A Framework for Maintaining Socio-technical Balance during Evolution of Complex Systems

Motivation

Leavitt's model

Wicked Systems

What is complexity

Designing for alignment in complex systems

Is there a need to structure and support community relationships

Summary

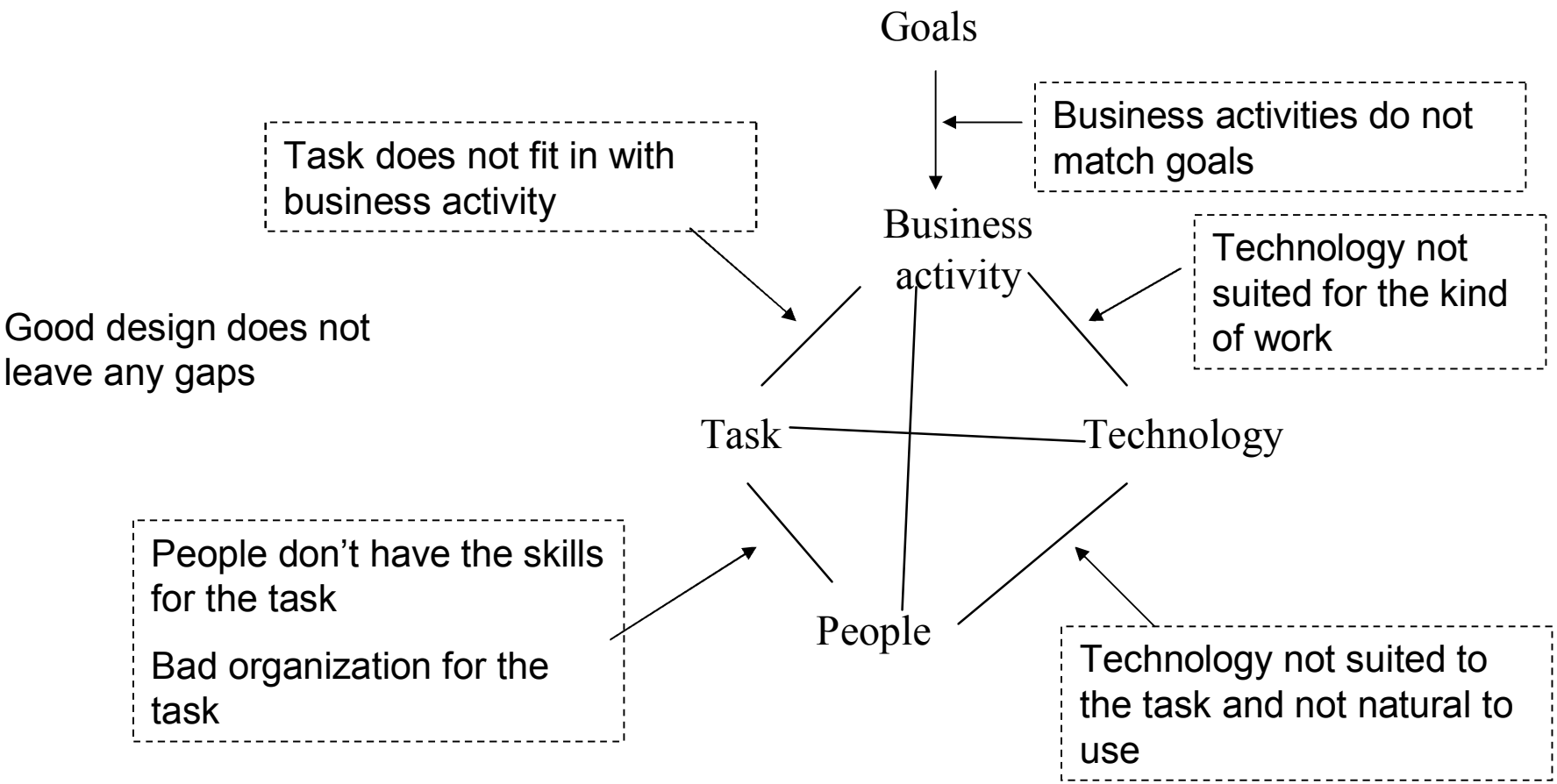
Socio-Technical balance in networked systems

It is now recognized that for work to proceed smoothly there must be a match between people and technology

Research in this area has mostly addressed well defined tasks within a single organization

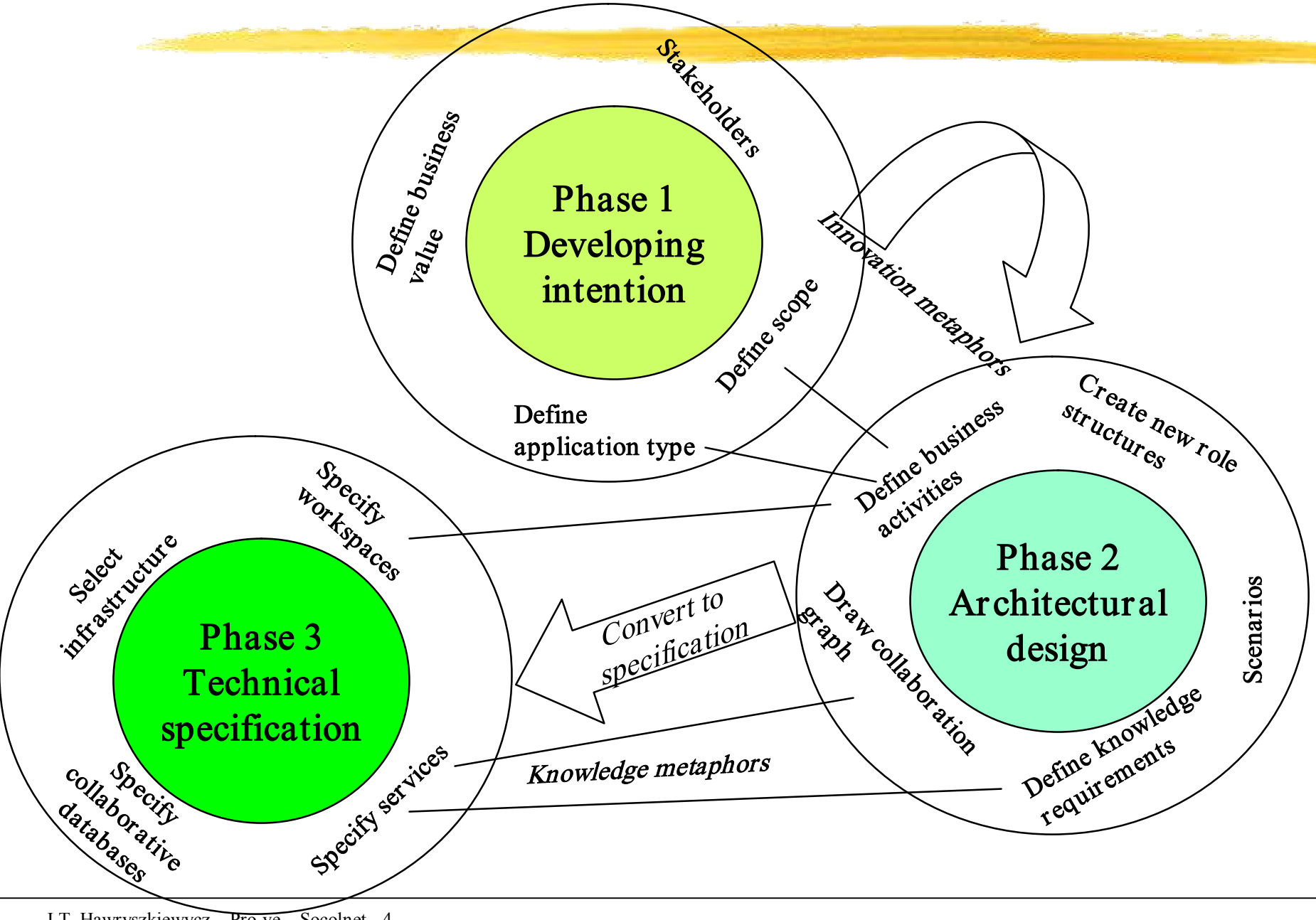
Work is now becoming more complex and marches must often be made across organizations

Maintaining socio-technical balances

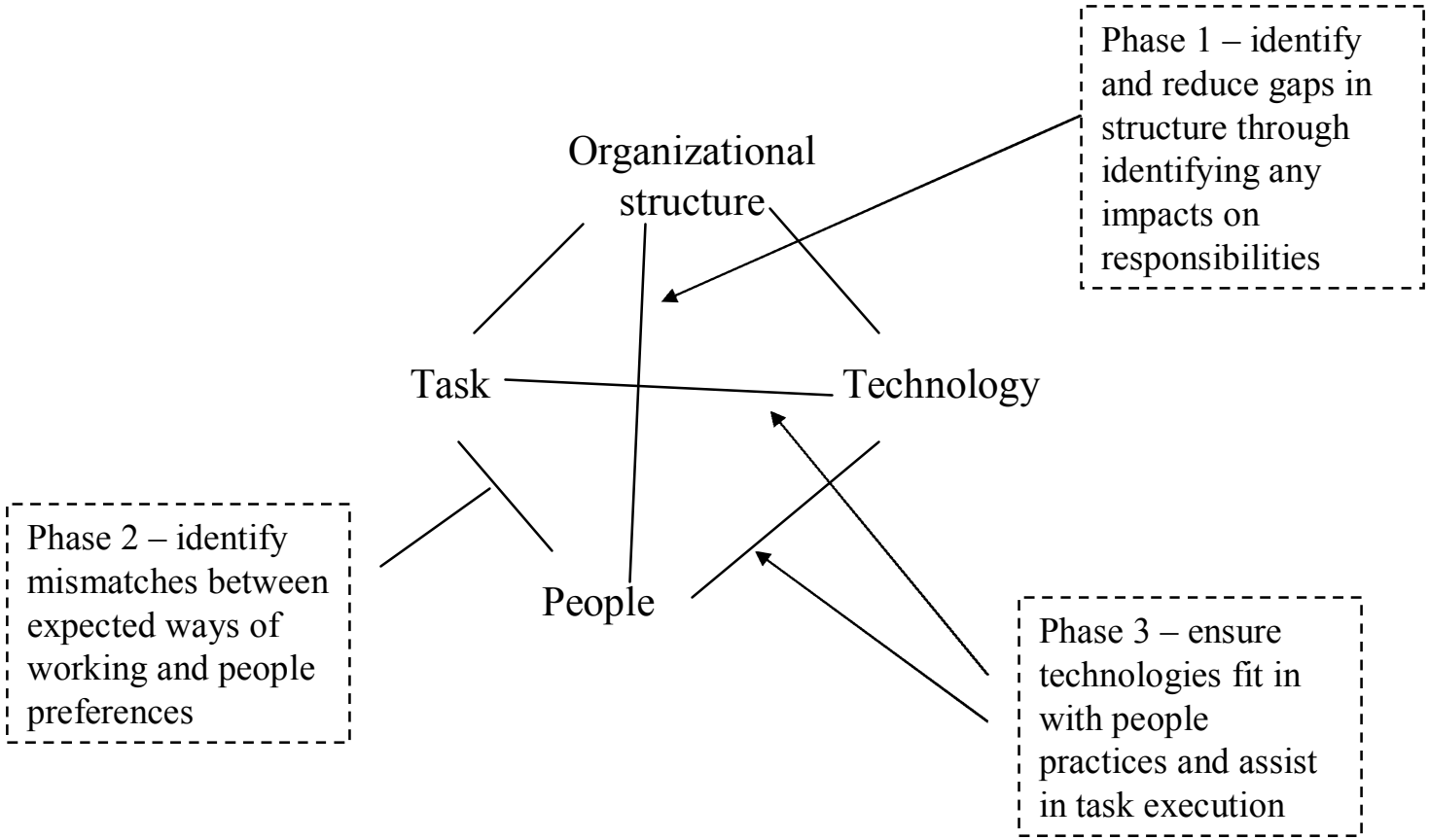


How to maintain the balance (or alignment during change)

Addressing socio technical balance in design



A systematic approach to reaching balance



Trends to Large Scale Collaboration

Difficult to s

Policy formulation

Strategic Planning

Community and network support

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Public

Requires holistic thinking

Have ways to knock out bad ideas

Systematic approaches to social innovation

Worl

Aging Population

Sustainability issues

Obesity

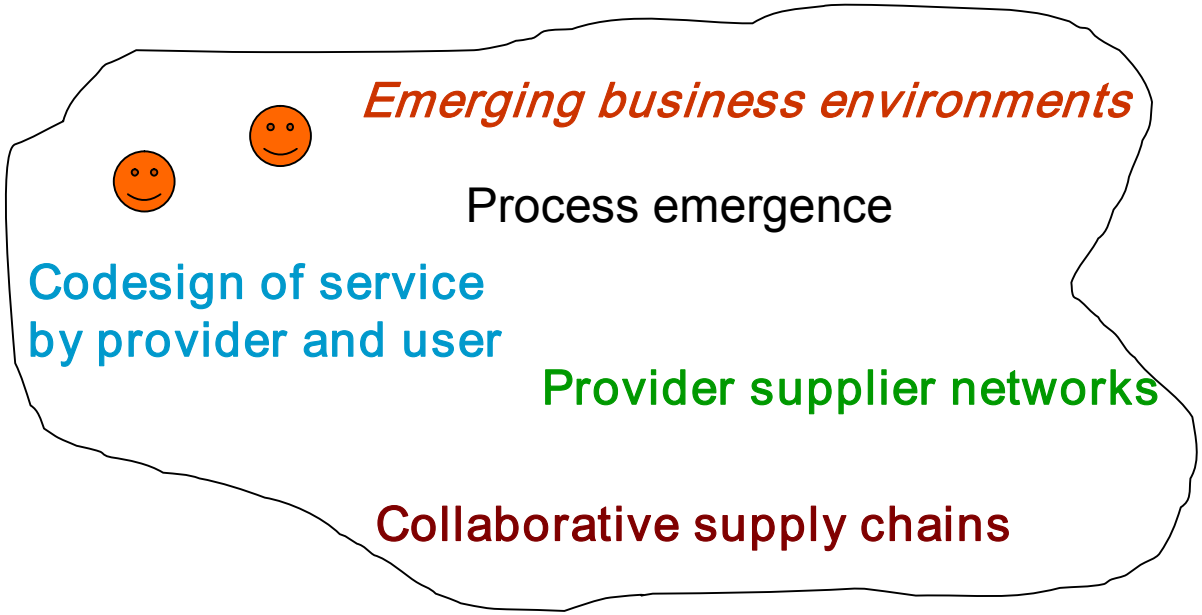
Supportive structures and p

Facilitate information managen
sharing

Encourage initiative and recognize the need for learning

Growing complexity in the business environment

System of systems

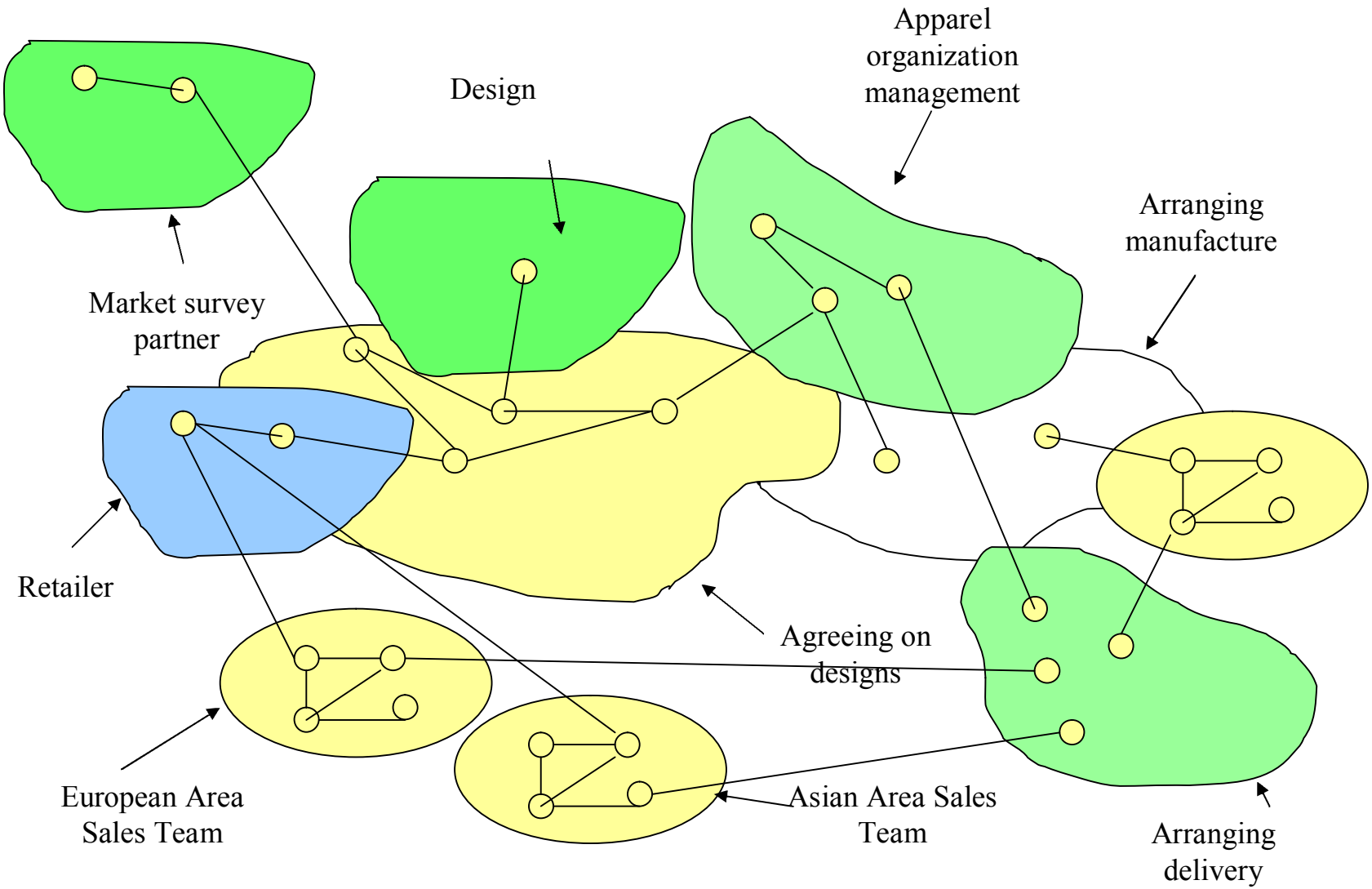


Emphasis on knowledge creation

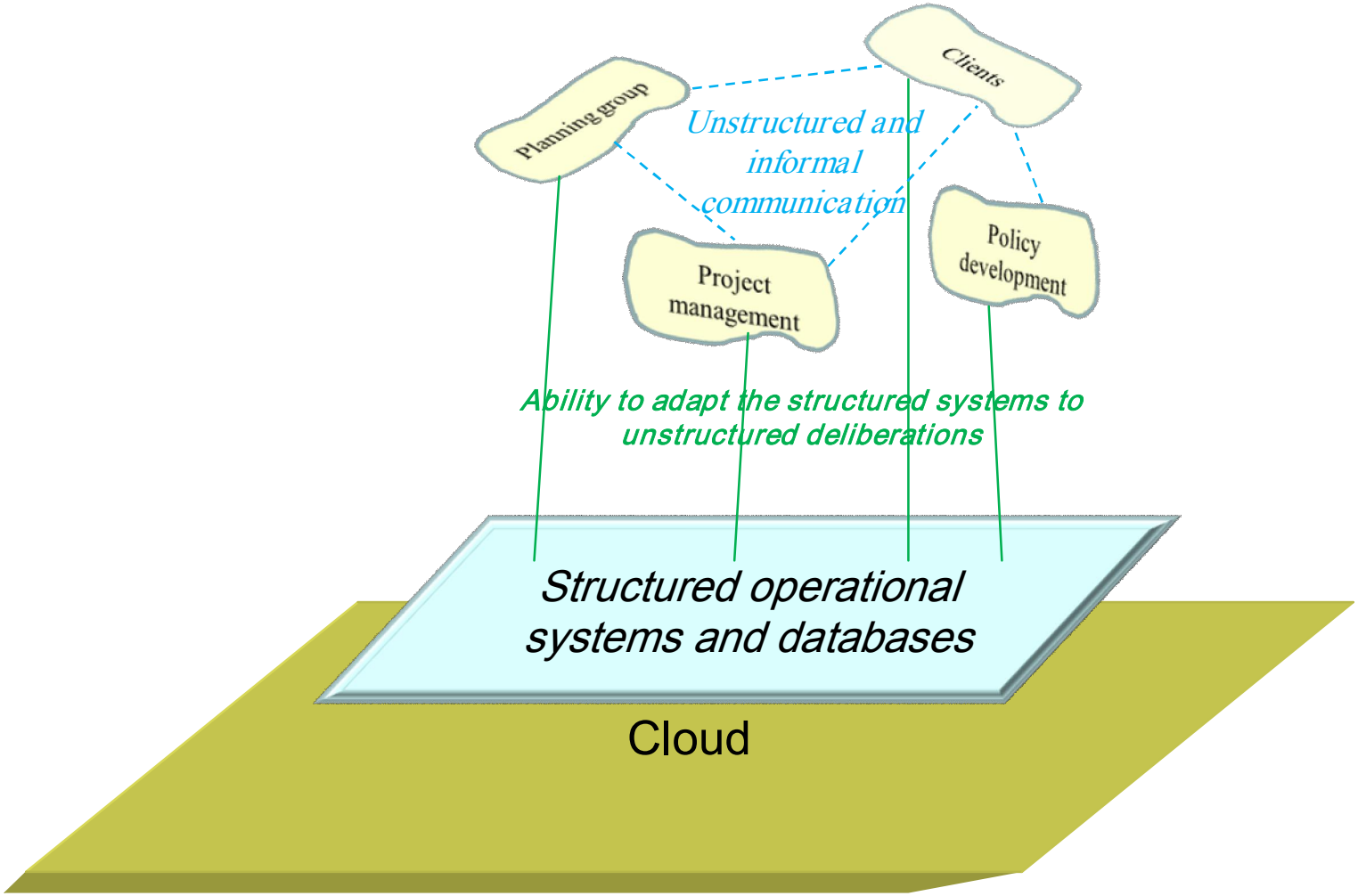
Emphasis on innovation

Greater need to adapt to changes in the environment

Social networking – loosely structured communities

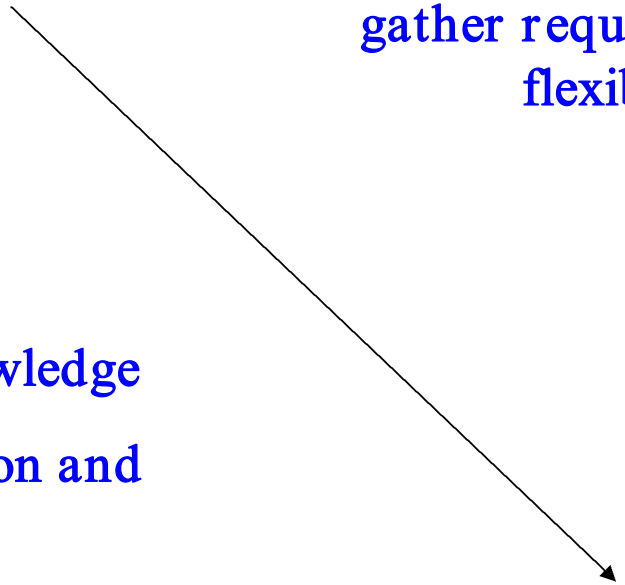


Ensemble of communities



Trends in large scale collaboration

From loosely structured communities



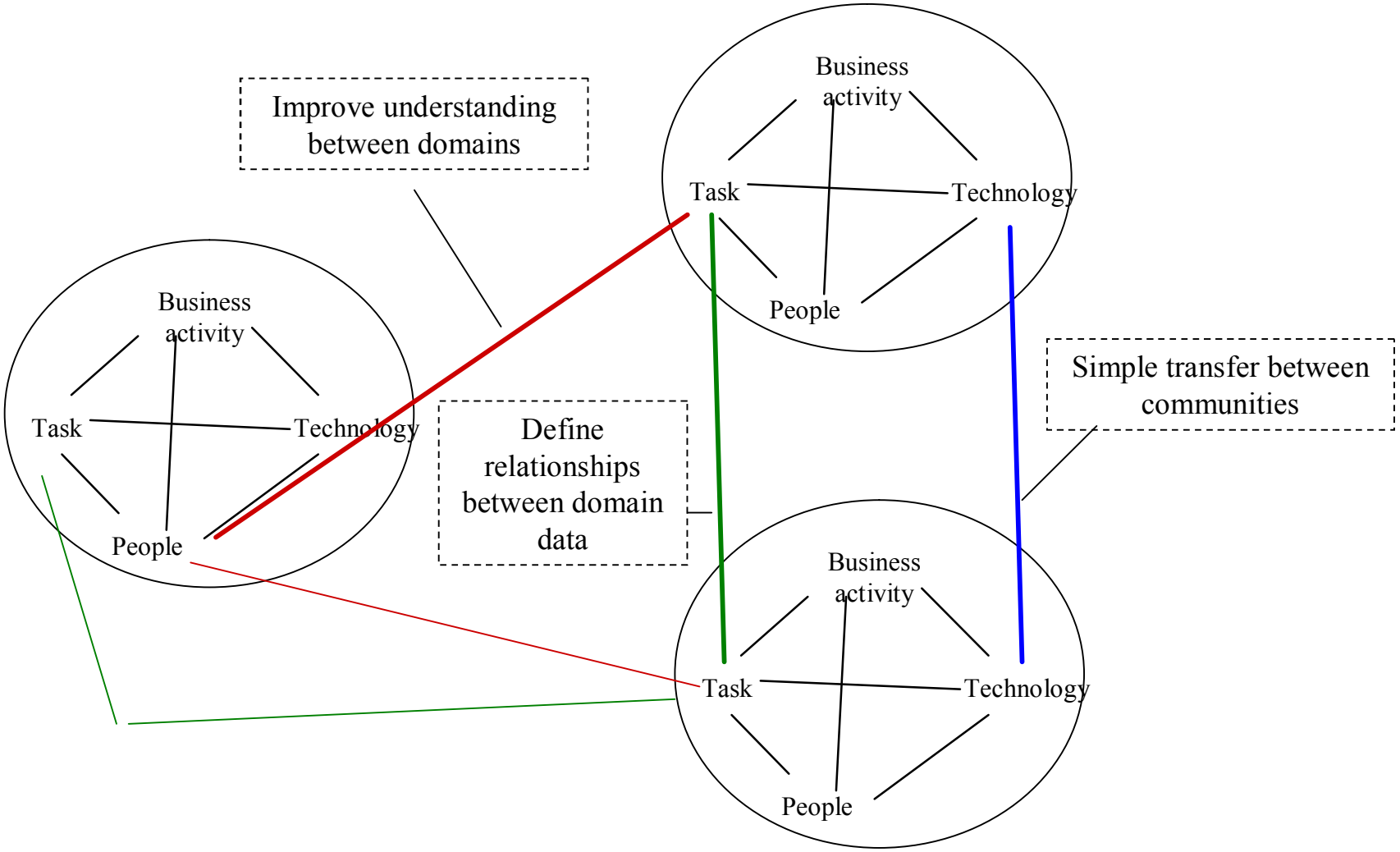
Use complexity as a guideline to gather requirements and design flexible platforms

Improve flow of knowledge

Facilitate collaboration and innovation

Managed communities

Aligning in the Networked World



What is complexity?

(Using complexity theory to understand business dynamics)

Research has greater emphasis on complexity theory

Complicated

Deterministic but unpredictable

Can lead to chaos

Creativity emerges from the edge of chaos - McElroy

Complex

More choice and self organization in how to work

Reorganizing to fit in better with environment

Looking at better ways to work

Increasing choice is good

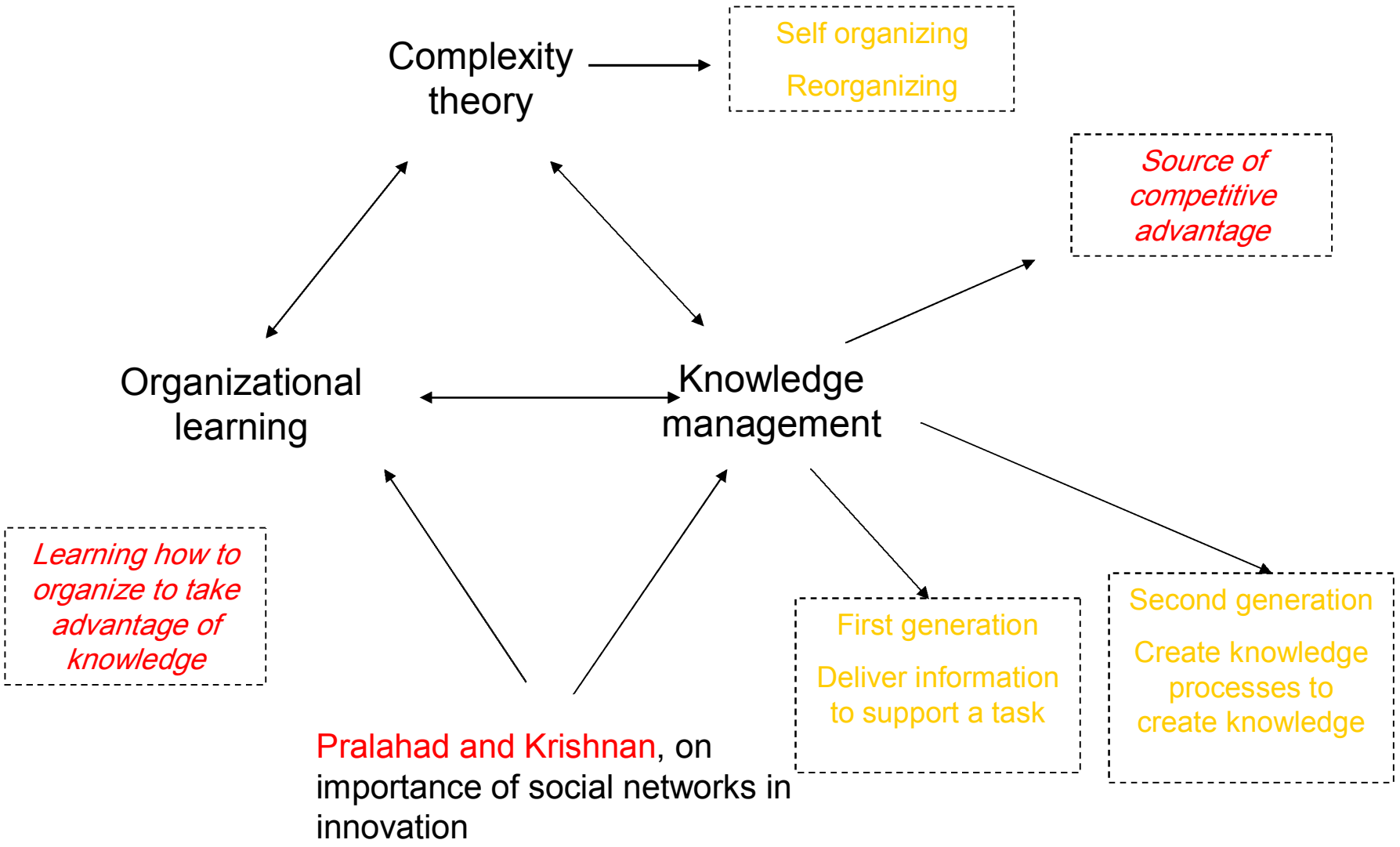
Adaptive

Organizes in response to environmental change

Random requests for different kinds of service

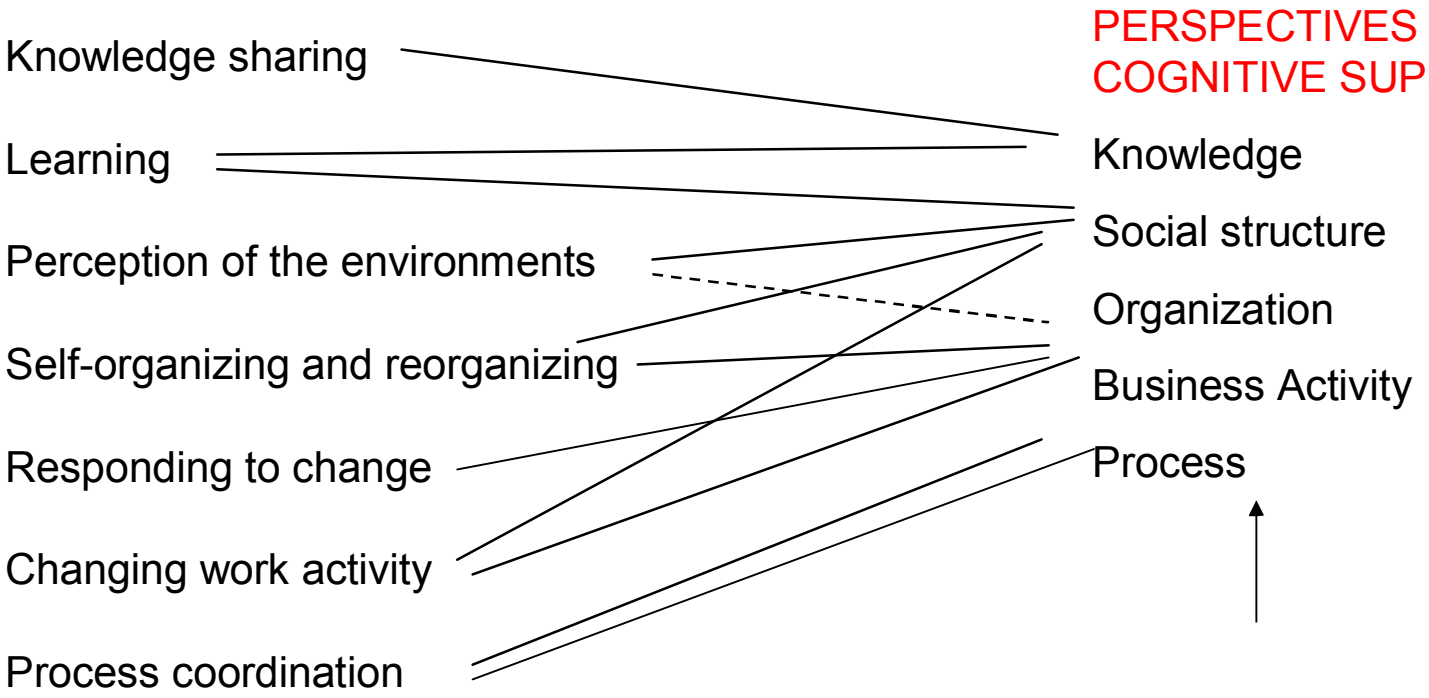
Complexity Theory and Process Aspects

McElroy



What are key considerations

DESIGN "CHECK-LIST" FROM COMPLEXITY THEORY

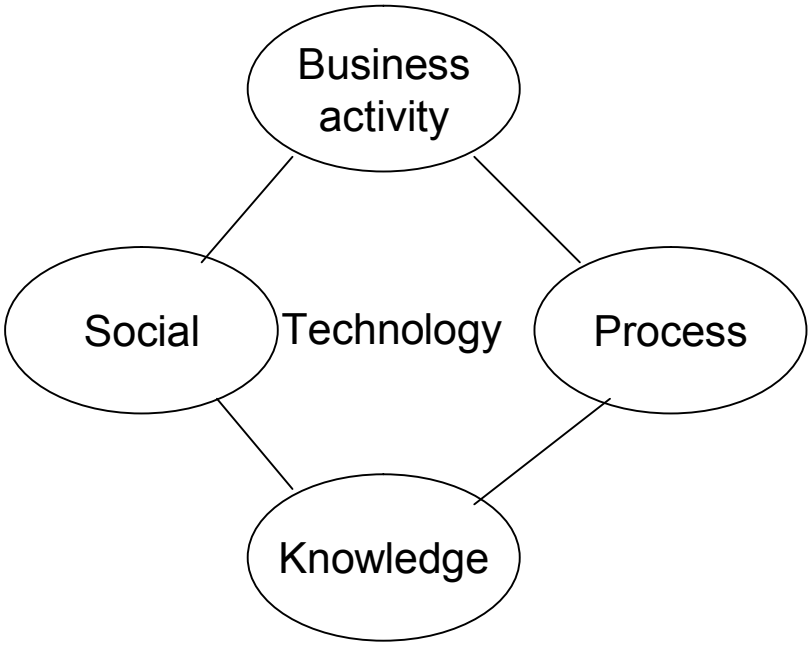


These need more emphasis in design

Greater choice needed by designers

My Hypothesis: Improve understanding by describing complexity through perspectives

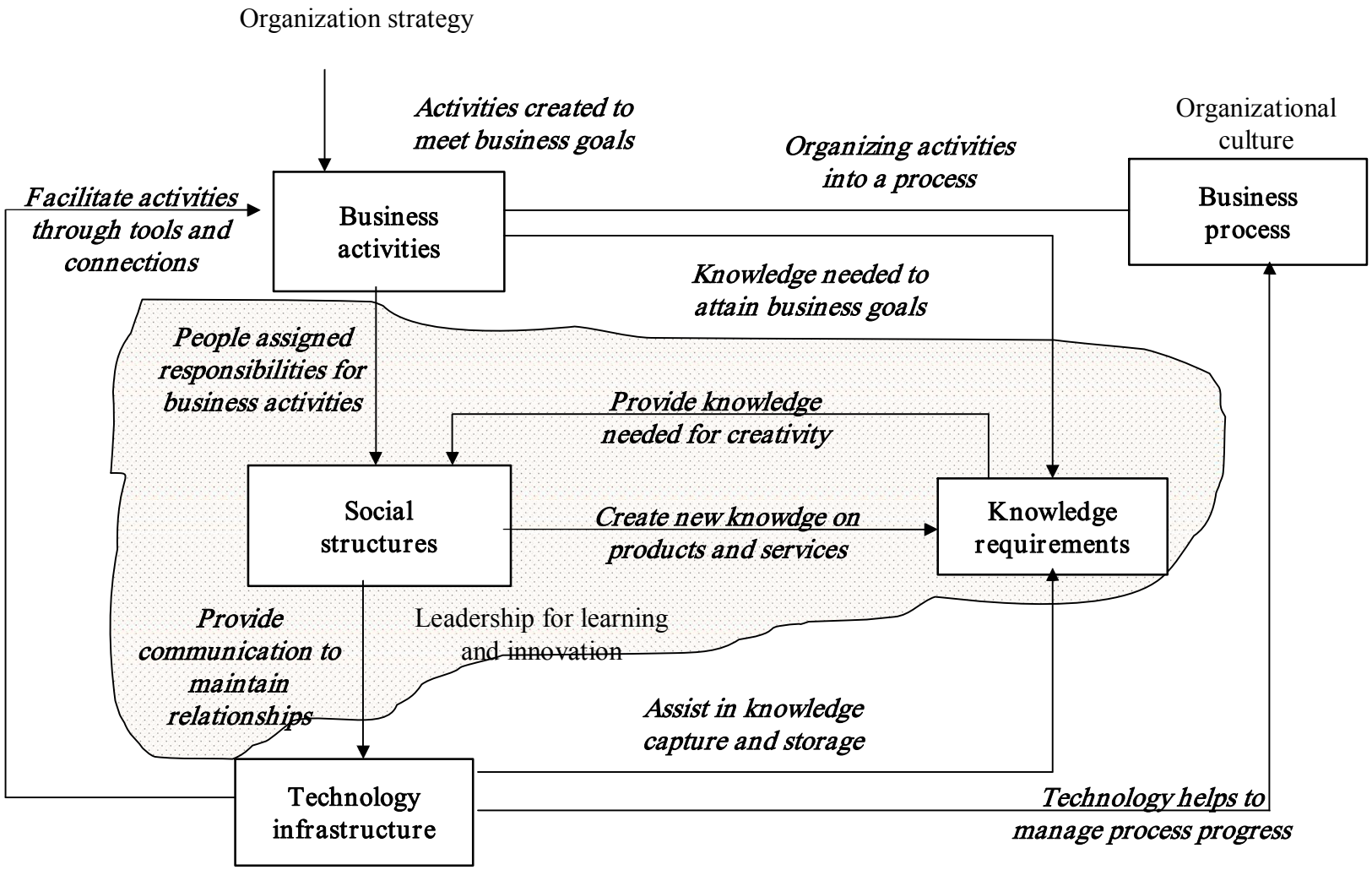
Complexity seen from many perspectives but providing a holistic view



Improves cognition through providing a language to describe complex systems in meaningful ways

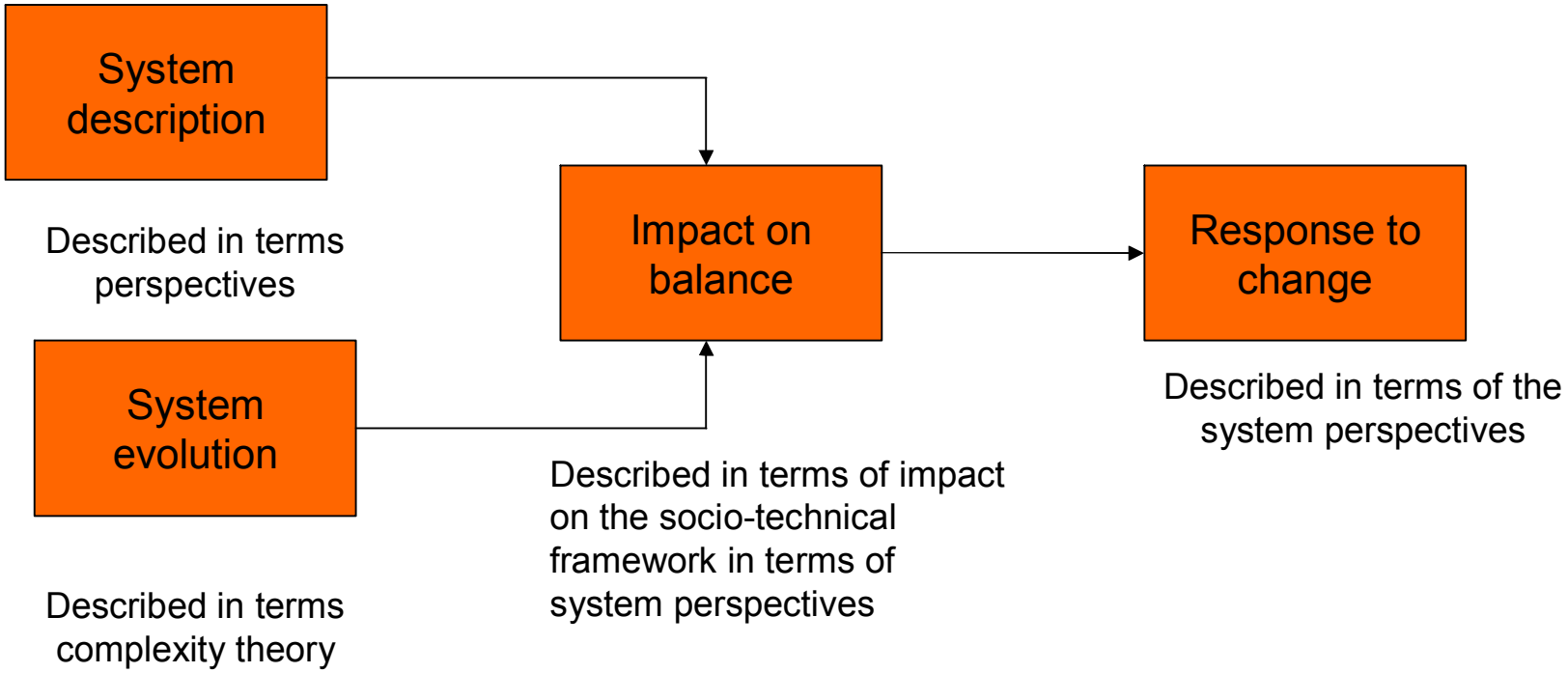
Modules that make up a complex business system

Combining the Perspectives into Holistic Model using Lightweight Modeling Methods



Relationships can be used to see the impact of change

Socio-technical impact of change

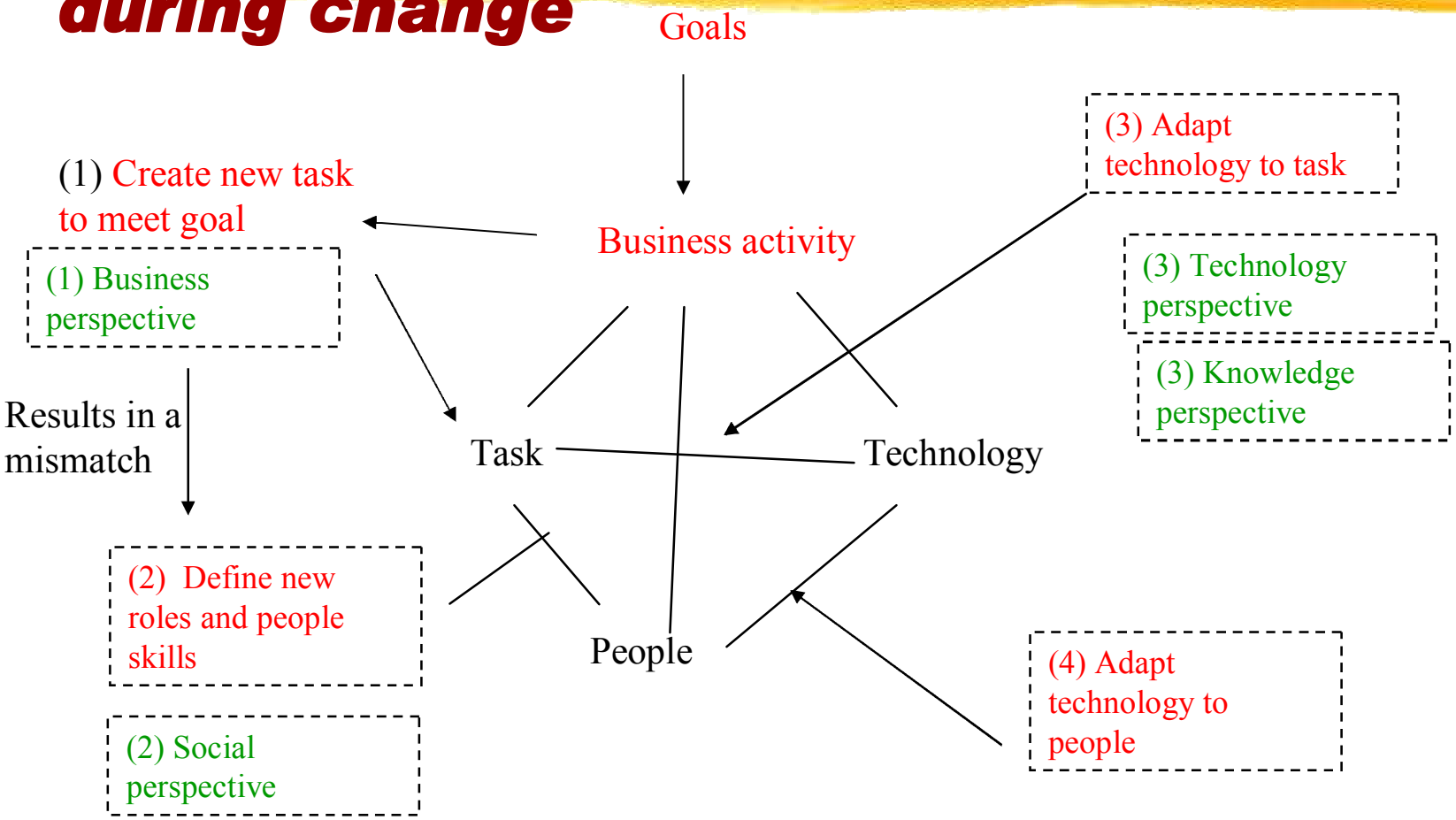


Change of direction → Impact on business activity → change in task --.> new alignment

What is the change driver?

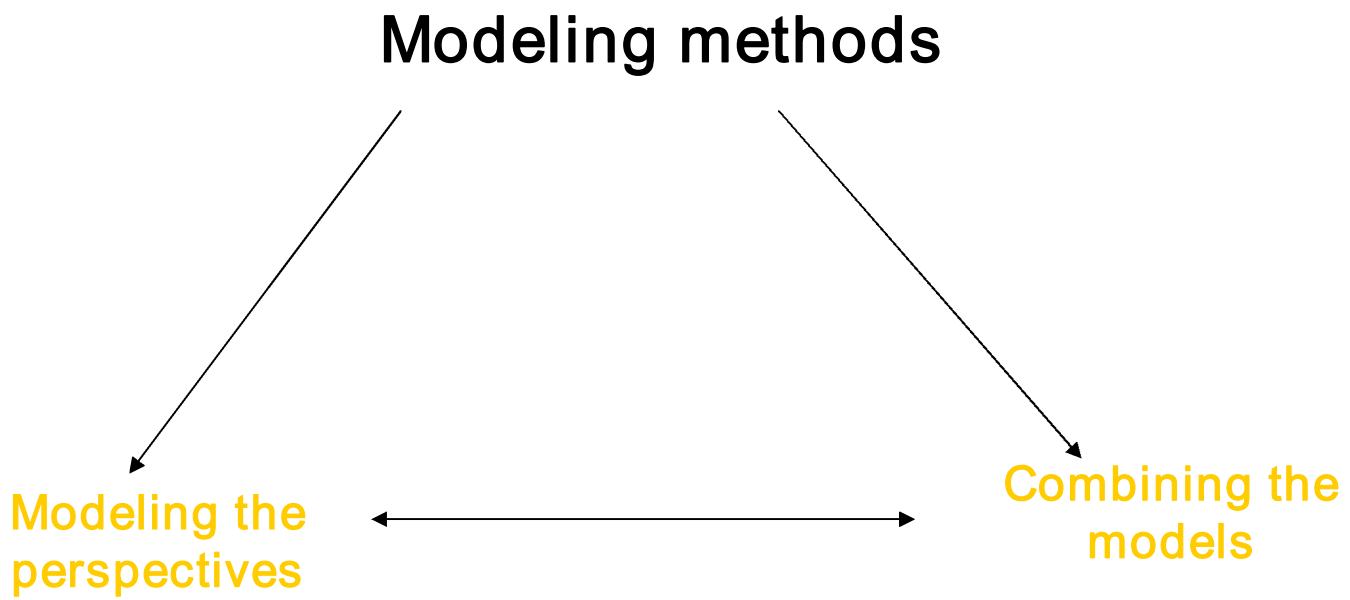
New knowledge needed	→	How to align technologies and get the right expertise
Social change	→	Redesign responsibilities and business activities
Business work practice	→	Redesign social structure
New technology	→	Redesign tasks and responsibilities

Maintaining a well balanced system during change



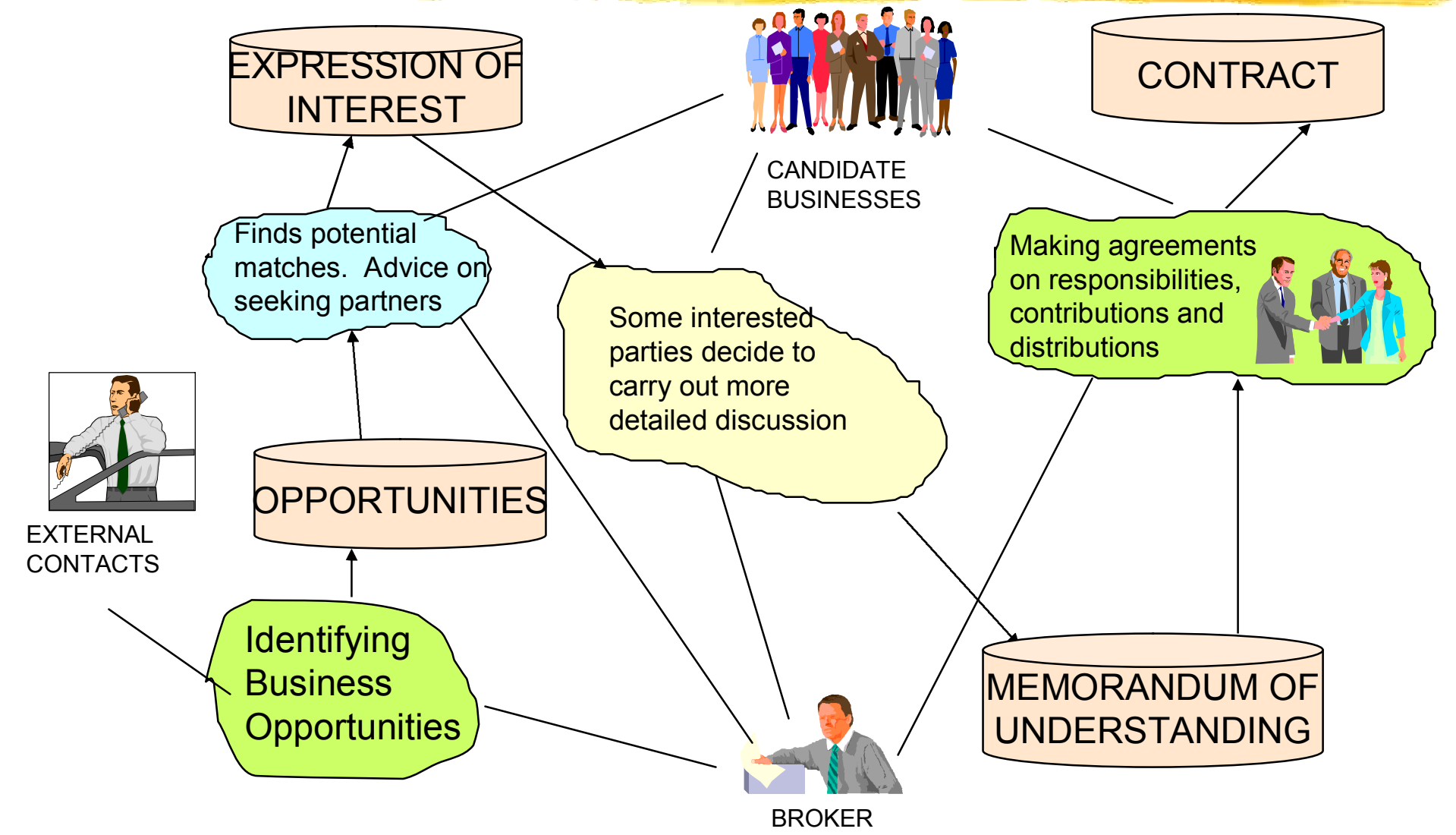
Change of direction → Impact on business activity → change in task --.> new alignment

Holistic approach

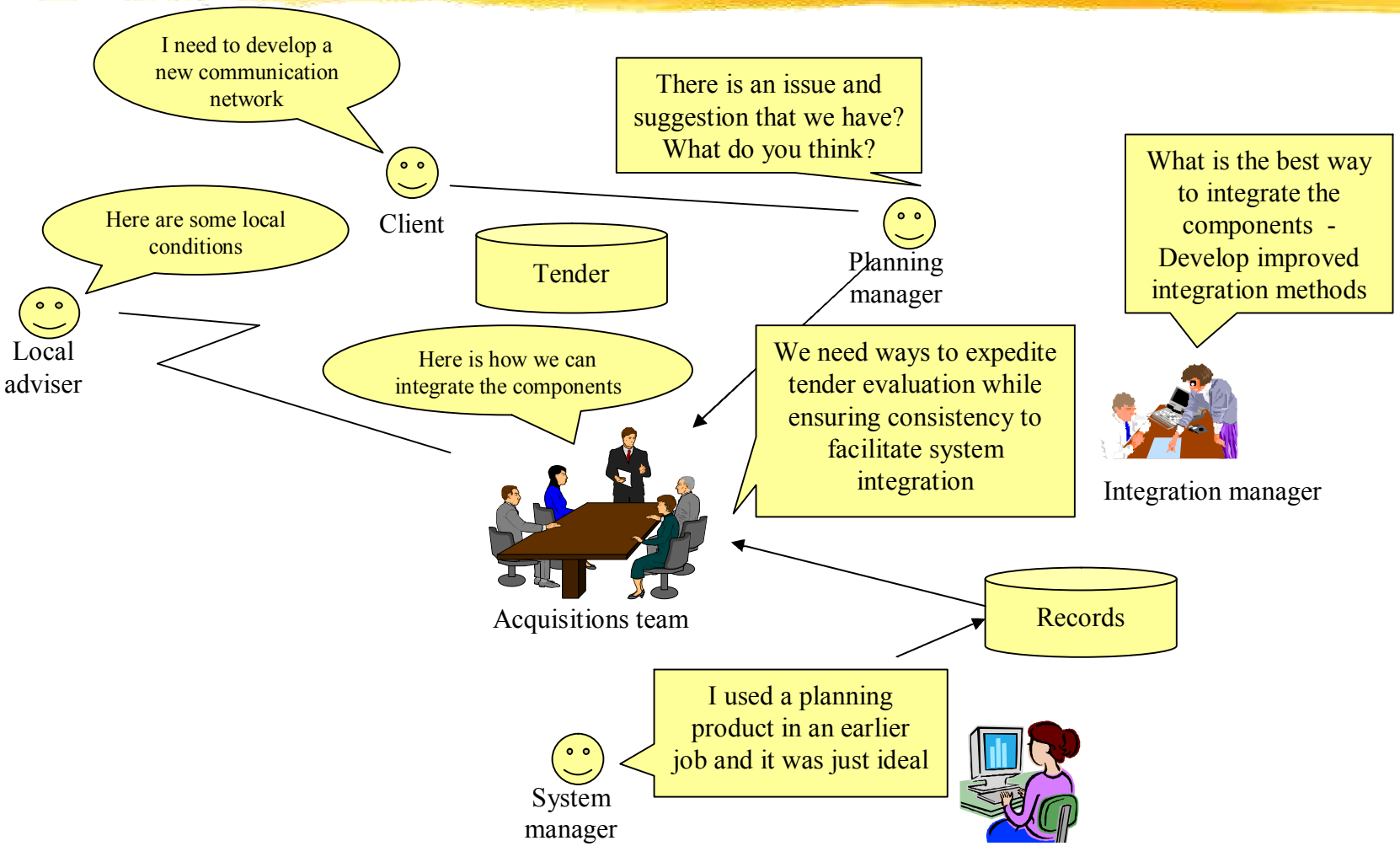


Methods for use by business analysts to specify the business architecture
Extend to allow users to dynamically specify change

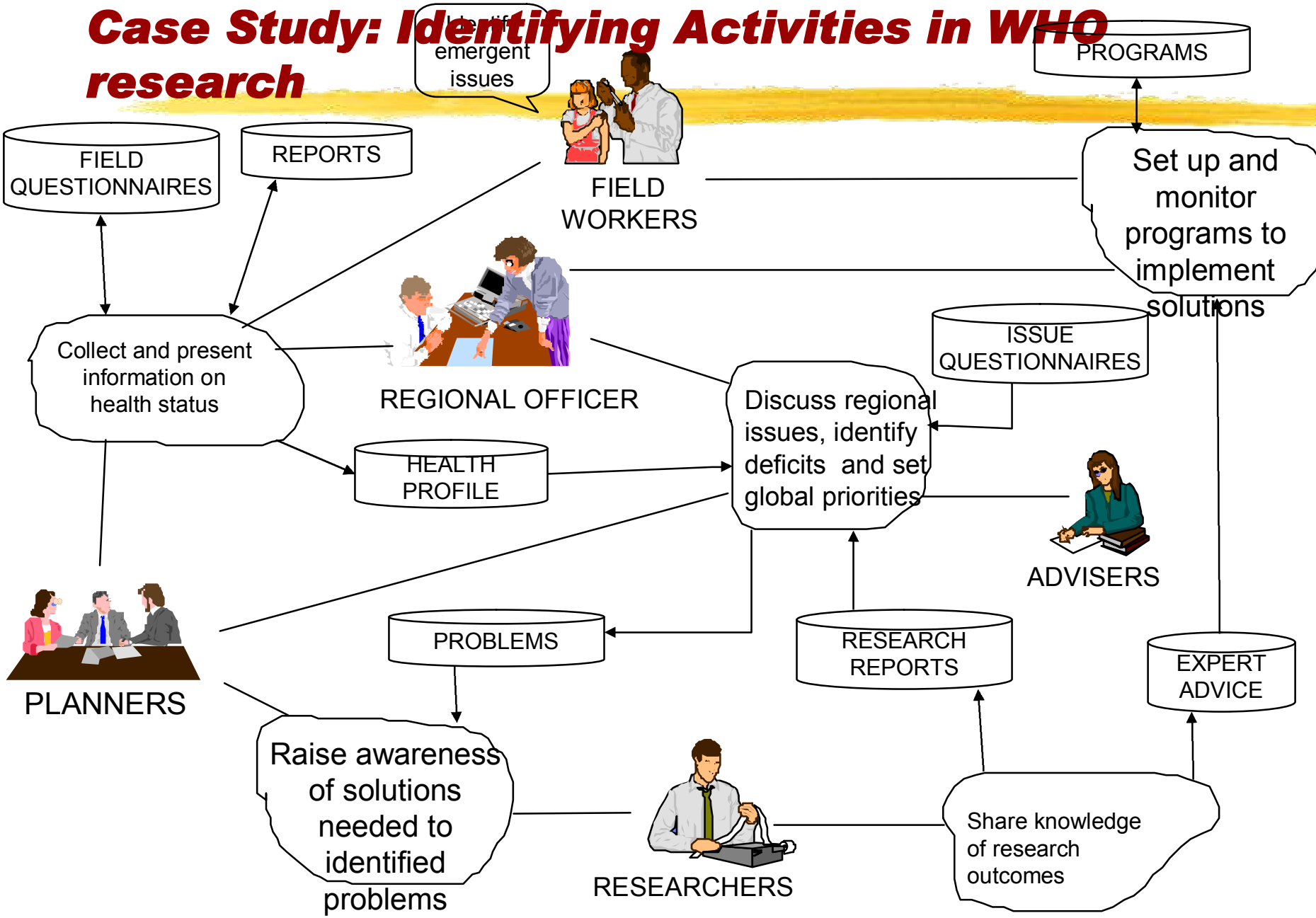
Case Study: Business Activities in Business Network Formation



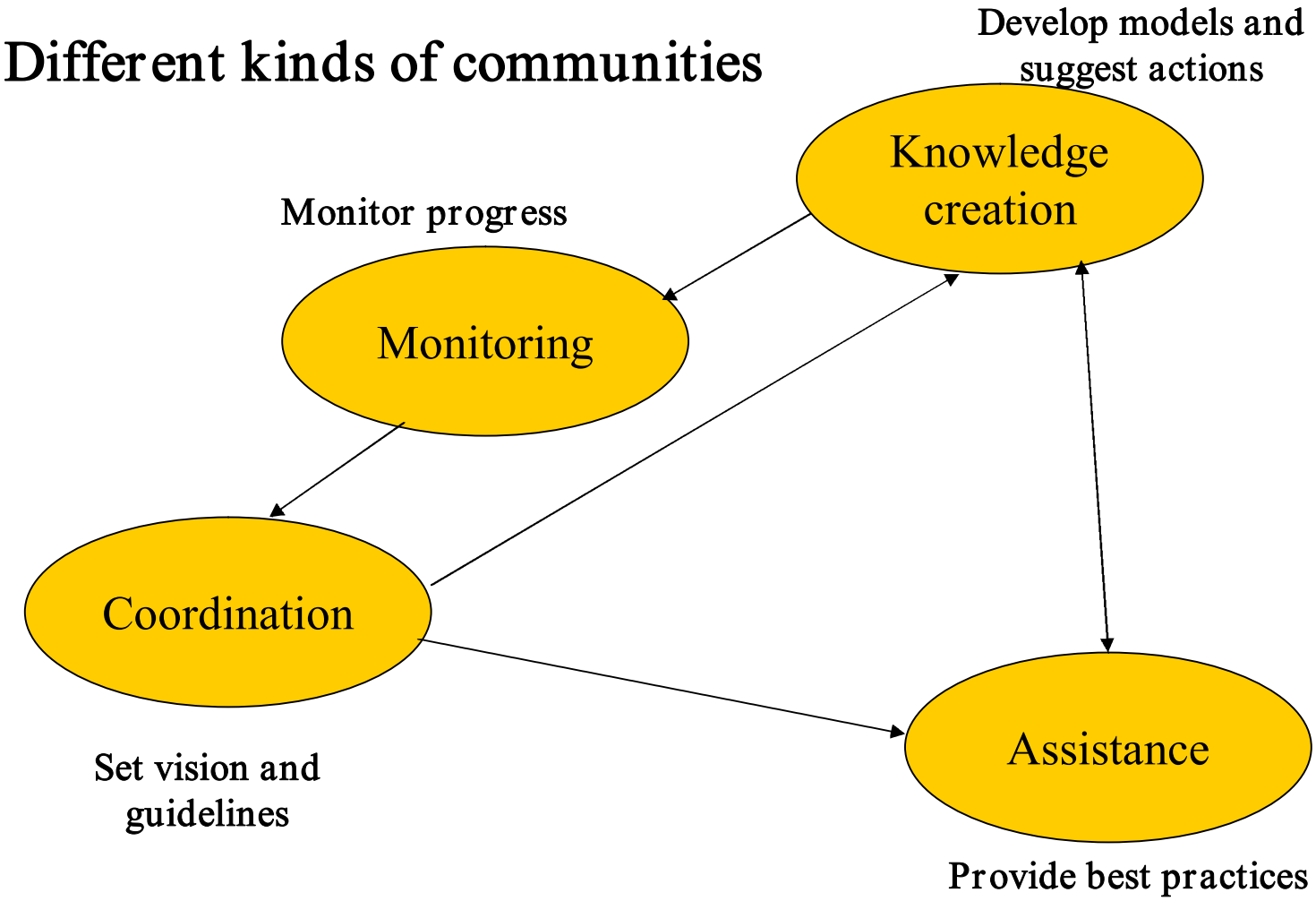
Knowledge perspective in tendering



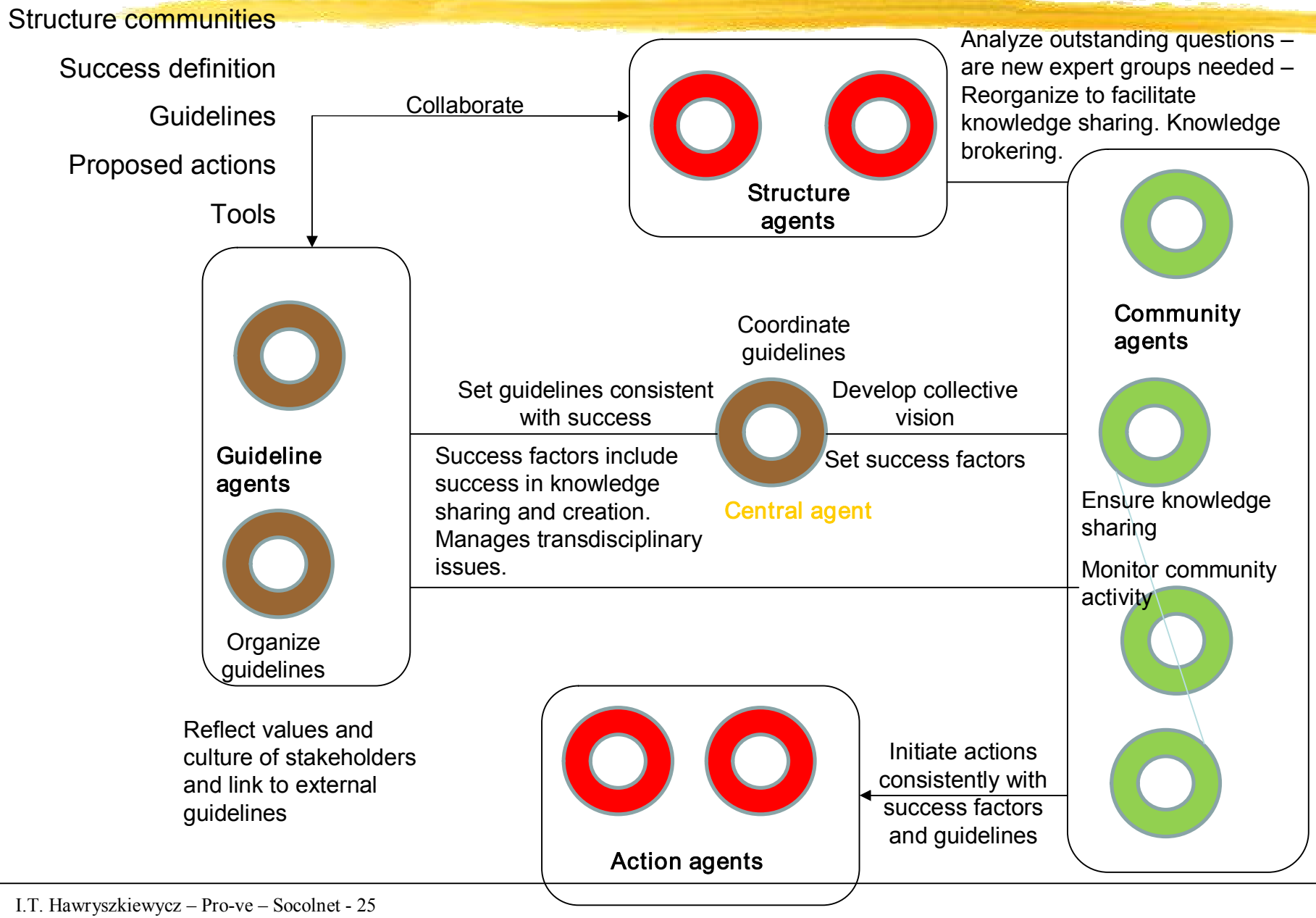
Case Study: Identifying Activities in WHO research



Do we need special Communities to ensure large scale collaboration



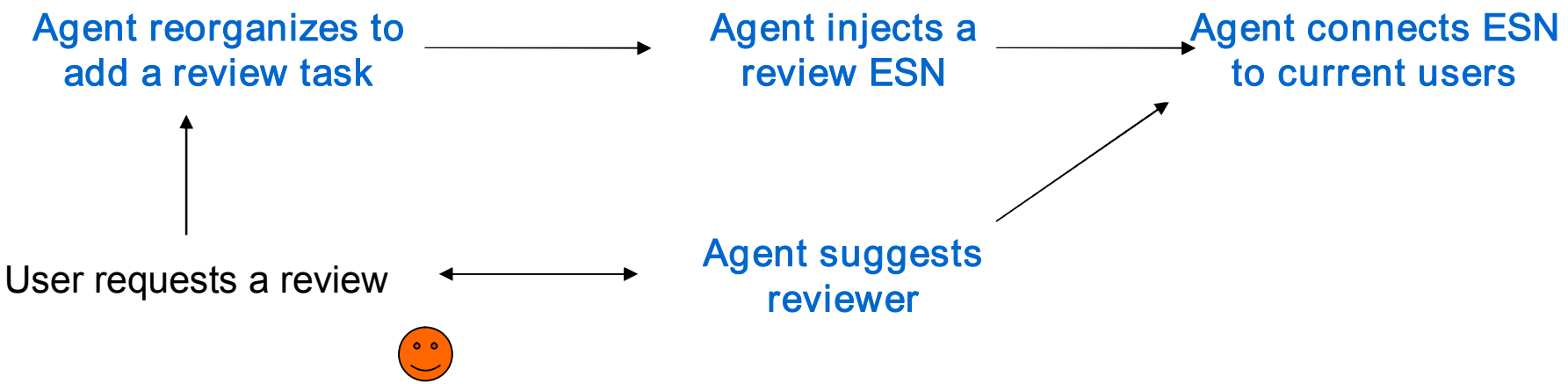
A possible agent classification



Future work - Providing agent support

Develop services for communities in large scale collaboration

Agents to support the services



Summary

Growth of community activities

Identify community best practices

Use ESN to define community structures