Innovation Management & Technology Transfer

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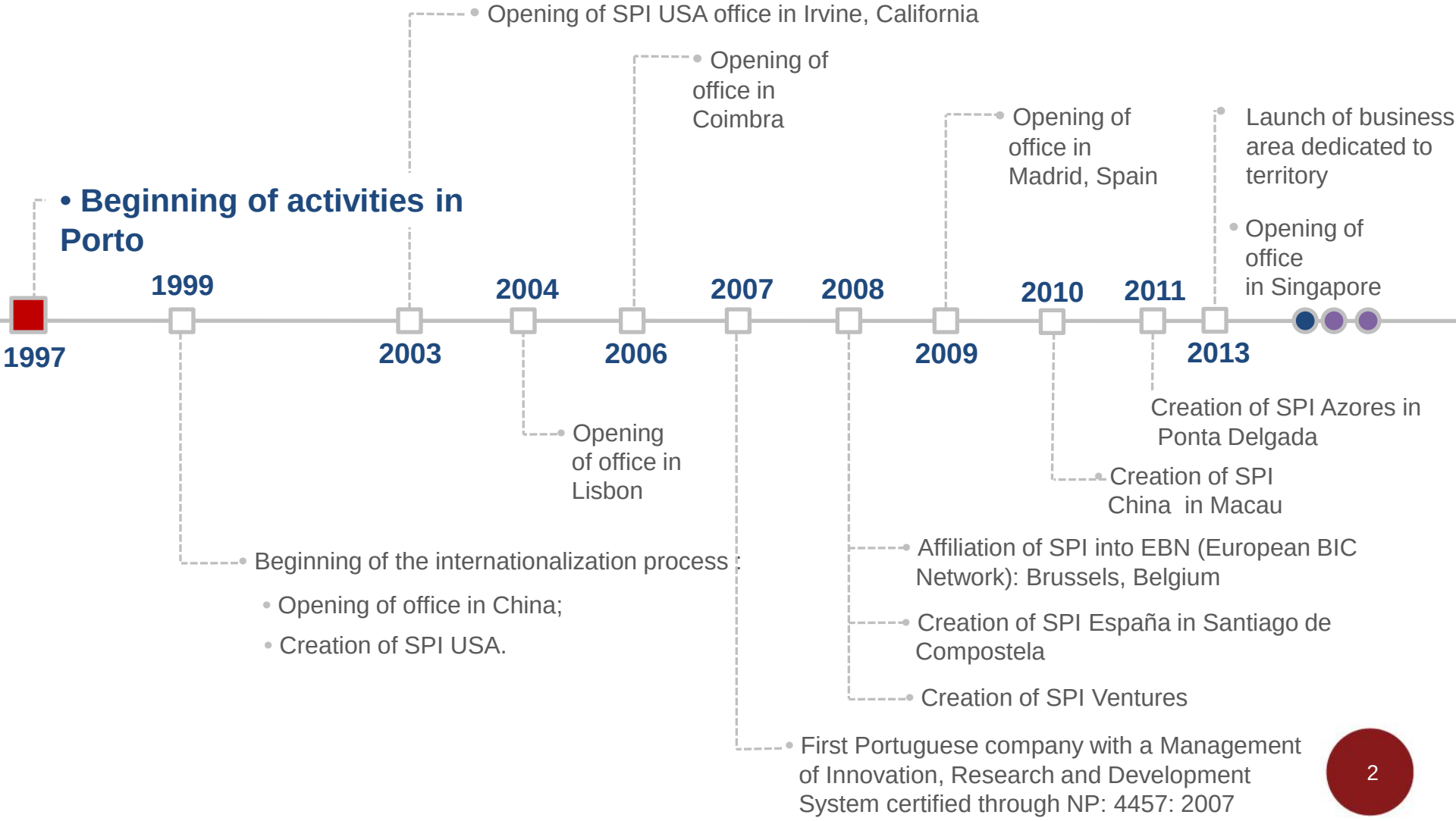
Sociedade Portuguesa de Inovação

Introduction to SPI



Introduction to SPI

EUROPEAN COMMISSION| FP7 PROJECTS

EUROPEAN SCOPE

INTERNATIONAL SCOPE

01. Introduction to Innovation

What is Innovation?

Definition

Innovation is the successful production, assimilation and exploitation of novelty in the economic and social spheres.

- The renewal and enlargement of the range of products and services and the associated markets;
- The establishment of new methods of production, supply and distribution;
- The introduction of changes in management, work organisation, and the working conditions and skills of the workforce.

European Commission's Green Paper on Innovation

Types of innovation

Product/service: introduction in the market of new or significantly improved products and services, in respect to their features and usability.

Other examples?

Types of innovation

Process: implementation of new or significantly improved processes (manufacturing, logistics, and distribution).

Other examples?

Types of innovation

Organisation: implementation of new organisational methods in business practice and in external relations.

Other examples?

Types of innovation

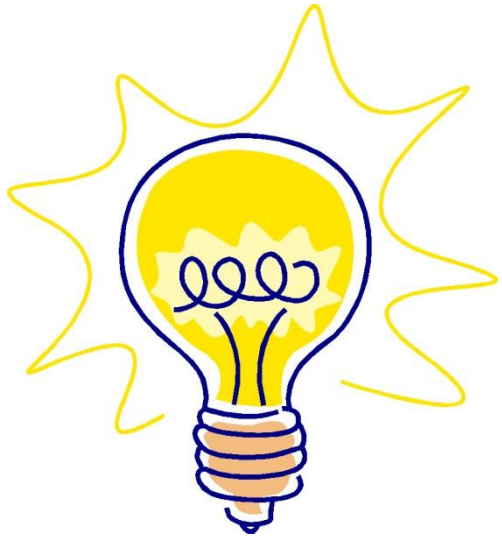
Marketing: implementation of new marketing methods and tools, involving significant improvements in the product design, package, price, distribution or promotion.

amazon

Other examples?

Innovation – a metaphor

Grades of Innovation

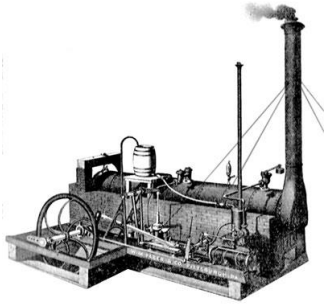


Incremental innovation: The new product incorporates a few new elements, absent in the previous one, without changing the basic functionalities

Grades of Innovation

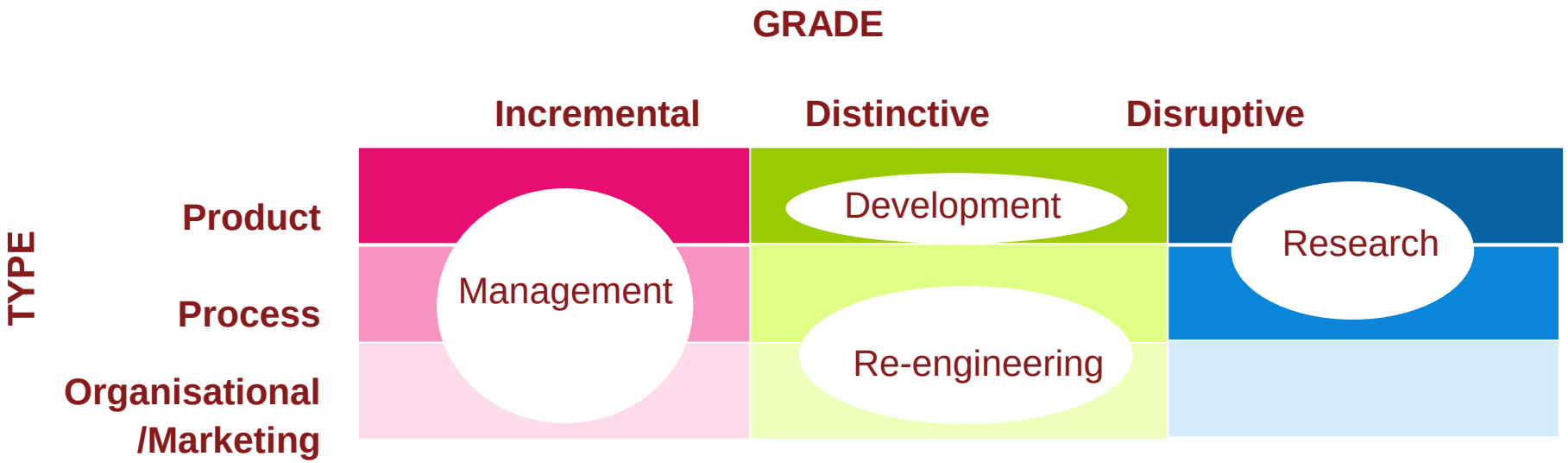
Distinctive innovation: Although possessing some traits similar to previous products, the new product incorporates attributes which correspond to previously non-existing functions.

Grades of Innovation



Disruptive innovation: Complete break-up with previously existing products. It may arise in response to the satisfaction of a certain need, or by creating a new need which previously did not exist.

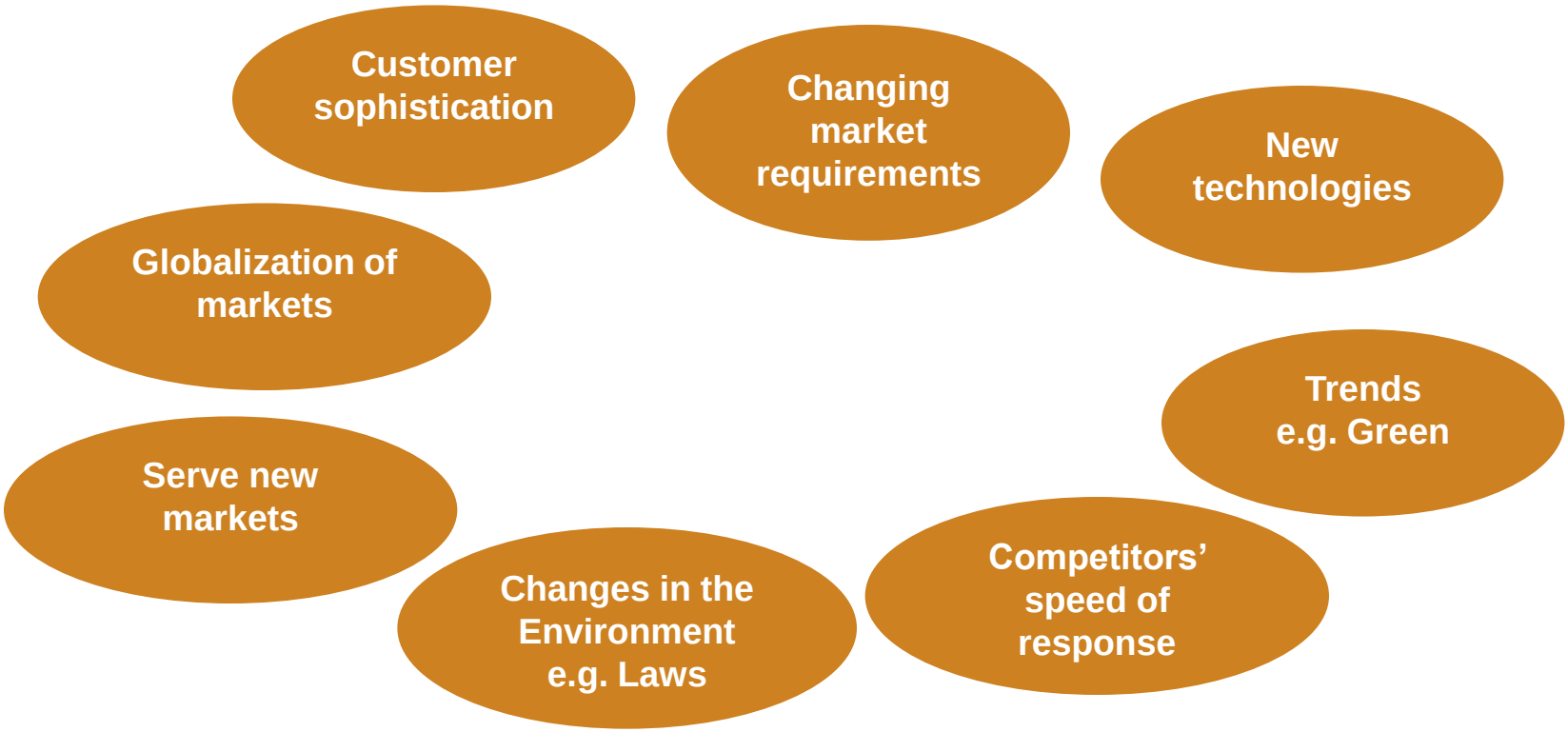
Grades of Innovation



Each path of innovation has a distinct positioning.

Adriano Freire

Why do enterprises innovate?



Differentiation

Even a pumpkin can easily stand out in a crowded field.
What's stopping you from doing the same with your product?

Benefits

- Profit/Margins increase
- Product diversification
- Product differentiation
- Satisfying customer needs
- Customer loyalty
- Keeping or increasing market quota

SURVIVE IN THE MARKET

Risks

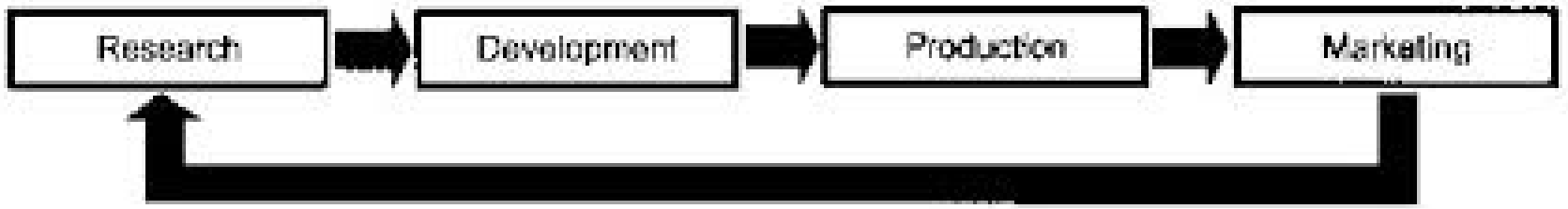
- Non-acceptance of the product on the market
- High investments that run the risk of not being profitable during the product life cycle
- Excessive concentration of resources and attention on the new product at the expense of quality and marketing of the existing products
- The company becoming dependent on the new product
- Failure in product development and market entry

Barriers

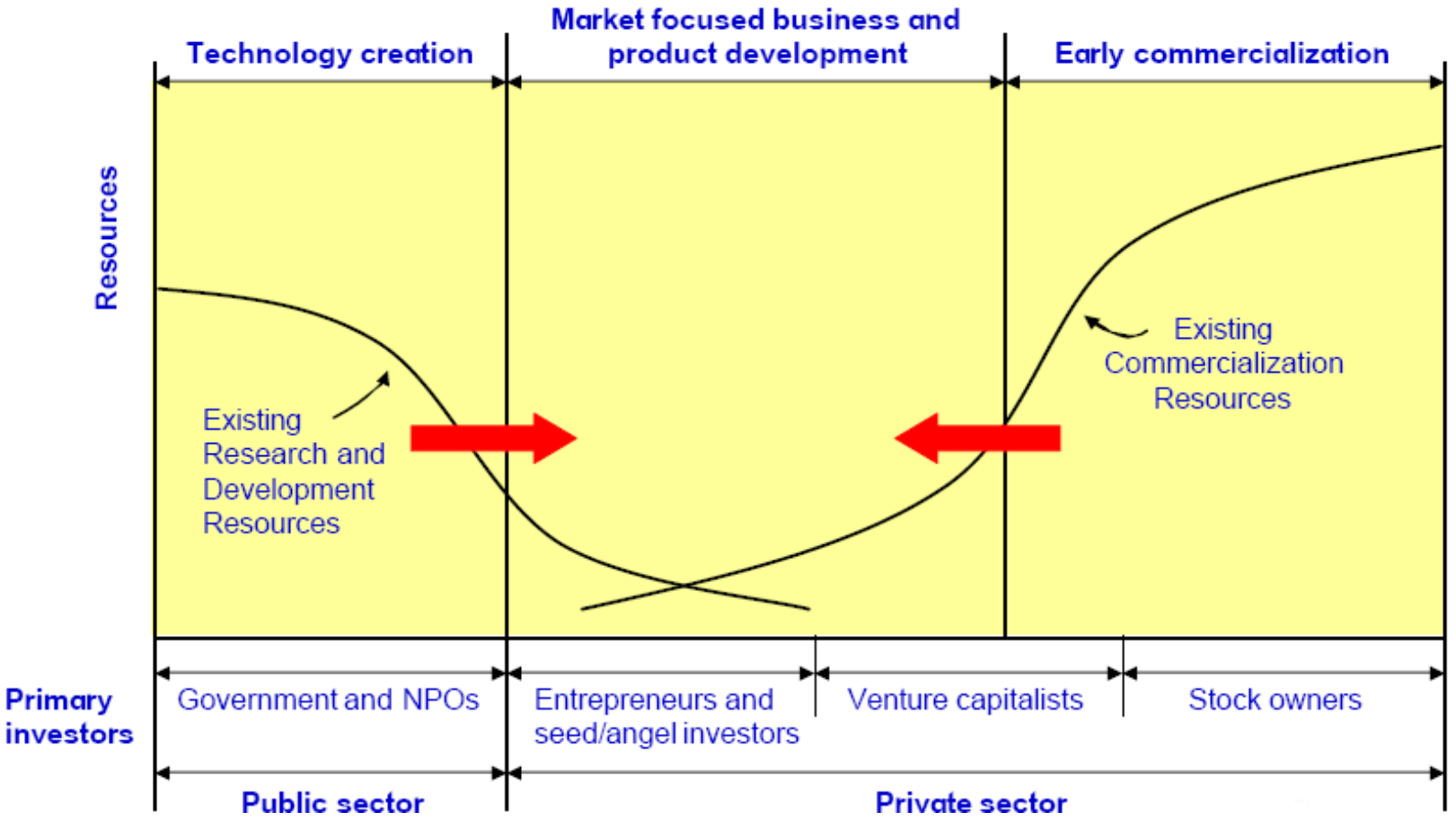
- Failure to recognise change/threats/opportunities
- Lack of ambition and vision
- Risk aversion
- Lack of market understanding
- Lack of expertise in the process
- Lack of finance

02. Innovation System

The linear model of innovation



Innovation System

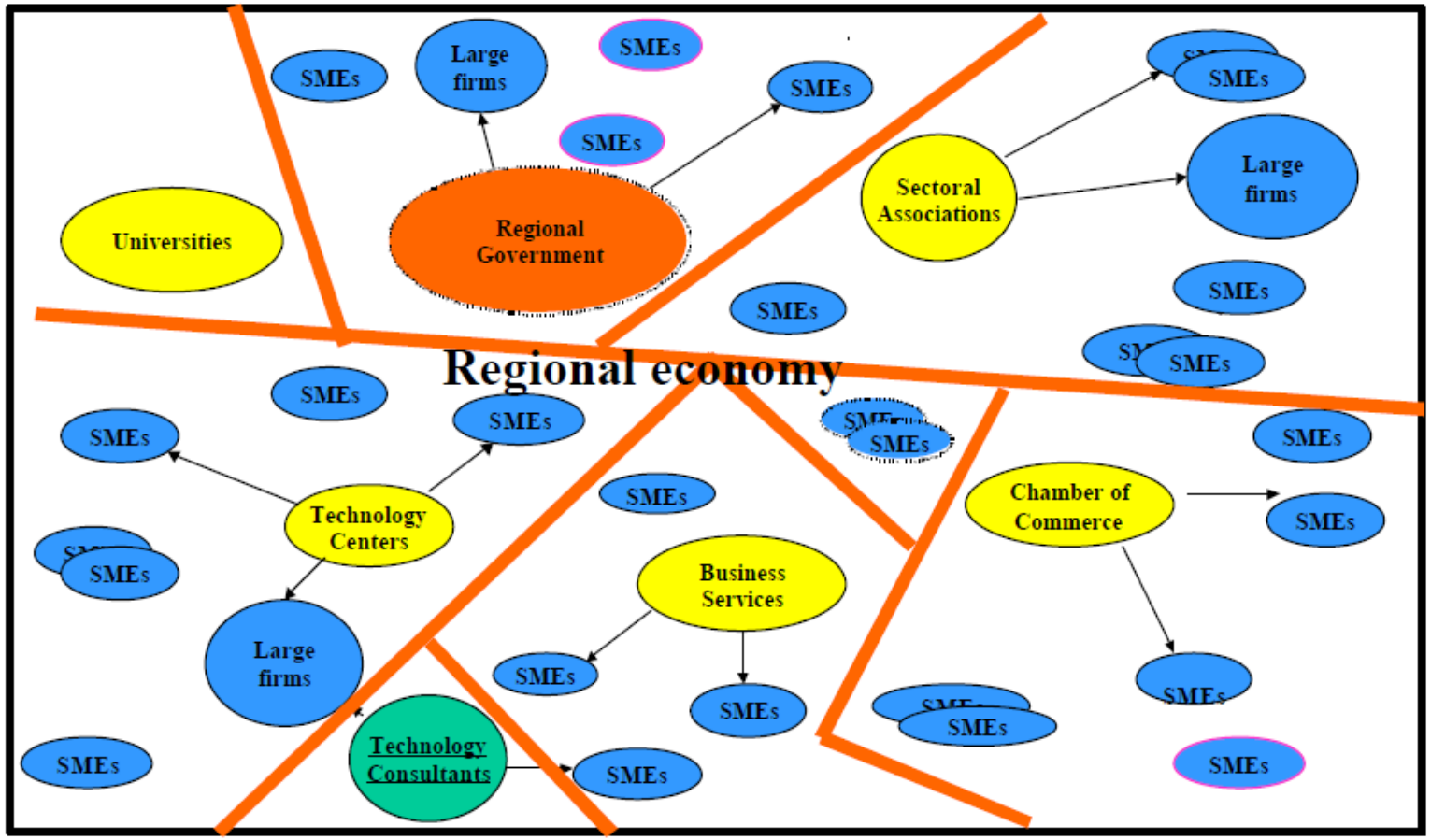


Innovation System

" .. the network of institutions in the public and private sectors whose activities and interactions initiate, import, modify and diffuse new technologies." *Freeman*

".. the elements and relationships which interact in the production, diffusion and use of new, and economically useful, knowledge ... and are either located within or rooted inside the borders of a nation state." *Lundvall*

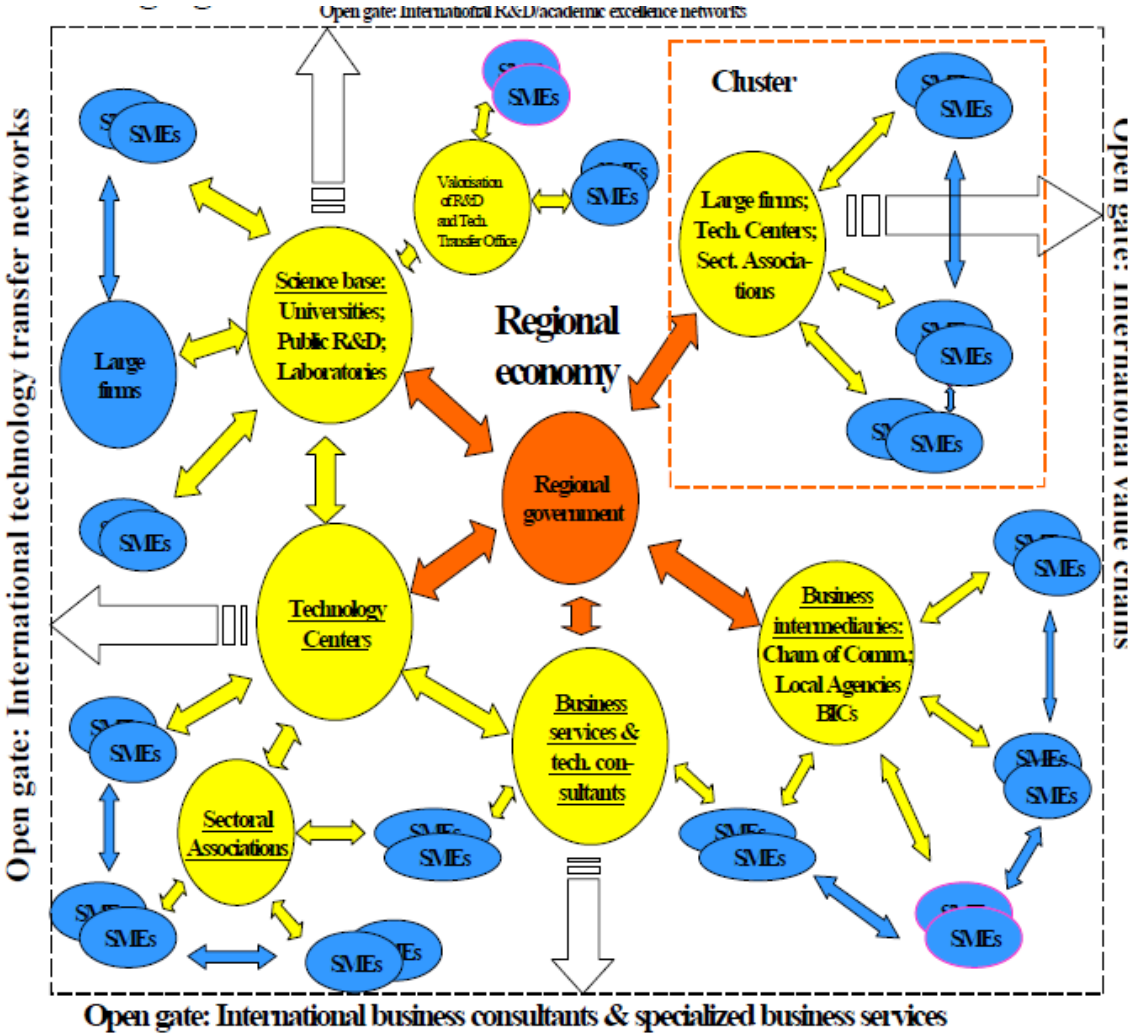
Fragmented regional innovation system



M. Landabaso: Learning Regions in Europe

Innovation System

Innovation system in a learning region



M. Landabaso: Learning Regions in Europe

- **Importance of establishing connections**

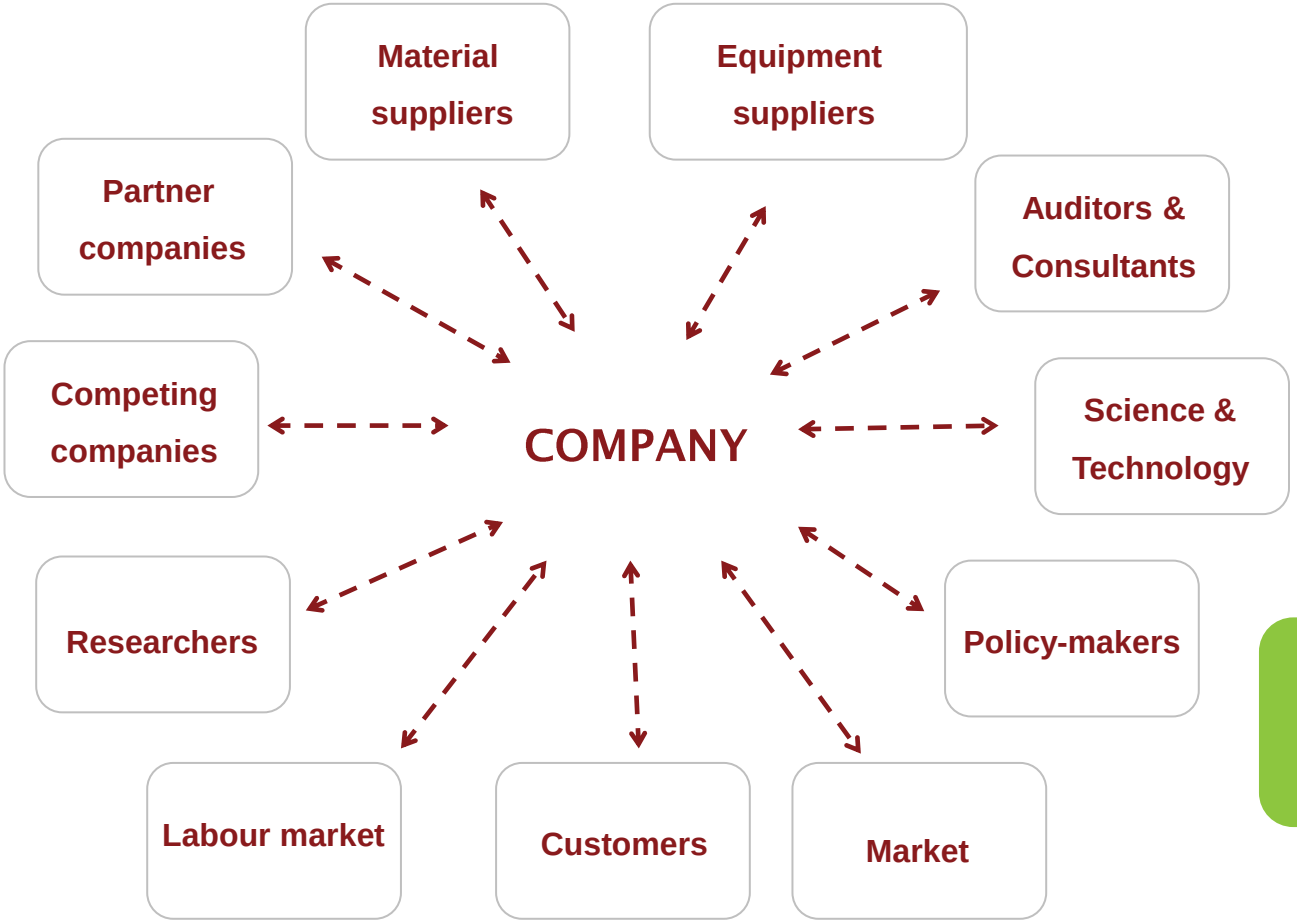
Two actions necessary to stimulate and enhance the innovation system:

-> **Matching** (match innovation supply and demand);

-> **Linking** (establishing links between stakeholders)

03. Importance of Cooperation

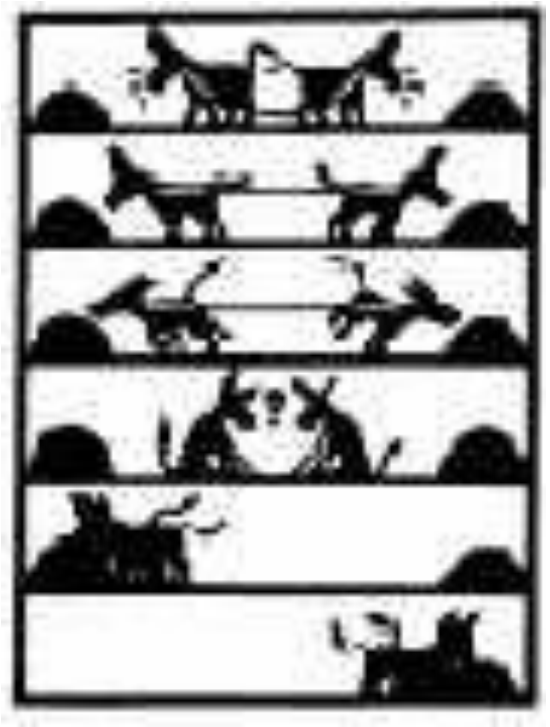
Importance of cooperation



How could these relations be innovatively explored?

Importance of cooperation

- **But also simultaneity of Cooperation and Competition between stakeholders**



Importance of cultural change

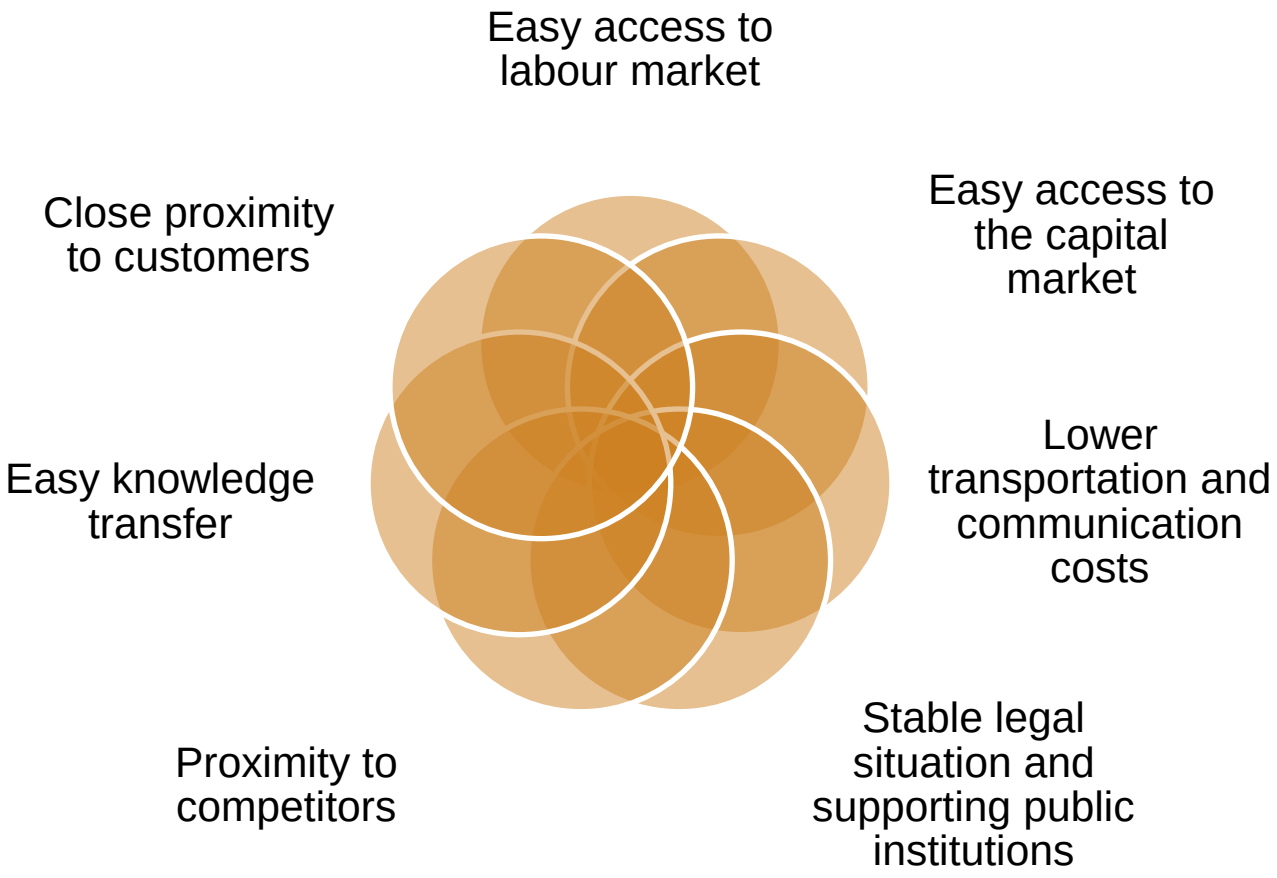
Importance of cooperation

"A cluster is a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities."

Michael Porter

Importance of information interaction and external relations

Importance of cooperation



04. The Innovation Management System

The Innovation Management System

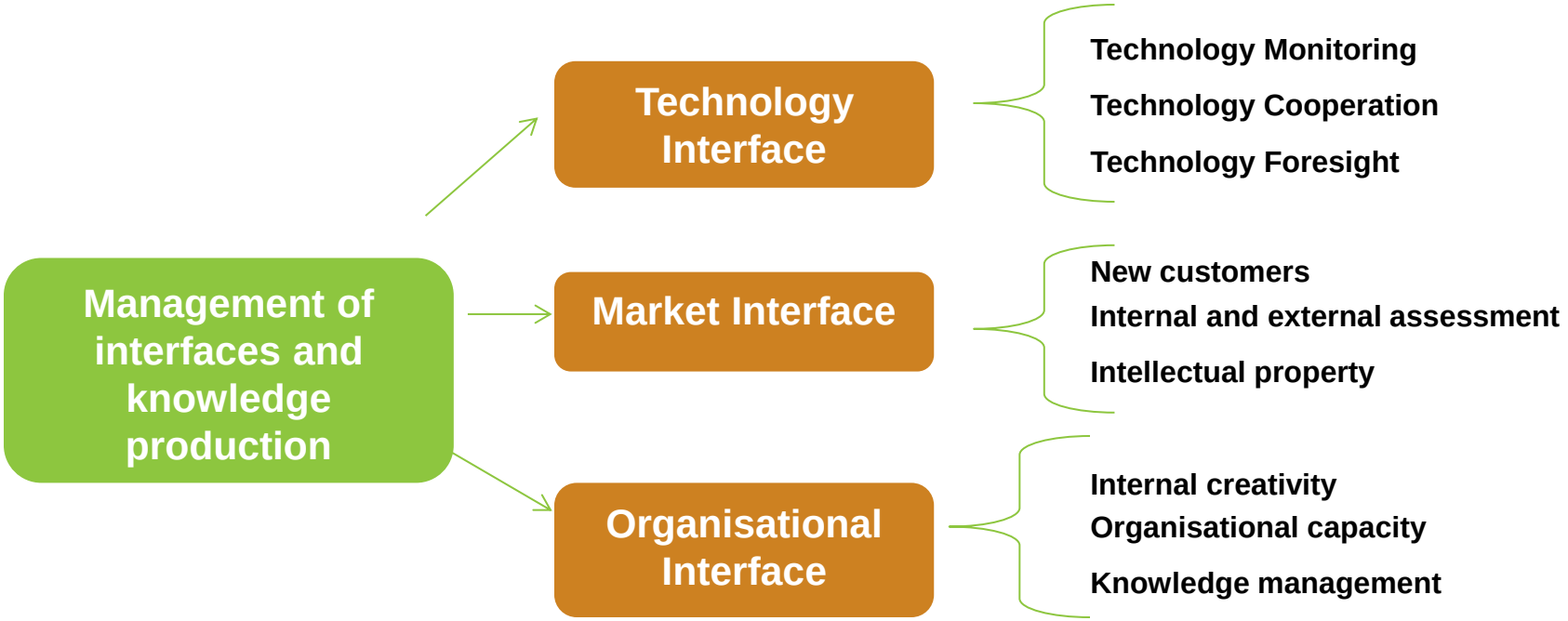
Innovation Management is the systematic planning, steering and controlling of innovations in an organisation.

It is part of the implementation of the business strategy.

Innovation Management needs to be tailored to a company's individual requirements due to different cultures, size, organisation, business models, strategy etc.

The Innovation Management System

As part of the management of interfaces and knowledge production there are several procedures that should be implemented to monitor different sources of knowledge. These different sources are shown in the following scheme:



The Innovation Management System

Regarding the technology interface the company must take into account the following mechanisms:

Technology interface	**Technology Monitoring**	Systematic observation of the technology on the market, the emerging technologies and the technological trends and developments
	Technology Cooperation	Partnership activities with other institutions and organisations in order to share technical and scientific information and develop RDI activities (prototypes, products or processes)
	Technology Foresight	Foresight activities focusing on the development of technologies presenting potential economic interest

The Innovation Management System

Regarding the market interface the company must take into account the following mechanisms:

Market Interface	**New customers**	Observation and analysis of potential customers and new markets
	Internal and external assessment	Analysis of the internal and external context of the organisation and its position with regard to opportunities and threats
	Intellectual property	Management of the possibilities offered by the intellectual property systems for the protection, exploitation and dissemination of the results obtained in the innovation process

The Innovation Management System

Regarding the organisational interface the company must take into account the following mechanisms:

Organisational Interface	**Internal creativity**	Practices harnessing and stimulating the creativity within the organisation
	Organisational capacity	Strategies for designing the structure and organisational models for innovation
	Knowledge management	Practices for the generation, validation and dissemination of existing knowledge within the organisation and for the management of the needs of external knowledge

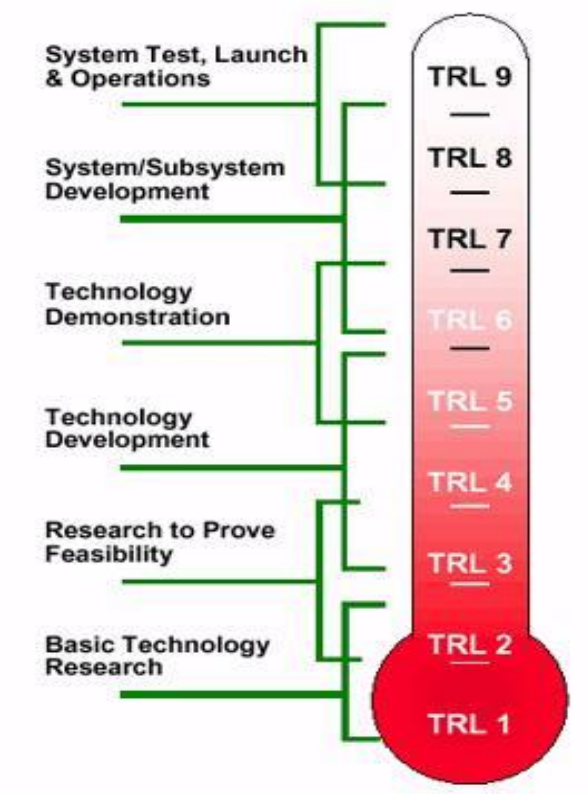
05. Technology Readiness Levels

Technology Readiness Levels

Technology Readiness Level (TRL)

Technology Readiness Levels (TRL) are a type of measurement system used to assess the maturity level of a particular technology.

Each technology project is evaluated against the parameters for each technology level and is then assigned a TRL rating based on the projects progress.



NASA

Technology Readiness Level (TRL)

TRL	
TRL 1	Basic principles observed
TRL 2	Technology concept formulated
TRL 3	Experimental proof of concept
TRL 4	Technology validated in lab
TRL 5	Technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)
TRL 6	Technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)
TRL 7	System prototype demonstration in operational environment
TRL 8	System complete and qualified
TRL 9	Actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)

Horizon 2020 – Work Programme 2014/2015, General Annexes

06. Technology Transfer

Technology Transfer in its broadest sense is:

The flow of know-how, experience and equipment amongst different stakeholders such as governments, private sector entities, financial institutions, NGOs and research institutions

Source: United Nations - UNCTAD series Transfer of Technology 2001

Types of stakeholders involved in technology transfer may include:

- Governments (national, federal, regional, provincial, local, municipal)
- Private-sector business (transnational, national, local/SMEs - including producers, users, distributors, and financial institutions)
- Donors (Multilateral Banks, Bilateral Agencies)
- International institutions (WTO, OECD)
- Research (R&D centers, labs, universities)
- Media/public groups (Community groups, NGOs)

In the process of transferring technology successfully (i.e. desired impact) it is vital:

(…) All key players and stakeholders must have the necessary knowledge and skills to perform the roles and tasks expected of them (…)

Source: UNEP

In the process of technology transfer partnerships and networks of various stakeholders are often involved and may depend on the coordination of multiple organizations, such as:

- **Networks of information service providers**
- **Networks of business consultants**
- **Networks of financial firms**
- **And partnerships among stakeholders**

GOVERNMENTS CAN FACILITATE NETWORKS AND PARTNERSHIPS

Motivations and Barriers for Technology Transfer

Firms are motivated to acquire technologies due to the potential for:

- Cost reductions (e.g. Production costs) and/or increase in revenue
- Increased technical capabilities or quality reductions that cannot be achieved on their own
- Higher perceived status of "international level" technologies
- Access to managerial and marketing expertise, and sources of capital
- Greater access to export markets
- Access to new distribution networks

Source: UNIDO - Innovative Technology Transfer Framework Linked to Trade

Motivations and Barriers for Technology Transfer

Possible barriers include:

- Lack of human capital - technical capabilities
- Lack of absorptive capacity - ability to recognize the value of new external information and successfully adopt, assimilate and exploit it
- Lack of connectedness – weak interpersonal relationships, poor communication among partners, weak networking platforms
- Lack of trust – on an individual and/or organization level
- Lack of prior experience with partnerships – lack of contacts with foreign technology holders, lack of experience in foreign countries
- Lack of integrated policy and support

Source: UNIDO - Innovative Technology Transfer Framework Linked to Trade

Transfer Channels of Technology Transfer

Common Private sector (industry and other) channels include:

- Foreign direct investment
- Joint Ventures
- Licensing
- Sub-contracting and Procurement
- Human Resource and Technical Assistance
- Co-production and Strategic Partnerships
- Company Acquisition

PRIVATE SECTOR CHANNELS CAN BE HIGHLY INFLUENCED BY GOVERNMENT POLICIES

Brainstorming

Brainstorming

Let´s think of 5 important ideas to develop **innovation support schemes!**

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