

Mental Distance

and Its Implications for the Design of Software and Data

Welcome!

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Software and Data Technologies
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July 24, 2010

Mental Distance

and Its Implications for the Design of Software and Data

Important Note

- Case study is: www.dooce.com.
- It is an excellent social network.
- One of the best for showing the traditional perspective of design.
- The author wishes www.dooce.com much continued success!

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Mental distance is a measure of the conceptual similarity between the underlying intention of:

- 1) a social network conversation
- 2) an online ad.

Long distance = poor ad alignment.

Short distance = good ad alignment.

Chen, 2002
Lewis, 2003

Given this definition of mental distance...
the language-action perspective can give business:

- 1) access to small, dynamic niche markets occurring in social networks,
- 2) a way to create highly aligned online ads for those markets.

Mental Distance

and Its Implications for the Design of Software and Data

Part 1 – Prolog

- Social Networks

Mental Distance

and Its Implications for the Design of Software and Data

Part 1 – Prolog

Part 2 – Traditional Perspective

- Populations
- Connections
- Conversations
- Long Distance

Mental Distance

and Its Implications for the Design of Software and Data

Part 1 – Prolog

Part 2 – Traditional Perspective

Part 3 – Alternate Perspective

- Inference
- Intention
- Clusters
- Short Distance

Mental Distance

and Its Implications for the Design of Software and Data

Part 1 – Prolog

Part 2 – Traditional Perspective

Part 3 – Alternate Perspective

Part 4 – Software Implications

- Architecture
- Ontology
- History
- Agents

Mental Distance

and Its Implications for the Design of Software and Data

Part 1 – Prolog

Part 2 – Traditional Perspective

Part 3 – Alternate Perspective

Part 4 – Software Implications

Part 5 – Epilog

- Semantic Web Fit

Mental Distance

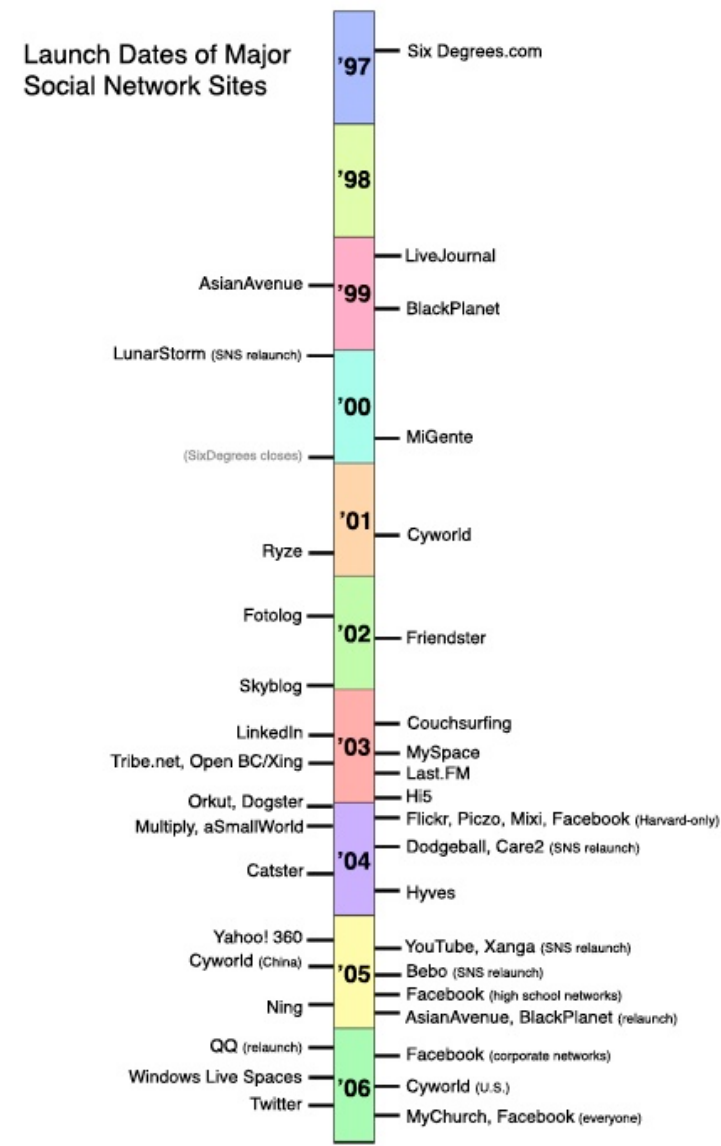
and Its Implications for the Design of Software and Data

Part 1 – Prolog

- Social Networks

1. Social Networks

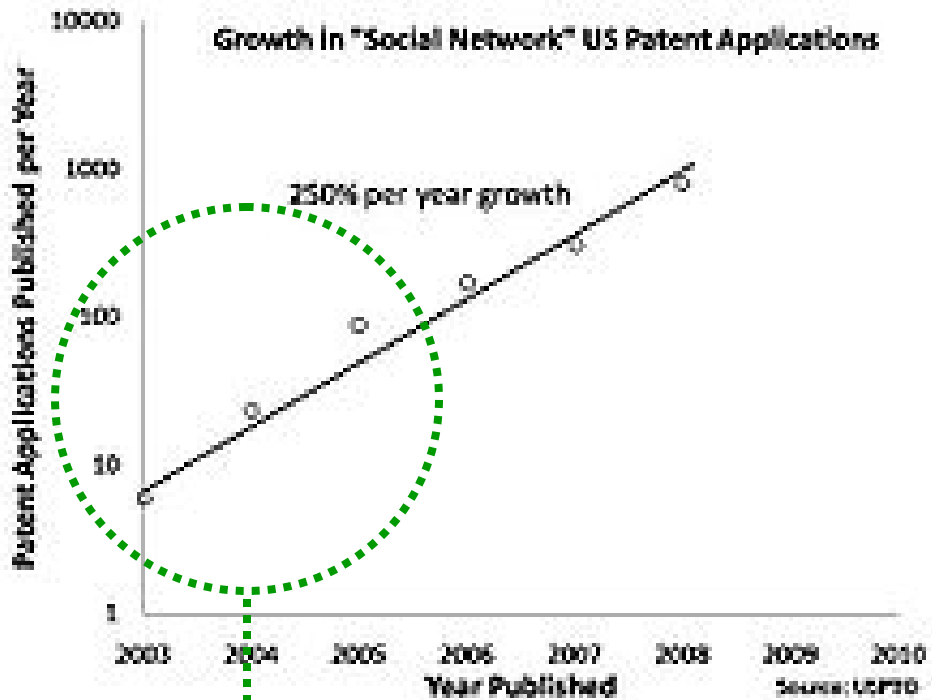
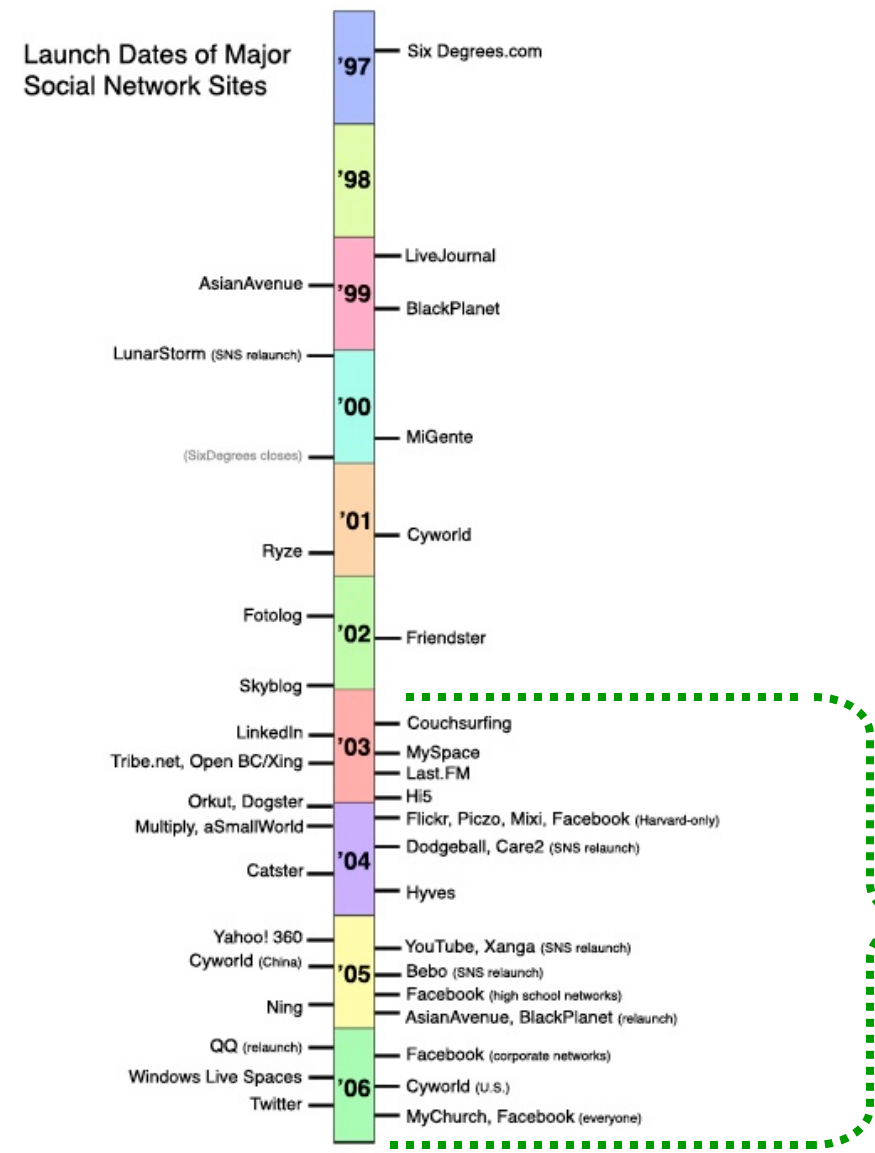
Some Early Social Network Sites



Kasavanna, 2009

1. Social Networks

Exponential Growth 2003 to 2008



Cha, 2009

Mental Distance

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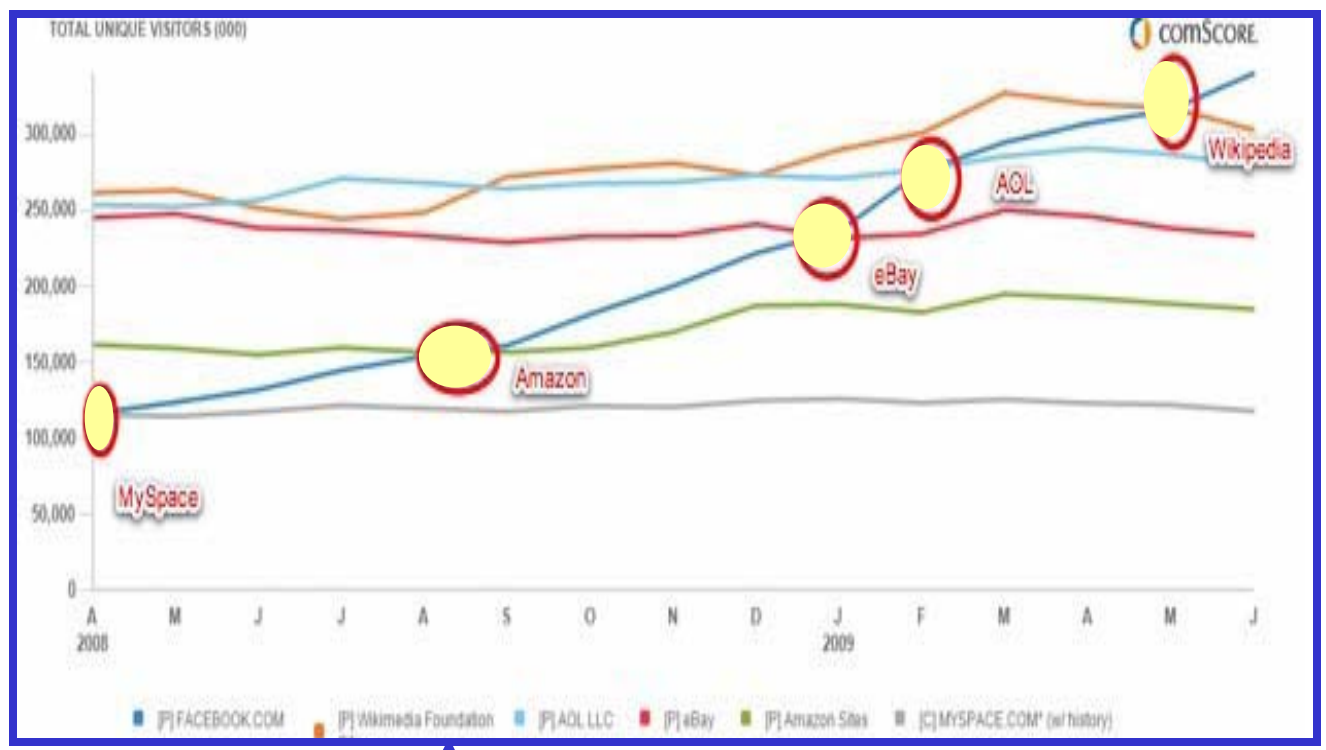
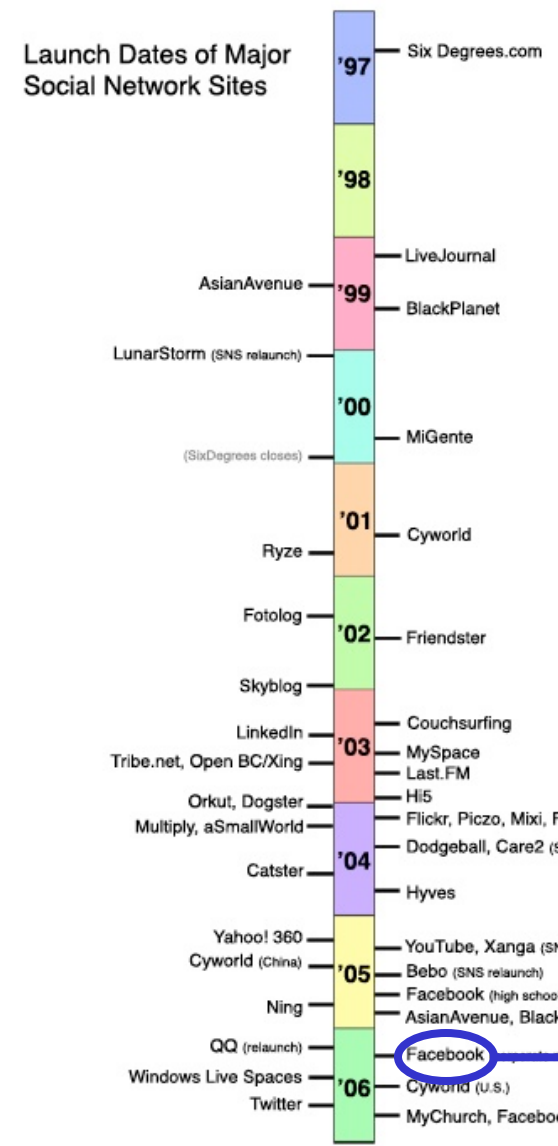
Part 1 – Prolog

Part 2 – Traditional Perspective

- Populations
- Connections
- Conversations
- Long Distance

2. Populations

Facebook = 4th Largest Population in the World



Scale, 2008

2. Populations

Case Study: www.dooce.com ... affluent U.S. Mothers

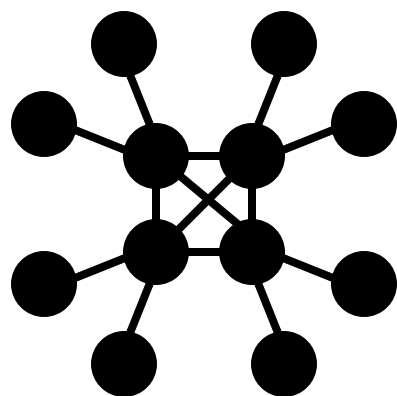
A monolog on work-life balance.



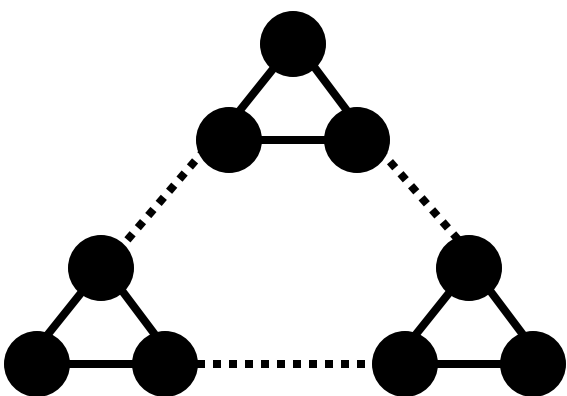
January 4, 2010

3. Connections

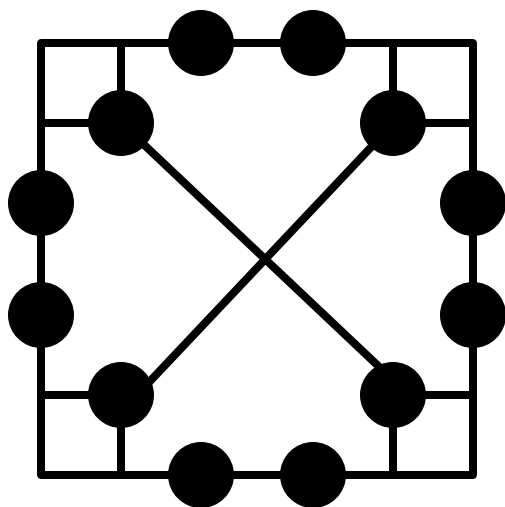
Typical Structures, Complex, Hard to Analyze



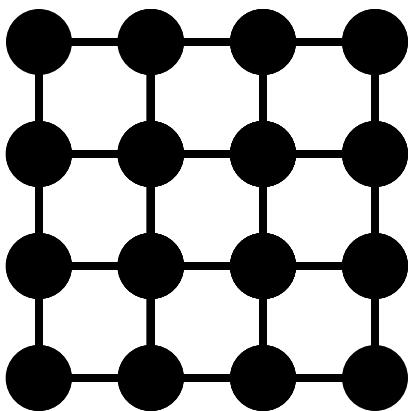
Core – Periphery



Cliques



Watts-Strogatz (friends)

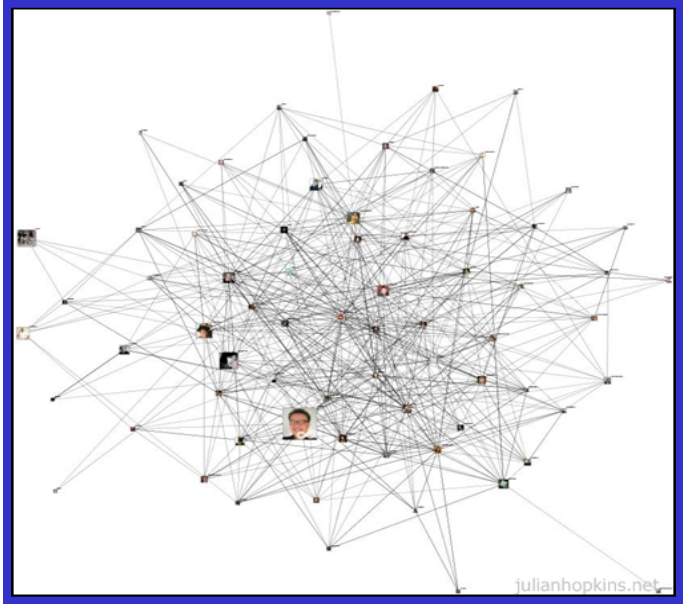


Scale Free

Freeman, 2000

3. Connections

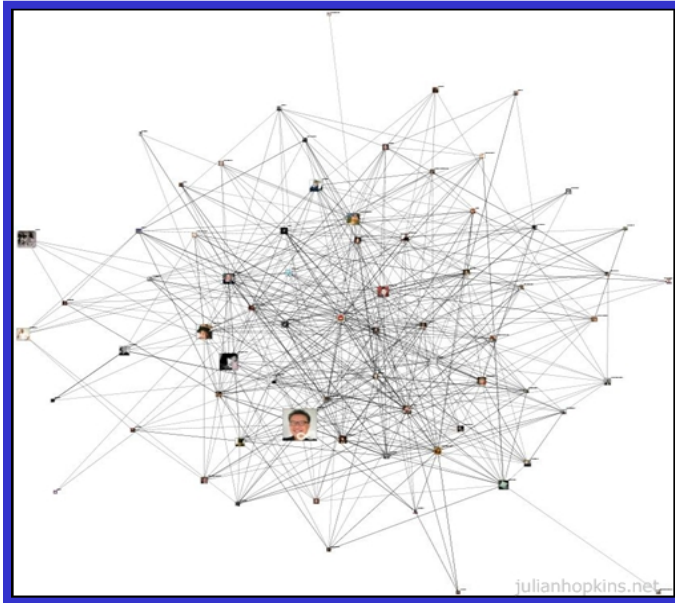
Example: Twitter “Followers” Network



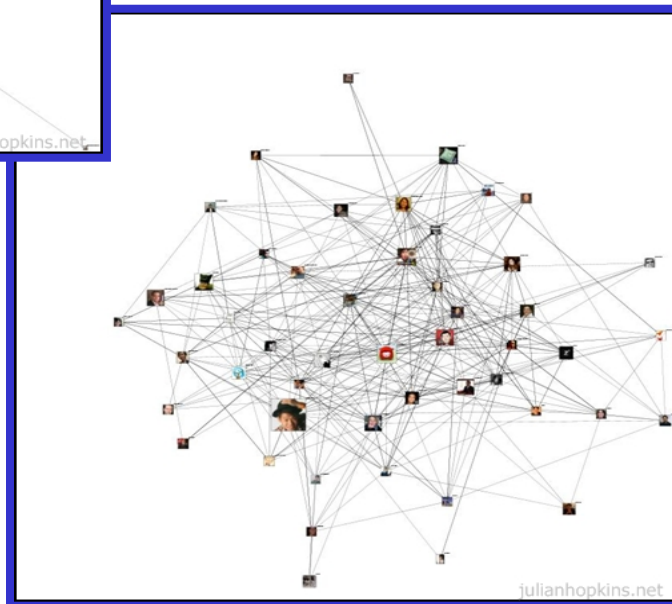
A Twitter “Followers” Relationship Network

3. Connections

Example: Twitter “Following” Network



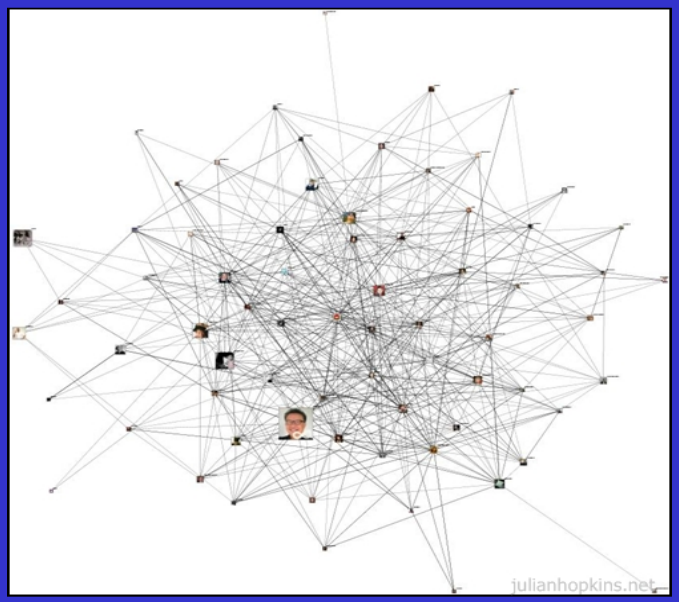
A Twitter “Followers” Relationship Network



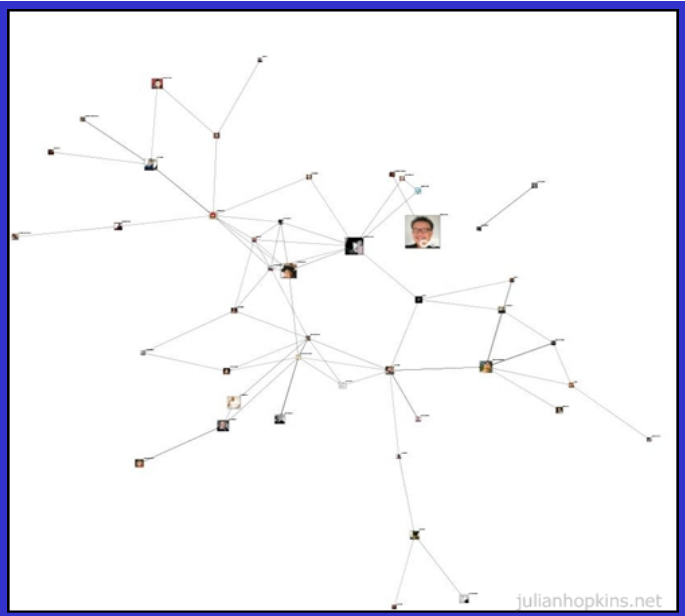
A Twitter “Following” Relationship Network

4. Conversations

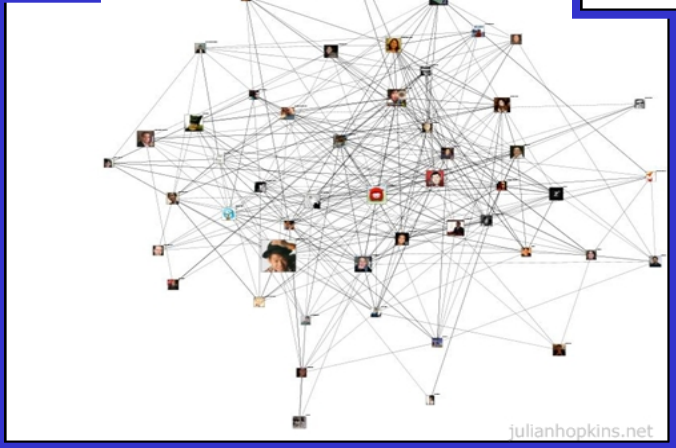
Example: Twitter “Conversation” Network



A Twitter “Followers” Relationship Network



A Twitter Conversation Network



A Twitter “Following” Relationship Network

4. Conversations

Case Study: Diverse Family Life Conversations



An early morning lecture in semantics

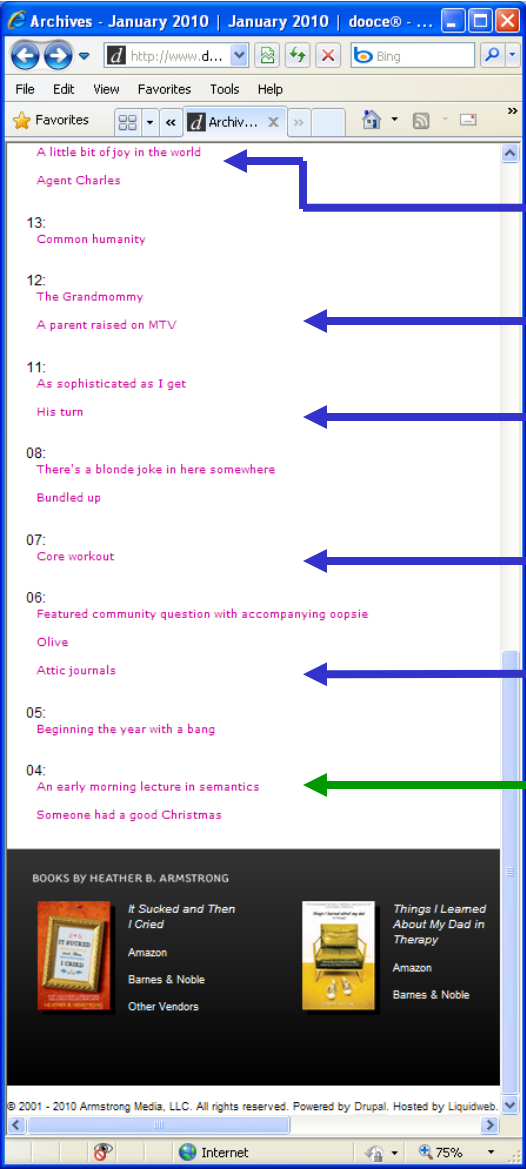
“Can I have my treat after I finish my Cocoa Puffs?”

“I think we need to have a long talk about what you define as a treat.”

January 4, 2010

4. Conversations

Hard to Classify: Many, Varied Conversations



Baby

Music

Fatherhood

Exercise

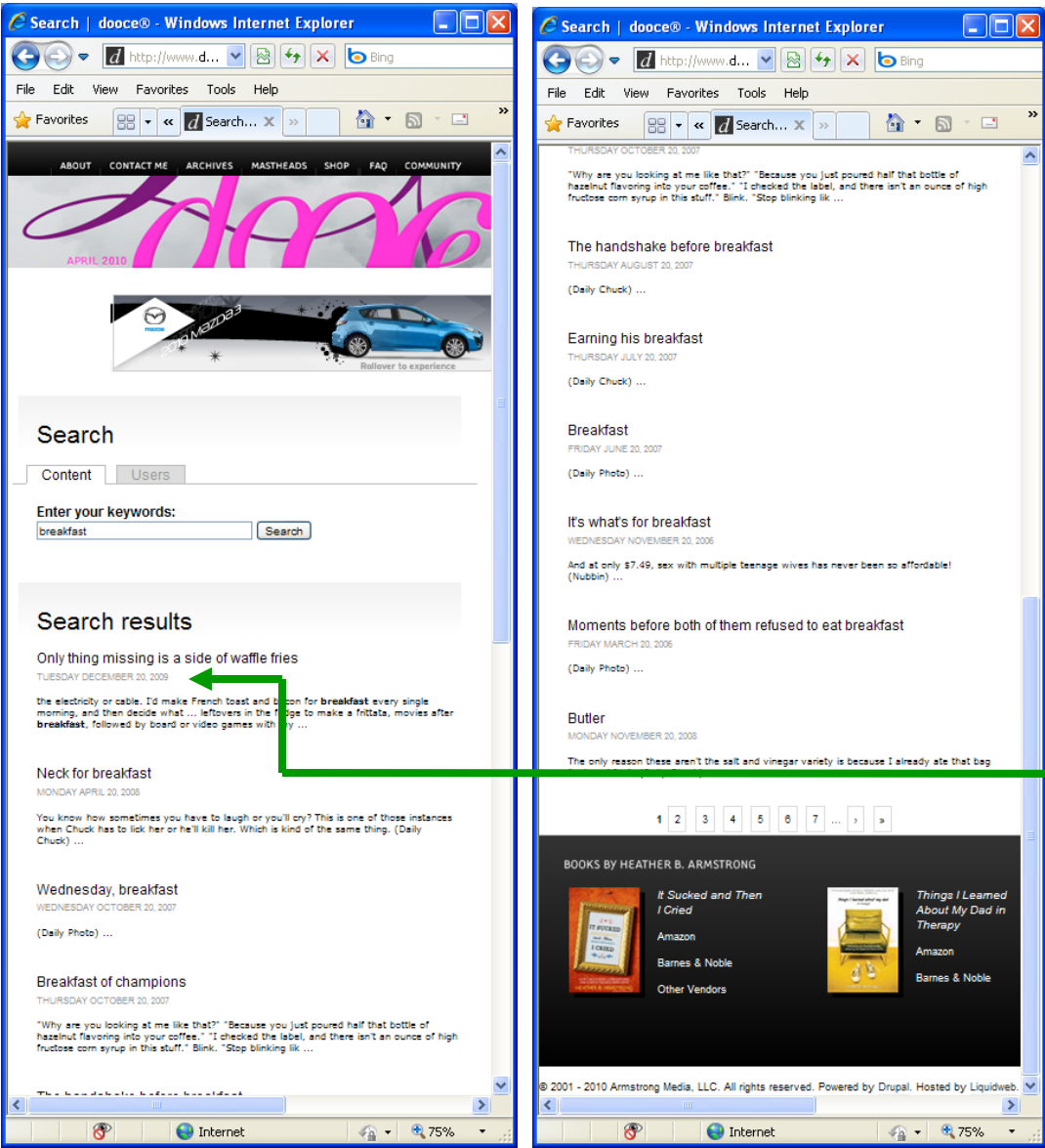
Journals

Breakfast

January 4, 2010

4. Conversations

Simple Search Organization? ... May Not Work



Breakfast
is missing
(word not
in title)

January 4, 2010

5. Long Distance

Generalize → Profile → Poor Ad Alignment ...

MARKETING STRATEGIES

Mass Marketing

Direct Marketing

MARKETING ATTRIBUTES			
Product	Target	Pricing	Techniques
Simple	All consumers	One nation, one price	Mass media
Stratified	Segments	One price	Targeted communications, e.g., mail and phone

Case Study: Ads Match Profile, Not Conversation

Books



5. Long Distance

Generalize → Segment → Poor Ad Alignment ...

MARKETING STRATEGIES	MARKETING ATTRIBUTES			
	Product	Target	Pricing	Techniques
Mass Marketing	Simple	All consumers	One nation, one price	Mass media
Direct Marketing	Stratified	Segments	One price	Targeted communications, e.g., mail and phone
Micromarketing	Complex	Micro-segments	Variable pricing	Segment profiles

5. Long Distance

Case Study: Ads Not Aligned to Breakfast

face hidden to protect privacy

Hair Spray


Movie

Books

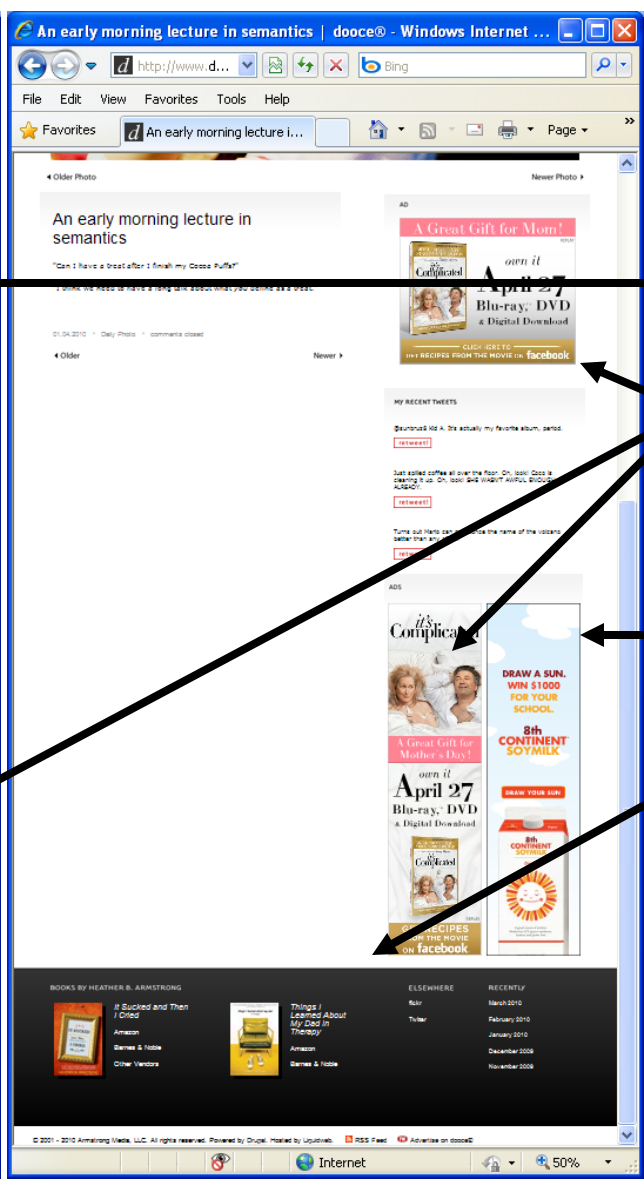
January 4, 2010

5. Long Distance

Case Study: One Breakfast Ad ... Poor Alignment



face hidden to protect privacy



face hidden to protect privacy

Hair Spray

Movie

Milk

Books

January 4, 2010

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Part 1 – Prolog

Part 2 – Traditional Perspective

Part 3 – Alternate Perspective

- Inference
- Intention
- Clusters
- Short Distance

6. Inference

Case Study: Here is a conversation...



An early morning lecture in semantics

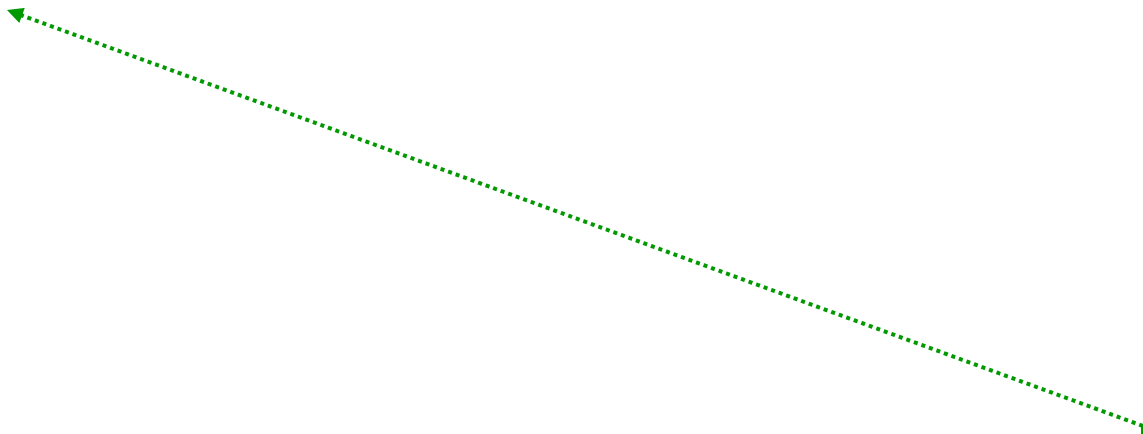
“Can I have my treat after I finish my Cocoa Puffs?”

“I think we need to have a long talk about what you define as a treat.”

January 4, 2010

6. Inference

Natural Language → Inference Engine → Concepts



“Can I have my **treat**

after I finish my
Cocoa Puffs?”

“I think we need to
have a long talk
about what you
define as a treat.”

Horvitz, 1999

6. Inference

Product Knowledge → Inference Engine → Things

wants
treat

had
cereal

“Can I have my treat
after I finish my
Cocoa Puffs?”

“I think we need to
have a long talk
about what you
define as a treat.”

Ghani, 2002

6. Inference

Word Associations → Inference Engine → Meaning

wants
treat

serious
talk

“Can I have my treat
after I finish my
Cocoa Puffs?”

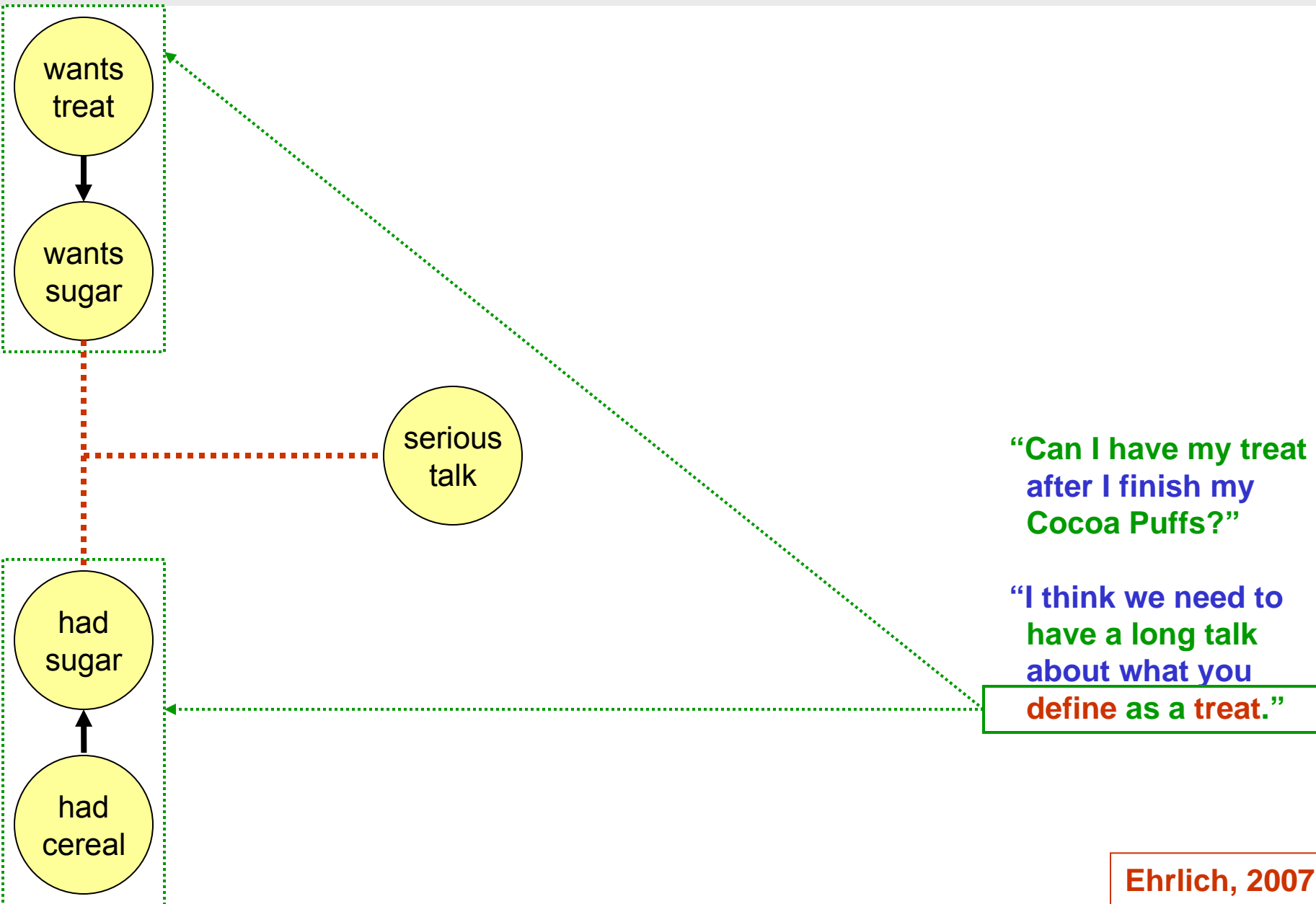
“I think we need to
have a long talk
about what you
define as a treat.”

had
cereal

Andrews, 2005

6. Inference

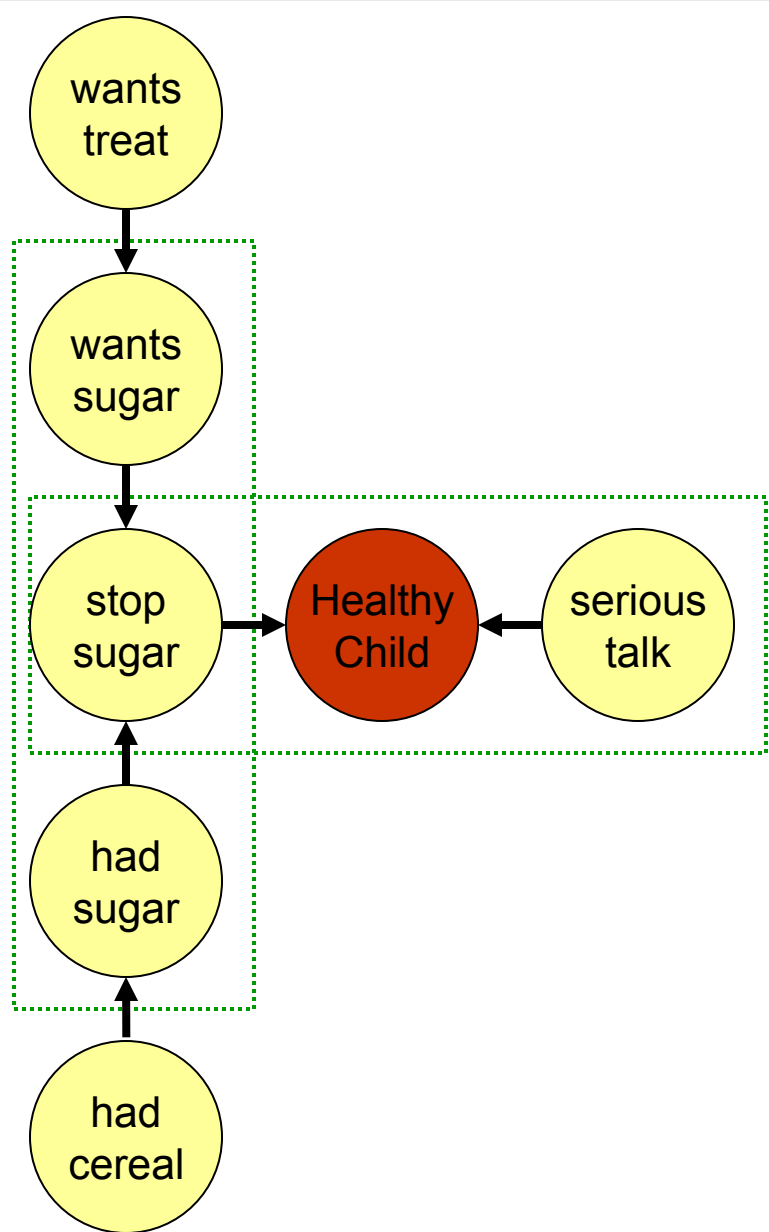
Social Context → Inference Engine → Meaning



Ehrlich, 2007

6. Inference

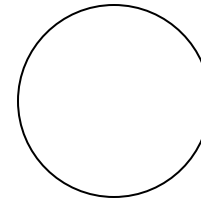
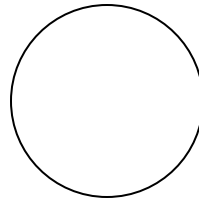
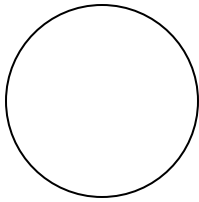
Intention Ontology → Inference Engine → Intent



“Can I have my treat
after I finish my
Cocoa Puffs?”

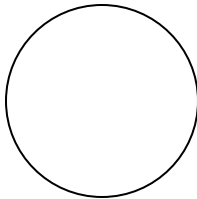
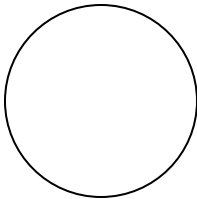
“I think we need to
have a long talk
about what you
define as a treat.”

Banks, 2002



Heidegger, 1962

Being



Self

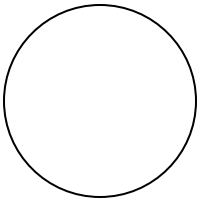
Backstrom, 2006

7. Intention

Intention for Acting, Goal-oriented: do what you say

Being

Acting



Self

Others

Sabatar, 2002

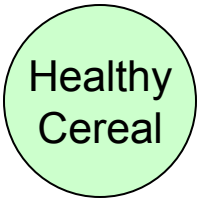
7. Intention

Intention for Having, Possession-oriented: get results

Being

Acting

Having

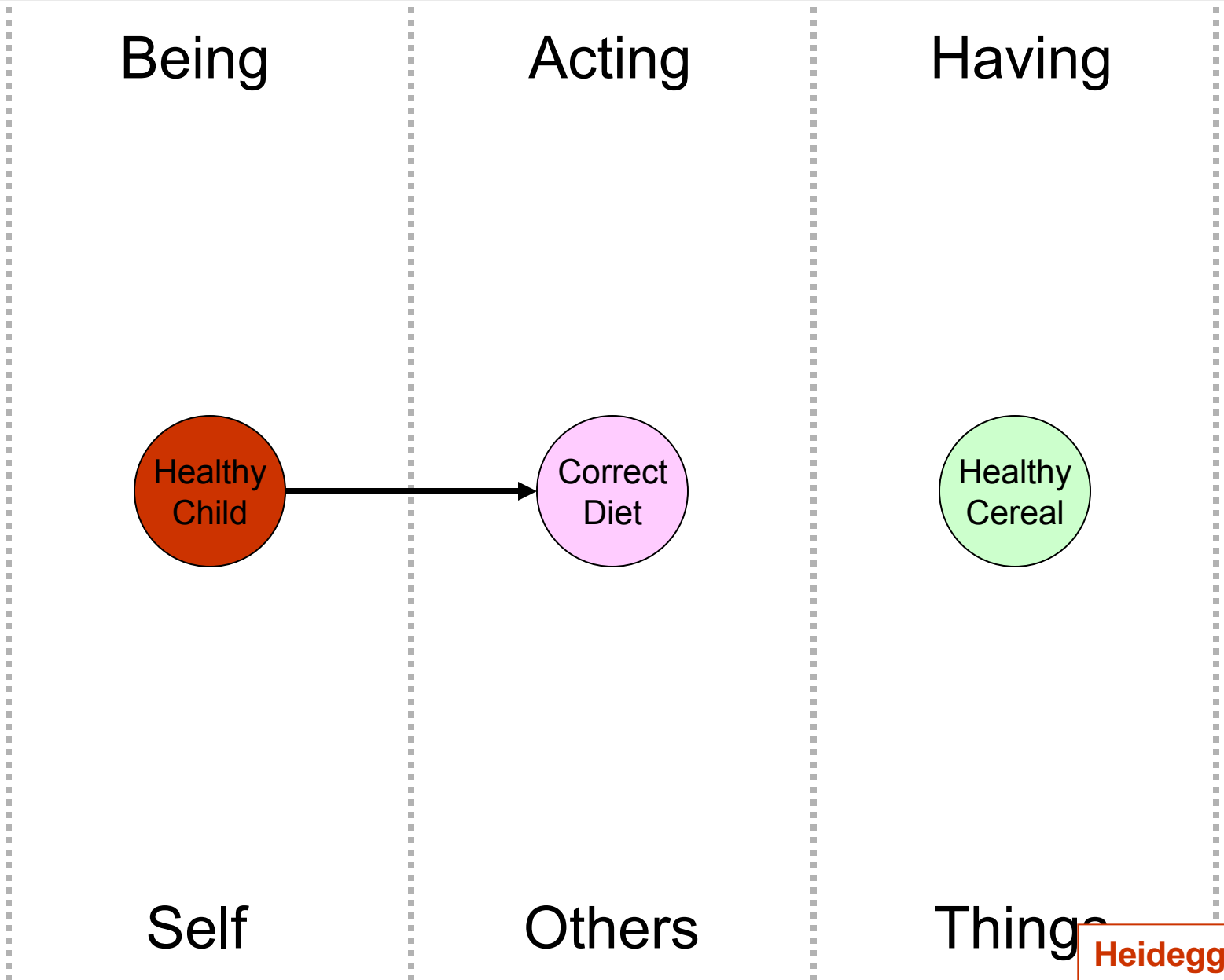


Self

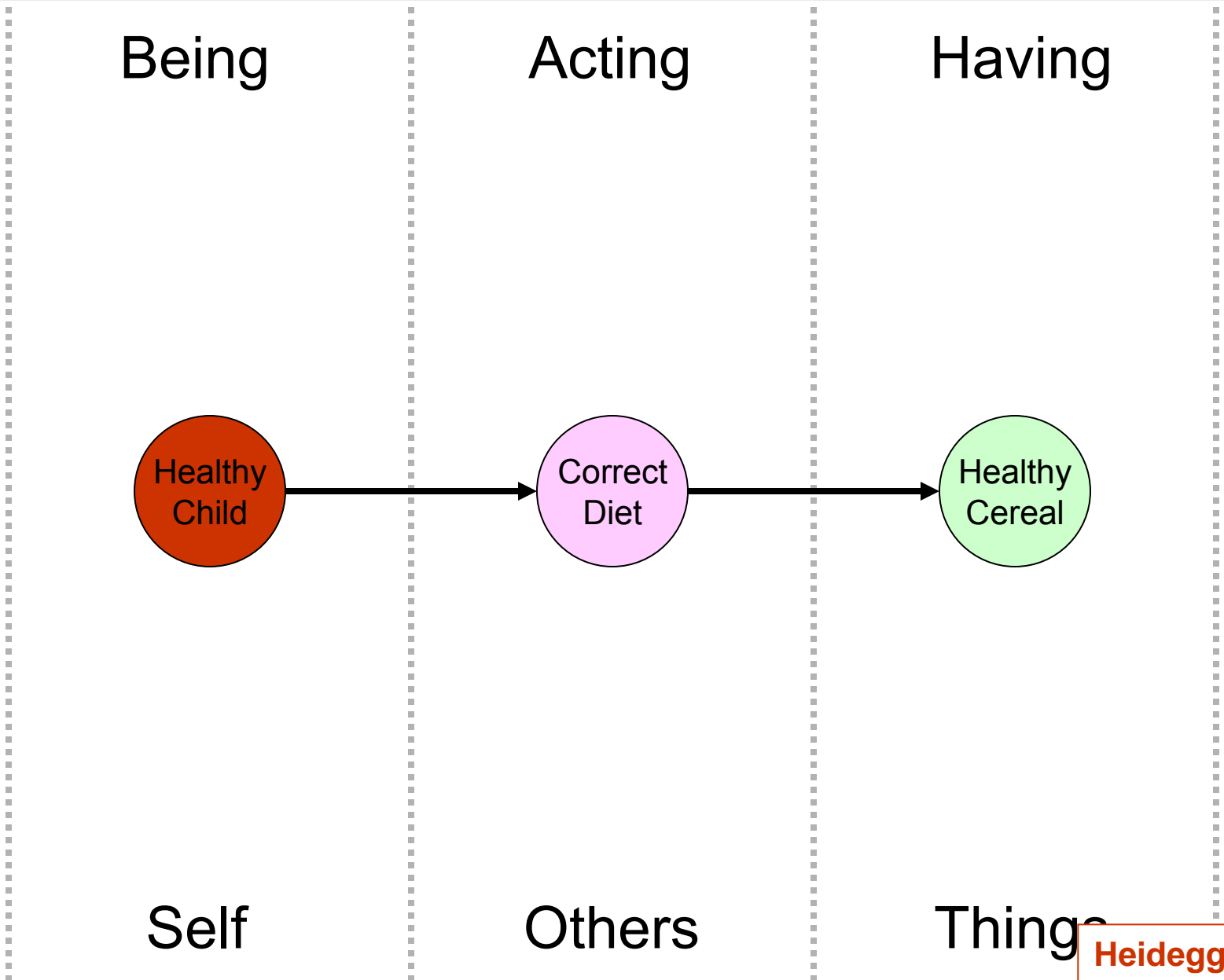
Others

Things

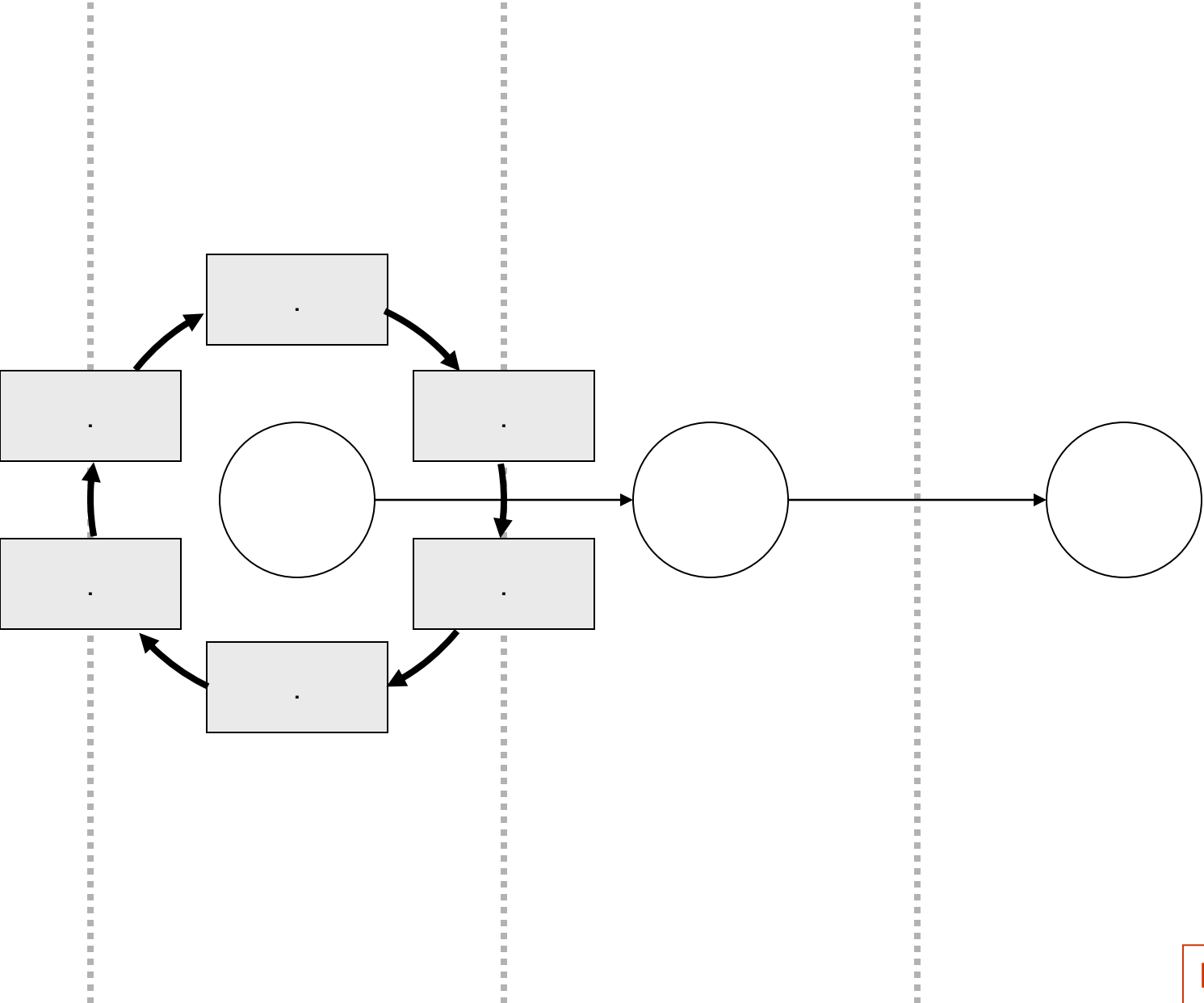
Recker, 2005

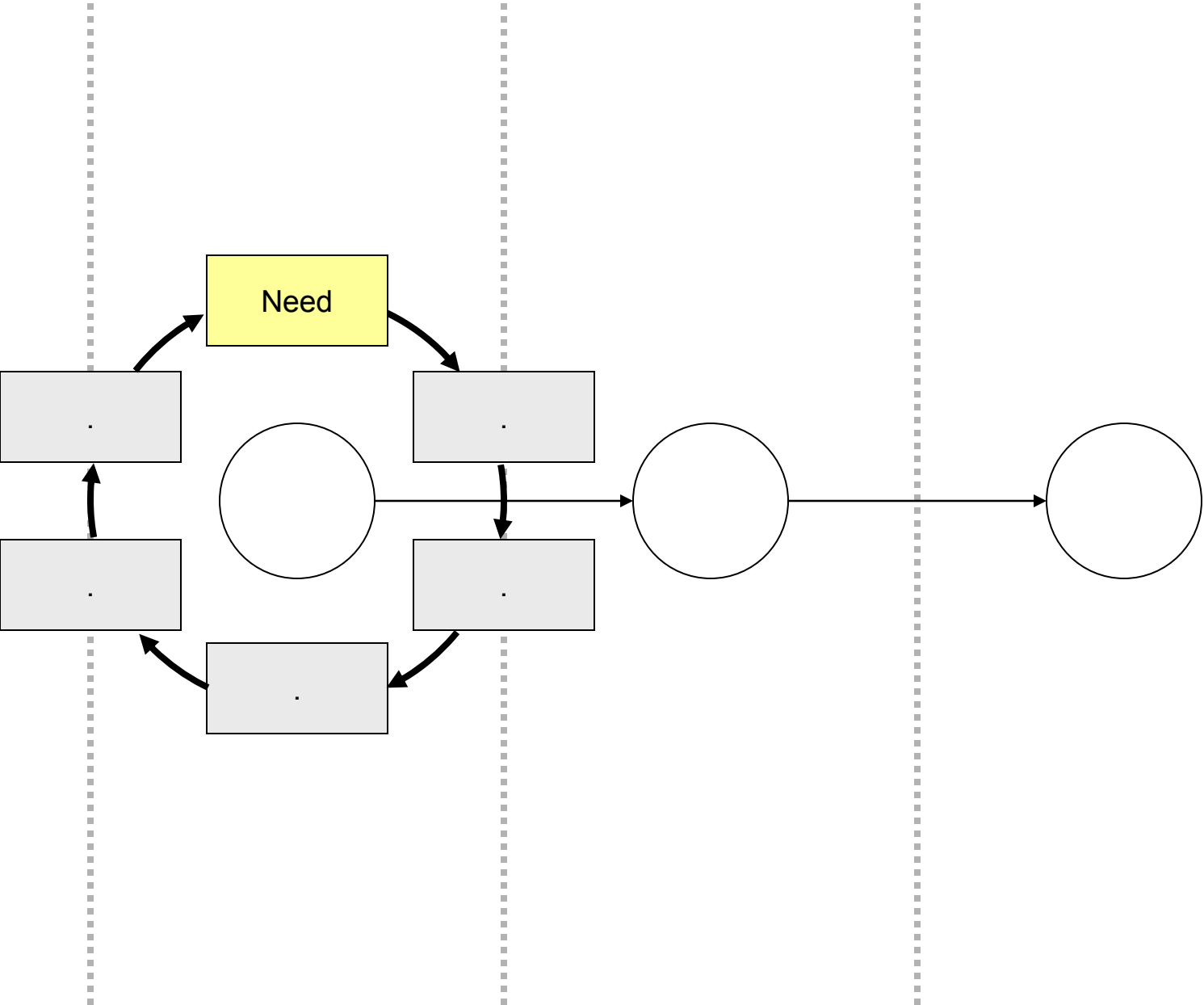


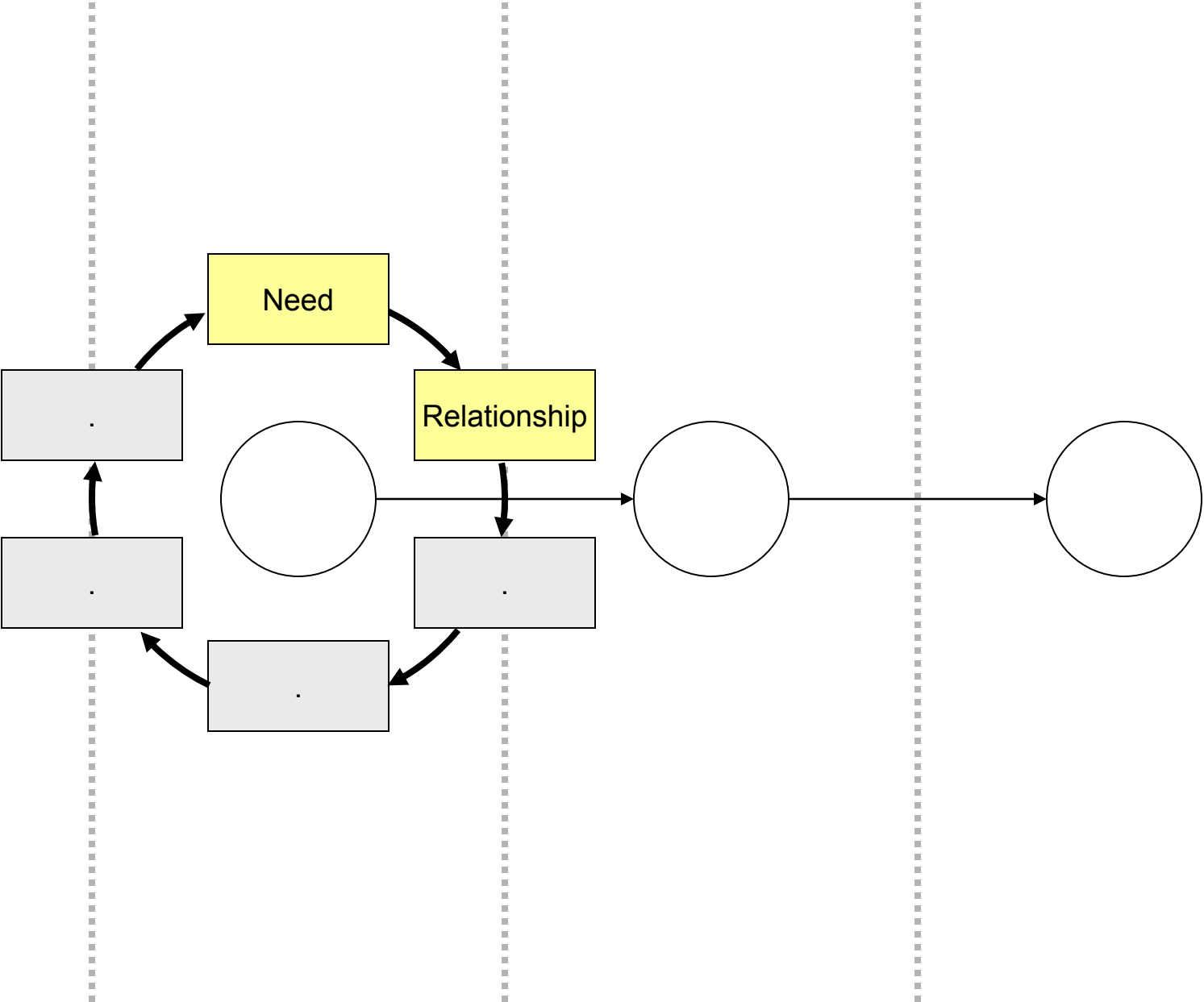
Heidegger, 1962

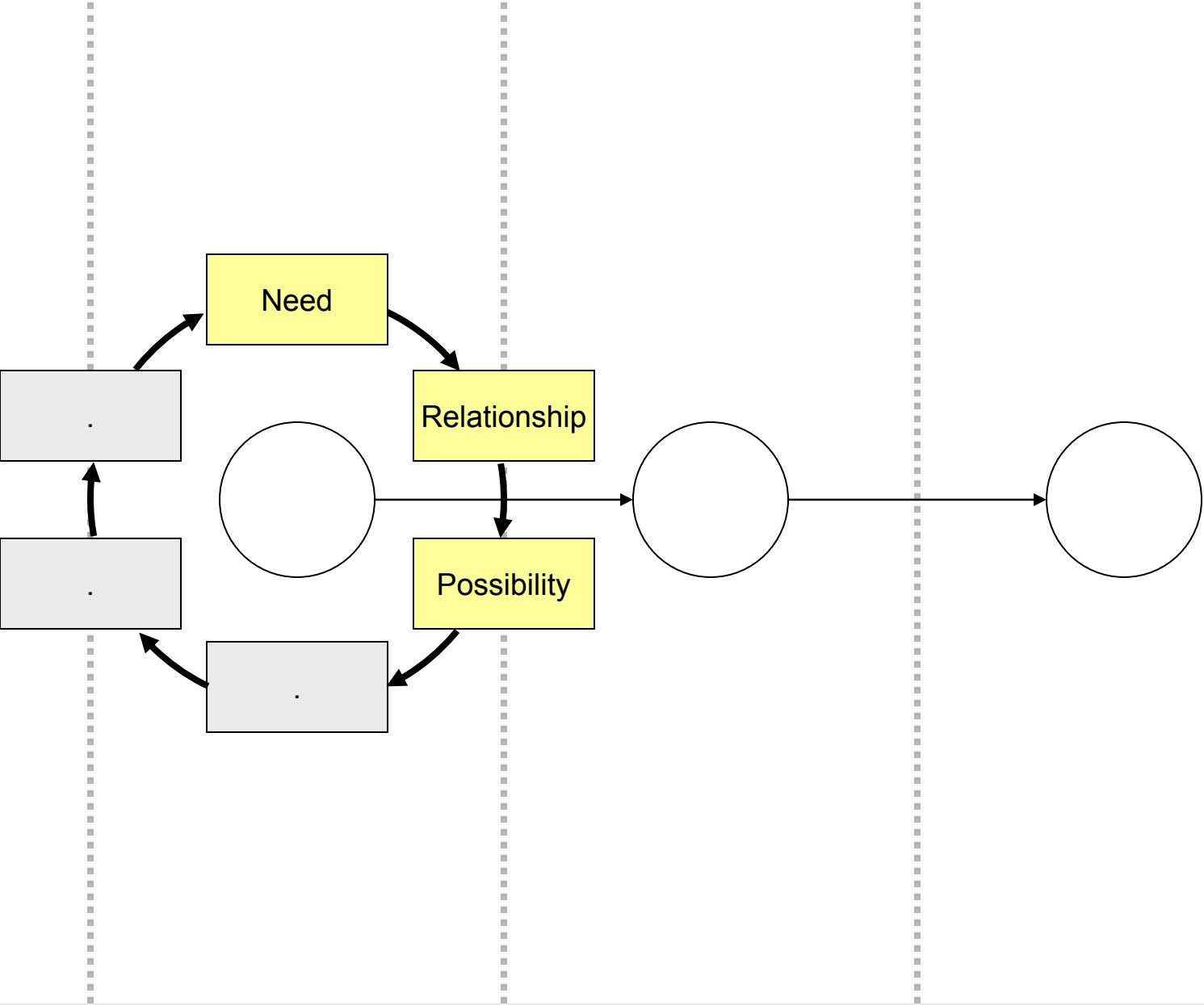


Heidegger, 1962

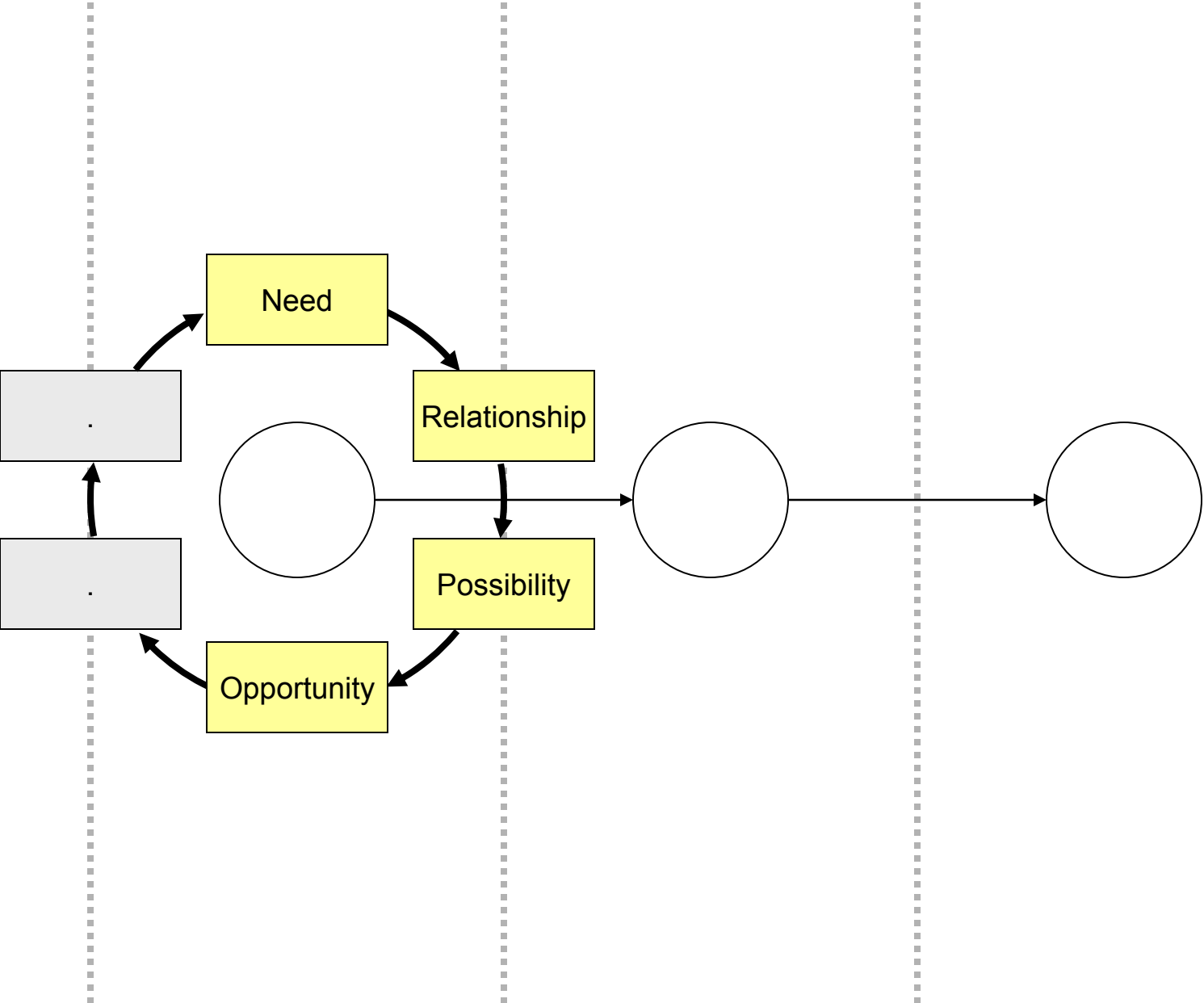




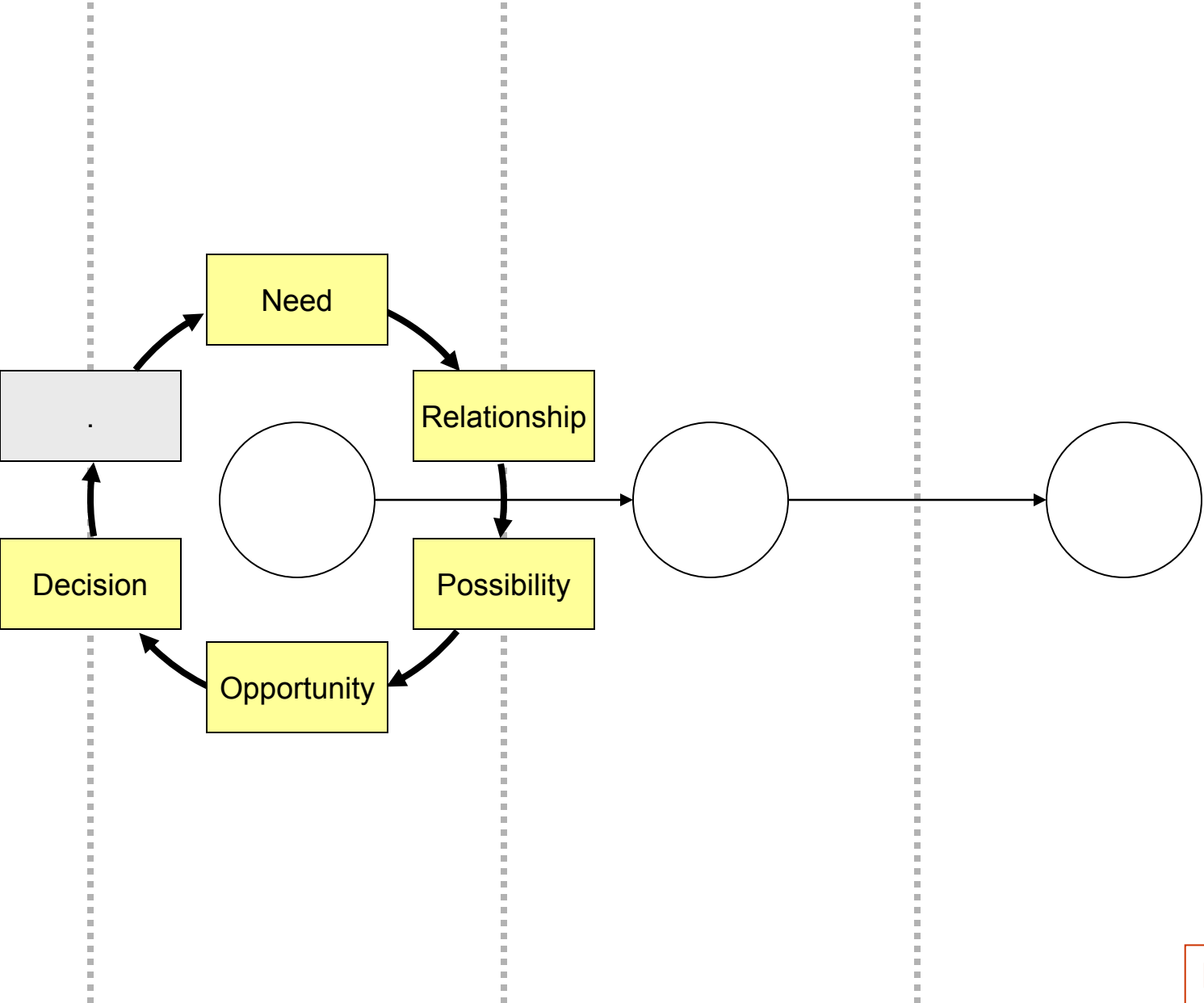




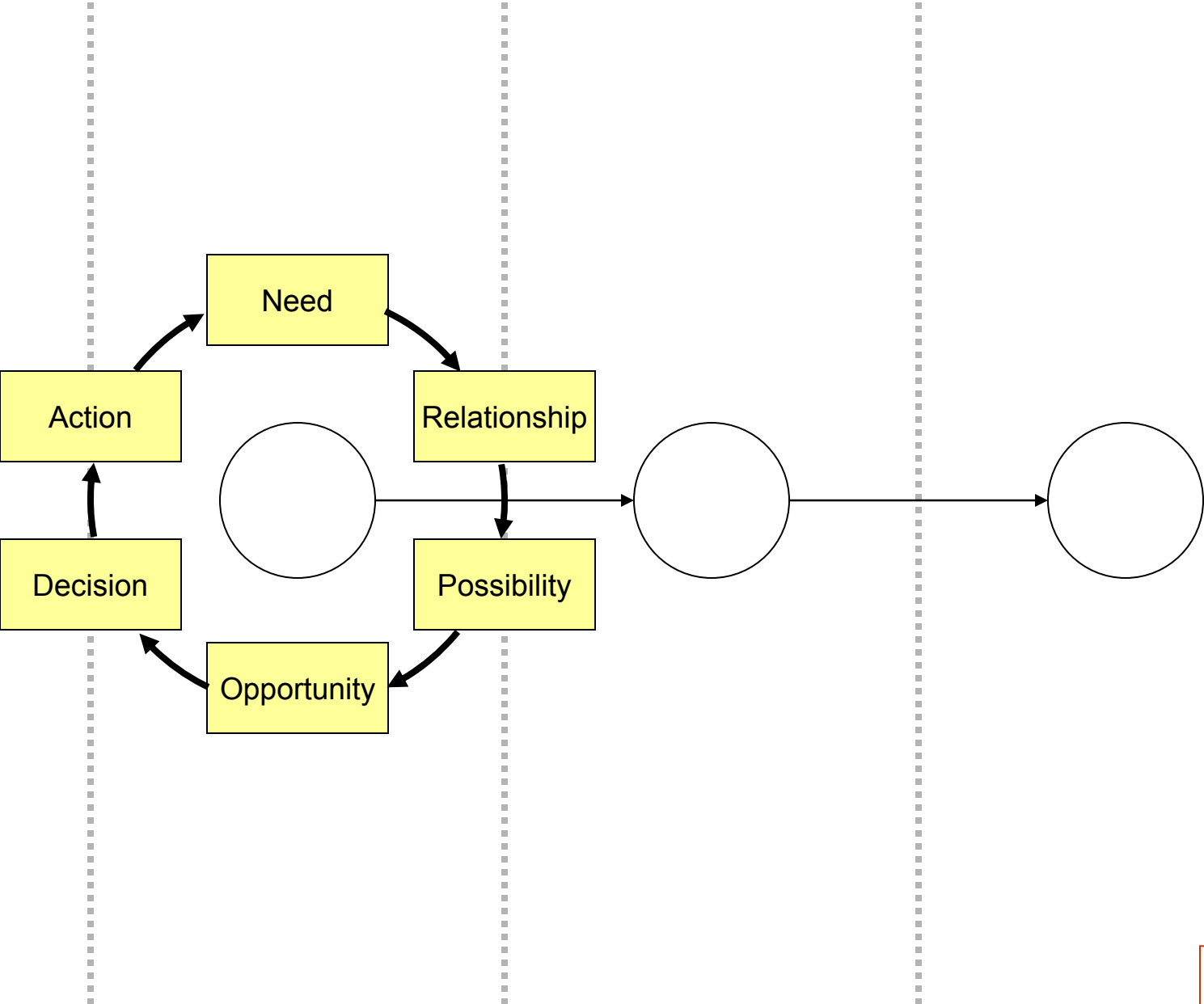
Denning, 2003



Denning, 2003



Dougherty, 1992

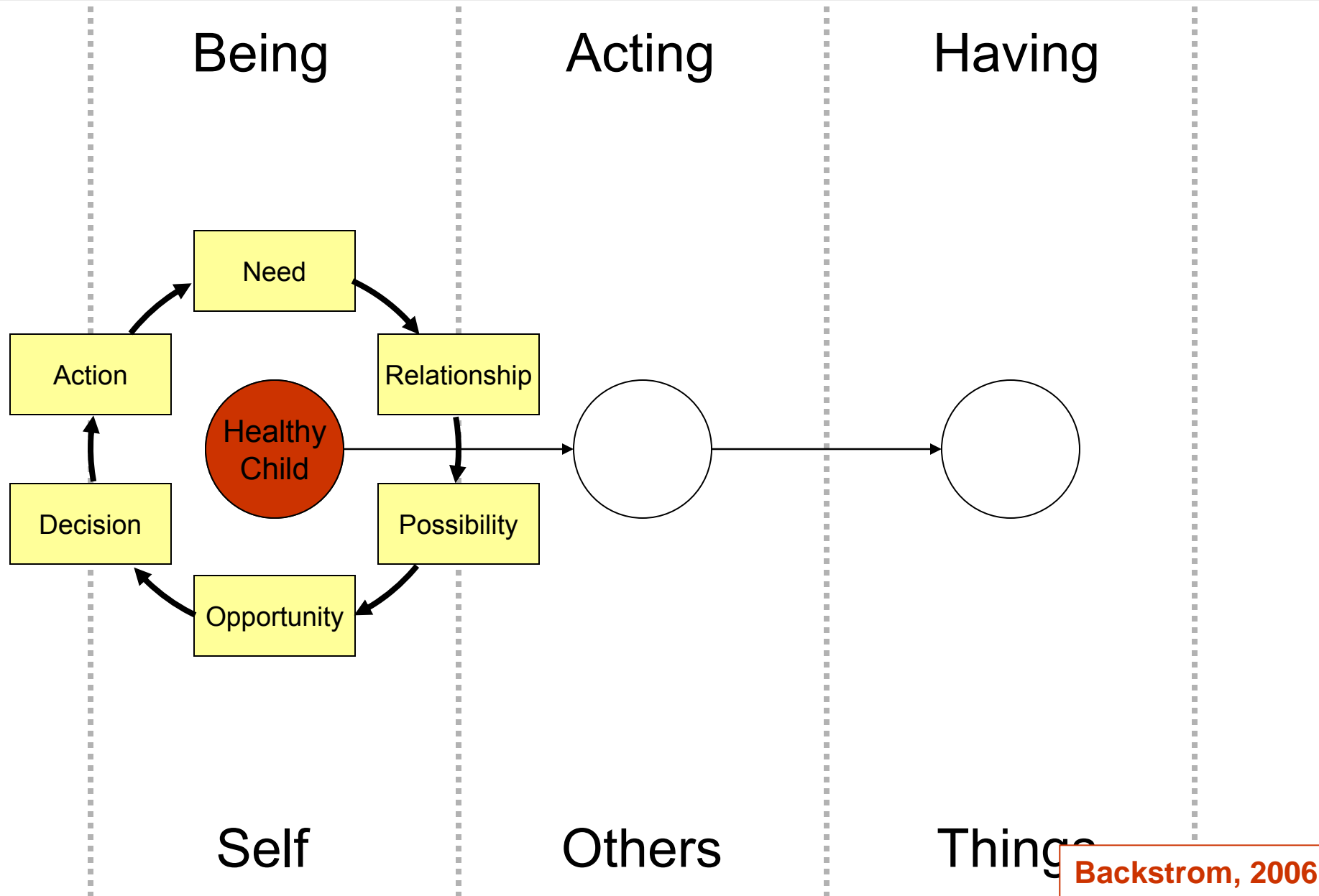


9. Short Distance

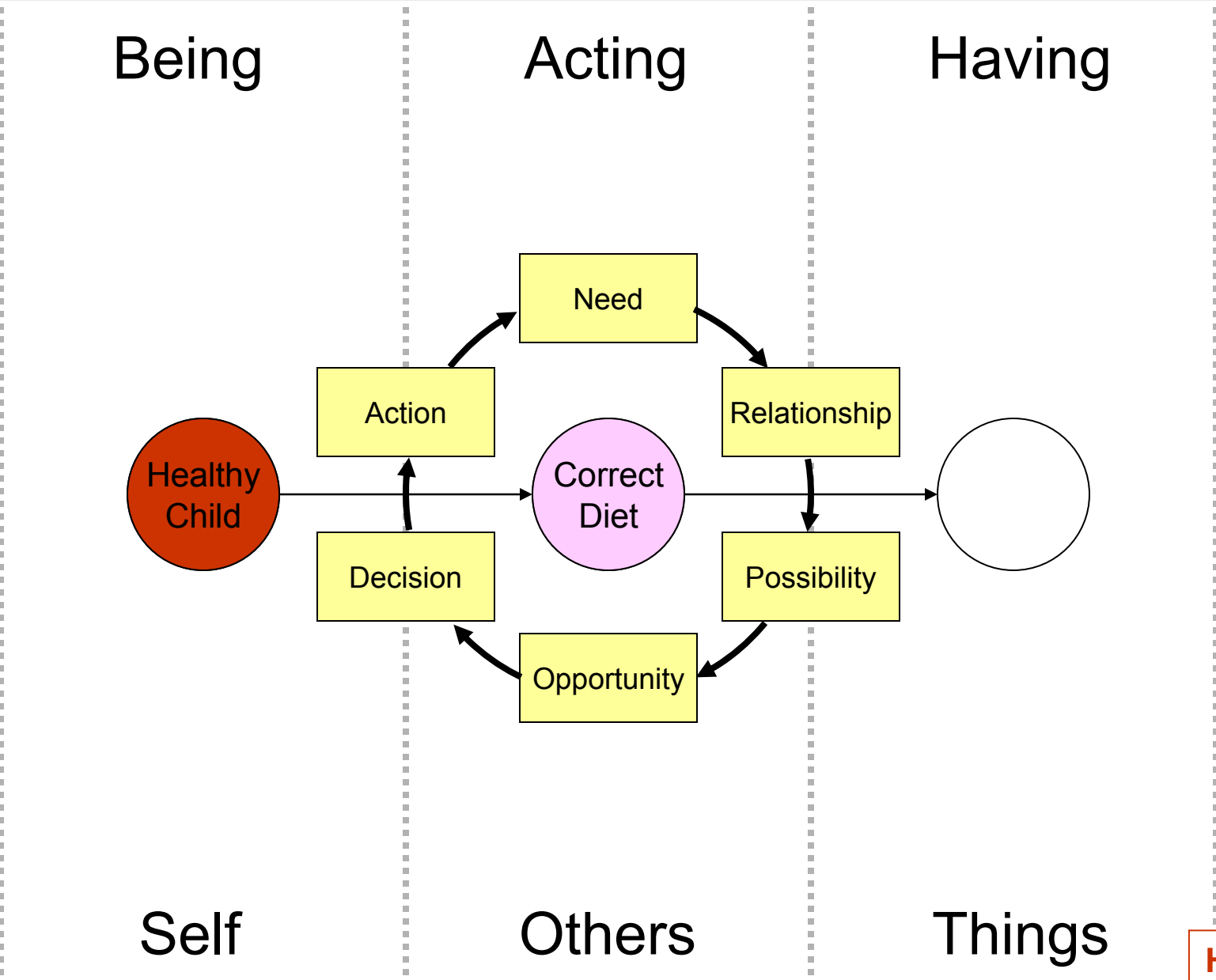
Intention → Local Bias → Niche → Personalization

MARKETING STRATEGIES	MARKETING ATTRIBUTES			
	Product	Target	Pricing	Techniques
Mass Marketing	Simple	All consumers	One nation, one price	Mass media
Direct Marketing	Stratified	Segments	One price	Targeted communications, e.g., mail and phone
Micromarketing	Complex	Micro-segments	Variable pricing	Segment profiles
Personalized, One-to-one Marketing	Highly complex	Individual	Unique pricing	Individual profiles

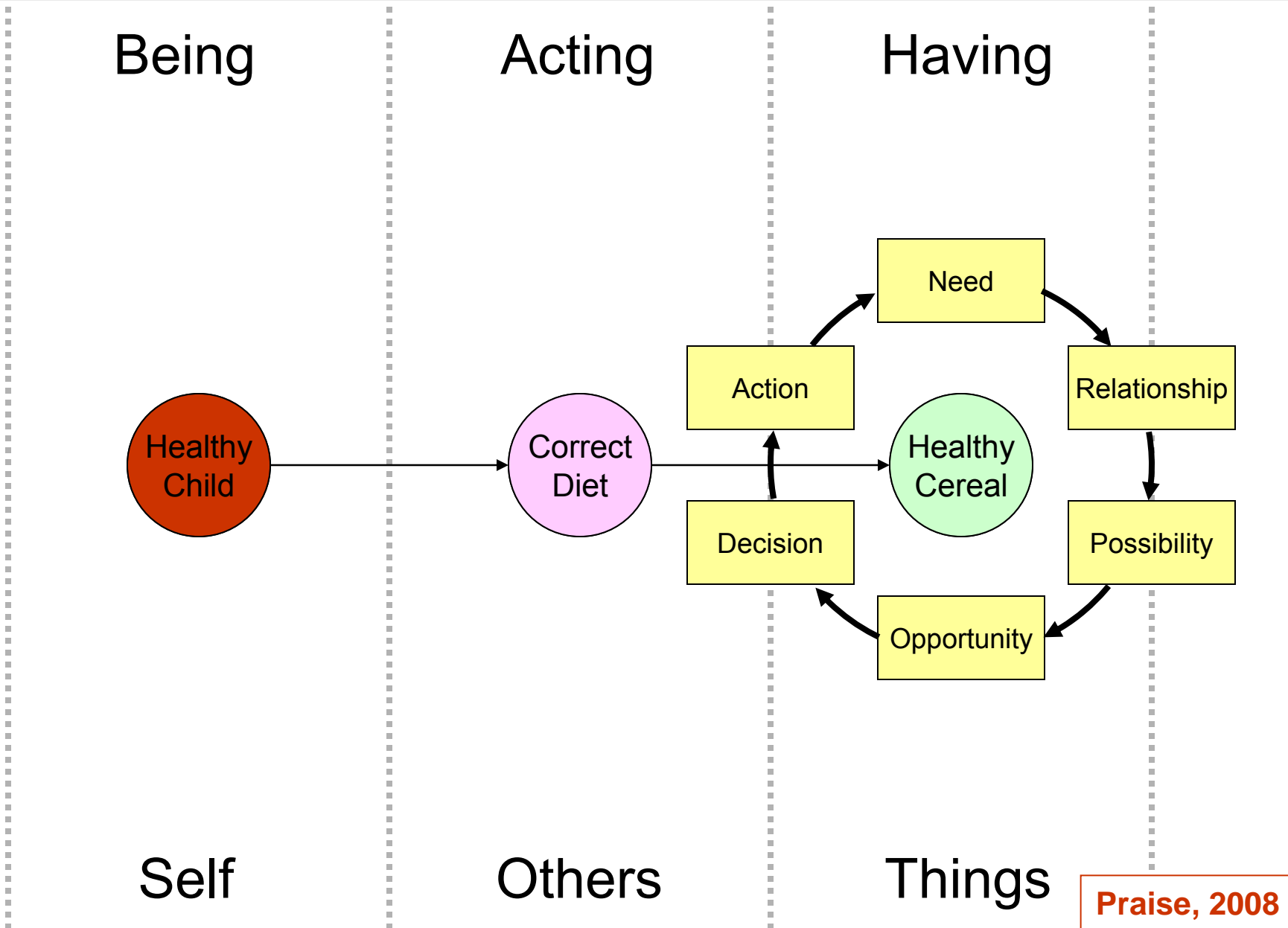
Laudon, 2004



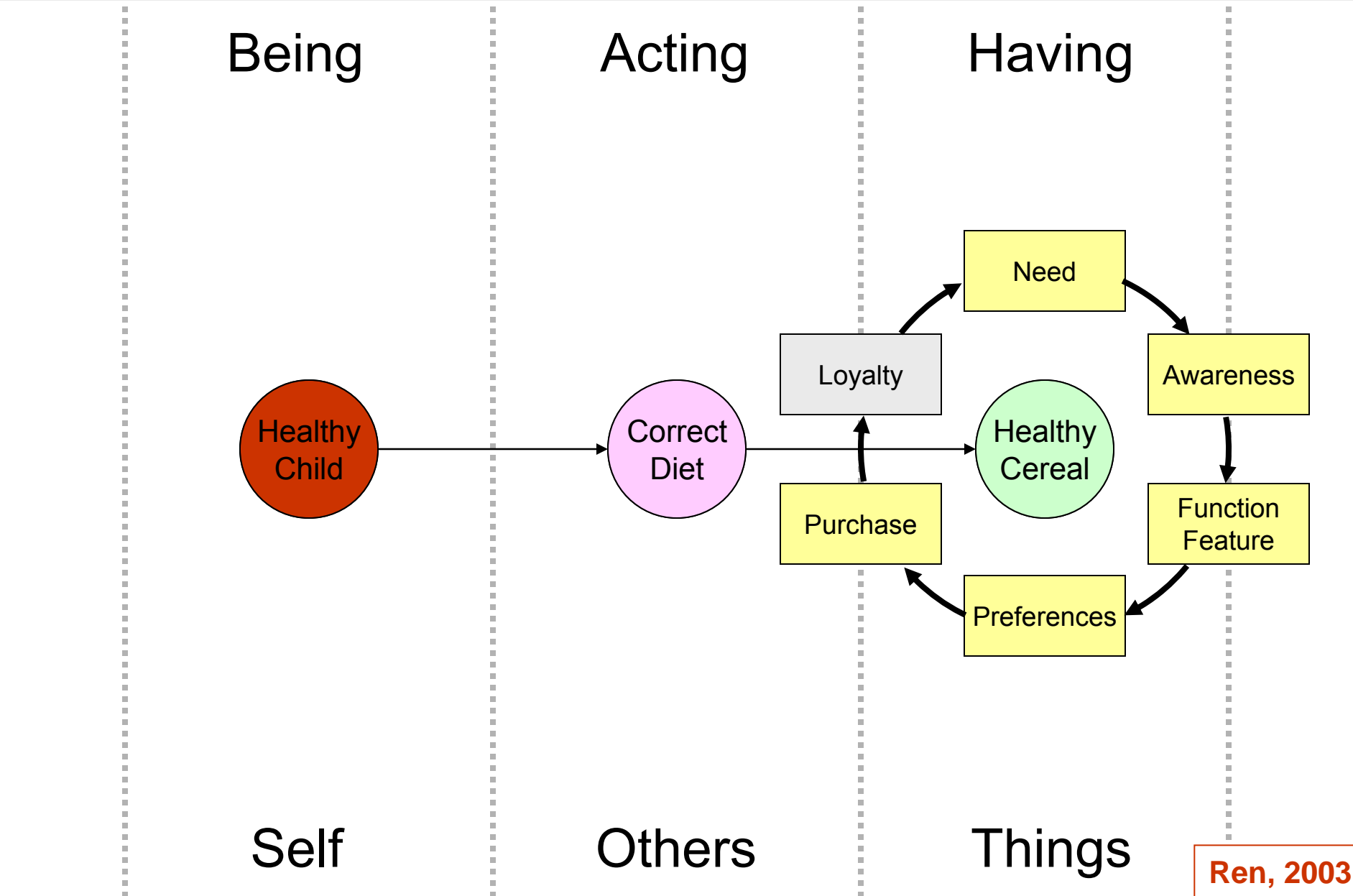
Backstrom, 2006

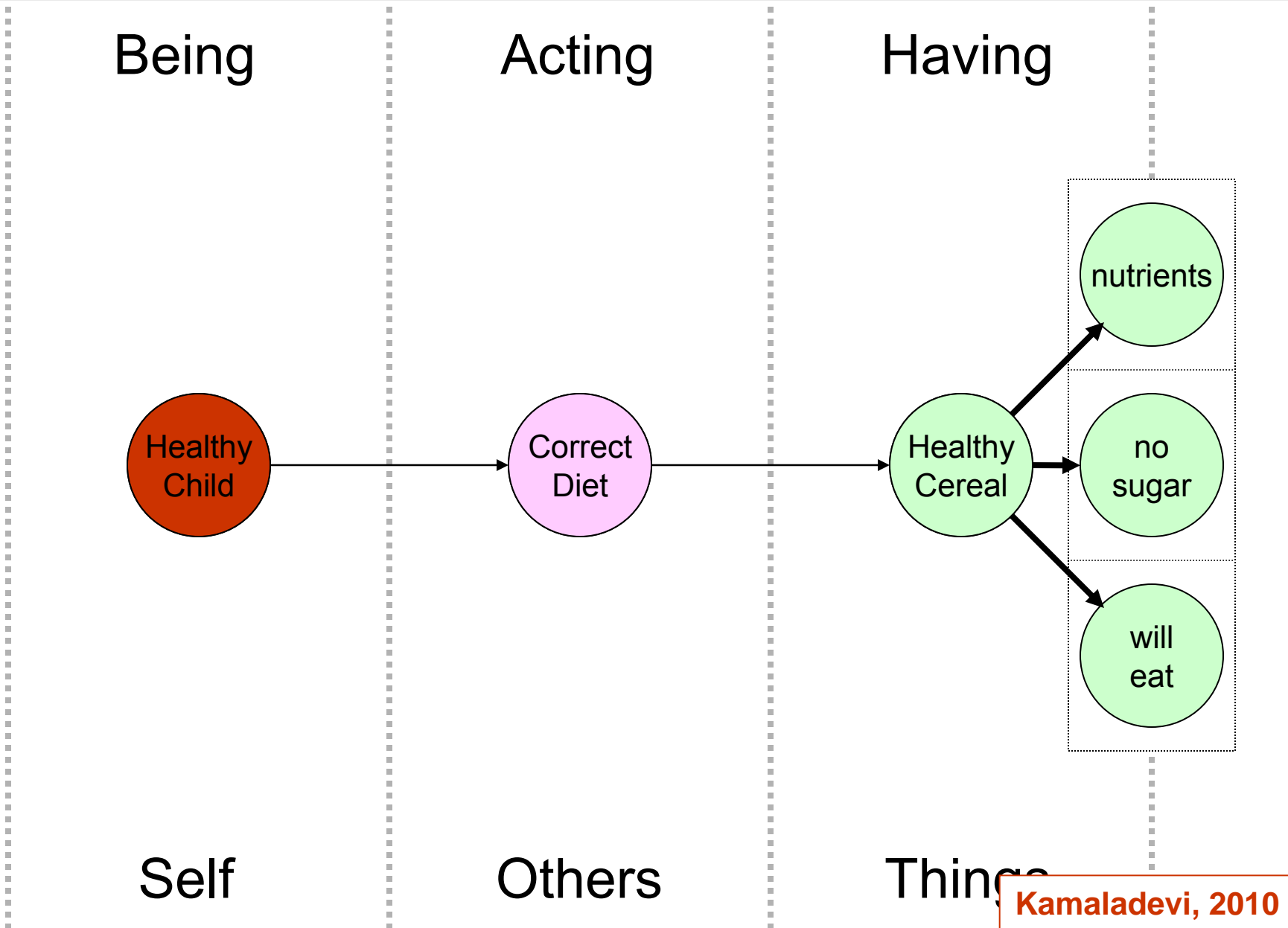


Hill, 2006



Praise, 2008



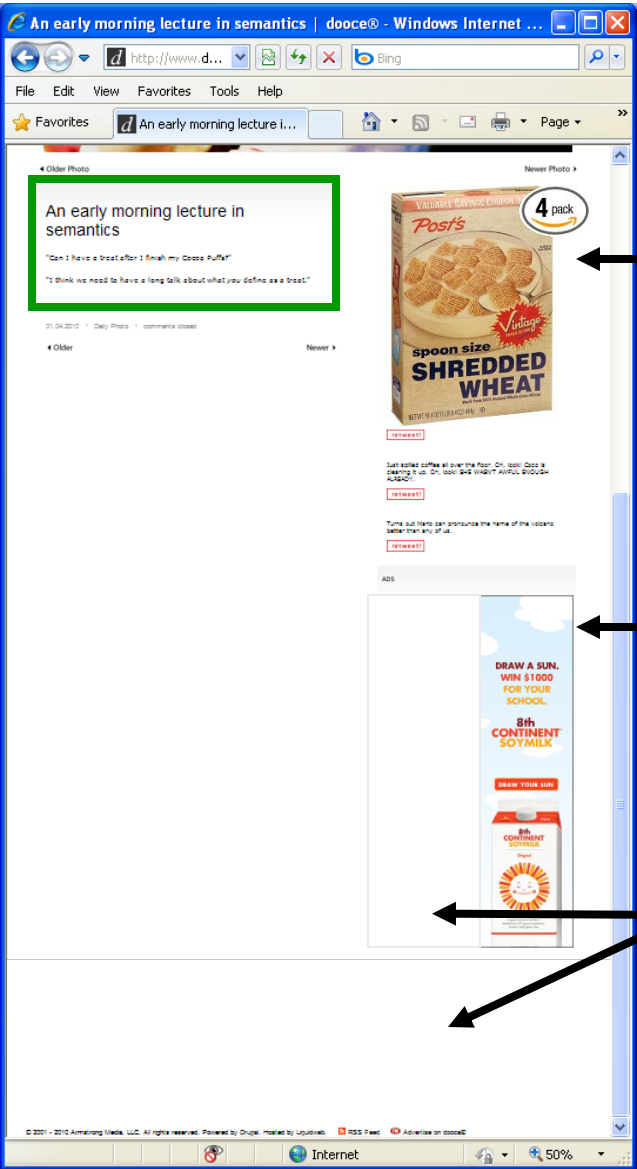
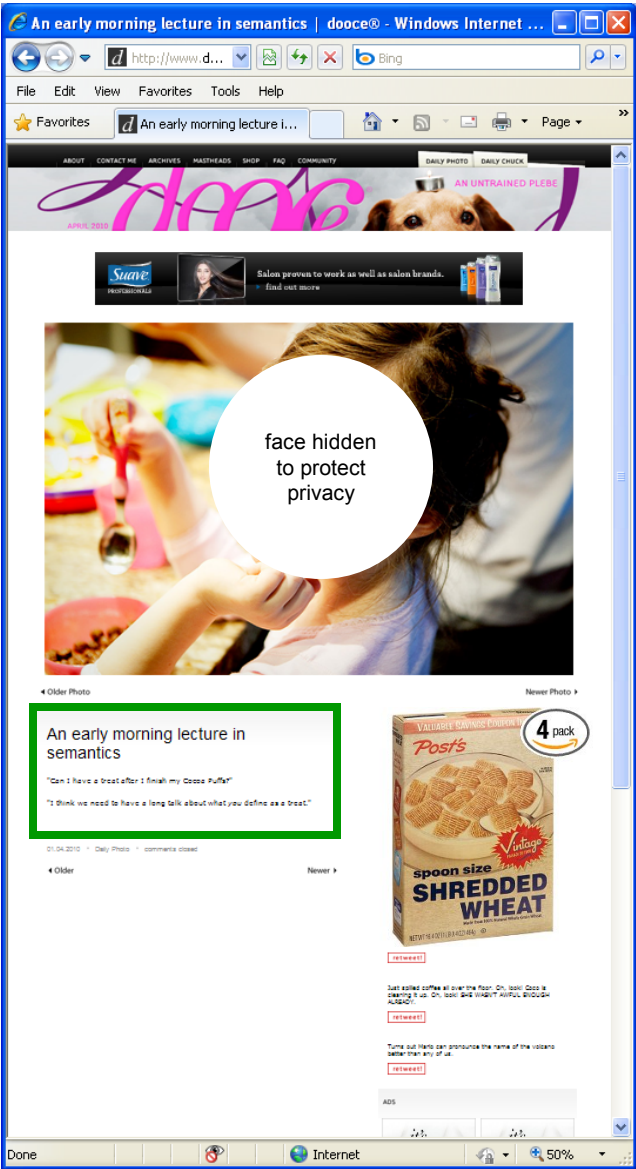


Kamaladevi, 2010

				
✓	✓	✓	✓	nutrients
✓	✓	✓	✓	no sugar
			✓	will eat

9. Short Distance

#6. Ad Alignment: Consistency, Relevance, Branding



Cereal

Bundle

Milk

No Movie
No Books

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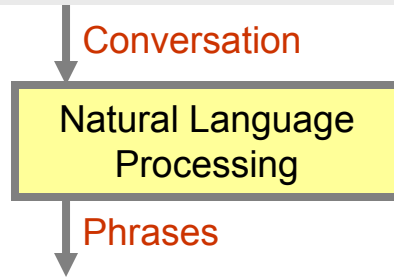
Part 1 – Prolog

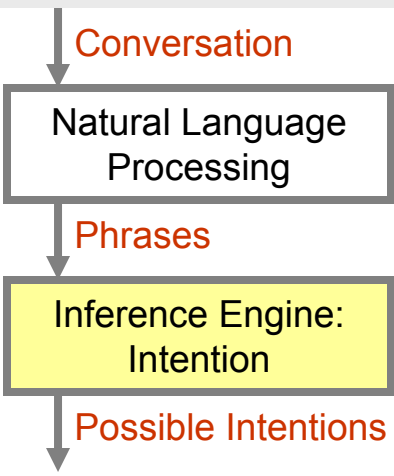
Part 2 – Traditional Perspective

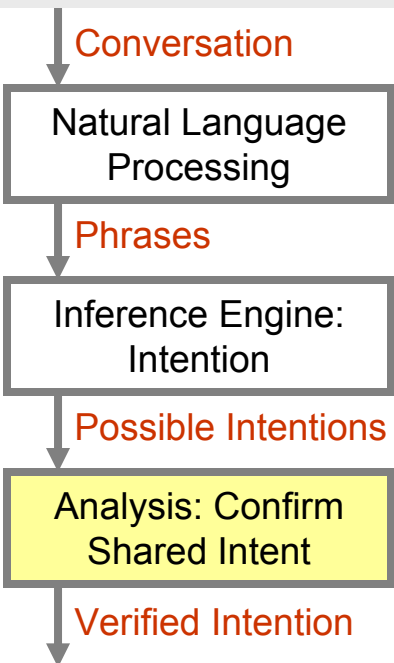
Part 3 – Alternate Perspective

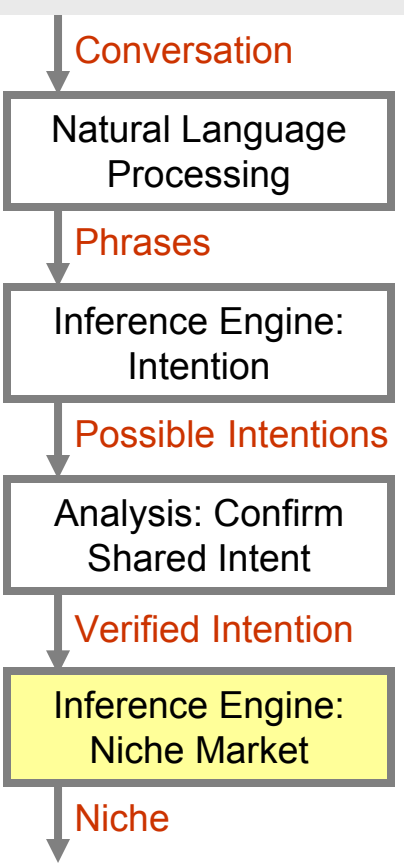
Part 4 – Software Implications

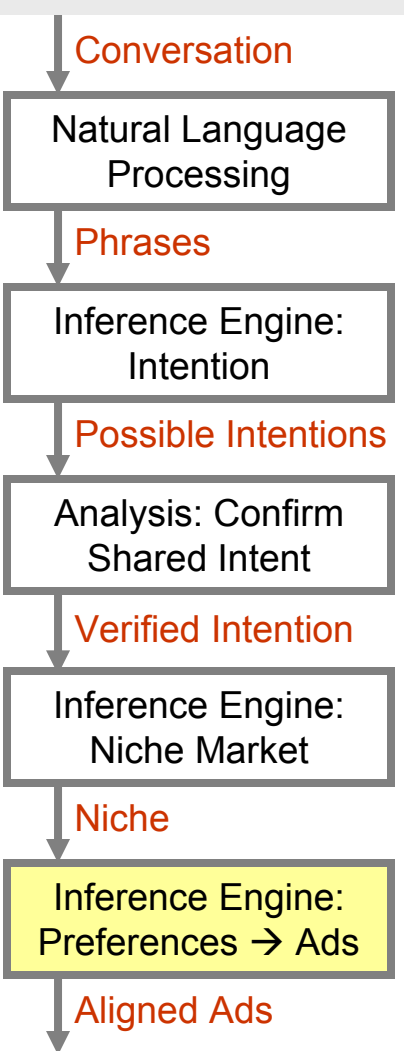
- Architecture
- Ontology
- History
- Agents

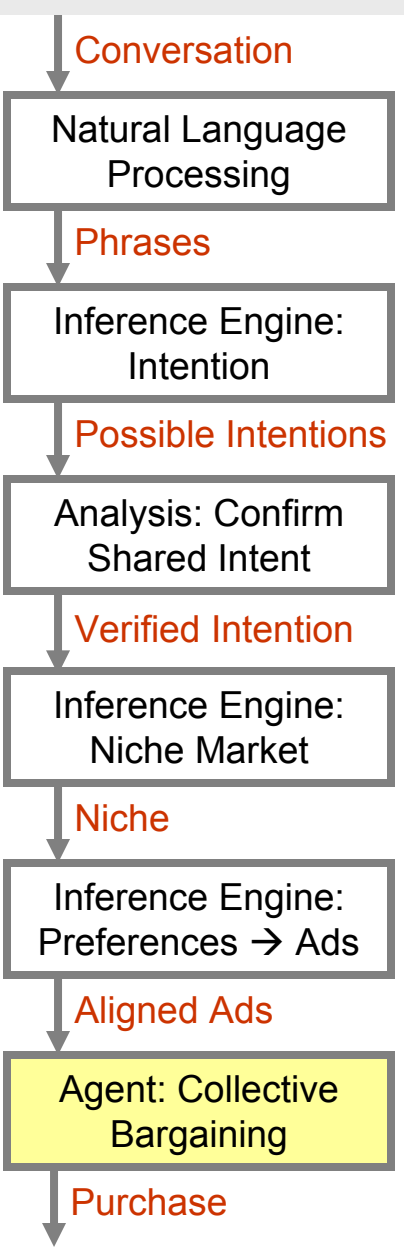


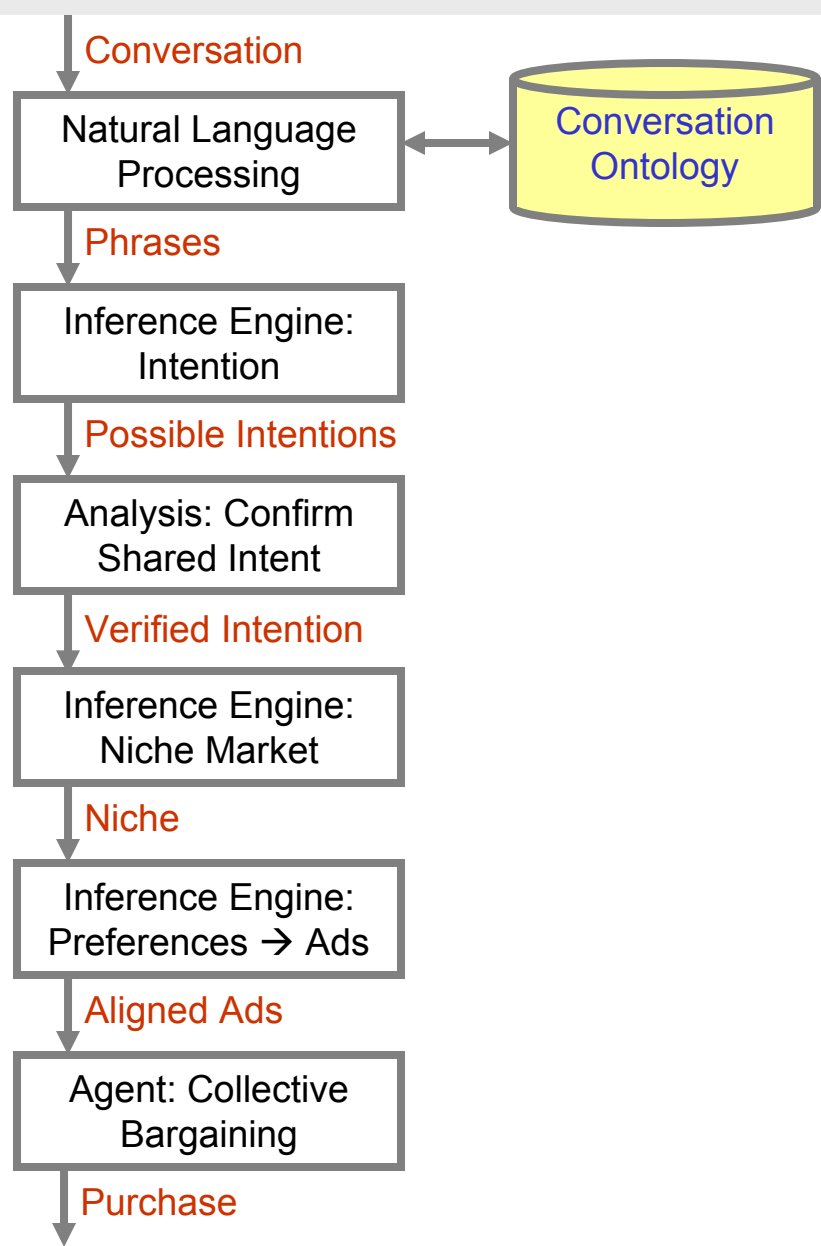










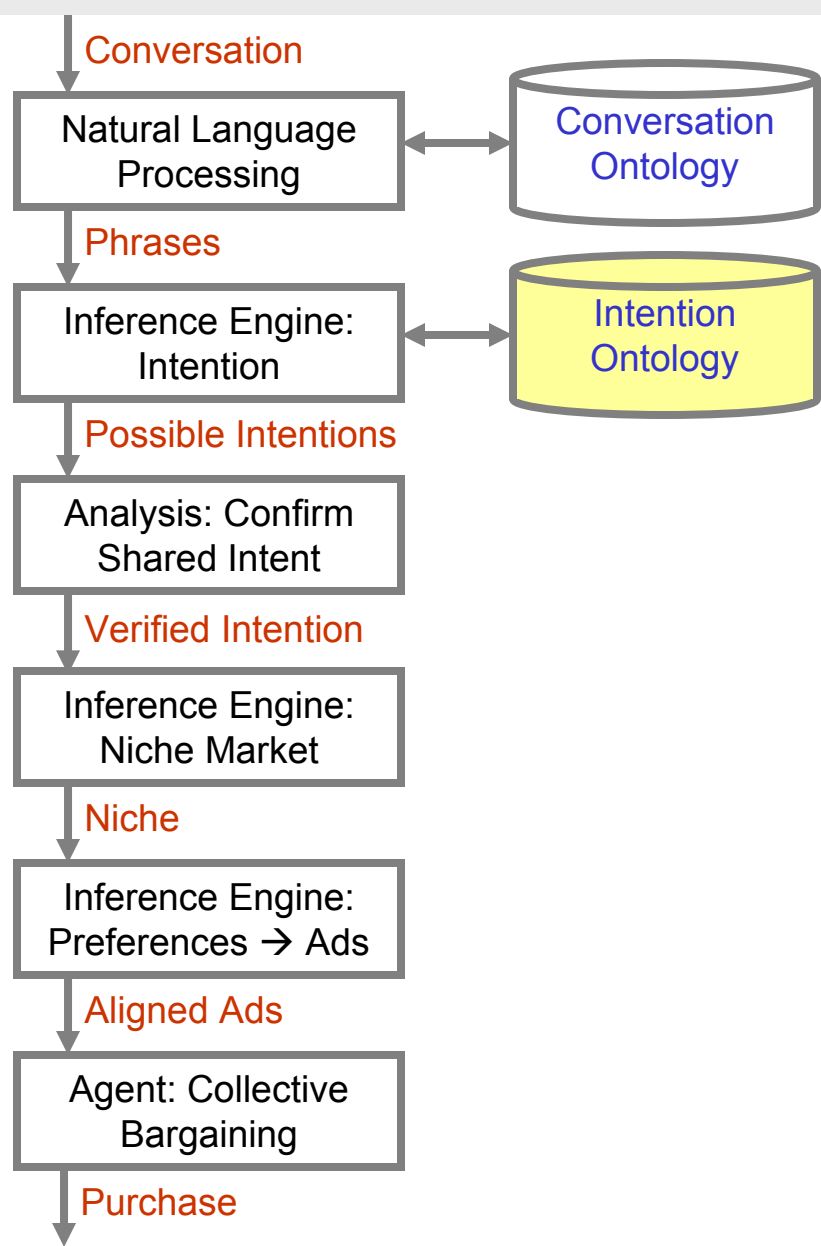


TYPES:

- Need
- Relationship
- Possibility
- Opportunity
- Decision
- **ACTION**

ELEMENTS:

- Request
- Promise
- Offer
- Counter
- ...

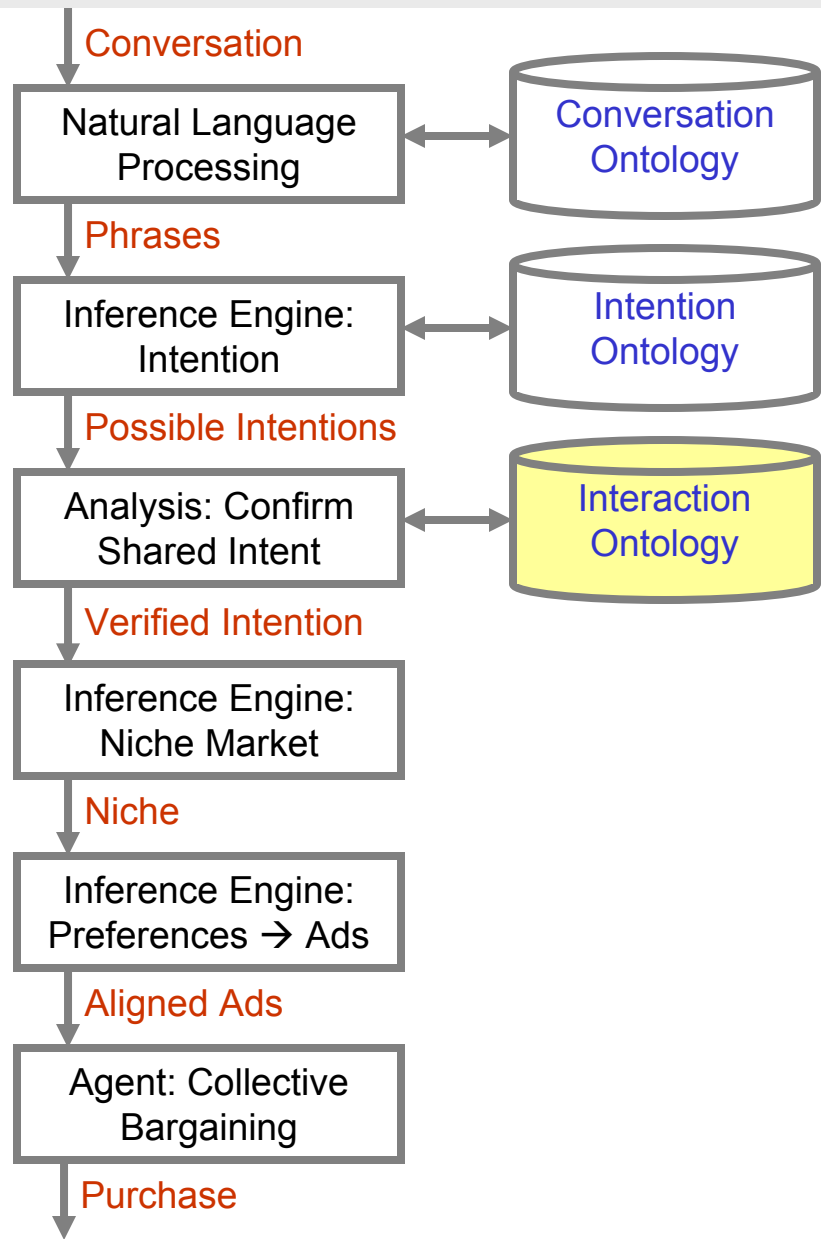


TYPES:

- Being
- Doing
- **HAVING**

ELEMENTS:

- Intent to Buy
- Product
- Preferences
- Order
- Pricing
- ...

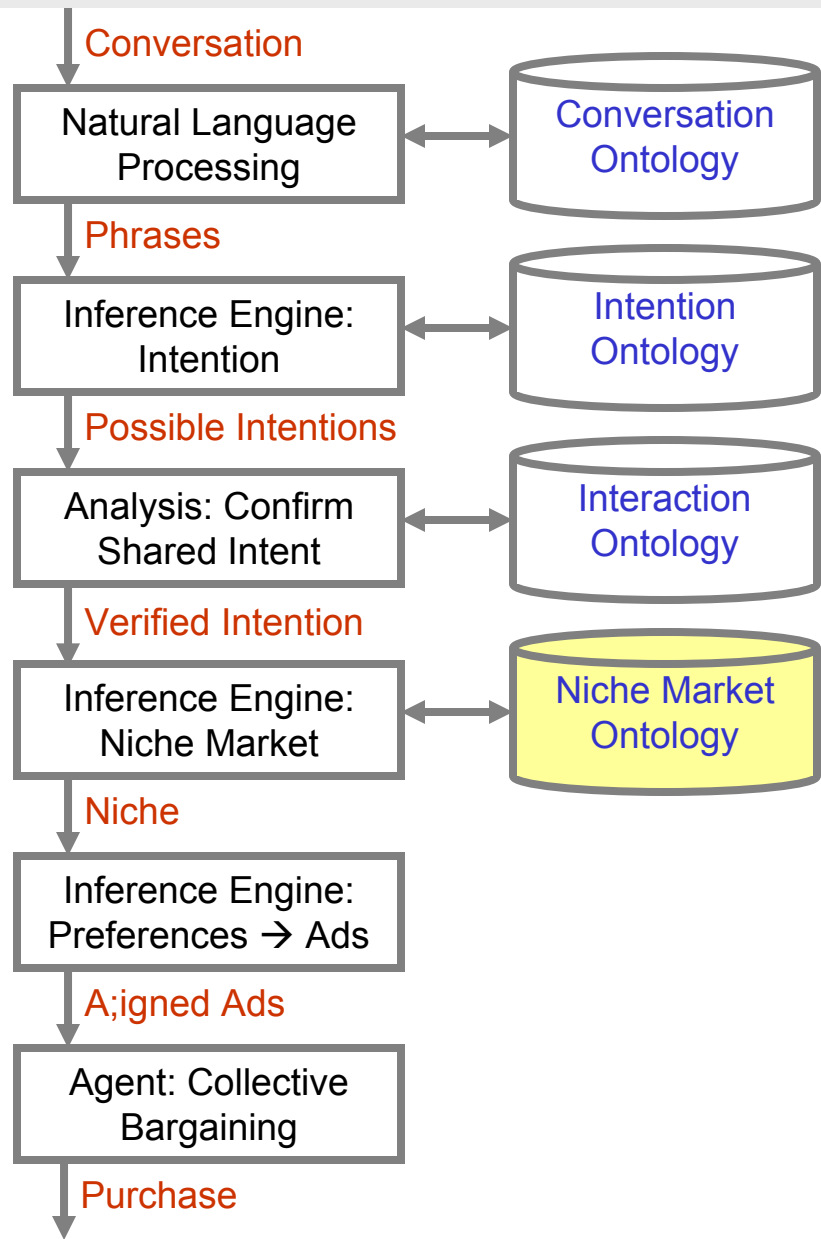


DIMENSIONS:

- Intent
- Agreement
- **UNDERSTANDING**

ELEMENTS:

- Utterance
- Presentation
- Acceptance
- Confirmation
- ...



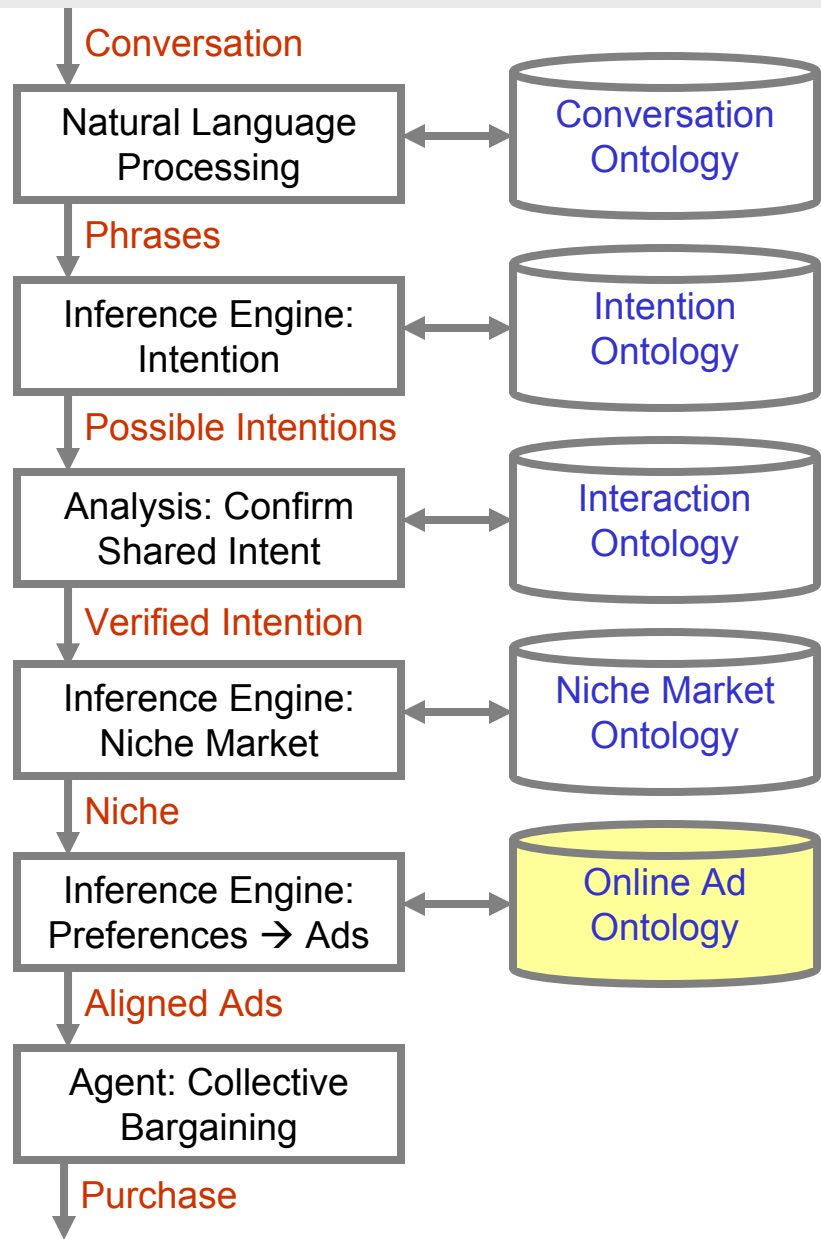
MARKETING MIX:

- Product
- Pricing
- Distribution
- **COMMUNICATION**

ELEMENTS:

- Agents (understand each niche market's intentions)
- Bundle (built for one intended use)
- Ads (High Alignment)
- Brand Equity (product function = intended use)
- ...

Engelbach, 2006



ACCESS TO:

- Product Catalogs
- Yellow Pages

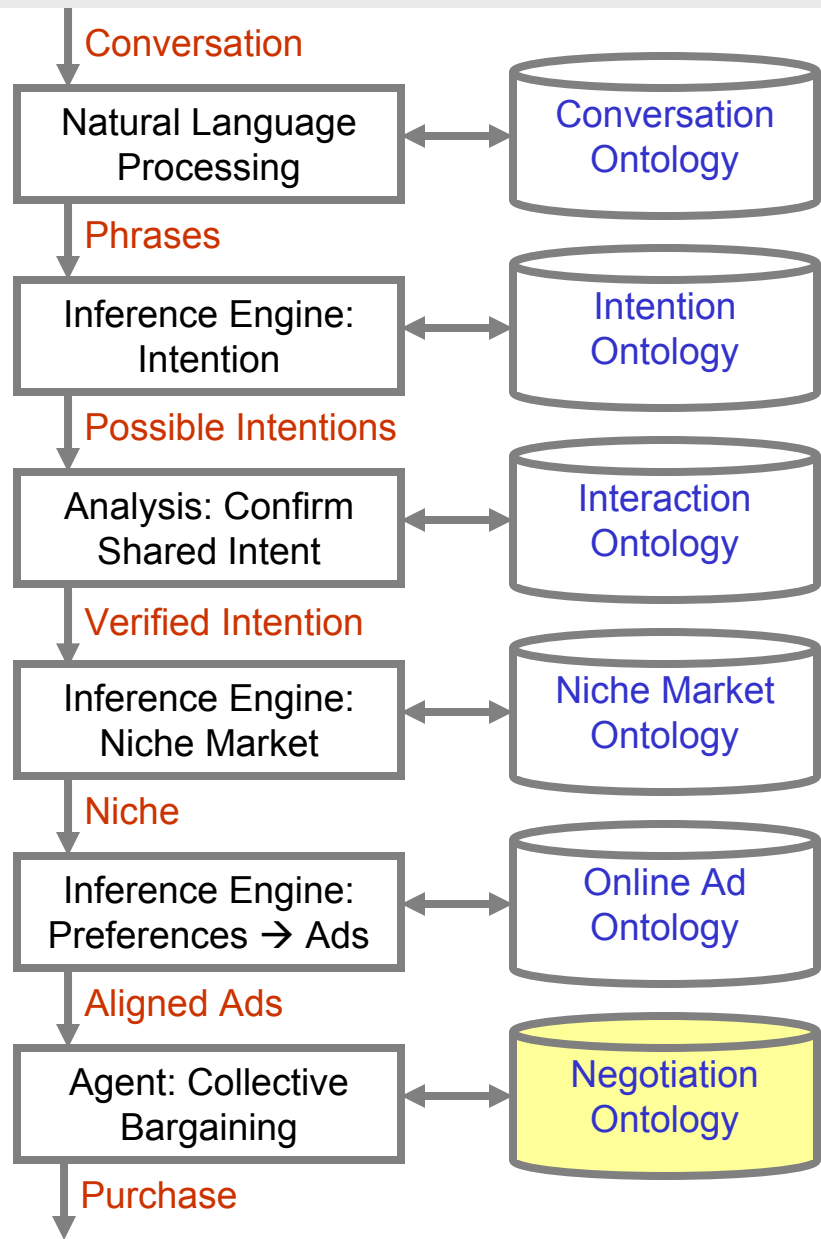
LIMITED BY:

- Constant Updates
- Rigid Set of Terms
- Large Vocabulary

SOLUTION:

- Vocabulary:
terms = Intentions
- Relationships:
semantics among terms = distances between intentions

Guarino, 1999



MAPPING:

- Buyer preferences
- Seller preferences
- Intention-based map

NEGOTIATION:

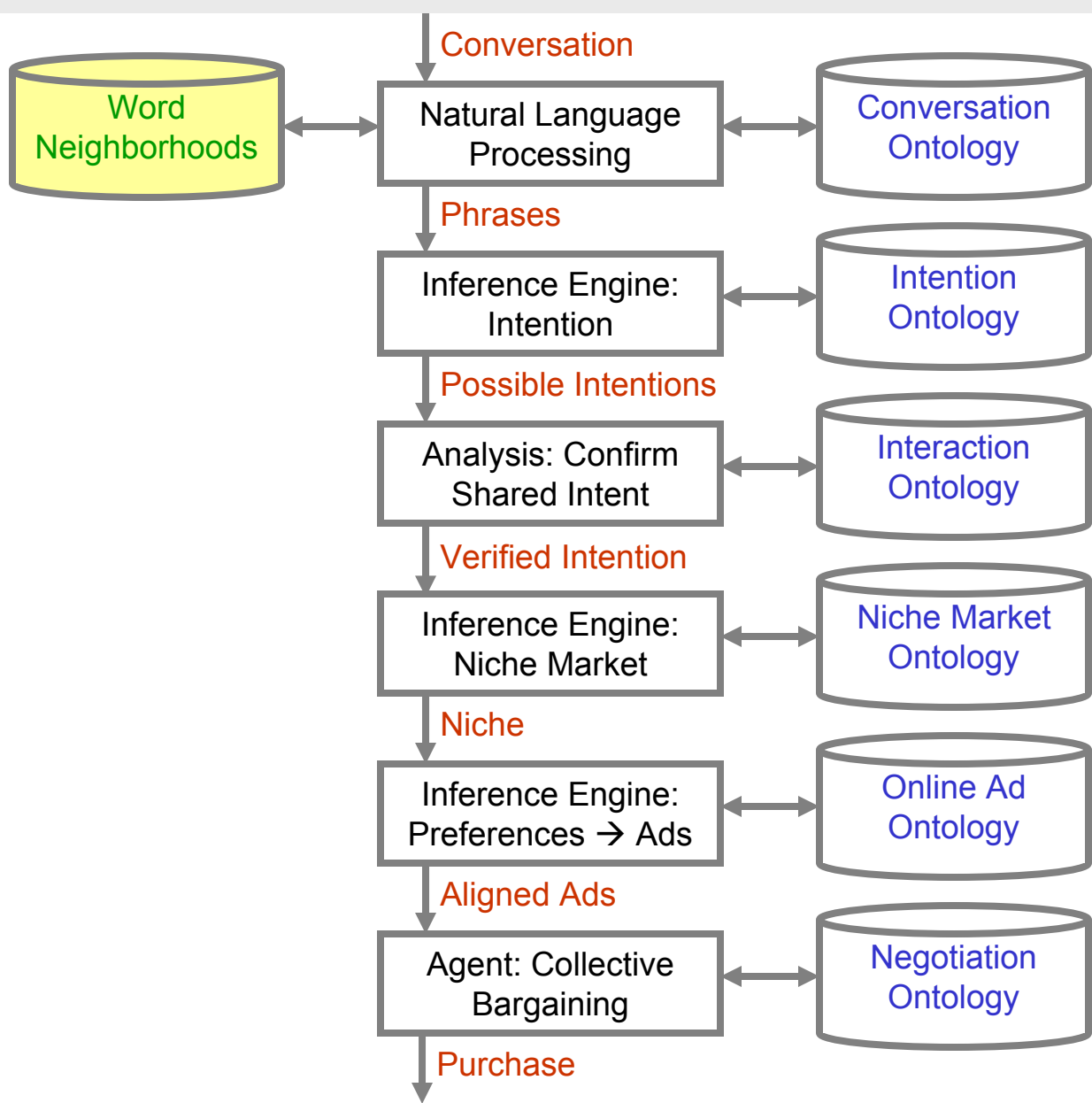
- Non-ambiguity
- Use intentions in the Yellow Pages and Catalogs

BEYOND PRICE:

- Satisfy Need...
- Satisfy Intended Use

11. History

Reuse: Words Neighborhoods → Intentions



WORDS...

- Assumptions
- Inter-relationships
- Collections

CONTEXT:

- Specific Topic
- The Conversation

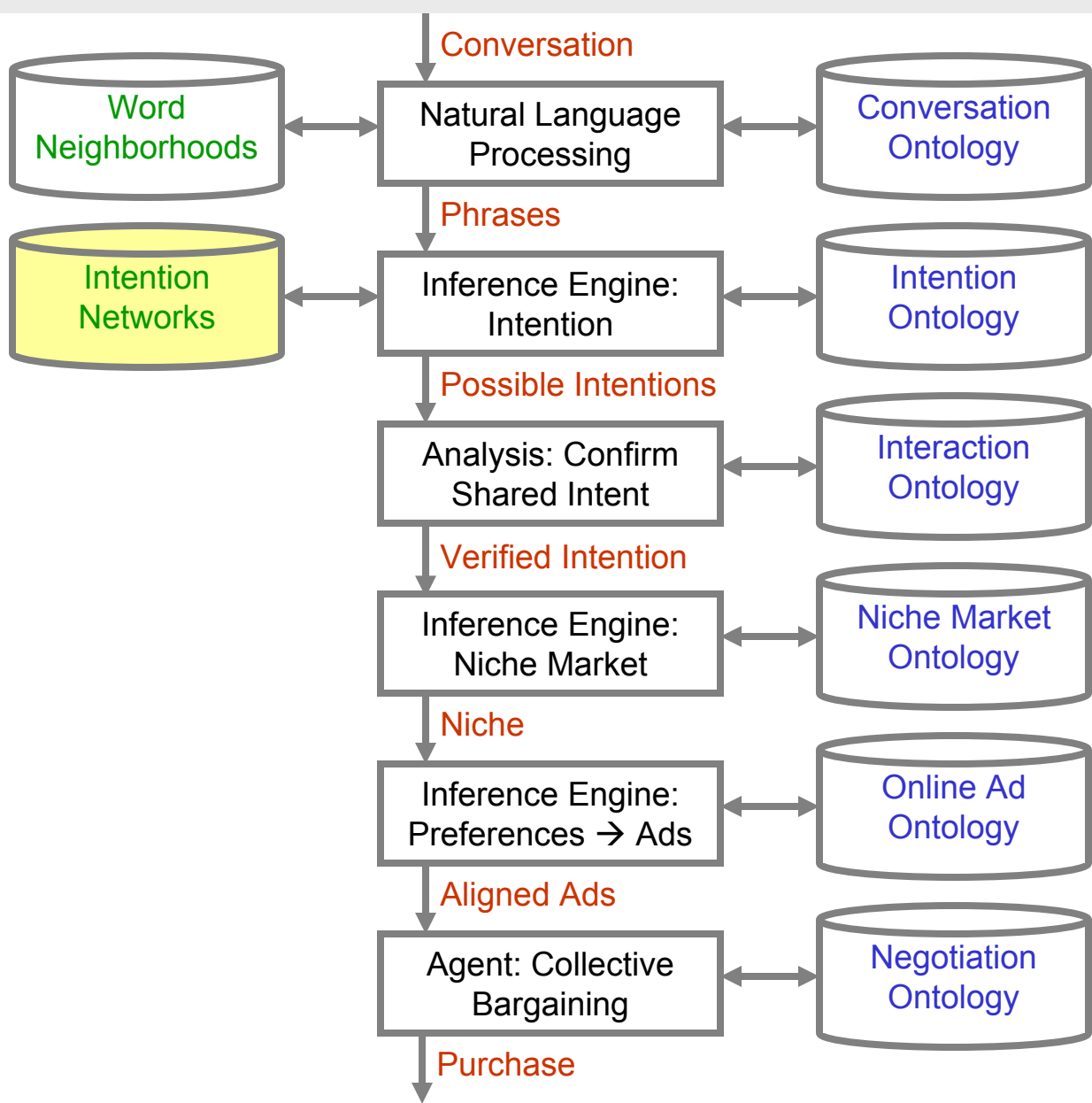
CAUTION:

- Generic Associations
- Prior attempts to use those assumptions without success.

Craven, 2000

11. History

Reuse: Contexts + Phrases → Intentions



Context = Breakfast

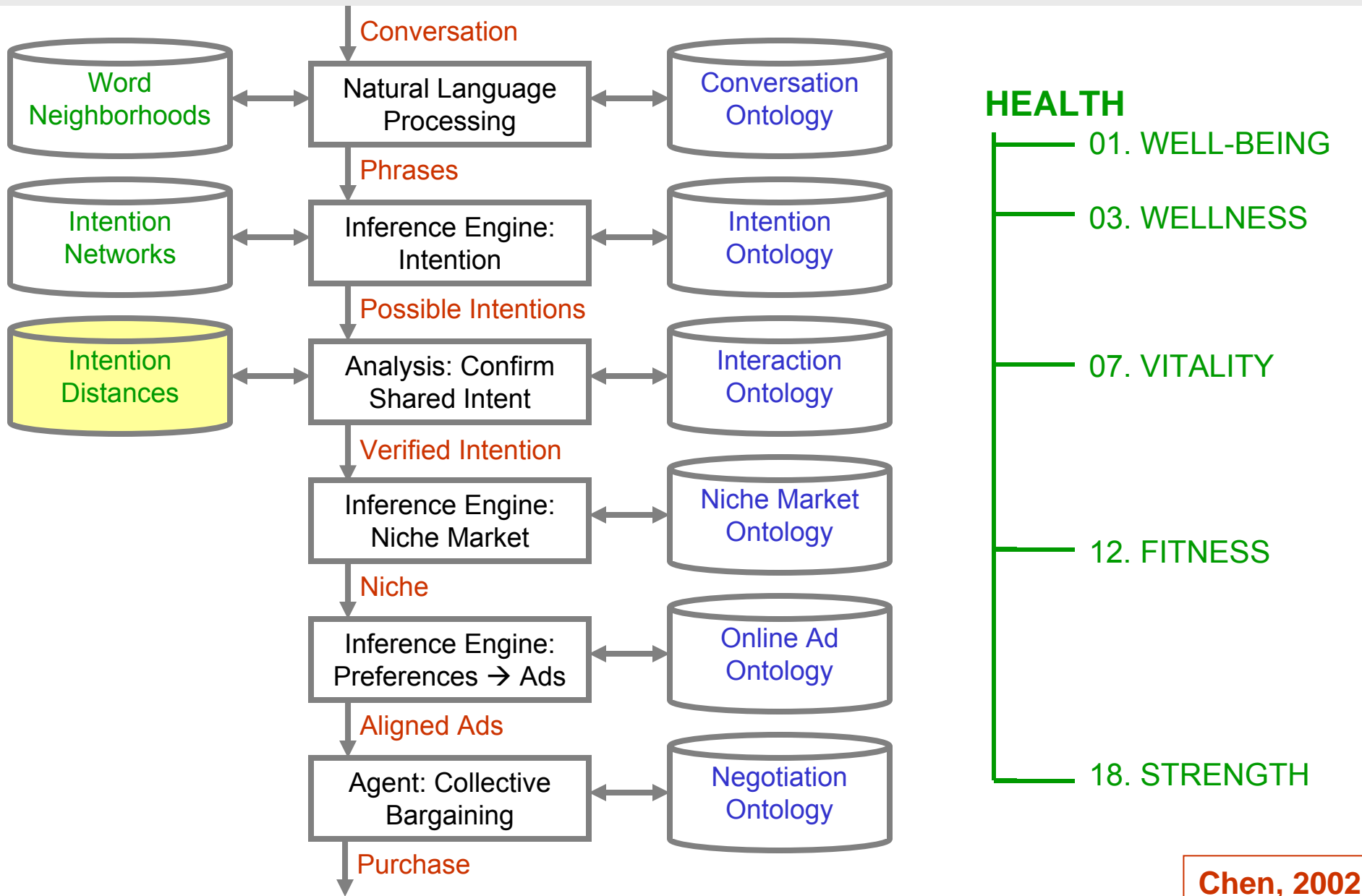
- 1) Treat → Sugar
- 2) No Treat → No Sugar
- 3) No Sugar → **Health**

CAUTION:
Reasoning under
uncertainty is likely.

Paek, 1999

11. History

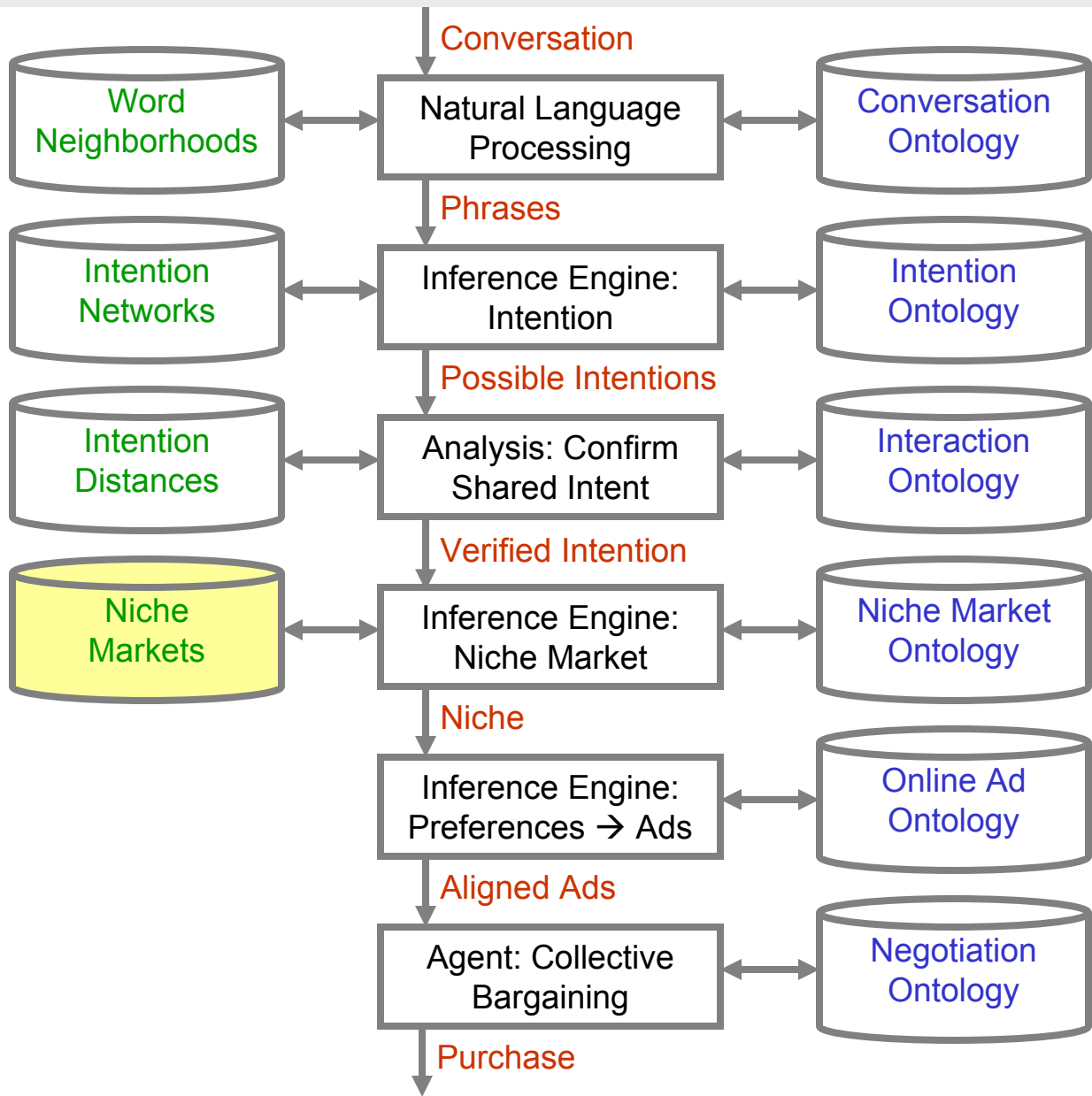
Build: Self-Organizing Map of “Similarity Distances”



Chen, 2002

11. History

Use: Intention (Short Distance) → More Preferences



HEALTH

- Nutrients
- No Sugar
- Will Eat

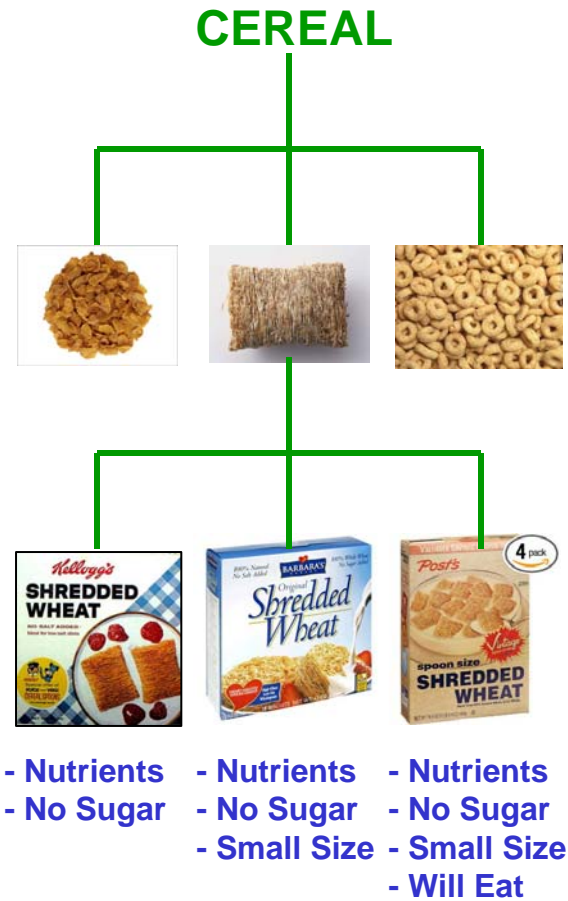
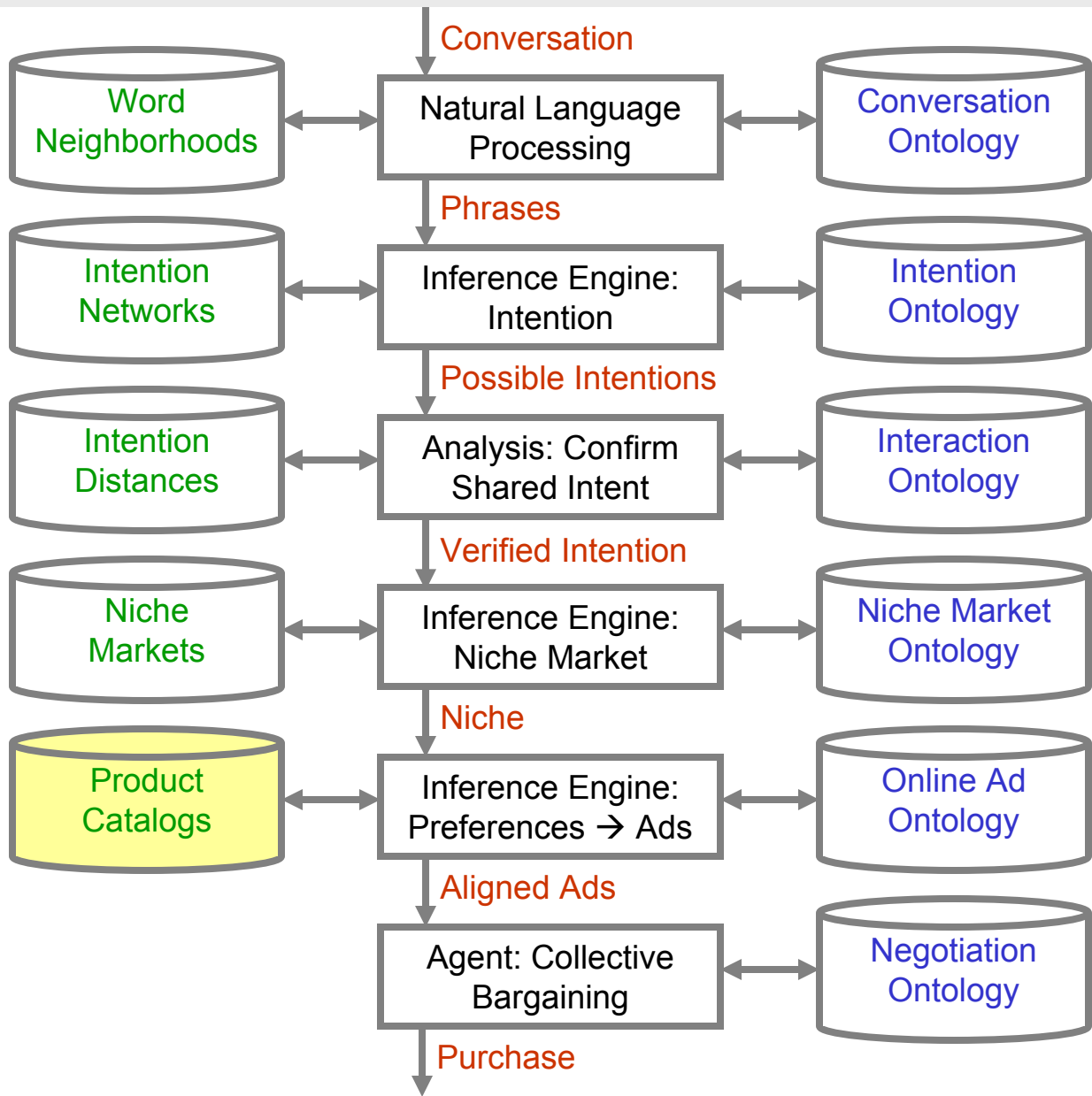
01. WELL-BEING

- Vitamins
- Omega-3

Cohen, 2000

11. History

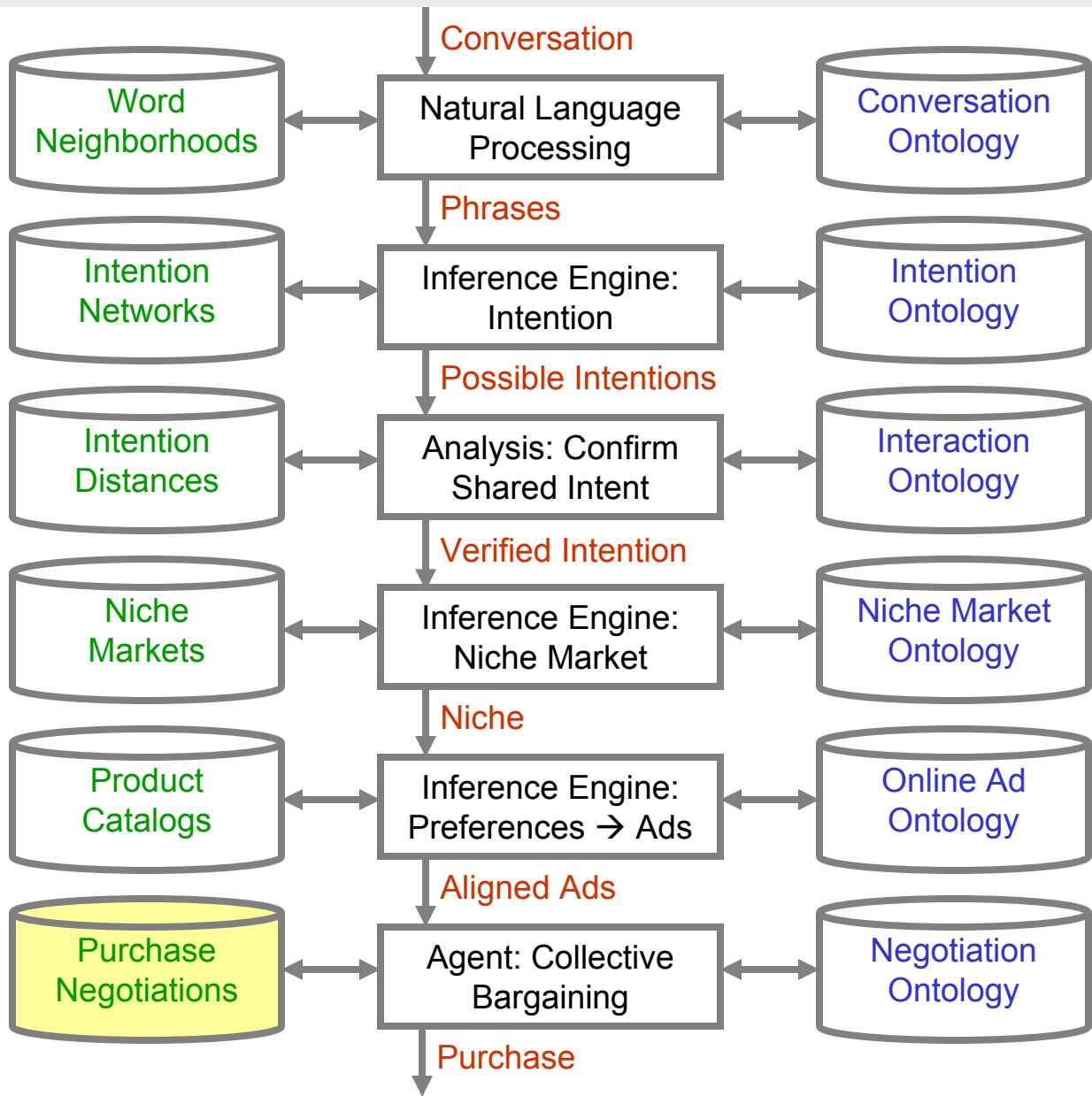
Organize: Taxonomy + Configuration + Preferences



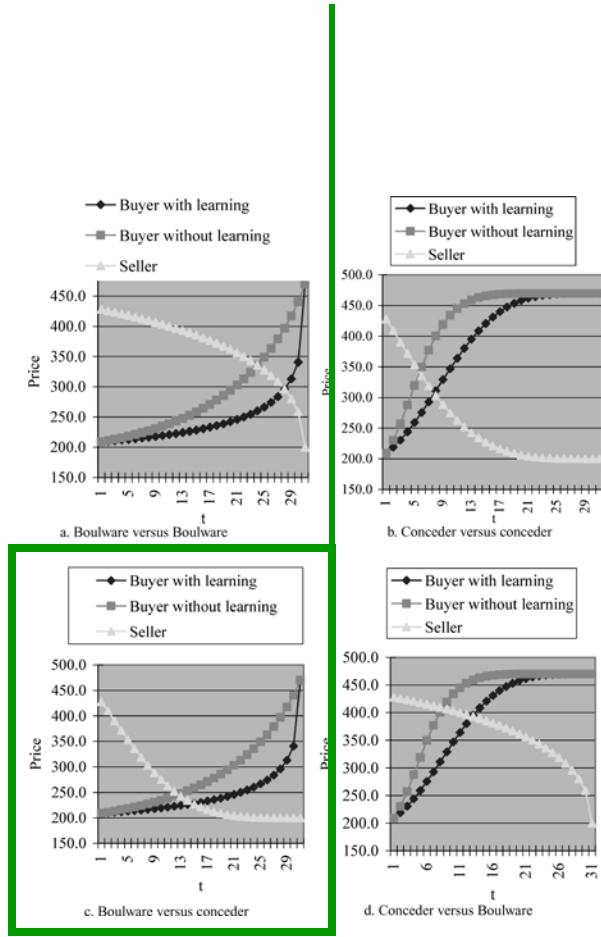
Brafman, 2007
Buchner, 1999

11. History

Negotiation Success + Strategic Delay → Low Cost



STRATEGIC DELAY



Mok, 2005
Winoto, 2002

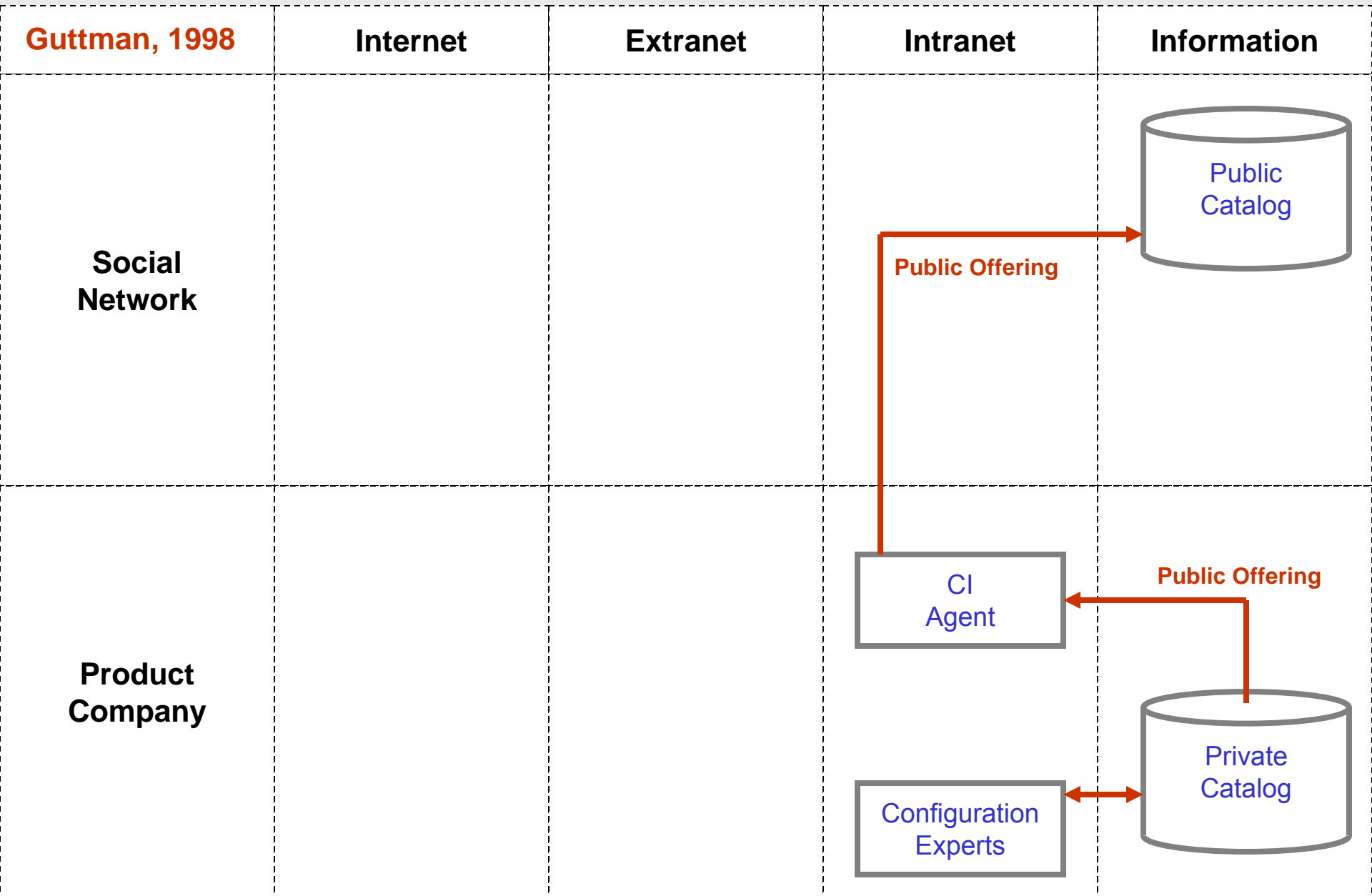
13. Agents

Hybrid = Knowledge Base + Collaborative Filtering

Tran, 2000	Internet	Extranet	Intranet	Information
Social Network				
Product Company				

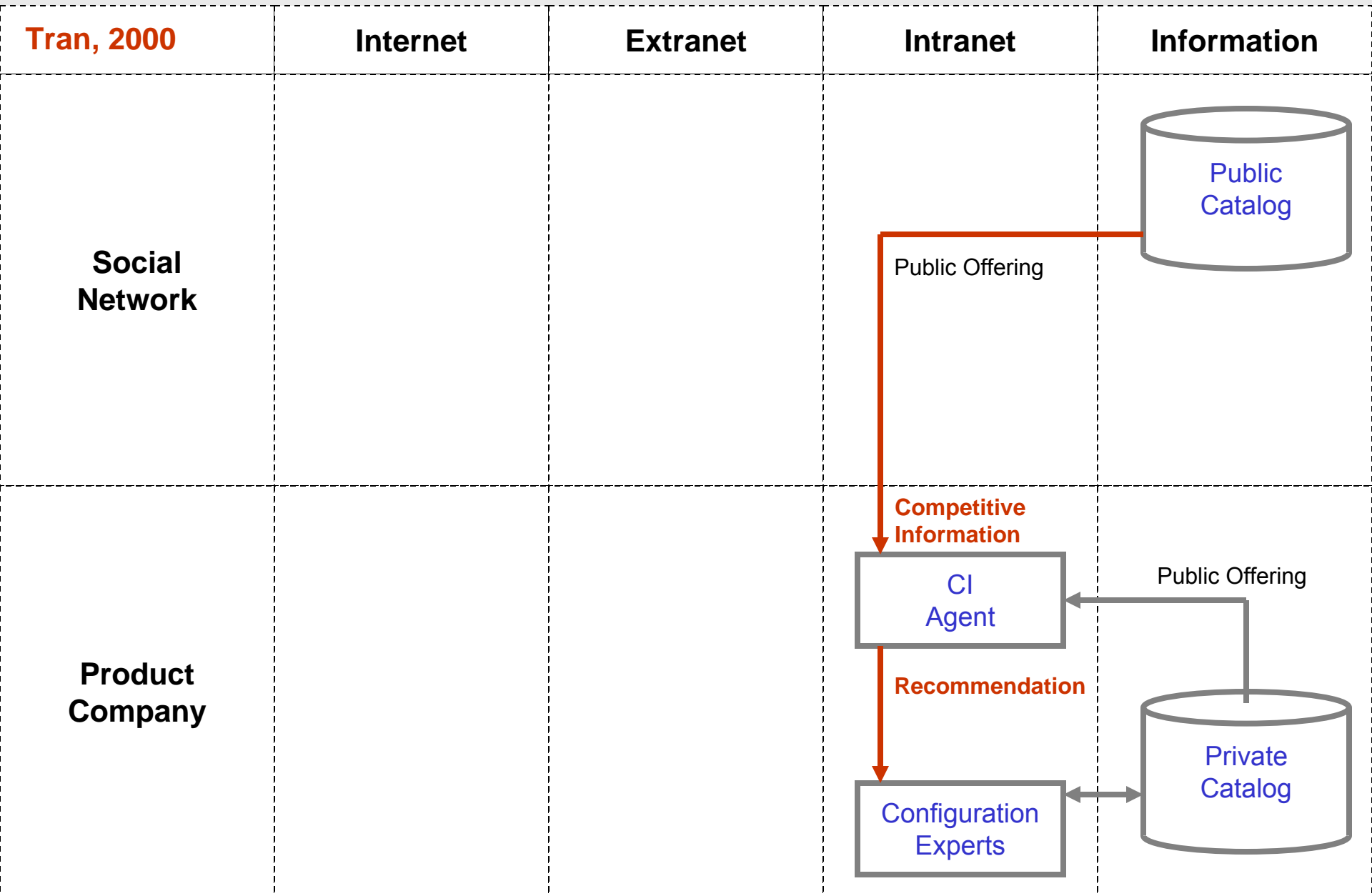
13. Agents

Knowledge Base: Standard Taxonomy, All Configs.



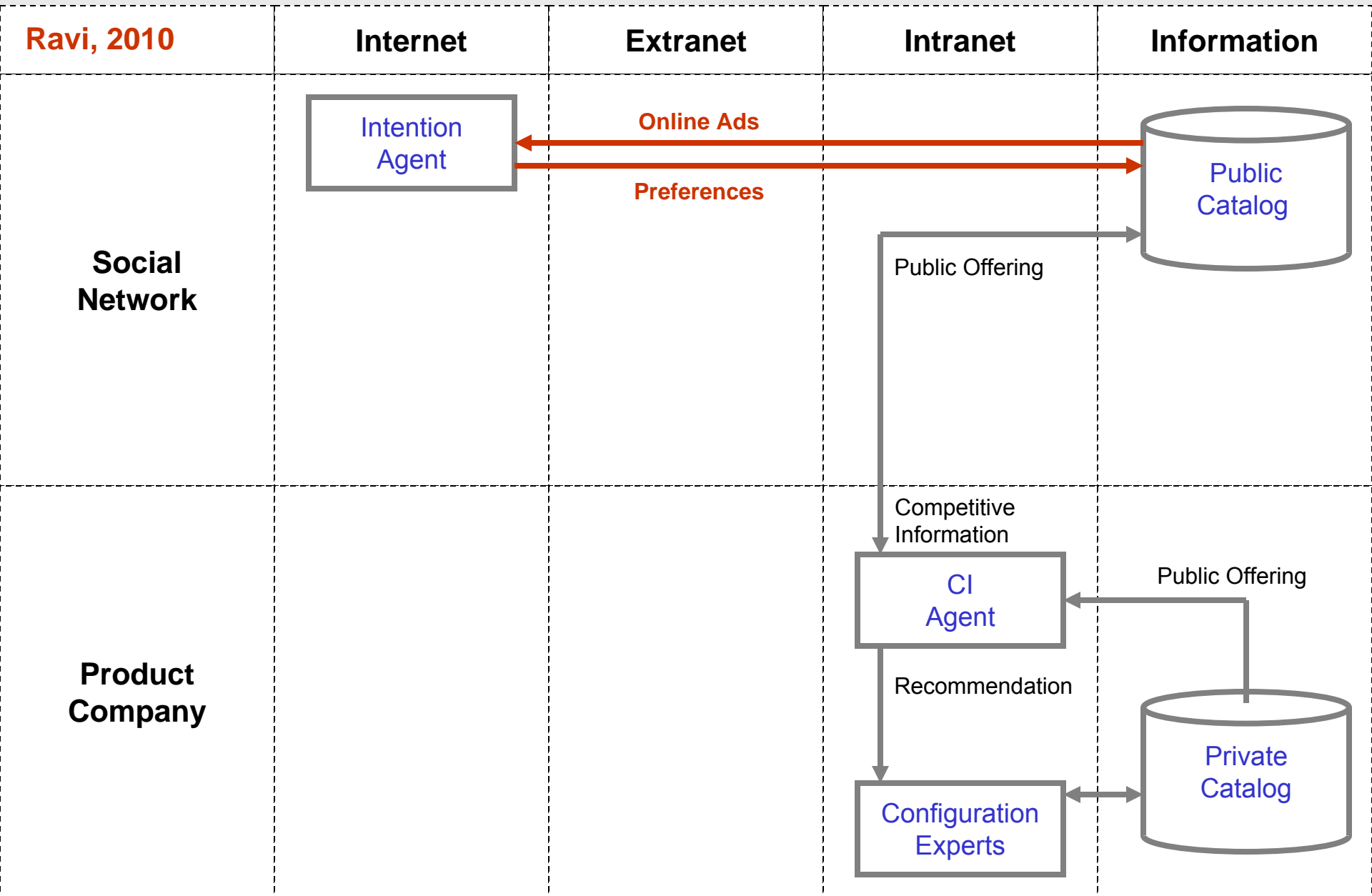
13. Agents

Knowledge Base: Similar Products + Configurations



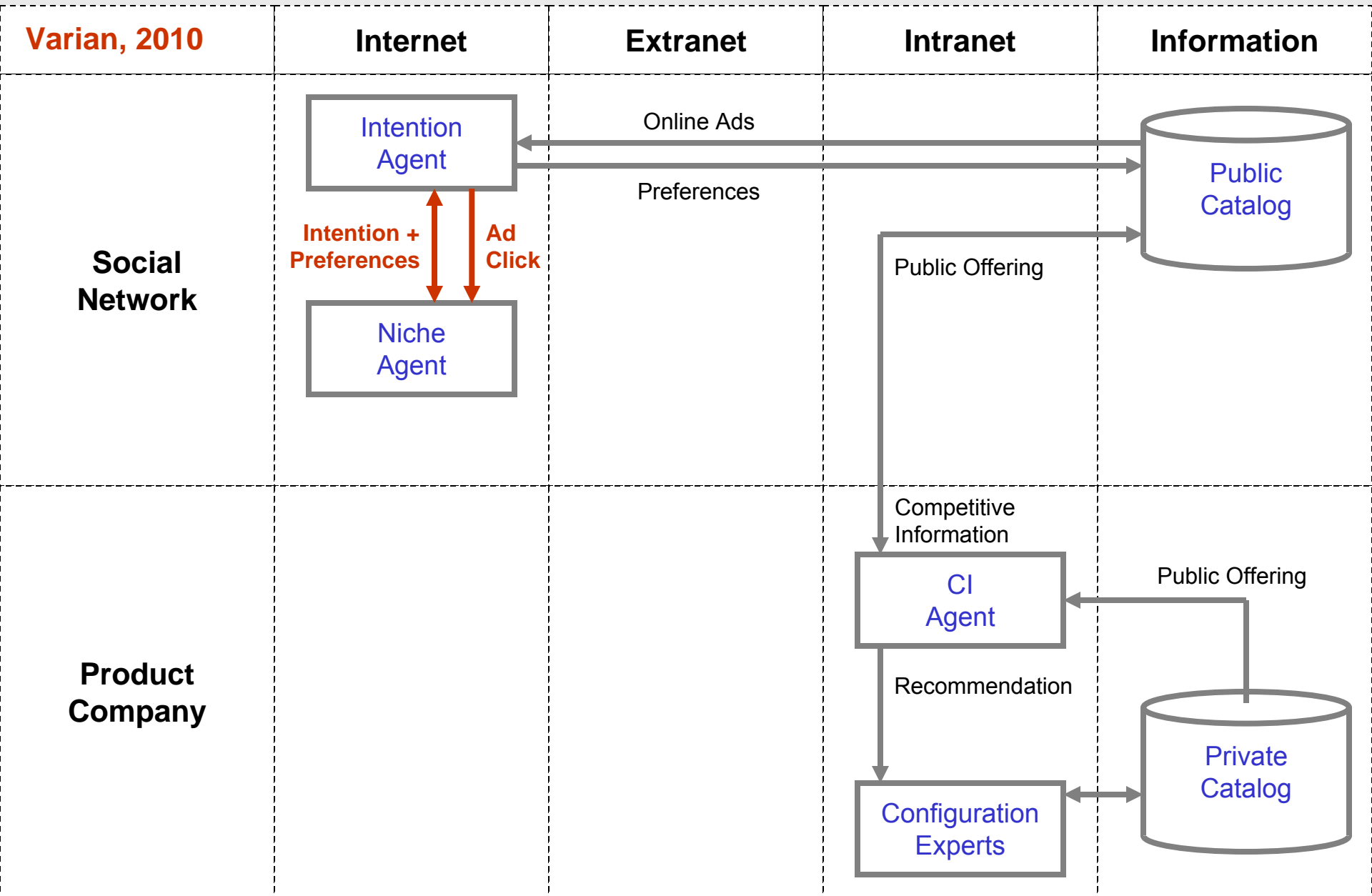
13. Agents

Collaborative Filtering: Intention-based Preferences



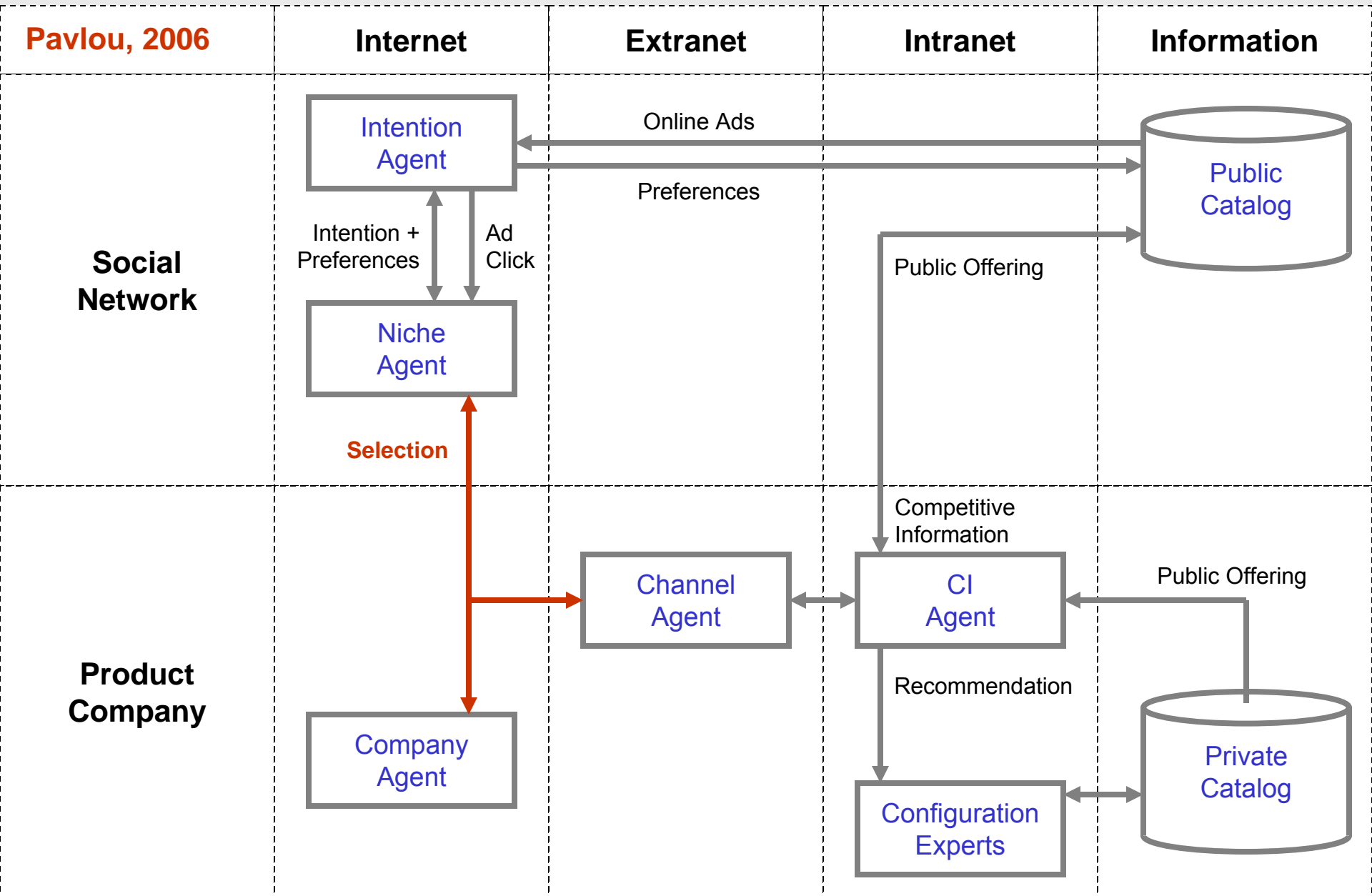
13. Agents

Buy Step 1: Ad → Conversation for Having → Prefs.



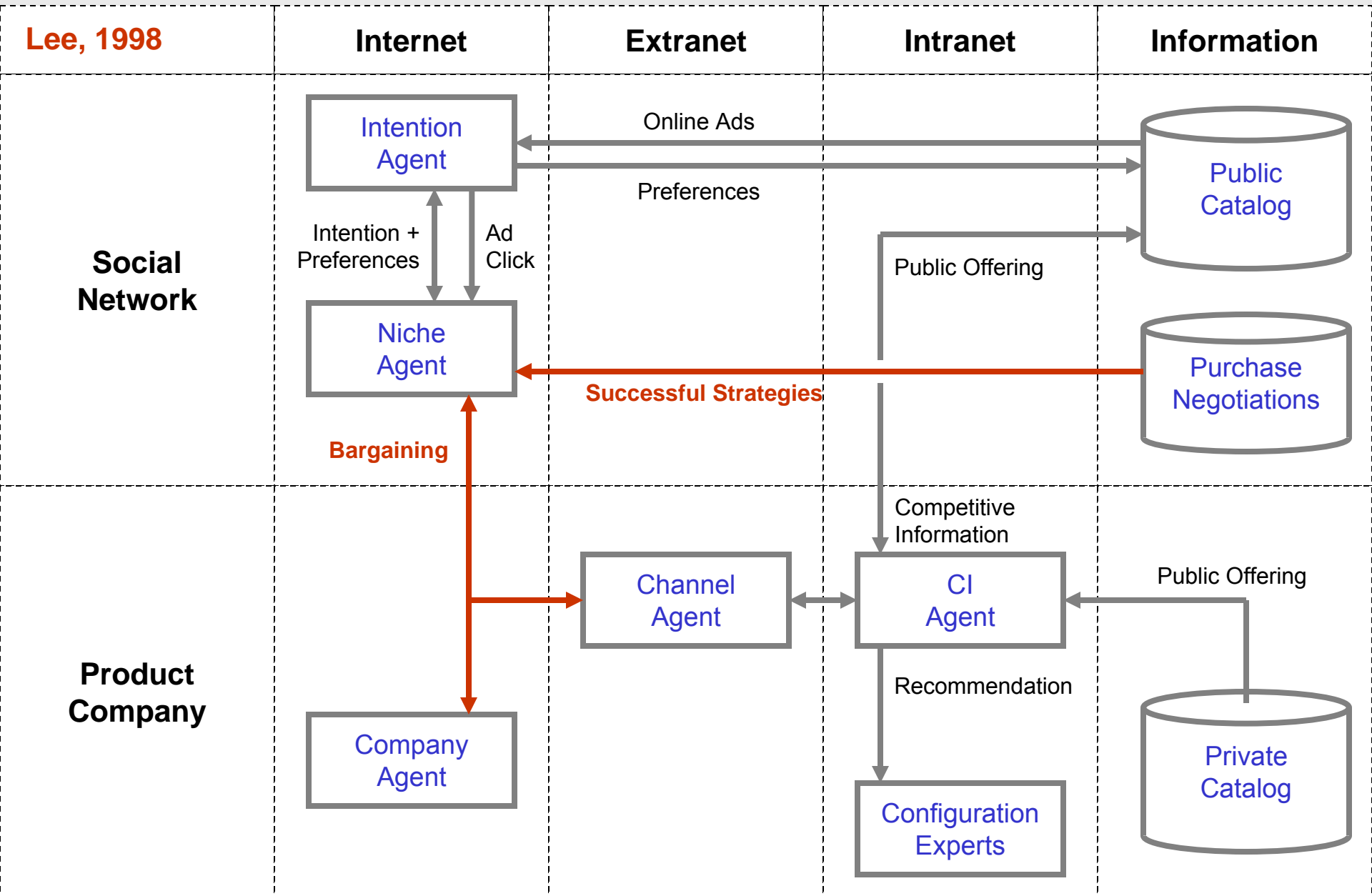
13. Agents

Buy Step 2: Preferences → Vendors + Their Channels



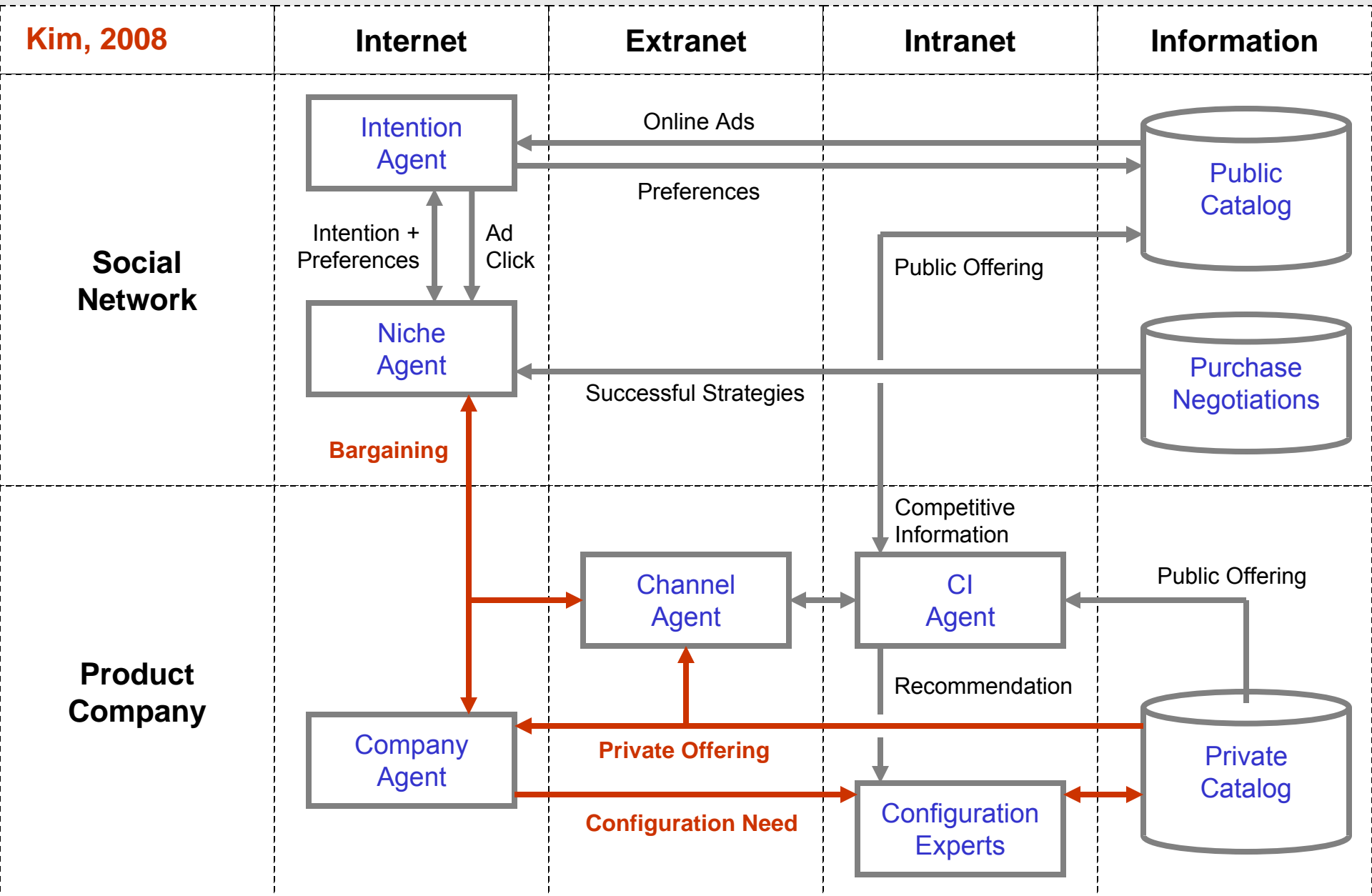
13. Agents

Buy Step 3: Use Successful Negotiation Strategies



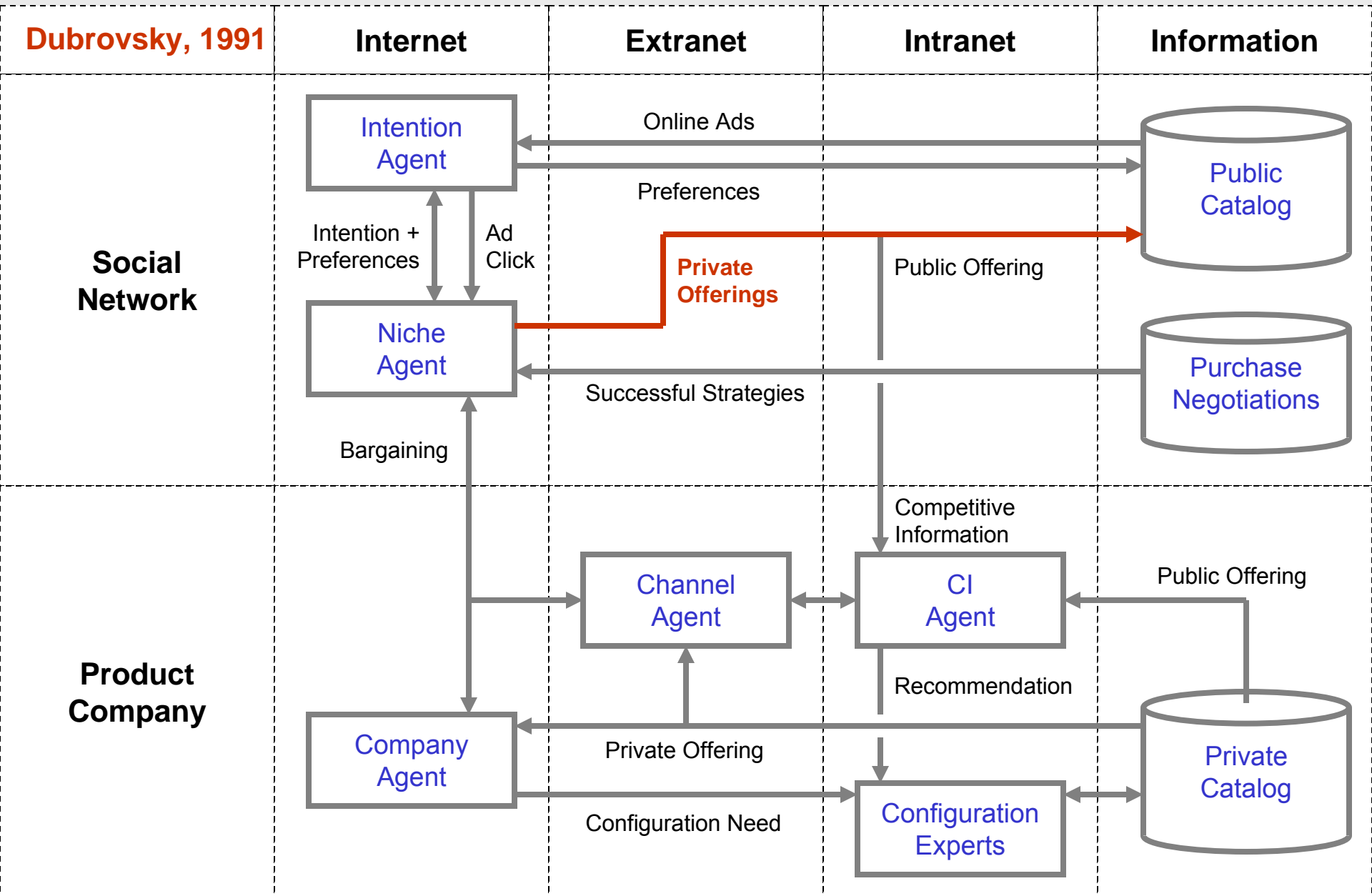
13. Agents

Buy Step 4: New Configurations Might Be Offered



13. Agents

Buy Step 5: Publish Previously Non-public Configs.



Mental Distance

and Its Implications for the Design of Software and Data

Part 1 – Prolog

Part 2 – Traditional Perspective

Part 3 – Alternate Perspective

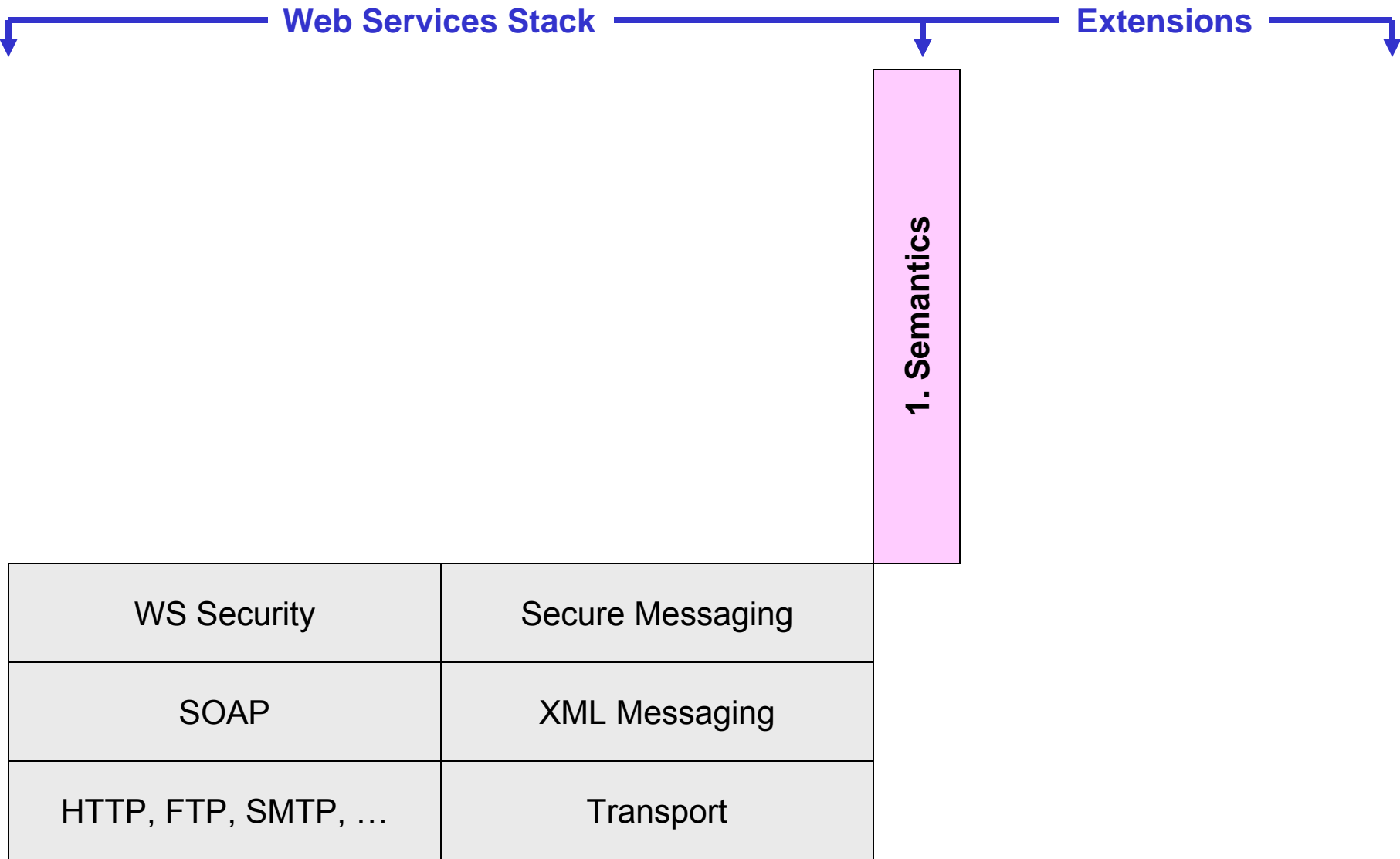
Part 4 – Software Implications

Part 5 – Epilog

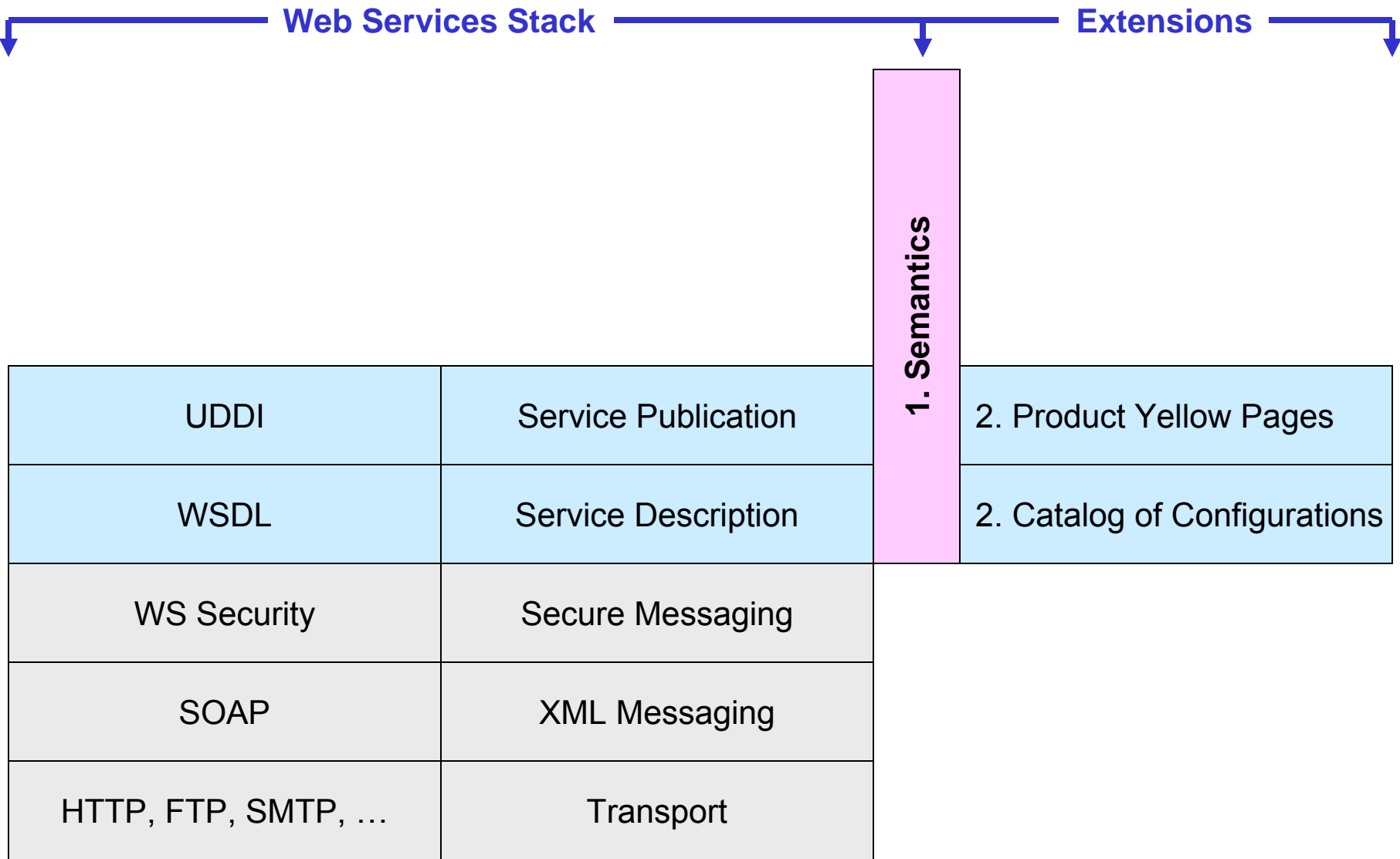
- Semantic Web Fit

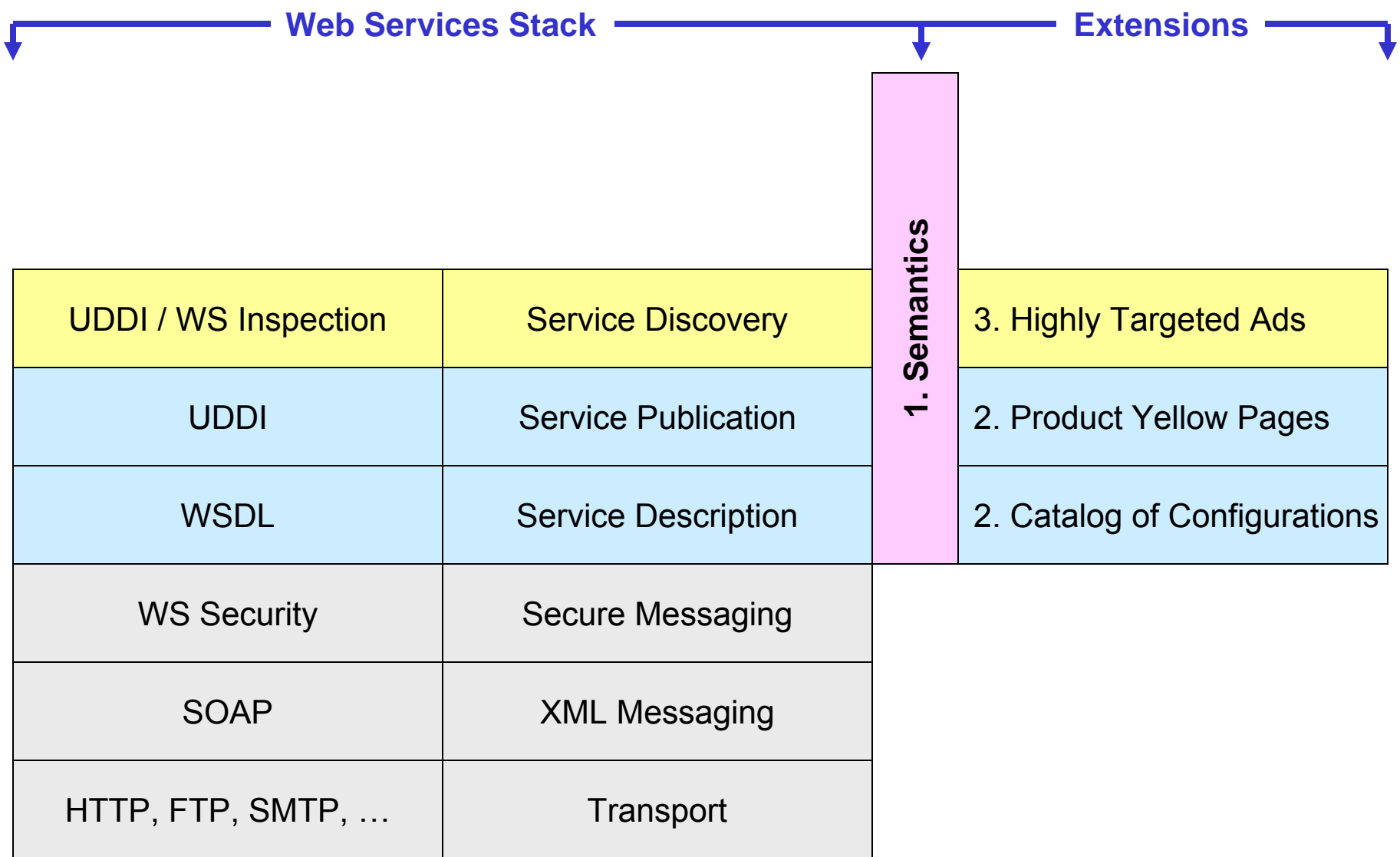


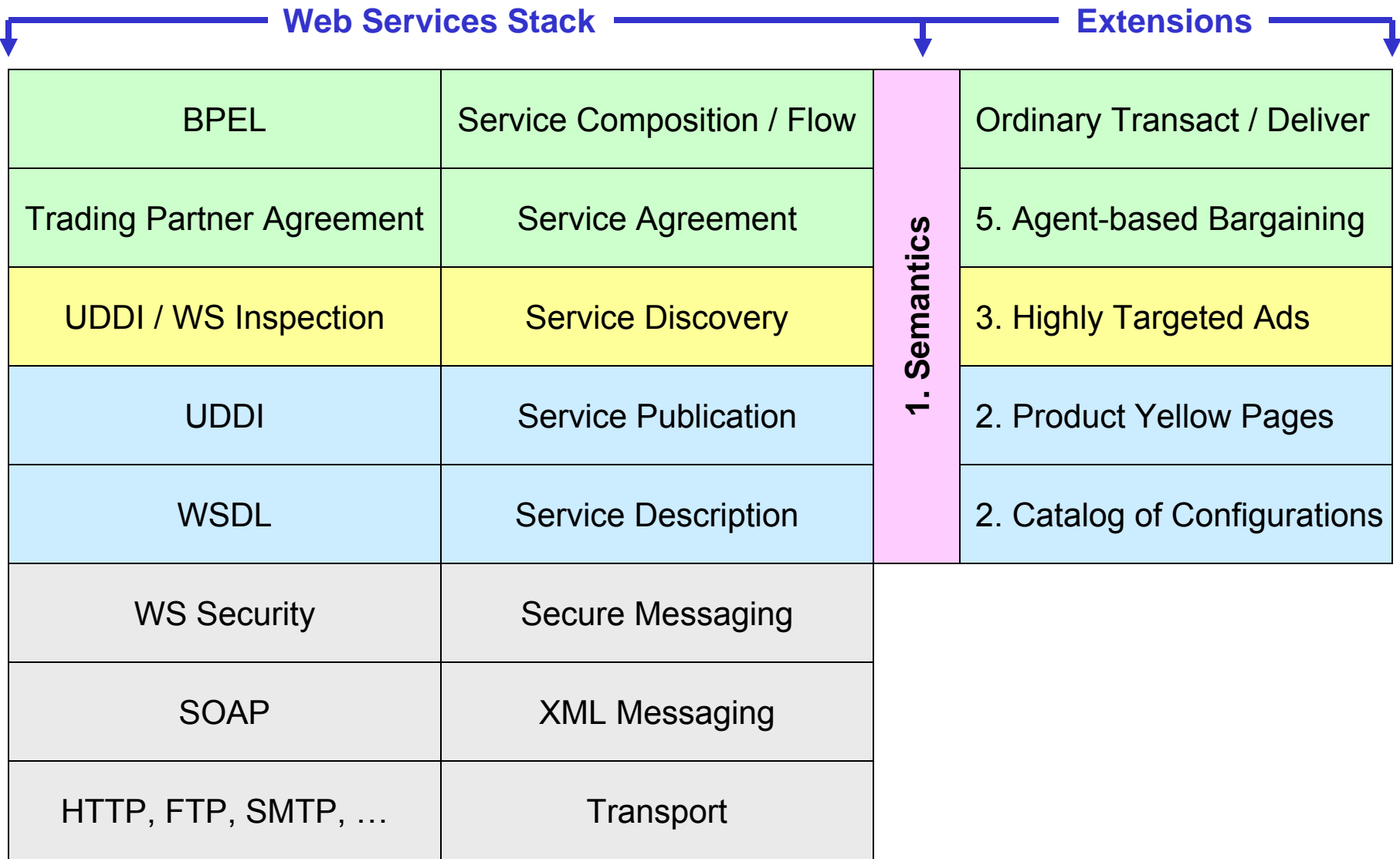
WS Security	Secure Messaging
SOAP	XML Messaging
HTTP, FTP, SMTP, ...	Transport



Bussler, 2002







Mental Distance

and Its Implications for e-Business Software

Thank you!

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July 24, 2010

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