A Logical Framework for Evaluating the Outcomes of Team Science

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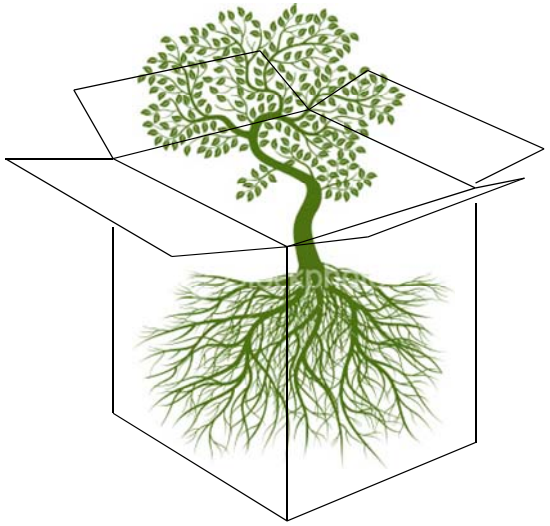
Outline

- Objectives
- Tool – logical framework
- Research Profiles
- Evaluation questions and timing
- Categories of indicators
- Differences by profile
- Summary - conclusions

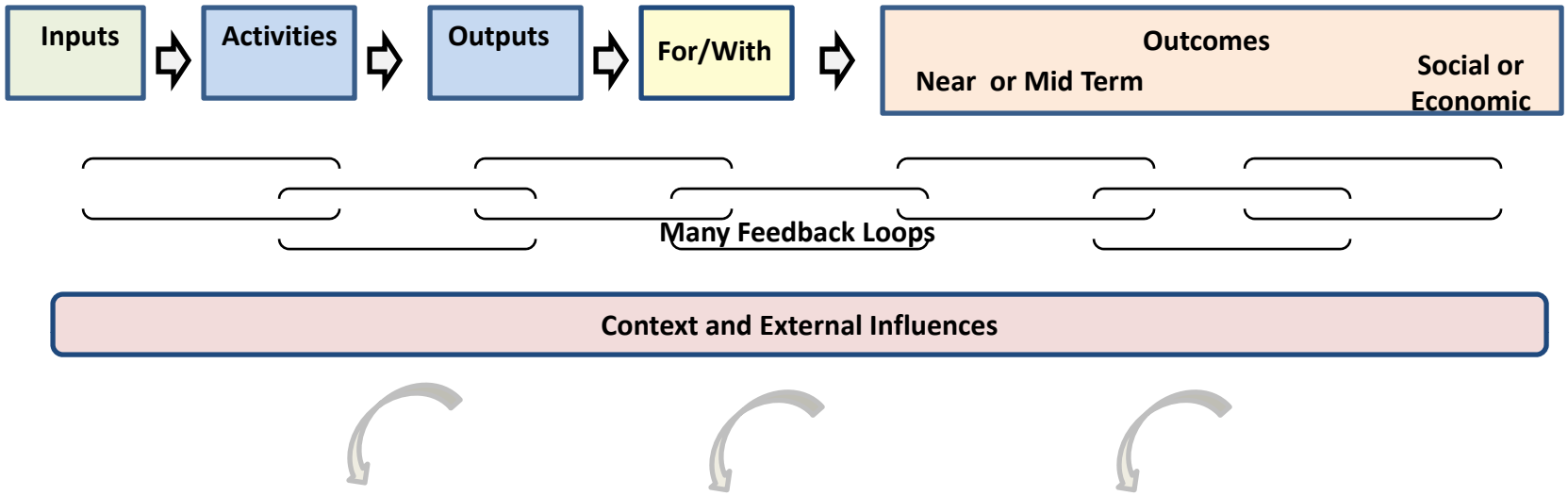
Objective

Provide ideas on evaluating outcomes of team science

- scientific and societal,
- for different profiles of teams and contexts,
- in order to assess “effectiveness” of teams,
- and see patterns to build theory.

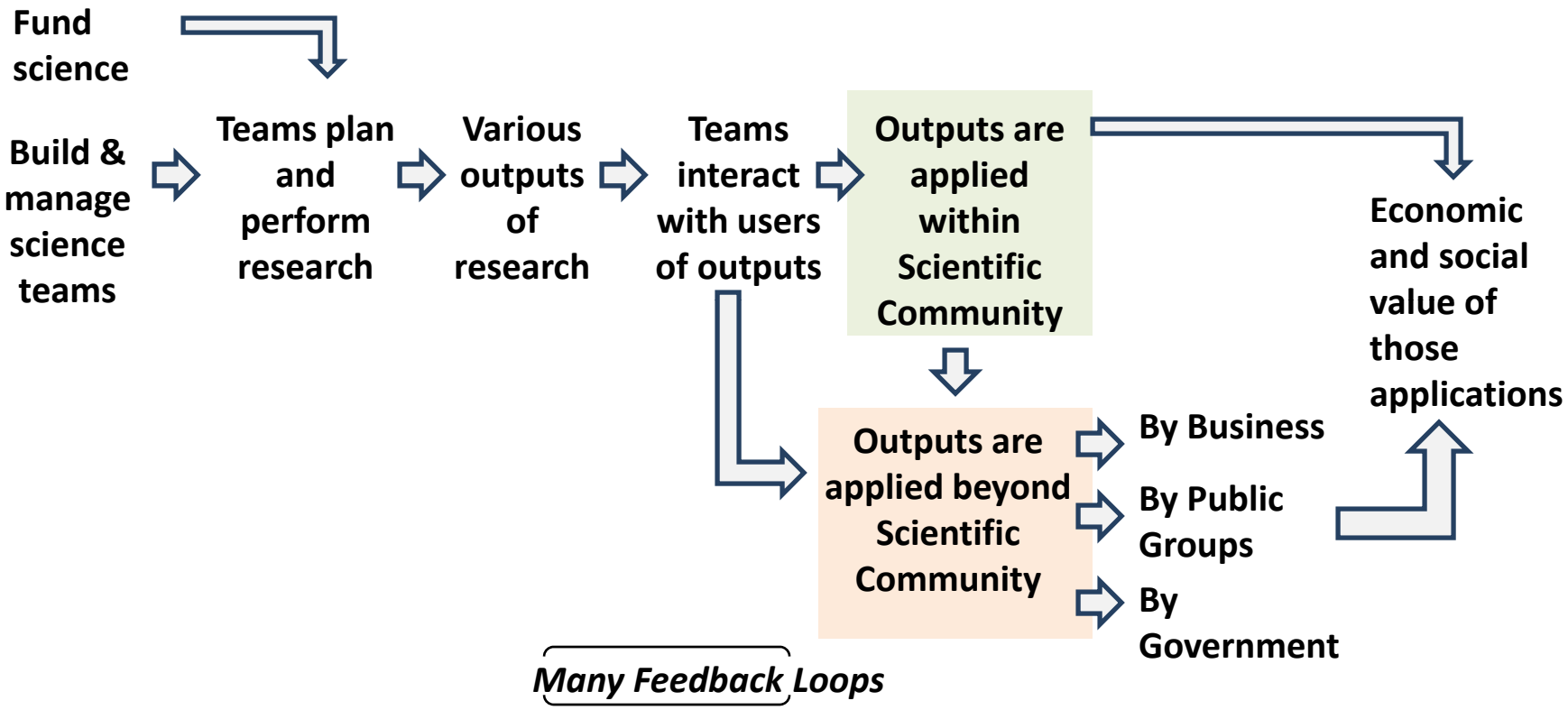


First, Develop A Logical Framework

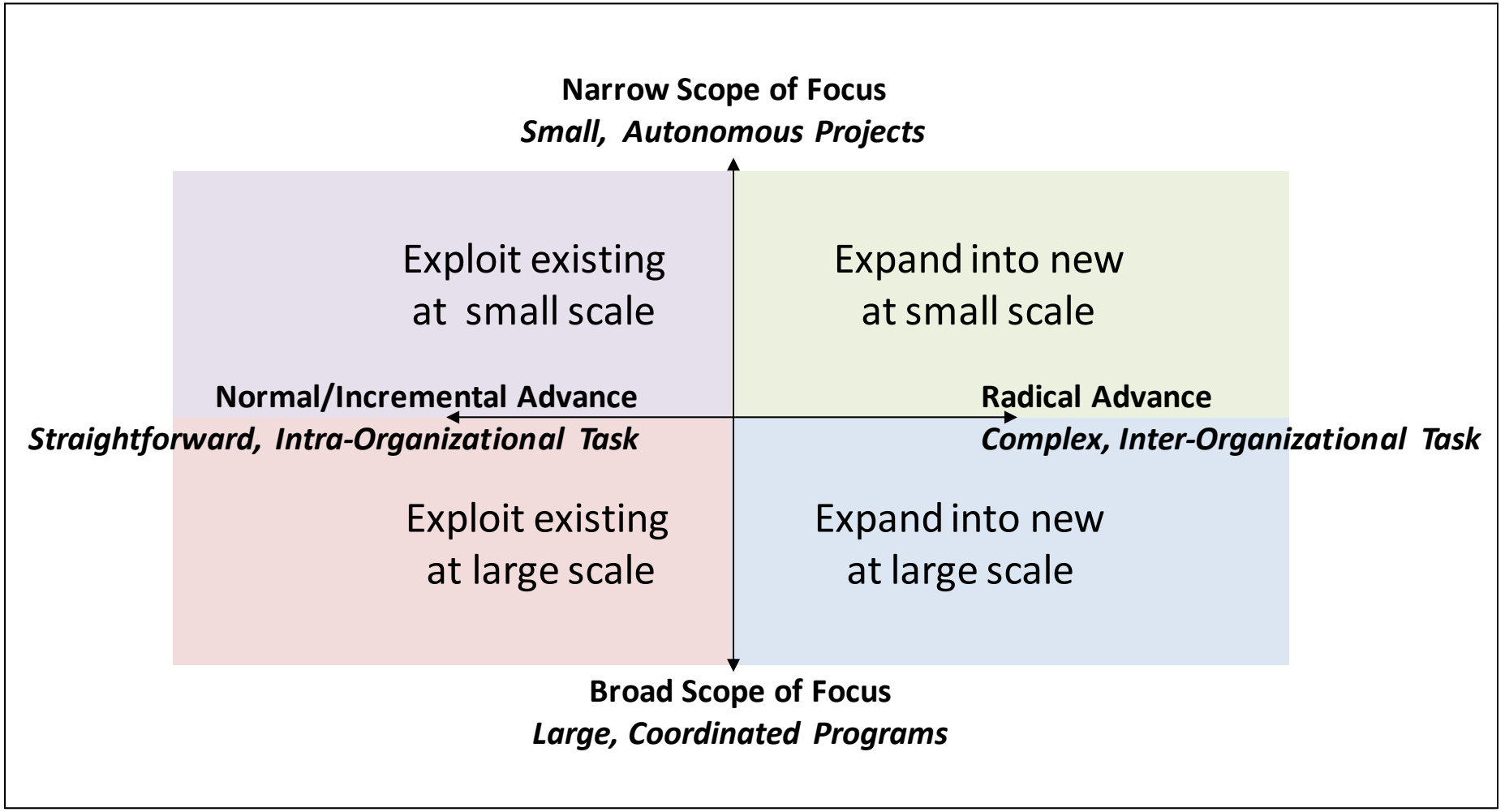


Indicators for						
Inputs	Activities	Outputs	Interactions	Near term Outcomes	Mid term Outcomes	Social or Economic Outcomes
Characteristics of likely differentiating factors; External influences on achievement						

High Level Logic Model for Outcomes of Team Science



Outcomes Differ Depending on Research Profile



See Jordan, Hage and Mote, 2012, 2008, 2007, 2003

Timing of Evaluation of Outcomes, Effectiveness

Shorter Term (every 3-5 years)

- quantity, quality of outputs
- connectedness of team with potential users
- science outcomes ? (sometimes) application outcomes

Context

- Is there correlation between contextual/team characteristics and outputs/outcomes?
- What worked and what did not?
- How do outputs/outcomes compare to similar individual efforts?

Retrospective (after 10 years or more)

- Assess outcomes and their value
- Trace to/from teams; Plausible story of contribution

Logical Framework of Indicator Categories - 1

Inputs

-Funds
-Team quality, organization
-Instruments
-Knowledge base
-Technical base
-Research environment

[Resources]

Activities/Outputs

ACTIVITIES
- Plan
- Investigate
- Prove concept
- Prototype

OUTPUTS
- Ideas/ Knowledge advances (Excellence, Novelty, Publications, tech reports)
- New research tools, techniques
- People trained
- Preparation for transition to application

[Productivity]

Interactions

CONNECTEDNESS
-With other scientists (pre-development)
-Across functions with developers, manufacturers, marketing
-Inter-sectoral
-With intermediaries
- With potential application users

LEVEL OF INTEGRATION (co-located, boundary spanners, etc.)

[Indicates influence]

Logical Framework of Indicator Categories - 2

Near Term	Outcomes Mid Term	Long term

SCIENCE OUTCOMES

1. Research activity "performance"
2. Research agility
3. Organization, integration of knowledge
4. Impact on science
5. Science infrastructure
   - -Knowledge Base
   - - Tools, Facilities
   - - People

APPLICATION OUTCOMES (potential and actual):

1. Industry
2. Government
3. Tech. Infrastructure

ADOPTION INFRASTRUCTRE (potential and actual):

1. Business
2. Government procurement
3. Public groups

VALUE OF THOSE APPLICATIONS:

Economic

-general
-business
-energy

Social

-health
-environment
-security
-other

Logical Framework of Indicator Categories - 3

Macro

Context

- Availability of Capital
- Availability of Capabilities
- Ease of coordination

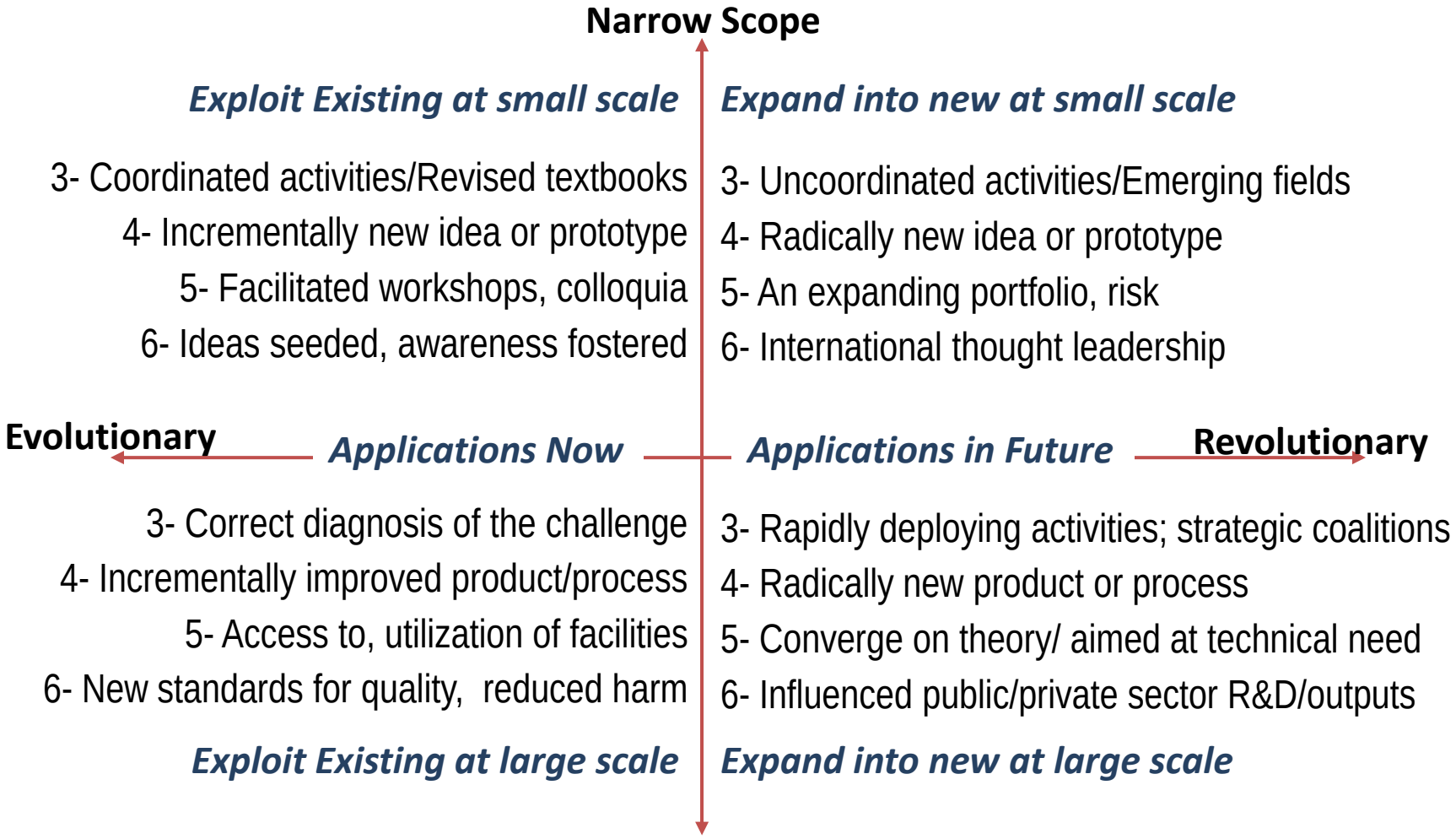
Meso/Sector

Characteristics of Interactions:	Nature of the application of research:
a. diversity	a. Breadth
b. continuity	b. Timing
c. mechanism used	c. Radicalness of change for application
	d. Sector speed for technical change
	e. Sector absorptive capacity, resources

Characteristics of the team (size, diversity, organizational/manage-ment, readiness, etc.)	Nature of the research problem a. research type b. radicalness c. scope

Micro

Outcomes Vary By Research Profile



Categories from Feller & Gamota, 2003

3 - Structure/Organization of Knowledge
4 – Scientific Impact
5 – Science Infrastructure
6 – Application, Societal Impacts

Summary - Conclusions

- Assessing effectiveness and building theory requires linking outcomes to characteristics of teams and organizations.
- A logical framework is helpful for this.
- Everything here is a candidate for further discussion.

For more discussion or questions, contact me, gretchen.jordan@comcast.net

Logical Framework of Indicator Categories To Assess Effectiveness of Team Science

Inputs

-Funds
-Staff/Team quality
-Instruments
-Knowledge base
-Technical base
-Research environment

Activities/ Outputs

A. ACTIVITIES
-plan
-investigate
-prove concept
- prototype

B. OUTPUTS
1. Ideas/ Knowledge advances (Excellence, Publications, tech reports, IP, awards)
2. New research tools, techniques
3. People trained
4. Preparation for transition to application

[Productivity]

Interactions

C. CONNECTEDNESS
-With other scientists (pre-development)
-Across functions with developers, manufacturers, marketing
-Inter-sectoral
-With intermediaries
- With potential application users

D. Level of integration (co-located, boundary spanners, etc.)

[Indicates influence]

Outcomes

Near Term

E. SCIENCE OUTCOMES
1. Research activity "performance"
2. Research Agility
3. Organization, integration of knowledge
4. Impact on science
-Change state of the art, emerging fields, …
5. Change in science infrastructure
5a. Knowledge Base
5b. Tools, Facilities
5c. People, talent

Mid Term

F. APPLICATION OUTCOMES (potential and actual):
1. Industry: new product, process, service
2. Government: policy, program
3. Tech. Infrastructure: standards, generic technology

G. ADOPTION INFRASTRUCTRE (potential and actual):
1. Business: distribution channel, logistics, training, etc.
2. Government procurement
3. Public: new media campaign, Advocacy group

[Application, Absorptive capacity]

Long term

H. VALUE OF THOSE APPLICATIONS:
Economic
-general
-business
-energy
Social
-health
-environment
-security
-other

Context

Micro

Characteristics of the team (size, diversity, organizational/ management, readiness, etc.)

Nature of the research problem
a. research type
b. radicalness
c. scope

Meso/Sector

Characteristics of Interactions:
a. diversity
b. continuity
c. mechanism used

Nature of the application of research:
a. Breadth
b. Timing
c. Radicalness of change for application
d. Sector speed for technical change
e. Sector absorptive capacity, resources

Macro

Availability of:
-Capital
-Capabilities (people, instruments)
-Ease of coordination

G. Jordan October 2013