Smart Specialisation and Business Strategy:
Build Your Own Innovation Ecosystem

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Foresight: Future innovation ecosystems

- **T**he Research Triangle Foundation and the Institute for the Future organized in 2008 and 2009 a series of workshops with the participation of experts from different countries and professions in brainstorming important trends of technology-led economic development for the next 20 years. The White Paper published under the title **'Future Knowledge Ecosystems' describes fourteen emerging trends** that will broadly set the context for technology-based economic development in the coming decades.

- The report of the National Intelligence Council (2012) 'Global Trends 2030: Alternative Worlds' points out on **'individual empowerment' and 'big data' as main megatrends** and game-changers for the same period, which are expected to alter the world.

Foresight: Future knowledge ecosystems (2009)

Trends in economy and society

1. Stimulus capitalism: Public investments in basic science and research infrastructure will be used as a primary tool to stimulate both short-term and long-term growth

2. Group economy: New tools for cooperation will drive down the cost of forming groups around any shared interest, identity or activity. New models for creating wealth will emerge at the intersection of the social web and grassroots movements.

3. Ecological economics: As governments and industries work to address global warming through carbon markets and taxes, the measurement of the economic value of ecological processes will be increasingly important.

Trends in science and technology

4. Biology by design will supplant physics as the most scientifically vibrant and economically important field, letting us read and write nature's 'source code' at will.

5. Spread of ubiquitous computing will create massive new streams of research data, while simultaneously providing new tools for scientific collaboration in the lab.

6. Social networks where people and computers work together to make sense of data will enable a shift from artificial intelligence to hybrid sensemaking.

7. New scientists will transform the practice of science by forging transdisciplinary fields, multi-sector careers and cultural influences.

8. Science institutions will be transformed as collaborative, open and online models for collaboration and knowledge sharing break through obsolete barriers.

Trends in R&D models

9. New models of lightweight innovation seek to do more, faster with less, and cast a broader net for ideas.

10. Universities will continue their transformation from ivory tower to economic engine and play a greatly expanded role in economic development – in time, it could become their primary function, trumping education.

Trends in R&D and innovation places

11. A new global map of science is emerging, in which smaller countries are playing an increasingly important role, challenging the Western superpowers' centuries-long dominance.

12. Economic development practice will shift from trying to copy the success of others to building **sticky know-how** – tacit knowledge that builds on local cultural and industrial resources, and isn't mobile.

13. The social life of small research spaces will create dynamic, transdisciplinary places that bring virtual networks to ground.

14. Regional knowledge ecosystems will emerge as a new strategic frame, providing scale, efficiency and global platforms for economic development.

Foresight: Global Trends 2030 - Alternative Worlds (2012)

Individual empowerment is the most important megatrend

It is both a cause and effect of most other trends, including the expanding global economy, rapid growth of the developing countries, widespread exploitation of ICTs.

Individual empowerment is expected to accelerate because of a huge growth of the global middle class and greater educational attainment.

Major technology arenas that shape global economic development

- information technologies
- new manufacturing and automation technologies
- technologies to meet food, water, and energy needs, and
- health technologies

figure also '**big data**'.

Big data era:

- Almost free computing power and data storage
- Broadband networks
- Cloud-based solutions

➢ ***URER-DRIVEN INNOVATION – CLOUD COMPUTING AND IoT***

Foresight: Towards BOWIE

These mega-trends indicate that changes come from bottom-up, open innovation networks ,and communities created over the Internet:

- Co-creation and living lab communities
- Crowdsourcing marketplaces for micro- and macro-tasks
- Web-assisted intelligence and semantic search and info tracking
- Web collaborative platforms for knowledge and resources sharing
- IoT solutions and smart objects
- Open Intellectual Property

The same trends enable companies to Build their Own Innovation Ecosystem (BOWIEs) using open innovation networks and smart environments, and rediscover their

- (1) Market
- (2) Technology, and
- (3) Business model

Smart Specialisation and BOWIE

Smart specialisation Strategies (S3) are creating smart environments supporting innovation and knowledge-based development. But, much of S3 success depends on how companies behave and harness the advantages and innovation resources offered externally .

How companies will create their own innovation ecosystem that enables a continuous discovery of (1) new markets, (2)technologies, and (3) business models. BOWIEs rely more on behavioural change than hard investments.

We will describe the setting of BOWIEs with respect to three recent research project of URENIO dealing with open innovation and smart environments:

- CROSS-INNO-CUT, about the use of ICTs for innovative cost cutting applications <http://www.cost-cutting.eu/crossinnocut>
- INTERVALUE, about web-based platforms for the valorisation of academic R&D <http://www.urenio.org/intervalue>
- PEOPLE, about the making of smart city economies <http://www.people-pilot.eu>

1. *Market discovery:*

Lessons from CROSS-INNO-CUT

CROSS.INNO.CUT

cross border implementation
of innovative cost cutting technologies

- ABOUT THE PROJECT
- NEWS
- NEWSLETTERS
- PROJECT ACTIVITIES
- THEMATIC AREAS
- PARTNERSHIP
- COST CUTTING DIGITAL TOOLBOX
- COMMUNITY OF INTEREST
- ABOUT THE PROGRAMME

Thematic areas

Mainstream market discovery: Push process

Market discovery is time and resource consuming process of gathering and analysing information and adapting accordingly marketing activities, including:

(1) Review of products or services

- Outline the products/services offered . Key product benefits and competitive differentiators. Product documentation. Top profitable products.

(2) Review of sales

- Lead sources. Lead ROI. Sales documentation. Pricing rational. Incentives and discounts. Sales statistics.

(3) Review of existing customers

- Customer database. Distribution per industry codes. Customer profiles, and motivations.

(4) Review of competitors

- Top competitors. Competitors' strengths & weaknesses. Marketing strategy. Offline and online. Comparison grids and variables. Ranking advantages.

(5) Marketing design, implementation and product push

- Customers database. Market research. Marketing library. Design of marketing campaigns. Trade shows and events. ROI information.

Market discovery in smart environments

The rise of the Internet-based collaborative economy introduces a series of new trends. In smart environments, market intelligence and discovery are placed into communities of users, consumers, and technology providers.
New trends due to:

Rise of the Intention Economy

- Active role of customers. Ability to declare and discuss intentions. Expressions of intent which correlate to purchase. The buyer notifies the market - the market respond to intentions. Becomes feasible into interconnected environments

Rise of the Pull Economy

- Demand instead of supply as main driver of growth. Networked environments empower individuals, and communities to pull the products and services on their own terms and time requirements

Rise of the Attention Economy

- Capturing the attention of customers in an overflow of information. Critical factor: the user and the management of his/her attention. The attention economy infrastructure: a series of services (info, news, alerts, search), storage (repositories), and recording (devices) of attention.

Online market discovery – Hybrid products

Managing the virtual identity of products can capture the intentions of end-users and consumers and turn them into market strategy and discovery. **A series of e-tools** are available to trace down customers needs and demands and design products appropriately:

- **Search Engine Optimisation** and Search Engine Marketing (SEO and SEM) to obtain higher Google Rankings and Higher Search Engine Rankings.
- **Google adwords**, pay-per-click campaigns, and conversion tracking for enhanced monitoring and keywords optimisation.
- **Email marketing** for targeted, low cost - high value, marketing for email campaigns to targeted customers and target markets.
- **Market intelligence dashboards** – single computer screen of most important market segments and trends.
- **Ecommerce websites**, online shops and sales solutions for B2B and B2C.
- **Product feed manager systems** and web applications enabling mass product uploads to platforms such as eBay, Amazon, and Google Merchant.

A kingdom for social media

Social media apps

- **Blogs**: perhaps the best known form of social media
- **Wikis**: add or edit content, communal database.
- **Podcasts**: audio and video files available by subscription.
- **Forums**: areas for online discussion around specific topics
- **Content communities**: share particular kinds of content, photos, bookmarks, and videos.
- **Microblogging**: social networking with small size blogging

Tracing intentions and markets

Two-way interaction: understanding markets – informing markets:

Setting communities, and uncovering how to build communities around products, building businesses with social media and selling with social;

Social tactics, finding out the best and newest ways to market products with social media

Social strategy, discovering new strategies that draw customers, using profiles on social media and measuring social activities, trends

Content management, learning how bloggers and podcasters build and maintain content

2. ***Technology discovery:***
Lessons from INTERVALUE

InterValue
Inter-regional cooperation for valorisation of R&D

SOUTH EAST EUROPE
Transnational Cooperation Programme

Home | About the Project | Partners | Collaborative Platform | News & Activities | Contact | Search

A self-sustained R&D valorisation network

INTERVALUE project aims to bridge the gap between R&D creators, producers, financiers and marketers by creating a trans-national mechanism that facilitates the valorization of research results.

R&D results valorization plans creation

A network of experts will help researchers to create valorisation plans by exploring the technical feasibility, scientific relevance, market potential and investing/funding potential of the R&D result. This process will be assisted by the web platform and the workflow tools.

Visit INTERVALUE Collaborative Platform | Learn More

Collect | Mentor | Promote | Funding

About the Project

Learn More

Objectives

The overall objective of the project is to set up a mechanism covering most of the SEE area, which allows sharing and dissemination of key technologies and help to establish supply chains between the R&D institutions and the business sector. The project follows an integrated approach for strengthening the linkages among university R&D, industries, and public or private funding schemes through involvement of experts in evaluation and valorisation of R&D results. INTERVALUE sets two strategic goals:

1. Enhancement of interregional cooperation by enlarging the capacity and marketability of R&D results through joint actions and by creating critical mass of R&D results in selected areas.
2. Commercial exploitation of research outcomes delivered from the SEE research centers which will improve their capabilities to demonstrate their research outcomes and will facilitating SMEs to find solutions in specific technological problems.

Projects News & Activities

View All

R&D Results Repository is growing...

INTERVALUE partners keep on collecting R&D results which are presented in the R&D Results Repository (http://www.researchvalue.net). The Repository has currently 263 results for which partners have collected descriptions. We are happy to also include results from Slovenia from Jozef Stefan Institute which voluntarily contributes to the Repository.

Read More »

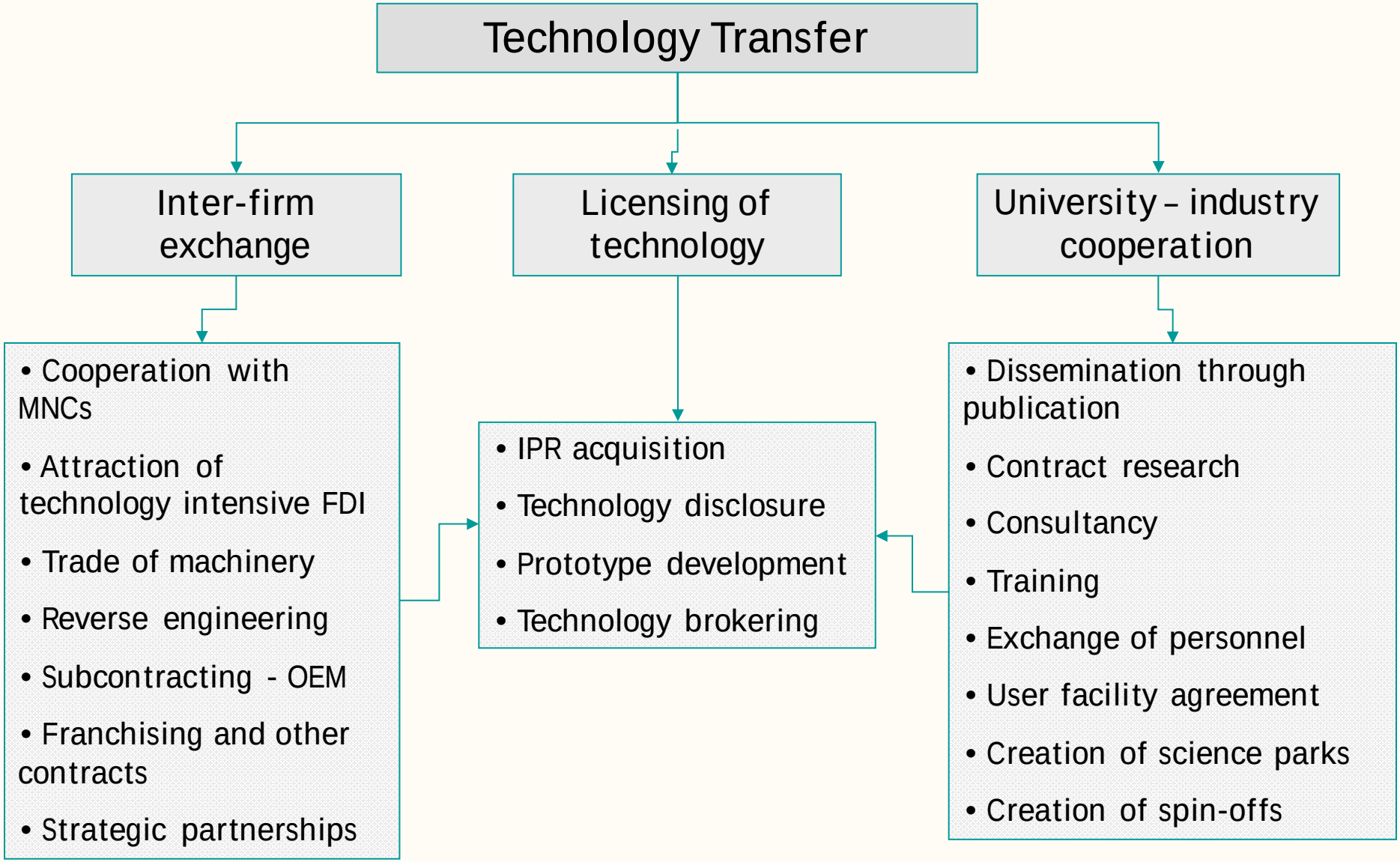
4th Steering Committee meeting in Craiova, Romania

The 4th meeting of INTERVALUE Steering Committee took place in Craiova Romania, hosted by our partner Regional Development Agency of South West Oltenia. During the 2 days meeting the partners discussed a number of major project issues. Read More »

Presentation of INTERVALUE in ICEIRD Conference

The INTERVALUE concept and project activity will be presented in the ICEIRD (International Conference for Entrepreneurship, Innovation and Regional

Technology acquisition: Major routes



University R&D: Open source of knowledge and technology

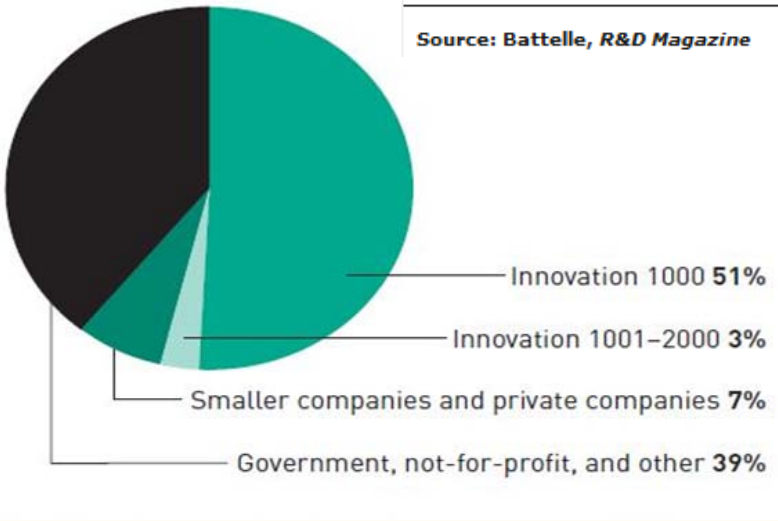
Global R&D Spending Forecast

	2010 GERD PPP Billion U.S. $	2010 R&D as % of GDP	2011 GERD PPP Billions U.S. $	2011 R&D as % of GDP	2012 GERD PPP Billions U.S. $	2012 R&D as % of GDP
Americas	473.7	2.3%	491.8	2.3%	505.6	2.3%
U.S.	415.1	2.8%	427.2	2.8%	436.0	2.8%
Asia	429.9	1.8%	473.5	1.9%	514.4	1.9%
Japan	148.3	3.4%	152.1	3.5%	157.6	3.5%
China	149.3	1.5%	174.9	1.6%	198.9	1.6%
India	32.5	0.8%	38.0	0.8%	41.3	0.8%
Europe	310.5	1.9%	326.7	1.9%	338.1	2.0%
Rest of World	37.8	1.0%	41.4	1.1%	44.5	1.1%
Total	1,251.9	2.0%	1,333.4	2.0%	1,402.6	2.0%

GERD, Gross Expenditures on R&D, PPP, Purchasing Power Parity

Source: Battelle, *R&D Magazine*

Total Spending: US$879 billion



University R&D: Rise of open access policies

Intellectual property is a property right and can be transferred much like any other type of property by sale or assignation. The owner of IP may not necessarily be the person who created it in the first place.

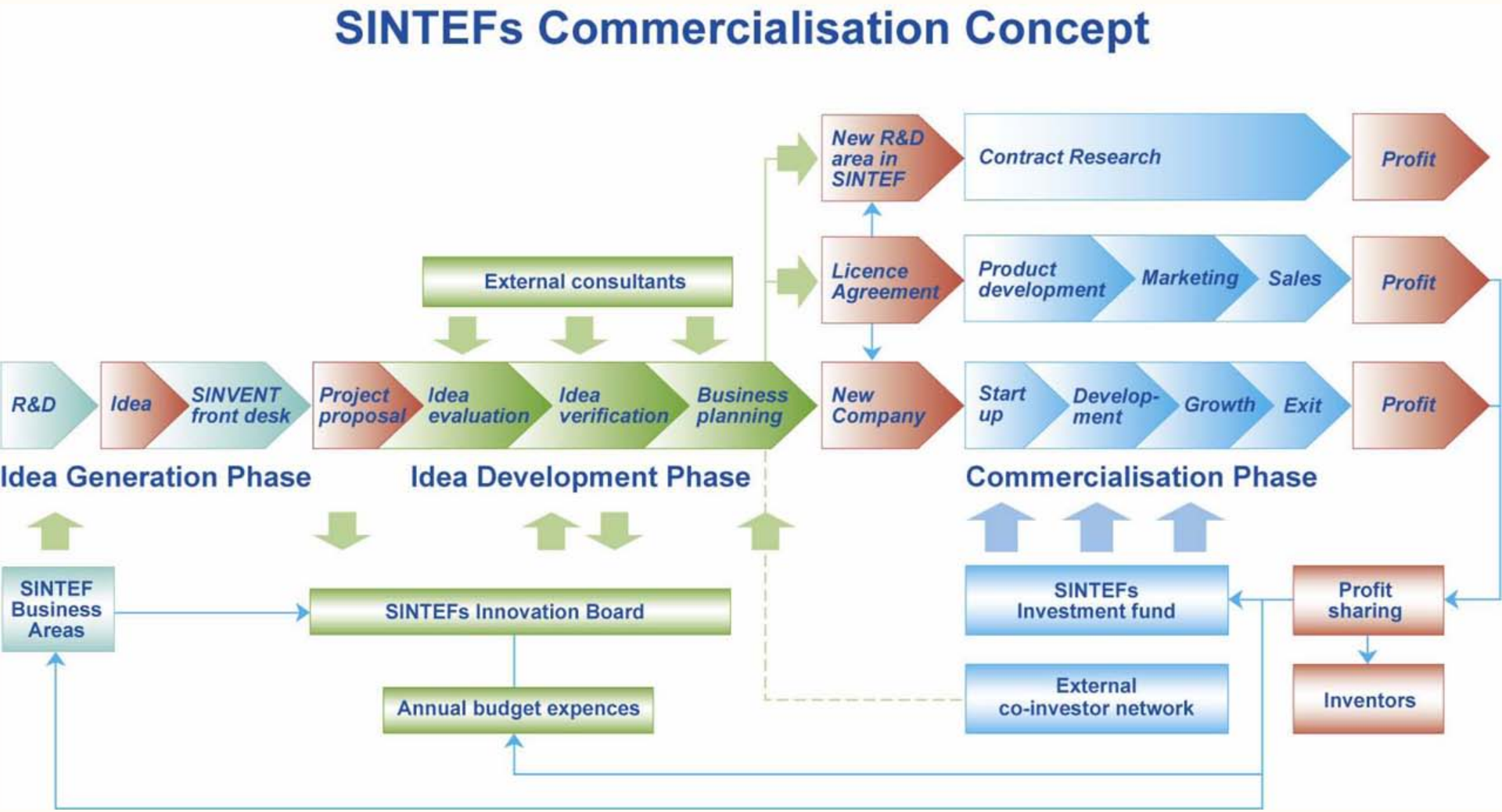
Emerging trends towards open access to academic R&D:

- R&D licensed under a Creative Commons License
- Free open source software under GPL, DSB, LGPL, etc.
- Free to use previously published journal articles, book chapters and conference presentations,
- Open access of academic journal papers by the publishers

UK: The government is to unveil plans to make publicly funded scientific research immediately available for anyone to read for free by 2014.

FP funded projects are encouraged to publish in open access journals and develop software under free licenses.

University R&D: Valorisation roadmap



Intervalue: Academic R&D valorisation platform

InterValue
Inter-regional cooperation for valorisation of R&D

SOUTH EAST EUROPE
Transnational Cooperation Programme

Programme co-funded be the European Commission

Platform Home | R&D Repository | Valorisation Plans | Implementation

InterValue Platform

Collaboration for the Valorisation of R&D

The INTERVALUE Platform supports the process of valorisation of research results. It is not only a meta-repository of R&D results, but also a collaborative space facilitating the interaction between researchers, companies and experts, improving the collaboration and knowledge sharing, and supporting a culture of innovation among them. Learn more »

R&D Repository

Providers from universities and research and technological institutions submit their research outcomes that lead to the development of new products, new production processes and new services.

Visit the repository ▸

Valorisation Plans

A network of experts help researchers to create valorisation plans for their R&D results covering technical feasibility, IP protection, market potential and funding potential.

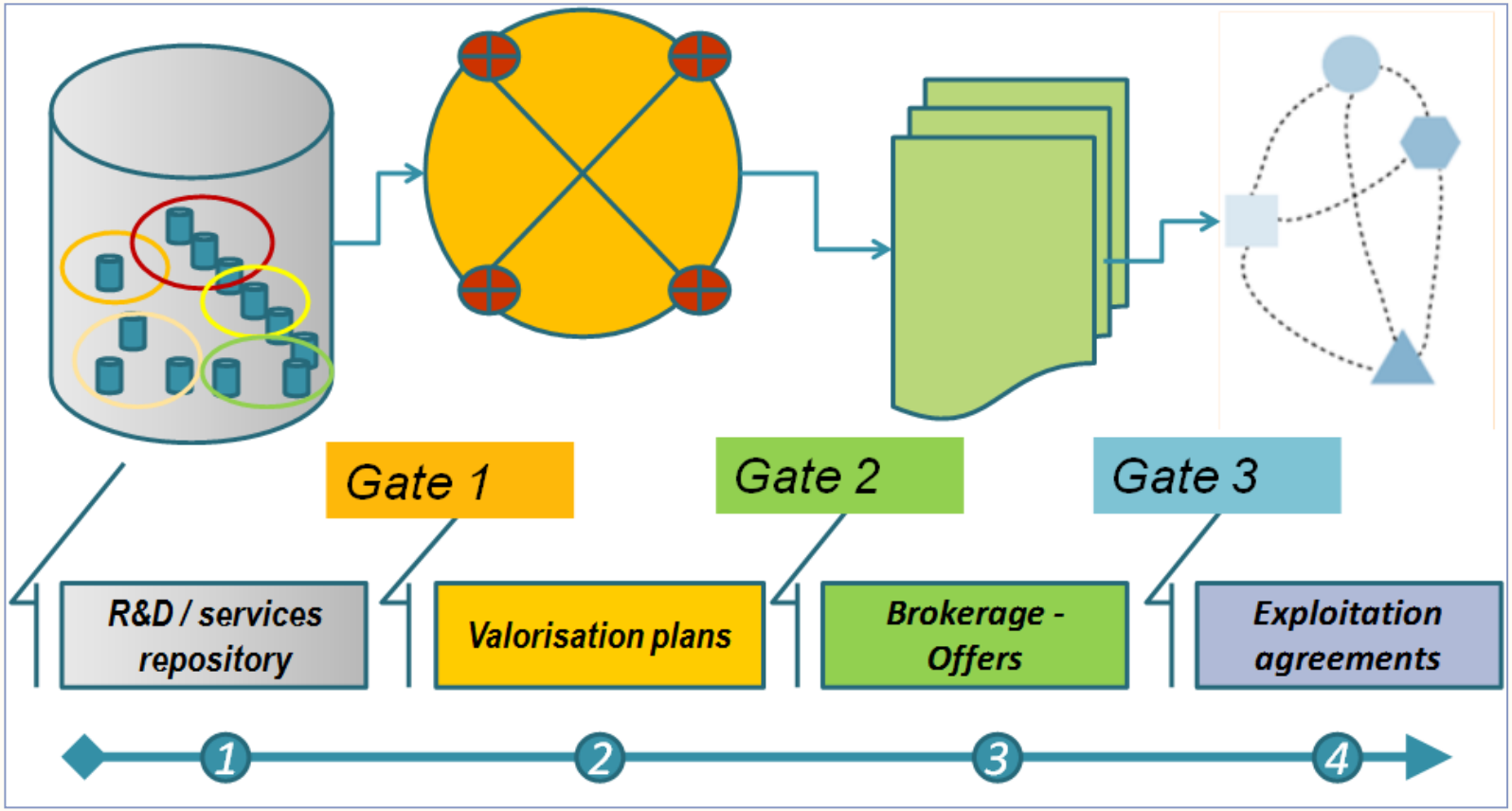
View the valorisation plans ▸

IP Agreements

License agreements and new products developments are facilitated through on-line learning roadmaps, inter-regional brokerage events, newsletters and pilot applications funding.

Learn more ▸

Intervalue: Stages and gates of R&D valorisation



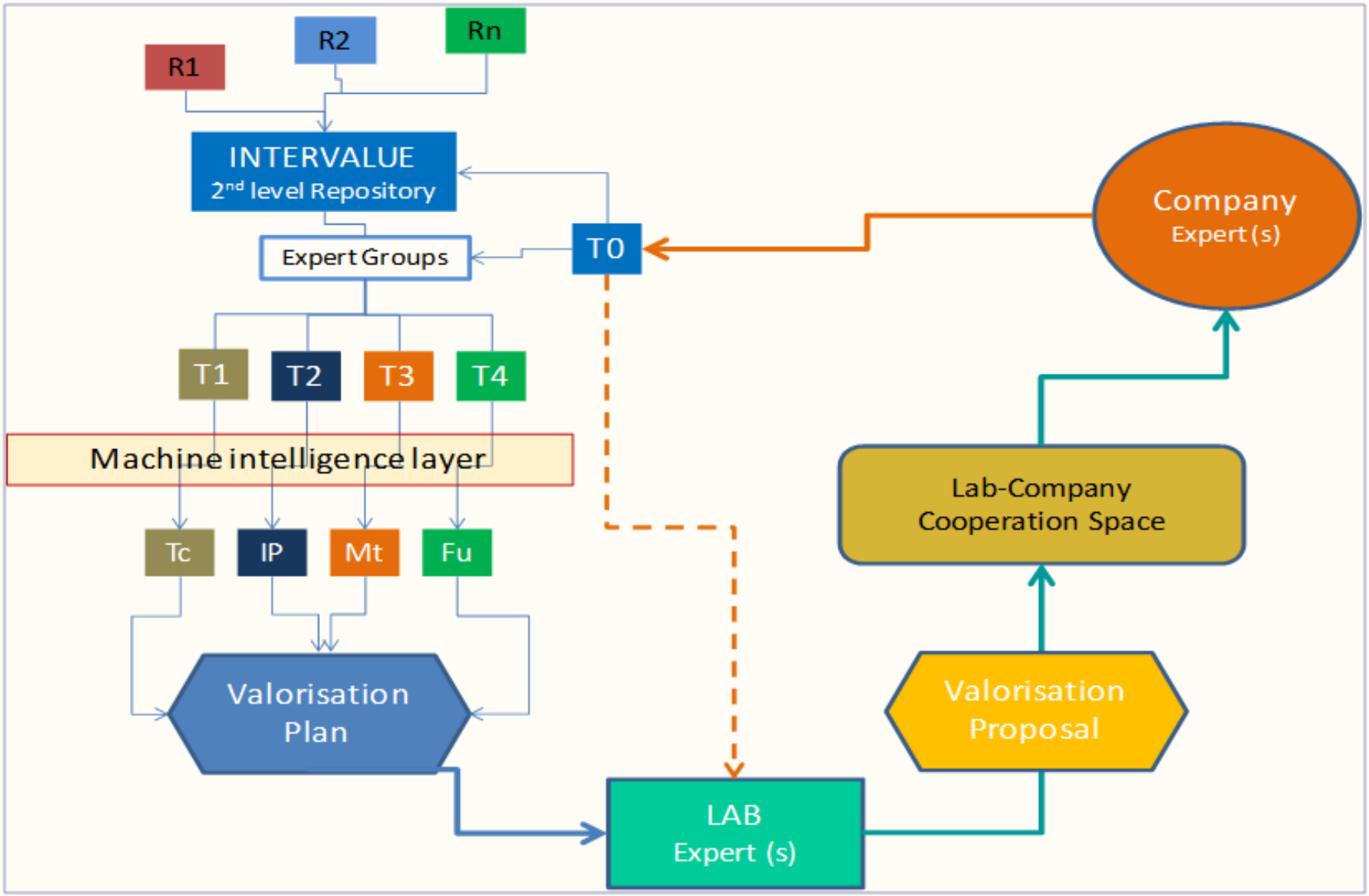
(1) **R&D repository** – description files
(2) **Experts data base**
(3) **Valorisation plans**
- Technical feasibility
- Scientific relevance
- Market potential
- Investment opportunities

(4) **Brokerage events**
(5) Online dissemination

(6) **Secure agreement space**
(7) IPR and other guides for research valorisation

R&D Repository + Valorisation Plans + IP Agreements

Intervalue: R&D valorisation workflow



Intervalue platform: Content from 210 R&D organisations

Type of R&D Results – A sample from 5 regions

	Central Macedonia	Friuli region	South-West Oltenia	Yugozapaden	Central Hungary
Software	78%	65%	58%	0%	21%
Product	16% New 22% Improvement of existing	48% New 6% Improvement of existing	27% New 19% Improvement of existing	**45% New** **21% Improvement of existing**	**61% New** **46% Improvement of existing**
Service	59% new 19% Improvement of existing	42% new 10% Improvement of existing	35% New 8% improvement of existing	7% New 0% improvement of existing	4% New 4% improvement of existing
Process	**9% New** 9% Improvement of existing	**10% New** 13% Improvement of existing	**8% New** 19% Improvement of existing	**24% New** 24% Improvement of existing	**39% New** 14% Improvement of existing

Central Macedonia	Friuli region	South-West Oltenia	Yugozapaden	Central Hungary
Thematic areas of technology				
ICT 36% Environmental engineering 18% Electrical, electronic and computer engineering 14% Civil engineering 10%	**ICT 55%** Electrical, electronic and computer engineering 26% Environmental engineering 16%	**ICT 67%** Electrical, electronic and computer engineering 22% Organization and management of enterprises 15% Other engineering 11%	**Environmental engineering 31%** Civil engineering 20% Mechanical engineering 18% ICT engineering 16% Chemical engineering 13% Chemistry 13% Biochemistry 11%	**Biological sciences 18%** **ICT 18%** Civil engineering 14% Electrical, electronic and computer engineering 14% Chemistry 11% Physical science 11%
Sectors of potential application –Region specific				
Computer and related activities 42% Research and development 22% Health and social work 14% Other business activities 14% Agriculture 10% Public administration and defense 10%	Computer and related activities 48% Research and Development 23% Health and social work 6% **Manufacture of food and beverages 6%** **Manufacture of machinery 6%**	Other business activities 63% **Manufacture of electrical machinery and apparatus n.e.c. 19%** **Manufacture of machinery and equipment 19%**	Computer and related activities 16% Health and social work 16% Construction 13% **Manufacture of other transport equipment 13%** **Recycling 13%** **Manufacture of electrical machinery 11%**	Research and development 25% **Manufacture of medical precision and optical instruments 18%** **Manufacture of electrical machinery apparatus 14%** Education 11% Health and social work 11%

Stage of development – Need for further development

	Central Macedonia	Friuli region	South-West Oltenia	Yugozapaden	Central Hungary
Tested	Yes 88% No 13%	Yes 87% No 10%	Yes 23% No 77%	Yes 69% No 31%	Yes 64% No 32%
Result of testing					
Immediately exploitable	45%	39%	17%	46%	40%
Minor changes/ additions/ tests	55%	68%	44%	43%	52%
Needs more changes/ additions/ tests	**17%**	**21%**	**72%**	**43%**	**44%**
Needs of resources for full exploitation					
Human resources	Adequate 61% **Partly ad. 68%** Not able 4%	Adequate 54% **Partly ad. 61%** Not able 18%	Adequate 84% **Partly ad. 52%** Not able 4%	Adequate 64% **Partly ad. 25%** Not able 21%	Adequate 52% **Partly ad. 41%** Not able 11%
Hardware/ technical resources	Adequate 42% **Partly ad. 69%** Not able 4%	Adequate 43% **Partly ad. 52%** **N**ot able 19%	Adequate 16% **Partly ad. 47%** Not able 53%	Adequate 38% **Partly ad.31%** Not able41%	Adequate 32% **Partly ad. 41%** Not able 50%

Innovation potential of R&D

	Central Macedonia	Friuli region	South-West Oltenia	Yugozapaden	Central Hungary
Innovation Potential					
Technology driven	**67%**	**74%**	**47%**	**11%**	**41%**
Market driven	**57%**	**70%**	**0%**	**46%**	**30%**
Replacement of existing product	13%	15%	13%	61%	22%
Product related to cost reduction	7%	15%	27%	54%	15%
Radical new product	**7%**	**7%**	**20%**	**4%**	**19%**
Added value					
Higher quality	25%	23%	26%	31%	46%
Better technical characteristics	**64%**	**63%**	**63%**	**54%**	**71%**
Lower cost	14%	17%	16%	58%	21%
New services/ option	64%	33%	37%	8%	4%

Target Market

	C. Macedonia	Friuli region	S-West Oltenia	Yugozapaden	Central Hungary
National	10%	3%	13%	61%	4%
European	7%	3%	17%	39%	19%
Global	**83%**	**97%**	**87%**	**36%**	**81%**
Product characterization					
Base	3%	4%	67%	22%	9%
Leading	**67%**	**63%**	**29%**	**56%**	**35%**
Key	37%	33%	4%	22%	57%
Current stage of market					
Existing	**53%**	**93%**	**75%**	**85%**	**64%**
Emerging	60%	7%	38%	27%	44%
Growth	29%	48%	43%	46%	17%
Maturity	4%	12%	10%	42%	0%
Product to be marketed to					
Regulated markets	25%	24%	40%	27%	16%
Markets of free negotiation	**100%**	**86%**	**60%**	**85%**	**96%**

IP Protection mode

	Central Macedonia	Friuli region	South-West Oltenia	Yugozapaden	Central Hungary
Patent	**43%**	**47%**	**54%**	**54%**	**70%**
Trademark	0%	3%	8%	18%	41%
License	20%	10%	42%	0%	0%
Copyright	23%	37%	8%	0%	4%
Secrecy	10%	0%	0%	0%	0%
Industrial design	7%	3%	0%	21%	7%
Other	3%	10%	0%	46%	22%

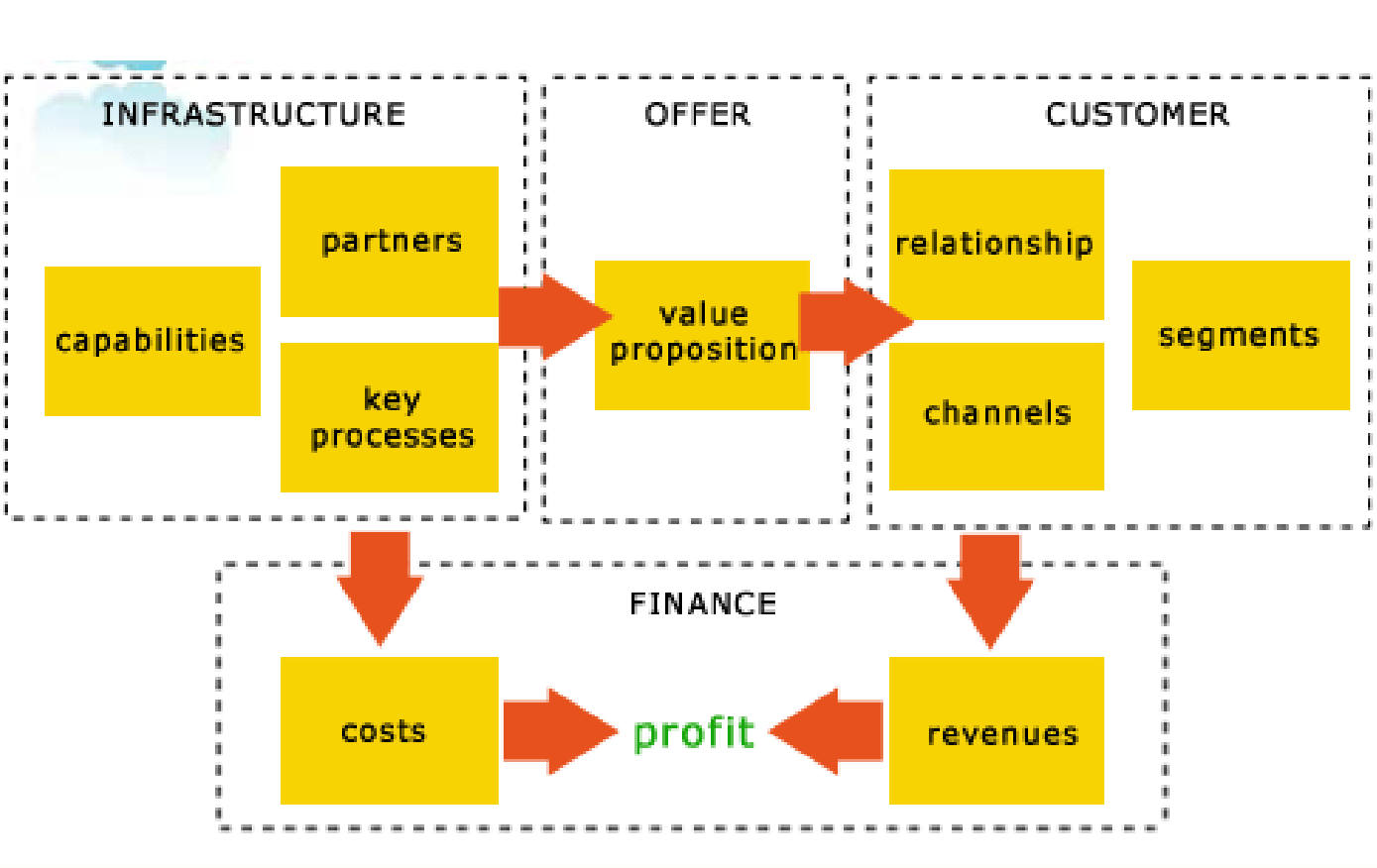
- **Owners of the results are research units within universities and research centers, individual researchers, and technology transfer offices, which is an indication of the vague framework of ownership of R&D results.**
- Knowledge on IP protection is limited to specific methods. Patent is the most popular option. In cases where products are related to software, the patent application is directed to the USPTO. In Bulgaria and Hungary, most of 'other' options refer to utility models.

3. Business model discovery:
Lessons from PEOPLE

The PEOPLE project looked at business models relying on open innovation and smart environments, combining

- Collaborative funding
- Crowd-sourcing
- Cloud-based solution

Business models



Business models serve two important objectives:

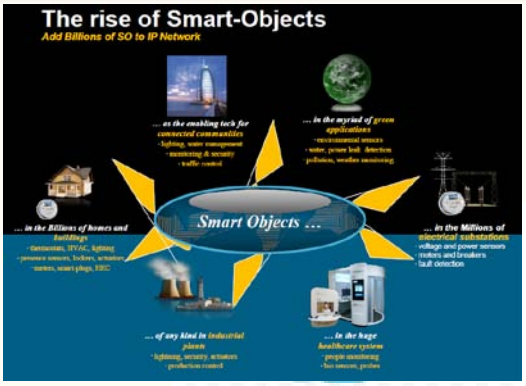
- **Create value** by defining a series of activities from raw materials to the final product, and
- **Capture a portion of this value** by establishing a competitive advantage

Towards Open Business Models: Stages of maturity

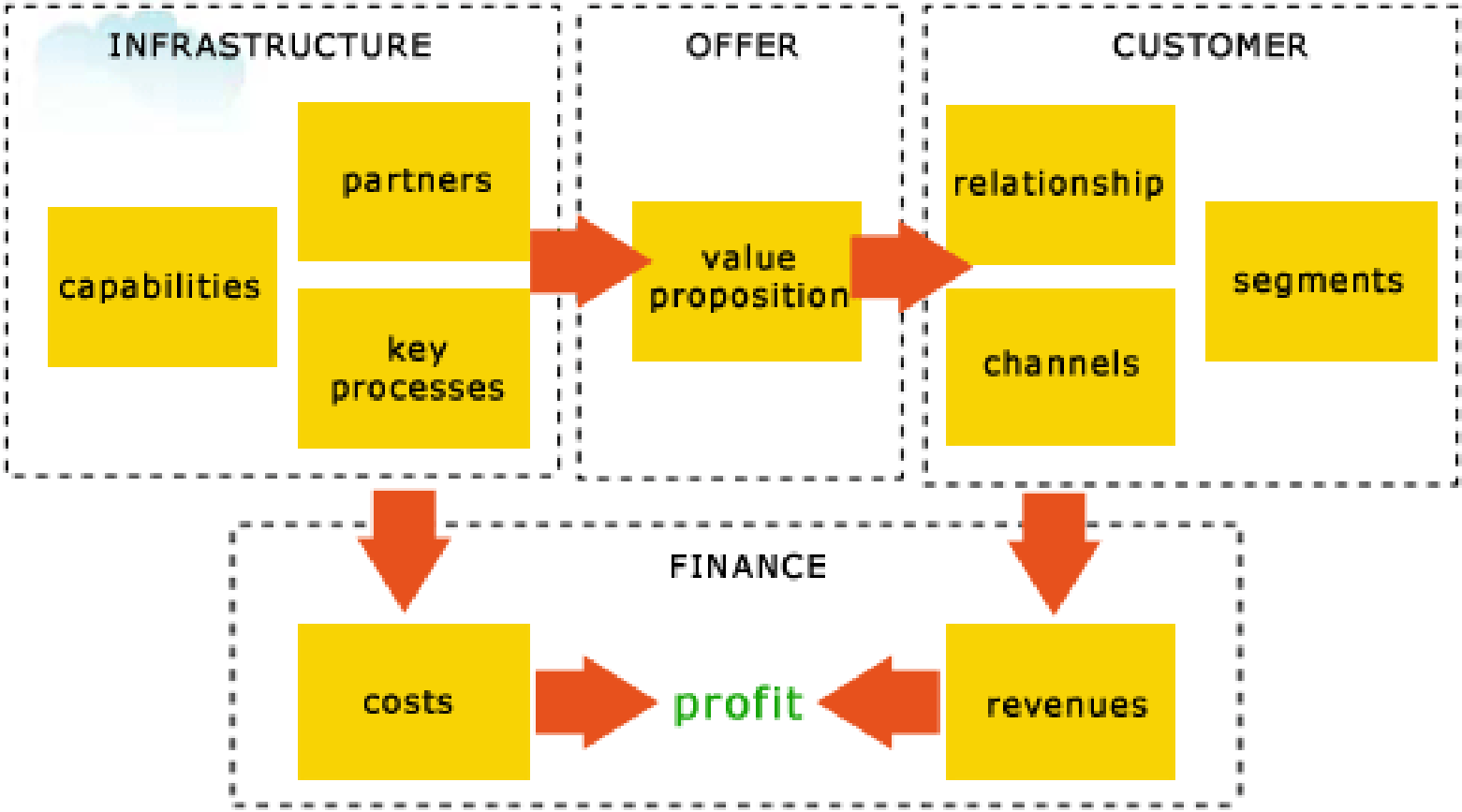
	Business model	Innovation process	IP management
1	**Undifferentiated**: no differentiation, hard work, but can't attract capital, cannot scale	None	NA
2	**Differentiated**: advantages over performance, ad hoc innovation, but hard to sustain	Ad hoc	Reactive
3	**Segmented**: serves multiple segments, more volume, lower costs, but still internally focused	Planned	Defensive
4	**Externally aware**: harnesses external sources of knowledge to complement internal capabilities	Externally supportive	Enabling asset
5	**Integrated**: External sources routinely utilized, unused internal ideas flow outside , systems integrator of internal and external technologies	Connected	Financial assets
6	**Platform**: Ultimate stage of open innovation, benefits from others investments in the platform, **an ecosystem is created**	New business opportunities	Strategic assets

Sources: Chesbrough 2006 and 2008 http://www.slideshare.net/SiliconValleyST/business-model-innovation-by-h-chesbrough

Business models in smart environments



Will Smart Environments disrupt your Business Model?



Business Models in smart environments

BUSINESS MODEL BLOCK	POTENTIAL CHANGES	ADVANTAGES
INFRASTRUCTURE (Partners)	Crowdsourcing skills, ideas, and competences over platforms and virtual networks	➢ Increase the skill base and innovation capability of the company
OFFER (Value proposition)	Turn products to smart objects Use smart object-components Turn products to hybrid / manage product hybrid identities	➢ Connect products to IoT ➢Real time operation assess ➢ Tracing components
CUSTOMER (Channels and market segments)	Use other companies distribution channels Create collaborative marketplaces Turn customers to producers of services for the company products	➢ Increase customer base ➢ Increase customer loyalty ➢ Scale down marketing and distribution costs
FINANCE (Costs)	Leasing infrastructure and services from the cloud Maintain data and services on the cloud	➢ Reduce initial investments ➢ Reduce operational costs ➢ Scaling up and down hardware

New forms of funding: Collaborative funding

- **Public Development Funding,** regional – national – international, supporting development and inclusion
- **Advertising ,** for commercially oriented services or services related to promotion.
- **Sponsorship,** overlap with advertising, but differ in the fact that sponsors endorse / support a cause/organization and its operation.
- **Reselling,** a service that may be appealing enough to be resold from one organization to another.
- **Free Core Service & Paying for Additional Features,** a core service is open to the public and upon paying a fee, additional features are made available to users.
- **Leasing,** for some platforms that may be attractive enough to be given to a private company for operation
- **Data Monetization,** based on "selling" data collected and analysed through the various apps and e-services.
- **Crowd Funding,** by raising capital through collective cooperation and trust by people that pool money to support efforts and initiatives by other people and organizations.

Smart Specialisation creates Favorable Environments
but
BOWIE is an individual discovery