

Knowledge Synthesis and Integration: Changing Models, Changing Practices

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InSource

~ Research Excellence for Practical Solutions

Overview

- Framing knowledge integration
- Shifting the paradigm
- Building a toolkit
- Moving to action
- Making recommendations
- Becoming a revolutionary

Generations of Knowledge Thinking

1: Linear Models (1960s-mid 90s)

LANGUAGE

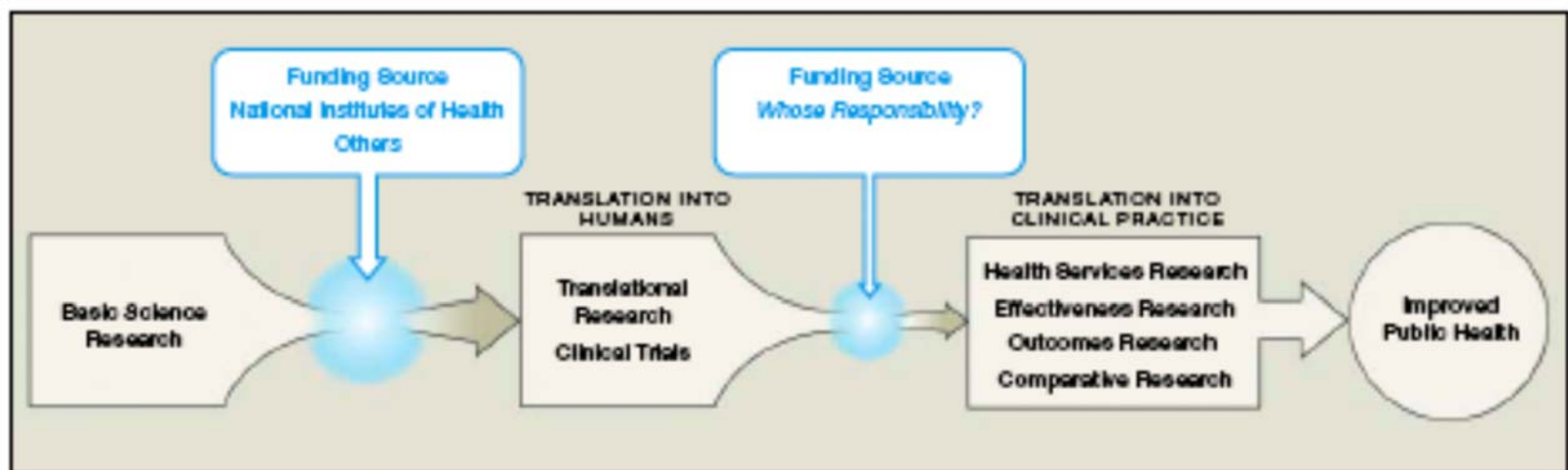
- Dissemination
- Diffusion
- Knowledge transfer
- Knowledge uptake

KEY ASSUMPTIONS

- Knowledge is a product
- Key process is a handoff from research producers to research users
- Knowledge is generalizable across contexts is a function of effective packaging

Best A, Hiatt RA, & Norman CD. *Pat Ed & Counsel*
2008;71:319-327

Linear Models ~ Two Stage Translational Research



Clinical research can be viewed as encountering 2 separate roadblocks on the way toward improving public health. These 2 translational blocks have different factors creating each but whereas the National Institutes of Health has been consistently targeting the bench-to-bedside block, no one is taking responsibility for the second, which is integrally tied with the funding of the health care delivery system.

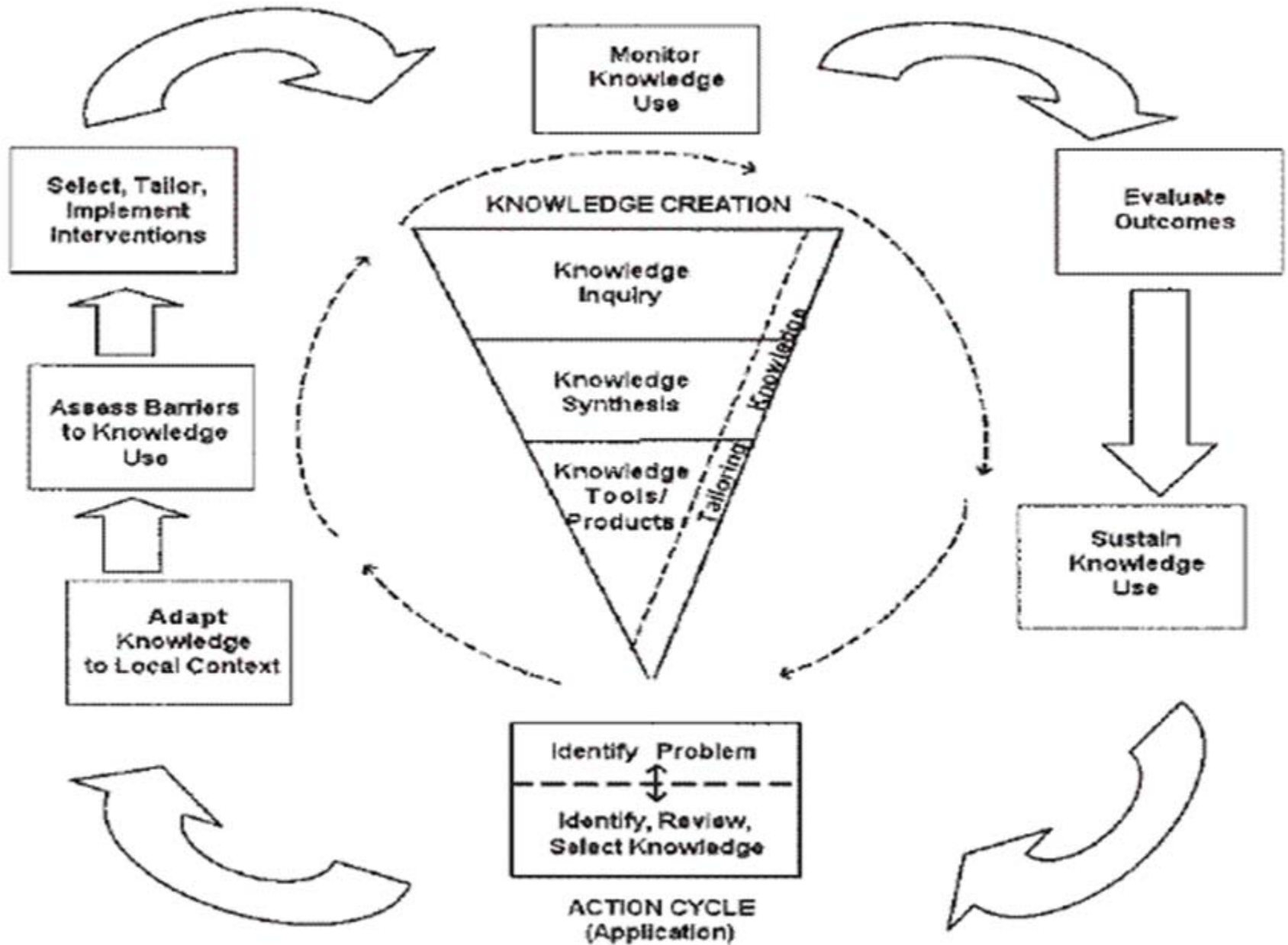
Generations of Knowledge Thinking

2: Relationship Models (Mid-90s to present)

LANGUAGE

KEY ASSUMPTIONS

- Knowledge exchange
- Knowledge from multiple sources research, theory, and practice
- Key process is interpersonal, involving social relationships
- Networks of research producers and research consumers
- Collaborate thru production-synthesis-integration cycle
- Knowledge is context-linked, and must be adapted to local setting
- Degree of use is a function of effective relationships and processes



Circular Models 2 ~ NHS Systems Change



Kelly MP, Speller V, & Meyrick J (2004). London: Health Development Agency,

<http://www.nice.org.uk/page.aspx?o=502709>

Generations of Knowledge Thinking

3: Systems Models

LANGUAGE

- Knowledge integration
- Knowledge translation
- Knowledge mobilization
- Knowledge exchange and uptake

KEY ASSUMPTIONS

- Knowledge cycle is tightly woven within priorities, culture, and context
- Explicit and tacit knowledge need to be integrated to inform decision making and policy
- Relationships mediate throughout the cycle, and must be understood from a systems perspective, in the context of the organization and its strategic processes
- Degree of use is a function of effective integration with the organization(s) and its systems

SYSTEM ANTECEDENTS FOR INNOVATION

Structure	Absorptive capacity for new knowledge	Receptive context for change
Size/maturity	Pre-existing knowledge/skills base	Leadership and vision
Formalisation	Ability to find, interpret, re-codify and integrate new knowledge	Good managerial relations
Differentiation	Enablement of knowledge sharing via internal and external networks	Risk-taking climate
Decentralisation		Clear goals and priorities
Slack resources		High quality data capture

SYSTEM READINESS FOR INNOVATION

- Tension for change
- Innovation-system fit
- Power balances (supporters vs opponents)
- Assessment of implications
- Dedicated time / resources
- Monitoring and feedback

THE INNOVATION

- Relative advantage
- Compatibility
- Low complexity
- Trialability
- Observability
- Potential for reinvention
- Risk
- Task issues
- Nature of knowledge required (tacit/explicit)
- Technical support

COMMUNICATION AND INFLUENCE

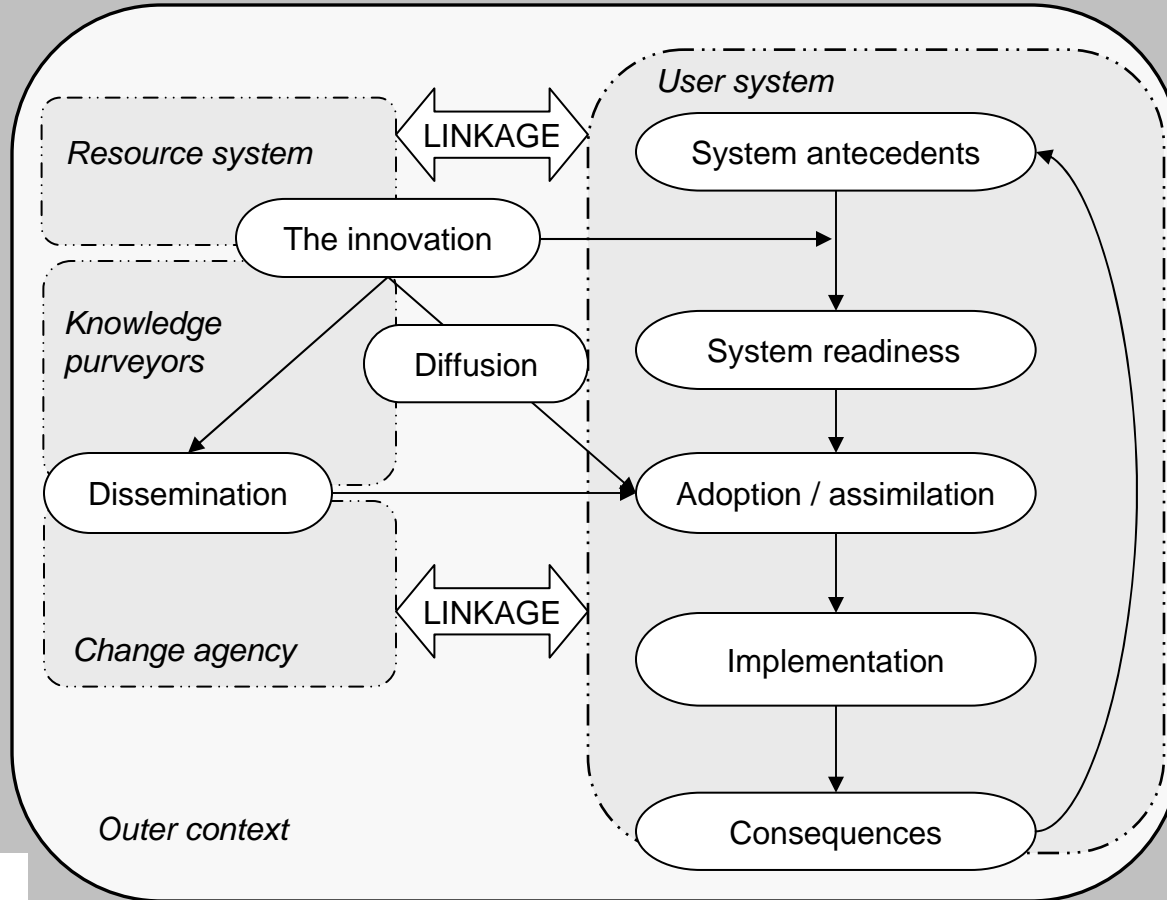
DIFFUSION (Informal, unplanned)

- Social networks
- Homophily
- Peer opinion
- Marketing
- Expert opinion
- Champions
- Boundary spanners
- Change agents

DISSEMINATION (formal, planned)

THE OUTER CONTEXT

- Socio-political climate
- Incentives and mandates
- Inter-organisational norm-setting & networks
- Environmental stability



THE ADOPTER

- Needs
- Motivation
- Values and goals
- Skills
- Learning style
- Social networks

ASSIMILATION

- Complex, non-linear process
- 'Soft periphery' elements

THE IMPLEMENTATION PROCESS

- Decision-making devolved to front line teams
- Hands-on approach by leaders and managers
- Human resource issues, especially training
- Dedicated resources
- Internal communication
- External collaboration
- Reinvention/development
- Feedback on progress

LINKAGE

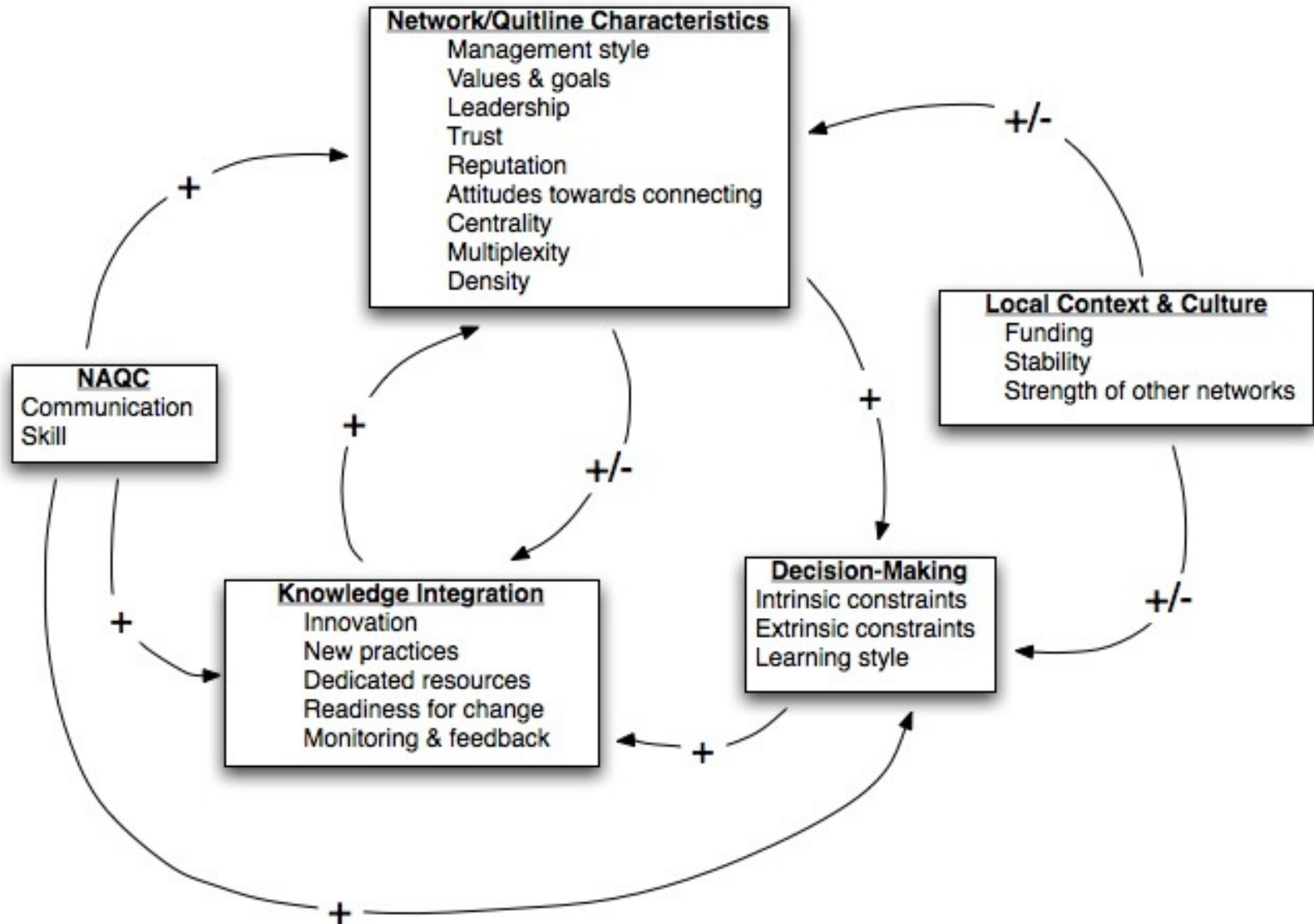
Design stage

- Shared meanings and mission
- Effective knowledge transfer
- User involvement in specification
- Capture of user-led innovation

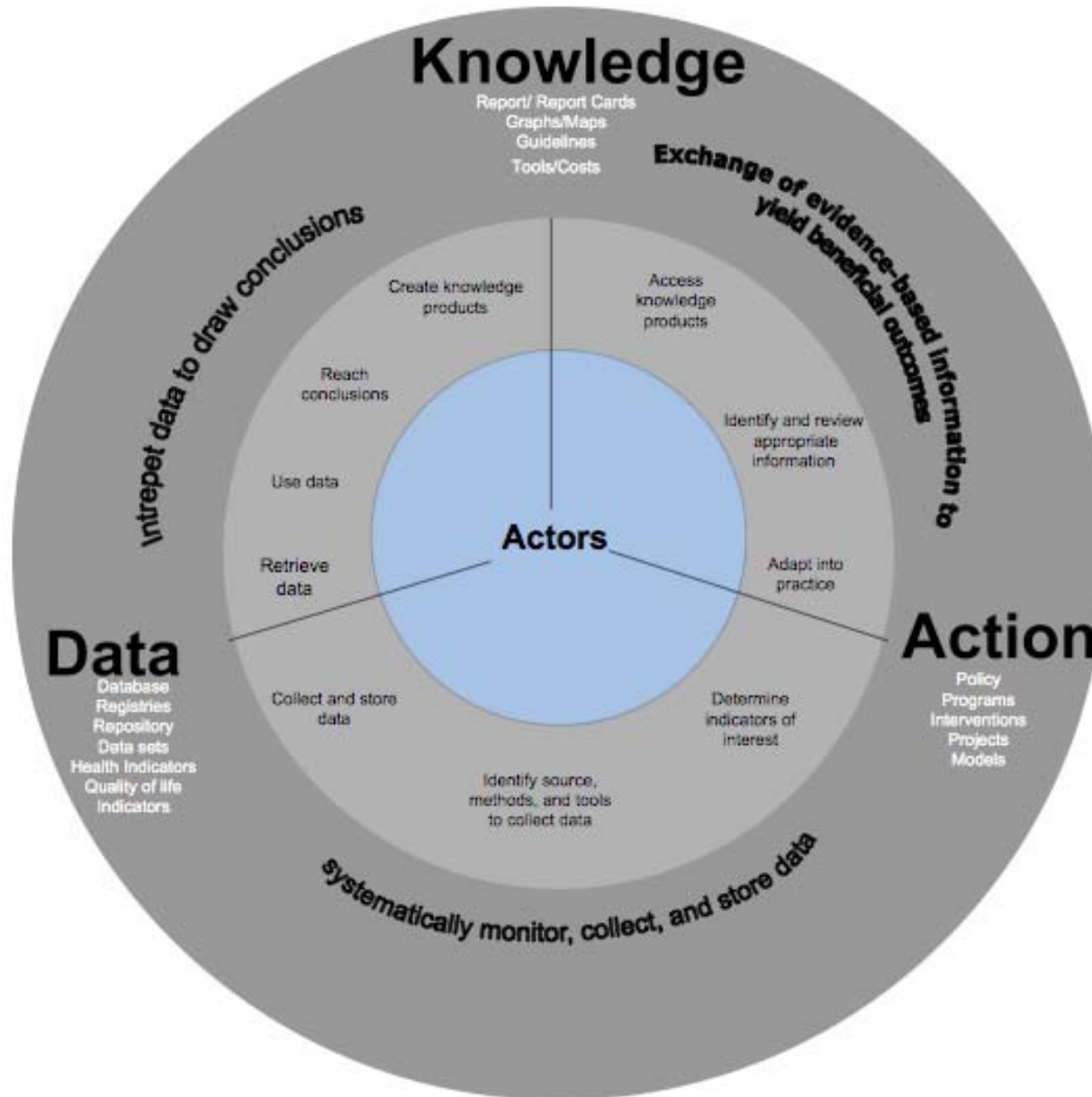
Implementation stage

- Communication and information
- User orientation
- Product augmentation e.g. technical help
- Project management support

INITIAL KIQNIC MAP



CAPTURE



Knowledge Synthesis Framework

SYSTEM/ POLICY			
TEAM/ ORGANIZATION			
INDIVIDUAL			
	BASIC	CLINICAL	POPULATION

Sample Strategies

SYSTEM/ POLICY	<ul style="list-style-type: none"> • incentives • EHRs • report cards 	<ul style="list-style-type: none"> • multi-component intervention • interagency networks • supportive funding policies • KE platforms linking producers and users
TEAM/ ORGANIZATION	<ul style="list-style-type: none"> • detailing • office systems 	<ul style="list-style-type: none"> • communities of practice/knowledge networks
INDIVIDUAL	<ul style="list-style-type: none"> • active training • on-demand evidence tools • self-monitoring • follow-up 	<ul style="list-style-type: none"> • user friendly MIS

CLINICAL

POPULATION

Seminal Articles

SYSTEMS THINKING

Greenhalgh, Trisha, et al. Diffusion in service organizations.
Milbank Quarterly 2004;82:581-629.

CHANGE THEORY

Grol, Richard, et al. Planning and studying
improvement in patient care.
Milbank Quarterly 2007; 85:93-138.

KNOWLEDGE TO ACTION MODELS

Van de Ven, Andrew, & Johnson, Paul.
Knowledge for theory and practice.
Academy of Management Review
2006; 31:802-821.

Van de Ven, A. *Engaged Scholarship*. Oxford, 2007

Van De Ven's Three Lenses

1. Knowledge transfer problem
2. Problem is different theory and practice knowledge
3. Knowledge production problem

 “Engaged Scholarship”

Linking Change Theory to KTA

TRANSFER (linear)

- Cognitive
- Educational
- Motivational
- Communications

EXCHANGE (relationship)

- Social learning
- Social network and influence
- Teamwork

CO- PRODUCTION (systems)

- Complexity
- Leadership
- Organizational culture, learning and innovation
- Quality Management and integrated care

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A Paradigm Shift

Reductionism	Complexity Science
Metaphor is a machine	Metaphor is a living system
Change by Plan & control. Standardization of parts	Feedback loops and adaptation. Change by Learn & adapt
Single causative factor	Multiple causal factors interacting
No connection between micro and macro	Multilevel influence and emergence
Controlled High internal validity	Context dependency High external validity

Comparison of Knowledge Types

MODE I

- Focus is knowledge generation
- Basic to applied research
- Scientist as expert
- Clear standards of knowledge

MODE II

- Focus is problem-solving
- Learn by doing
- Knowledge is co-created and context dependent
- Flexible methods & general guidelines for quality

Denis JL et al. In Lemieux-Charles L & Champagne F. *Using Knowledge and Evidence in Health Care*, U of T Press, 2005

Solutions to Complex Problems

- Support individuals / individuals matter
- Match complexity to capacity
- Establish networks and teams
- Set functional goals
- Distribute decision, action, & authority
- Create competition and feedback loops
- Assess effectiveness at various levels

Places to Intervene in a system

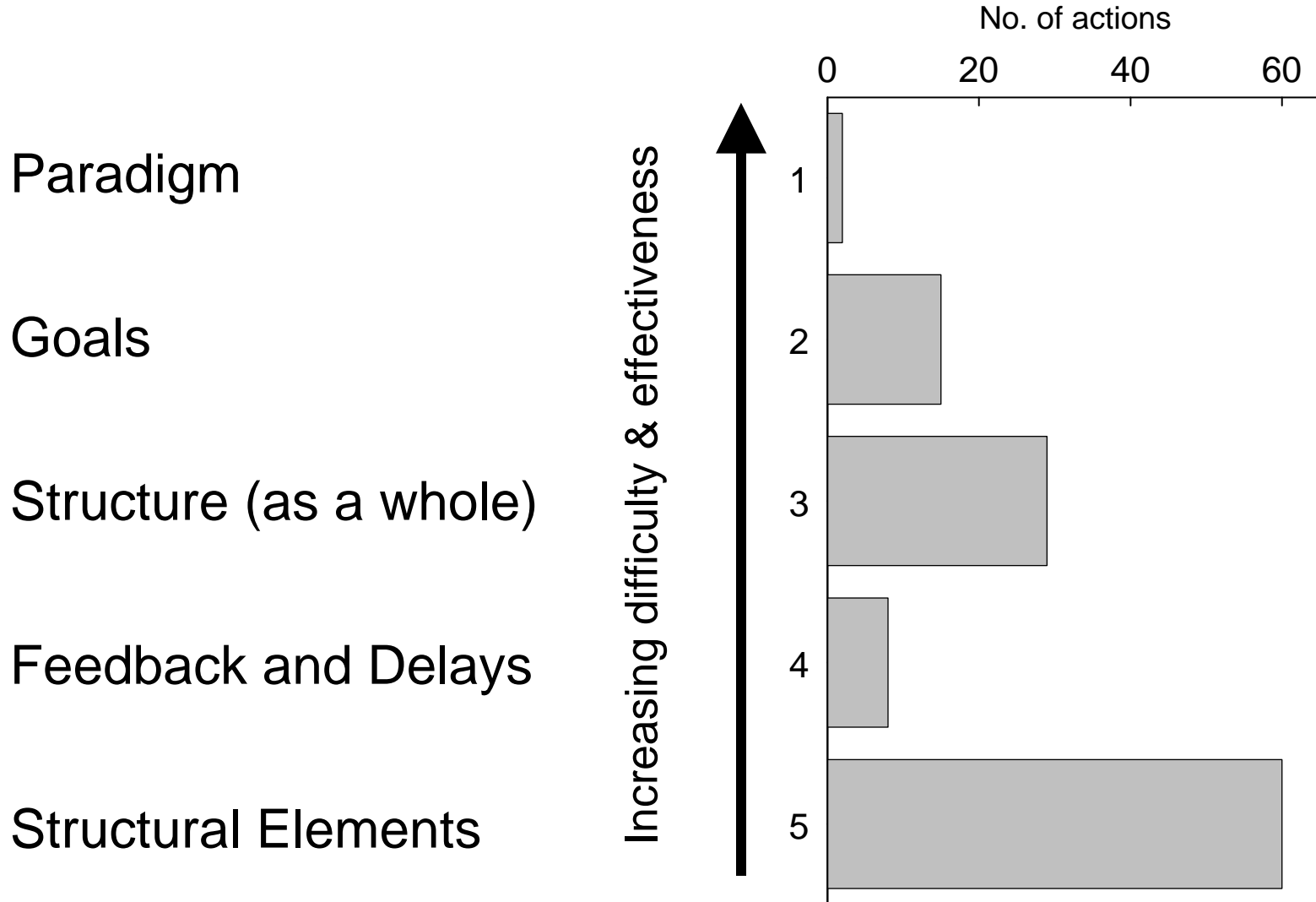
“... an invitation to think more broadly about the many ways there might be to get systems to change.” Donella Meadows 1999

Effectiveness ↑

Difficulty ↓

- ❖ The power to transcend paradigms
- ❖ The paradigm that the system arises out of
- ❖ The goal of the system
- ❖ The power to add, change, evolve, or self-organize system structure
- ❖ The rules of the system
- ❖ The structure of information flow
- ❖ The gain around driving positive feedback loops
- ❖ The strength of negative feedback loops
- ❖ The length of delays
- ❖ The structure of material stocks and flows
- ❖ The size of buffers and other stabilizing stocks
- ❖ Constants, parameters, numbers

Places to Intervene

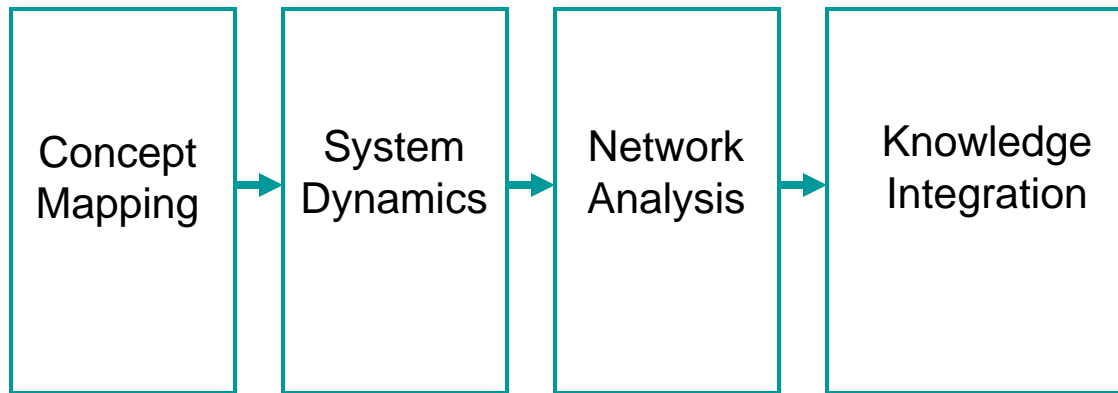


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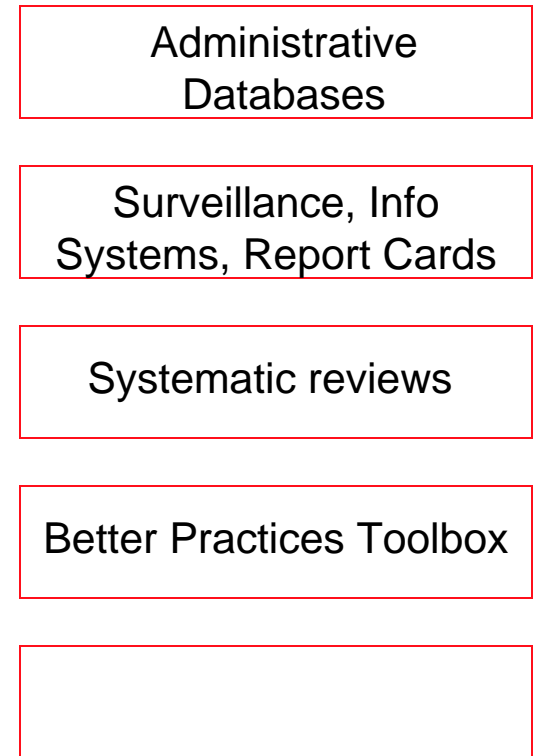
Action Research

WHOLE SYSTEMS METHODS

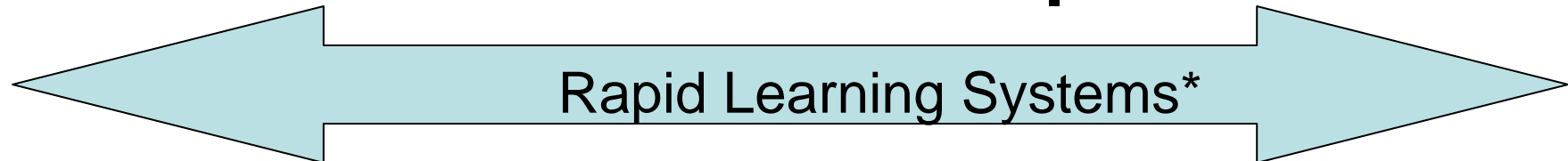


STRATEGIC CHANGE

REFINING METHODS

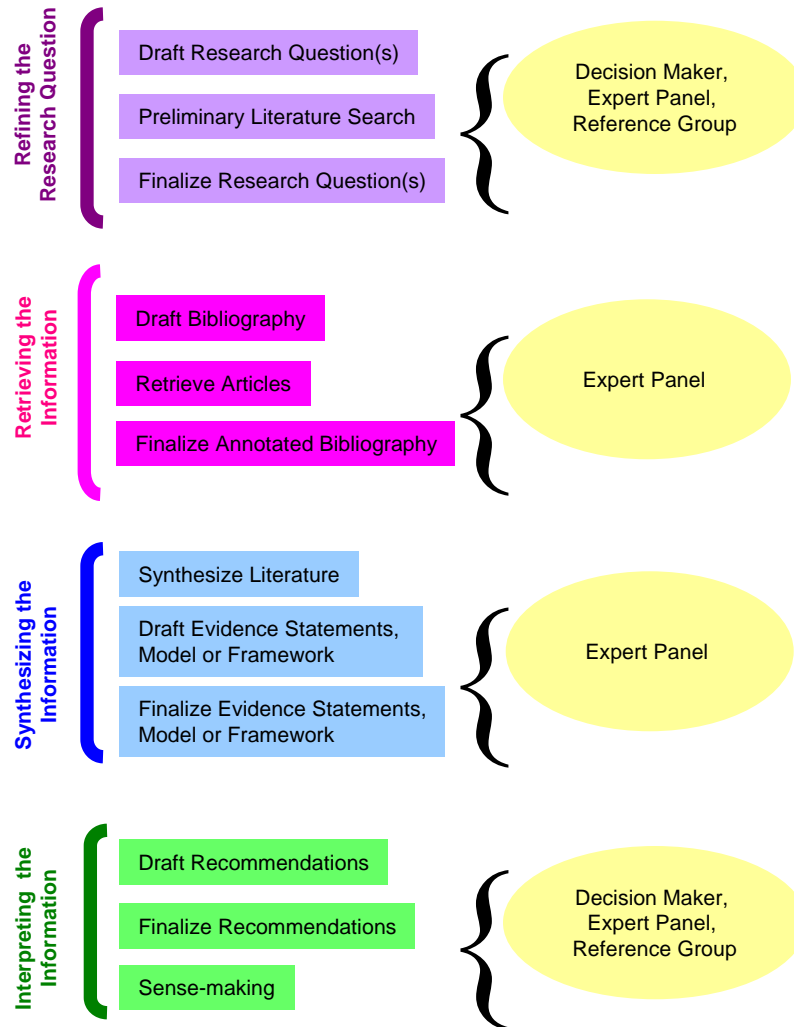


Rapid Learning Systems*



*Etheredge L, *Health Affairs* 2007 26(2): w107-w118

The Rapid Review Process



Implications for Partnerships

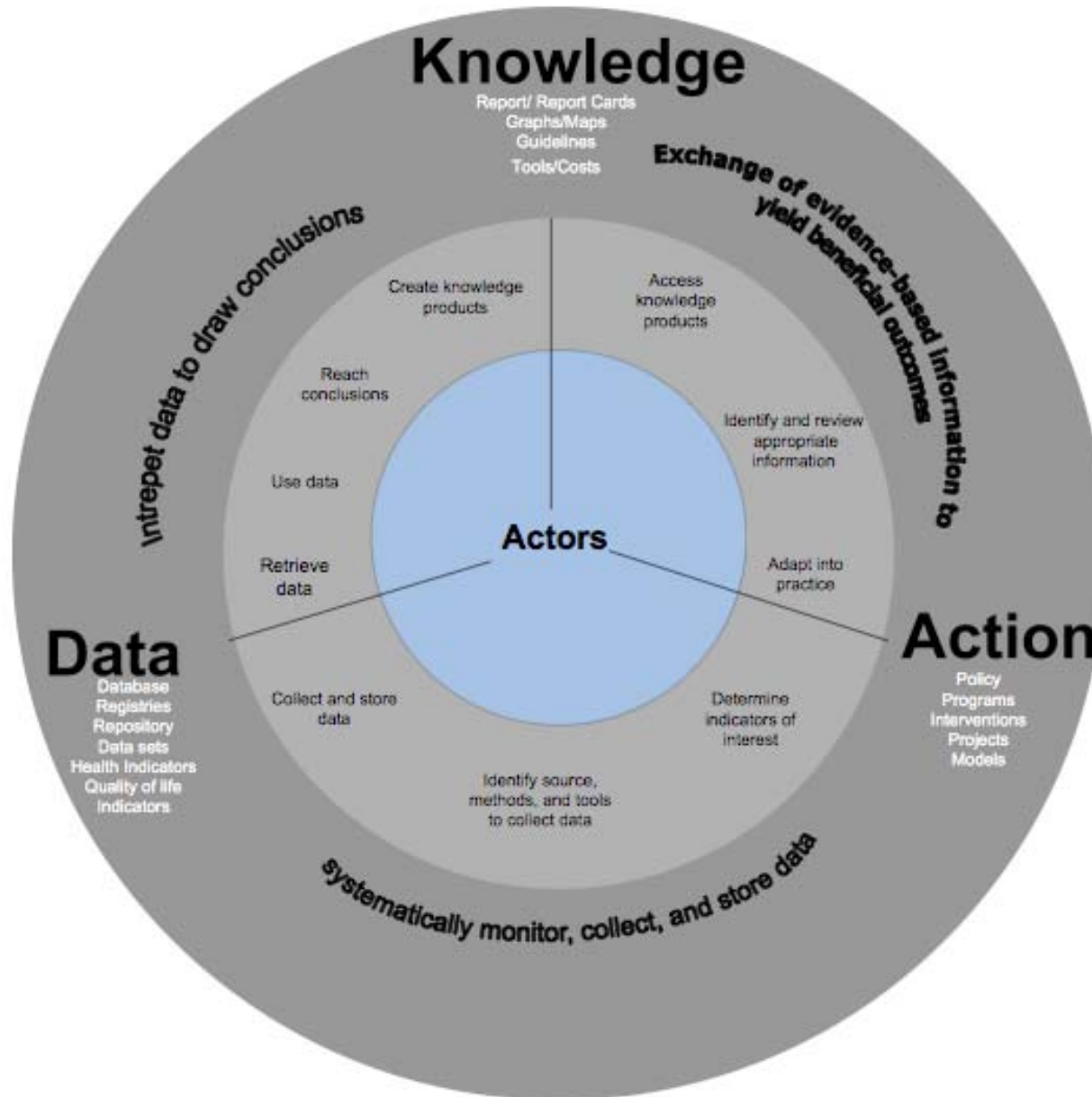
- Clear common aims
- Trust
- Collaborative leadership
- Sensitivity to power issues
- Membership structure
- Action learning

Best A, & Hall N. *Rapid Review of Interorganizational Partnerships*. InSource, 2006

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CAPTURE



Building trust slide

- From our IOP review and CAPTURE agent-based model, partnership and trust essential prerequisite for integrated systems
- 44 leaders, 5 countries, multiple sectors for 2-day trust building workshop focused on obesity
- Explored the knowledge, attitudes, skills, and character traits necessary to build trust for collaborative action
- Identified key factors, resources, tools, approaches and structures to get to trust

Critical Factors for Trust

- Common ground
- Shared vision, agenda
- Leadership
- Commitment
- Communication
- Accountability

Envisioning CAPTURE

1. Method and tool platform
2. Integrative common framework, logic and language
3. Coordinated, comprehensive strategy

Critical Elements in Integrative Strategy

- Shared vision and goals
- “Servant” leadership
- Well-defined roles, responsibilities, and strategies for work sharing
- Matched resources and capacity building
- Common indicators and evaluation tools
- High-performance coordination, communications, and learning systems/networks/communities
- Approach to linking strategy and policy

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RECOMMENDATIONS

- **Lens.** Complex problems need systems solutions
- **Methods.** Invest in systems methods and tools
- **Funding.** Structure to support integrated Knowledge-Action-Data platforms
- **Coordination.** Orchestrate multi-level strategy for shaping paradigm, structure and elements

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1. Revolution in academia

- Van de Ven's "engaged scholarship"
- Gabriele Bammer's "integration and implementation science"
 - Systems thinking and complexity science
 - Participatory methods
 - Knowledge management, exchange and implementation

Van de Ven, A. *Engaged Scholarship*. Oxford, 2007

Bammer G. *Ecology and Society* 2005; 10(2):6

www.ecologyandsociety.org/vol10/iss2/art6/

2. Revolution in strategy

- Research a line item competing with patient service
- Transformative versus incremental strategy

3. Revolution in science

- Generalizable versus contextual knowledge
- Behaviour change AND system dynamics
- Clinical versus public health evidence