2011 Ontology Summit Communique:
Making the Case for Ontology

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This talk is a companion to the Joint Communique of the Ontology Summit 2011, the sixth annual series of events in which the international ontology community explores a given topic over a series of online meetings culminating in a face-to-face symposium held at the National Institute of Standards and Technology (NIST).

Goal: *The goal of the 2011 Ontology Summit is to assist in making the case for the use of ontology by providing concrete application examples, success/value metrics and advocacy strategies. This communique provides tips, guidelines, and strategies for making the case for ontology to a variety of potential beneficiaries and future stakeholders.*

A solution looking for a problem.

- **'O' community searched and searched** (80s & 90s)

- **Build more and more ontologies**

and more and more tools

- **For a dozen years, still searching for commercial impact.**

Can you spell 'glacial'?

- **Main output:**
  - **Long lists of potential benefits**
  - **Lots of research prototypes**

- **Explosion of commercial interest and deployments began as a trickle around 2000.**

- **Mid-late 2000s more and more reported deployments and benefits.**

- **Surprise: reported benefits same as predicted!**

Recent Trends

- **Semantic Technology Conf. grows through recession**

- **Semantic Technology Companies / Consultancies**
  - **2005: a few dozen**
  - **2010: several hundred**
  - **Bigger companies buying smaller ones**

- **Patent Applications:**
  - 90s: **a handful per year**
  - Pre-recession: **triple digits**

- **Semantic Web Meetups:**
  - 100% annual growth for 3 yrs

Semantic Web Meetups around the world

Groups	Members	Interested	Cities	Countries
72	12,468	3,154	52	17

Put this map on your website.   Timeline animation

Semantic Web Meetup Group   Interested in a new Semantic Web Meetup Group

6

Today

- **Large numbers of deployed ontologies (100? 1000s?)**

- **Dramatic increase in recent years**

- **Technology is mature and ready for prime time**

- **Still niche…   Still too many blank stares.**

- **Making the Case for Ontology is necessary for ontology to become mainstream.**

Target Audience

- **First:** Ontology Technology Evangelists (you know who you are).

- **Second:** Semantic Technology Evangelists

- **Third:** Anyone interested in learning about practical value of Ontology and/or Semantic Technology

Four Guidelines

1. **Know who to target**

   - *Early adopters*
   - *Has problems that ontology can solve*

2. **Establish Relevance**

   - *Value, not technology*
   - *Relate to audience situation*
   - *Show how and why ontology adds value*

3. **Generate Excitement, Instill Confidence**

   - *Relevant success stories*
   - *Cite market trends & activity*
   - *Be realistic.*

4. **Communicate Clearly and Listen**

   - *Concrete, not abstract*
   - *1 liners and Elevator Speeches*
   - *Tailor to audience*

Building a Foundation for Making the Case

HERE and NOW:
- *Examples of Ontology Applications*

- *Ontology Usage Framework*

- *Value Models, Value Metrics and the Value Proposition*

FUTURE:
- *Grand Challenges*

OVER-ARCHING
- *Strategies for "Making the Case"*

Where and How are ontologies already being applied and delivering value?

- *Just about everywhere you look*
- *Variety of mechanisms*

For example:

- Secure and dynamic infrastructure for combining wide variety of information on large scale.

- Add intelligence to the user interface.

- Semantic document processing in law, medicine, defense

- Ontology-driven software engineering for dramatic improvements in speed of development and reliability.

More Examples:

- Improved monitoring and maintenance in manufacturing

- Manage networks providing diagnostics, logistics, planning, scheduling & cyber-security

- Build systems that know, learn, adapt and reason as people do – e.g. e-learning, tutors, advisors

- Assess risk and compliance in policy-driven processes such as fraud, case management & emergency response
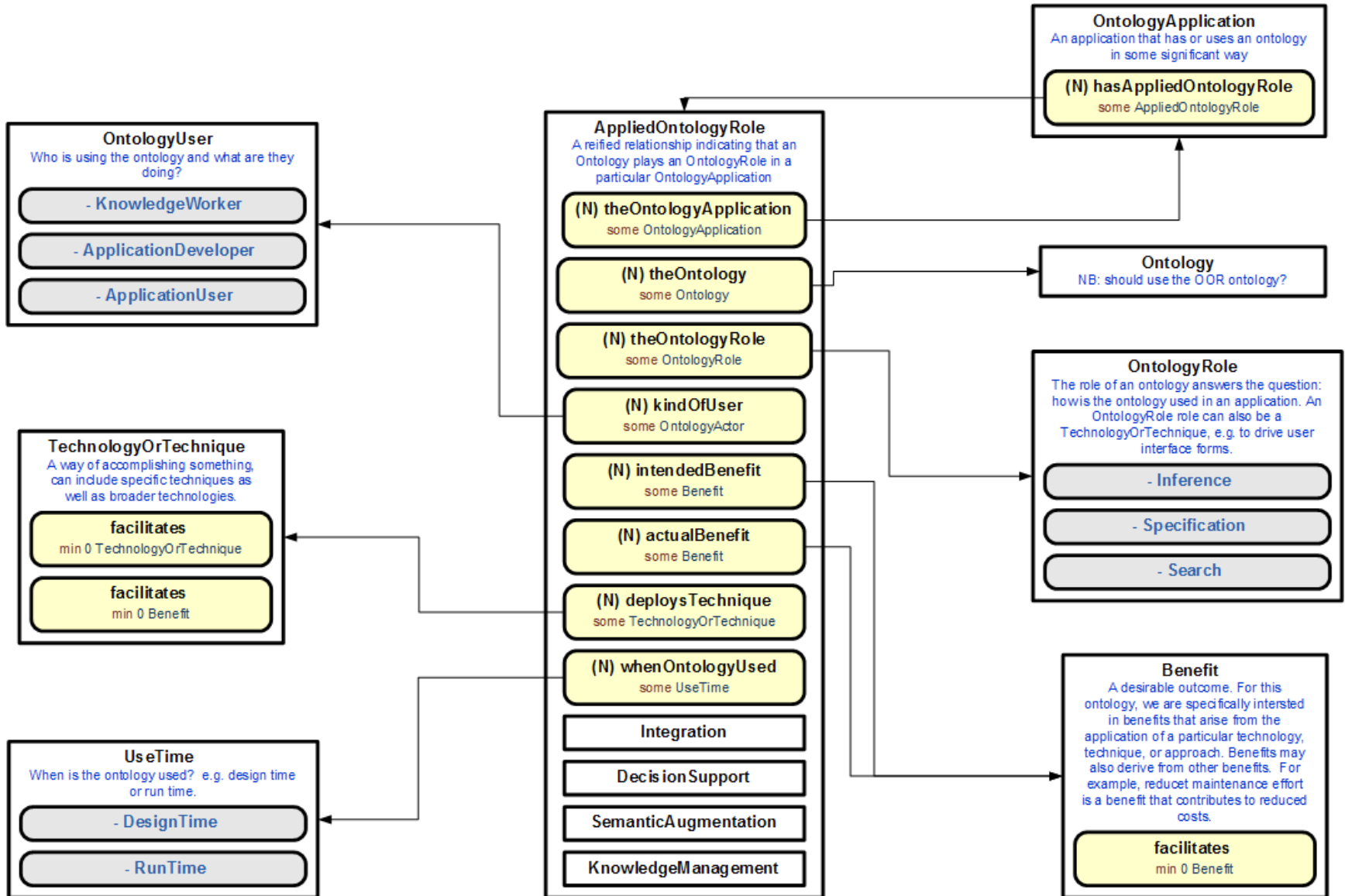
A Startling Variety!

Ontology Usage Framework

GOALS

- To better understand and classify ontology uses

- A common way to compare and contrast (metadata)

- Basis for a future searchable online catalog

Variety of Dimensions…

Ontology Usage Framework

Where is the value?

Five broad categories:

- IT Efficiency

- Operational Efficiency

- Business Agility

- Business Efficiency

- Customer Satisfaction

Other value propositions:

- Human understanding

- Agility / Flexibility

- Interoperability / Integration

- Customer Satisfaction

How to tell the story of value?
(hint: first GET the story!)

Manufacturing Quality Assurance

Defective Widgets:
- 1 in a 1000 widgets coming of the line are defective
- All have same defect

Challenge:
- Enormously complex manufacturing process
- Countless possible pathways
- Very time consuming to track down, may not succeed

Manufacturing Quality Assurance

SOLUTION:
- **Build ontologies for various aspects of business**
  - Each machine, components and attributes
  - Manufacturing process pathways
  - Products

- **Capture data during manufacturing process; based on the ontologies**

- **Query the system:**
  - What is common among all defective widgets?
  - Answer: 99% of defective widgets came off one particular line

Manufacturing Quality Assurance

OUTCOME:
- **System uses data & knowledge to draw conclusions** e.g. identify machines as source of problem

- **Go look at machines, notice defective part, replace it.**

- **Generate a report as well**

- **Used to take a week, now takes 10 minutes.**

- **Customer**:   "We love ontologies." Continued investment.

Manufacturing Quality Assurance

Why Did It Work?

- **Flexibility: Traditional DB applications brittle,** not able to support changing environment.

Geekese for "Connectivity"

- **Interoperability / Integration: Ontologies are basis for linking across data silos.**

Geekese for "Drawing conclusions"

- **Inference: In complex environment, reduce information overload.**

Get and tell this story.

Strategies for Different Audiences

Audience	Goal / Approach
Policy/Strategic Decision Maker	Convince them that this is the strategic direction to go. e.g. identify a poor decision that an ontology could have helped prevent.
Budget Holder / Business Decision Maker	Convince them that this is a good investment.
Technology Decision Maker (e.g. CIOs, Architects)	Convince them that this is the right concept.
Technology Implementer	Convince them that this is the right implementation approach.
Users/Consumer	Create trust, create buzz, as they will be driving the needs.
Educator	Train people with the right skills.

Clarify meaning and reduce complexity.

"Ontology is critical for you to know the difference between what you think you know and what you really know."

"Francis Ford Coppola said 'The secret to making a good movie is getting everyone to make the same movie.' So it is with enterprises and that's what ontologies [can often] do."

"Ontology … provide[s] a unified account of how human thought and machine data can be united into a Web of meaning."

Improve Agility and Flexibilty

"There are three main things that ontologies are good for: Flexibility, Flexibility and Flexibility."

"The real world is complex and changing, you need a solution that can cope with that complexity and adapt with the changes. That's what ontology does for you"

"… [Ontologies] provide a powerful framework to manage, update and evolve the high value components of responsive, agile organizations."

Improve Interoperability and Integration

"Ontology enables semantic interoperability by presenting information consistently across organizations and domains and machines"

"Growing complexity and a need for smarter use of resources and solutions that cut across silos, means that it has become ever important to make explicit [our] implicit ontologies thereby easing interoperability and improving operational effectiveness.... "

A New Paradigm?

"Ontology does for machines what the World Wide Web did for people."

"Ontology promises to be the driver for the next paradigm shift. If you think personal computing, and the Internet have been disruptive, wait and see what Ontology can bring about."
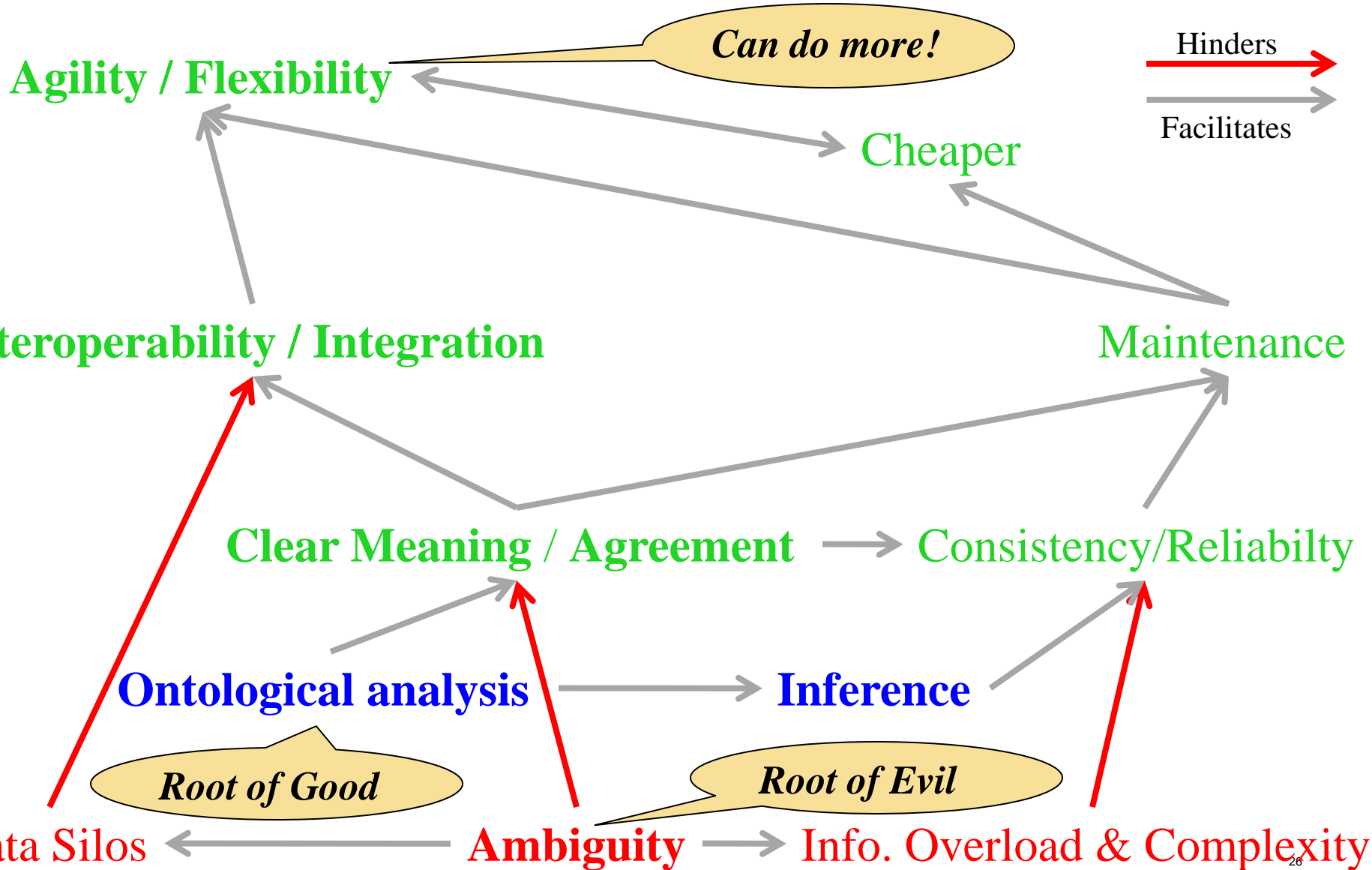
"Everything in IT up till now has been about technology first and business a distant second. But semantic and ontological technology are different ... No other technology has ever really been primarily about the work of business."
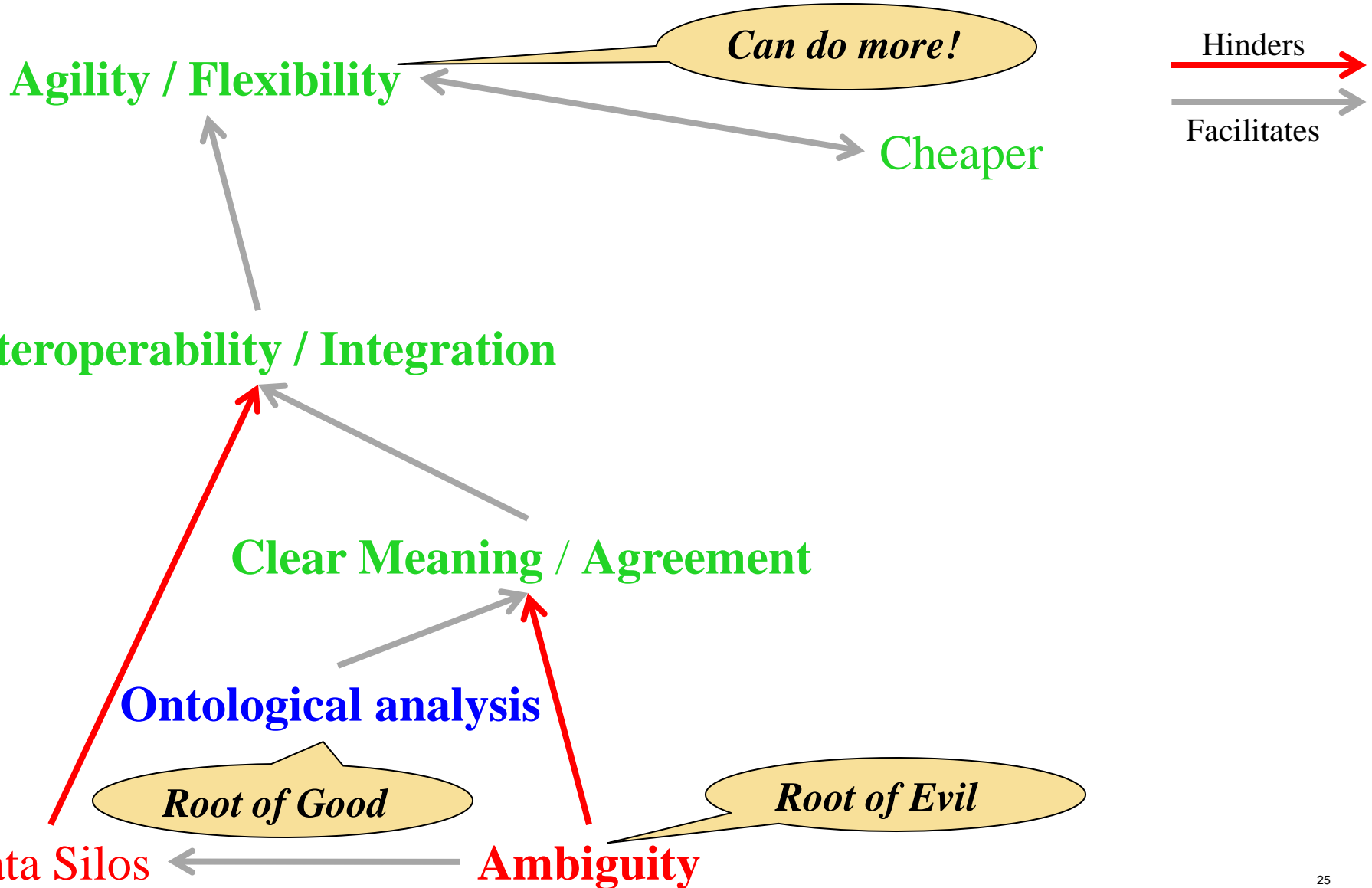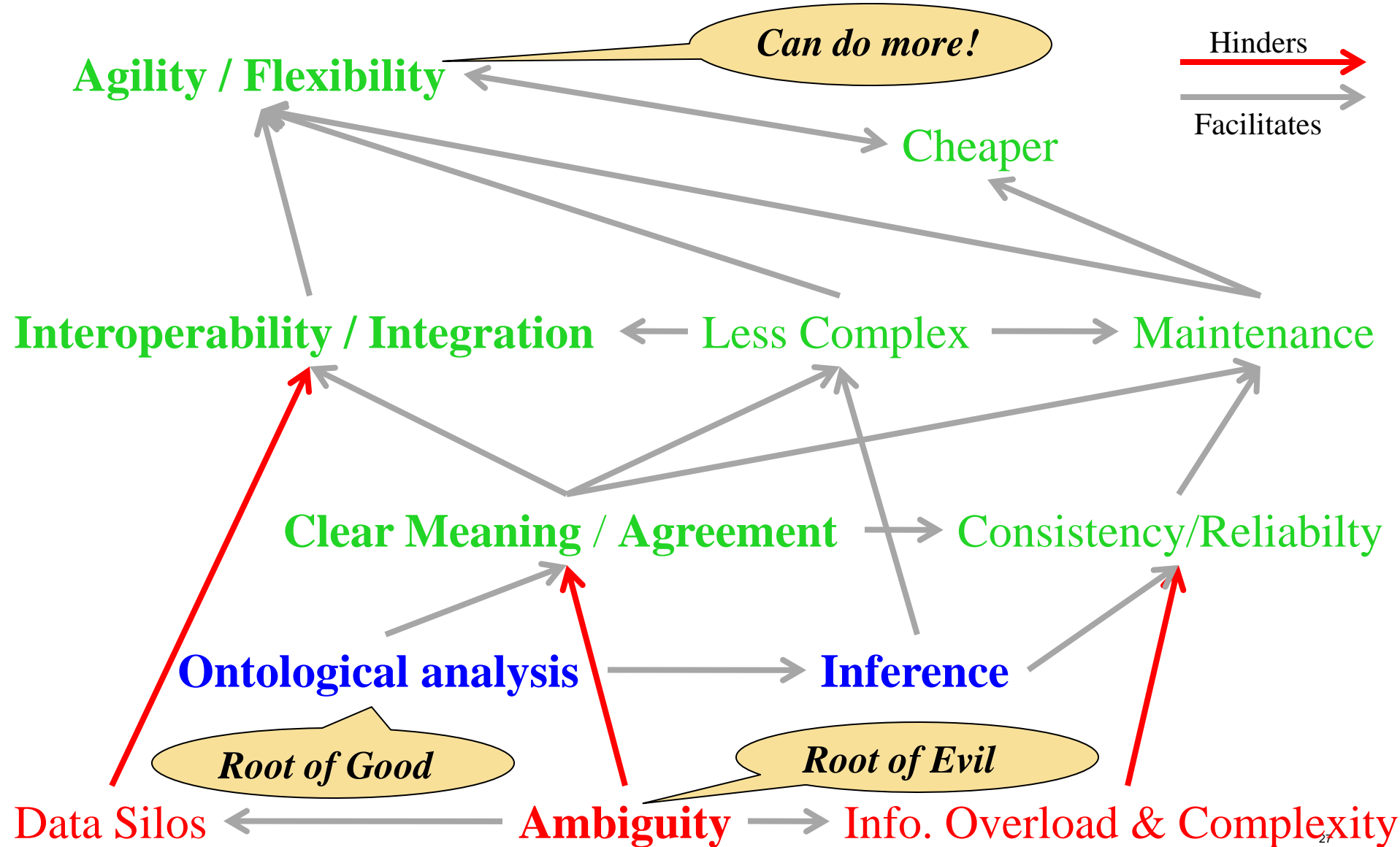
Natural Synergy with "Semantic Technology"

- Semantic Web - Graph data structures (flexibility)

- Machine Learning

- Natural Language processing

- Similarity technology

The Main Message

- Ontology is about clarifying meaning and supporting inference

- Key value propositions are:
  - Getting to shared understanding
  - Flexibility/agility
  - Interoperability Integration

- Ontology technology is ready for prime time

Go Forth and Ontologize!