Ontology Summit 2010: Creating the Ontologists of the Future

Survey Report:
Ontological Curricular Content and
Quality Assurance —
Presently





Co-Champions

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 Presenter.





Tracks at-a-Glance

Curricular Content—Presently:

 Mission: The track mission is to survey the existing provision of ontology education with regard to curricular content.

Questions of Substance:

- Which educational programmes are there, if any, which are mainly or entirely devoted to ontology and related topics?
- Within other educational programmes, what modules/courses are there which are mainly or entirely devoted to ontology and related topics?
- Are there any other programmes or modules/courses with sufficient ontologically relevant content?
- Are there curricular models (a.k.a. curricular guidelines) that include ontology-related topics?

Quality Assurance—Presently:

- Mission: The track mission is to survey the existing forms of quality assurance (e.g., accreditation, certification, and licensure) for programs, courses, and professionals.
- Questions of Substance:
 - By what bodies, if any, are the programmes identified as having substantial ontological content currently accredited?
 - By what bodies, if any, are ontology professionals currently certified?
 - What other forms of quality assurance exist that may be relevant to the track mission?





The Survey

- Survey questions are attached to this document (Appendix A)
- Data are from 1/13/2010 to 3/2/2010





The Results

- Structured in sections
- First section: our summary with comments
- Second section: our recommended future actions
- Third section: statistics per question ("Stats")
- Several appendices





 The large amount of 'noise' (incomplete and 'n/a' answers) is due to the fact our survey was the first one that was published and respondents were under the impression ours was the only survey being offered for the whole Ontology Summit 2010





- Only a few responses correspond to programs devoted to ontology-centered topics (3)
- The majority of the responses correspond to programs which offer ontology-centered courses, but not programs (21)
- The remaining responses correspond to courses with ontology-related topics, but not entirely ontology-centered (15)





- Most of the programs are degreeconferring
- Most of the programs are at the MS level
- Most of the programs are associated with Computing-related departments





 A total of 34 institutions were captured, from 9 different countries





 We captured quite a few ontology-related courses with their associated URLs (see Appendix C)





 It is not clear if the few captured curricular guidelines which target ontology-centered curricula are comparable—in terms of maturity—to those put forward by ACM/IEEE for Computing





- Bodies that accredit programs are in Appendix D
- Bodies that certify professionals are in Appendix E
- It is not clear if these professional certifications have the maturity of—say the IEEE Computer Society's <u>Certifications</u> for Software Professionals





- Development of an ontology-based registry with a web interface—that allows members of the community to add information about their educational and training initiatives which are ontology-centered
- The web interface would provide the community with dynamic answers to a variety of queries and also with access to shared educational and training resources





- An interesting project would be the development of this registry with a team of students from different universities (from different countries), in the context of capstone-like courses
- There might even be agencies that might fund this project (Any ideas?)





 Use the captured course information to compare with and contrast against curricular recommendations this community will put forward





 Since the majority of the captured programs come from Computing, the community might want to consider 'lobbying' to infuse more ontology-related content into computing curricula models (e.g., <u>ACM/IEEE</u>)





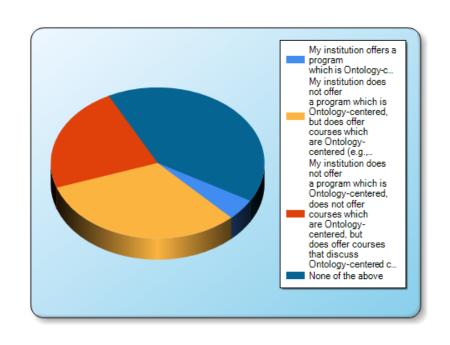
 Since there seem to be existing professional certification bodies, the community might want to consider offering feedback to them about their certification processes





Stats: Emphasis

| Response | Frequency | Count |
|---|-----------|-------|
| My institution offers a program which is Ontology-centered (e.g., "BS in Ontology Engineering") | 4.5% | 3 |
| My institution does not offer a program which is Ontology-centered, but does offer courses which are Ontology-centered (e.g., a course called "Applications of Ontologies to Software Engineering", as part of a "BS in Software Engineering") | 31.8% | 21 |
| My institution does not offer a program which is Ontology-centered, does not offer courses which are Ontology-centered, but does offer courses that discuss Ontology-centered concepts (e.g., ontologies are studied as part of a course entitled "Introduction to Artificial Intelligence", which is part of a "BS in Computer Science") | 22.7% | 15 |
| None of the above | 40.9% | 27 |
| Not Answered | | 16 |
| Mean | | 3.000 |
| Standard Deviation | | 0.961 |
| Valid Responses | | 66 |
| Total Responses | | 82 |

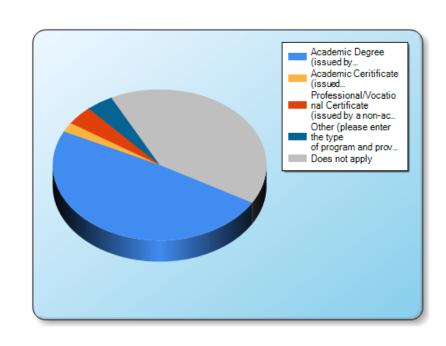






Stats: Type of Program

| Response | Frequency | Count |
|--|-----------|-------|
| Academic Degree (issued by an academic institution) | 49.0% | 24 |
| Academic Ceritificate (issued by an academic institution) | 2.0% | 1 |
| Professional/Vocational Certificate (issued by a non-academic institution) | 4.1% | 2 |
| Other (please enter the type of program and provide a brief explanation) | 4.1% | 2 |
| Does not apply | 40.8% | 20 |
| Not Answered | | 16 |
| Mean | | 2.857 |
| Standard Deviation | | 1.926 |
| Valid Responses | | 49 |
| Total Responses | | 65 |

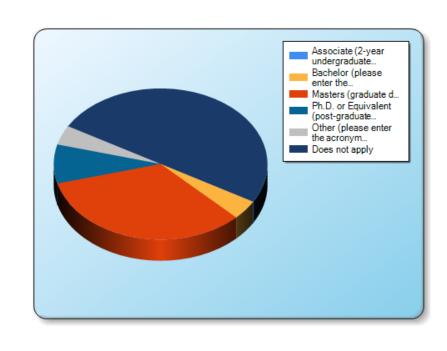






Stats: Type of Degree

| Response | Frequency | Count |
|---|-----------|-------|
| Associate (2-year undergraduate degree) | 0.0% | 0 |
| Bachelor (please enter the number of years) | 4.2% | 2 |
| Masters (graduate degree) | 33.3% | 16 |
| Ph.D. or Equivalent (post-graduate degree) | 8.3% | 4 |
| Other (please enter the acronym and its definition) | 4.2% | 2 |
| Does not apply | 50.0% | 24 |
| Not Answered | | 17 |
| Mean | | 4.625 |
| Standard Deviation | | 1.482 |
| Valid Responses | | 48 |
| Total Responses | | 65 |

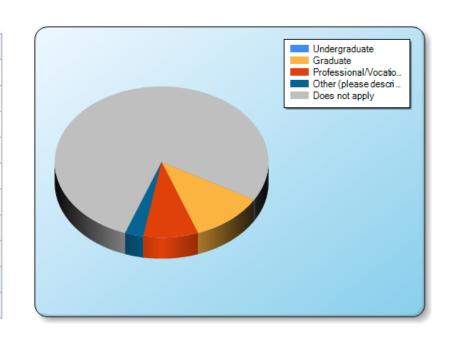






Stats: Level of Non-Degree

| Response | Frequency | Count |
|-------------------------|-----------|-------|
| Undergraduate | 0.0% | 0 |
| Graduate | 11.1% | 4 |
| Professional/Vocational | 8.3% | 3 |
| Other (please describe) | 2.8% | 1 |
| Does not apply | 77.8% | 28 |
| Not Answered | | 29 |
| Mean | | 4.472 |
| Standard Deviation | | 1.055 |
| Valid Responses | | 36 |
| Total Responses | | 65 |

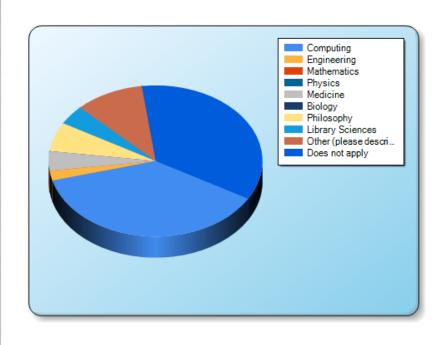






Stats: Main Discipline

| Response | Frequency | Count |
|-------------------------|-----------|-------|
| Computing | 37.5% | 18 |
| Engineering | 2.1% | 1 |
| Mathematics | 0.0% | 0 |
| Physics | 0.0% | 0 |
| Medicine | 4.2% | 2 |
| Biology | 0.0% | 0 |
| Philosophy | 6.3% | 3 |
| Library Sciences | 4.2% | 2 |
| Other (please describe) | 10.4% | 5 |
| Does not apply | 35.4% | 17 |
| Not Answered | | 17 |
| Mean | | 5.875 |
| Standard Deviation | | 4.113 |
| Valid Responses | | 48 |
| Total Responses | | 65 |







Stats: URL to Programs

Response Frequency Count Enter URL to program's website 21 48.8% Not available/Not known 51.2% 22 Not Answered 1.512 Mean Standard Deviation 0.506 43 Valid Responses **Total Responses** 65

Note: actually, 22 URLs were reported. See Appendix B





Stats: Courses and URLs

- We captured 48 course names
- Of these, only 26 URLs where submitted
- Not all URL submitted necessarily point (directly) to actual course syllabi
- See Appendix C





Stats: Curricular Models

- We captured the names of 5 bodies which offer advise on how to build ontologyrelated curricular content
- Of these, only 3 URLs were offered





Stats: Institutions

- We captured the names of 34 institutions
- From 9 different countries In the order they were entered: USA, UK, Germany, Belgium, Brazil, Iran, Italy, Japan, Netherlands
- (Apparently Ohio and California are now countries ©)
- Most of the names of units, and URLs to institutions and units were captured





Stats: Accreditation— Program

- We captured the names of 9 accreditation bodies
- Of these, only one is missing an URL pointing to it





Stats: Accreditation— Institutions

- We captured the names of 9 accreditation bodies
- Of these, only 3 are missing an URL pointing to it
- See Appendix D





Stats: Certification— Professionals

- We captured the names of 4 bodies that accredit Ontologists as professionals with their corresponding URLs
- See Appendix E





Respondent Comments

- We captured 16 final comments
- See Appendix F





Appendix A

Survey questions follow





Ontology Summit 2010: Content+Quality Presently

The context of this survey is the **"Ontology Summit 2010"** (OS10), whose theme is "Creating the Ontologists of the Future."

Information about OS10 can be found at http://ontolog.cim3.net/cgi-bin/wiki.pl?OntologySummit2010 (link will open in a new window)

OS10 focuses on three tracks: Content, Quality, and Requirements. This survey is associated with the tracks: current ontology-centered curricular content, and current quality assurance. We have defined the mission and questions we seek to answer in connection with these two tracks as follows.

Track Label: Content - Subtrack Label: Present

Mission: The track mission is to survey the existing provision of ontology education with regard to curricular content.

Pertinent questions: Which educational programs are there, if any, that are mainly or entirely devoted to ontology and related topics? Within other educational programs, what modules/courses are there which are mainly or entirely devoted to ontology and related topics? Are there any other programs or modules/courses with sufficient ontologically relevant content? Are there curricular models (a.k.a. curricular guidelines) that include ontology-related topics?

Track Label: Quality - Subtrack Label: Present

Mission: The track mission is to survey the existing forms of quality assurance (e.g., accreditation, certification, and licensure) for programs, and professionals.

Pertinent questions: By what bodies, if any, are the programs identified as having substantial ontological content currently accredited? By what bodies, if any, are ontology professionals currently certified? What other forms of quality assurance exist that may be relevant to the track mission?

The answers you provide when responding to this survey will be used to produce a report which will be presented at the Ontology Summit 2010 Symposium, which will be held at the National Institute for Standards and Technology (NIST: http://www.nist.gov/index.html), located in Gaithersburg--Maryland, USA--on March 15th and 16th, 2010. This event will be part of the 2010 NIST Interoperability Week.

Please, feel free to forward the URL to this survey to (and/or answer this survey on behalf of) colleagues you know who are associated with ontology-related

programs (academic, professional, vocational, etc.)

If you have any questions about this survey please contact the following individuals:

Dr. Antony Galton (School of Engineering, Computing, and Mathematics. University of Exeter, UK): A.P.Galton@exeter.ac.uk

Dr. Arturo Sanchez-Ruiz (School of Computing, University of North Florida, USA): ASanchez@unf.edu

Emphasis on Ontology-Related Contents. This question attempts to identify how your program emphasizes Ontology-centered concepts. Please select one of the options given below.

We are very conscious that in a world-wide context there is much scope for possible confusion arising from the use of different terms to describe key units of educational provision. For this summit we aim to use US terminology consistently as much as possible, and we would be grateful if participants from outside the US could draw our attention to variants that exist in other parts of the world that they are aware of.

In standard US usage the main terms used are:

- Program: a collection of inter-dependent curricular elements (a.k.a. "Courses"--see the definition below) which typically culminate in a degree (e.g., BS, MS, PhD) or a certificate, in a major. The "Major" of a program is usually associated with a discipline (e.g., "Computing", "Engineering", etc.) Some educational institutions in the US use terms such as "Concentration" and "Track" with a meaning that is akin to that of "Program," in the sense that "Concentrations" and "Tracks" do culminate in a degree or a certificate, in sub-area of a major. Consider, for example, a "BS in Information Systems" (as a sub-area of Computing.) In some US universities this program could be also called "BS in Computing with a Concentration in Information Systems;" or "BS in Computing Information Systems Track." For the sake of completeness, our definition of "Program" encompasses professional and/or vocational training programs which are not offered by an educational institution.
- Course: a cohesive curricular element that is offered by an institution as part of one or more programs.

In the UK, terminology varies somewhat across institutions. "Course" is generally used to mean a Program (for which this term is also used, but spelt "Programme"). What the US calls Courses, the UK typically calls either "Units" or "Modules."

- m My institution offers a program which is Ontology-centered (e.g., "BS in Ontology Engineering")
- m My institution does not offer a program which is Ontology-centered, but does offer courses which are Ontology-centered (e.g., a course called "Applications of Ontologies to Software Engineering", as part of a "BS in Software Engineering")
- m My institution does not offer a program which is Ontology-centered, does not offer courses which are Ontology-centered, but does offer courses that discuss Ontology-centered concepts (e.g., ontologies are studied as part of a course entitled "Introduction to Artificial Intelligence", which is part of a "BS in Computer Science")
 - m None of the above

| Please enter the name of the program which contains the courses (or select "Does not apply"). m Name of the Program m Does not apply |
|--|
| Please select/enter the type of program (or select "Does not apply"). m Academic Degree (issued by an academic institution) m Academic Ceritificate (issued by an academic institution) m Professional/Vocational Certificate (issued by a non-academic institution) m Other (please enter the type of program and provide a brief explanation) |
| m Does not apply |
| If your program offers a degree, please select/enter the type of the degree. Otherwise, please select "Does not apply". m Associate (2-year undergraduate degree) m Bachelor (please enter the number of years) m Masters (graduate degree) m Ph.D. or Equivalent (post-graduate degree) m Other (please enter the acronym and its definition) m Does not apply |
| If the program does not offer a degree, please select/describe its level, or select "Does not apply". m Undergraduate m Graduate m Professional/Vocational m Other (please describe) m Does not apply |
| Please select/describe the main discipline with which this program is associated; or select "Does not apply". m Computing m Engineering m Mathematics m Physics m Medicine m Biology m Philosophy m Library Sciences m Other (please describe) m Does not apply |
| If known, please enter the URL to the website associated with this program; or select "Not available/Not known". m Enter URL to program's website |

m Not available/Not known

If known, please enter the name and URL to the course descriptions/syllabi of up to 10 ontology-related courses which are part of this program. (Note: if the course name or URL is not known, please leave the text box empty)

| Course name 1 | • |
|------------------------|---------|
| URL 1 | |
| Course name 2 | · |
| URL 2 | |
| URL 2Course name 3 | |
| URL 3 Course name 4 | |
| Course name 4 | |
| URL 4 | |
| Course name 5 | |
| URL 5 | |
| Course name 6 | |
| URL 6 | |
| Course name 7 | |
| URL 7 | |
| Course name 8 | |
| URL 8 | |
| Course name 9 | |
| URL 9 | |
| Course name 10 | |
| URL 10 | <u></u> |

Ontology-Related Curricular Models/Recommendations/Guidelines.

Curricular models/recommendations/guidelines offer advise on how to build curricular contents associated with a discipline/sub-discipline. For instance, the Association for Computing Machinery (ACM), and the Computer Society of the Institute for Electrical and Electronics Engineers (IEEE-CS), have put together several of these. See, for instance:

- (a) http://www.acm.org/education/curricula-recommendations; and
- (b) http://www.computer.org/portal/web/education. Please enter the information of up to 5 institutions you are aware of which offer curricular models/recommendations/guidelines for ontology-related curricular content. Under "Level of recommendation", the options refer to ontology-related recommendations at the level of: (1) the program (enter "Program"); (2) courses within the program (enter "Courses"); and (3) topics within courses of the program (enter "Course Topics")

| | ithin the program (enter "Courses"); and (3) topics within courses of the rogram (enter "Course Topics") Name of Institution 1 URL to its website Name of the program/s (if more than one, please separate the names by using |
|---|--|
| _ | |
| а | semicolon) Level of recommendation (enter "Program", "Courses", "Course Topics") |
| _ | Name of Institution 2URL to its website |
| а | Name of the program/s (if more than one, please separate the names by using |
| | semicolon) Level of recommendation (enter "Program", "Courses", "Course Topics") |
| | Name of Institution 3 URL to its website |
| а | Name of the program/s (if more than one, please separate the names by using |
| | semicolon) Level of recommendation (enter "Program", "Courses", "Course Topics") |
| _ | Name of Institution 4 URL to its website |
| а | Name of the program/s (if more than one, please separate the names by using semicolon) |
| | Level of recommendation (enter "Program", "Courses", "Course Topics") |
| _ | Name of Institution 5 URL to its website |
| a | Name of the program/s (if more than one, please separate the names by using semicolon) |
| u | Level of recommendation (enter "Program", "Courses", "Course Topics") |

| Identifying the institution. All curricular content questions referred to ontology-related courses offered by your institution. Please identify your |
|---|
| institution by entering the following information |
| Name of Institution |
| Location (City) |
| Location (Country) |
| Name of Unit within Institution (e.g., Department of, School of, Division of |
| College of, etc; or N/A) |
| URL to website of Institution |
| URL to website of Unit (if different from website of institution) |
| |

| Quality Assurance: Program/Curricular Level. If your program is accredite (which usually happens at the level of the inner-most unit housing the program please describe the accrediting body by entering its name and the URL to its website (if known.) Please leave the text boxes empty if this does not apply to your program. | m,) |
|--|-------|
| Name of accreditation body URL to accreditation body's website (if known) | |
| Quality Assurance: Institutional Level. If your institution is accredited, pleadescribe the accrediting body by entering its name and the URL to its website known.) Also, please include a brief comment indicating how this institutional accreditation is related to the ontology-related curricular content offered by your institution. Please leave the text boxes empty if this does not apply to your institution. Name of accreditation body URL to its website (if known) Briefly explain the relationship between this accreditation and the ontology-related curricular content offered by your institution | e (ii |
| Quality Assurance: Ontologists as Professionals. If you know of any organization/s that certifies/certify ontologists as professionals, please use the text boxes below to enter the information of up to 5 of such organizations. Name of certification organization 1 | е |
| One to organization of wobsite | |

| Final Comments. Please include any relevant comments related to ontology contents and quality assurance you are aware of, which have not been covere by this survey | |
|---|--|
| Contact Information. Please share with us the contact information we will use, should we need to contact you (or the person on behalf of whom you responded this survey.) | |
| Thank you very much for your time and cooperation! Contact name Contact email address URL to contact's website | |

Appendix B

URL to programs follow





Survey: Content + Quality – Presently

URLs to Programs

http://www.unf.edu/ccec/cis/SoChtml/SoCSoftEngMS.08.html

http://www.bath.ac.uk/comp-sci/undergraduate/comp-sci/index.html

http://www.informatik.uni-leipzig.de/~brewka/gk/indexeng.html

http://www.ucdmc.ucdavis.edu/informatics/

http://www.uniriotec.br/ppgi

http://www.uff.br/cienciainformacao

http://www.informatik.uni-hamburg.de/Info/Studium/MSc/

http://www.secam.ex.ac.uk/applied-artificial-intelligence.dhtml

EMCL http://www.computational-logic.eu/home.php and

Semantic Web http://www.unibz.it/en/inf/progs/mcs/studyplans/SW.aspx

http://ksg-projects.meraka.csir.co.za/ksg-projects/events/moss09/

http://www.eci.ufmg.br/ppgci/

http://www2.cin.ufpe.br/site/secao.php?s=3&c=31

http://ontolog.cim3.net/cgi-bin/wiki.pl?WikiHomePage

http://www.eci.ufimg.br/ppgc

http://www.iakm.kent.edu/

http://www.ucdmc.ucdavis.edu/informatics/

http://csee.umbc.edu/

http://www.ccs.neu.edu/graduate/degreeprograms/mscompsci.html

http://www.hss.cmu.edu/philosophy/courses-descriptions.php

http://www.few.vu.nl/en/current-students/masterprogrammes-a-z/artificial-intelligence/index.asp

http://bmi.stanford.edu

Appendix C

Course names and URLs follow





Survey: Content + Quality - Presently

URLs to Courses

Engineering of Software II

CM30174 Intelligent Agents

Formal ontology in medical information systems

MHI289F Knowledge Management

Fundamentals of Database Systems

CS 401 - Advanced Bioinformatics: Anatomical Ontologies

Knowledge and Ontology Engineering

Modeling Knowledge Domains

MA in Philosophy with Concentration in Ontology

Seminar on Ontologies

Ontology for Information Systems

Semantic Web Technologies—General

Semantic Web Technologies—Ontology Engineering

Mathematical Foundations

Data Mining and Bio-Informatics

Ontologies & the Semantic Web

Foundations for Information Semantics: Logic and Logic Programming

Knowledge and Ontology Engineering

Knowledge Organization Systems

MHI289F Knowledge Management

INFS 770 Knowledge Management for E-Business

Managing Software Development

Modal Logic

Open Information Systems

Ontology 101

Ontology Engineering

Modeling biomedical systems

Ontological engineering

ECS 268 SCIENTIFIC DATA AND WORKFLOW MANAGEMENT

PhD in Philosophy

Knowledge Representation and Ontologies

Description Logics

Metaphysics

Introduction to Information Semantics: Ontologies, Semantics, Knowledge Representation, and the Semantic Web

ECS 268 SCIENTIFIC DATA AND WORKFLOW MANAGEMENT

INFS 770 Intelligent Agents and the Semantic Web

Knowledge-based Systems

Introduction to the Ontology Definition Metamodel

Knowledge Engineering and Management

Computational Logic

Ontology based data management

Ontology for Geographic Information Science
Advanced Information Semantics: Ontology Engineering, Ontology Lifecycle Management, and Ontology **Applications**

Foundations of Artificial Intelligence

Intelligent Web Applications

Ontologies and databases

Dispositions and Powers

Natural Language Processing

Problems in Ontology

Methods of Software Development

Problems in Ontology

Appendix D

Institution-accrediting bodies follow





Survey: Content + Quality – Presently

URLs to Institution-Accrediting Bodies

ABET

British Computer Society

VLIR

ASIIN e.V.

The ministry of education in Rome gives the final approval (after the faculty and the senate)

<u>CAPES</u> - Coordenação de Aperfeiçoamento de Pessoal de Nível Superior

Ministries of Education and Science & Technology

Iran Ministry of Science, Research and Technology

Computer Science Accreditation Commission (CSAB)

Appendix E

Professional certification bodies follow





Survey: Content + Quality – Presently

Professional Certification Bodies

TopQuadrant
Semsphere
Laboratory for Applied Ontology, University of
Trento
State University of NY at Buffalo

Appendix F

Final comments offered by respondents follow





Survey: Content + Quality - Presently

Respondents' Final Comments

(Verbatim quotes)

- 1. None at this point. Great job! :-)
- 2. In my opinion, this is still a very immature area, and it is not clear that it is ripe for formalisation.
- 3. This survey is clearly not intended for many (dare I say "most") of the members of the Ontolog community (Peter Yim) or many of the potential (industrial) participated in the upcoming Ontology Summit. I was looking for an opportunity to provide some input on what kind of subjects pertain or contribute to ontology development - no such opportunity here.
- 4. I appreciate your work on this, as I see the need to share experiences in teaching issues on ontology and would like to share materials as well.
- 5. I am a Ph.D. student and working in the area of mapping biology knowledge with regard to education. I follow mostly the ontology literature, obo, ro community for my work. I shall be really interested to get involved in the initiative of establishing education and curricular material in ontology. thankyou.
- 6. I am not aware of any ontology content quality assurance. I had to develop the second part of the Semantic Web Technologies course, and it was imposed on me that it had to have 2 lectures on OWL, 5 on ontology engineering, and 5 on SemWeb for the Life sciences (so I could not properly treat all the introductory ontology topics that I think should have been in the curriculum). I did look around quite extensively to see what others taught, noticed a very large diversity, and that, basically, the lecturer chooses the course content to match their own specialties. Regarding possible contents, I have compiled a separate document about a year ago, which contains some considerations on learning outcomes, basic and advanced topics, and a more comprehensive list of official courses and additional tutorials at summer schools given by members of the KRDB Centre that bear some relation to "ontology engineering". I will send this file separately.
- 7. I am not sure if the expression "Information Science" in Brazil has the same conotation as it has in other countries. As far as I know, there are three distintive "lines" inside what is called IS here: studies related to sociology (information and society), studies related to library science (organization of information), and studies related to management of information in organizations (knowlegde management ans related technologies). The ontologies research generally falls under the two last lines mentioned.
- 8. I am delighted that this survey is being made. I don't think anyone has a good grasp on who is teaching what (in Ontology) around the world now. Thanks for putting this together.

- 9. I am not affiliated with any organization at present that grants a degree in ontology. I would have liked your survey to also ask the opinion of what ought to be (in current or near term time frame) the content of degree or certification or vocational training programs especially workshop and collaborative educational ontology activities in these days of multi-modal learning opportunities.
- 10. Up to my best knowledge, the only ontology engineering course in Iran is taught in Shahid Beheshti University but there are many other courses which are related to ontologies in part and are taught in many universities such as artificial intelligence and semantic web course in BS program and natural language processing and information retrieval courses in MS program.
- 11. Most of the questions were irrelevant and should not have been asked after some of my initial answers. Minor annoyance.
- 12. IAKM program is a multi-disciplinary program, so it is difficult to answer some of your questions. IA or KM does not have accreditation body. The administration home of the IAKM is the School of Library and Information Science.
- 13. Apologize for the incomplete response, am a practitioneer in a different domain one that needs ontologies to help get our semantics straightened out. But not connected with an institution as needed for this survey
- 14. You have allowed space to describe only one program at the institution. There is more than one program at my school that offers ontology-related content.
- 15. While I recently joined Carnegie Mellon University, I have no direct knowledge of the offerings, so my answers in this survey are by no means authoritative.
- 16. Given that a number of us have give professional training, yet are not academic, you might have considered creating a branch of this survey to cover us.