

The IEA and the General Framework Model for Development

4 July 2018, St. Petersburg, Russia

Presented by:

Andrew Todd

International Development Standing
Committee Chair

Who are we?

- **International not-for-profit organization registered in Geneva, Switzerland**
- **An association of HFE societies**
- **Promote HFE on the global scale**
- **IEA is a promotor, producer, facilitator, catalyst, spokesperson,...**

IEA Family Members [51]

USA
Canada

Great Britain
Ireland
Portugal
Spain
SELF
Belgium
Italy
Germany

Austria
Switzerland
Greece
Netherlands
Nordic
Hungary
Latvia
Czech

Poland
Croatia
Servia
Slovakia
Ukraine
Russia

China Korea
Taiwan Japan
Hong Kong

Argentine
Brazil
Colombia
Chile
Ecuador
Mexico
Per
Uruguay

Israel
Iran
Turkey

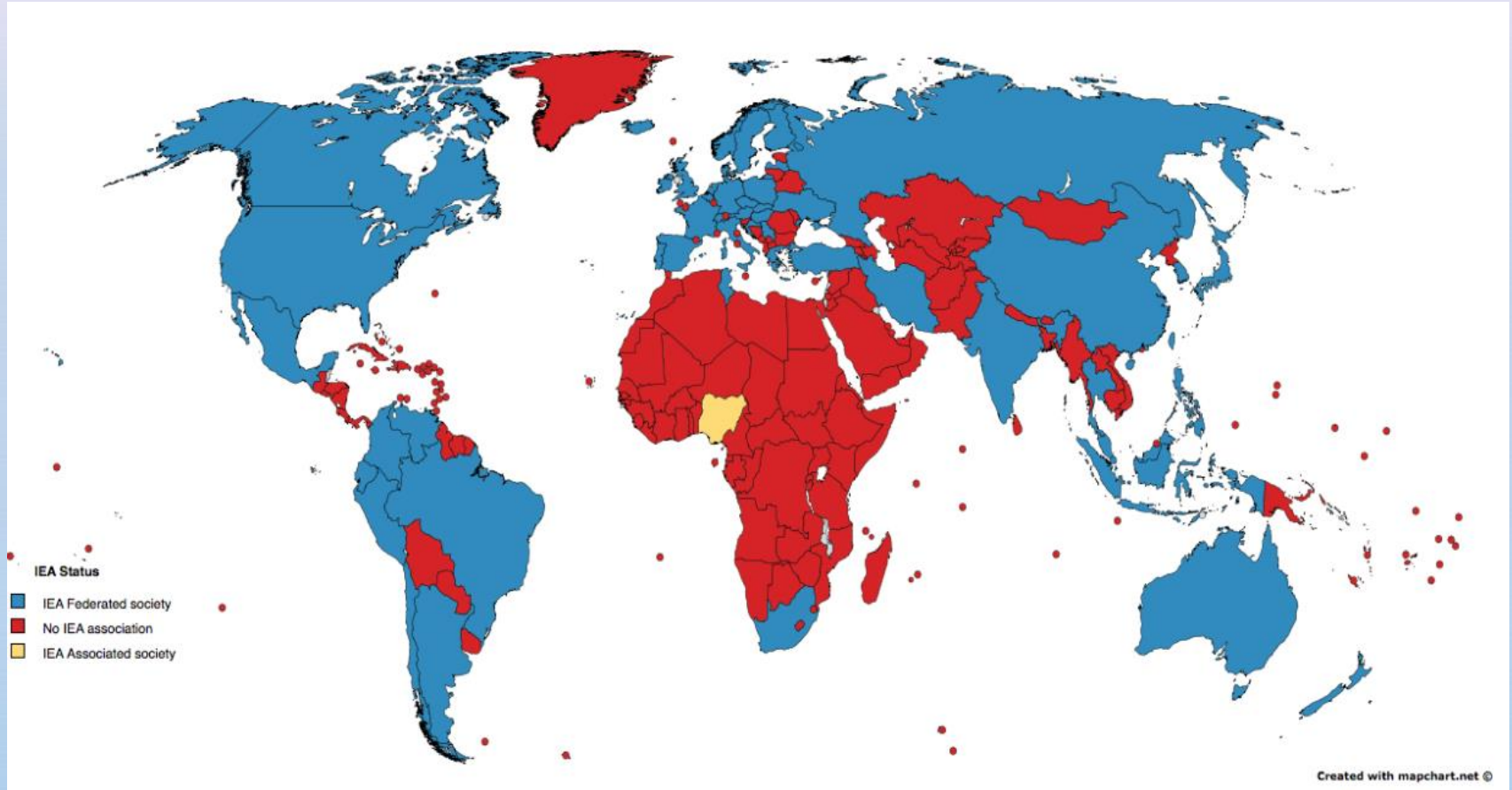
India

Indonesia
Singapore
Thai
Philippines
Malaysia

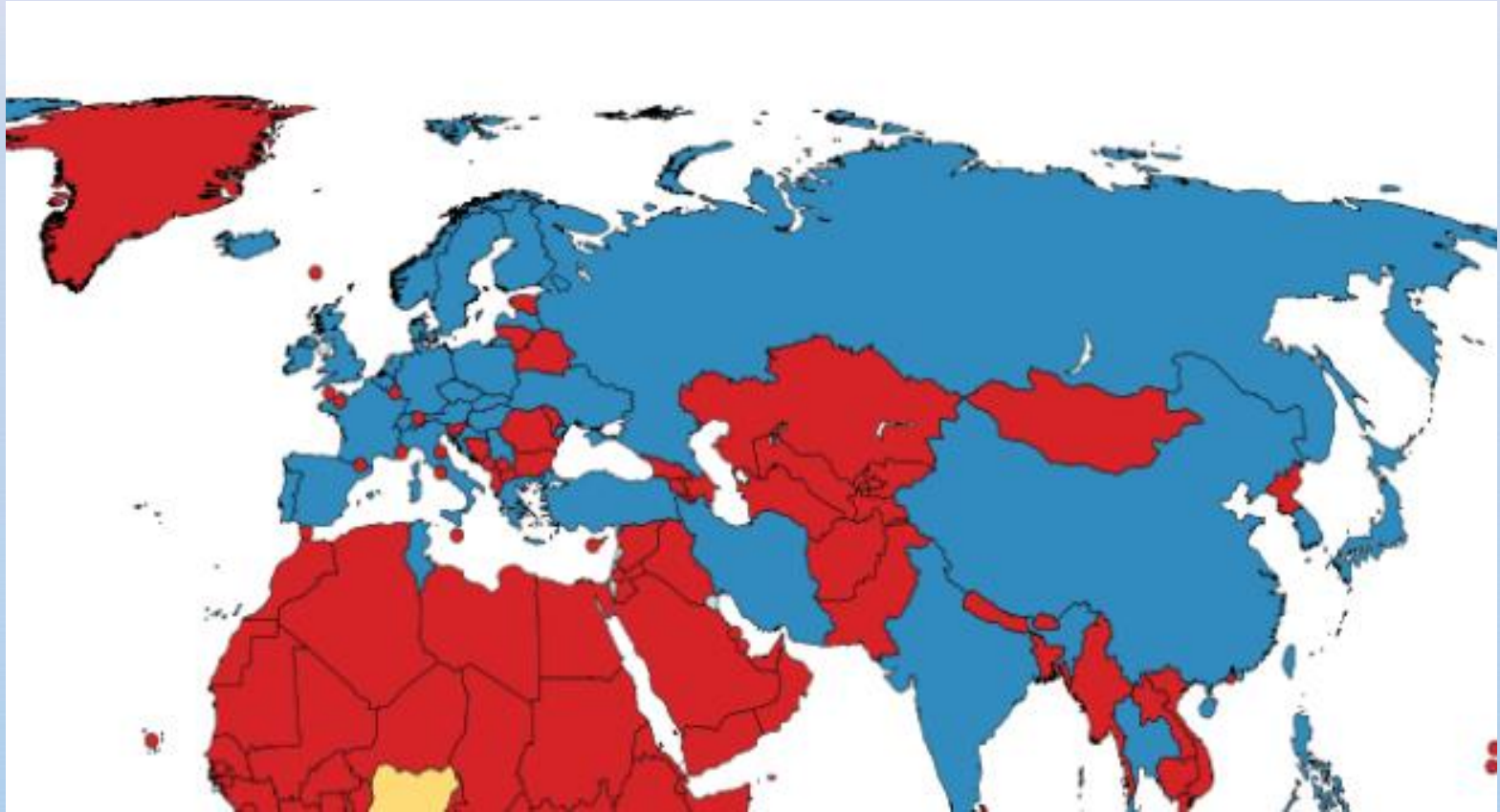
Tunisia
South Africa

Australia
New Zealand

IEA Regional Coverage



IEA Regional Coverage



Ergonomics in Context

There is potential for growth in all regions, yet HFE remains unexploited!

WHY?

Global reasons why HFE is underexploited?

1. People are not aware of the value HFE can add. (No demand)
2. When there is demand, there is not enough high-quality HFE
3. HFE is small in comparison to established disciplines (e.g. engineering and psychology)
4. Multi-disciplinary nature = diverse topics and views = unclear communication with external world

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What is the need?

Provision of:

.... high quality HFE professionals who can advocate for themselves through demonstration of financial benefits is key to creating this demand.

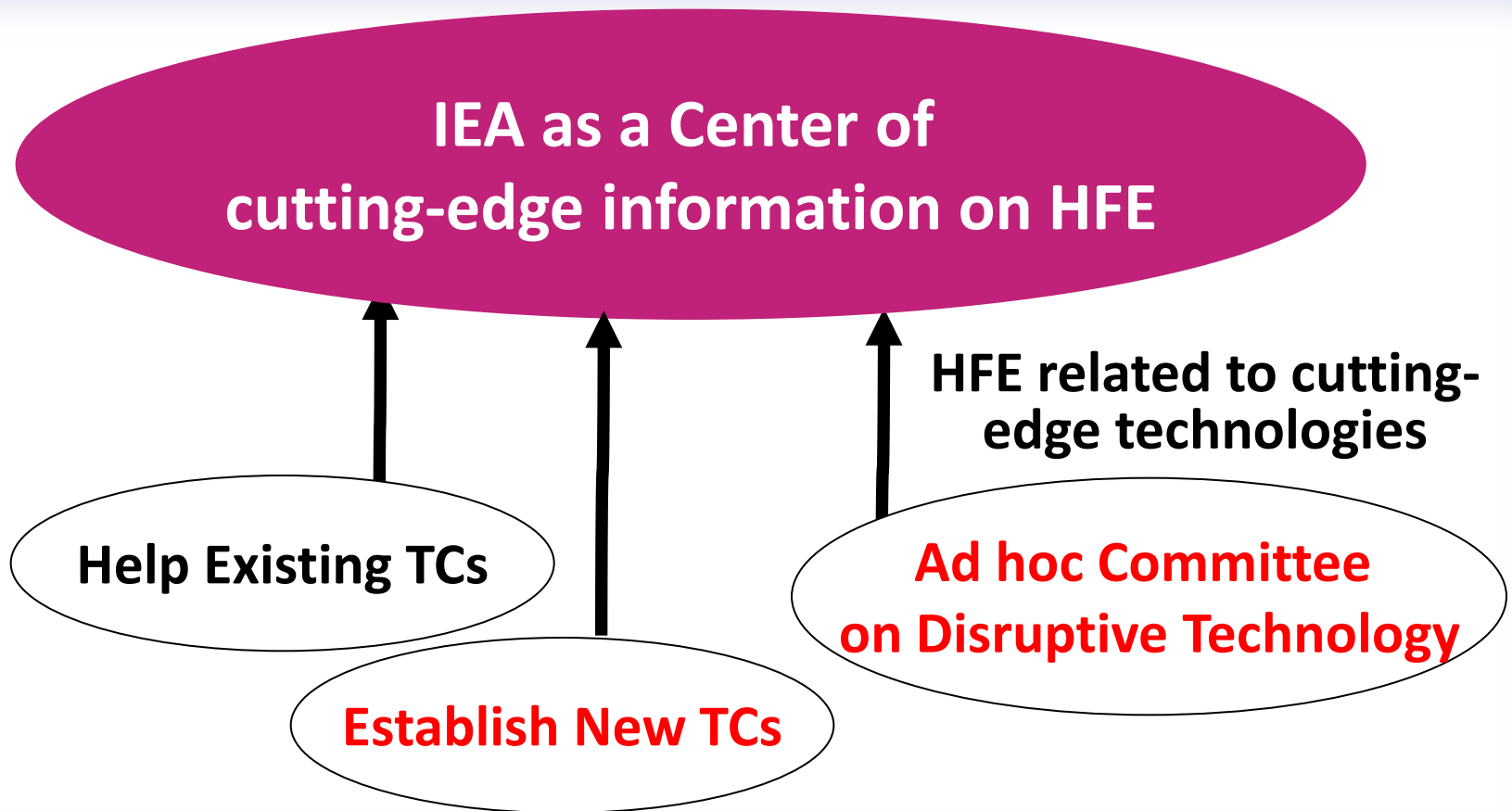
Therefore....

Education and certification (core competencies) are the cornerstones of HFE development strategy

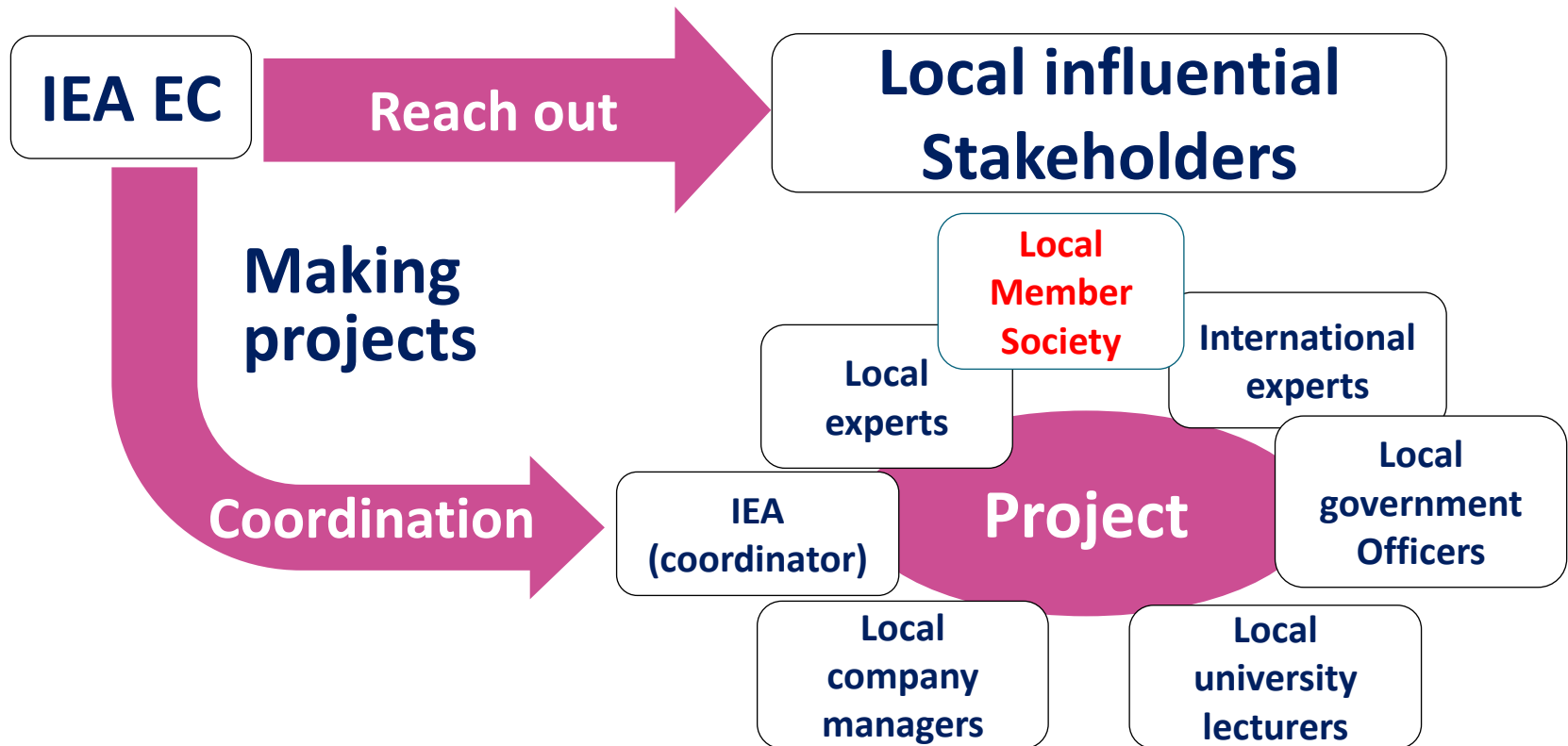
The Seven Policies (2015 -)

- 1. Contribute to science and technology (S&T)**
- 2. Stakeholder engagement**
- 3. Collaborate with IEA Networks**
- 4. Reinforce IEA Networks**
- 5. Identify roles of IEA in promoting certification and related matters**
- 6. Reinforce relationship with external organizations**
- 7. Reinforce the infrastructure of IEA**

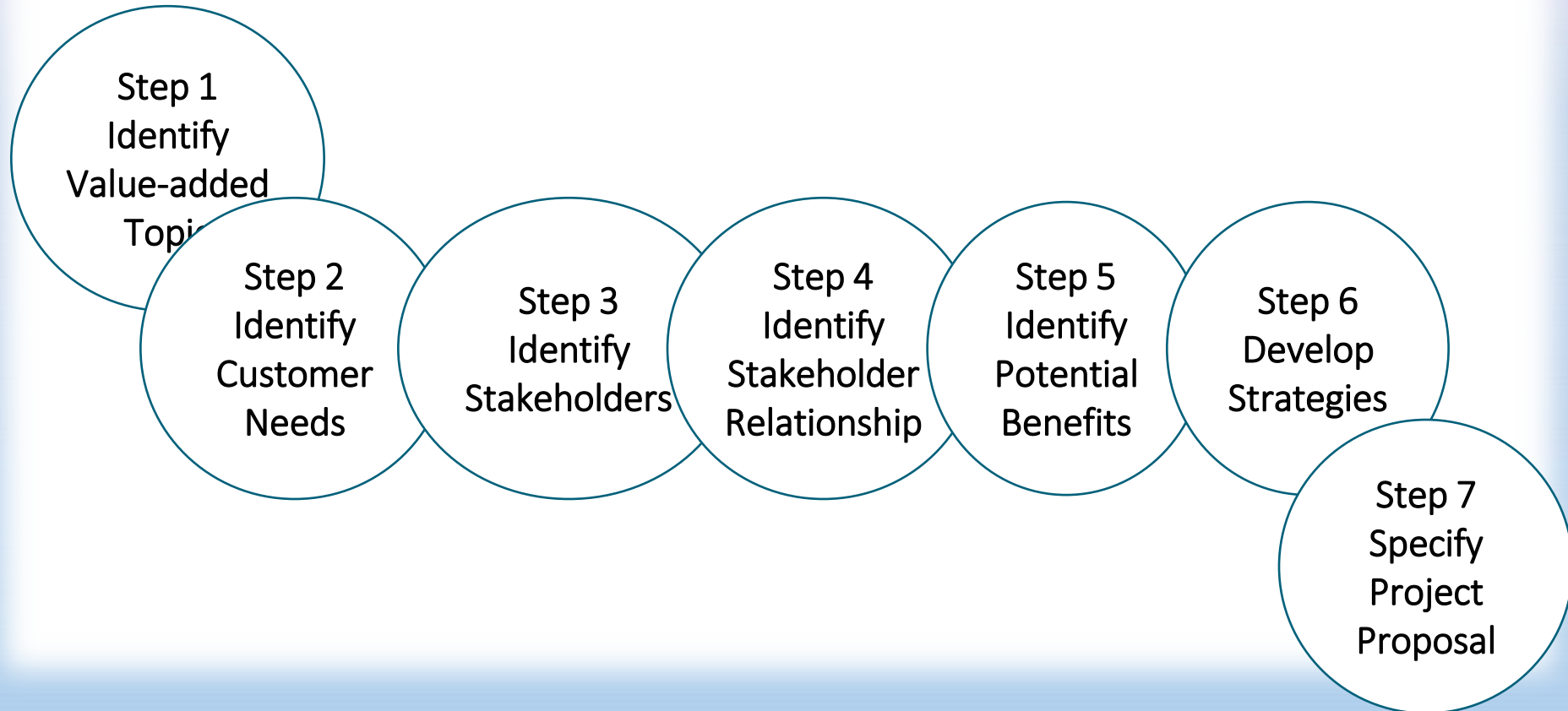
Policy: Contribute to S&T



Policy: Stakeholder Engagement

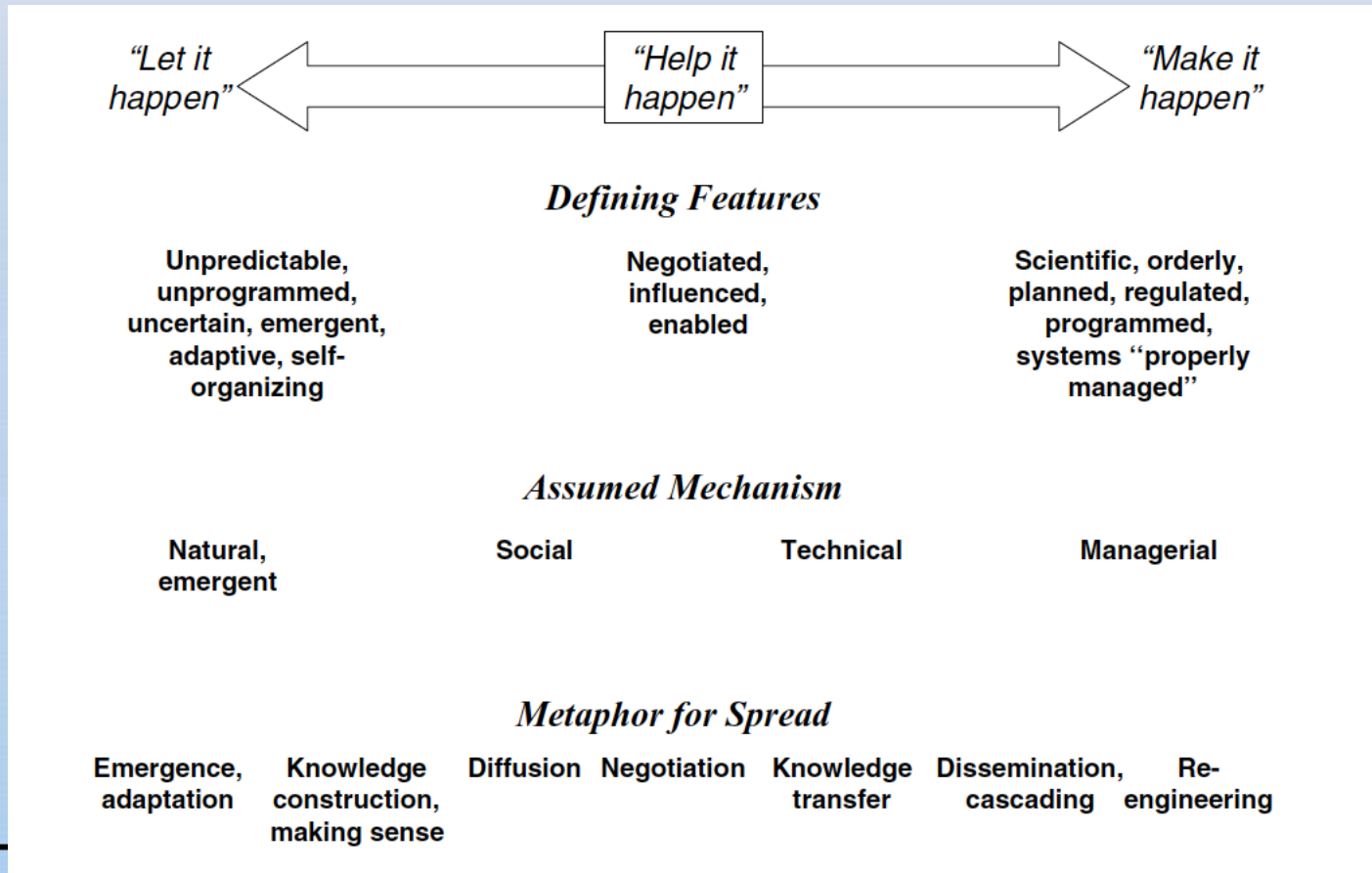


General Framework Model (GFM)

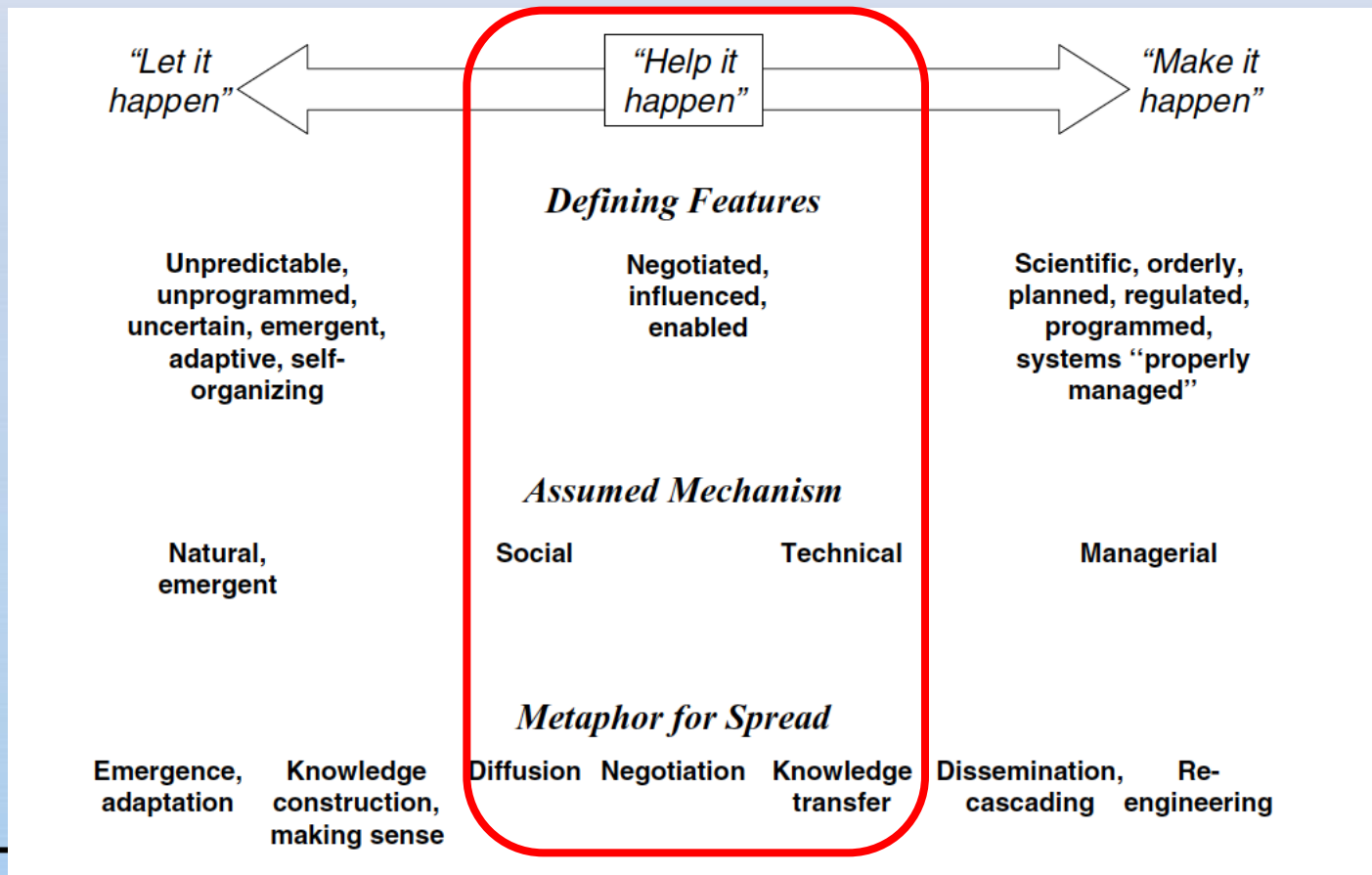


Making the GFM work - philosophy behind the IEA approach?

A shift in perspective

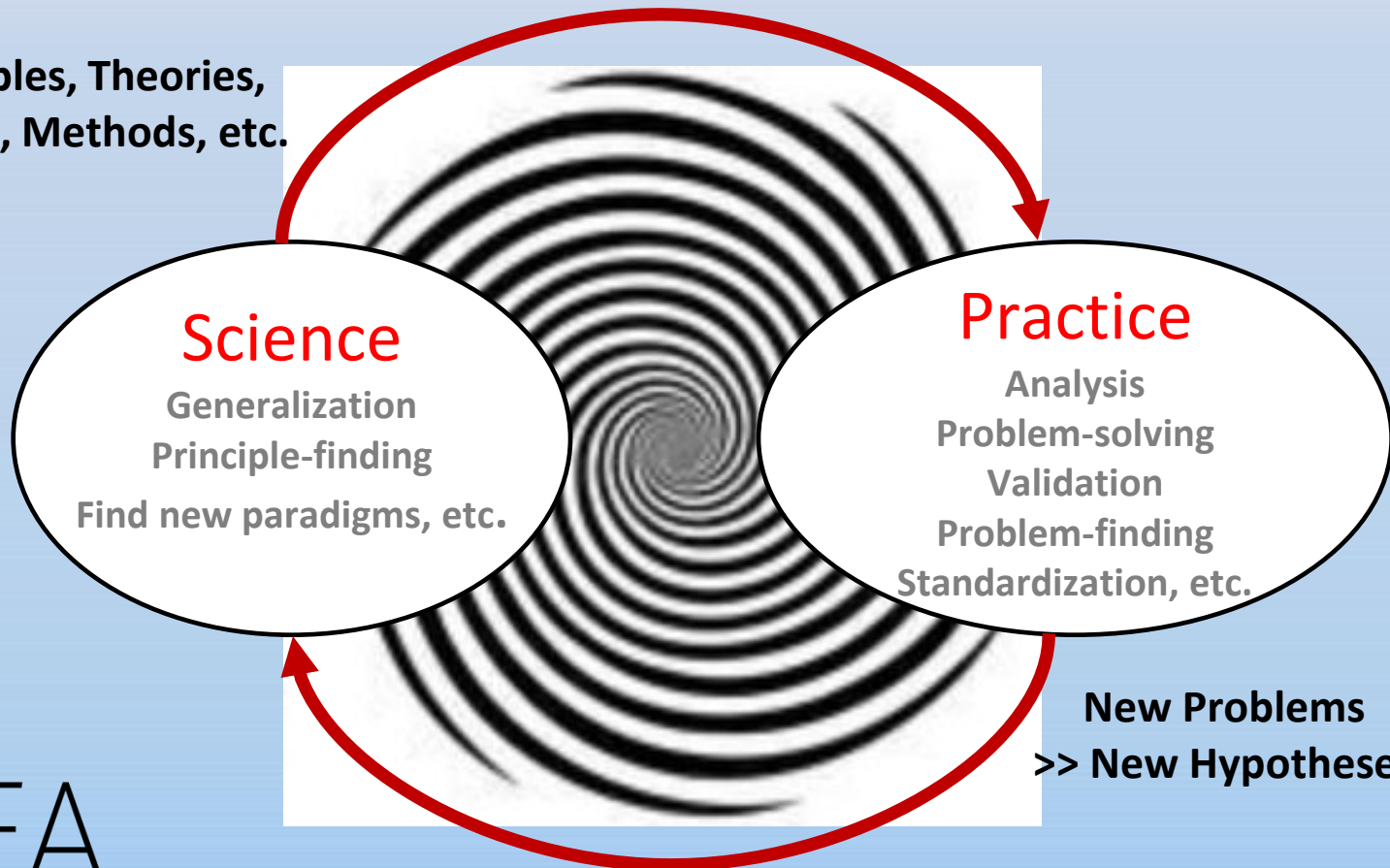


A shift in perspective



Co-creation of a demand

Principles, Theories,
Models, Methods, etc.



Co-creation of a demand

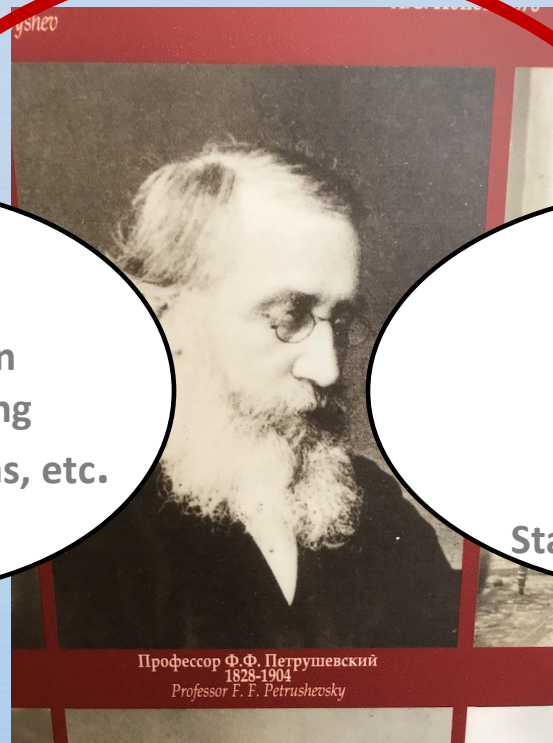
Principles, Theories,
Models, Methods, etc.

Science

Generalization
Principle-finding
Find new paradigms, etc.

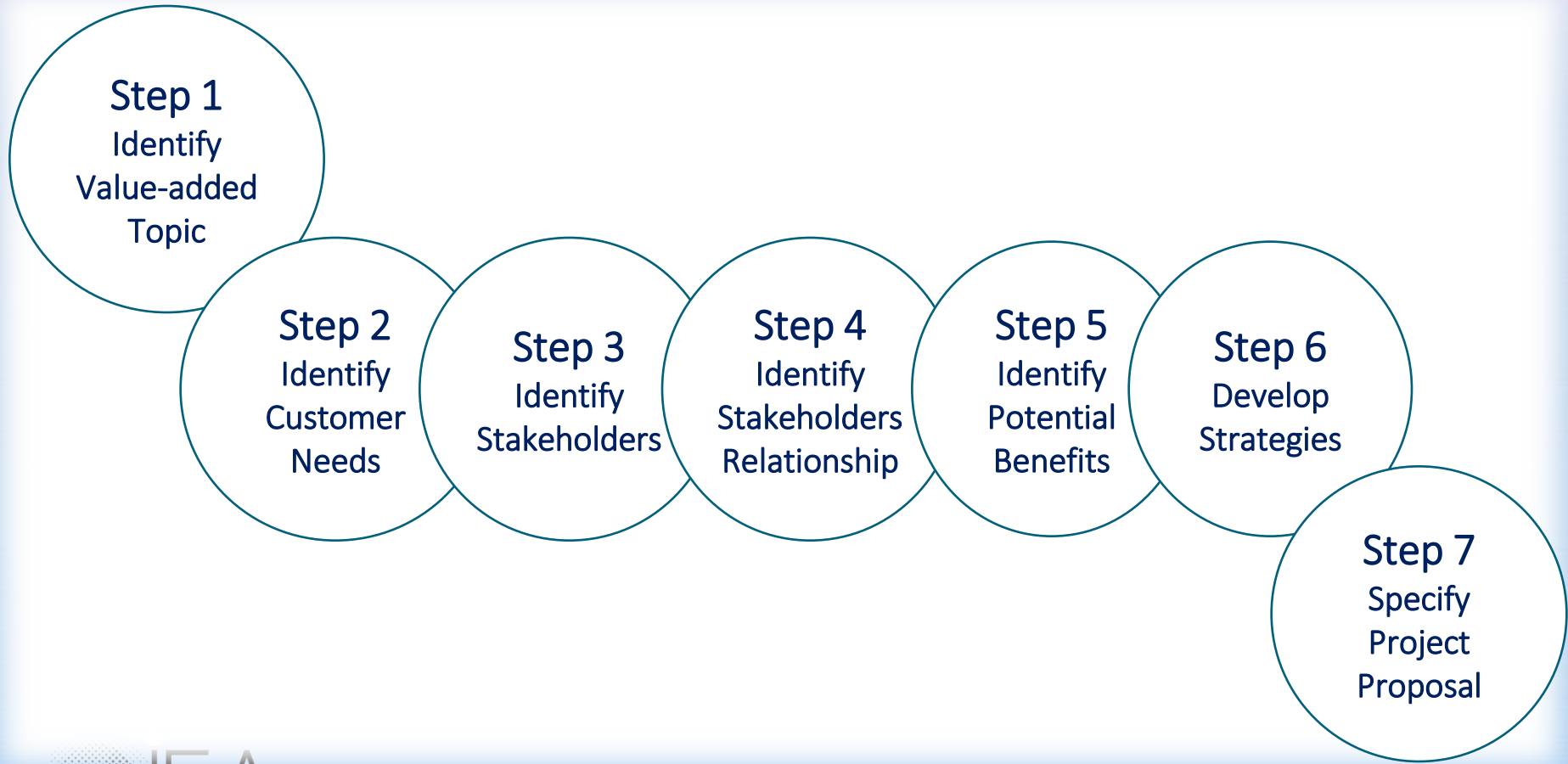
Practice

Analysis
Problem-solving
Validation
Problem-finding
Standardization, etc.



New Problems
>> New Hypotheses

GFM model



```
graph LR; S1((Step 1  
Identify Value-added  
Topic)) --- S2((Step 2  
Identify Customer  
Needs)); S2 --- S3((Step 3  
Identify Stakeholders)); S3 --- S4((Step 4  
Identify Stakeholders  
Relationship)); S4 --- S5((Step 5  
Identify Potential  
Benefits)); S5 --- S6((Step 6  
Develop Strategies)); S6 --- S7((Step 7  
Specify Project  
Proposal));
```

Step 1
Identify
Value-added
Topic

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Step 6
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Step 7
Specify
Project
Proposal

Step 1: Value-added topic

Finding topics that can add value in terms of:

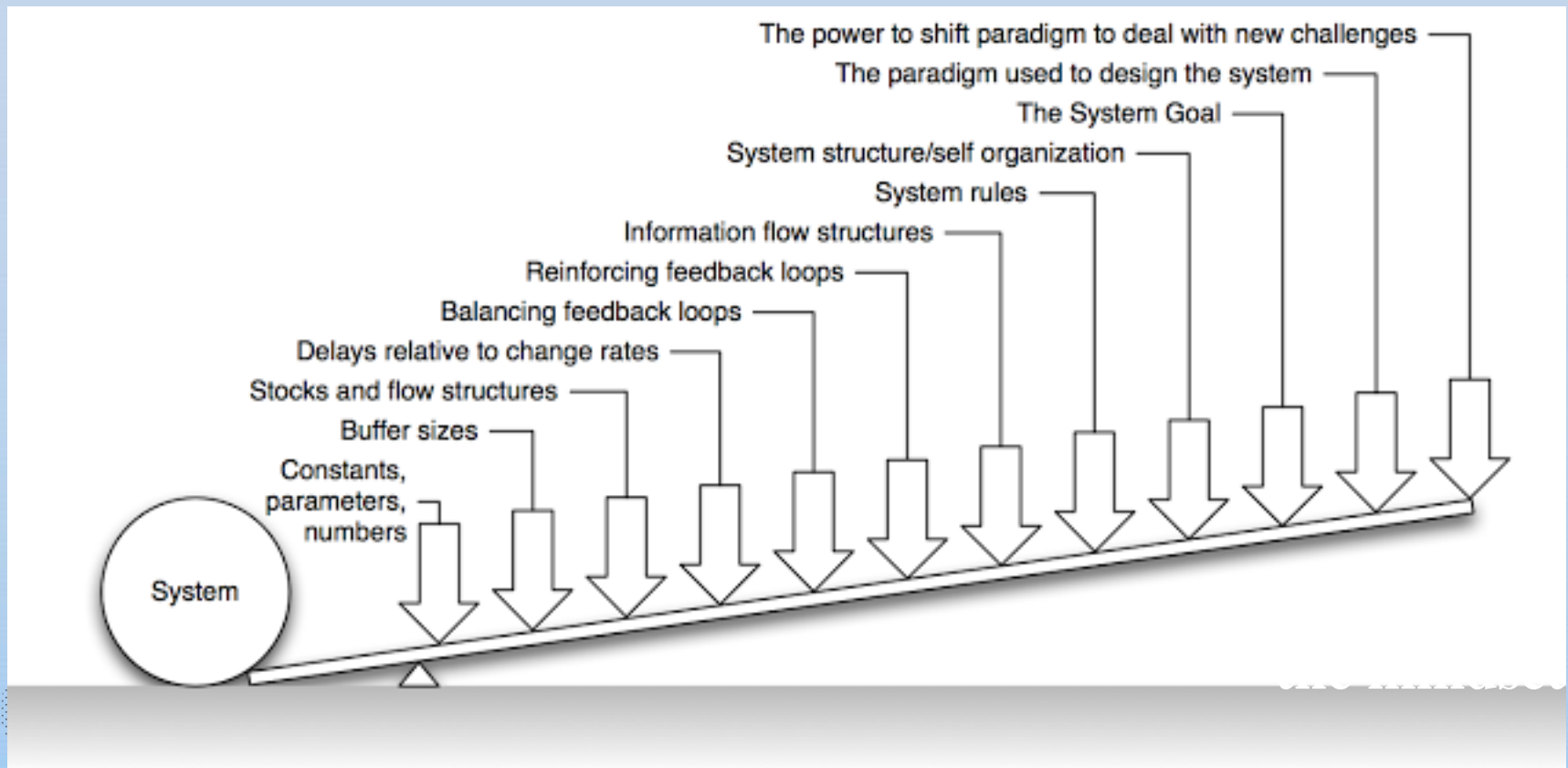
- Significance of scientific contribution
- Potential impact to the industry, academic community, and people/organization/public/society
- Contribution to uplifting the status of HFE and HFE professionals

Identifying topics can be tricky:

- Identify team of interested professionals HFE professionals

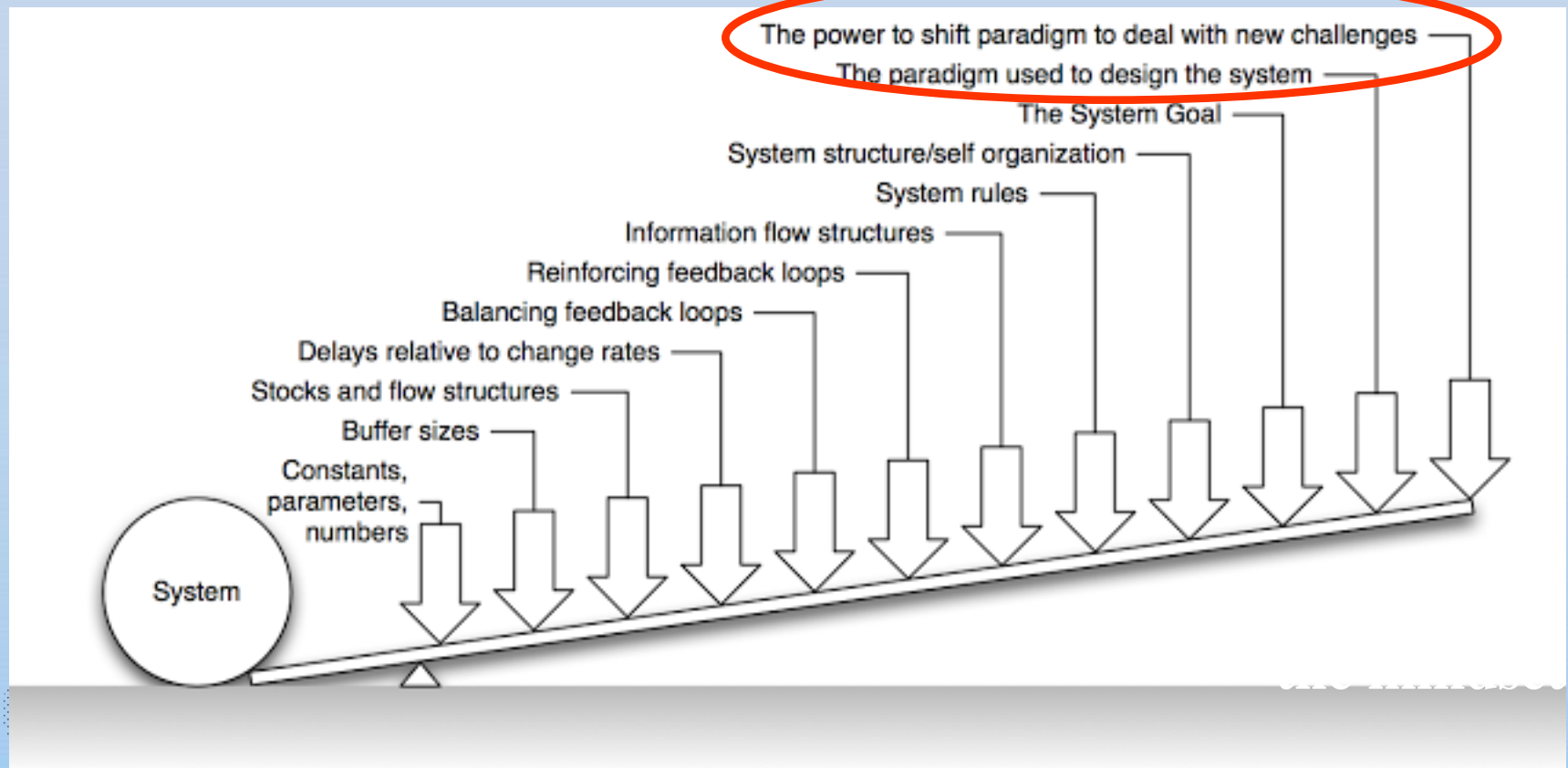
Step 1: Value-added topic

Meadows – Leverage points in a system:



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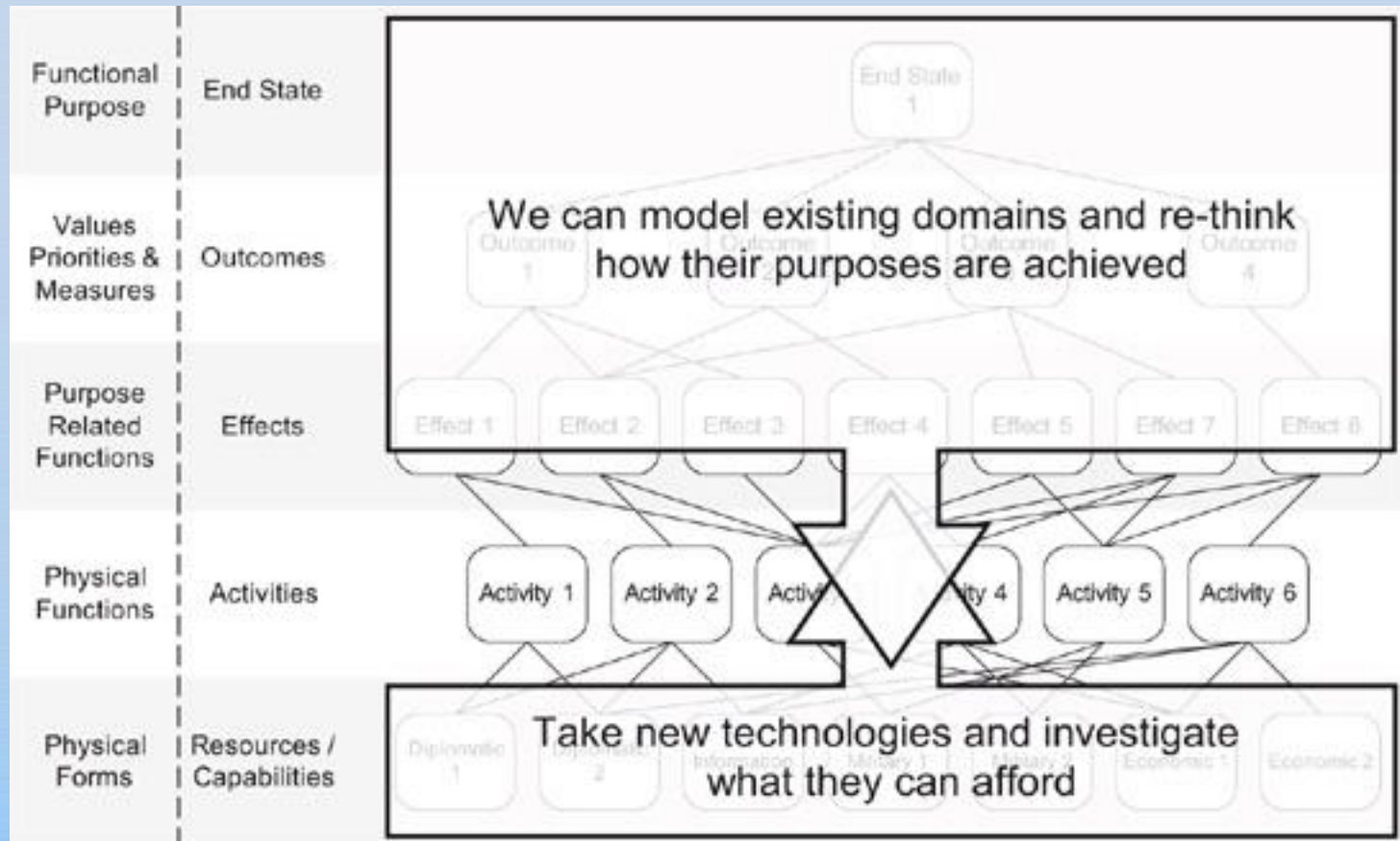
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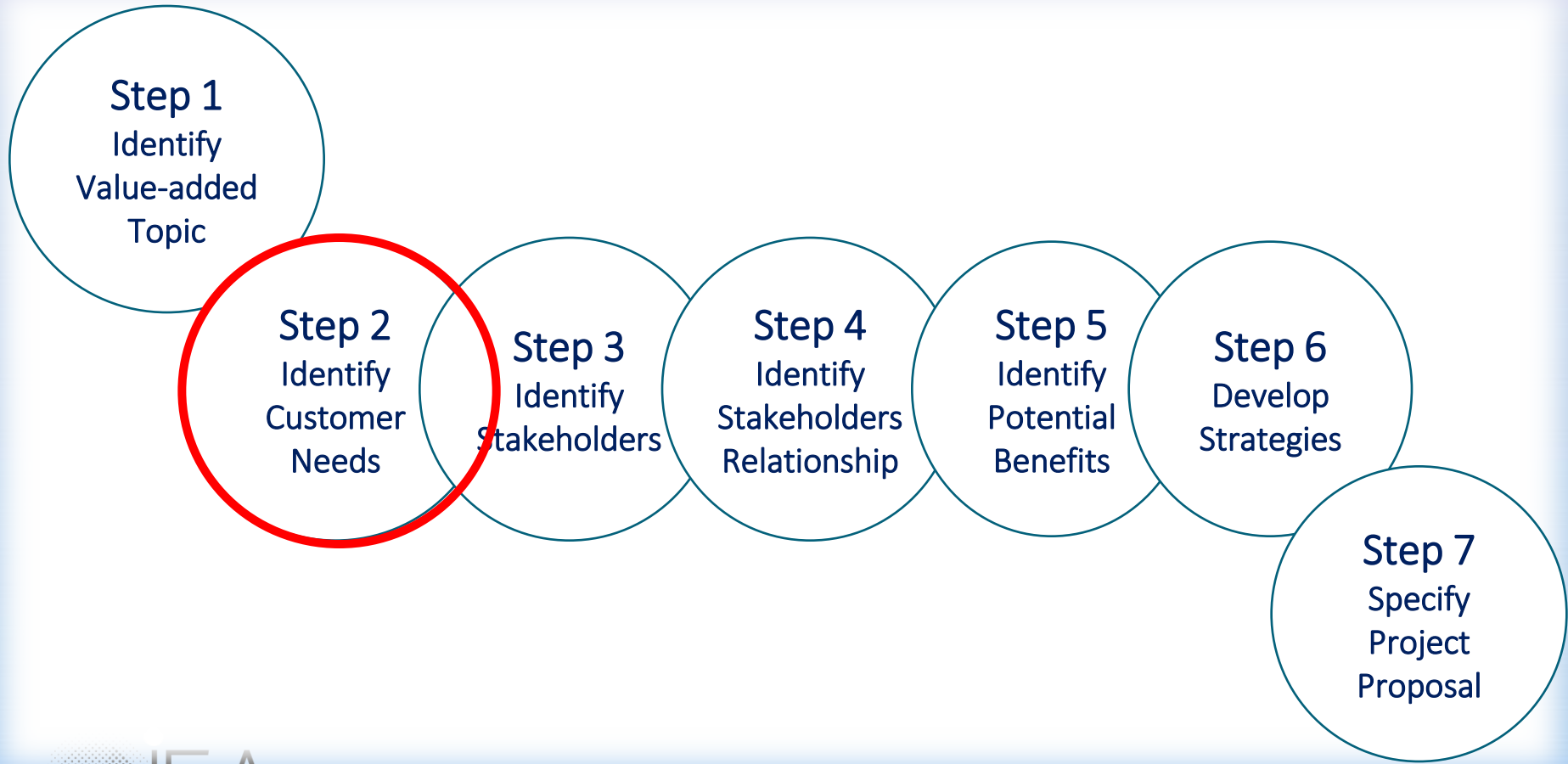
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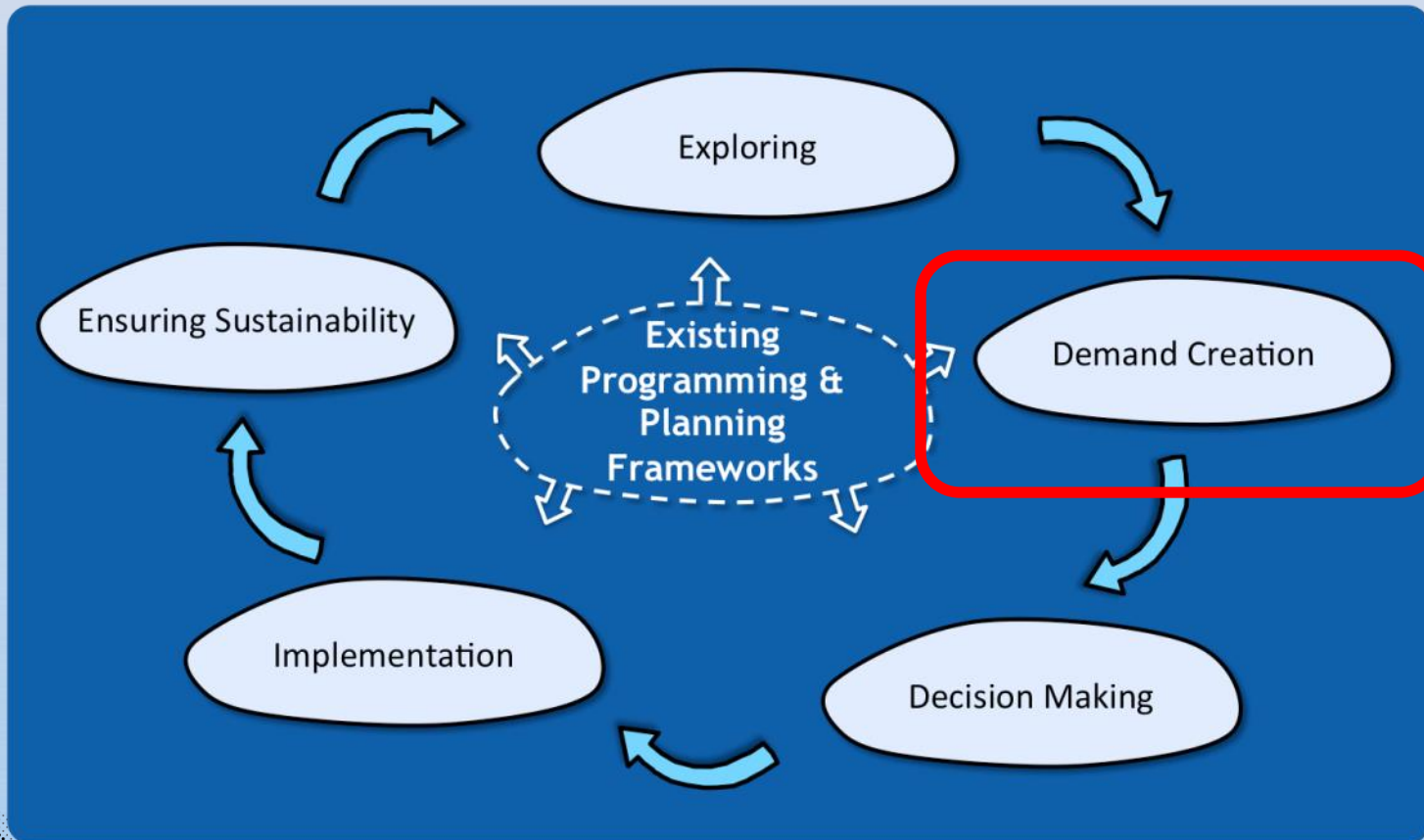
Value-added topic

- Tools for diagnosis of current situation (Jenkins et al., 2009)





Step 2: Customer needs



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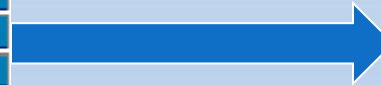
- Listening to potential customers is key
- HFE professional must add value, provide balanced specifications
- Be aware of own biases
- Develop contextual approach – questionnaires, seminars, workshops, etc
- Typically not a once off approach (i.e. repeated meetings required)
- Painstaking but necessary

Step 2: Customer needs

Tools

- Action planning
- Brainstorming
- Buzz
- Card technique (metaplan)
- CATWOE
- Cause and effect mapping
- Conceptual Modeling
- Delphi technique
- Empowerment Circle
- Evaluation wheel
- Fishbone analysis
- Flow diagrams
- Focus groups
- Force Field Analysis
- Historical analysis
- Historical Narratives
- Interrelationship diagrams
- Issue analysis
- Locality mapping
- Matrix analysis
- Mindmapping
- Nominal group technique
- Problem tree
- Questionnaires/Surveys
- Rich pictures
- Role Plays
- Objectives hierarchy
- Objectives Tree

- Semi-structured interviewing
- SWOT analysis
- Timeline
- Time Trend
- Venn diagrams
- Visioning



Methodologies

- Adaptive Management
- Adult learning circles
- Communities of practice
- Future Search Conference
- Learning systems methodology
- Logical Framework Approach
- OOPP/ZOPP/GOPP
- Open space technology
- Participatory Learning and Action (PLA)
- PRA
- RAAKS
- Scenario analysis
- Situation analysis
- Soft Systems Methodology
- Stakeholder analysis
- Technology of Participation
- Theatre for Development

Examples of customer needs – SA hospitals

Hospital #1

- Patient absconding esp. during pension payout days and weekends
- Patient falls
- Early neonatal deaths
- Litigation - major concern for DOH in general, paying billions every year
- e. Patients refusing treatment while being admitted in hospital

Hospital #2

- Patient falls
- Bath burns
- Hand washing not done by staff and patients
- Embolisms
- Needle prick injuries
- Adverse Drug Reactions

Hospital #3

- Infrastructure constraints in waiting area, drug room etc.
- Infection Control
- Staff attitudes
- Litigation
- Poor patient records
- Poor clinical management of patients

Hospital #4

- Poor infrastructure leads to cross infection
- Patient falls
- Fire risk

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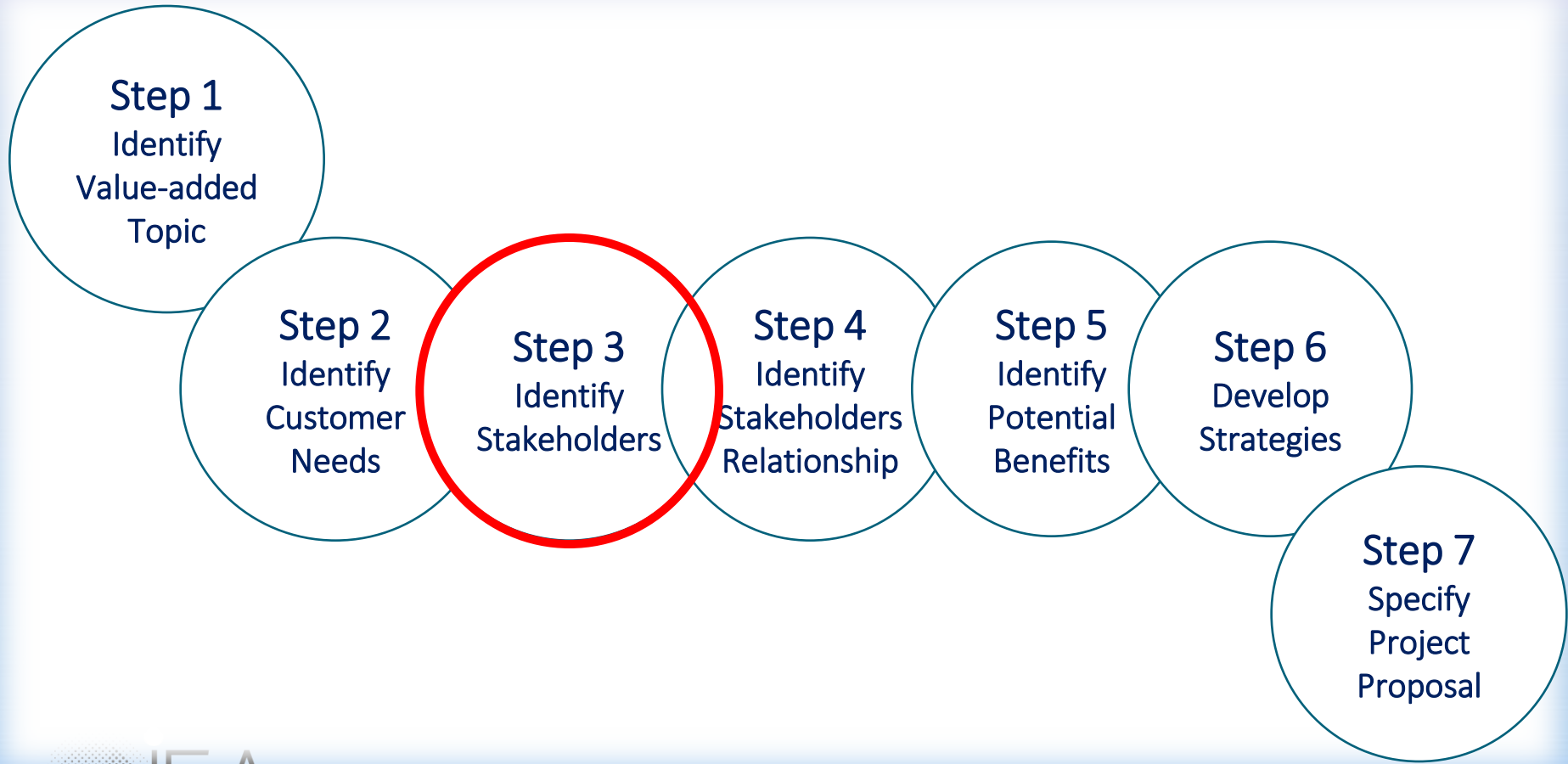
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Hospital #4

- Poor infrastructure leads to cross infection
- **Patient Falls**
- Fire risk



Step 3: Stakeholder identification

Understanding system stakeholders:

- What are the types of stakeholders?
- At what levels do these stakeholders exist?

Why?

Why stakeholders matter:

HFE acknowledges the complex socio-technical system (society development no different)

- Wilson (2014) - Ergonomics in the wild:
 - Systems focus
 - Context
 - Interactions
 - Holism
 - Emergence
 - Embedding

Emergence:

- Wheatley and Frieze :

“Change begins as local actions spring up simultaneously in many different areas. If these changes remain disconnected, nothing happens beyond each locale. However, when they become connected, local actions can emerge as a powerful system with influence at a more global or comprehensive level”

Emergence is how local changes can materialize as global systems of influence.

Emergence to create networks

Searle and Todd (2018): Exemplary network diagram of an at-risk community



Emergence to create networks

Using emergence to take social innovation to scale (Wheatley and Frieze, 2006)?

- Stages in creating emergence:
 - Stage 1: Networks – Discovering shared purpose
 - Stage 2: Communities of practice – Developing new practices
 - Stage 3: Systems of influence – New practices become the norm

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Act Locally, connect regionally and learn globally

Building Networks

- Systems background:
 - System **homeostasis** or **rheostasis**?
 - Systems are sociotechnical by nature
 - Political and social context matters
- HF&E recognises the importance of the “human factor” – typified as stakeholders as key element of socio-technical systems:
 - Introduce resilience OR
 - resist systemic changes and impair performance

Building Networks

- the problems, means, solutions, and science needed can be viewed differently by the stakeholders involved,
- may change with time.

Therefore need the identification, classification, and management of stakeholders and their relationships

Step 3: Stakeholder identification

4 types of stakeholders:

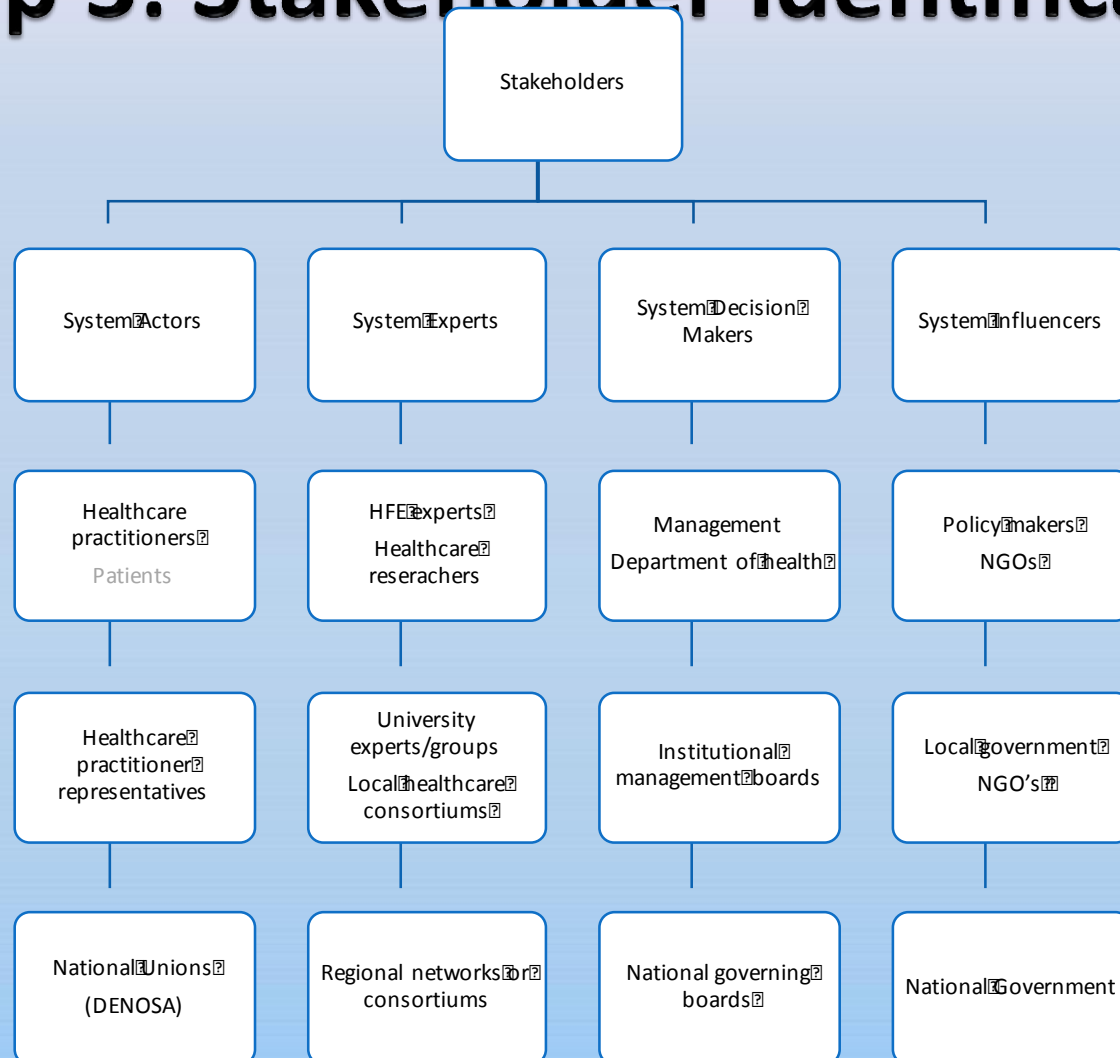
- System actors (i.e. employees, product users)
- System experts (engineers, psychologists, HFE specialists)
- System decision makers (managers)
- System influencers (government, media, standards organisations, regulators and citizens)

Step 3: Stakeholder identification

Identification of level of organization of stakeholders (Dul *et al.*):

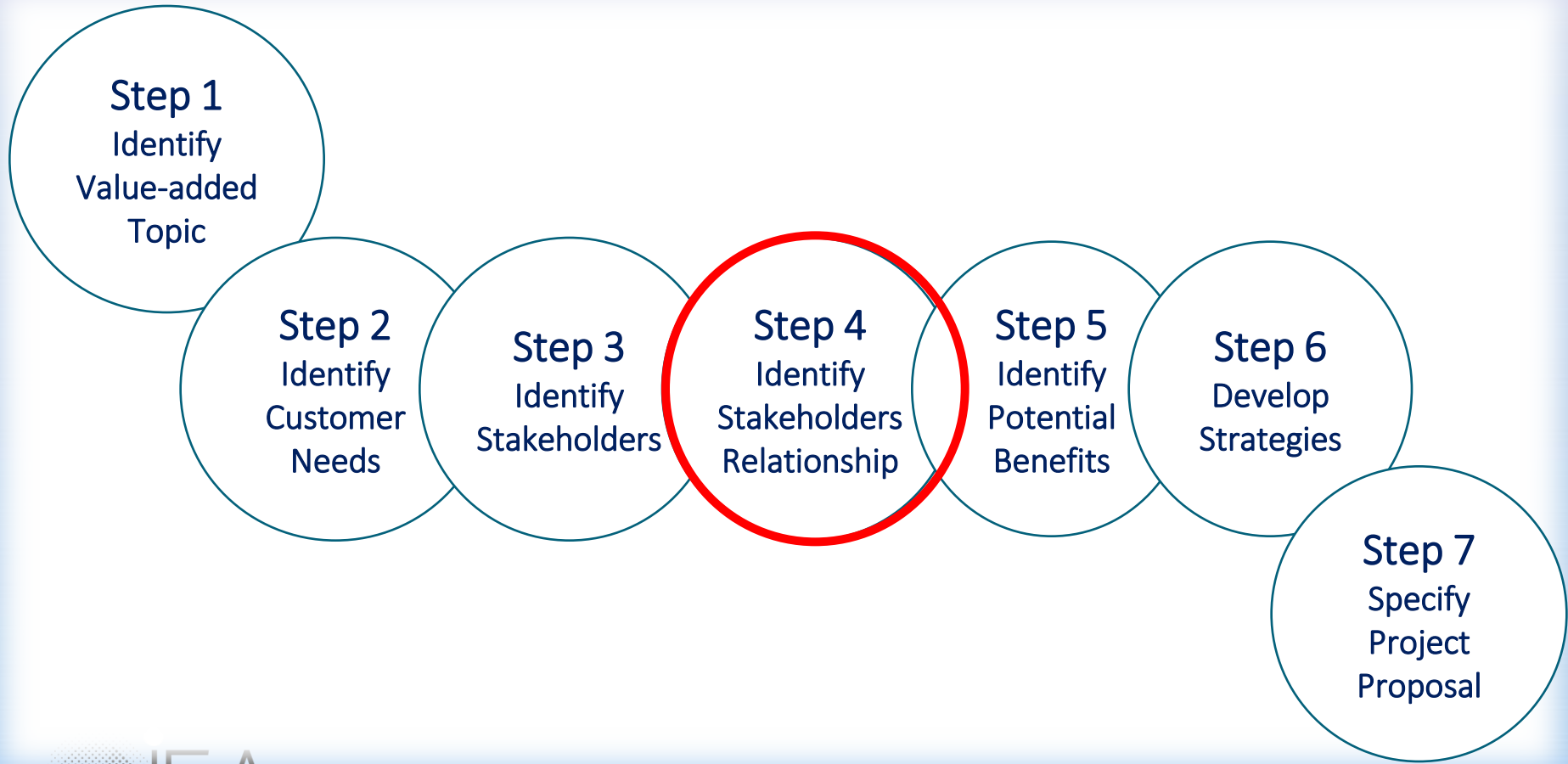
- Individual (a person within a company, product user)
- Company level organization (workers council, user groups)
- Regional/country level organization (trade unions)
- Global level organization (ILO, WHO)

Step 3: Stakeholder identification

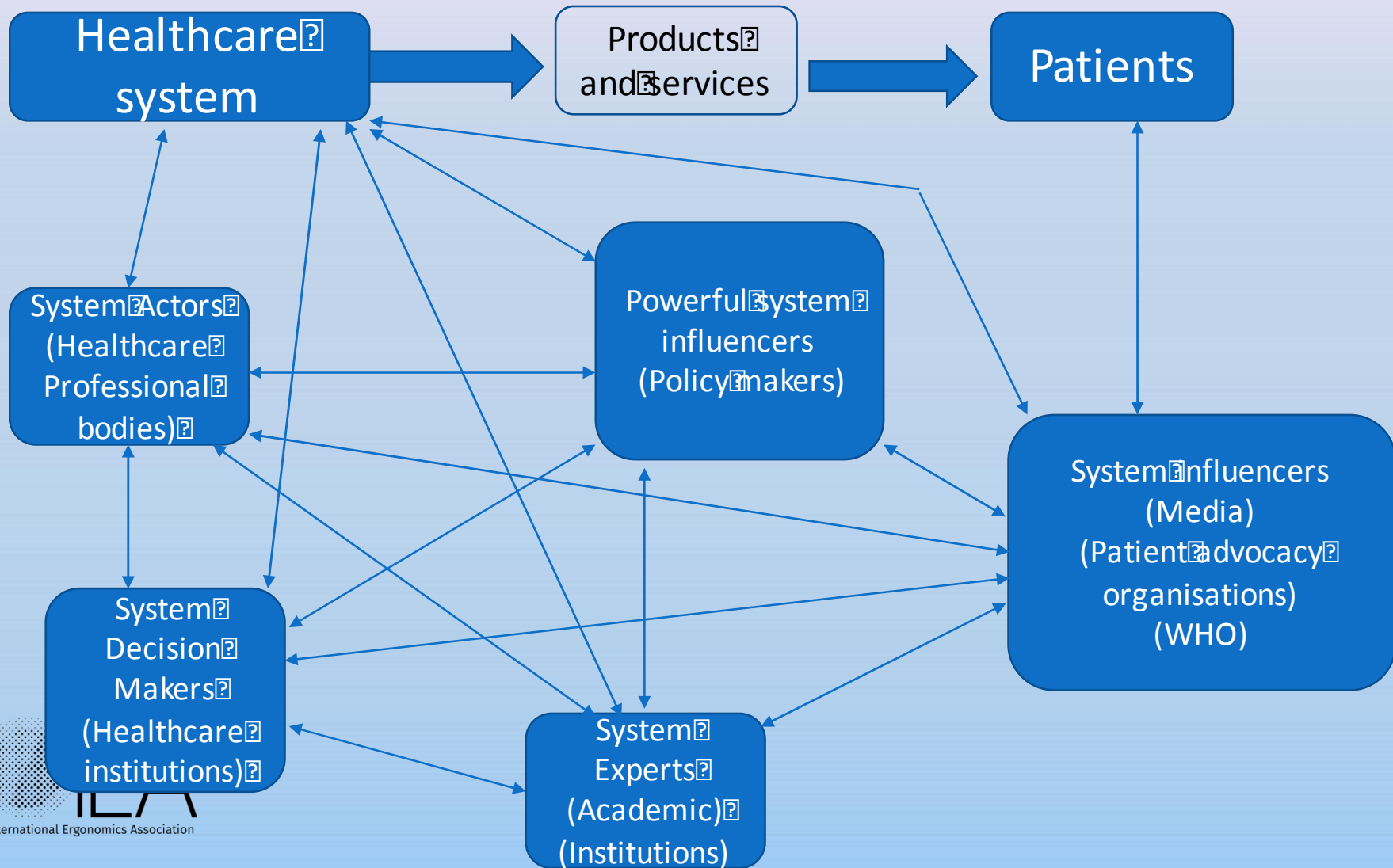


Individual

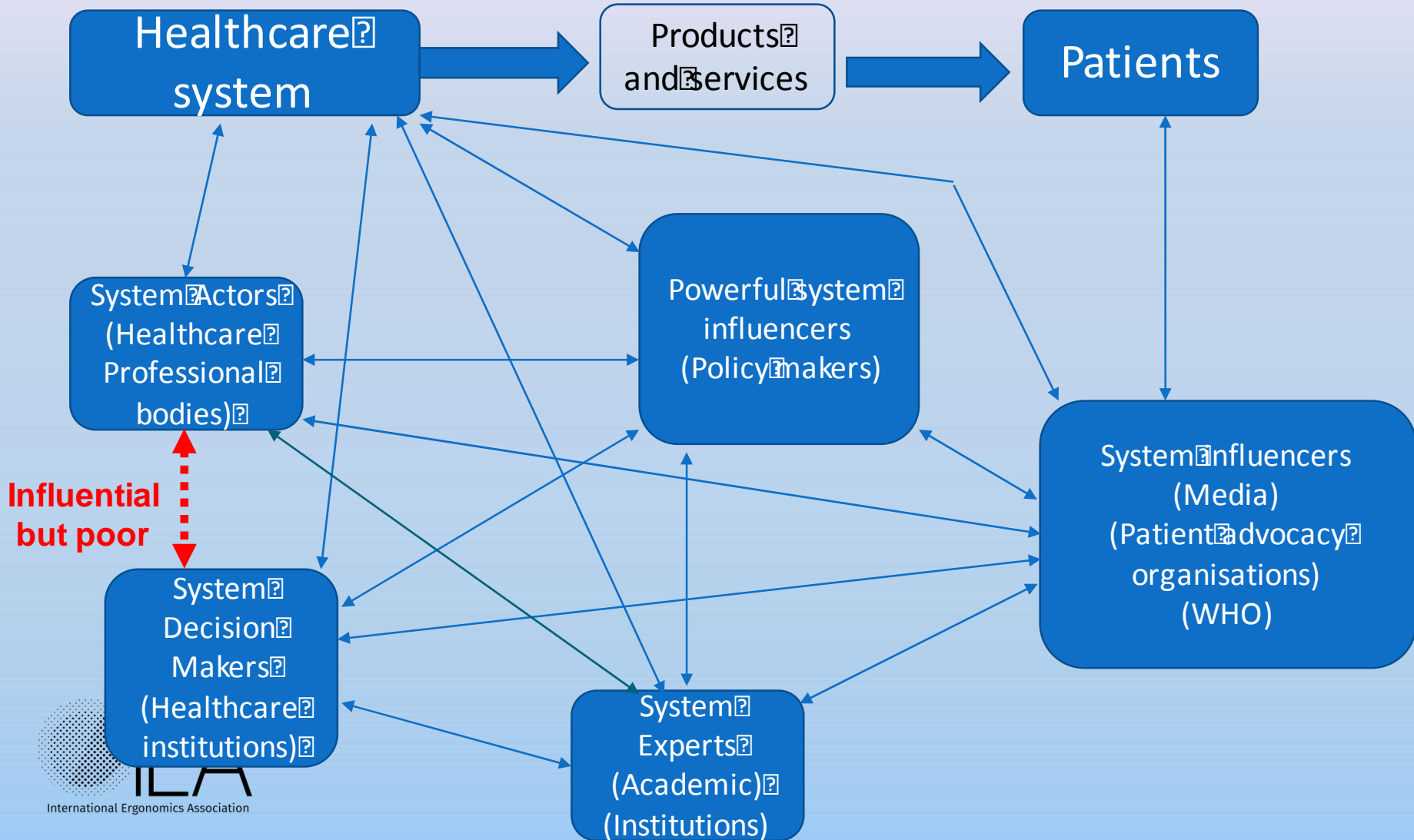
Company



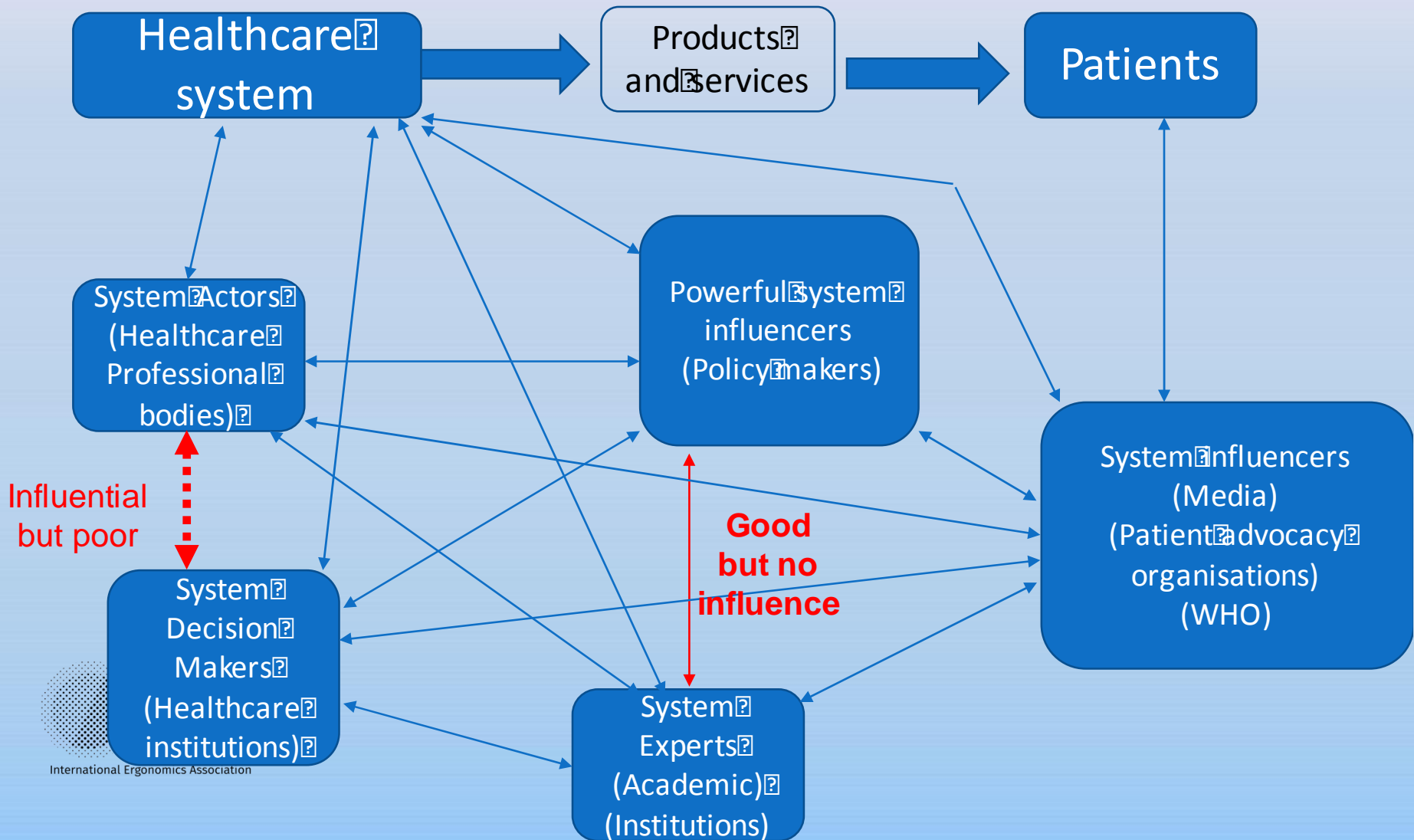
Example of mapping



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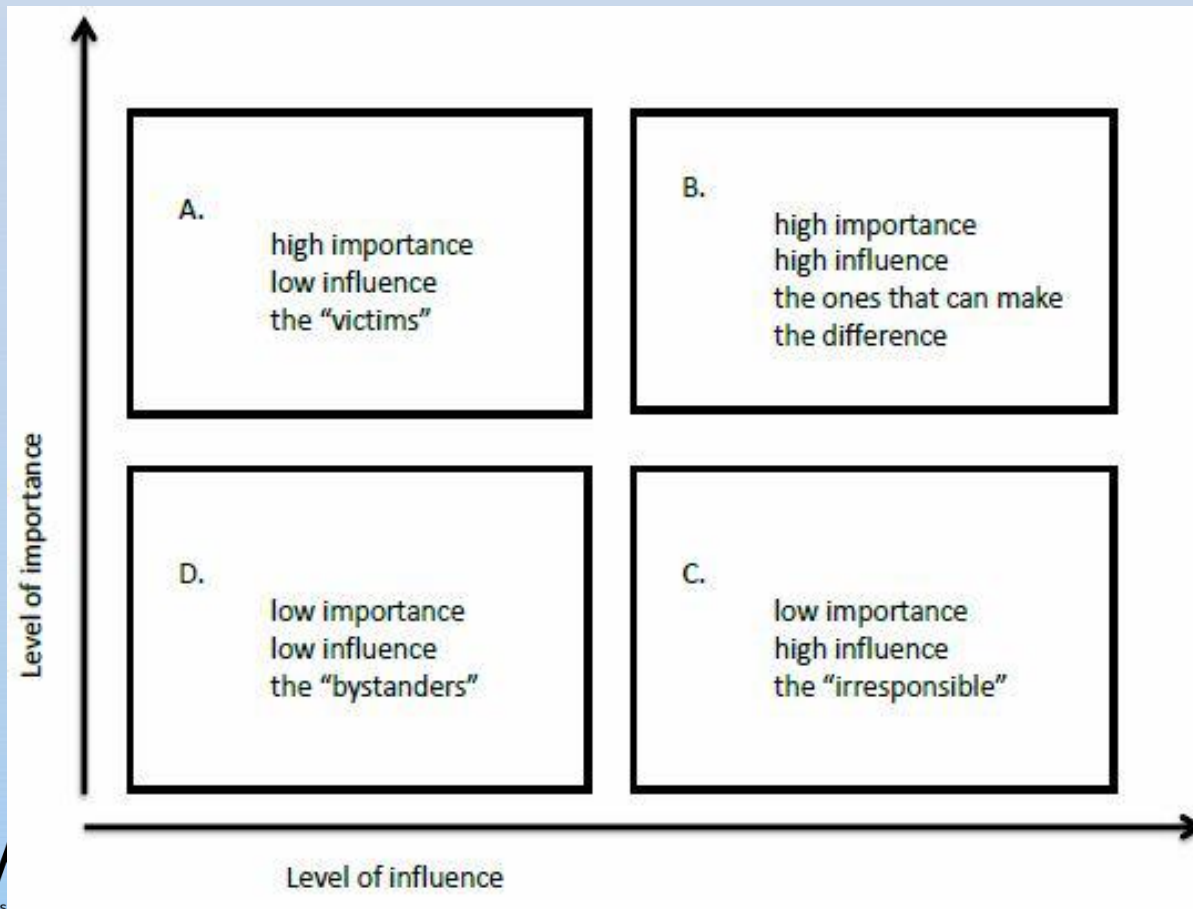


Example of mapping



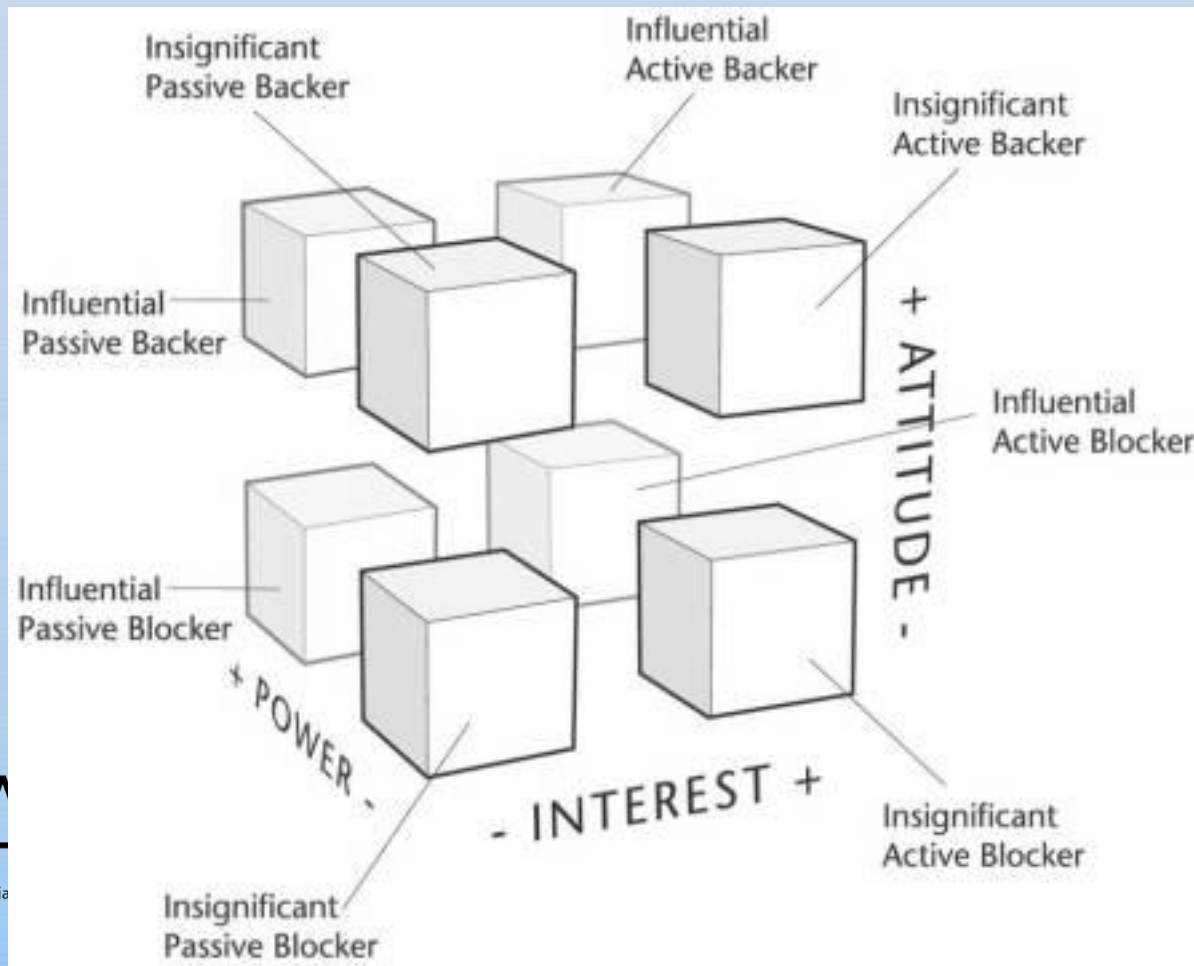
Mapping Outcomes:

Stakeholder identification tools – Importance and influence?



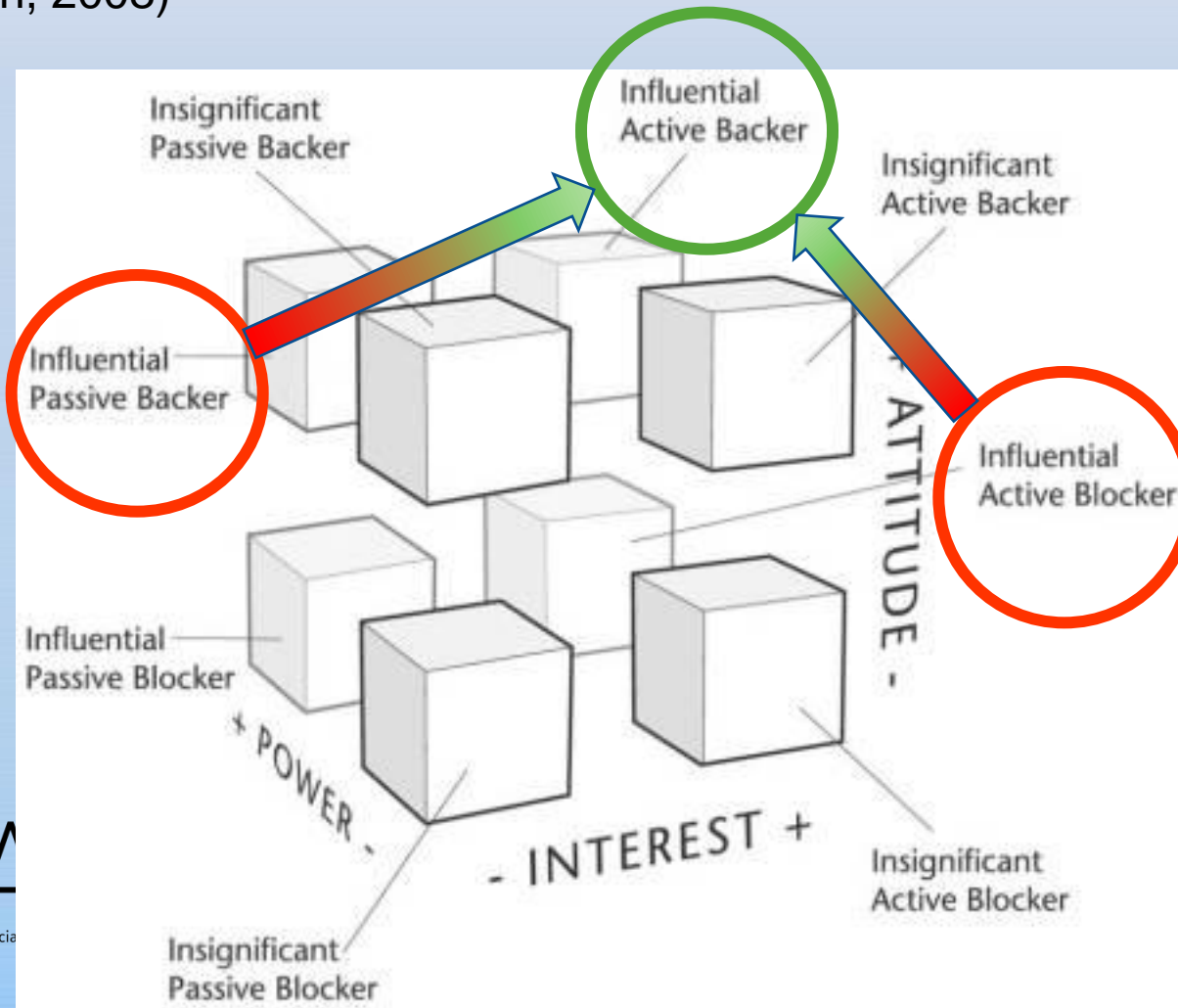
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Mapping Outcomes

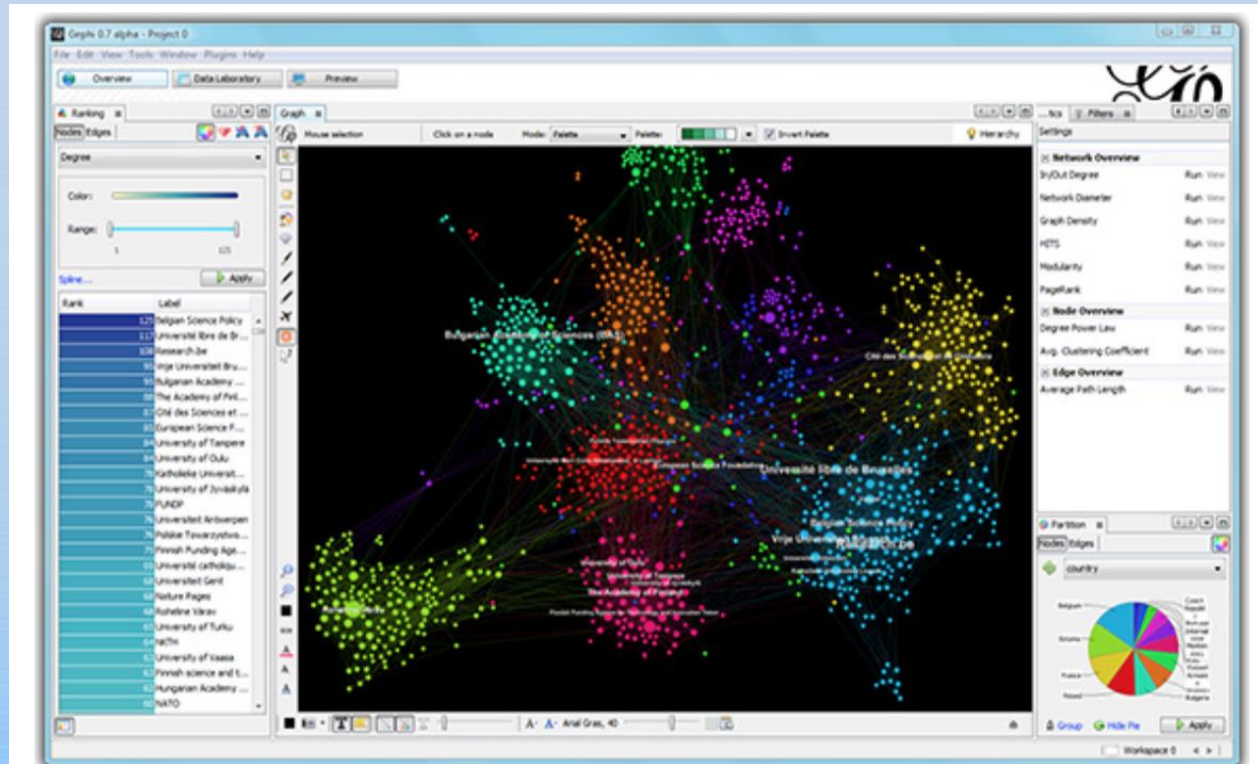
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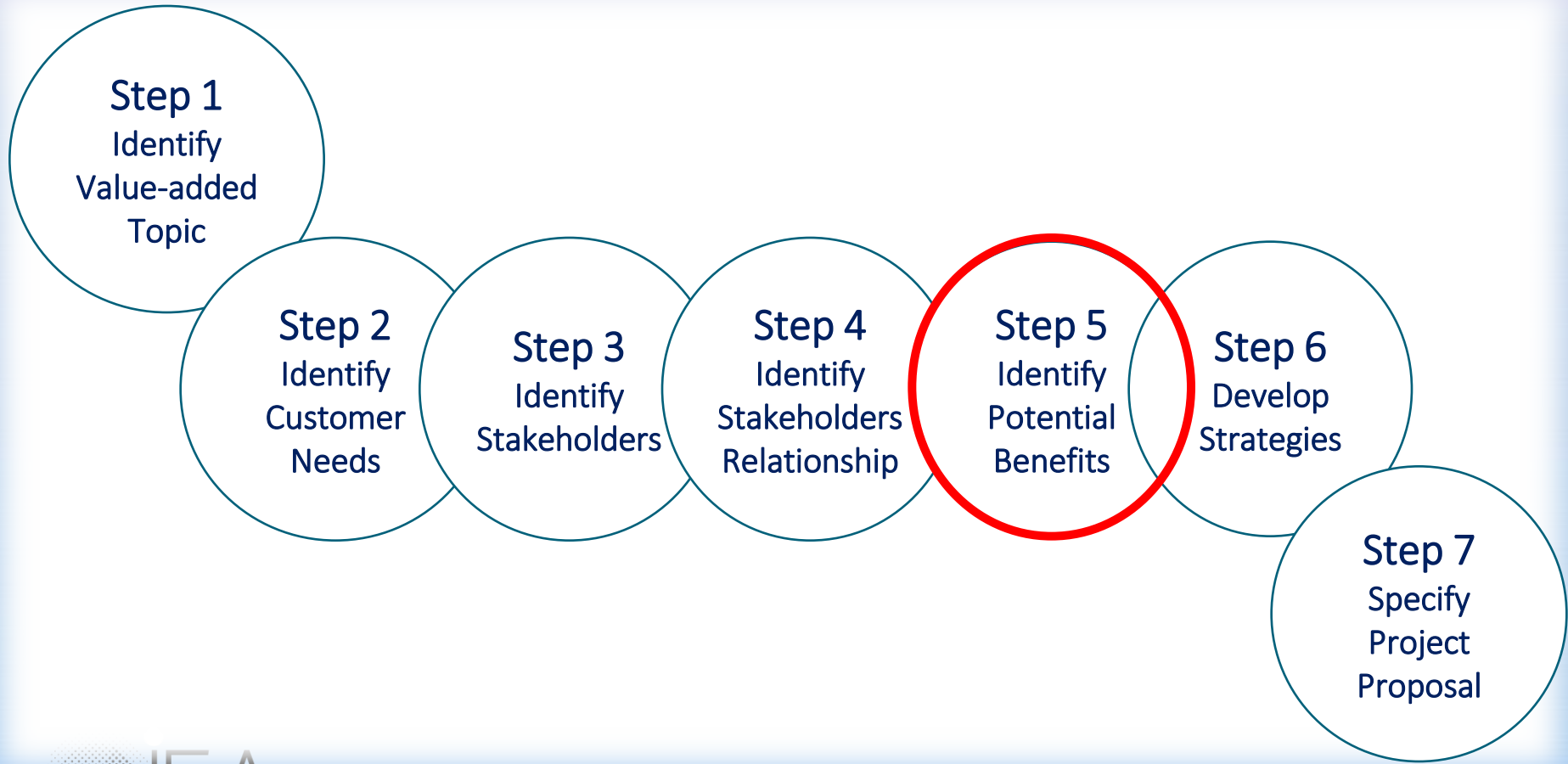


Further mapping tools

Stakeholder identification tools:

- Stakeholder networking – standard tools (Prell et al., 2009)
- Social network analysis (Gephi)
- Network Weaving





Step 5: Output/benefit specification

Specification of the outputs for the various stakeholders and the various levels:

| Stakeholder | Benefit | Constraint |
|-------------|---------|------------|
| | | |
| | | |
| | | |

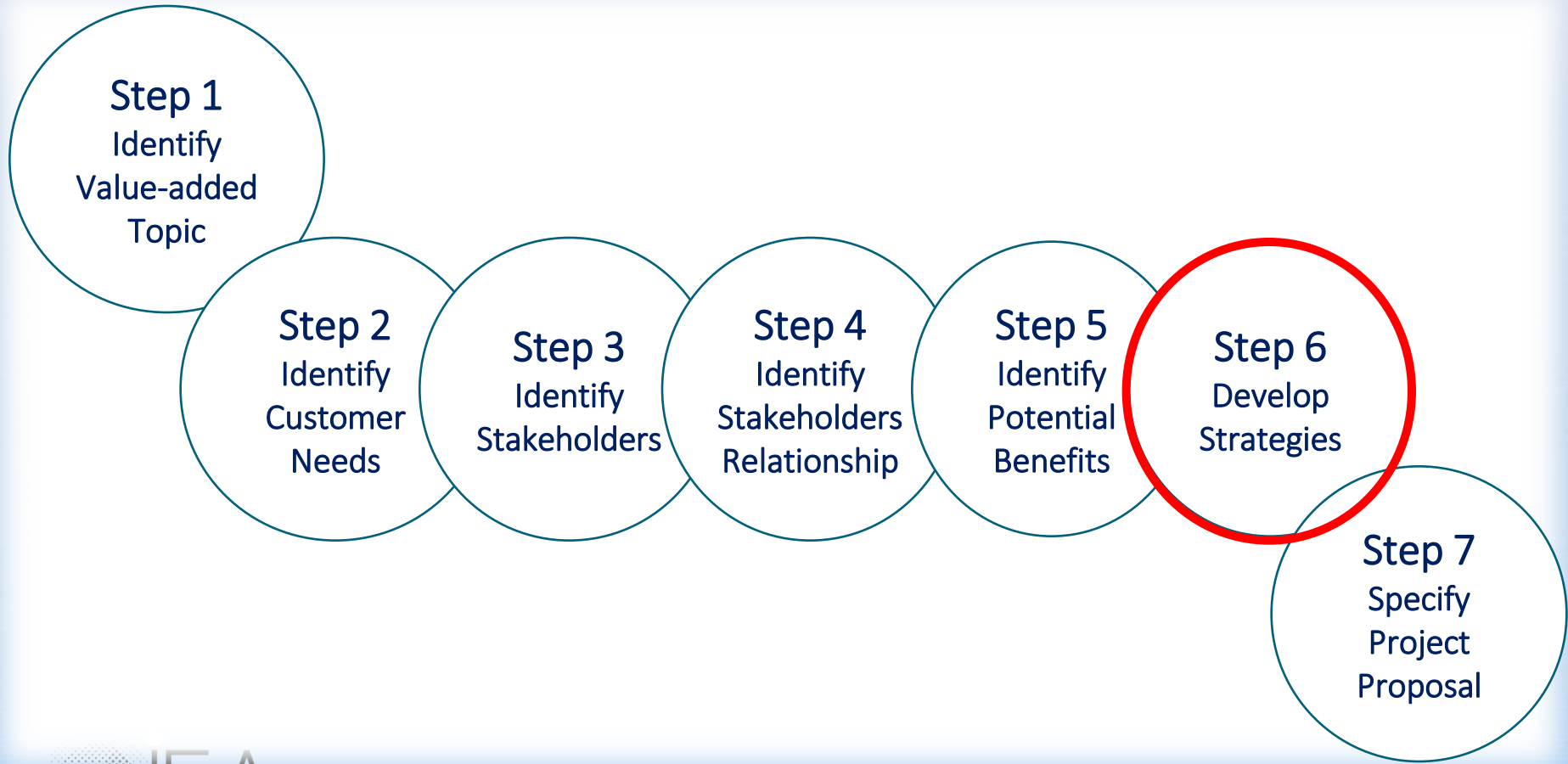
Step 5: Output/benefit specification

Specification of the outputs for the various stakeholders and the various levels:

- What does each stakeholder want
- What benefits will each stakeholder accrue from HF&E
- Provides insights into:
 - How the proposed project should be explained to stakeholders.
 - How the proposed project should be organized.

Step 5: Output/benefit specification

| Major stakeholders | | Goals and benefits of stakeholders within the major stakeholders | | | |
|------------------------|-------------------------|---|---|--|---|
| Category | Major player | Workers | HFE specialists | Decision-makers (mangers) | Influencers (policy makers) |
| System influencer | Department of health | Genuine concern shown from government for the health care workers and patient safety | Regulators can obtain a better framework development. Such a framework should be specified by the project, perhaps in the form of guidance. | Officials can obtain better ideas for regulation and policy on research investment. This can be accomplished through communications with high officials. | The ministry can implement better policies that satisfy global standards. This can also be accomplished through communications with high officials. |
| System decision-makers | Identified Hospitals | Genuine concern shown by hospital for health care practitioners and patients = improved productivity. | Specialists on occupational health and safety control staff can acquire better approaches and tools through collaboration with other researchers | Managers can obtain a better framework for managing workers and HFE specialists. Such a framework should be specified by the project, perhaps in the form of guidance. | Company policy makers can improve the policies related to safety and well-being that meet international standards. A concise document summarizing principles may be useful. |
| | Company managers | Workers are provided with safer work environments and better well-being | ditto | ditto | ditto |
| System experts | Identified universities | | <p>Researchers can obtain funded research opportunities.</p> <p>Researchers can develop and/or apply their methods and tools through collaborative practices.</p> | As research organizations, the universities can obtain better policies for overseas collaboration. This is probably not a direct outcome of the project. HFE specialists who belong to universities should report to the management. | |



Step 6: Develop Strategies

Keys to success:

- Multiple win scenarios for all stakeholders
- Project specification in smaller units (cascade or parallel)
- Clearly define:
 - Project outputs for the customer
 - Long term benefits for the HFE professional/specialist

Step 6: Developing strategies

Act Locally, connect regionally and learn globally:

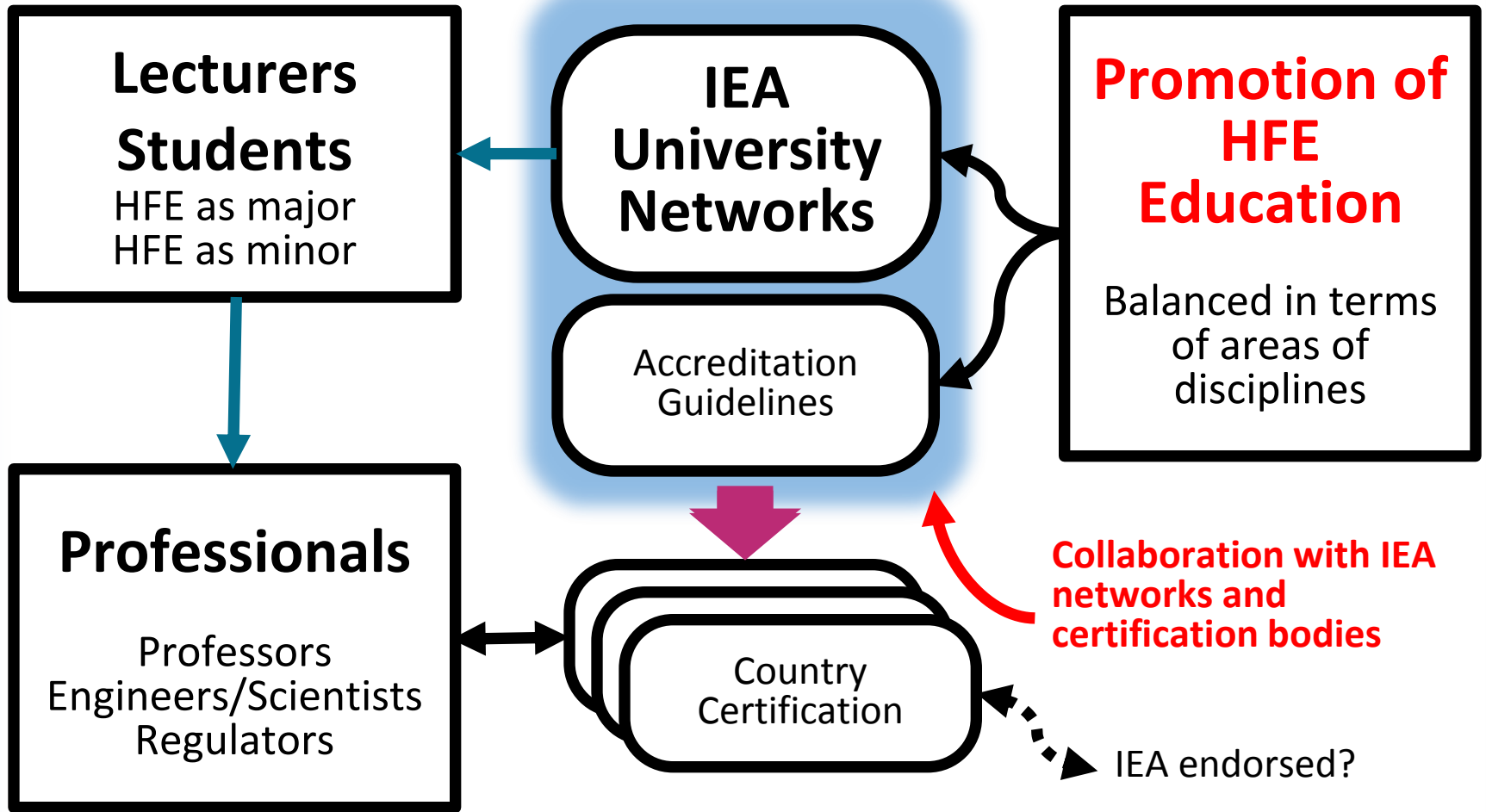
- Resource scarcity:

- IEA
- Local network
- Federated societies
- Prospective societies

locally viable solutions to contextual problems needed

Distributed resources possessed by the human capital represented in stakeholders needs to be leveraged for such solutions to be found.

Step 6: Develop Strategies



So far, successful in Latin America , Asia, and BRICS.