A Pragmatic Approach to Agent Societies

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A Pragmatic approach to Agent Societies
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- Introduction: Paradoxes, challenges, opportunities
- Scenarios:
  - NEON, Collaborative Protegé, BPEL4People, CYC
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Acknowledgments


Foreword: our position


- EU IST ELeGI project 2205 final report, 80p, June 2007

N. Singh, The Pragmatic Web: Preliminary Thoughts

- We can achieve the vision of the semantic web by first concentrating on services rather than data and second by modelling services as agents rather than as distributed objects and viewing service providers and consumers as participating in rich multiagent systems.
Foreword: other’s recent position

John F Sowa (Oct08) Dynamic Ontology, A Wittgensteinian Method of Relating Language to the World … This talk compares Wittgenstein's ideas to trends in artificial intelligence. Monolithic frameworks similar to his early approach have had limited success, but his later ideas suggest promising ways of developing, relating, and using dynamically evolving ontologies. <<omissis>>

Alan Bundy (Feb07) Cooperating Reasoning Processes: More than just the Sum of their Parts Using the achievements of my research group over the last 35+ years, I provide evidence to support the following hypothesis: By complementing each other, cooperating reasoning process can achieve much more than they could if they only acted individually.
Foreword: Recent results


Introduction:
“If that is the solution, then … what was the problem?”

1. Optimization of the existing Products
2. Centralized architectures
3. Formal learning
4. Static
5. Client server
6. Objects
7. Synchronous communication
8. Algorithms
9. Compilation
10. Web
11. Individual
12. Rationality
13. W3C XML « standards »

1. Paradigm change
2. Services
3. Distributed architectures
4. Informal learning
5. Dynamic
6. Peer-to-Peer
7. Agents
8. Asynchronous communication
9. Interaction
10. Interpretation
11. Grid
12. Social
13. Emotions
14. Ontologies
Introduction: Three paradoxes

- Gap between “social” and “technological”
  - Co-adaptation (Scanlon & O’Shea, 2007) … We take a strong position that we now have new topologies for learning which have no direct analogues in past educational practice…
  - spiral model
  - human activities in focus (Clancey, 2005)

- Gap between “available” and “used”
  - Learning - Doing (Eisenstadt, 2007) … Advanced learning technologies have been touted for six decades as either a cost-effective or an exciting new way to provide real benefits to a wide audience. Yet, even given some stellar exceptions, the broader promise is demonstrably false. This paper attempts to disentangle the good from the bad, pointing out examples of what works, what fails, and why….

- Gap between “academy” and “industry”
  - Brain - Brawn; Agents - (Web and Grid) services; Ontologies - Standards …
Introduction: two meanings of “pragmatic”

- **Pragmatic #1**: concrete
  - “If that is the solution, then … what was the problem?”
  - Practical, concerned with making decisions and actions that are useful in practice, not just theory

- **Pragmatic #2**: related to Pragmatics
  - Pragmatics is the study of the ability of natural language speakers to communicate more than that which is explicitly stated.
  - Another perspective is that pragmatics deals with the ways we reach our goal in communication.
    - Speech Acts
  - **The Pragmatic Web**
Introduction: Agent Societies

- Interaction-> Human and Artificial Agents
  - HA-AA; HA-HA, HA-HA mediated; AA-AA
- Communication-> collaboration and competition
- Foundations-> sharing “meanings” in context
- Central role of Ontologies-> but also of other standards
- Human in the loop-> first of all Learning (*who can help me NOW?* - *presence and trust!* )
- Asynchronous (eg: Wiki, Protegé, Neon …) and Synchronous (eg: Skype, Flashmeeting, Agora …)
Collaboration and Sharing

- Collaboratory
  - NeON
  - Collaborative Protégé
  - BPEL4People
  - CYC

- Access Grid
  - Collabvis

- Agora - GSD
  - Current use
  - Comparing Agora with Access Grid
What IS Interaction?


- **Problem solving**
  - Performing a task - providing a service
  - Algorithmically producing outputs from inputs

- **Observable Behavior**
  - Functional transformation from input to output
  - Interaction steps
  - Interleaved inputs and outputs modeled by *dynamic streams*
  - Future input values depend on past output values

- **Environment**
  - Is part of the model
  - Supplies inputs, consumes outputs
  - Cannot be static or effectively computable
  - **May include humans**

- **Concurrency**

*Concurrent, distributed, reactive, embedded, component-oriented, agent-oriented, service-oriented systems exploit INTERACTION AS A FUNDAMENTAL PARADIGM*
From Products to Services in Human-Human Interaction: Computer mediated human communication#3: GSD in action
The scientific questions of the ENCORE project

- Is it possible to believe today that the construction of **shared** meanings in a complex but very focused scientific domain such as *Organic Chemistry* is feasible and under what conditions?
- Assuming the existence of Web 2.0 tools such as Wikipedia, is it just enough to use it also for scientific knowledge or rather we need a more **professional** infrastructure?
- In the era of Web X.Y, what are the implications of **humans consuming and producing services** within a **collaborative context** on the Net?
2.2.3 Matching requirements and tools
(page 22 of 82)
Collaborative Protégé & WS-BPEL

- BPEL for People (2007)
- Modeling Human Aspects of Business Processes ...(2008)
CYC

- Dough Lenat Video, 2006
- … there is no "correct" Ontology … no "correct" KB …
- … 12 different Web sites disagree on what the meaning of an employee is …
- … need to share not just content but context (who believed it, when, at what level of granularity, … microtheory …)
- … RDF, OWL: tens of relations; we found you need tens of thousands of relations (cq: words in a language) …
- … the earth is locally flat (even if it is globally spherical) …
- … if it is raining carry an umbrella …:
  - Assuming: human being, after the invention of the umbrella, unless you go swimming, …
Dimensions of the **context space** -> context subsumption

*(if p is true in context C and p->q is valid in context k and c and k overlap, when is q true ?)*

- Let’s
- Time
- GeoLocation
- ofTypePlace
- ofTypeTime
- Culture
- Sophistication/Security
- Topic
- Granularity
- Modality/Disposition/Epistemology
- Argument-Preference
- Justification
Emerged from **ELeGI - Informal Learning Stream**
- Context specific to Human Learning
- **SEES on Learning as a side effect of Building an Ontology**

**Awareness, Ubiquity, Immanence**

**Trust on the Virtual Community**
- **Security, Presence**

**Immediate learning** to communicate

Subsequent learning to build Ontologies
- With the available tools (eg: Protegé, NeON, other ones ..)

The next scenario: **CNFM**
Conclusions

“If that is the solution, then … what was the problem?”

Pragmatics, Semantics, Syntax in the order

Being pragmatic means also being realistic

If the goal is Education, then the prerequisite is motivation: emotions and rationality

We cannot solve complex problems with simple means; perhaps we may simplify the problems, yet progress …

Happy to be with you! MANY THANKS TO BRAZIL AND YOU ALL for inviting me again!