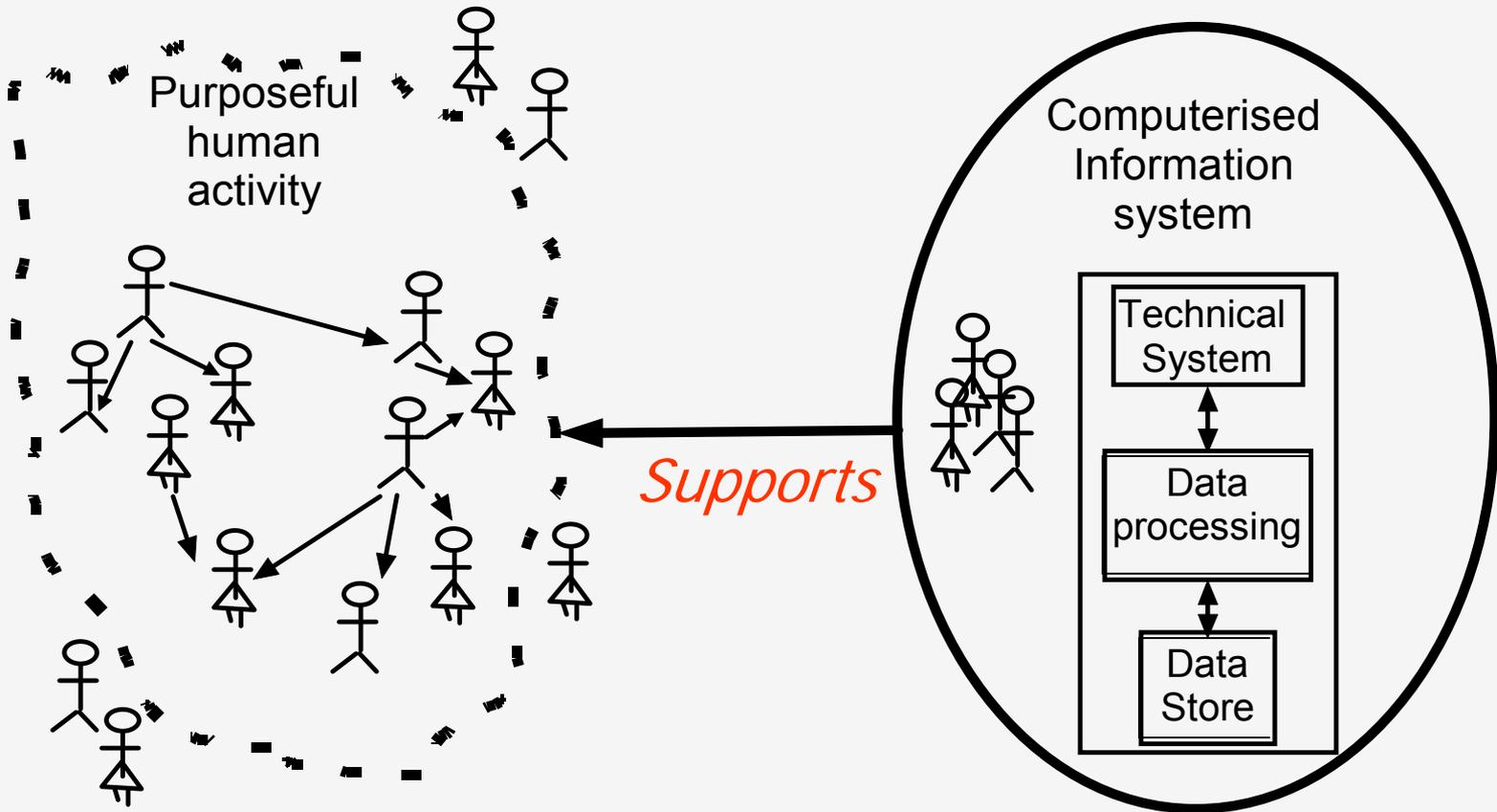# Group Memory In Boundary-Spanning, Organizational Knowledge Management

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Work Systems and Information Systems

Purposeful human activity

Supports

Computerised Information system

Technical System

Data processing

Data Store

Boundary-Spanning Collaboration

Collaborative practices in organizations take place in groups that involve stakeholders from multiple business areas, with little shared understanding or common language.
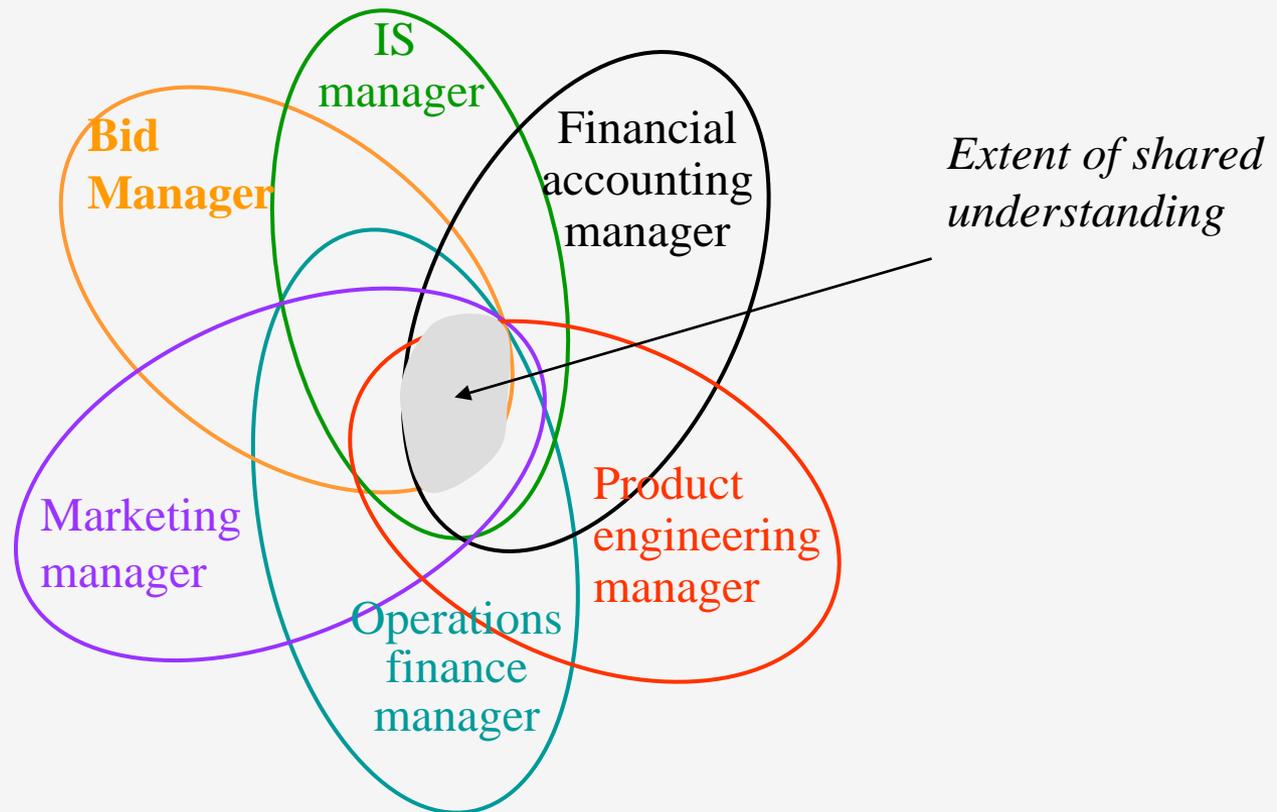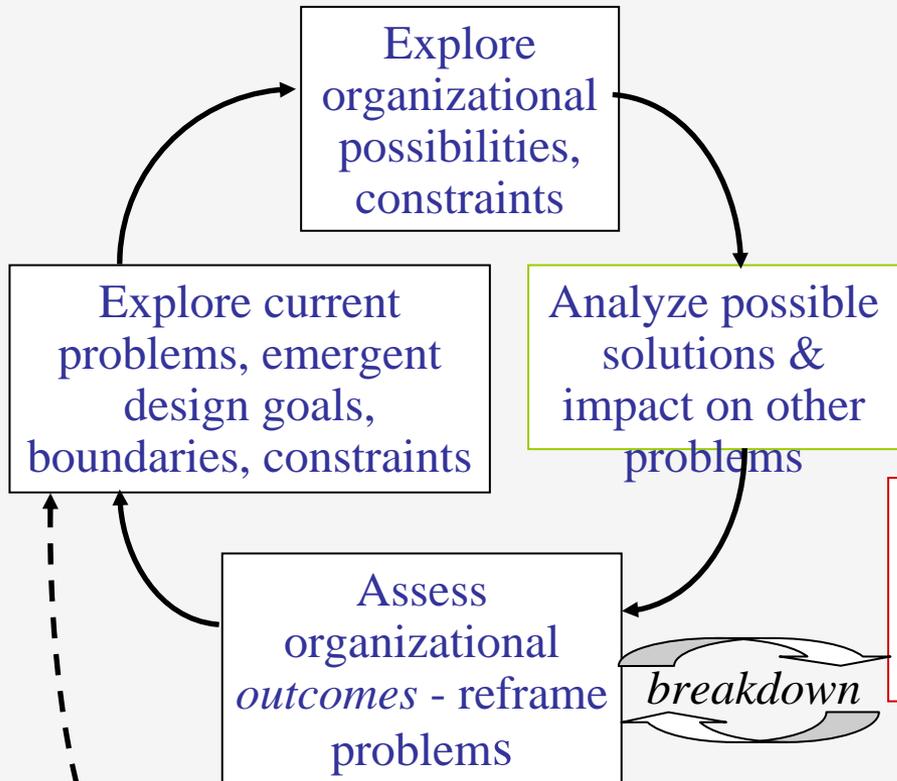
Analysis

- Ongoing discussion and interpretation of observed meetings, interactions, interviews, artifacts (documents, models, systems of technology)
- Understanding situational contexts and contingencies across
  - Actors (disciplinary & functional domains)
  - Time (tracking emergence of knowledge)
  - "Projects" – coordinated, purposeful work.
- A content analysis of
  - Knowledge-sharing mechanisms
  - Use of boundary objects (virtual and physical) for collaboration, knowledge exchange, and group memory
  - Actor roles in spanning group boundaries
    - Focusing on expertise and domain knowledge
  - Knowledge-leadership processes: who defines relevant and valuable knowledge.

Dialectics of Collective Discovery

Opening Up Design Problems

Closing Down Potential Solutions

Explore organizational possibilities, constraints

Explore current problems, emergent design goals, boundaries, constraints

Analyze possible solutions & impact on other problems

Assess organizational *outcomes* - reframe problems

breakdown

Synthesize design: agree & model system form & requirements

Review *partial solutions* against problem-definitions

Assess *understood parts* of system against agreed goals, boundaries, constraints

Agree actions/scope for organizational & technical change

Implement design (technological & organizational change)

A "dual-cycle" model of enterprise system design.

Process Drivers and Breakdowns in Boundary-Spanning Design

Primary Generator Concept – Solution model provides design process framework and abstract goals
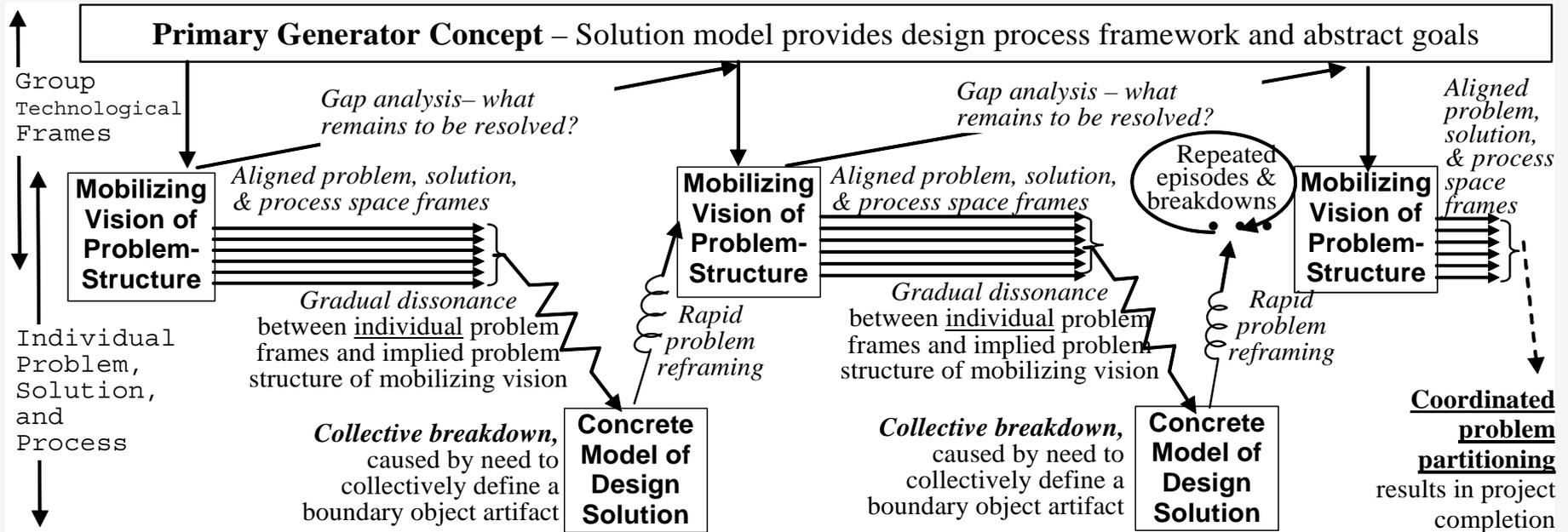
Group Technological Frames

Gap analysis– what remains to be resolved?

Gap analysis – what remains to be resolved?

Aligned problem, solution, & process space frames

Mobilizing Vision of Problem-Structure

Aligned problem, solution, & process space frames

Mobilizing Vision of Problem-Structure

Repeated episodes & breakdowns

Mobilizing Vision of Problem-Structure

Aligned problem, solution, & process space frames

Individual Problem, Solution, and Process

Gradual dissonance between <u>individual</u> problem frames and implied problem structure of mobilizing vision

Rapid problem reframing

Gradual dissonance between <u>individual</u> problem frames and implied problem structure of mobilizing vision

Rapid problem reframing

Collective breakdown, caused by need to collectively define a boundary object artifact

Concrete Model of Design Solution

Collective breakdown, caused by need to collectively define a boundary object artifact

Concrete Model of Design Solution

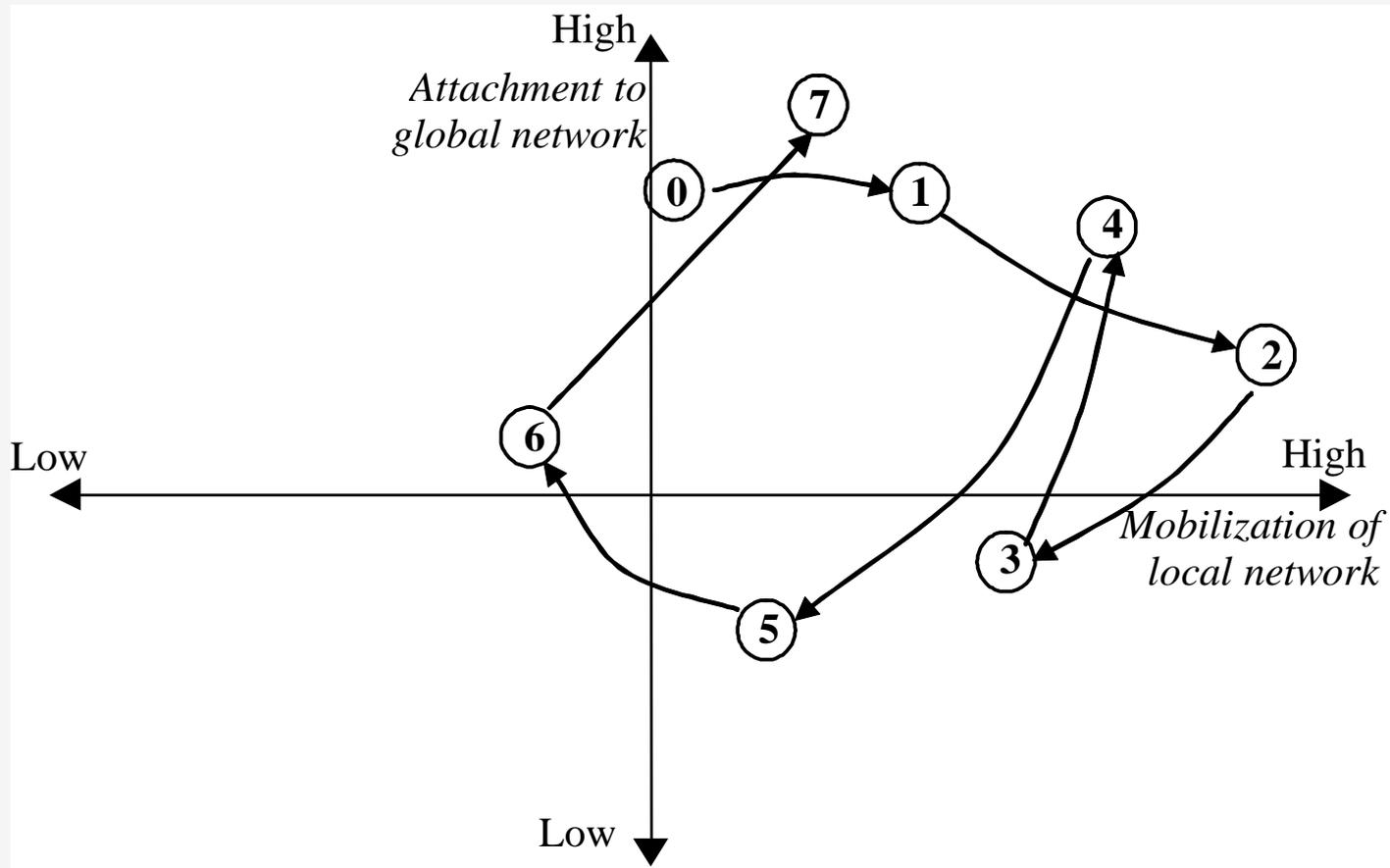<u>**Coordinated problem partitioning**</u> results in project completion

Longitudinal study of management group in co-design of business and IT systems

Content analysis, focusing on trajectories of action in framing collective visions of the design, and mediating role of boundary objects
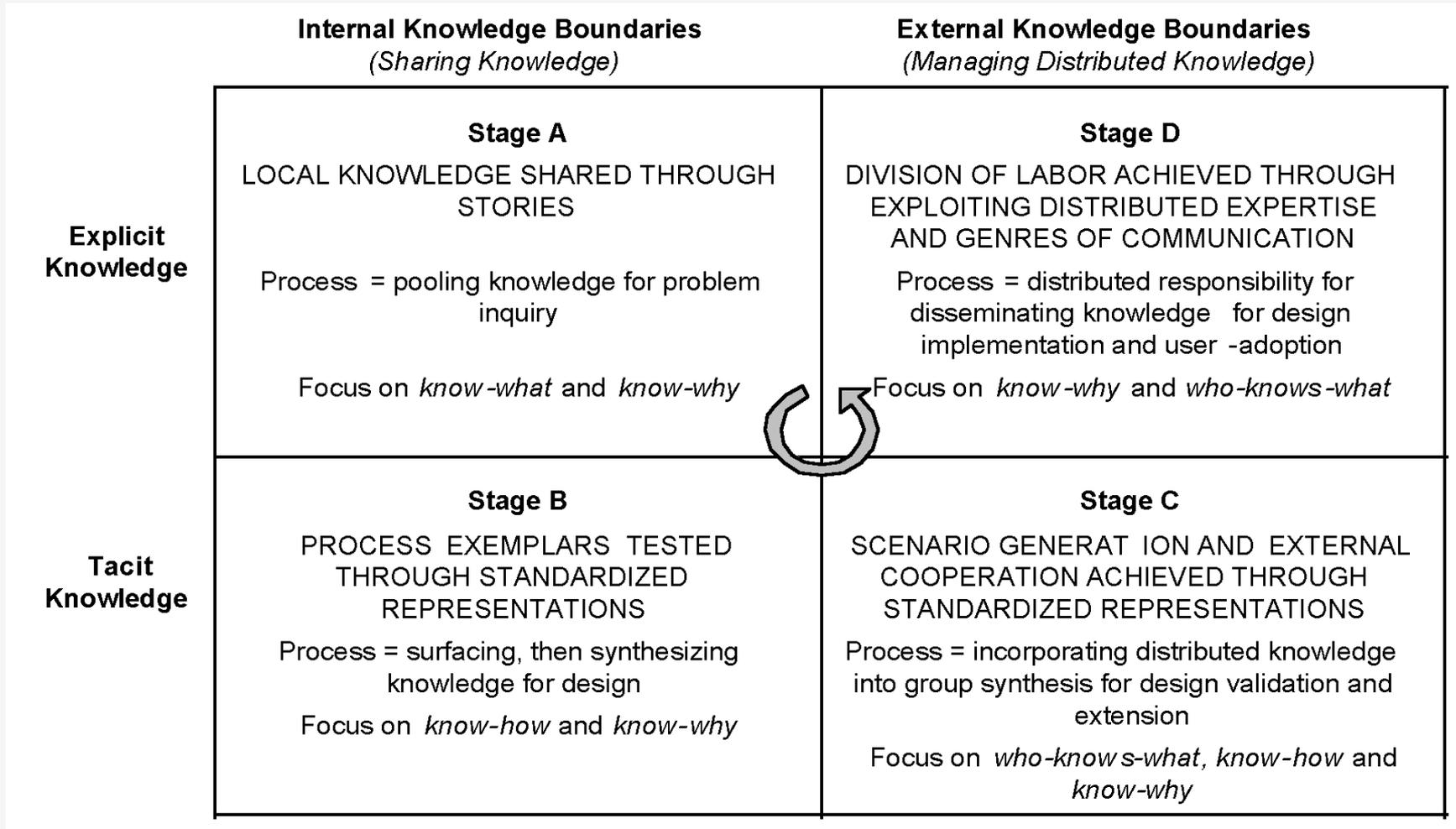
A Political Trajectory Of A Boundary-Spanning Design Project

- Actor-network analysis of boundary objects as mediating artifacts in collective design
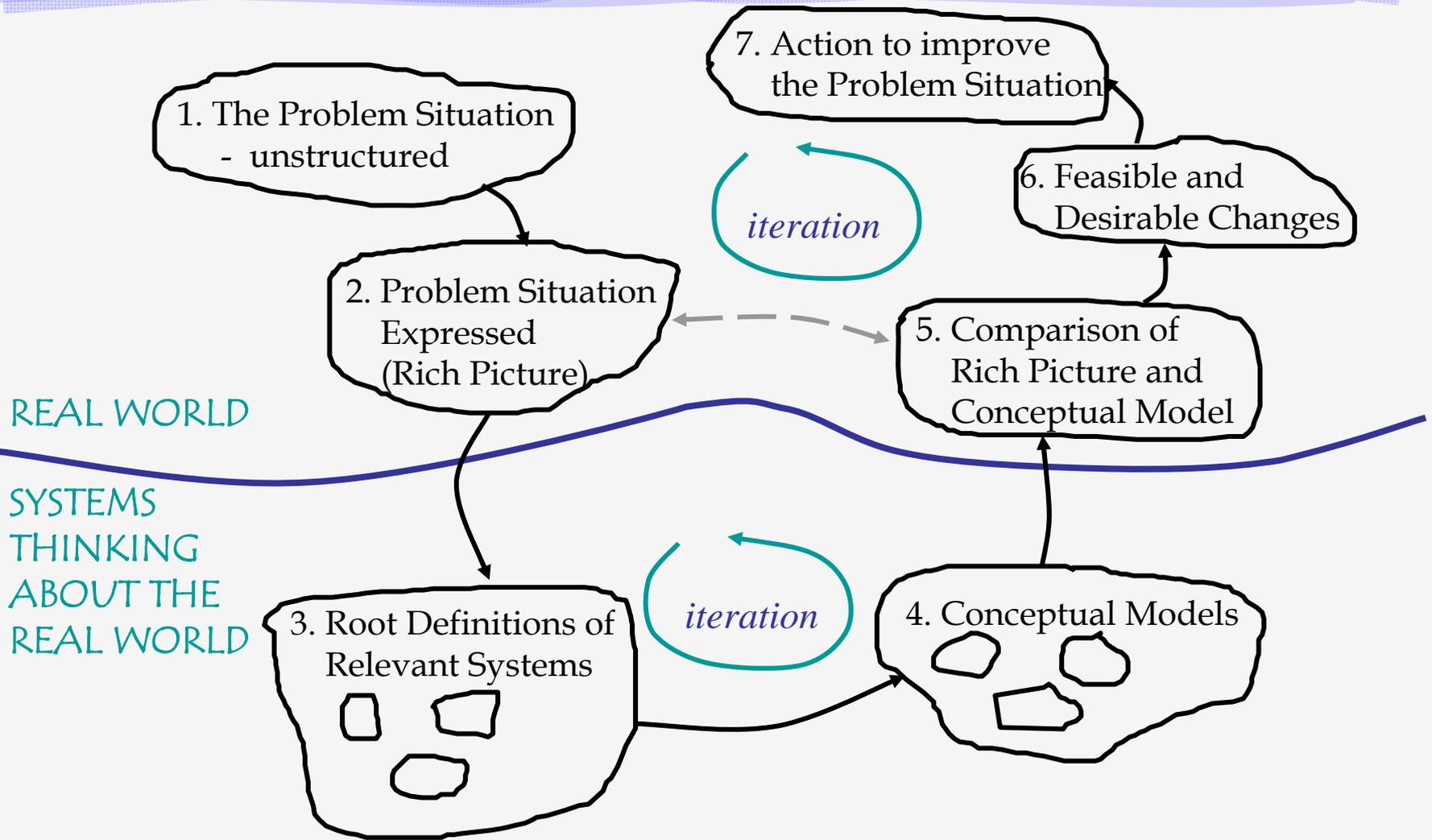
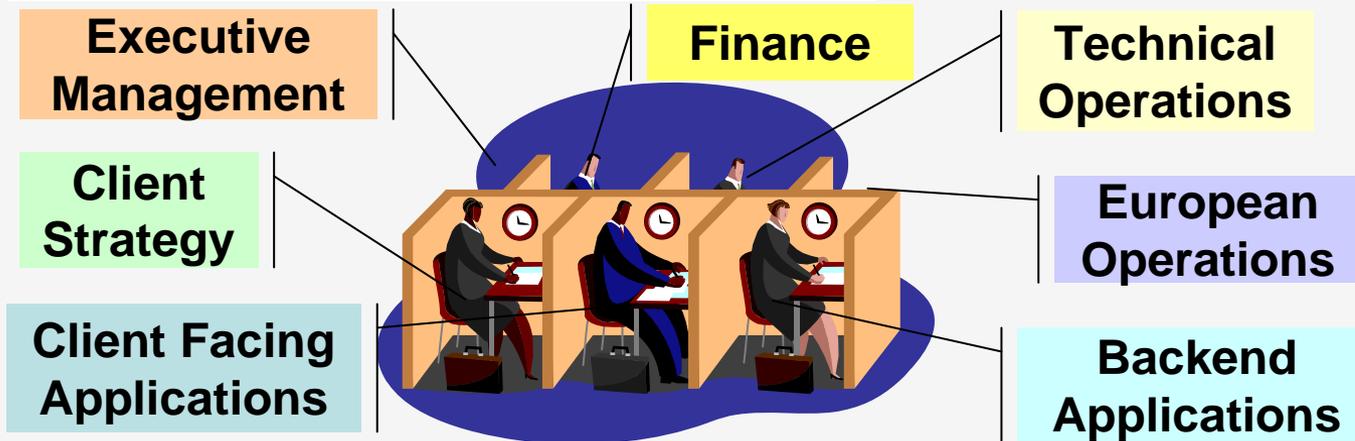# Modes of knowledge use at various stages of design emergence

	Internal Knowledge Boundaries *(Sharing Knowledge)*	External Knowledge Boundaries *(Managing Distributed Knowledge)*
Explicit Knowledge	**Stage A** LOCAL KNOWLEDGE SHARED THROUGH STORIES Process = pooling knowledge for problem inquiry Focus on *know-what* and *know-why*	**Stage D** DIVISION OF LABOR ACHIEVED THROUGH EXPLOITING DISTRIBUTED EXPERTISE AND GENRES OF COMMUNICATION Process = distributed responsibility for disseminating knowledge for design implementation and user-adoption Focus on *know-why* and *who-knows-what*
Tacit Knowledge	**Stage B** PROCESS EXEMPLARS TESTED THROUGH STANDARDIZED REPRESENTATIONS Process = surfacing, then synthesizing knowledge for design Focus on *know-how* and *know-why*	**Stage C** SCENARIO GENERATION AND EXTERNAL COOPERATION ACHIEVED THROUGH STANDARDIZED REPRESENTATIONS Process = incorporating distributed knowledge into group synthesis for design validation and extension Focus on *who-knows-what, know-how* and *know-why*

Soft Systems Methodology

7. Action to improve the Problem Situation

1. The Problem Situation - unstructured

iteration

6. Feasible and Desirable Changes

2. Problem Situation Expressed (Rich Picture)

5. Comparison of Rich Picture and Conceptual Model

REAL WORLD

SYSTEMS THINKING ABOUT THE REAL WORLD

3. Root Definitions of Relevant Systems

iteration

4. Conceptual Models

Research Question

How are different forms of knowledge managed and coordinated across the boundaries of a virtual, global organization?

Group Boundaries

EXPERTISE BOUNDARIES

Executive Management

Finance

Technical Operations

Client Strategy

European Operations

Client Facing Applications

Backend Applications

OTHER BOUNDARIES

- **Group affiliation**
- **Professional affiliation**
- **Political (reporting) affiliation**
- **Project affiliation**

GEOGRAPHICAL BOUNDARIES

ParentCorp

EU Operations

eCommerce Group HQ

Apps Vendor

EU Customer Service
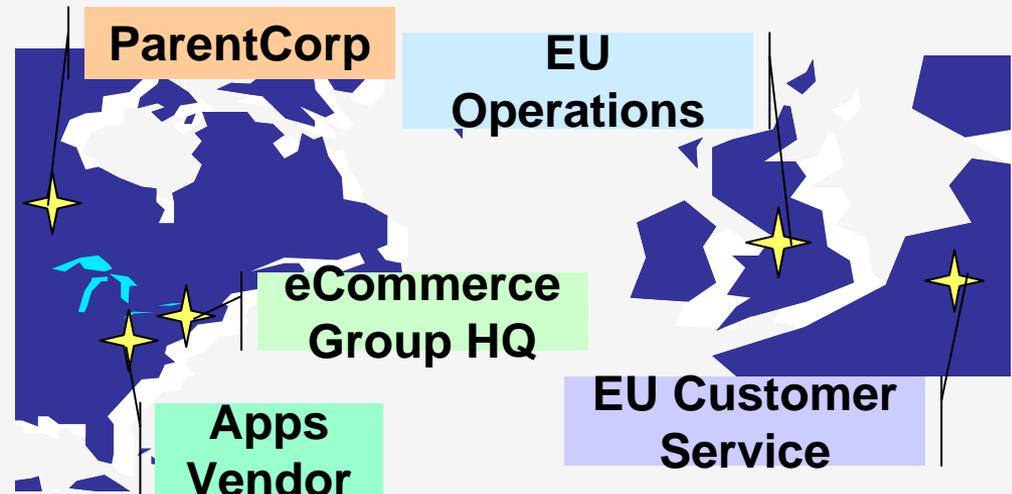
Method

- Researchers "attend" by telephone and transcribe meetings

- Sample statistics through April 2006
  - Over 280 meetings
  - 815 pages of transcription
  - Average length: 0:30
  - Shortest: 0:04
  - Longest: 1:35

- Longitudinal, ethnographic, exploratory

Setting - eServCorp

- eServCorp Global eCommerce Group
  - **Virtual** - EVP eCommerce, Local Direct Reports, International "Dotted Line" Reports, Vendor Staff
  - **Distributed** - US Headquarters, Remote Vendor, Operations in about 40 Countries
- Standing "virtual team meeting"
  - 7:30 a.m. teleconference
  - 4 days per week

Organizational Problem-Structuredness

- ## Well-structured problem
  - Problem-structure clear.
  - Unambiguous consensus goals for change.

- ## Ill-structured problem
  - Problem-structure uncertain
  - Multiple alternative solutions may achieve consensus goals for change.

- ## Wicked problem
  - Multiple, interrelated problem definitions and boundaries
  - Multiple, often competing *goals for change* prioritized by stakeholders.

↓ Increasing Problem Emergence, Ambiguity, Multivocality

Knowledge Coordination Span

(i) Local coordination span

- Local group acts as **project manager**, controlling and defining problem

(ii) Conjoint agency

- Local group acts as a **hub**, coordinating expertise from other (internal or external) groups to define and resolve problem.

(iii) Distributed Collaboration

- Local group part of a **web** of organizational/external groups, collaborating or subordinate in problem definition.

↓ Increasing Diversity of: Locus-of-Control, Expertise, Frameworks for action
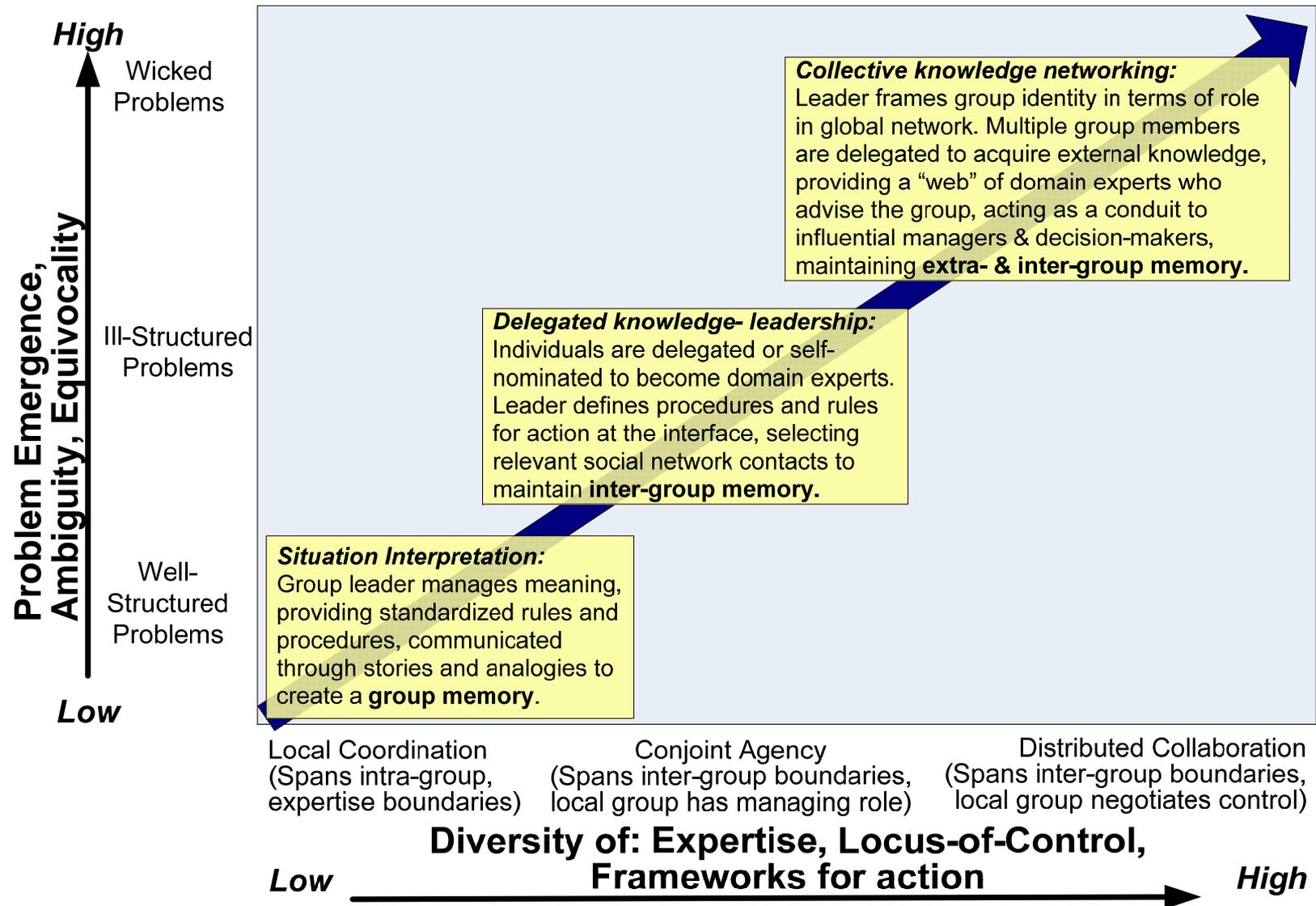
Group Memory Boundary Objects

- Interpersonal interactions of group / between groups
  - Daily conference call
  - Project conference calls
  - Client conference calls

- Persistence
  - Emails
  - Spreadsheets and documents – modified by multiple actors
  - Project documents (specs and contracts)

- Roles, social networks, and expertise
  - Boundary-spanner roles change with problem-distance

Group Memory Processes in a Global, Virtual Organization

Problem Emergence, Ambiguity, Equivocality (vertical axis)

- High — Wicked Problems
- Ill-Structured Problems
- Well-Structured Problems
- Low

Collective knowledge networking:
Leader frames group identity in terms of role in global network. Multiple group members are delegated to acquire external knowledge, providing a "web" of domain experts who advise the group, acting as a conduit to influential managers & decision-makers, maintaining **extra- & inter-group memory.**

Delegated knowledge- leadership:
Individuals are delegated or self-nominated to become domain experts. Leader defines procedures and rules for action at the interface, selecting relevant social network contacts to maintain **inter-group memory.**

Situation Interpretation:
Group leader manages meaning, providing standardized rules and procedures, communicated through stories and analogies to create a **group memory**.

Local Coordination
(Spans intra-group, expertise boundaries)

Conjoint Agency
(Spans inter-group boundaries, local group has managing role)

Distributed Collaboration
(Spans inter-group boundaries, local group negotiates control)

Diversity of: Expertise, Locus-of-Control, Frameworks for action

Low ——————————————→ *High*

What Changes With Problem Distance?

(i) Low problem distance

– *Intra-group memory is situational*, focusing on how to recognize common problems and communicating lessons learned

(ii) Intermediate problem distance

– *Intra-group memory* relates to who-knows-what, as knowledge leadership in specific domains of action is delegated to boundary-spanners
– *Inter-group memory* focuses on coordination at the boundary with other groups: boundary-spanning domain-expert roles, coupled with shared procedures and rules for collaboration at the boundary

(iii) Low problem distance

– *Intra-group memory* aggregates knowledge of external domains (boundary-spanners move into external domain expert roles)
– *Inter-group memory* maintained by group leader through negotiated shared interests with social network of influential decision makers
– *Extra-group memory* maintained through extended social network roles: group members who have boundary-spanner roles are connected by the group leader with influential decision-makers in other groups
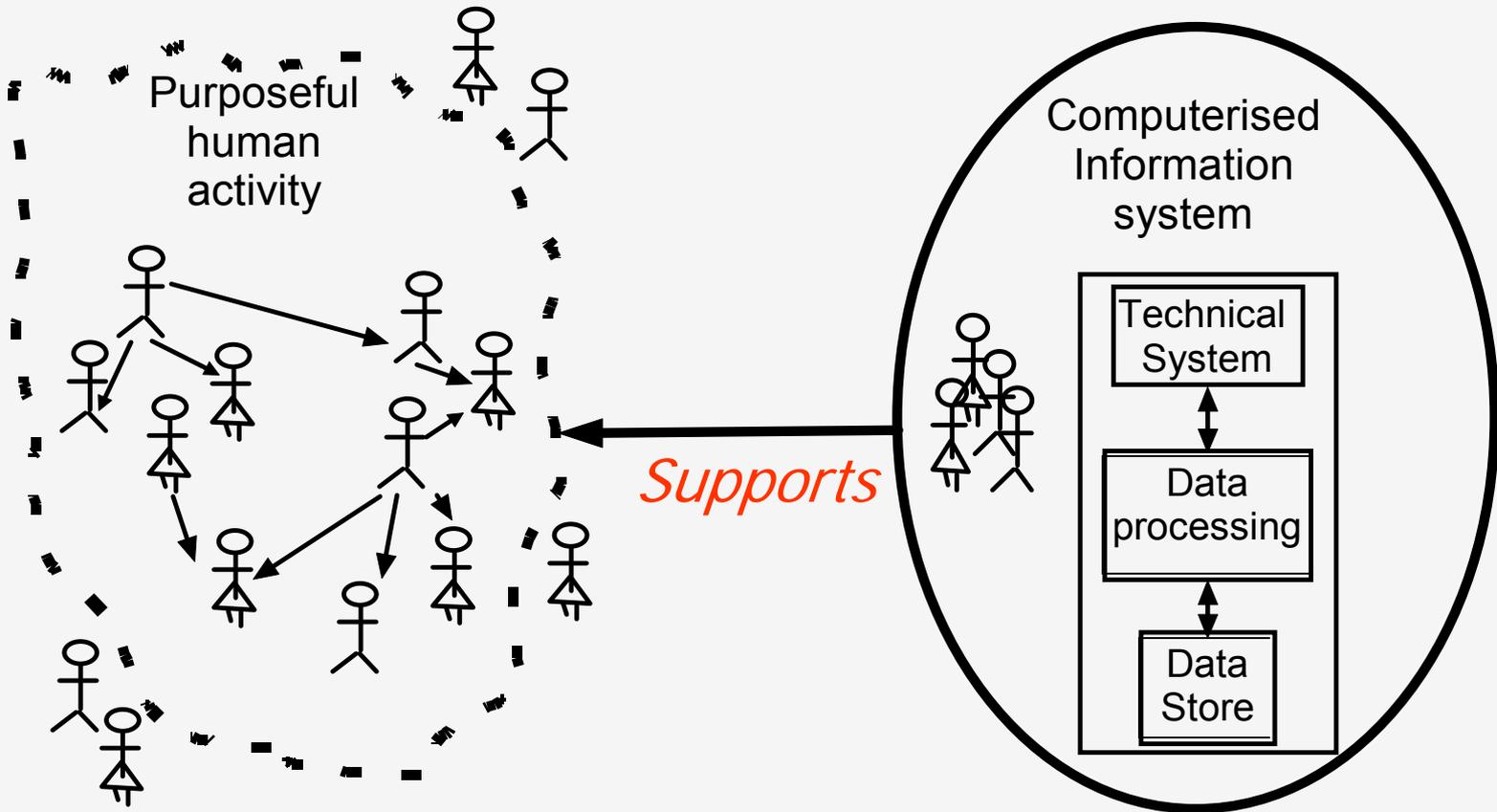
Modes of Organizational Problem-Solving

	Well-Structured Problems	Ill-Structured Problems	Wicked Problems
Local Coordination	*Situation interpretation:* stories & analogies create shared resource to identify similar problems	*Group identity construction:* plans, processes & checklists formalize procedural memory	*Framing collective strategy:* group agrees evolving goals of change, to clarify approach to problem
Conjoint Agency	*Scope interpretation:* stories & analogies communicate rules, evaluation-criteria, responsibilities at boundary	*Delegated knowledge-leadership:* domain expert roles assumed. Rules & procedures at coordinate knowledge transfer at boundary	*Defining a collective response:* delegated boundary-spanner locates knowledge & controls evolving boundary procedures
Distributed Coordination	*Coordinating division of labor:* functional domain-expert roles and social network leveraged for knowledge exchange	*Managing external networks of influence:* group domain-experts jointly formulate problem, negotiate group responsibilities	*Collective knowledge networking:* leader negotiates group role; group members become expert in evolving set of knowledge-domains

Purposeful human activity

Computerised Information system

Technical System

Data processing

Data Store

Supports

Adapted from Winter et al. (1995)