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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

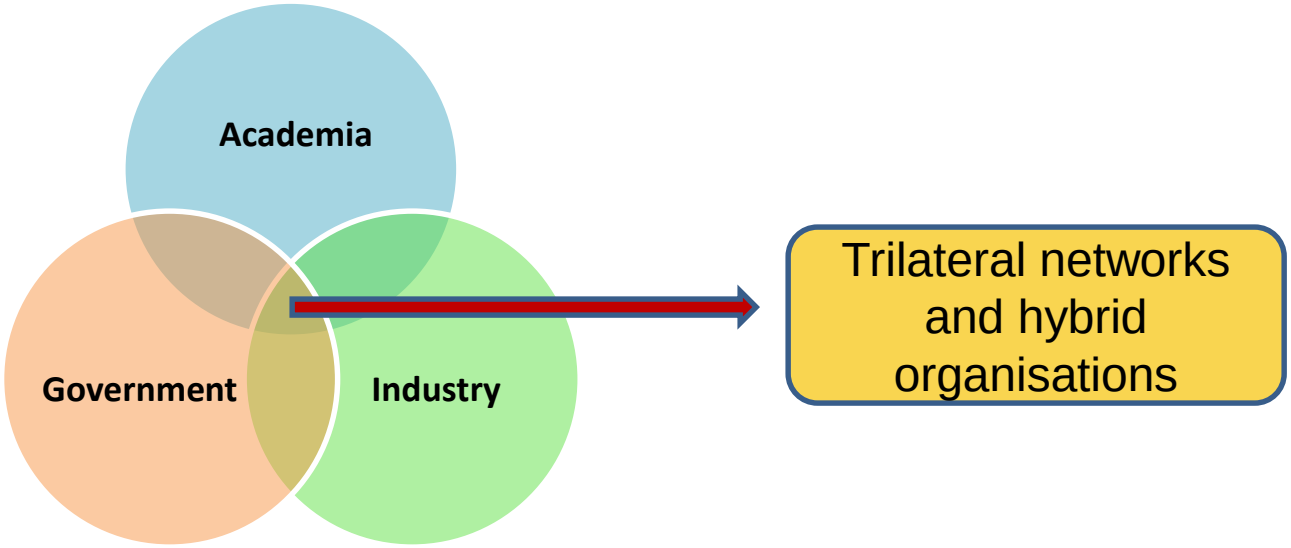
- Government plays the lead role, driving academia and industry.
- Knowledge institutions begin to concentrate certain R&D activities, with some networks emerging around them.

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.

Etzkowitz, H (2002). The triple helix university – industry – government implications for policy and evaluation, working paper 2002-11,

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.

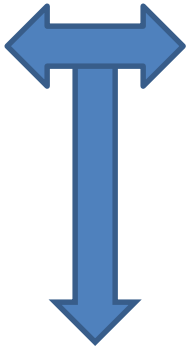
"Institutions taking non-traditional roles are viewed as a major potential source of innovation in innovation."

Triple Helix IX International Conference 11-14 July 2011

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

Academia

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



Industry

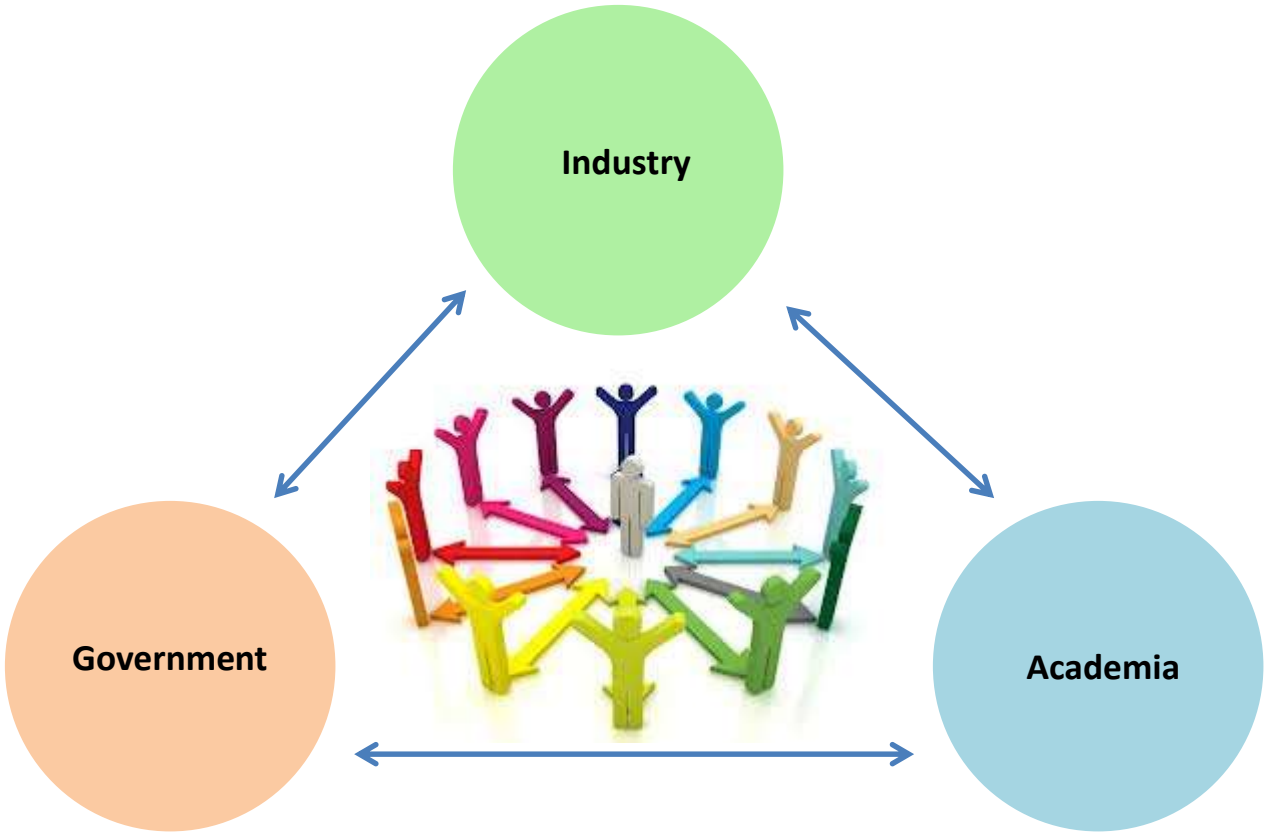
- High value research projects
- Access to co-funded (subsidised) research
- Access to intellectual property
- Access to students

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

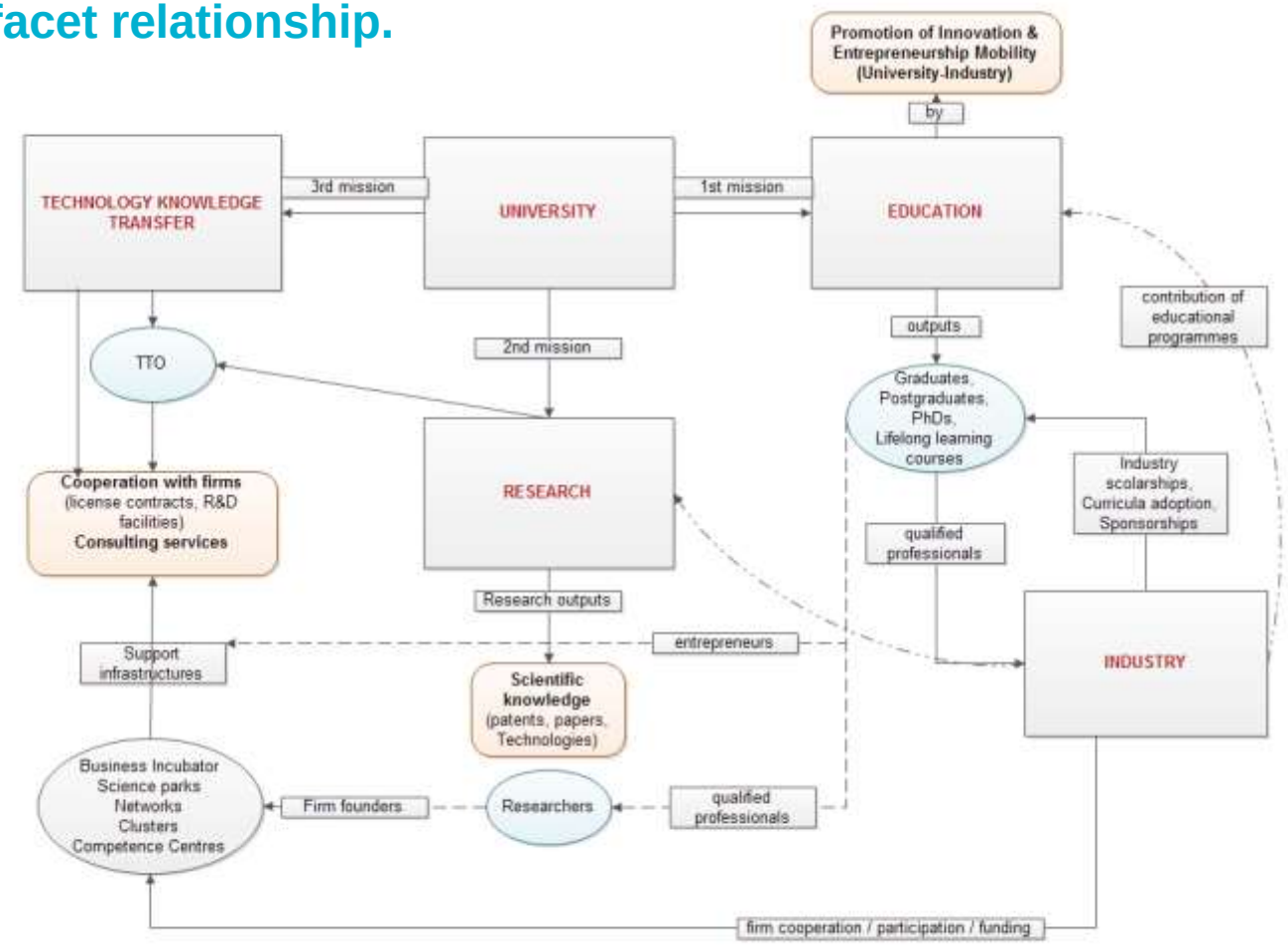
+

Industry is looking to reduce costs

=

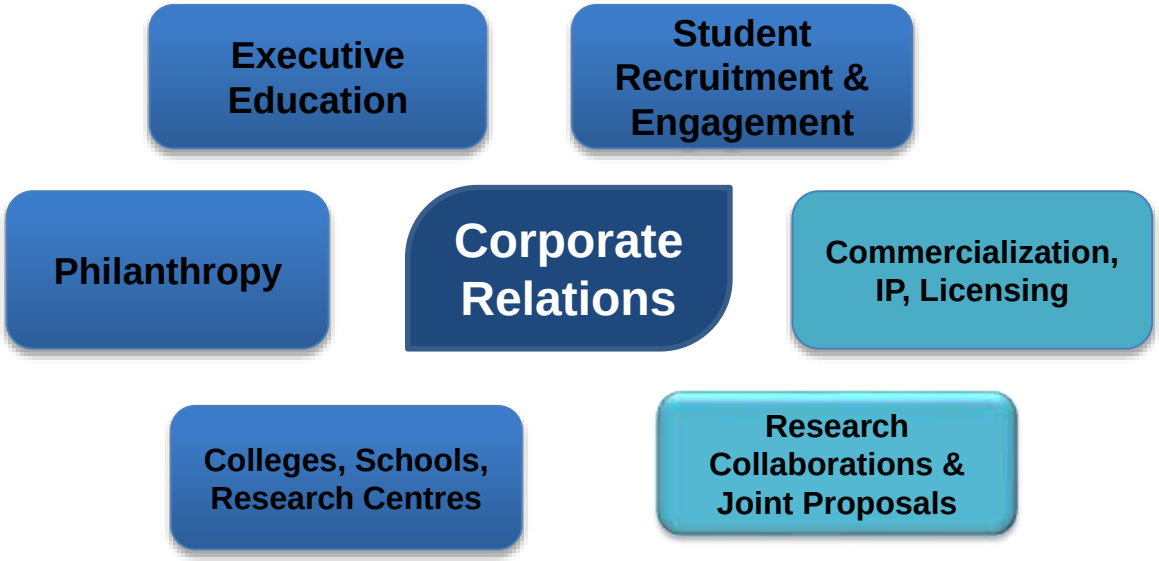
Opportunity for AIG Partnerships (Open Innovation Model)

The university - industry relationship has evolved into a complex and multi-facet relationship.



Jarohnovich and Avotins, Journal of Higher Education Theory and Practice, 2013

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.”*

Necessary Conditions - University

Dynamic Faculty

- ✓ 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

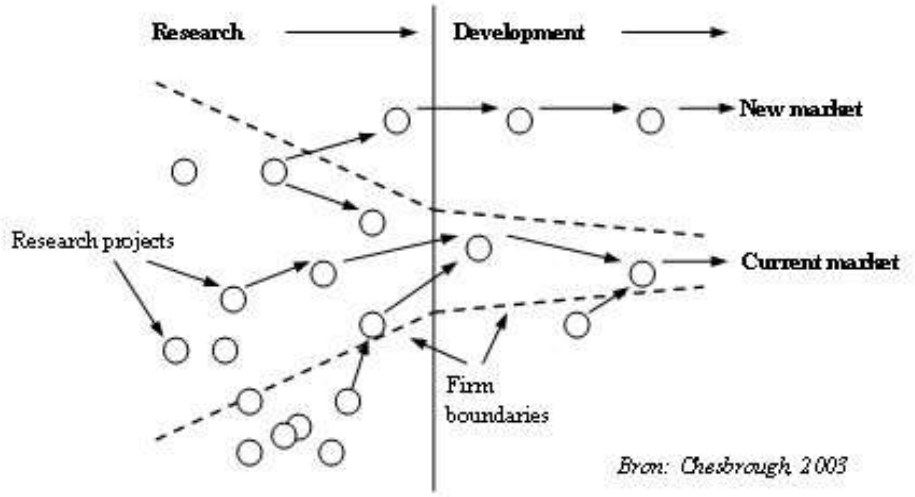
Supportive Environment

- ✓ 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

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"



Necessary Conditions - Industry

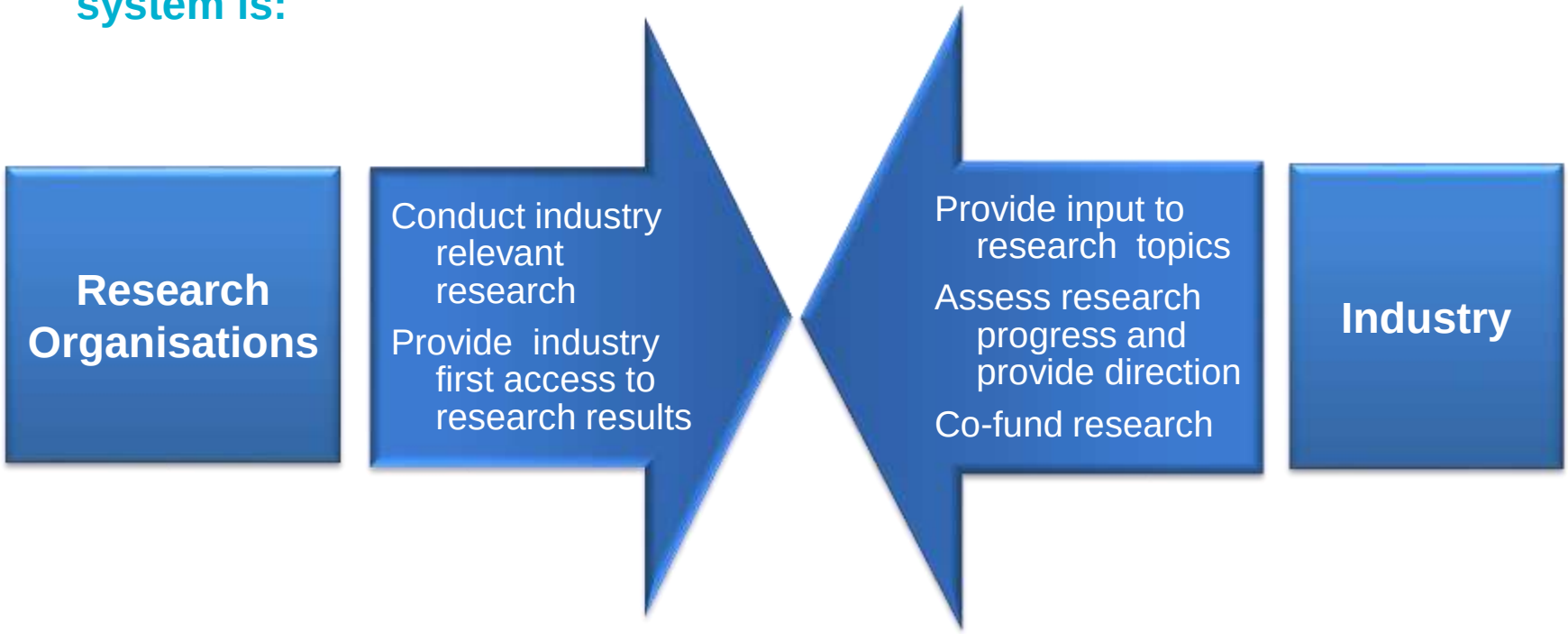
- a high importance is placed on innovation
- belief/acceptance of the Open Innovation principles
- an understanding of the partnership potential value – confident the university can deliver
- ability to fund joint projects (e.g. Euros / equipment / materials / etc)
- the partnership provides possible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

Necessary Conditions - Government

Provide Credibility	✓ Establish standards for hybrid organisations – builds confidence in industry ✓ Establish a 3rd party open review process of partnership programmes ✓ Have industry well represented in all aspects (standards development, programme review processes, etc.)
Supportive Environment	✓ Give universities autonomy ✓ Remove the bureaucracy ✓ Provide incentives (Euros, tax credits, etc.) ✓ Understand that RDI is dynamic and may not produce immediate tangible results – requires a subjective evaluation process

03. Role of Different Entities

The primary role of collaborative RDI partners in a mature innovation system is:



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

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

Industry/University Cooperative Research Centers (NSF) – US

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

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**

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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

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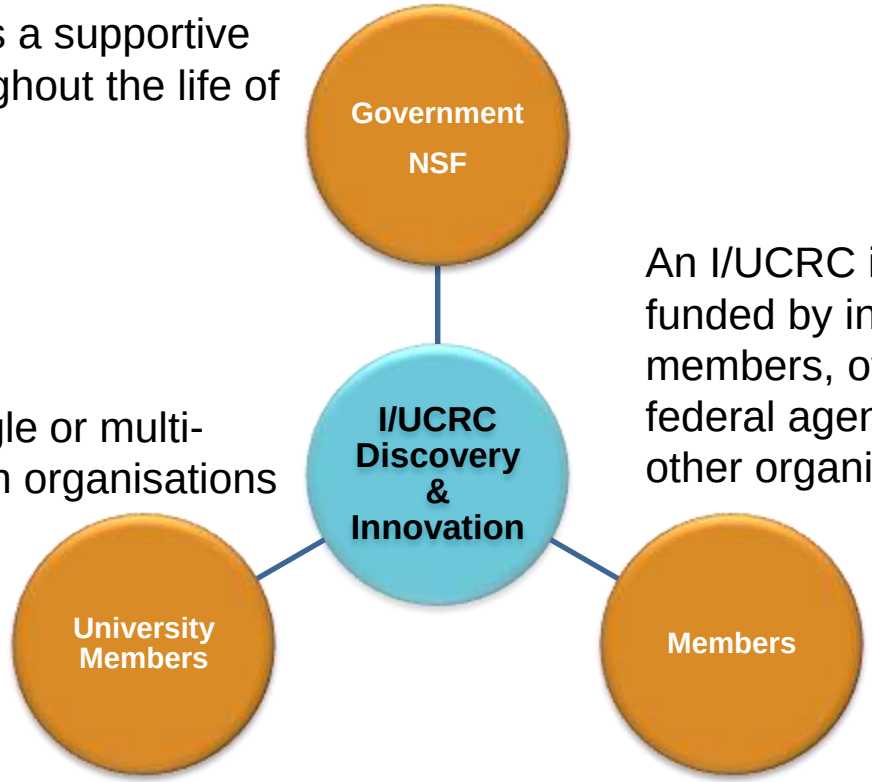
NSF takes a supportive role throughout the life of the center



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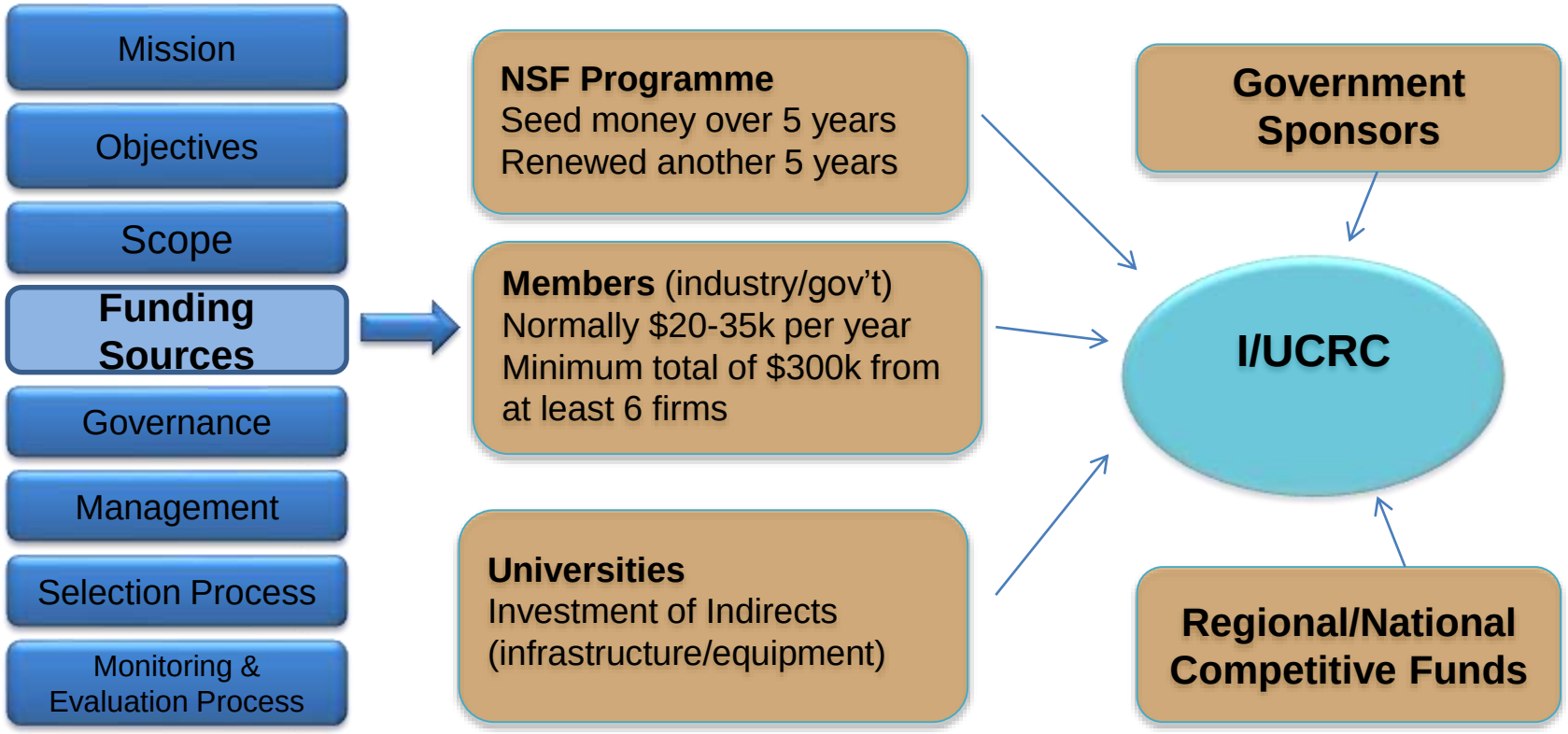
I/UCRCs work like a research "franchise" with operational guidelines and evaluation tools.

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



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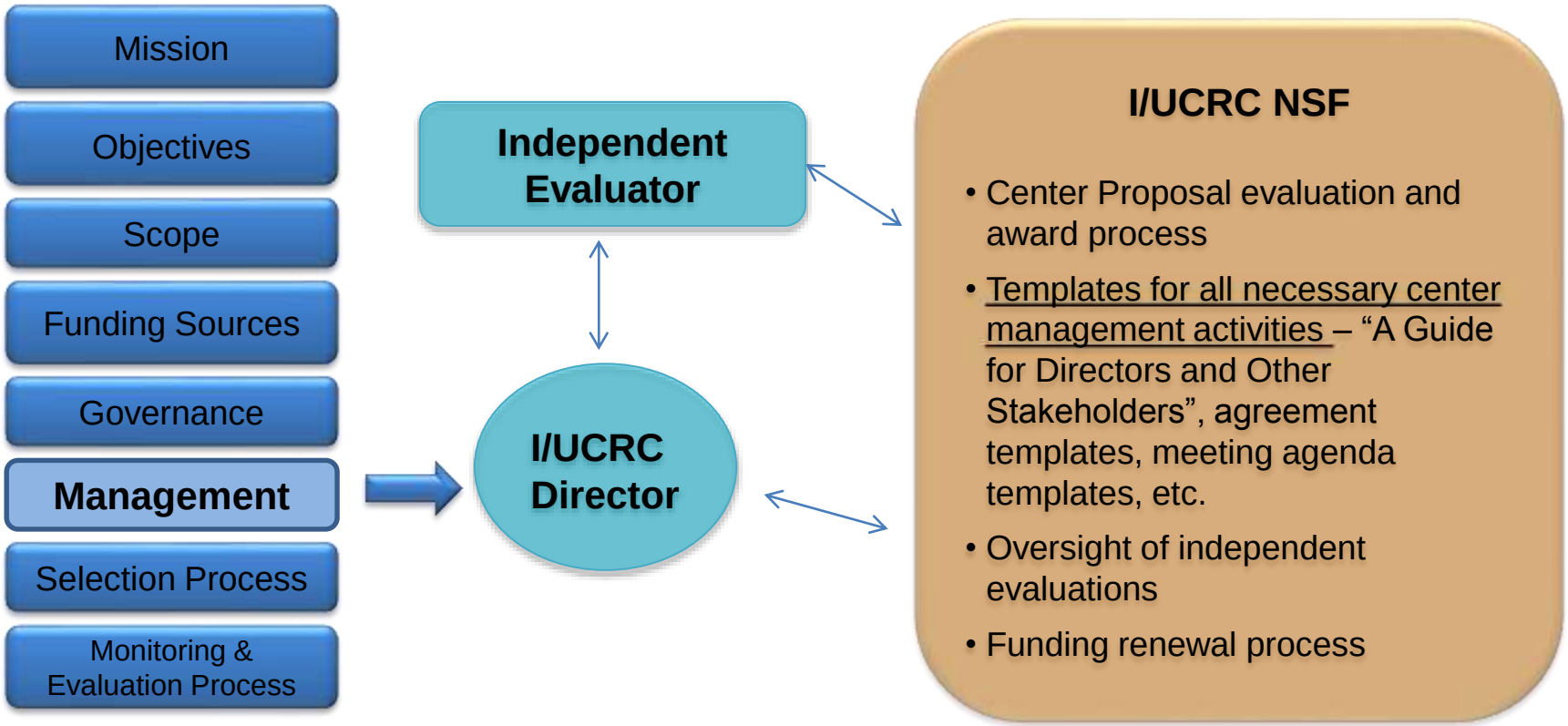
- NSF is independent receiving funding directly from congressional appropriations with an oversight board.
- NSF's board is comprised of industry and academia representatives nominated by the President.
- Known to have extensive external and internal reviews at the request of NSF's Director and at the request of oversight bodies – e.g. Congressional oversight.

Industry/University Cooperative Research Centers (NSF) – US



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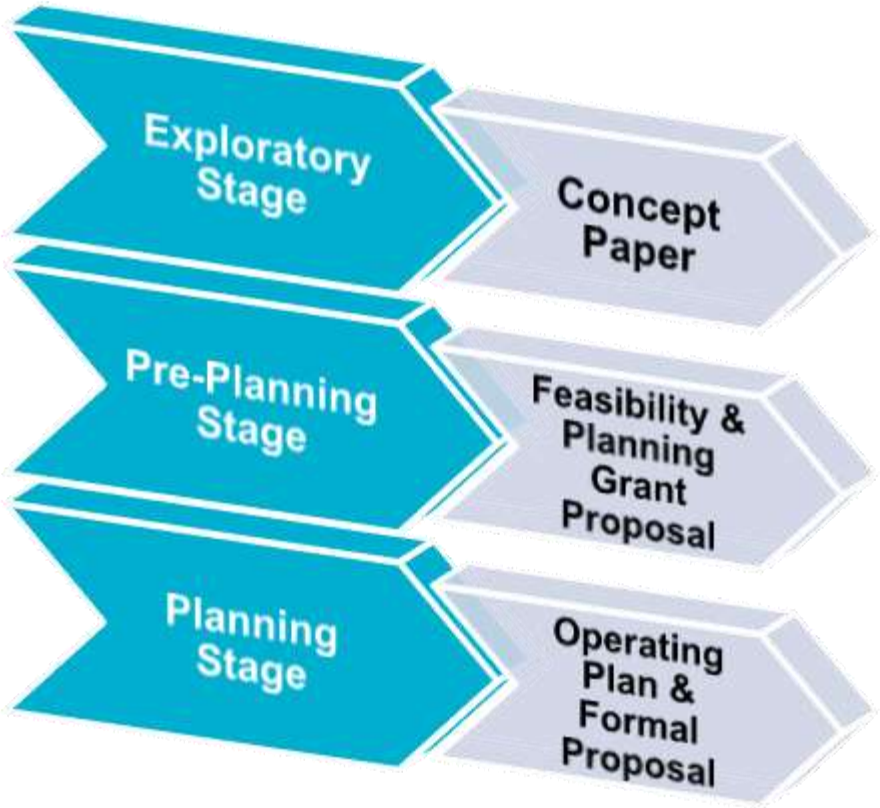

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Evaluation criteria include:

- 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

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- **Monitoring & Evaluation Process**

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

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- **Monitoring & Evaluation Process**

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.

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