The Triple Helix Model – Role of different entities
01. The Triple Helix Theoretical Framework
02. Necessary Conditions
03. Role of Difference Entities
01. The Triple Helix Theoretical Framework
Triple Helix model to describe the development of regional innovation systems:

**Triple Helix I**
- Government plays the lead role, driving academia and industry.
- Knowledge institutions begin to concentrate certain R&D activities, with some networks emerging around them.

**Triple Helix II**
- Industry is the driving force, with the other two spheres as secondary support structures.
- Actors from three spheres begin working together to generate new strategies and ideas.

The Triple Helix III – knowledge based society

Academia, government, industry together are “generating a knowledge infrastructure in terms of overlapping institutional spheres, with each taking the role of the other and with hybrid organisations emerging at the interfaces.”

Etzkowitz and Leydesdorff, 2000
The Triple Helix III is comprised of three elements:

1. A prominent role for the university in innovation, on par with industry and government in a knowledge-based society.
2. A movement toward collaborative relationships among the three major institutional spheres, in which innovation policy is increasingly an outcome of interaction rather than a prescription from government.
3. Each institutional sphere also “takes the role of the other” performing new roles as well as their traditional function.

“Institutions taking non-traditional roles are viewed as a major potential source of innovation in innovation.”

*Triple Helix IX International Conference 11-14 July 2011*
The Triple Helix Model – Role of different entities

Academia – Industry – Government partnerships are a win-win for all parties:

**Academia**
- New funding
- New research and education programmes
- Student recruitment and placement

**Industry**
- High value research projects
- Access to co-funded (subsidised) research
- Access to intellectual property
- Access to students

**Government (Regional)**
Economic growth / Advanced industries / Educated workforce
02. Necessary Conditions
Effective Triple Helix partnerships ALWAYS require a Culture Change!
New realities encourage Triple Helix partnerships

Academia/Government budgets are decreasing + Industry is looking to reduce costs = Opportunity for AIG Partnerships (Open Innovation Model)
The university - industry relationship has evolved into a complex and multi-facet relationship.

Leading universities provide a “one-stop shopping” experience for industry.

AGAIN - “Institutions taking non-traditional roles are viewed as a major potential source of innovation in innovation.”
The Triple Helix Model – Role of different entities

Necessary Conditions - University

- an ability to interact with industry
- an ability to understand industry needs
- an interest to support those needs – willing to put Industry Needs above Personal Research Interests

Dynamic Faculty

- access to necessary infrastructure (equipment, laboratories, etc)
- industry relationships (joint projects) are encouraged by the department/college/university
- time is allocated to research
- IP, licensing, publishing are given weight in the faculty review process
- a department/position responsible to developing industry relationships – Corporate Relations

Supportive Environment
The shift from **Closed Innovation** to **Open Innovation** principles in industry:

**Closed Innovation** - “To profit from R&D, we must discover it, develop it, and ship it ourselves.

**Open Innovation** - “External R&D can create significant value: internal R&D is needed to claim some portion of that value”

[Diagram showing the shift from Closed to Open Innovation]
Necessary Conditions - Industry

- a high importance is placed on innovation
- belief/acceptance of the Open Innovation principles
- an understanding of the partnership potential value – confident the university can deliver
- ability to fund joint projects (e.g. Euros / equipment / materials / etc)
- the partnership provides possible leverage over their competitors (e.g. set period to implement the results before university discloses to the research community – publishes papers)
### Necessary Conditions - Government

<table>
<thead>
<tr>
<th>Provide Credibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Establish standards for hybrid organisations – builds confidence in industry</td>
</tr>
<tr>
<td>✓ Establish a 3(^{rd}) party open review process of partnership programmes</td>
</tr>
<tr>
<td>✓ Have industry well represented in all aspects (standards development, programme review processes, etc.)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supportive Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Give universities autonomy</td>
</tr>
<tr>
<td>✓ Remove the bureaucracy</td>
</tr>
<tr>
<td>✓ Provide incentives (Euros, tax credits, etc.)</td>
</tr>
<tr>
<td>✓ Understand that RDI is dynamic and may not produce immediate tangible results – requires a subjective evaluation process</td>
</tr>
</tbody>
</table>
03. Role of Different Entities
The primary role of collaborative RDI partners in a mature innovation system is:

**Research Organisations**
- Conduct industry relevant research
- Provide industry first access to research results

**Industry**
- Provide input to research topics
- Assess research progress and provide direction
- Co-fund research
Role of Different Entities

Through Example

US National Science Foundation
Industry/University Cooperative Research Centers
One of the most successful, if not the most, Triple Helix structures established in the United States

Program Snapshot

Over 30 years performance history

<table>
<thead>
<tr>
<th>61 Centers with 178 Sites</th>
<th>Students</th>
<th>Sustainability:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 1000 Memberships, 52% Large Business, 26% Small Business, 15% Federal Members (90% satisfaction)</td>
<td>2100 students involved</td>
<td>Over 40 Graduated I/UCRCs remain in operation</td>
</tr>
<tr>
<td>$16.4M in Program Funding</td>
<td>1000 graduated in 2011</td>
<td></td>
</tr>
<tr>
<td>$130M in Total Center Funding</td>
<td>30% hired by members</td>
<td></td>
</tr>
<tr>
<td>8:1 Leveraging of NSF funds</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A clear and concise mission statement:

- To contribute to the nation’s research infrastructure base by developing long-term partnerships among industry, academia and government.

- To leverage NSF funds with industry to support graduate students performing industrially relevant research.
Industry/University Cooperative Research Centers (NSF) – US

The objectives support the mission statement while accounting for the context of the region:

• To pursue fundamental engineering and scientific research having industrial relevance.

• To produce graduates who have a broad, industrially oriented perspective in their research and practice.

• To accelerate and promote the transfer of knowledge and technology between university and industry.
Industry/University Cooperative Research Centers (NSF) – US

**Mission**

NSF takes a supportive role throughout the life of the center

**Scope**

An I/UCRC is primarily funded by industry members, other federal agencies and other organisations

- Single or multi-research organisations

**Objectives**

**Funding Sources**

**Governance**

**Management**

**Selection Process**

**Monitoring & Evaluation Process**

**Government NSF**

**I/UCRC Discovery & Innovation**

**University Members**

**Members**
The Triple Helix Model – Role of different entities

Industry/University Cooperative Research Centers (NSF) – US

I/UCRCs work like a research “franchise” with operational guidelines and evaluation tools.

I/UCRCs attract industry participation through the NSF’s stamp of approval – gives the I/UCRC significant credibility.
Industry/University Cooperative Research Centers (NSF) – US

**Mission**

**Objectives**

**Scope**

**Funding Sources**

- NSF Programme
  - Seed money over 5 years
  - Renewed another 5 years

- Members (industry/gov’t)
  - Normally $20-35k per year
  - Minimum total of $300k from at least 6 firms

- Universities
  - Investment of Indirects (infrastructure/equipment)

**Governance**

**Management**

**Selection Process**

**Monitoring & Evaluation Process**

**Government Sponsors**

- Regional/National Competitive Funds

I/UCRC

**NSF Programme**

**Members** (industry/gov’t)

**Universities**

Investment of Indirects (infrastructure/equipment)
Industry/University Cooperative Research Centers (NSF) – US

- NSF is independent receiving funding directly from congressional appropriations with an oversight board.
- NSF’s board is comprised of industry and academia representatives nominated by the President.
- Known to have extensive external and internal reviews at the request of NSF’s Director and at the request of oversight bodies – e.g. Congressional oversight.
Industry/University Cooperative Research Centers (NSF) – US

I/UCRC NSF

- Center Proposal evaluation and award process
- Templates for all necessary center management activities – “A Guide for Directors and Other Stakeholders”, agreement templates, meeting agenda templates, etc.
- Oversight of independent evaluations
- Funding renewal process

Independent Evaluator

I/UCRC Director

Mission
Objectives
Scope
Funding Sources
Governance
Management
Selection Process
Monitoring & Evaluation Process
Industry/University Cooperative Research Centers (NSF) – US

- Mission
- Objectives
- Scope
- Funding Sources
- Governance
- Management
- Selection Process
- Monitoring & Evaluation Process

The Triple Helix Model – Role of different entities
Industry/University Cooperative Research Centers (NSF) – US

Evaluation criteria include:

- Industry membership commitment
- High-quality, industry-relevant research
- Significant student involvement
- Clear technical focus, research need, and defined research agenda
- Strong industry and university collaboration
- High Center Director and research team capability
- Significant university administration commitment
Industry/University Cooperative Research Centers (NSF) – US

NSF provides additional funds so that centers will have the resources to hire independent evaluators to conduct a standardized evaluation.

Standardized evaluation includes:

- Submitting a yearly Evaluation Report detailing the center’s progress to members and associated faculty
- Conducting exit interviews when members leave the center
- Administering and analyzing an annual process and outcome questionnaire to Industrial Advisory Board members and faculty
Industry/University Cooperative Research Centers (NSF) – US

The evaluation process takes into account the difficulty of evaluating research – uncertain nature of the activity, the complexity of its processes, and the ambiguity and delays of its outputs.
Closing Comments

Key points that cannot be overlooked:

• Triple Helix partnerships require **dynamic and highly capable researchers** with an **interest to establish industry relations**.

• These collaborations in many cases take a **cultural change** to ensure they are successful.

• There **must be a strong incentive** for both the industry and the researcher or research organisation to collaborate.
HEADQUARTERS

SPI PORTO
Avenida Marechal Gomes da Costa, 1376
4150-356 Porto - PORTUGAL
E-Mail: spipporto@spi.pt
P: +351 22 607 64 00
F: +351 22 609 91 64
www.spieurope.eu

The Triple Helix Model – Role of different entities