
A Framework for Inter-Organizational Collaboration and Sensemaking Integrating Communication and Knowledge Management Tools

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 - The opinions presented in this paper are NOT those of Army Research Office (ARO) and are solely those of the authors.
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Agenda

- Introduction
 - Requirements
 - Sensemaking
 - Communities of Practice
 - Knowledge Management
 - Framework
 - Implementation
 - Scenario
-

Introduction

- Thesis research on “collaborative sensemaking”
 - Military often involved in collaboration with
 - Other militaries
 - Governments
 - Businesses
 - NGO’s
 - Each organization may have its own:
 - Goals, culture, language, or vision of the world
 - Processes, procedures, terms, and acronyms
 - How can they work together towards their goals?
-

Sensemaking

An Example

- UN Group set out to plan a relief effort for Afghanistan.
 - Group consisted of several bodies from UN, World Bank, & Oxfam (anti-poverty NGO).
 - Leader spent most time working on political issues
 - Due to changing circumstances in Afghanistan they had difficulty meeting
 - Many did not speak until workshops were held in Pakistan.
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Sensemaking Requirements

■ Wicked Problems

- Difficult to understand
- Multiple people and organizations involved
- Stakeholders have radically different views of the world

■ Key Questions

- How do all of these people communicate?
 - How do they arrive at a shared understanding?
 - How do you integrate past knowledge with collaboration processes?
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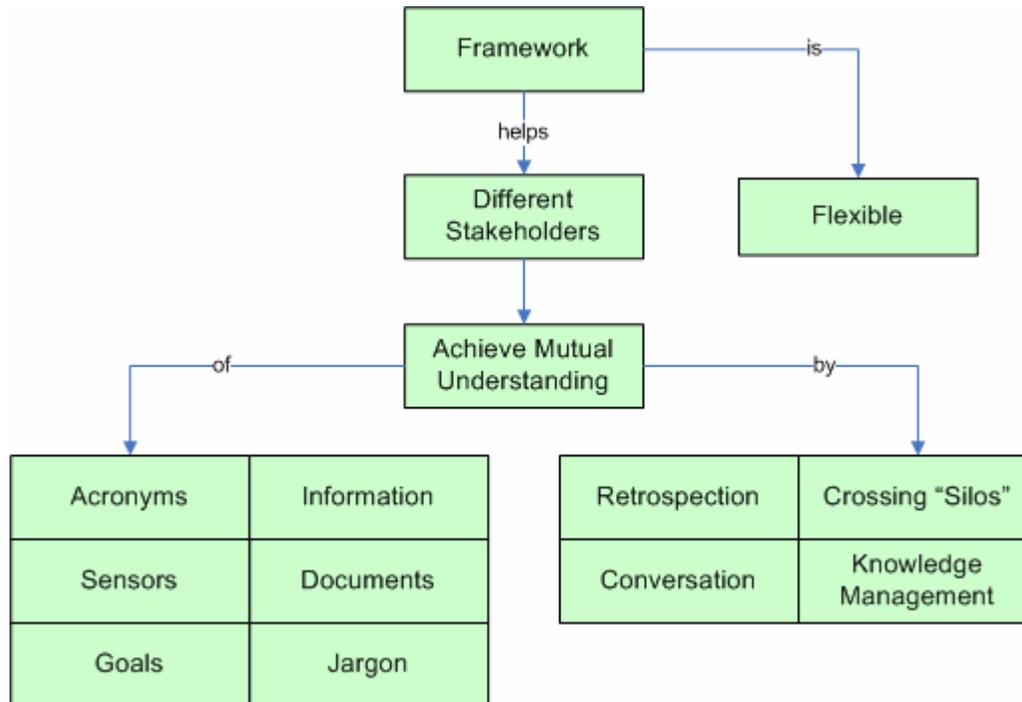
Sensemaking

- Sensemaking is an approach to solving such a “wicked” problem.
 - Sensemaking key properties:
 - Personal (system must support each person’s role)
 - Retrospective (-> knowledge management)
 - Social (-> communities of practice)
 - Processes Involved:
 - Comprehending
 - Mutual understanding
-

Sensemaking Requirements

- Network Centric Warfare (NCW)
 - From Alberts & Hayes (2006)
 - A way to achieve more autonomous, “self-synchronizing” groups.
 - Groups must be able to react with up-to-date information.
 - Need better information sharing and collaboration
 - Recommend creating socio-technical networks facilitated by technology
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Sensemaking Requirements



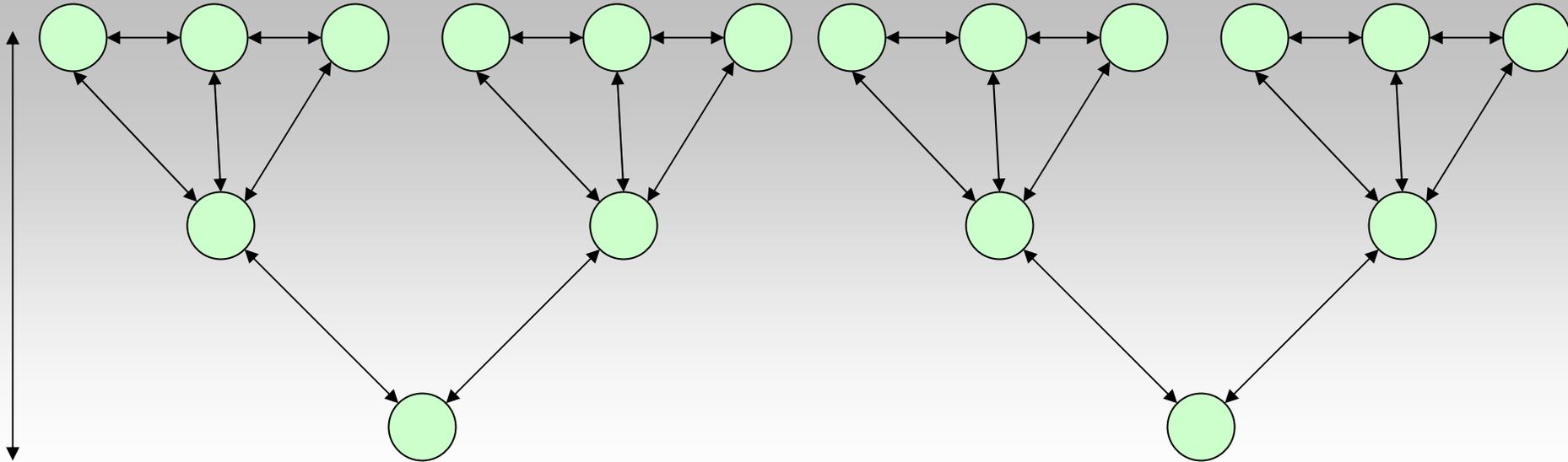
Collaboration & Communities of Practice Requirements

Communication

- How do they communicate now?
 - Emergency Management:
 - Synchronously: telephone, cell phone, satellite phone
 - Follows chain of command within each organization
 - Long hierarchy before information reaches the top
 - Even longer before it is transmitted across boundaries
 - Inter-Organizational Collaboration:
 - People hesitant to report information because they view it as wasted time
 - Meet face-to-face one or twice (travel is difficult, not everyone attends)
 - Talk individually by telephone, collectively by conference call
 - Use e-mail and / or electronic mailing lists.
-

Communication Hierarchy and Silos

In the Scenario



Observing Scenario

Communities of Practice

- Topics Vary Widely
 - Troops discussing tactics
 - Students learning a new subject
 - Engineers discussing programming
 - Vary by
 - Size
 - How long they've existed
 - People co-located or not
 - How similar people are to one another
 - Within or across organizations
-

Benefits to Organizations

■ Short-term:

- Improve quality of decisions
- Find answers more quickly
- Get additional perspectives on problems

■ Long-term:

- Build new capabilities and alliances
 - Increase strategic thinking about employee knowledge and capabilities
 - Reduce “silos”
 - Better retain talent
 - Allow distributed cognition— pooling of knowledge
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Carroll's CoP Framework

■ Carroll's Framework:

□ Communities of Practice

- Each group of people can be thought of as a community
- Supporting tools different based mainly on time and place restrictions

□ Common Ground

- Mutual beliefs, knowledge, assumptions, etc.
- Also involve grounding process (unconsciously establishing mutual knowledge, see next slide)

□ Social Capital

- Reciprocity, trust, and social dilemma

□ Human Development

- Zone of proximal development, opportunistic learning
-

Factors that affect communications and grounding

Factor	Description
Co-presence	People in same physical space
Visibility	People can see one another
Audibility	People can hear one another
Co-temporality	People are experience conversation of roughly the same time
Simultaneity	People take turns in order
Reviewability	People can review messages
Revisability	People can revise messages

Communication Tool Requirements

- Time (Asynchronous, Synchronous)
 - Place (Co-located, distributed)
 - Activity (Push, Pull)
 - Smartness (One-to-one, Broadcast)
 - Device Required
 - Usability (Speed, Readability, Portability)
-

Communication Requirements

	Same Time	Different Time
Same Place	Required	Not Required
Different Place	Required (e.g., Telephone)	Required (e.g., Broadcast / Push / Pull / One-to-one)

Knowledge Management

Knowledge Management (KM)

- From Wikipedia: “A range of practices and techniques used by organizations to identify, represent and distribute knowledge, know-how, expertise, intellectual capital and other forms of knowledge for leverage, reuse and transfer of knowledge and learning across the organization.”
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KM Processes

- **Creating / Transferring**
 - Like Nonaka's spiral
 - **Planning**
 - Requirements definition
 - **Assessing**
 - Assignment of value
 - **Maintaining**
 - Reviewing, updating, etc
 - **Integrating**
 - Is it used by other applications and people?
 - **Organizing**
 - How can people find the knowledge
-

KM – Nonaka's Spiral

		To:	
		Tacit	Explicit
From:	Tacit	Socialization	Externalization
	Explicit	Internalization	Combination

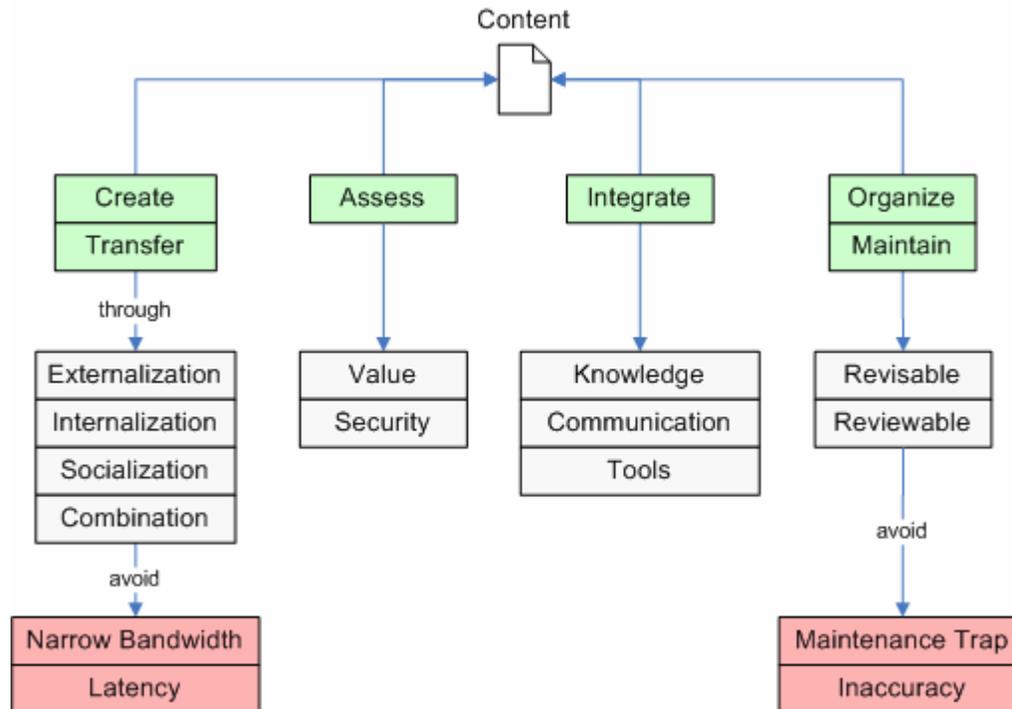
KM Tools

- Most tools are focused on creating knowledge from data.
 - Data Mining
 - Knowledge Storage:
 - Databases, Files, Documents
 - FAQ's
 - Often not standardized across organizations
 - Limited methods to find knowledge
 - Search engines
 - “Knowledge-based” search
 - Lack of integration big problem
-

KM Bottlenecks

- **Narrow Bandwidth**
 - To capture knowledge from its source (often one person)
 - **Acquisition Latency**
 - Delay from when knowledge has been captured to when it can be consumed (e.g.,. Wait for publisher)
 - **Knowledge Inaccuracy**
 - Mistakes are made, may take a long time to correct
 - **Maintenance Trap**
 - The more knowledge that is captured, the more difficult it is to maintain
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Knowledge Management Requirements



The Framework

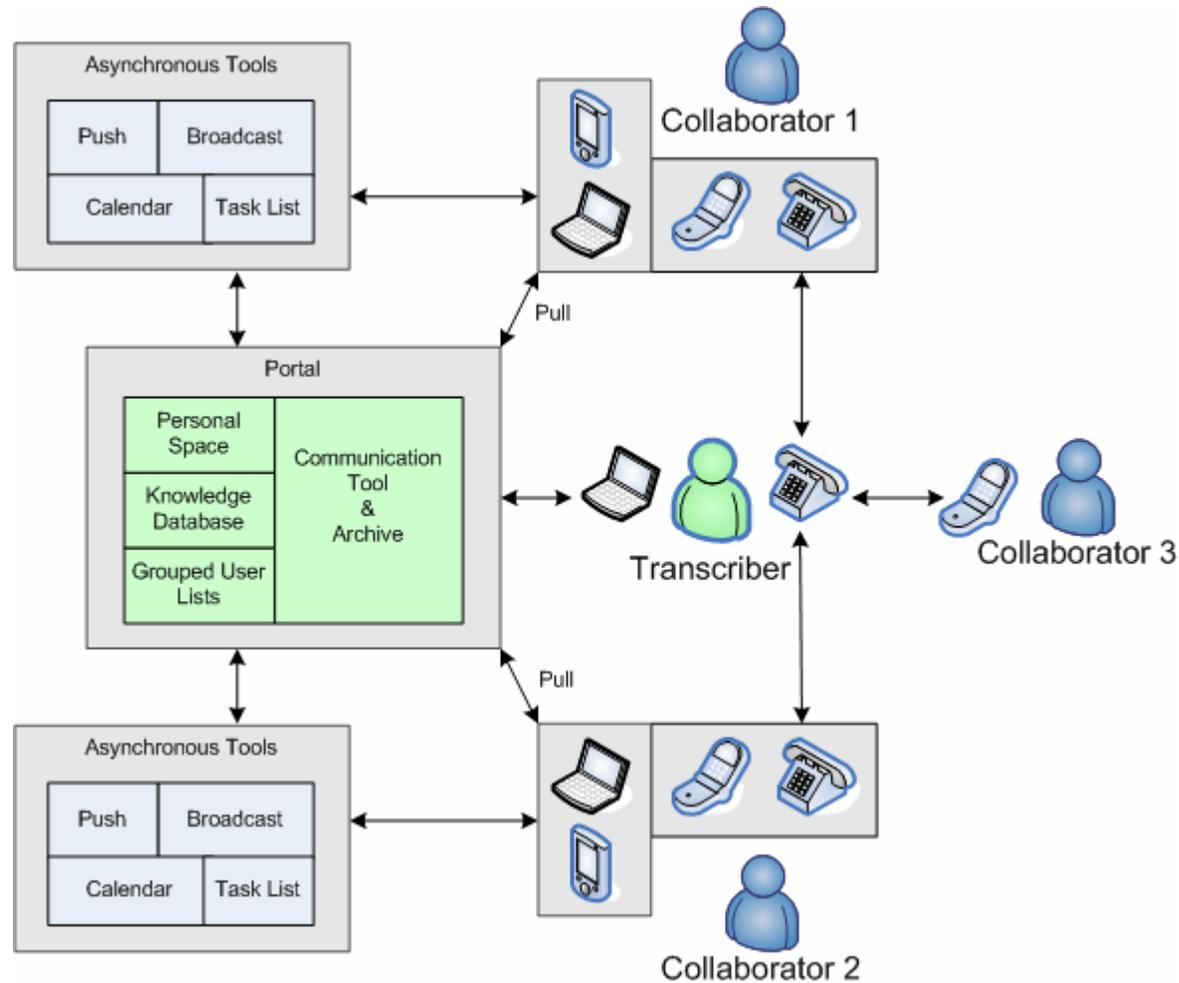
Framework

- Must support two scenarios
 - Communication
 - Allows people to use tools that fulfill their needs
 - Devices (phones, PDA's, computers, etc)
 - Applications (compendium, wiki, etc)
 - Communication protocols (e-mail, RSS, text messages, etc)
 - Knowledge Management
 - Support processes
 - Reduce bottlenecks
 - Portable across organizational boundaries
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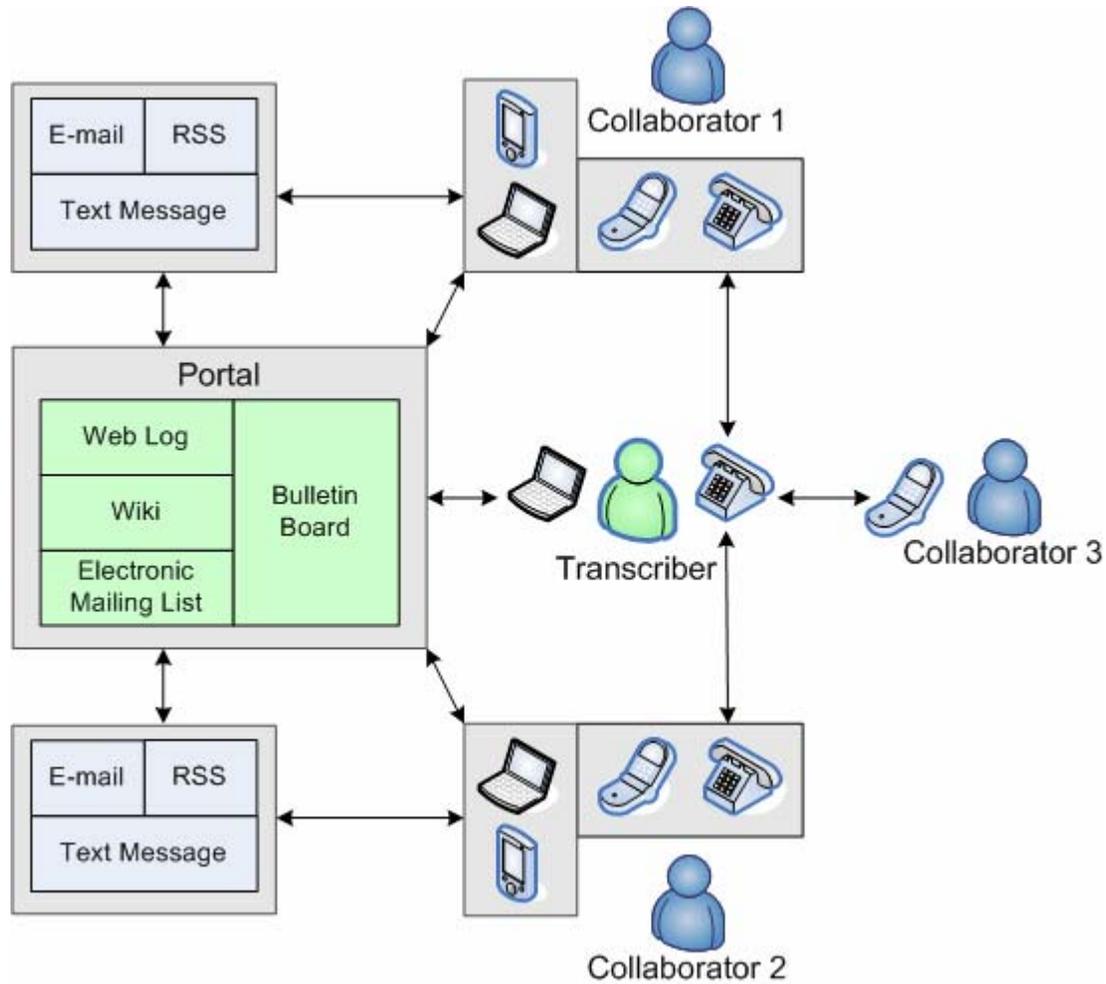
Framework

- Two different ways to represent framework:
 - Theoretical
 - Includes broader terms like KM, Communication, Collaboration, etc.
 - Still working on how to best represent this in a graphic
 - Implementation
 - Specific applications
 - How it is used in specific scenarios
-

Framework - Theoretical

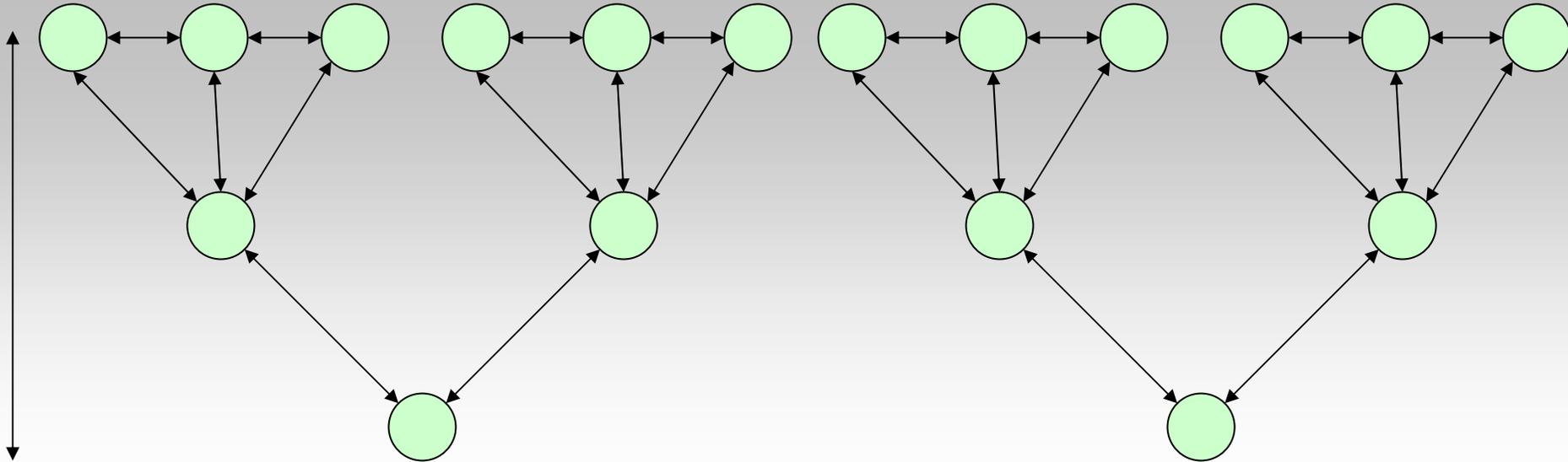


Framework - Implementation



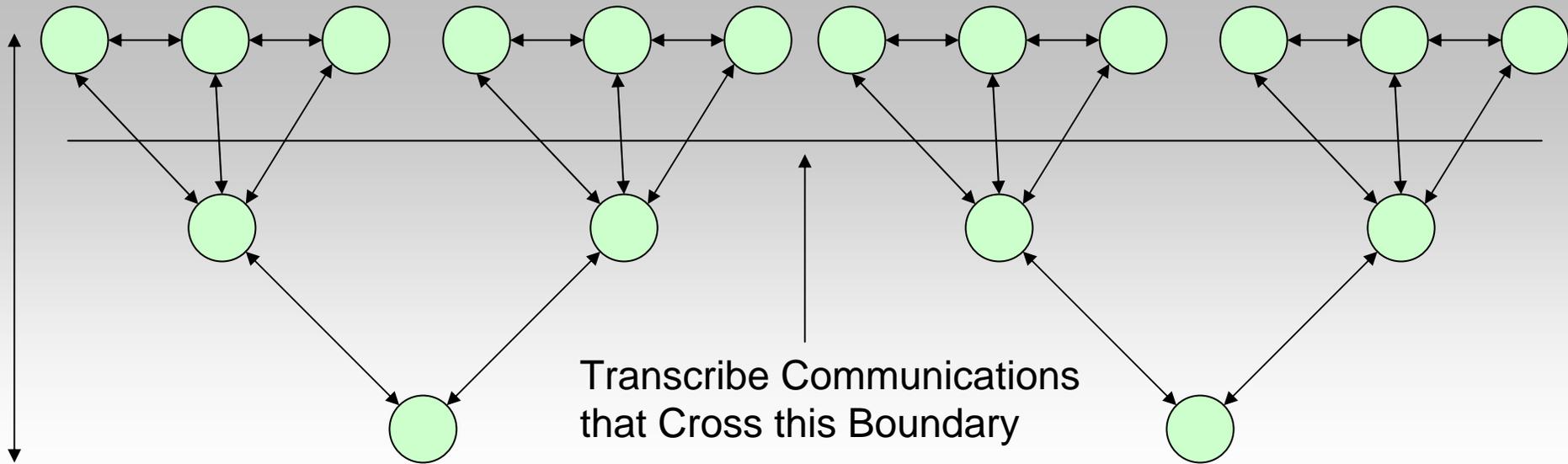
EM Communication Hierarchy

In the Scenario

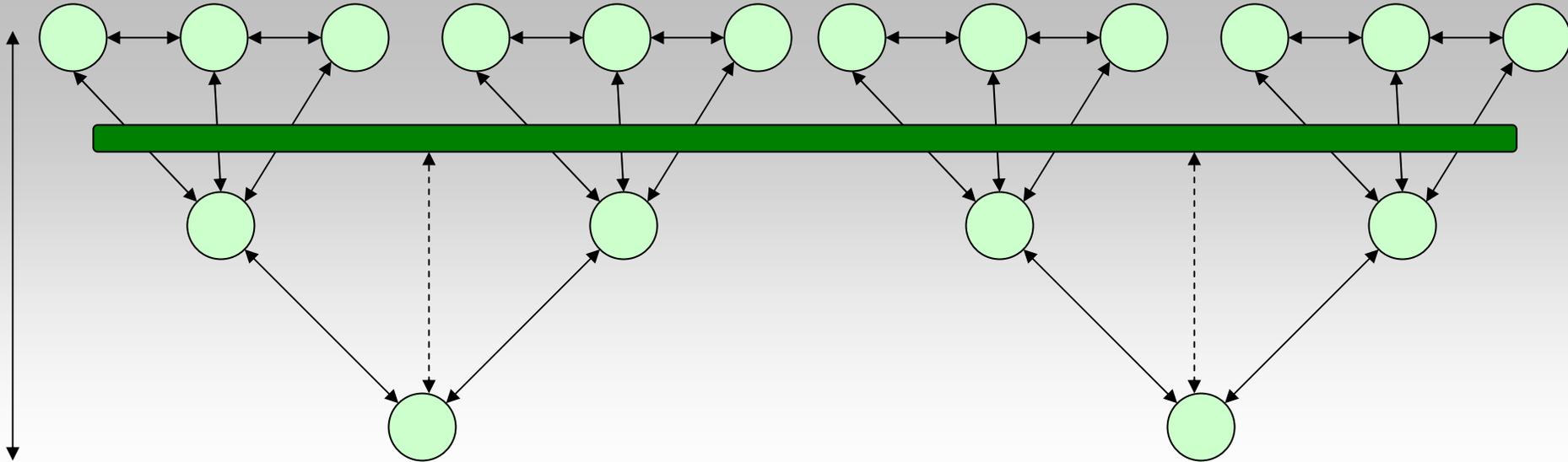


Observing Scenario

EM Communication Hierarchy



EM Communication Hierarchy



Old channels still exist, but decision maker can bypass them if necessary

EM Communication Hierarchy

- Hierarchy is shorter
 - Managers can see communications down to smallest level if they wish
- Silos are reduced
 - Information crosses boundaries with no effort



Asynchronous Communication Tool

- Requirements match capabilities of bulletin boards



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Health, Diet, and Exercise Forums

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Reviews			
Product Reviews Reviews of consumer products, such as exercise equipment, videos, heart rate and blood pressure monitors.	1	1	Sat Jan 07, 2006 6:25 pm plnii ↕
Diet Reviews Reviews about long-standing and new diets, such as Atkins and Weight Watchers.	3	4	Fri Dec 30, 2005 10:01 pm plnii ↕
Medical Reviews Reviews about medical procedures such as the gastric bypass, cosmetic surgery, etc.	0	0	No Posts
Software and Web Application Reviews Reviews of software and web applications (e.g., VideOne) reviews related to diet, exercise, and overall health.	0	0	No Posts
Online Community Reviews A place to share and discuss online communities for various medical conditions, support groups, etc.	2	5	Sat Apr 29, 2006 11:02 pm StuChiAdmin ↕
Articles & Information			
Medical Journal Articles A summary of medical journal articles that may relate to diet, exercise, and health related to these issues. These articles were peer-reviewed, which means that they are a much more reliable source of information than websites, new reports, etc.	0	0	No Posts
Magazine, Newspaper, and Website Articles Discussion about and links to magazine, newspaper, and website articles	0	0	No Posts



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Diet Reviews

Moderators: None

Users browsing this forum: None

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Topics	Replies	Author	Views	Last Post
South Beach Diet	0	plnii	6	Fri Dec 30, 2005 10:01 pm plnii ↕
Atkins Diet	0	plnii	11	Fri Dec 30, 2005 9:51 pm plnii ↕
3 Day Diet	1	yaseen	5	Wed Dec 21, 2005 5:52 am plnii ↕

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Bulletin Boards

- Records discussions in threads.
 - Each thread is in a forum.
 - A forum may be grouped inside of another forum.
 - Useful way to organize the communications.
 - Also allows:
 - Discussions with other strategists
 - Searching across boundaries
 - Using tags to classify discussions
 - Hierarchical permissions
 - Content can be stored forever, or deleted.
-



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Sensemaking

Definition

[\[edit\]](#)

Sensemaking is difficult to define, but most simply it can be thought of as the "making of sense" (Weick, 1995), though practically this definition is not of much use. Weick pieces together several definitions to say that sensemaking involves placing stimuli into frameworks, which allows people to comprehend, understand, explain, attribute, extrapolate, and predict. It is perhaps more helpful to understand sensemaking by its properties:

- Grounded in identity construction
- Retrospective
- Enactive of sensible environments
- Social
- Ongoing
- Focused on and by extracted cues
- Driven by plausibility rather than accuracy

[\[edit\]](#)

References

- Weick, 1995, Sensemaking in Organizations

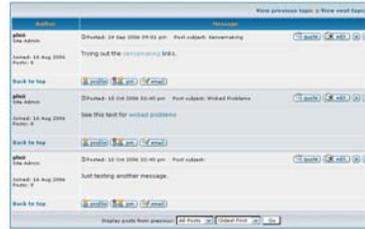
Wiki

- Collaborative editing
 - Version control system built in
 - Much like an encyclopedia
 - Knowledge management tool that:
 - Reduces bottlenecks
 - Easy to use
 - Can be standardized across boundaries
 - Can be integrated into other applications
-

Bulletin Board + Wiki Scenario



Navigates to BB



Doesn't understand "sensemaking"



Hovers over link



Retrieves brief definition from wiki



Wants to know more,
So clicks link



Taken to wiki page on sensemaking

A Scenario

- See paper for a scenario in which this framework can be used.
 - Supports emergency management
 - Managers can see what's happening in the field and discuss it with others
 - Supports distributed/asynchronous collaboration
 - People can interact through bulletin board or e-mail. Wiki can be used to create and store documents, terms, etc.
-

Future Research Directions

- Completed an experimental study testing integration of wiki and bulletin board.
 - Test using Army participants
 - Implement and test in real-world case study
 - Implement other parts of framework
-

Questions & Comments?
