

# More is Different: sensemaking and wayfinding in complex information environments



George Siemens

April 4, 2012

Presented to:

The logo for SOLAR (SOCIETY for LEARNING ANALYTICS RESEARCH). It features the word 'SOLAR' in a large, bold, sans-serif font, with a stylized blue 'O' containing a white dot. Below it, the words 'SOCIETY for LEARNING ANALYTICS RESEARCH' are written in a smaller, all-caps, sans-serif font.

**SOLAR**  
SOCIETY for LEARNING  
ANALYTICS RESEARCH



**Can learners be trusted to account for  
their own learning?**

Because the internet and social media  
make managing/owning/directing  
your own learning possible.

Intermediary agents need not apply.

# What is self-organization?

“Processes of self-organization literally create order out of disorder”

*Francis Heylighen*

“Individuals, groups, and communities all form symbiotic relationships for a wide variety of reasons but the underlying impetus is resource sharing. Whether the resource is food, information, or support, **individuals come together to share resources** (Ribbands, 1953).

*Erin Brewer, 2003*

Online Self-Organizing Social Systems (OSOSS)  
“structure allows large numbers of individuals to  
**self-organize in a highly decentralized** manner  
in order to solve problems and accomplish other  
goals.”

*Wiley & Edwards 2003*

The internet is very good at fragmenting  
information and narratives

We haven't developed skills and tools to weave fragmentation together into a coherent whole.

# Adaptation

To avoid getting lost in the “mass of inconsequential”

(Bush, 1945)

We still need control, but the points are different than where the education system has assigned them in the past.

Complex systems:

“a set of diverse actors who dynamically interact with one another awash in a sea of feedbacks.”

*Miller and Page, 2007*

Complexity:

“disturbing traits of mess, of the inextricable, or disorder, of ambiguity, or uncertainty”

*Morin, 2008*

Coherence is the thing...

“meaning relations that connect discourse segments”

*Kamalski et al. 2008: 323*

“an ancient urge to seek a comprehensive picture of the world—for the sake of understanding ourselves, for knowledge’s sake, and not the least for acting as best we can”

Cordero 2007

High-knowledge readers perform better with reduced coherence.

*McNamara et al. 1996: 35*

More is different

*P.W. Anderson (1972)*

Complex systems:

“a set of diverse actors who dynamically interact with one another awash in a sea of feedbacks.”

*Miller and Page, 2007*

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### Episode 88: Why Universities Should Experiment With 'Massive Open Courses'



Technology continues to change college life, and each month *The Chronicle's Tech Therapy* podcast offers analysis and

“For all intents and purposes I am sitting in the middle of a massive coffee-shop...in the middle of hundreds of half-baked, uninformed conversations...**not grounded in scholarship** and since the tendency is for the bloggers and tweeters to flit from conversation to conversation I have **no sense of any substantial engagement**”

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### Episode 88: Why Universities Should Experiment With 'Massive Open Courses'

October 6, 2011, 1:57 am



Technology continues to change college life, and each month *The Chronicle's Tech Therapy* podcast offers analysis and advice on what the latest gadgets and

“Too many **disconnected , unconnected things** going on to have a good sense that one is making reasonable, thoughtful choices.”

Because we've been presented with  
coherent wholes most of our lives  
(at least in formal education)



The real question, then, is not  
IF  
coherence is important, but  
WHO  
creates it

# Coherence formation has two components

1. Sensemaking

1. Wayfinding

# Sensemaking

“Sensemaking is a motivated, continuous effort to understand connections . . . in order to anticipate their trajectories and act effectively”

(Klein *et al.* 2006)

or

“Sensemaking is about labeling and categorizing to stabilize the streaming of experience”

(Weick *et al.* 2005: 411)

# Wayfinding

“the process that takes place when people orient themselves and navigate through space”

(Raubal and Winter 2002)

Or

“recognizing places and finding one’s way  
between places”

(Golledge 1992)

Sensemaking and wayfinding are  
personal

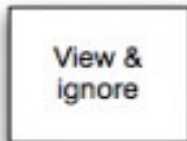
(even though they are socially and communally  
enabled)

# How I manage information

## 1. Access



## 2. Selection & Use



### Tools

Copy - digital or print



Personal Brain

Delicious

Mendeley

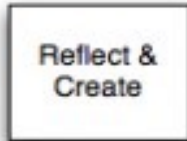


Twitter

Social Networks

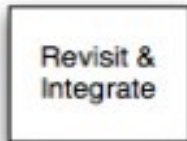
Blog

## 3. Extension & Extrapolation



Podcast

Landing

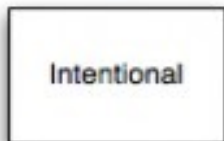


Articles

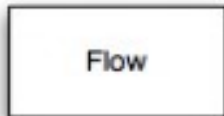
Visuals: Omni Graffle, CMAP



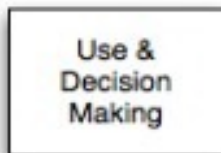
## 4. Recall & Context



Journals  
Books  
Lectures, Videos



Social Network  
Google Reader  
Alerts  
Email  
Discussion



Work  
Theory development  
Research Planning

# Finding the 'right' data set: authentic complex information environments



**Learning and Knowledge Analytics** Analyzing what can be connected



**EC&I 831: Social Media & Open Education**

Open, Connected, Social

eduMOOC

Online Learning Today...and Tomorrow

**Open Course in Education Futures**

[Artifact](#) [Blogs](#) [About This project](#) [Contributions](#) [Course Schedule](#) [Discussion Forums](#)

**CONNECTIVISM & CONNECTIVE KNOWLEDGE**

a rather large open online course...

2008, 2009, 2011

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**PLENK2010**

Personal Learning Environments  
Networks and Knowledge 2010

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# The data set

Connectivism and Connective Knowledge 2008  
(CCK08)

# The methods

1. Social network and participation analysis
2. Corbin & Strauss' (1990) version of grounded theory

# SNA & Participation Habits

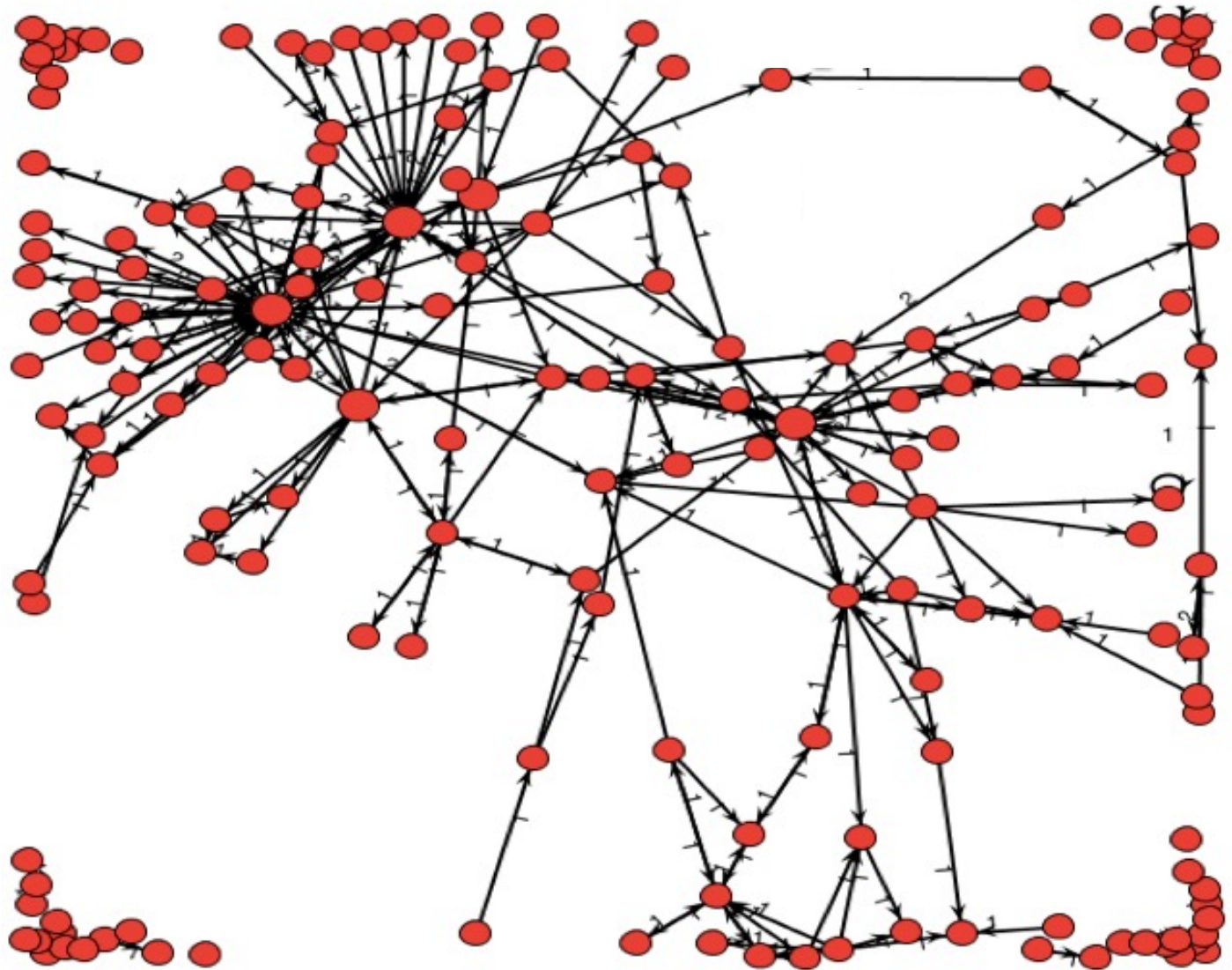
# CCK08 Weekly Forum Posts

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Week	Number of Participants	Number of Posts
Introduction	178	431
General Forum	146	1252
Week 1	83	312
Week 2	61	316
Week 3	48	453
Week 4	28	138
Week 5	42	271
Week 6	30	112
Week 7	25	132
Week 8	85	261
Week 9	28	146
Week 10	24	88
Week 11	35	153
Week 12	29	119

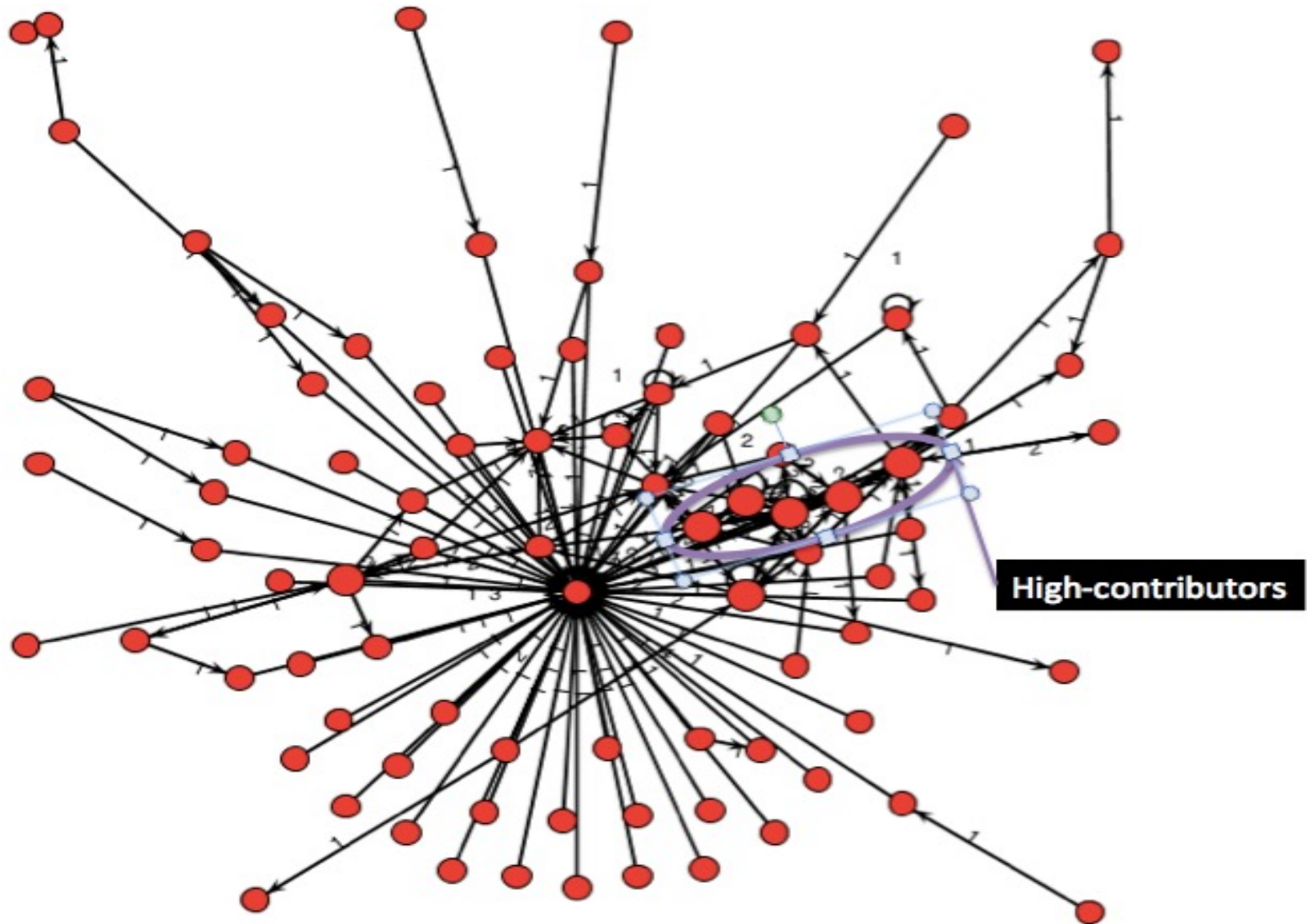
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# CCK08: Introduction forum



Limited interaction.  
Most are isolated

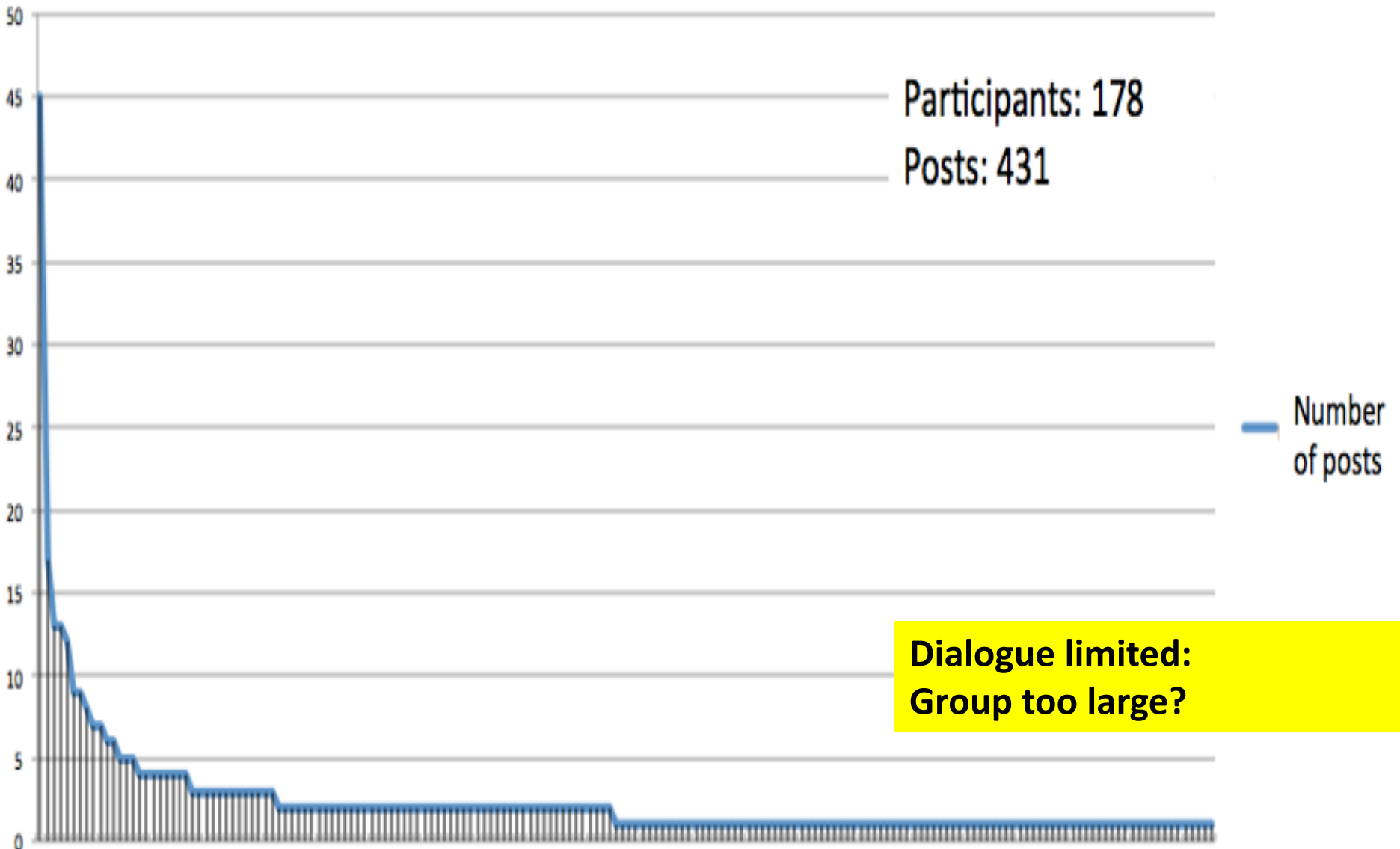
# Downes auto-subscribes learners in CCK08



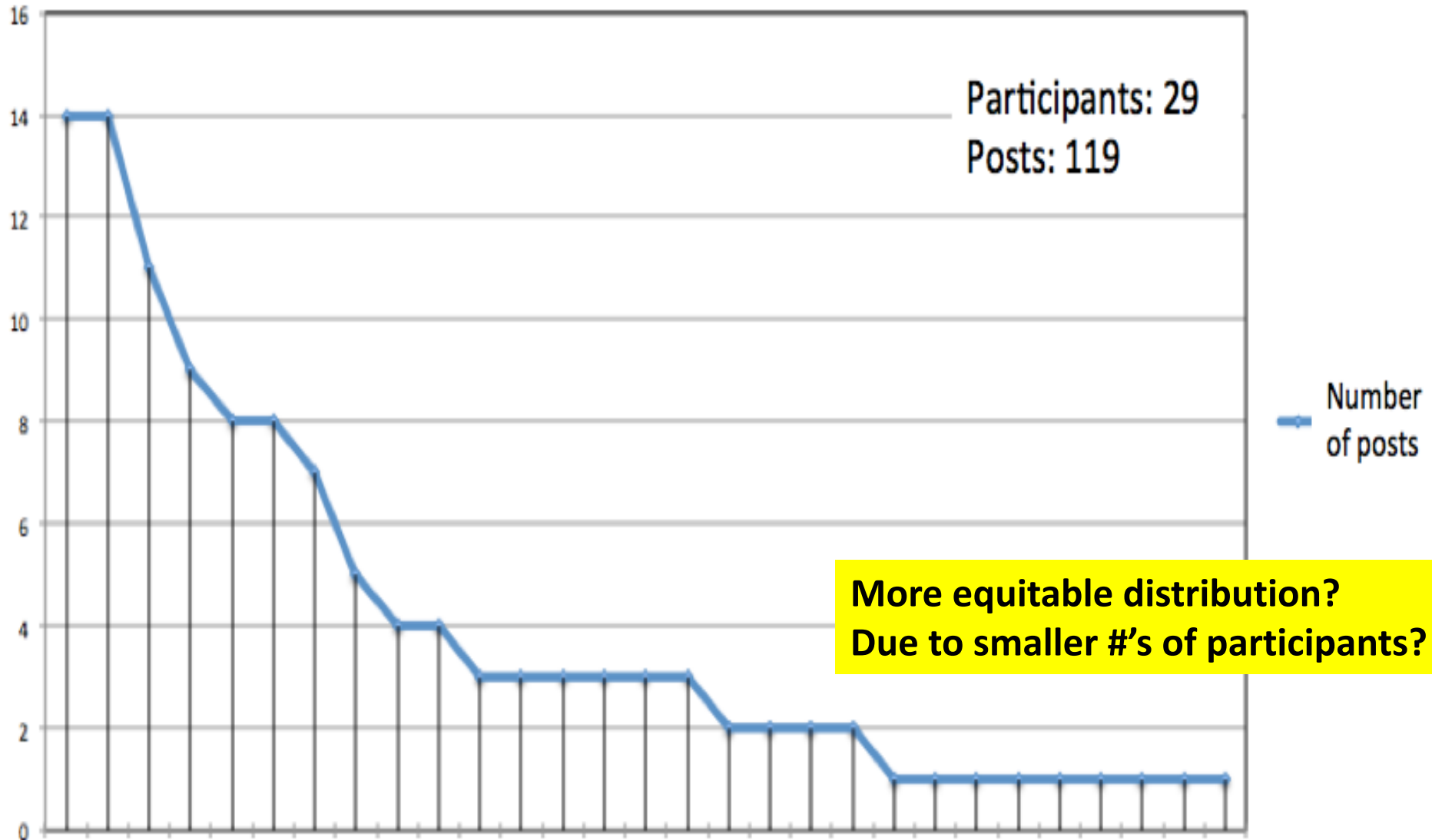
# Dramatic participation variance

Of the top ten posters in Week 1, only three were in the top ten in Week 12.

# Introduction forum posts: CCK08



# Week 12 forum posts: CCK08



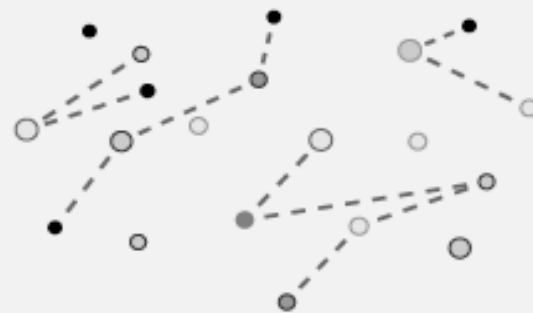
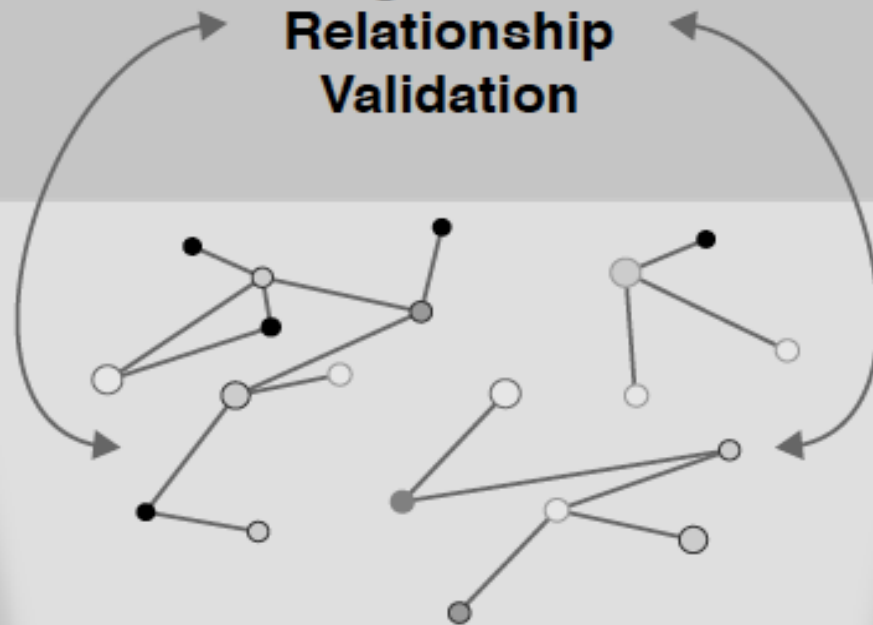
# THEORY DEVELOPMENT

**SELECTIVE  
CODING**

**Categories and  
Relationship  
Validation**

**AXIAL  
CODING**

**OPEN  
CODING**




**Theory  
Notes**

**Coding &  
Memoing**

**Continuous  
Collection,  
Sampling  
and Analysis  
Loop**

# Open coding using Cohere

 Type:  [add new](#)

Summary:  ← **A**


Description:  ← **C**

Public:

Add Tags:  (comma separated)

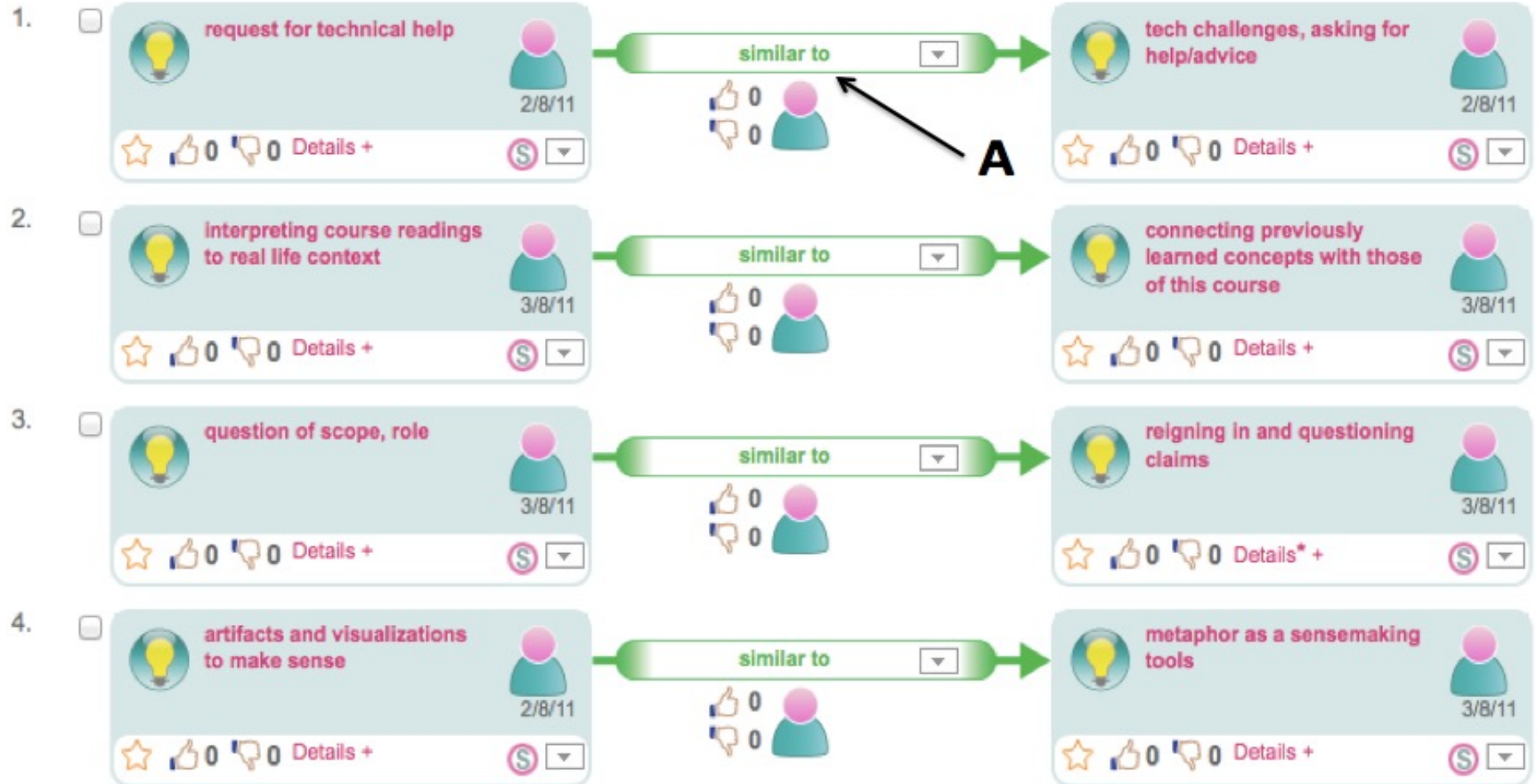
Groups: ▲ Extras: ▼ Websites: ▲

Groups:  Test\_random  
 CCK08

Websites:  [remove](#)  
Title:    
 Set this url as the icon for this idea  
Clip: Centre for e-learning in the same institution. See for more information: www.inholland.nl ← **B**

[add url](#)

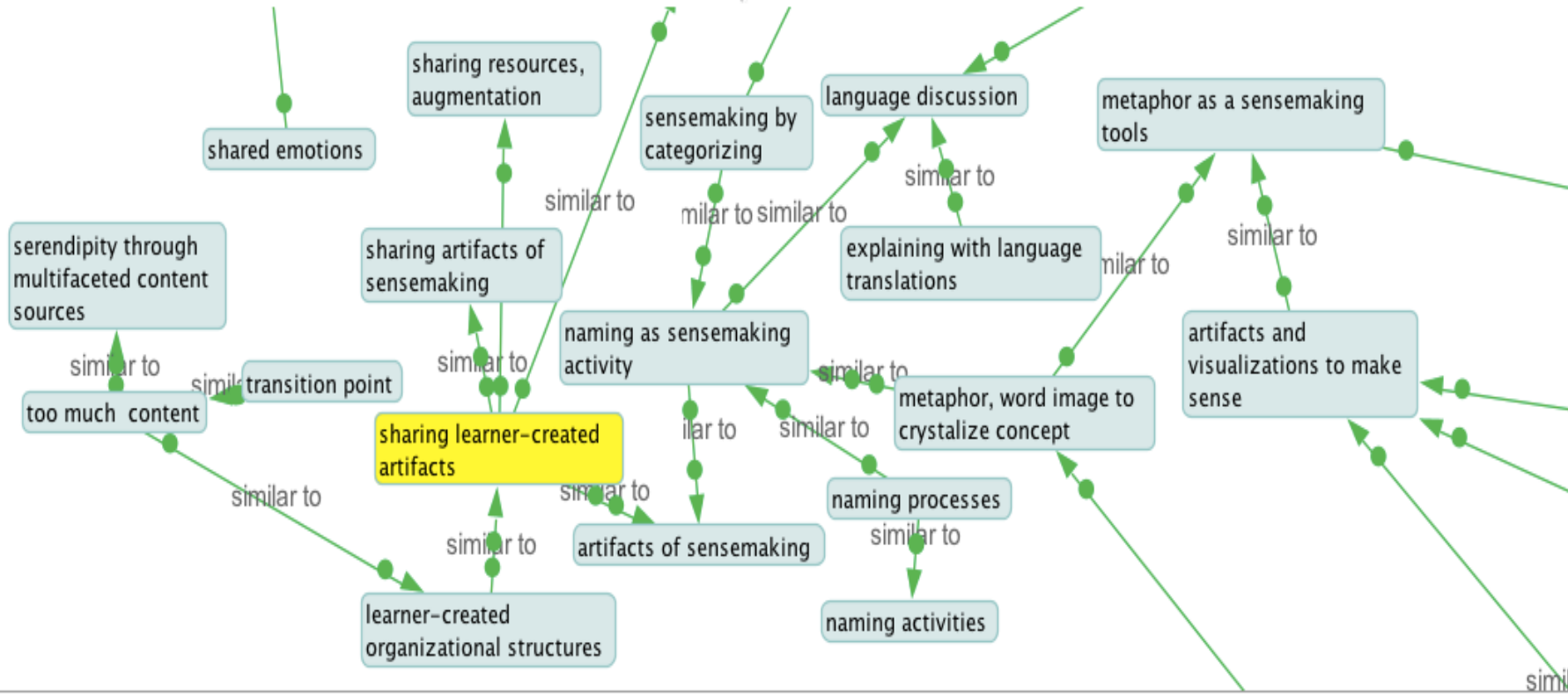
# Axial Coding



Concept Network Social Network

Gravity  -300 Length  0.0 Depth  1

Idea Icons  User Images



## GT Coding

S & W  
Overlap

Requests for assistance  
Disorientation  
Contextualizing  
Connecting  
Meta-course  
Technology as S/W Agent  
Emotive

Sensemaking

Identity  
Language activities  
Creating artefacts  
Collaborating and creating together  
Sharing  
Sensemaking activities

Wayfinding

Creating and sharing new spaces  
Domain exploration  
Navigation giving and receiving

Information

## Sensemaking and Wayfinding Information Model

Identity formation

Contextualizing

Navigation

Social

Sensegiving

Negotiation

Scope of knowledge domain

Technology as S/W agent

Individual

Social Networked

Technological Analytics

Creating spaces and artefacts

# SWIM in Open Online Courses

# SENSEMAKING WAYFINDING INFORMATION MODEL (SWIM)



Creating spaces and artefacts

**INDIVIDUAL**

**SOCIAL, NETWORKED**

**TECHNOLOGICAL  
& ANALYTICS**

# SENSEMAKING WAYFINDING INFORMATION MODEL (SWIM)



**Creating spaces and artefacts**

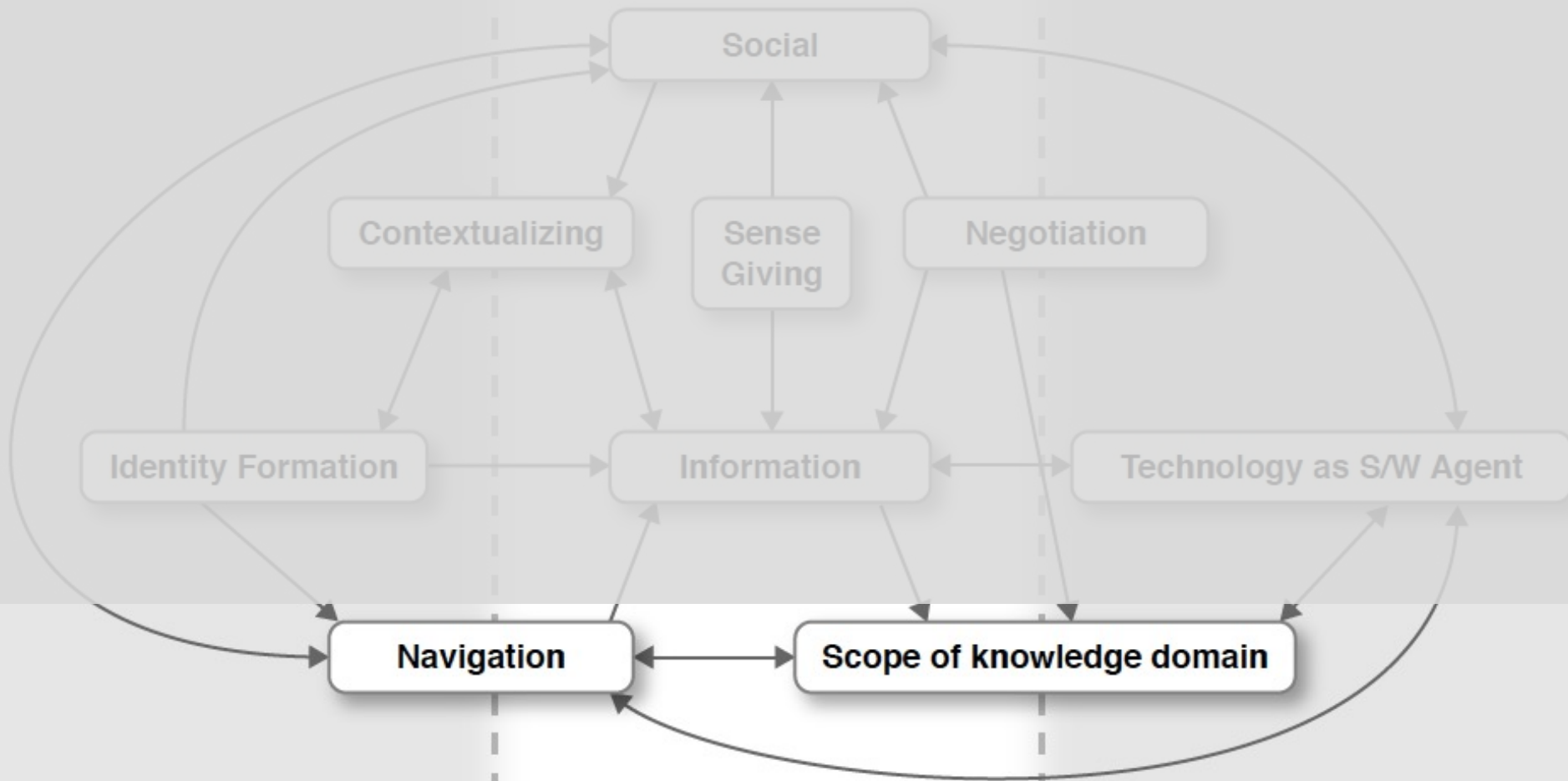
**INDIVIDUAL**

**SOCIAL, NETWORKED**

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# SENSEMAKING WAYFINDING INFORMATION MODEL (SWIM)



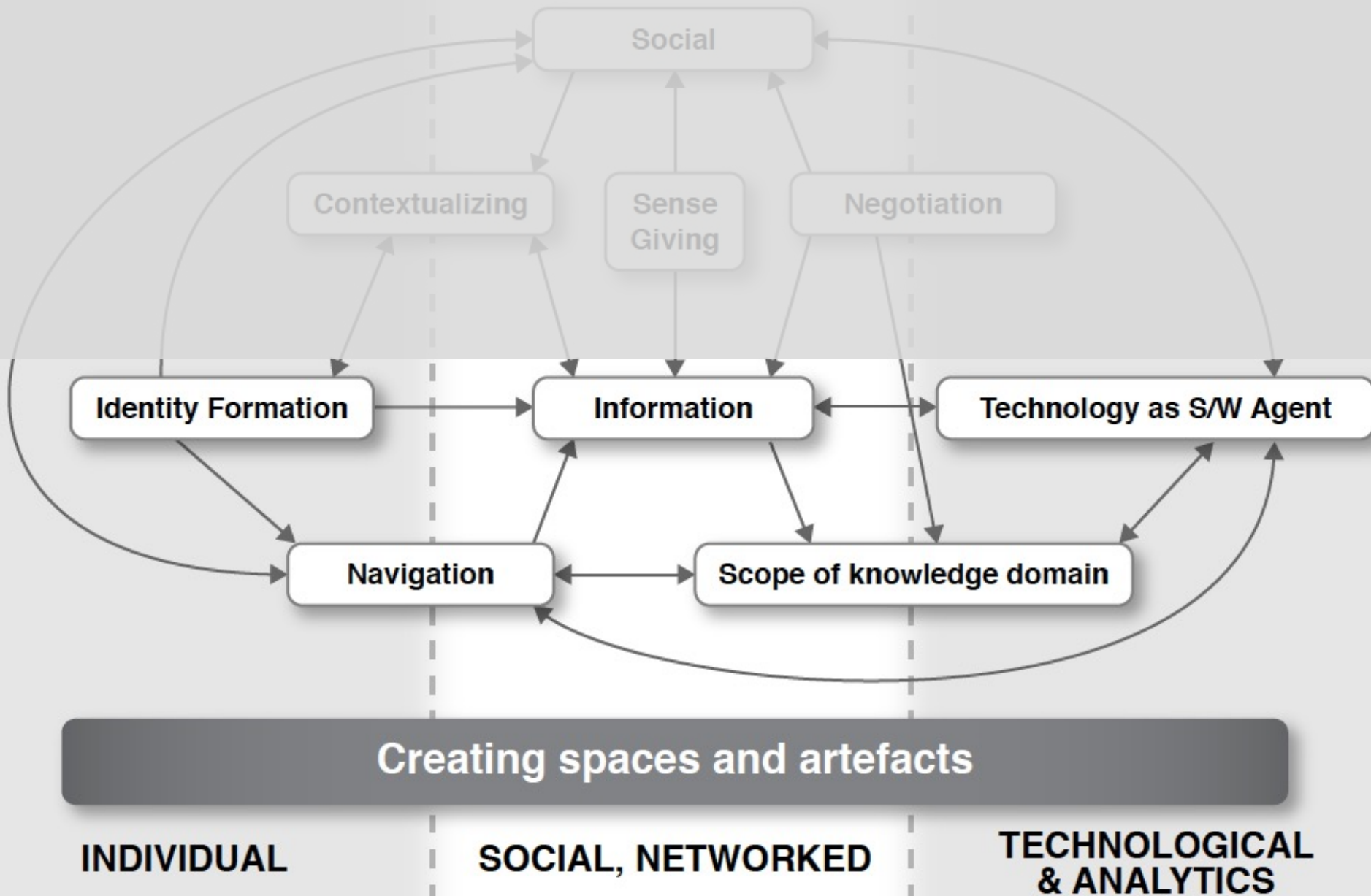
**Creating spaces and artefacts**

**INDIVIDUAL**

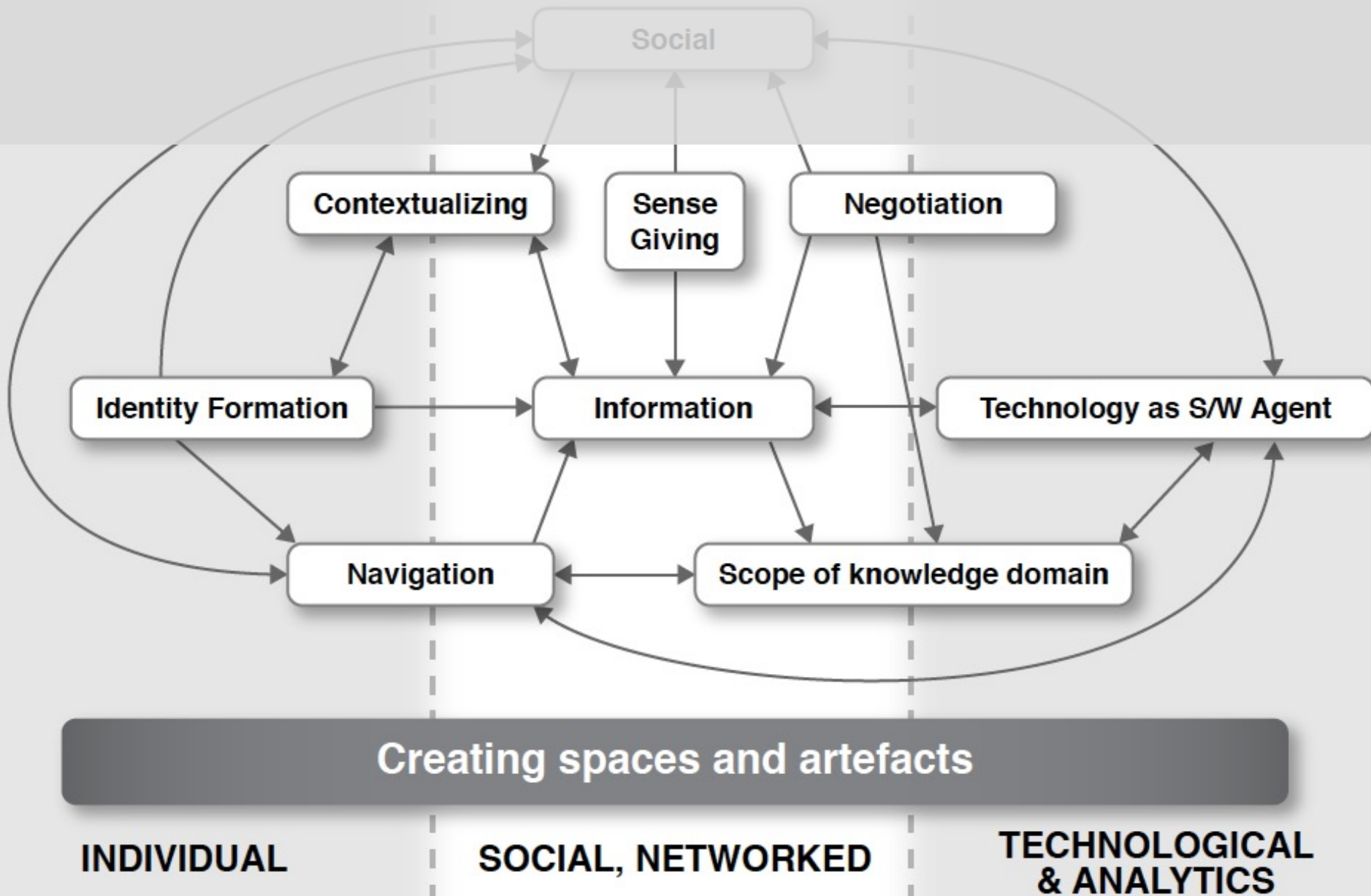
**SOCIAL, NETWORKED**

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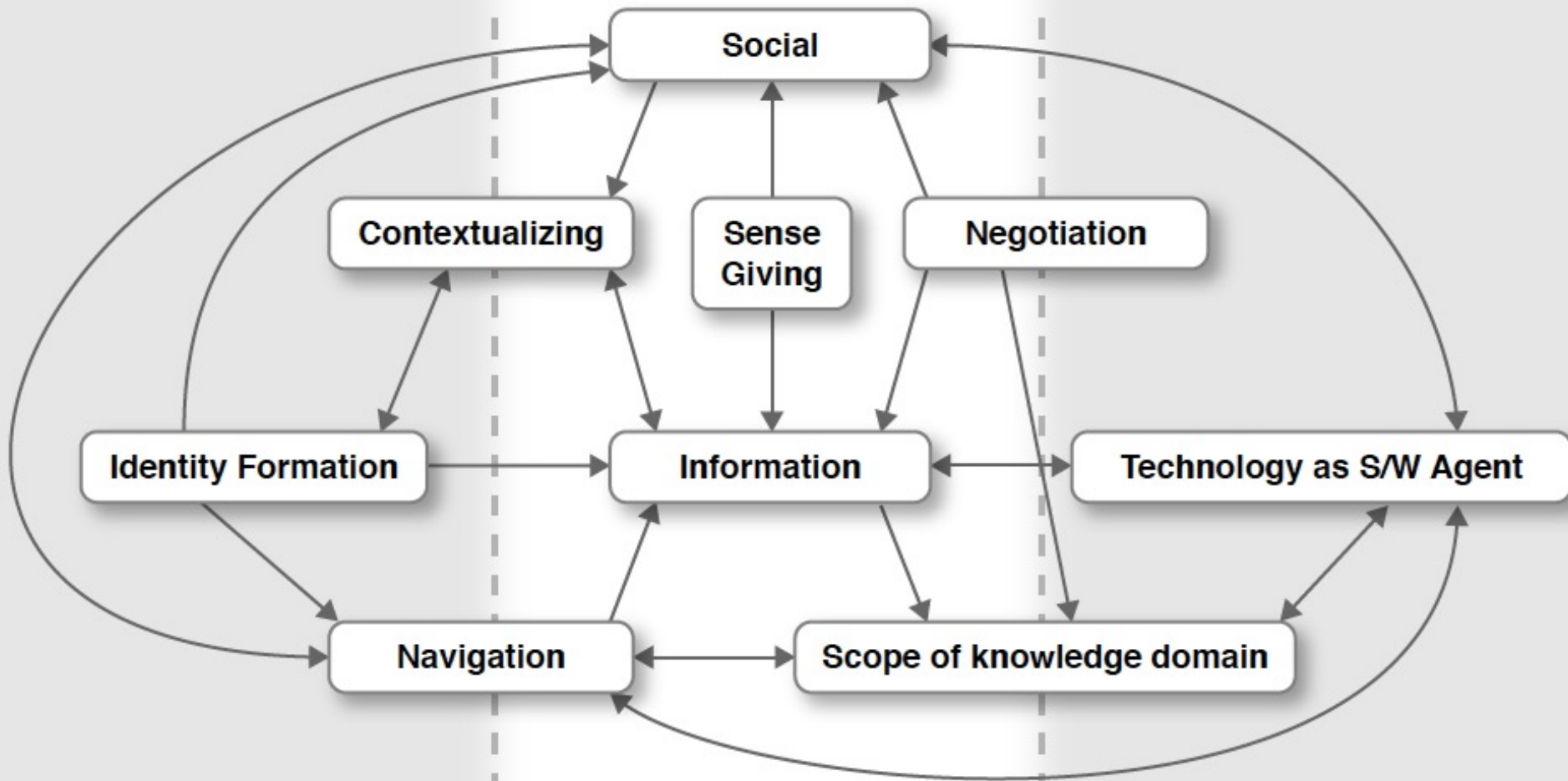
# SENSEMAKING WAYFINDING INFORMATION MODEL (SWIM)



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**Creating spaces and artefacts**

**INDIVIDUAL**

**SOCIAL, NETWORKED**

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# SENSEMAKING WAYFINDING INFORMATION MODEL (SWIM)

Self-organization and sub-networks

Sensegiving through artefact creation and sharing

Sensemaking/giving through language games

Knowledge domain expansion

Wayfinding cues, symbols

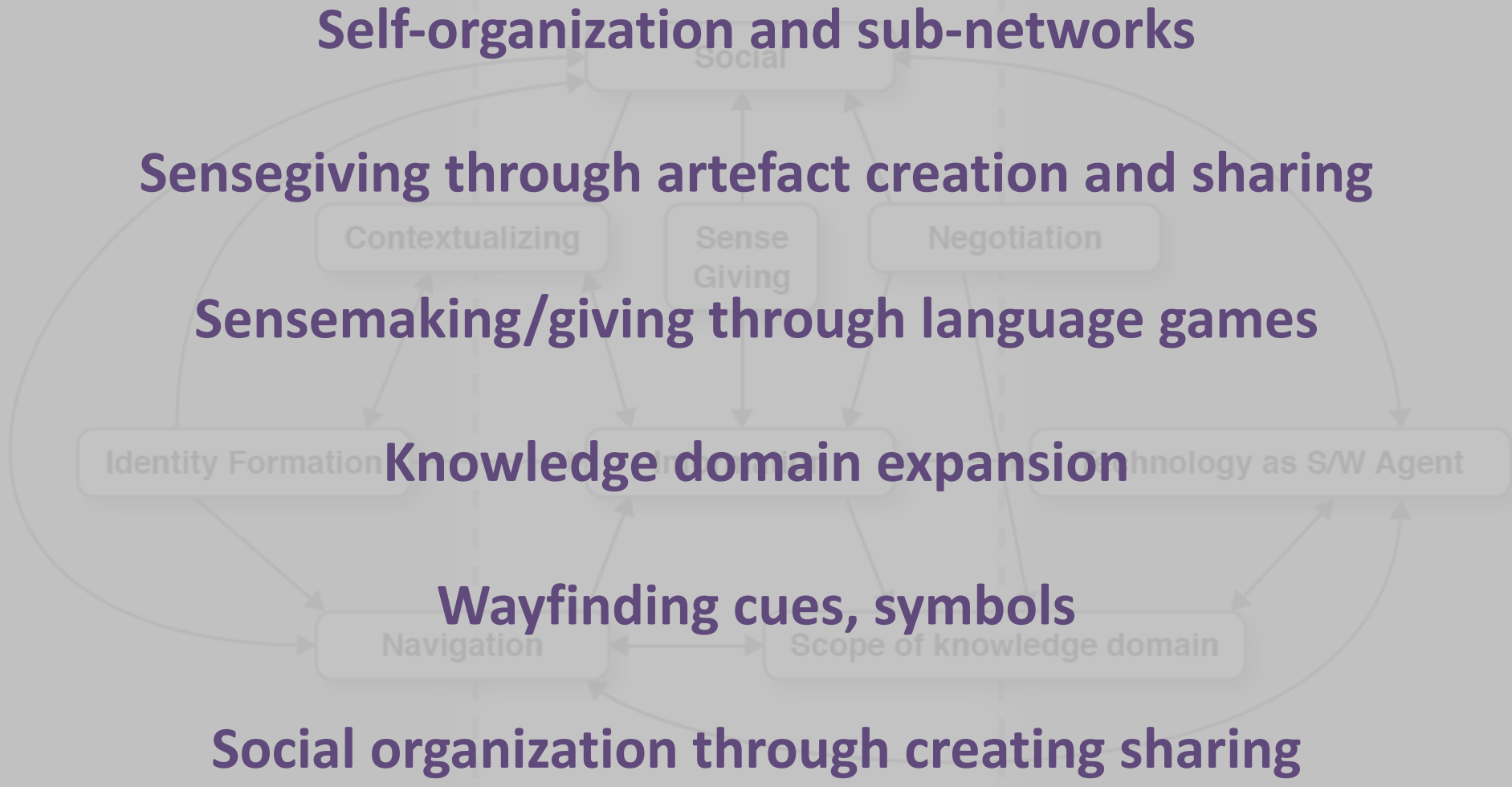
Social organization through creating sharing

Creating spaces and artefacts

INDIVIDUAL

SOCIAL, NETWORKED

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