Ontology Summit 2010 Symposium:
Creating the Ontologists of the Future

Future of Ontologists:

A Synthesis of Community Input & RTDelphi Study Results

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(v 2.1)

Future Outlook for Ontologists

Mission: **to develop an outlook on the Future Landscape of the Field of Ontology and Possibilities for the Education and Training of Ontologists**

The process …

- Collaboration with folks from the Millennium Project (a preeminent group of futures researchers)
- Panel Session-1 - "Surveying the Landscape and the Possibilities" - Thu 17-Dec-2009 [ref.]
- Synthesis-1: to come up with relevant Developments [ref.]
- RTDelphi Study revolving around the 16 Developments identified [ref. 1-summary] [ref. 2-full]
- Synthesis-2: key results, findings and observations

Pertinent Questions: [ref.]

- What major "Developments" do we foresee happening to the domain of Ontology?
- What are important trends that are beginning to emerge?
- How many "ontologists" (or professionals with an "ontology education") will the world need?
- When do you think we will start having "ontology departments"?
- What needs to happen between now and then?

Presenting ...

The Real-Time Delphi Study

Results

Collection of judgments about when certain developments* might occur, with possible reasons, drivers and barriers

**a development* *is an event or a fact that could have a significant impact on the future of a field, sector, world, etc.*

Collected Responses

The RTDelphi Study – see: [survey page]

Number of Participants: **35**

(cutting off at end 25-Feb-2010)

Demographics:

Gender Distribution:

Males= 75.00 %

Females= 25.00 %

Employment Distribution:

Academia: 26%

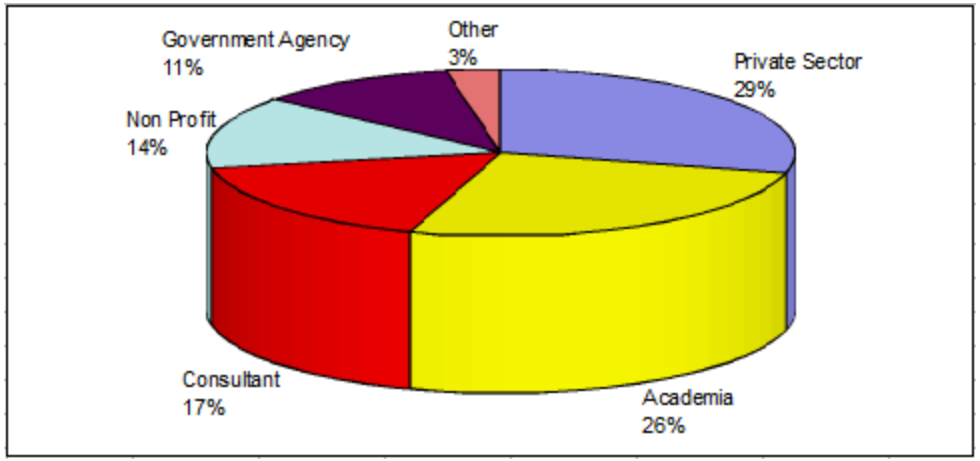
Private Sector: 29%

Non Profit: 14%

Government Agency: 11%

Consultant: 17%

Other:3%

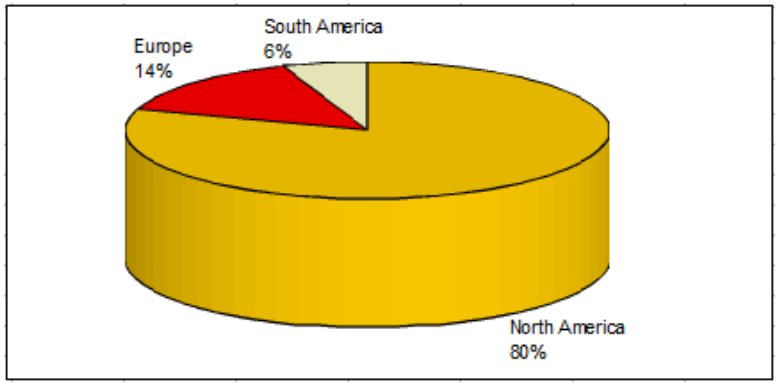


Region Distribution:

Europe: 14%

South America: 6%

North America: 80%



The Key Question: **When Will it Happen?**

- Already here, now?
- Within 2 years
- in 2~5 years
- in 5~10 years
- in 10~20 years
- beyond 20 years
- Never?

… if we want to develop education and training strategies for future ontology professionals, we better first try to understanding what it would be like for ontologists then.

The Collected Input

Referencing the [Response summary] …

Time-ranked visual of the collected input from the "Future of Ontologists" RTDelphi Study (v1.1b):

	Development	here now	within 2 yrs	2 to 5	5 to 10	10 to 20	beyond 20	never
14	Evidence of ontology benefits							
13	Ontology-enabled applications							
11	Ontology repositories available							
6	Proper understanding by industry and academia							
10	International standards also expressed as an ontology							
3	Cross-disciplinary programs							
4	5% of all professionals have ontology training							
16	Major breakthrough							
15	Ontology R&D funding							
5	Accredited programs are available							
12	"Ontologizing" tools largely available							
7	"Ontology" taught in secondary/high school education							
1	University Ontology Science department							
2	Ontology Engineering department							
9	Ontology understood by everyday people							
8	"Ontology" taught in primary/elementary school education							

Legend:	
	no answer
	<10%
	10-19.9%
	20-29.9%
	30-39.9%
	40% or above

(updated)

The Collected Input (ranked by time-frame)

This table summarizes the responses only for the column labled Timeframe. It is rank ordered.

Rank	Q Numb	Group	Question
1	14	7.60	Compelling evidence of the benefits of "Ontology" emerge; please suggest what they might be.
2	13	7.00	Compelling "ontology-enabled" applications emerge; please suggest what they might be.
3	11	6.63	Persistent repositories of quality ontologies are available for professional and public use (and they are being regularly used).
4	6	5.47	The terms and the disciplines of "Formal Ontology" and "Ontology in Information Science" are properly understood by academia and industry (in related fields).
5	10	5.31	International Standards are regularly being developed and expressed, BOTH in a natural language and as an ontology.
6	3	5.05	On a global basis, at least 10 universities have cross-disciplinary programs in Ontology Science and/or Engineering department offering Master degrees (for career professionals) or PhD degrees (for researchers).
7	4	4.65	At least 5% of all professionals in system architecture, systems design and engineering, software engineering and information technology will be required to have proper ontology training (and a larger number will need some background in ontology).
8	16	4.44	A major breakthrough is made in the field of Ontology.
9	15	4.19	Significant increase (10x the current level or better; assuming current level is non-zero) in R&D funding is put into developing Ontology science and engineering.
10	5	4.00	Accredited programs are available from educational institutions that train certified professional Ontologists (with the kind of standings that other professionals like scientists, engineers, architects, lawyers, doctors, nurses, pharmacists, etc.)
11	12	4.00	Compelling tools that allow everyday data and information to be "ontologized" by everyday people emerge; please suggest what those tools might be.
12	7	3.44	The "ontology" word, and teaching of the basics of it, shows up in secondary/high school education.
13	1	2.65	On a global basis, at least 10 universities have an Ontology Science department.
14	2	2.40	On a global basis, at least 10 universities have an Ontology Engineering department.
15	9	2.06	The discipline of "Ontology" is properly understood by everyday people (the way disciplines like mathematics, physics, psychology, music, art, etc. are understood).
16	8	1.31	The "ontology" word, and teaching of the basics of it, shows up in primary/elementary school education.

	Weight
here now (please explain)	10
within 2 years	9
2-5 years	7
5-10 years	5
10-20 years	3
beyond 20 years	1
never (please explain)	0

The Collected Input (ranked by time-frame)

Referencing the [Response summary] …

	Development	here now	within 2 yrs	2 to 5	5 to 10	10 to 20	beyond 20	never
14	Evidence of ontology benefits							
13	Ontology-enabled applications							
11	Ontology repositories available							
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Legend:	
	no answer
	<10%
	10-20%
	20-30%
	30-40%
	>40%

The Key Findings from the RTD Study (1)

Referencing the [Response summary] …

- There is general consensus from the panel of experts that a lot of these developments will be happening in the next 5~10 years *(some earlier, some later, of course!)*
- the general consensus is that a huge number of people with proper ontology education and training will be needed:
  … say, to the tune of 5% of information systems and software engineering professionals, in the 5~10 year time frame
- given that education and training should be in place before we can actually fill those demands, the sense of urgency to do that promptly and properly, should not be taken lightly
- That the study of Ontology will likely show up as cross-discipline programs, rather than as an Ontology Science or Ontology Engineering department in Universities

The Key Findings from the RTD Study (2)

Referencing the [Response summary] …

- A fair number believed that we (already or will soon) have good evidence on the benefits of the ontological approach, exemplified by (progressively) compelling ontology-driven applications, available ontology repositories and adoption by International standards, which will help drive a better understanding in Ontology and its value by industry and academia
- While R&D funding is supposed to be a leading indicator for the growth in the field of ontology, there is no consensus on its availability, and it appears that it might trail the timeframe of other developments
- somewhat lagging, too, are the availability of tools that might enable the wider adoption of the ontological approach

The Key Findings from the RTD Study (3)

Referencing the [Response summary] …

- There is a strong urge toward:
  - Clearly defining the discipline so that the field can settle in (as is, even practitioners are sometimes confused)
  - Making the investments in Education and R&D that befits the potential impact that Ontology promises
  - Develop the required body-of-knowledge and the curricula so as to provide reference for educators and trainers
  - Developing compelling applications so that others outside of the field can appreciate the value of the ontological approach
  - Developing the tools that will allow ontologies to be applied by more users (than just the experts)

The Key Findings from the RTD Study (4)

Referencing the [Response summary] …

- It is also generally believed that this discipline of “ontology” will not likely be understood by the masses (as they understand the disciplines of mathematics, physics, psychology, music or art, etc.) … and, while Ontology education might eventually move into secondary/high school education, it is unlikely that it will show up in primary/elementary schools
- See the wide range of opinions from the [full collected input dump] to make your own assessments and use that to help your own decision making ...

Postscript: about future studies (1)

- *" ... the future is already here, it's just unevenly distributed"* -William Gibson
- No one can predict the future. We are doing this so we can present a collective vision we can all share and, possibly, support our decisions with
- *"The best way to predict the future is to create it"* -Alan Kay

Postscript: about future studies (2)

- Given that the respondents are supposedly experts in the field and those who 'believe in' the future of ontology … do note that,
- Those who are deeply involved have a tendency to be over-optimistic about how soon things might happen
- … they also have a tendency to underestimate the strategic impact
- *"Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever has"* -Margaret Mead

A Huge

Thanks You!

... to each and everyone who has contributed to this study

- Questions?

  … email us:

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