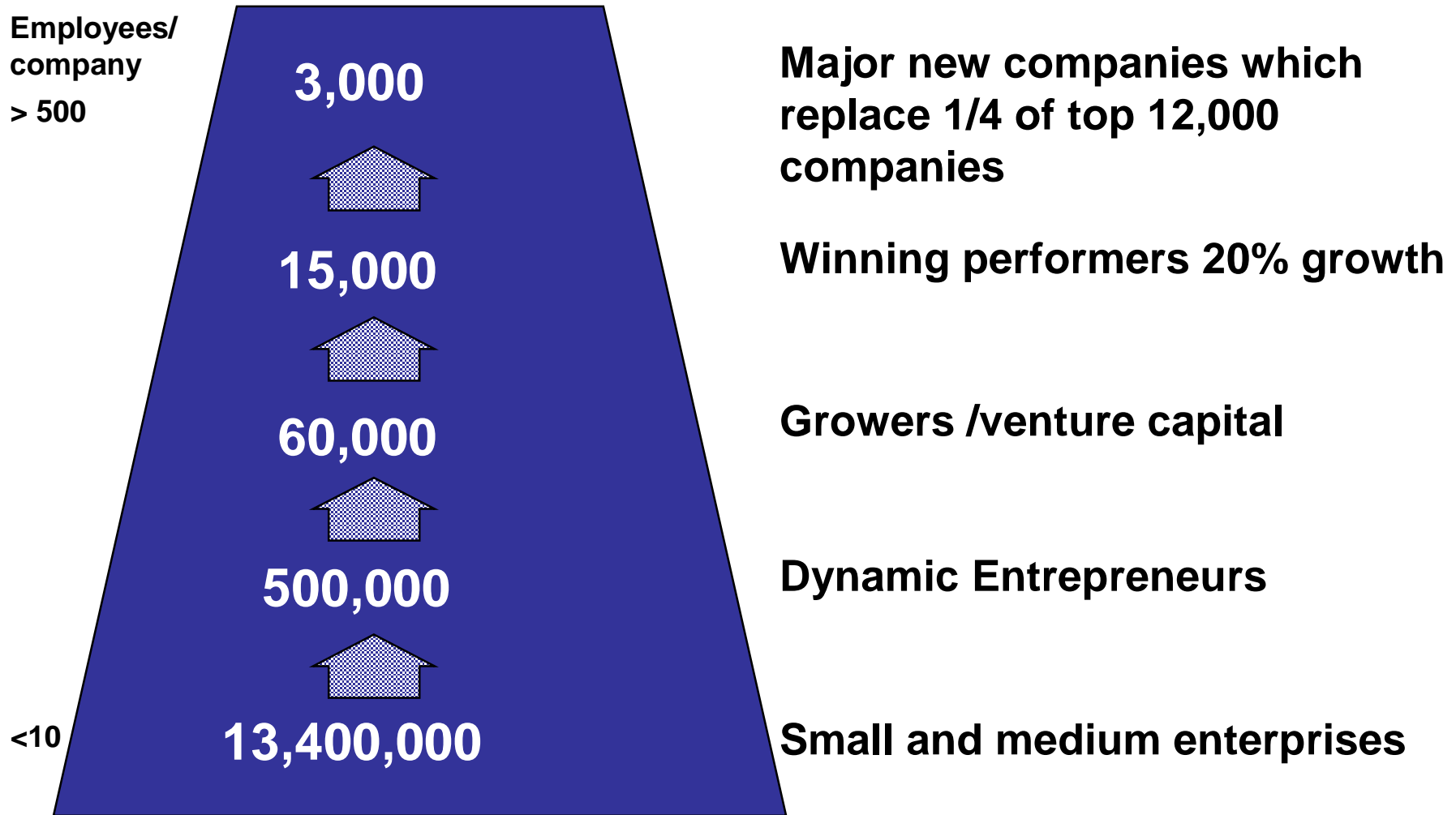
§ Risk taking

Gazelles

§ Role of universities

Gazelles, Dynamic Entrepreneurs Create 85% of All Jobs

ONLY 3% OF THE SMALL ENTERPRISES GROW

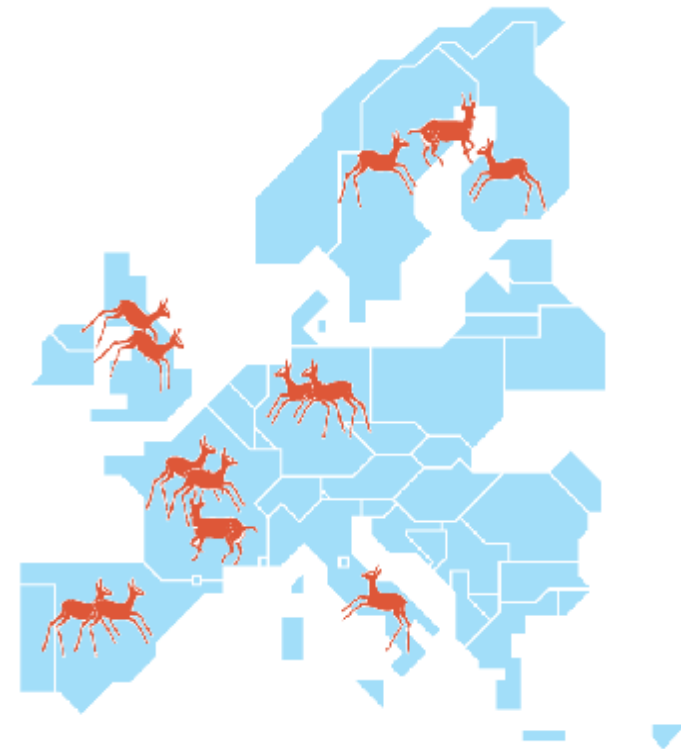


Another Problem in Europe

**American Gazelles
Jump across the U.S. and Globe**



**European Gazelles
Stay mostly Local**



Are our Universities European or National?



Mercator 1560+ Erasmus students at KU Leuven

Agenda

§ Experience Bert Twaalfhoven

§ Local → Global

§ Failures

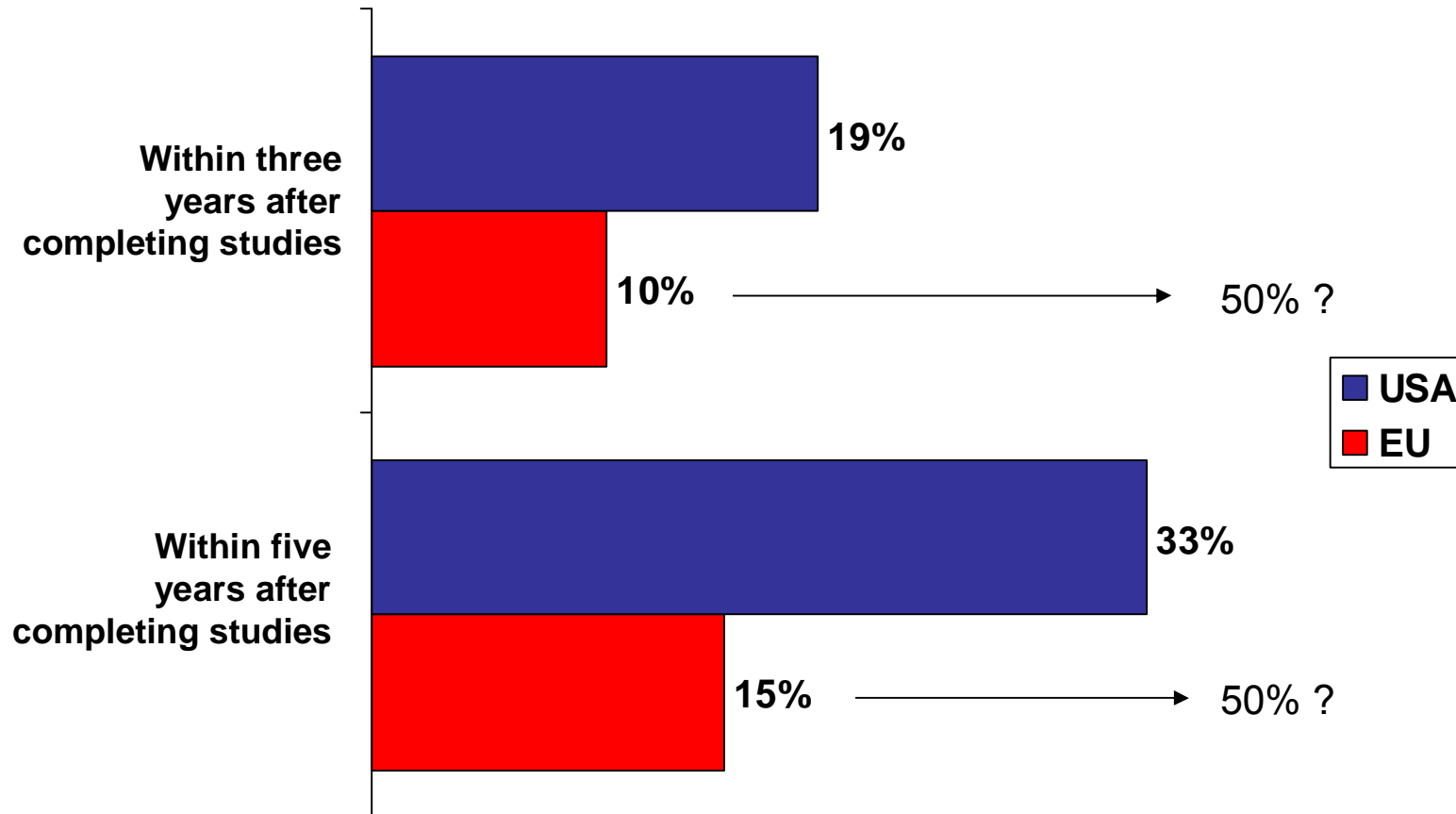
§ Risk taking

§ Gazelles

Role of universities

Entrepreneurship is not Considered a Priority for Life in Europe by Many Students

Student interest in becoming an entrepreneur



Source: Ministry of Economical Affairs/Netherlands



The Good Workplace Guide American Undergraduates' Ideal Employers

Company	2005	2004
BMW	1	2
PricewaterhouseCoopers	2	4
Ernst & Young	3	6
Boeing	4	7
Johnson & Johnson	5	17
Deloitte	6	8
Coca-Cola	7	5
Microsoft	8	1
CIA	9	14
FBI	10	138
Merrill Lynch	11	12
IBM	12	11
Apple Computer	13	41
KPMG	14	16
J.P. Morgan Chase	15	18

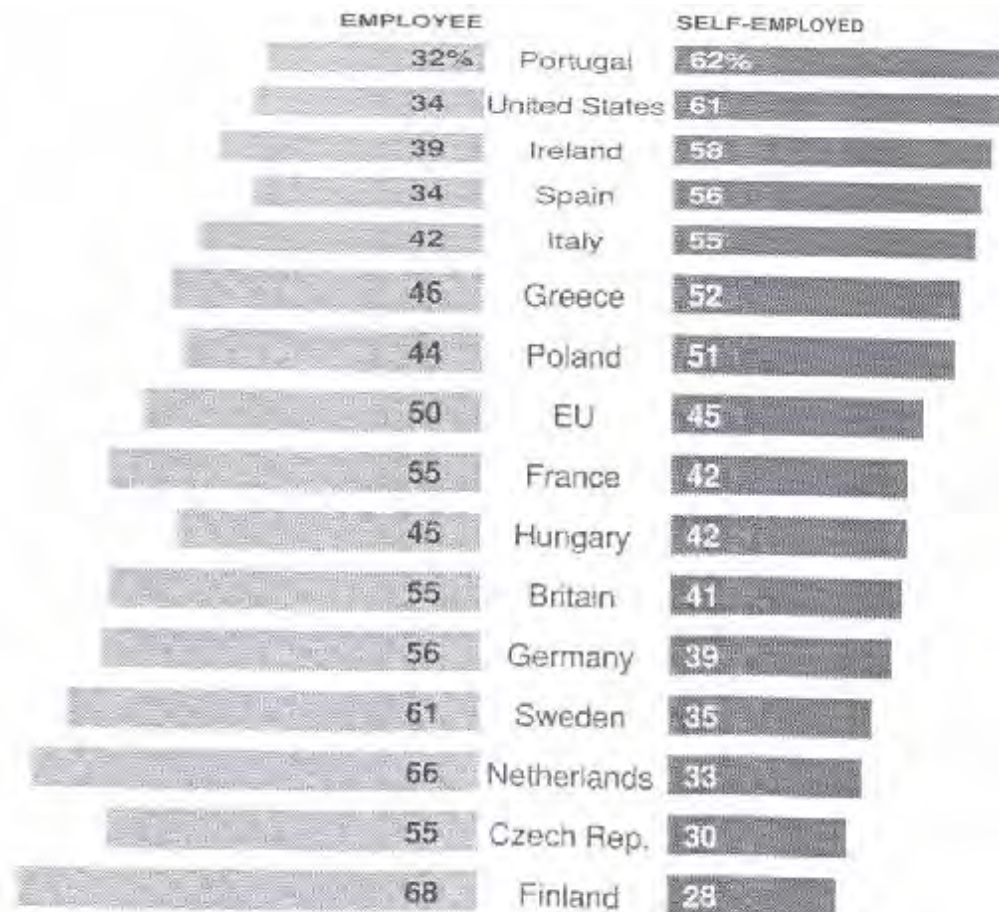
Source: Universum Communications

***The missed question:
“Do you want to be an entrepreneur?”***

Who Wants to be an Entrepreneur?

RESPONSE TO A 2004 POLL

Given a choice between different kinds of jobs, which would you prefer to be?



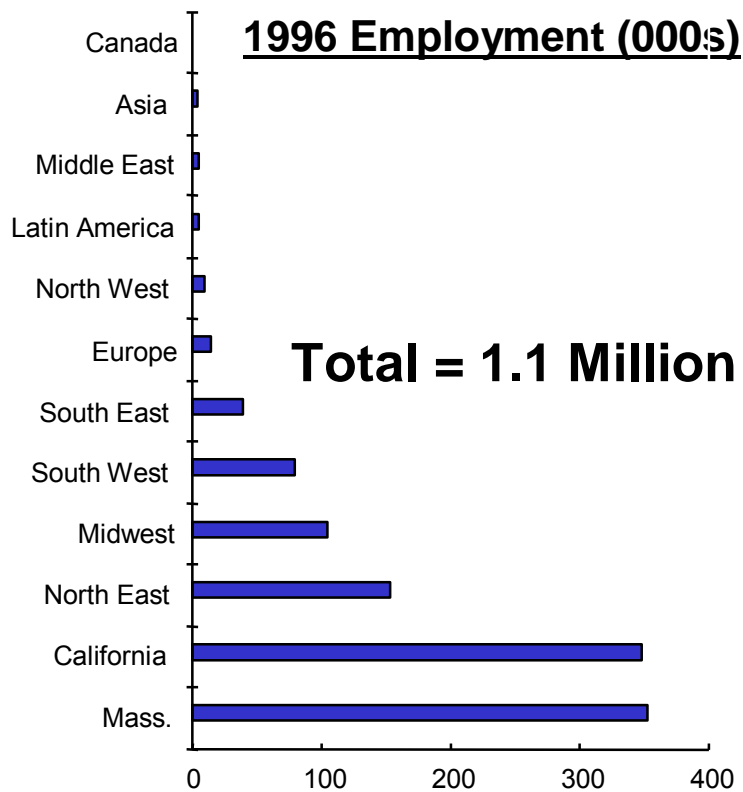
*Other responses not shown

Source: EOS Gallup Europe

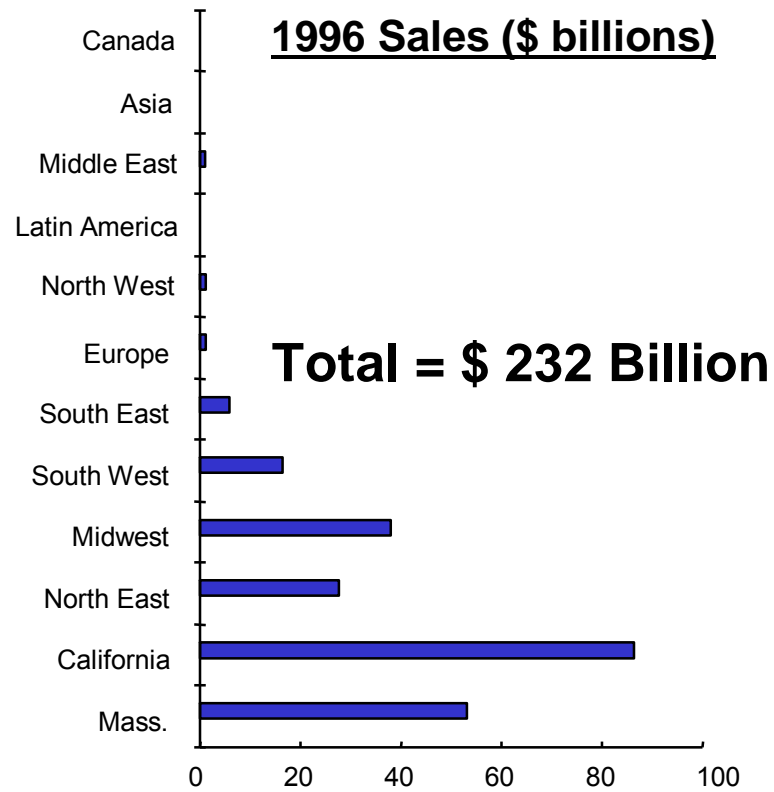
IHT

Role Technical Universities - MIT Phenomenon

4,000 ACTIVE FIRMS STARTED BY MIT GRADUATES



1997 Enrollment= 10 thousand



Average number of patents/year=100

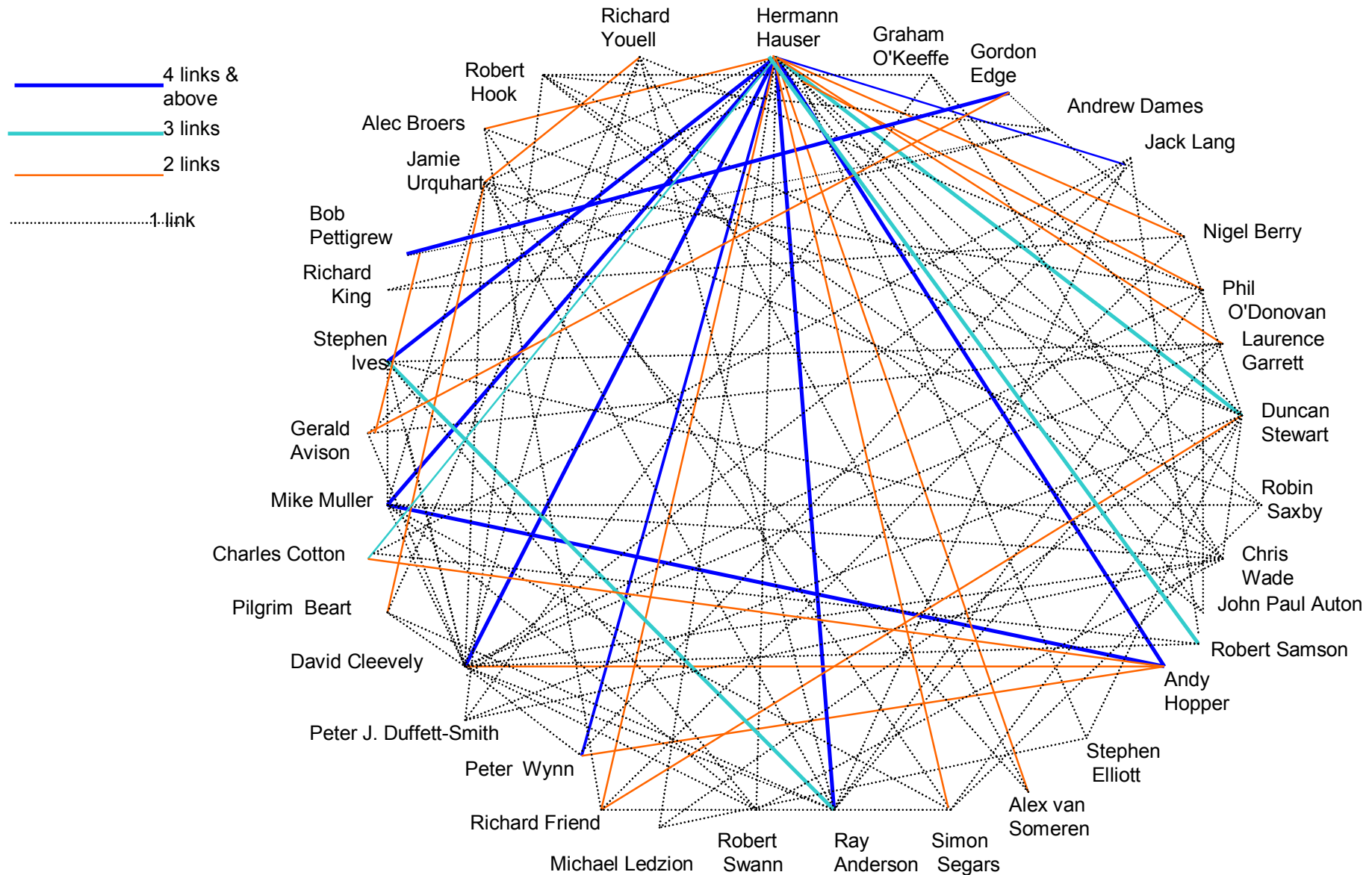


Source: Bank Boston, MIT



The Cambridge Phenomenon

The Individuals!

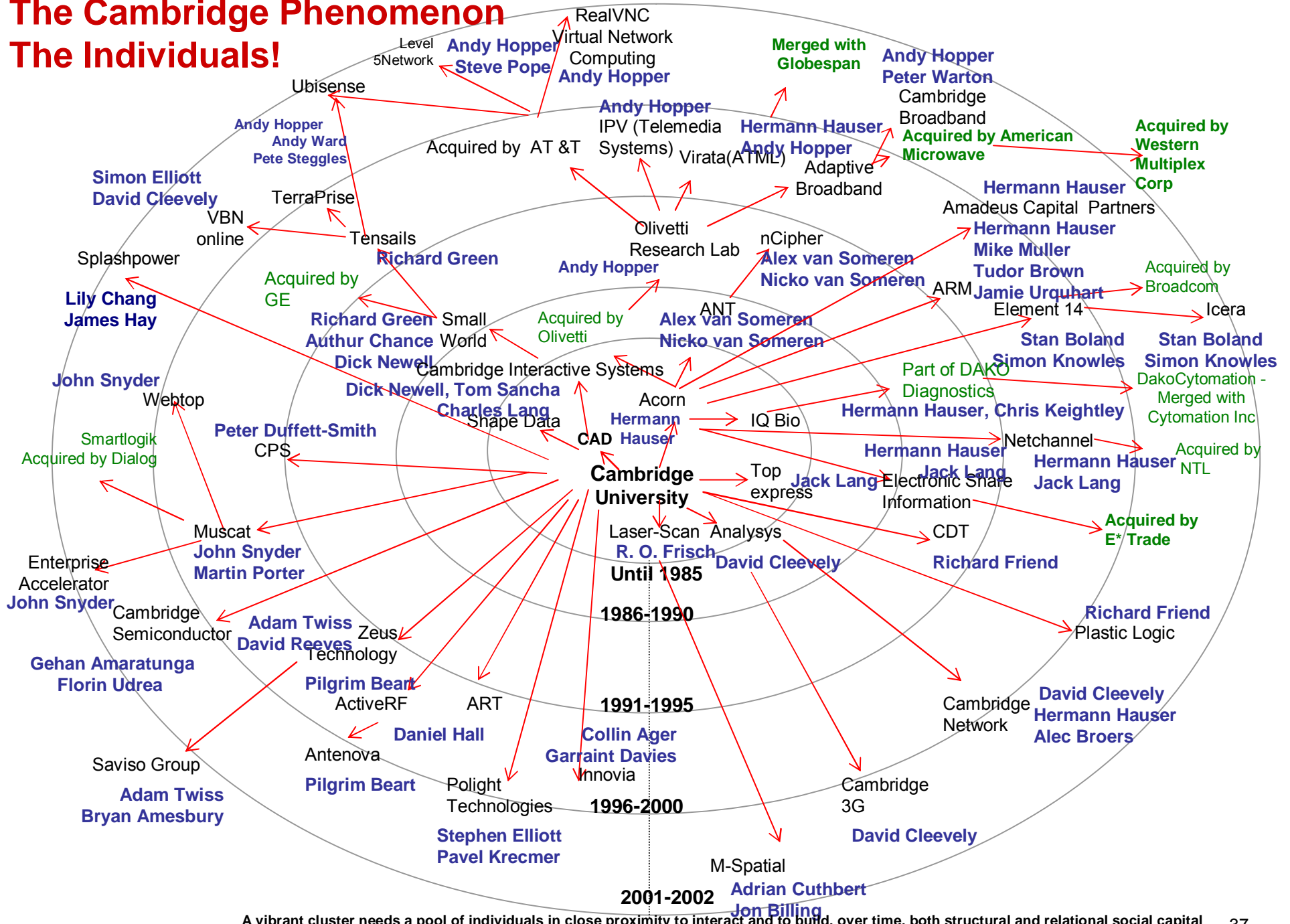


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The Cambridge Phenomenon

The Individuals!



Additional Faculties for Entrepreneurship in Central and Western Europe for 120 Institutions a Must

Country	University	# students	International students	Faculty in Innovation/E'ship	Start +Spin off Companies
USA	MIT	10.200	26%	33	5.000
	Harvard Business School	2.000	30%	31	50% of alumni own or share business
	Stanford	720	28%	24	Bus. Start 1/3 of alumni
EUROPE					
UK	Cambridge*	16.500	17%	8 +65 practitioners	1.250
France + Singap.	Insead	720	90%	14 + 2 visiting	
Greece	Universities	100.000+	?	?	?
Switzerland	ETH Zurich/ St. Gallen	13.000	30%	5	200
Finland	Helsinki University of Technology*	13.000	3%	4	300
Spain	IESE	450	75%	4 + 3 part-time	35% own their firm
Belgium	Vlerick*	3.500	5%	5	
Netherlands	Delft	13.000	8%	5	200 in 10 years
Denmark	Aarhus Business School (only in Danish)	6.500	10%	5	?

Shortage of 500 Professors in Entrepreneurship in Central and Western Europe!!



Source:EFER; Universities mentioned above; Dr. Bert W. M. Twaalfhoven



Do European Universities breed European Gazelles?

- European universities must play a role in promoting entrepreneurship and helping students learn how to start and grow enterprises
- **A survey in the summer of 2004*** of faculty teaching entrepreneurship showed that entrepreneurship education has grown significantly in the past five years and strong growth is expected in the next five. However, more needs to be done, particularly in 4 areas:
 - Curriculum
 - Entrepreneurship courses should be offered as a **requirement** and should be integrated into the curriculum of other courses, particularly at technical and scientific universities.
 - Courses should focus on all of the entrepreneurial growth phases, not just the start-up phase.
 - European schools need better links with business and entrepreneurs.
 - Training the teachers
 - Europe needs more faculty dedicated to entrepreneurship; shortage estimated at 500.
 - In the U.S., there are **four** times as many chairs/professorships as in Europe.
 - Training programs and workshops for professors are needed in areas such as case method teaching and action-oriented innovative approaches.
 - Spin-outs from technical universities
 - Given the excellence of technical and scientific training in Europe, there needs to be more focus on technology transfer and the commercialization of innovative technologies.
 - Cross-border faculty collaboration & research
 - There needs to be more faculty collaboration, faculty exchange and research across borders – sharing of best practices
 - Only **10%** of the entrepreneurship faculty at their schools are from outside of the country.
 - Less than **20%** of entrepreneurship faculty spend time teaching outside of the country.

* European Entrepreneurship Education survey conducted by EFER and efmd, 2004



Recommendations

- § **Entrepreneurship: Choice in Life**
- § **Entrepreneurship required course at technical universities and business schools**
- § **Tax incentives for long term risk taking**
- § **Entrepreneurs in class**
- § **Class to entrepreneurs**
- § **A European dimension**
- § **Learn from other initiatives**

European Foundation for Entrepreneurship Research

Mission

- § Encourage the development of research and teaching materials (case study) in Europe
- § Conduct teach-the-teacher programs to train entrepreneurship faculty
- § Facilitate the sharing of good practice and networks between faculty across Europe
- § Encourage communication between academics teaching entrepreneurship and the “real world” (entrepreneurs, companies)

Bert Twaalfhoven

- BS Fordham University New York
- MBA Harvard Business School 1954
- Global Entrepreneur: * started 51 companies in 11 countries over 40 years
* hired 650 students – 24 nationalities from 28 schools, of which ±200 MBA’s—for projects, competitive analysis
- 8 children of which 5 MBA’s (IESE, IMD, Harvard, Stanford, Tucson)

Karen Wilson

- BS Carnegie Mellon University
- MBA Harvard Business School
- Works on projects with EFER, IFC, EVCA and others addressing the broader entrepreneurial environment, specifically in the areas of education and policy and prioritizing the Baltics
- Previously worked in the venture capital industry as well as served as the Executive Director of the HBS Global Initiative and Director and Associate Member of the Managing Board at the World Economic Forum



Successful Entrepreneurs: Learn à Earn + Return



EFER website:
www.efer.nl

EFER studied 200 start-ups US + Europe, including Bert's 54 Start-ups

- A. How many months' losses? **30 months**
- B. How many months start to recover losses? **60 months**
- C. What percentage of start capital is lost before becomes profitable? **80%**

