

International experience of spin-off created by universities

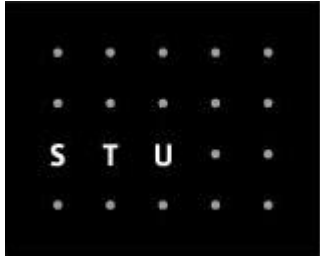


EVROPSKÁ UNIE
EVROPSKÝ FOND PRO REGIONÁLNÍ ROZVOJ
INVESTICE DO VAŠÍ BUDOUCNOSTI



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Zlín, 16 June 2014



Slovak University of Technology in Bratislava

- Founded in 1937, 17,059 students, the oldest and largest Slovak TU, 7 faculties
- STU Institute of Management
Assoc. Professor, PhD., M.B.A.
- Director of the STU Institute of Management, and
Head of Dept. of Economics and Management in Entrepreneurship
- Interests: Entrepreneurship (SMEs), Financial Management, Management Information Systems, Entrepreneurial University



International experience of spin-off companies created by universities

- 1. Introduction – entrepreneurial university**
- 2. Some research conclusions on university spinoffs**
 - Theory of spin-off process**
 - Spin-off definition issues**
 - Typology of university spin offs**
- 3. Ecosystem of Massachusetts Institute of
Technology**
- 4. Ecosystem of University of Oxford**
- 5. Ecosystem of Slovak University of Technology in
Bratislava**
- 6. Conclusions**

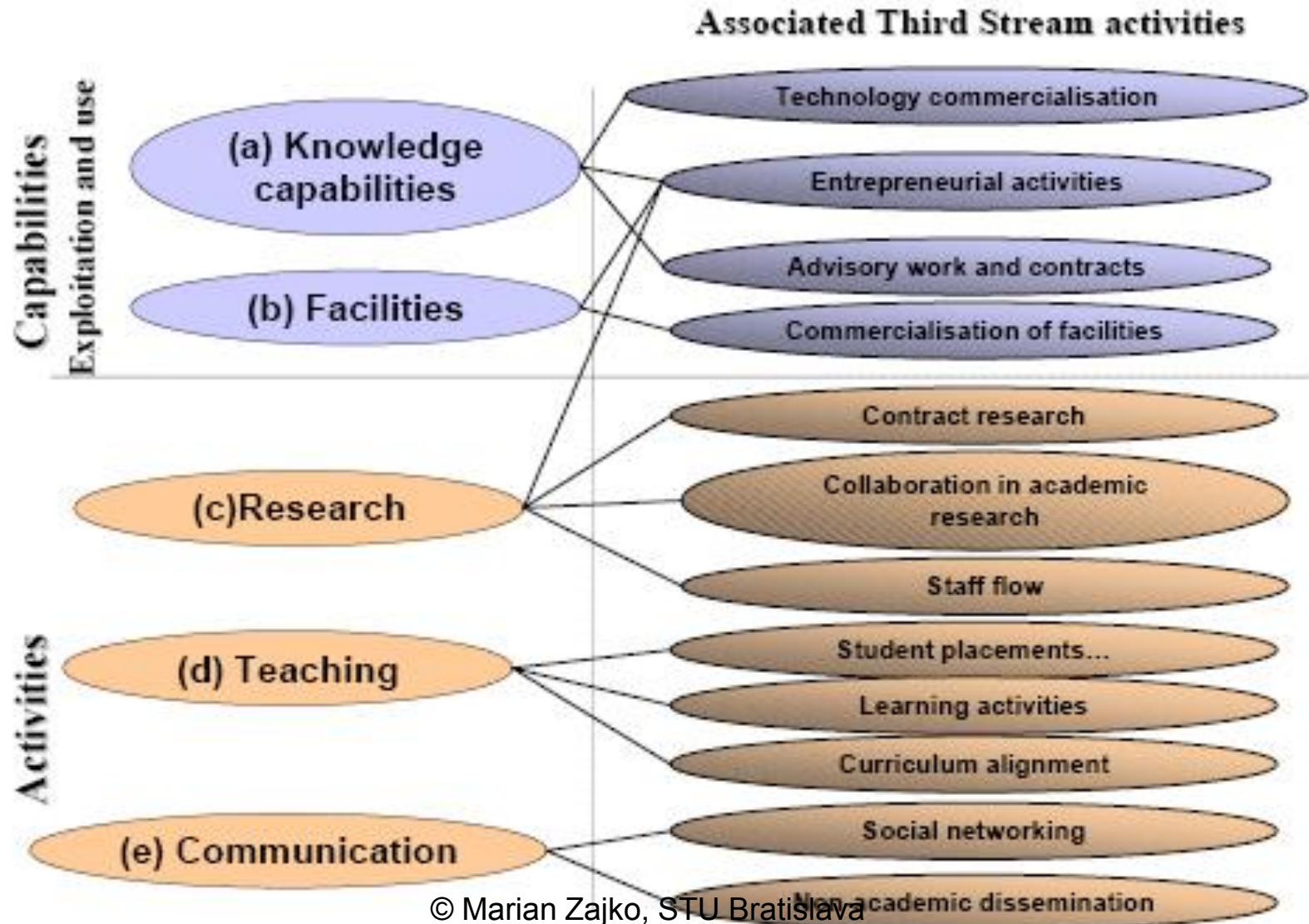
International experience of spin-off companies created by universities (1)

- Teaching and research – traditional missions of of universities
- To be broadend by the Third Mission activities:
- „ facilitate activities concerned with generation, use, application and exploitation of knowledge and other university capabilities outside academic environments“ .

(2002 Science and Technology Policy Research unit at the University of Sussex Report to the Russell Group)

Third stream - governments develop 3rd mission policies, allocate funding streams to its development

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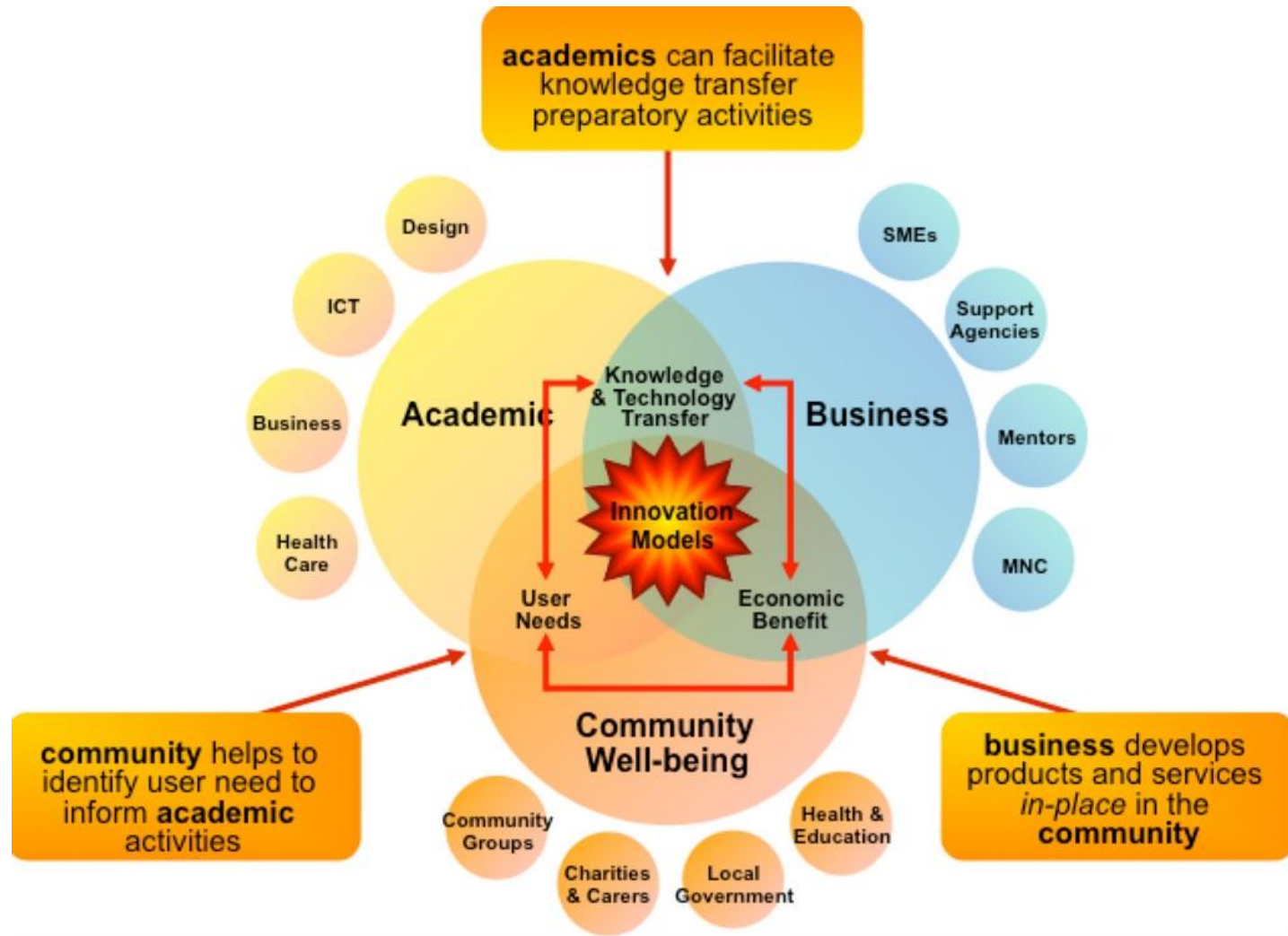
Term *entrepreneurial university*

- related to several third stream activities of a university

Reductions in system of previous central or regional public funding - high level of certainty to the current conditions

→ Open to a broad range of interpretations

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International experience of spin-off companies created by universities (1)

Entrepreneurial Universities *(A. Gibb, 2005)*

- bold in creating their own autonomy, accepting the fact that their funding by the state will be decreasing in time;
- accept the 'idea' of a university which embraces the scholarship of relevance and integration of knowledge and a sharing with, and learning from, the wider community;
- unafraid to maximise the potential for commercialisation of their ideas to create value in society and do not see this as a significant threat to academic values;
- internally organise to provide a stronger central steer to entrepreneurial endeavour while building on the natural autonomy of individual academics;
- promote the creation of incubators, technology transfer offices and patent protection arrangements, science parks not as ends in themselves but as powerful means to opening up and integrating into the university activity relationships with the relevant stakeholders in both a formal and informal institutional manner;
- encourage a wide range of interdisciplinary activity with the creation of interdisciplinary departments and R&D centres;

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The label 'Entrepreneurial University'

- frequently associated with the notion of the university as a regional innovation hub e.g.

University of Oxford,

University of Cambridge,

Massachusetts Institute of Technology

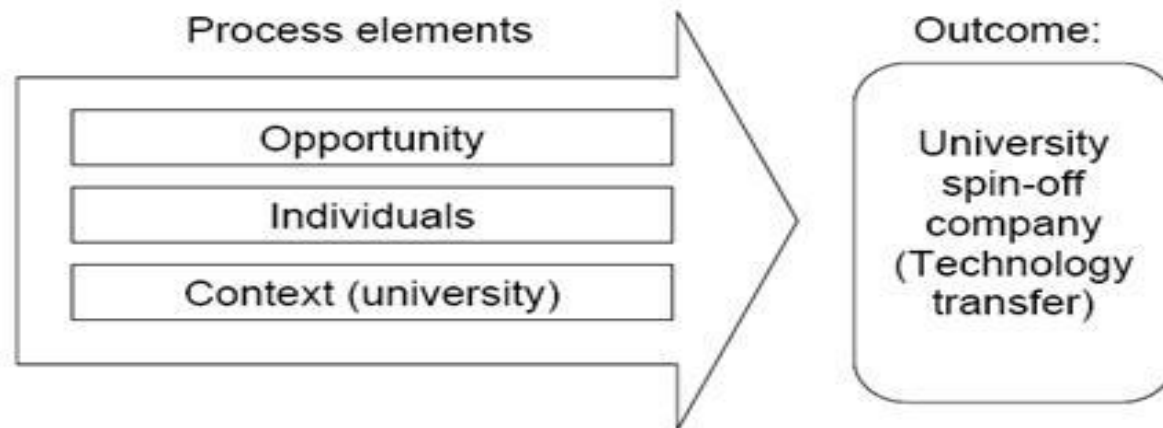
Wide acceptance:

successful innovation necessarily involves a highly interactive process of engagement between universities, industry and government.

International experience of spin-off companies created by universities (2)

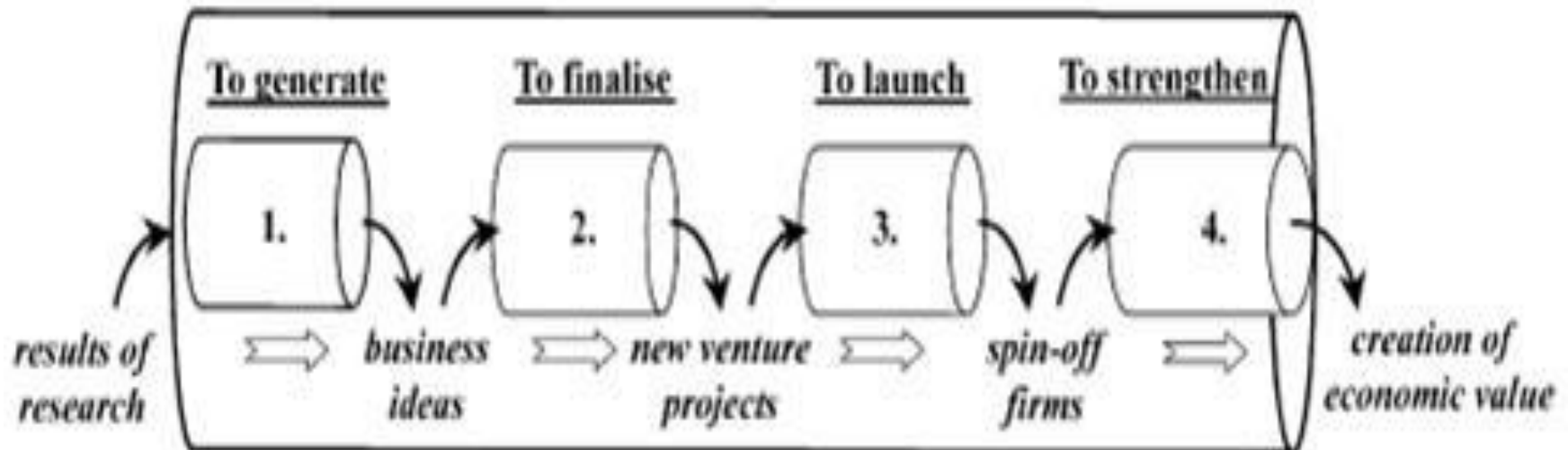
- **Theory of spin-off process**

Rasmussen (2006) – process : a research-based idea or opportunity, one person or a team of entrepreneurs, and the relevant context create the necessary properties for a new organization to emerge



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- *Ndonzuau et al (2002)* – spin-off development process in 4 stages, very similar to the 'stage-gate' process (Cooper, 1993) described for the new product introduction process

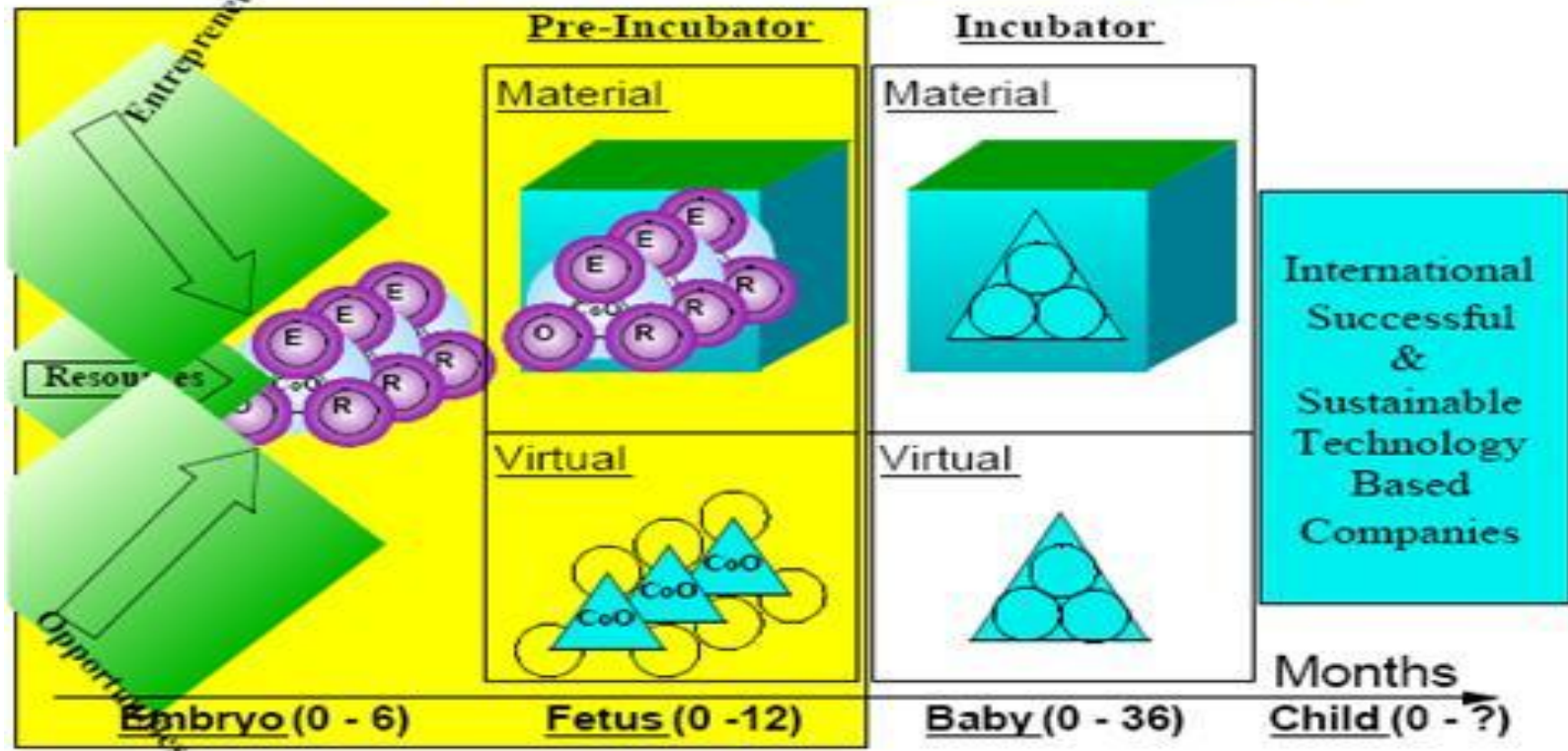


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- The programme IDEAS - Universidad Politecnica (2002) de Valencia
 - the spin-off generation process as a chaotic process driven by the interaction of three elements: **opportunity (O)**
entrepreneurs (E)
resources (R)

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Spin-off Generation Process



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Product commercialization - 4 basic stages of
"Core Entrepreneurial Action" :

- (1) **Exploring ideas** of products and services and the mechanisms and selection criteria for development
- (2) **Implementing the business concept of the idea**, i.e. the stage where a firm is created
- (3) **Finding the financial resources** to develop the business concept;
- (4) **Company operation**, consolidation and strengthening of entrepreneurial culture necessary for achieving the goals of company strategy.

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- **The Operational Environment:**

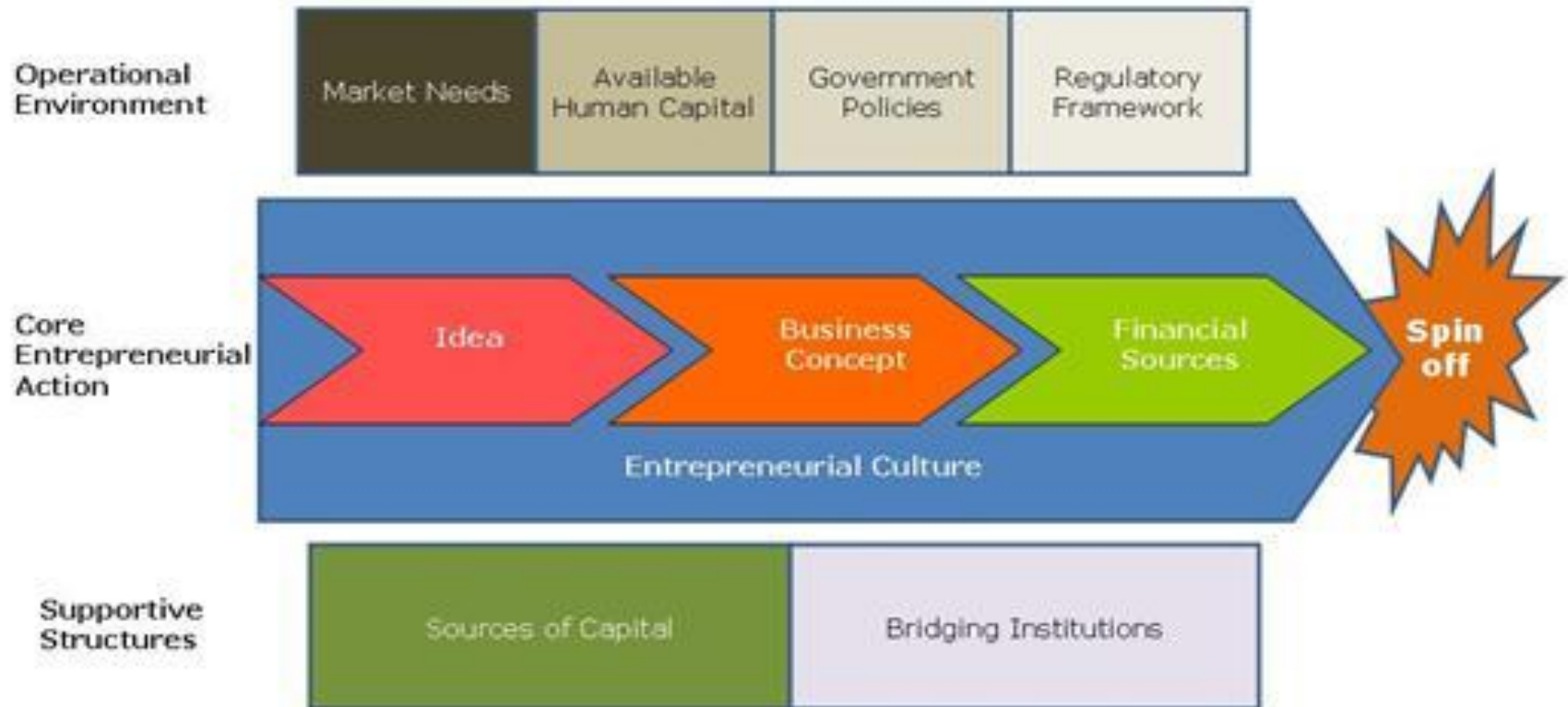
market needs, human capital, appropriate government policies and appropriate regulatory framework

- **The Supportive Structures of the early stages:**

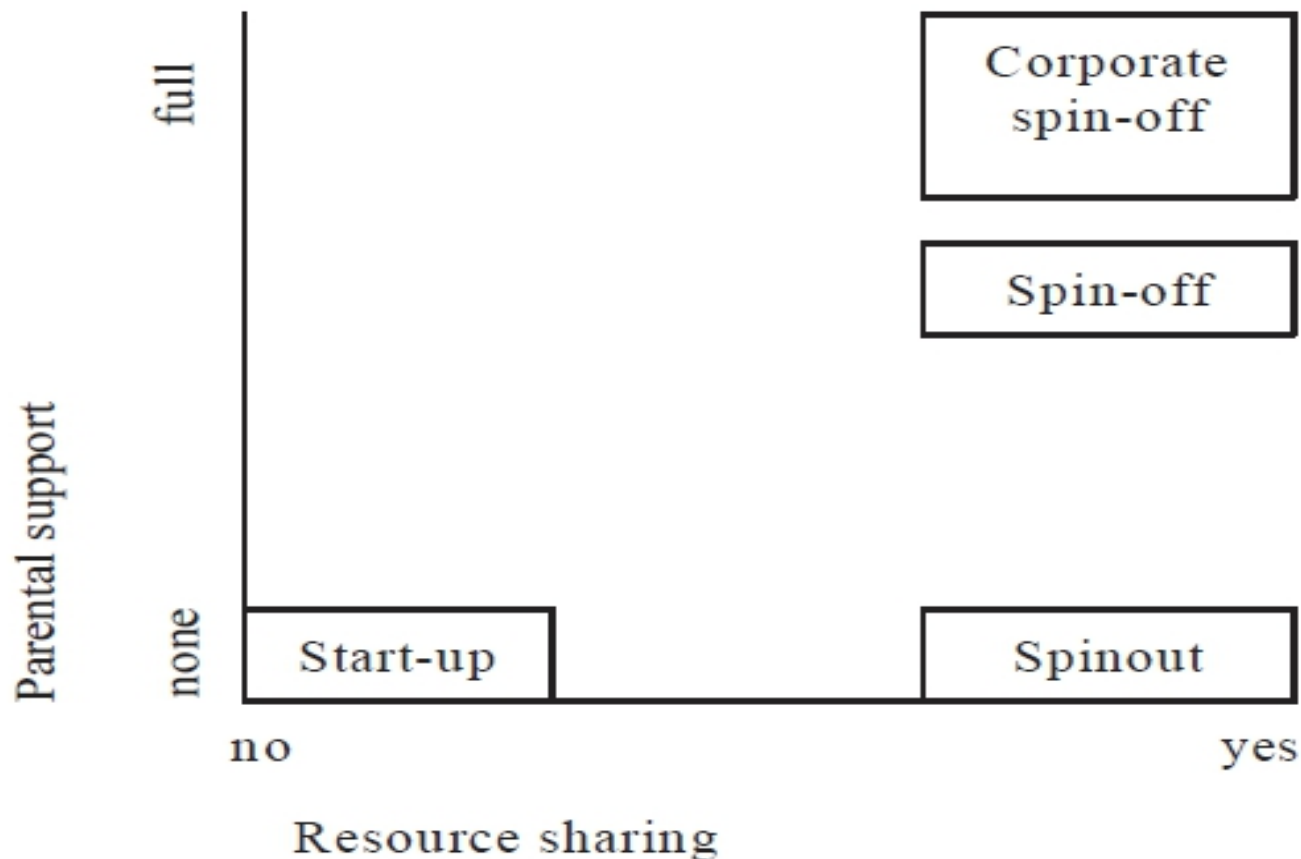
financial institutions keeping positive cash flow throughout the early stages;

bridging organisations/intermediaries to incubate the early days of the new spin-off in a relatively favourable environment

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International experience of spin-off companies created by universities (3)



Start-up vs Spin-out vs Spin-off (Koster 2004, p.5)

Spin-off - more appropriate term for companies supported by universities.

International experience of spin-off companies created by universities

Callan (2001) summarised the results of a 1999 OECD survey of government information sources on spin-offs

- characterised **a research spin-off** - a company that falls into at least one of the 4 following categories:
 - Companies that have an equity investment from a national library or university,
 - Companies that license technology from a public research institute or university,
 - Companies that consider a university or public sector employee to have been a founder,
 - Companies that have been established directly by a public research institution.

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Broader definitions of university spin-off (USO)

- *Rappaert et al (1999)*

„USO - firms whose products or services developed out of technology-based ideas or scientific technical know-how generated in a university setting by a faculty member, staff or student who founded (or cofounded with others) the firm.

The individual(s) may either leave the university to start a company or start the company while still inside the university.“

International experience of spin-off companies created by universities

- *Pirnay et al.(2003)* found 10 different definitions of university spin-offs in use, 6 from 1999 to 2003.
- Created the „traditional definition of university spin-offs“ *Pirnay et al.(2003, p. 356)* as

“new firms created to exploit commercially some knowledge, technology or research results developed within a university” - widely employed since 2003.

.....widely cited

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Recently --- Narrower definitions of university spin-off (USO) focusing on the IP:

- **University spin-off** - *“a new company founded to exploit a piece of intellectual property created in an academic institution” (Shane, 2004).*

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Supported by **the parent company/organization**:

- investing equity in the new firm;
- being the first customer of the spin-off and helping to create cash flow;
- providing incubation space and equipment or legal advice, finance, technology, etc.

Major factors of influence upon spinoff activity

(Shane, 2004):

- the university and societal environment,
- the technology developed at universities,
- the industries in which spinoffs operate,
- and the people involved.

International experience of spin-off companies created by universities (4)

Typology of university spin-offs

Carayannis et al (1998, p.4) - 5 types of USO:

- The founder of the spinoff company was an employee of the parent company but the technology was not transferred from the parent company,
- The core technology of the spin-off company originated in the parent company, but the founder of the spin-of did not transfer from the parent company,
- The founder of the spinoff company created the core technology of the spin-off company, but not while employed by the parent company,
- The founder of the spinoff company - neither employed by the parent company nor did the core technology originate there, but spin-off used some resources of the parent company,
- The core technology and the founder(s) of the spin-off company came from the parent company, and the founder continued to work with the parent company.

International experience of spin-off companies created by universities

Pirnay et al (2003) - typology of USOs based on 2 key discriminatory factors:

- the **status of individuals** involved in the spin-off process (researchers or students)
- the **nature of knowledge** transferred from university to the spin-off (codified or tacit), influencing its business activities (product or service-orientation).

Thus: (a) academic product-oriented spin-offs,
(b) academic service-oriented spin-offs,
(c) student product-oriented spin-offs,
(d) student service-oriented spin-offs.

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Nicolau and Birley (2003) - USO typology by

- the affiliation of the inventor to the university in 3 categories:
- orthodox spin-offs – where inventor/academic left the university to start the new company,
- hybrid spin-offs – where inventor/academic remained at the university holding a part-time position in the new company,
- technology spin-offs where inventor has no involvement in creation of the new company.

International experience of spin-off companies created by universities

Mustar et al. (2006) identified **3 common perspectives** in the comprehensive survey of the literature on spin-offs:

(1) the resource-based perspective,

(2) the business-model perspective,

(3) the institutional perspective.

International experience of spin-off companies created by universities

- **Resource-based analyses** - 4 broad resource categories recognized: technological, social, human, and financial - assets owned or controlled by the new venture, potential to considerably influence its growth.
- Additionally:
the organizational capabilities and
the institutional setting in which a business operates
to be considered.

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- **The business-model approach** in the analysis of research-based spin-offs - only recent subject of investigation:
- firm's value proposition, market segment focus, position in the value chain, cost structure, and revenue/profit potential,
- OR the process of transforming knowledge or prior experience into economic value,
- OR the actual growth orientation of the new venture,

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- **The institutional context**, in which a spin-off is founded and operates, i.e., the specific setting of the university, its culture, norms, and rules (Moray and Clarysse, 2005) - frequently discussed in the literature.
- Particular interest - *the degree of dependence or reliance of a university spin-off on regulations regarding intellectual property rights, transfer policies, or start-up help* → **Differentiate:**
- *spin-offs* having strong linkages to uni, depending heavily on the university's positive attitude towards technology commercialization,
- *start-ups* - only loosely connected with a university institute → not specifically influenced by uni policies.

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Salvador, Benghozi (2013) revealed the existence of 2 main kinds of research spin-offs:

- *more open-oriented research spin-offs*
- *less open-oriented research spin-offs.*

3 factors identified by the factor analysis:

competencies,

spin-off founders' and university choices ,

company attitude,

Choices and competencies influence *the company attitude:*

product or *service* orientation *with or without* patents.

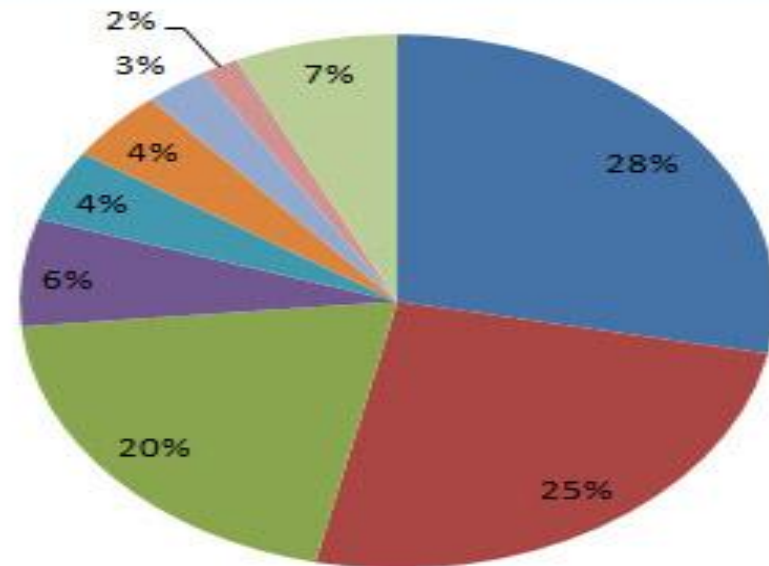
These 3 factors together – to be taken into account

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Table 4.4

Country	Total	%*	ASO Activity Status					
			Active	Merger	Acquisition	IPO	Failure	
Belgium	32	17%	23	1		2	6	
Denmark	11	6%	10				1	
Germany	22	12%	18			2	2	
Italy	9	5%	8				1	
Netherlands	31	17%	24	1		4	2	
Norway	10	5%	7			2	1	
Spain	11	6%	11					
Sweden	48	26%	43			3	2	
UK	11	6%	7				2	
Total	185		151	2		11	4	17
%*		100%	82%	1%		6%	2%	9%

Industry sector	Total	%*
1 Pharma / Biotech	52	28%
2 Electronics	47	25%
3 Software	37	20%
4 Materials	12	6%
5 Medical Devices	8	4%
6 Energy Cleantech	8	4%
7 Agriculture / Food	5	3%
8 Mechanics	3	2%
9 Others	13	7%
Total	185	100%



International experience of spin-off companies created by universities (5)

USOs - critical importance for a competitive knowledge based economy,

they can create:

- Innovative services and products of high added value and high transferable profile in the international market
- New knowledge-based jobs.

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The growth challenge for USO:

- Most USO are not larger than 10 employees after six years of survival. (P. Mustar, 2007)
- USOs in Delft (NL) have faced an average annual growth of 0.84 full time equivalent (fte) in 1998 to 2006.
- USOs in Trondheim (Norway): 0.89 full time equivalent (fte).
- USOs in Delft (NL) have faced an average annual growth of 1.0 full time equivalent (fte), in the years from founding of the firm up to 2010. (Fadilah, Van Geenhuizen and Taheri, 2012)

(Growth challenge for university spin-offs and the project Spin-up, presentation TU Delft)

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Main barriers to the growth of USOs:

- Legal framework (IPR and Researchers employment status)
- Finance Gap
- Knowledge Gap

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USOs initial lower performance

- highly influenced by their founders who have more extensive formal education and less extensive managerial skills than the founders of other independent start-ups
- The knowledge gap of USOs - basic reason for the lack of growth: lack of entrepreneurial knowledge and skills by the entrepreneur
- Academic entrepreneurs - lack of managerial or generalistic skills may directly influence their behaviour and thus the performance of USOs

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Missing skills and performance of spin-off firms:

→ larger chance for small growth, turnover and profitability compared to other firms

Top missing skills perceived as hampering the growth of the firm:

- Gaining financial capital
- Internationalization
- Sales
- Financial management
- Marketing management

There are country differences in missing entrepreneurial skills.

- Netherlands and Finland - in short of sales skills,
- Portugal - in short of internationalization skills,
- All countries - except the Netherlands – missing skills on gaining financial capital in the first place.

International experience of spin-off companies created by universities (6)

Europe - 4 distinct models of development of spin-off/spin-out programmes:

- **Top-down model:** government funding is channelled to spin-offs through public agencies, works well in establishing national programmes from a very low level (*Slovakia, Czech Republic, other „moderate and modest innovators by European Innovation Survey*);
- **Network model:** created and supported networks of privately funded university incubator, business support agency and investors (*VC or business angels*), *it works well in rising local economies, e.g. Chalmers University in Sweden*);
- **Incremental model:** incubators and funds of local universities are developed gradually over the time, *e.g. Lausanne University in Switzerland*; mostly followed by the European universities;
- **Technopole model:** fundamental reorientation of university to create a new entrepreneurial culture in all aspects of university life, needs strong support for innovation and change within the university, *e.g. INNOVA Program of Technical University of Catalonia*.

International experience of spin-off companies created by universities

Callan (2001): Benchmarking of the spinoffs in the OECD countries - results:

- **Broad range in spin-off performance** across OECD countries;
- Nearly all OECD countries had experienced a **growth in the number of spin-offs** from universities and public laboratories;
- **Agreement on the definition of spin-offs** could be helpful in normalising the survey data submitted so that spin-off performance can be compared over time and across countries more easily;
- It is **impossible to arrive at spin-off performance targets** due to variances in research institutions which make up the national research base of each country and fact that spin-offs are only one form of technology transfer which may be more or less necessary in a country;
- **Evaluation of public spin-offs** should be executed in a **broader context** of technology transfer and new firm generation.
- **Any cross-country comparisons should be done with great caution only.!**

International experience of spin-off companies created by universities

Callan (2001): contrary to wide-spread belief on USOs, spin-offs are mainly product innovators,

- they act **more as mediators** between the research and industry communities.

Studies showed:

many spin-offs were **small and slow-growing** firms, with **few** products

BUT **longer survival rates** than the average start-up.

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Clarysse, Heirman, and Degroof(2001): results from a Belgian study of the early-growth phase of new technology-based firms

to explain why European new technology-based firms fail to grow like their US counterparts.

- “Structural deficiencies” , e.g financial, fiscal or regulatory climate cannot explain this slow growth.
- **Decisive - the entrepreneurial climate of the firm’s region and its experiences and opportunities for knowledge acquisition.**
- Regions **not supportive of spin-off early-growth needs** – before the first infusion of venture capital – have a lower incidence of high-growth ventures.
- The challenge for Europe - **create an environment for spin-offs** to learn **how to translate** research into a product tailored to market demand and to develop an appropriate **business model**.
- Intermediary institutions and incubation centres would play a key role in it.

International experience of spin-off companies created by universities

Study on university commercialization at 8 leading U.S. Universities (*Wai Fong Boh et al, 2012*): Harvard University, MIT, Stanford University, University of Arizona, University of California, Berkeley, University of Maryland, University of North Carolina, and University of Utah.

Confirmed:

- **key role of TTOs** in evaluating invention disclosures, marketing inventions to potential licensees, filing patents, and licensing inventions to interested parties;
- the **overall university ecosystem** and a broad range of practices, as well as the **scope of university programmes and practices** may have a significant impact on technology transfer.

International experience of spin-off companies created by universities

Study on university commercialization at 8 leading U.S. Universities (*Wai Fong Boh et al, 2012*):

Emphasized:

- **graduate and post-doctoral students are critical participants in university spinoffs**
- → **examination of their roles**, especially in the early stages of spinoffs initiated by faculty and students;

International experience of spin-off companies created by universities

Found out: **6 stages for the early technology commercialization process at universities:**

1. *Idea generation*
2. *Commercialization decision*
3. *Prototype generation and establishment of commercial and technical viability*
4. *Founding team formation*
5. *Strategy and commercialization process determination*
6. *Fund raising to sustain activities, with the aim of convincing investors that the new technology has commercial and technical viability.*

International experience of spin-off companies created by universities

Identified - **4 primary pathways for university spinoff development:**

- **Pathway 1:** *Faculty principle investigator (PI) and an experienced entrepreneur (23 % of cases);*
- **Pathway 2:** *Faculty PI and PhD/post-doctoral students (41 % of cases);*
- **Pathway 3:** *Faculty PI, PhD/post-doctoral students, and business school students (13 % of cases);*
- **Pathway 4:** *Pure student effort, typically involving a Master's/PhD student and business school student (23 % of cases).*

International experience of spin-off companies created by universities

Found out: **University programmes and practices enhance entrepreneurial efforts for commercializing university technologies, including spin-offs:**

- *Project-based classes on technology commercialization;*
- *Mentoring programmes to new entrepreneurs;*
- *Accelerator/incubator programs for startups - mentoring, funding, office space, enhanced credibility, in some cases: oversight and management;*
- *Business plan competitions - platform for spin-off team formation and business plan development;*
- *Entrepreneurship education for students – critical inspiration for interest in entrepreneurship and for knowledge on successful spinoff development;*
- *Entrepreneurship education for faculty.*

International experience of spin-off companies created by universities

Identified: **3 widely applicable guidelines for technology transfer and spinoff development at universities:**

- Aligning the objectives of the university, TTO, faculty, and graduate students;
- Leveraging all potential university resources; and
- Encouraging graduate students to see technology commercialization as a career option.

Conclusion:

Universities **can and should** create an environment that fosters new business creation on university campuses.

Massachusetts Institute of Technology



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International experience of spin-off companies created by universities (7)

Ecosystem of MIT (MIT Sloan School of Management):

- Martin Trust Center for MIT Entrepreneurship
- MIT \$100K Entrepreneurship Competition
- MIT Global Startup Workshop
- MIT Venture Mentoring Service
- MIT Technology Licencing Office
- MIT Enterprise Forum
- MIT Deshpande Center
- Legatum Center for Development and Entrepreneurship
- Sloan Entrepreneurs for International Development
- Lemelson MIT Program
- MIT Media Lab
- MIT Entrepreneurship Review

International experience of spin-off companies created by universities

MIT Entrepreneurship Center (1990, Sloane School)

Martin Trust Center for MIT Entrepreneurship (since 2011)

- „Dual education“ of students as potential entrepreneurs (1990): teaching by academic professors and coaching and mentoring by extraordinary professors of business practice – successful entrepreneurs and VCs;
- **Sponsoring** MIT \$100K Entrepreneurship Competition and unique courses Entrepreneurship Lab and Global Entrepreneurship Lab - enable the MBAs work in start-ups all over the world;
- **Close collaboration** with MIT Venture Mentoring Service.

The core of the MIT ecosystem of innovative entrepreneurship

International experience of spin-off companies created by universities

MIT \$100K Entrepreneurship Competition

- Annual educational programme (since 1992) for MIT students and researchers to develop their talents, ideas and energy in the future successful company: financial prizes, startup founding services, mentor and investor networks It has taken place since 1992
- **MIT Global Startup Workshop** (since 1998) consulting on organization of the MIT \$100K Entrepreneurship Competition. Since 2007 - organizing workshops on building ecosystems of innovative entrepreneurship all over the world
- **MIT Venture Mentoring Service**
Cooperates with the MIT Entrepreneurship Center - team mentoring to early stage startups at the MIT campus by voluntary mentors with business experience

International experience of spin-off companies created by universities

MIT Technology Licencing Office

- providing to the inventors from the MIT and Lincoln Laboratory legal advice on protection of technologies and intellectual property, in selling patent licences and technology copyrights to established companies and start-ups. Portfolio of more than 1,000 US patents, each year it produces 60 to 80 licence contracts.
- **MIT Enterprise Forum** - 28 subsidiaries in 3 continents.
focus on technopreneurship educational programmes (more than 400 events a year) - supply of course content over Internet free of charge by means of MIT OpenCourseWare.

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MIT Deshpande Center

(Faculty of Engineering, 2002, donation)

- to boost academic research and , technology innovations in collaboration with industry, as well as early stage technology start-ups

Legatum Center for Development & Entrepreneurship

(since 2007, donation)

- highly competitive scholarship and grant programme for MIT students, who intend to start up their businesses in a developing country with low income per capita

Sloan Entrepreneurs for International Development

- student organization, its members get business education, start new companies and get involved in solving problems of companies in emerging markets.

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Lemelson MIT Program

- philanthropic foundation fostering inventions and innovations. It awards annually the MIT Lemelson Prize of \$500,000

MIT Media Lab

- teaching of interdisciplinary entrepreneurship in the media, sciences and engineering and helping (*MIT Venture Mentoring Service*) students transform their promising business ideas into lab prototypes and marketable products

The MIT Entrepreneurship Review

“where Einstein meets Edison,” or where “thinkers” meet “doers.”

- student-run, online publication on intersection issues of science, technology, and entrepreneurship

International experience of spin-off companies created by universities

MIT Impact Summary:

- The MIT graduates founded and developed corporations such as: Arthur D. Little Inc., HP, Genentech, Gillette, Raytheon, Teradyne and others.
- Estimate: 6,900 MIT alumni companies with worldwide sales of approximately \$164 mlrd located in Massachusetts alone and represent 26 % of the sales of all Massachusetts companies.
- 4,100 MIT alumni-founded firms are based in California, and generate an estimated \$134 mlrd in worldwide sales.
- Jobs created by MIT alumni companies - estimates: Massachusetts (worldwide under 1 M); California (526,000 jobs), New York (231,000 jobs), Texas (184,000 jobs) and Virginia (136,000 jobs).
- **MIT is crucial to the Massachusetts economy.** Without MIT, most of these companies never would have been located in Massachusetts.

International experience of spin-off companies created by universities (8)

The Spinouts UK analysis

- all spin-outs of UK universities and research institutes since 2000 (Young Company Finance):

- 1 University of Oxford (93 spin-outs),
- 2 Imperial College London (88 spin-outs),
- 3 University of Cambridge (77 spinouts).

University of Oxford



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Ecosystem of the University of Oxford:

- Oxford University Divisions and Departments
- Research Services
- Isis Innovation Ltd.
- Oxford Innovation Society
- Oxford Spin-out Equity Management
- Oxford Science and Entrepreneurship Centre
- Oxford University Begbroke Science Park
- Oxford Science Park
- Oxford Entrepreneurs

International experience of spin-off companies created by universities

Isis Innovation Ltd (1988 , technology transfer company of University of Oxford) - [Activity areas](#):

- Helping **Oxford University researchers to commercialise IP** from their research: patenting, licensing, spin-out companies,
- Managing **Oxford University Consulting** - helps Oxford University researchers to identify and manage consulting opportunities and helps clients access experts from Oxford's world-class interdisciplinary research base,
- Managing **Isis Enterprise** - technology transfer and innovation management consultancy business - helps technology providers and seekers to source, develop and commercialise new innovations across the public and private sectors around the world.
- Sponsoring and organization of **the Venturefest** in Oxford - international fair for entrepreneurs, influential forum for the advancement of high-tech and knowledge-based enterprise.

International experience of spin-off companies created by universities

The Isis Angels Network (over 100 members, expanding)

- Organization of investor search network for its new spin-out companies , arranging investment pitch meetings of early-stage technology investors with early stage spin-out teams.

The Isis Spinners club

- Provides opportunity for the CEOs and University nominee directors of the University's spin-outs to meet and share experiences or discuss presentations of invited professional speakers.

Oxford Innovation Society (since 1990)

- Managed by the Isis Innovation Ltd , business network linking together its members, Isis and University researchers to discuss new technologies and open innovation business opportunities
- Current members - from multinational and local companies and the professional services (patents, banks, accountants, lawyers)

International experience of spin-off companies created by universities

Oxford Spin-out Equity Management (OSEM)

University unit reporting to the University's Director of Finance and working closely with Isis. Manages the University's shareholdings in its spin-out companies after they have been spun-out by Isis.

3 main roles:

- **Strategic:** identifying opportunities to optimise the return on the University's investment and provide professional assistance to companies as they develop,
- **Tactical:** supporting companies by dealing with immediate or short-term issues such as funding or access to other support networks,
- **Procedural:** dealing with documentation relating to consents, fund-raising and exits.

Own investment fund manages on behalf of the University of Oxford portfolio of 57 companies - currently valued at around £46 mil. (May 2013).

International experience of spin-off companies created by universities (4)

- Since 1997 Isis Innovation has spun-out a new company every two months on average.
- Over £266 million in external investment raised by Isis spin-out companies since 2000, and 5 are currently listed on London's AIM market.
- New spin-outs bring back millions of pounds into University research and create many new jobs in the region, e.g. *Oxford RF Sensors* incorporated in 2004, or *Oxford NanoLabs* incorporated in 2005 currently renamed to *Oxford Nanopore Technologies* (since 2008)

International experience of spin-off companies created by universities

Oxford Science and Entrepreneurship Centre (OxSEC) - started in 2001, based at the **Oxford Saïd Business School** established in 1996 within the Oxford University

- creates awareness and encourages entrepreneurship in the University's science and technology communities
- offers training and support in knowledge and skills needed for early stage businesses and new ventures. Over 5,000 participants have taken part in its seminars and networking events since 2001.

International experience of spin-off companies created by universities

The Oxford University Begbroke Science Park

(since 1999, operated by the University's Department of Materials)

- New approach to research - the creation of multi-disciplinary centres of excellence bringing together experts in related fields to answer specific needs or explore specific areas. These centres of excellence work with industry partners to turn ideas into wealth-generating enterprise.
- Incubation facilities to spin-outs and start-ups working from inside and outside the University with practical start-up help.
- Central to the mission of bringing science and industry together is the *Knowledge Transfer Partnership (KTP) Office*, part of the Begbroke Directorate.
- Major interdisciplinary areas: Industrial materials and Manufacturing, Aerospace and Automotive, Nanotechnology, Environmental Technology, and IT and Communications Engineering.

International experience of spin-off companies created by universities

The Oxford Science Park

- joint venture between Magdalen College, Oxford and financial services group Prudential
- over 60 companies at the Park, 31% of them being active in the computer hardware or software, 43% in bioscience and 26% in other areas.

Oxford Entrepreneurs

- student society for entrepreneurs at the University of Oxford to
- encourage and support student entrepreneurship by providing inspiration, education, networking and the chance to learn by doing at The University of Oxford and beyond
- over 1,200 members, over 100 of them run their companies.

International experience of spin-off companies created by universities

University of Oxford Impact Summary

an important component of UK's / Oxfordshire's scientific and technologically based economy.

It contributes to:

- resilience of this economy in the recession period:
 - one of the lowest unemployment rates in the UK,
 - highly skilled and educated workforce,
 - high economic participation rates,
 - lower rate of decline in gross value added in recent years than other regions,
- knowledge based industries and services built around high technology businesses and spinning out from the universities and health sector,

International experience of spin-off companies created by universities

- high competitiveness
 - an average of 70 enterprises for every 1,000 economically active residents,
 - business survival rates above average,
- more start ups in 2011 than in 2010, and with Buckinghamshire and Berkshire it has the highest number of patents registered in the UK.

Slovak University of Technology in Bratislava



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International experience of spin-off companies created by universities

Organizational changes supporting entrepreneurship at STU

- **March 2008** – top down integration of **3 Departments of Economics & Management** (out of 4) in **4 STU Faculties** (out of 7, decentralized, autonomous) into the STU-wide **Institute of Management**
- **Objectives of the Institute of Management:**
 - Integration of teaching and research resources in management disciplines,
 - To guarantee not only specific courses and educational modules in management but also interdisciplinary STU-wide study programmes,
 - **To promote entrepreneurship education within the STU study programmes**
- Low level of cooperation of the IM departments with the STU Incubator and in entrepreneurship education,
- IM executes some educational and promotional functions of prospective Centre for Entrepreneurship and Innovation.

International experience of spin-off companies created by universities

Organizational changes supporting entrepreneurship STU (*cont.*)

- **Need for** working mission and strategy, inspiring objectives, internet information and discussion platform and cross-departmental pedagogical and research activities to be developed for the new members of the Institute of Management
- **Final strategy and organizational structure** of the Institute of Management is **still under development**
- **STU Scientific Ltd** - daughter company of the STU started operation in 2008. Its aim - valorization of the STU research results in industry, creation of spin-outs (6 sofar), ICT consulting and educational services,
- **TTO** from the STU to industry started operation in 2010 using the experience from Oxford University TT company ISIS.

International experience of spin-off companies created by universities

Entrepreneurship education at STU Faculties

- **Prevailing managerial approach** in teaching business courses and programmes,
 - **Traditional teaching methods** with some entrepreneurial elements,
 - Most appealing entrepreneurial elements may be found in the study programmes within the IM:
 - Economics and Management in Civil Engineering (MSc)
 - Management in Chemical and Food Companies (MSc)
 - Elective study programme on Economics and Management”
 - FCE and FEEIT.
- Industrial Management (MSc/PhD) – FMST in Trnava,

International experience of spin-off companies created by universities

Entrepreneurship education at STU Faculties (cont.)

- Since 2008 up till now – STU decision to host the **Global Entrepreneurship Week** in Slovakia together with other institutional and corporate partners
- Since 2008 up till now – Institute of Management started **cooperation with University Technology Incubator** (36 tech-startups since 2005) **and with the STU Scientific Ltd.** in promotion of entrepreneurship events and publication of professional magazine Transfer
- Since 2000 up till now - **Industrial Councils** of the faculties and industry corporations as advisory bodies of faculties, Alumnae Associations of faculties – no clear impact on entrepreneurship education
- **STU Office of Career Counselling** for students
- The IM participates in the **research project CENTROPE-tt – Tools for Transnational Support of Innovations in the Centrope Region** funded by the Central Europe programme within the EU ERDF fund (period from 2009 until 2012).

International experience of spin-off companies created by universities

Funding and institutional infrastructure – entrepreneurship education

- **State funding** of STU education – 63% of STU costs, no specific state funding of entrepreneurship education programmes at universities,
- **Grant funding** of R&D and infrastructure maintenance needs (18% of STU costs), fraction of it in entrepreneurial education grants,
- **Business contracts** with the third parties (4,3% of STU costs),
- **Institutional infrastructure:**
 - **STU Institute of Management** in Bratislava,
 - **Institute of Industrial Engineering, Management and Quality Engineering** of the STU Faculty of Materials and Technology in Trnava (50 km away from Bratislava),
 - **University Technology Incubator**, valorization company **STU Scientific Ltd.** in Bratislava, **TTO** in Bratislava

International experience of spin-off companies created by universities (10)

Conclusions - steps towards entrepreneurial university and successful university spin-outs

- Set up of **Centre for Entrepreneurship and Technology Incubator/Accelerator**
- Foster their cooperation with all relevant academic units,
- Find and test suitable ways of **contracted cooperation of professors and students with businesses** as complementary to curricular activities,
- Set up **Valorization Centre**
- Join/create the living **BA and VC networks**

International experience of spin-off companies created by universities

Conclusions - steps towards entrepreneurial university and successful university spin-outs (cont.)

- **Curricular activities** - entrepreneurship education or measures aimed at attracting more students within the university and from outside
- **Extracurricular/Outreach activities** - inspiring activities with potential to enhance the entrepreneurial climate within the institution (organized by academic units or in cooperation with student organizations) and its environment (municipality, region or country):
e.g. Business Plan Contests in close cooperation with real life businesses, Summer Schools, Awareness Lecture Schemes, Startup Weekends, Inspiring Business Guest Speakers (e.g. on entrepreneurship and intellectual property rights issues), Entrepreneurship “Road Shows” (e.g. by venture capital companies) as well as suitable ways of contracted cooperation between students and professors with businesses

International experience of spin-off companies created by universities

- **Conclusions - steps towards entrepreneurial university and successful university spin-outs** (cont.)
- No great strategy/plan will survive and flourish unless
the ideas and suggestions contained in it are seriously taken up by enthusiastic organizers, who on daily basis will instill these in the academic and student communities of faculties
- **Contacts and cooperation in entrepreneurship education and research** among universities of technology within a country **as well as on international scale,**

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