

INTRODUCTION TO ONTOLOGY

By Shrinivas M. Athalye

Librarian,

Swami Vivekanand Night College,

Datta Nagar, Ayre Road, Dombivli(East) 421 201

Email: smathalye42@gmail.com Mobile: 9223 374 300

Introduction

The word Ontology is derived from the Greek word 'Onto', which means existence. Ontology refers to study or theory of existence. It is often used by philosophers and early students of Aristotle as a synonym of 'metaphysics' to refer to what Aristotle himself called 'first philosophy'. In the 18th century, a German scientist Christian Wolf used this term effectively. He stated that Ontology is a truth which carries towards index of existence. Immanuel Kant designed the *Ishwarwad* with its help. The term Ontology was coined in 1613, independently by two philosophers, Rudolf Gockel in his *Laxicon Philosophicum* and Jacob Lorhard in his *Theatrum Philosophicum*. This word was first added in Nathaniel Bailey's Dictionary of 1721, which defines Ontology as an account of being in the abstract.

Definitions

Ontology can be defined in the context of Philosophy, Information Technology and Library and Information Science as under.

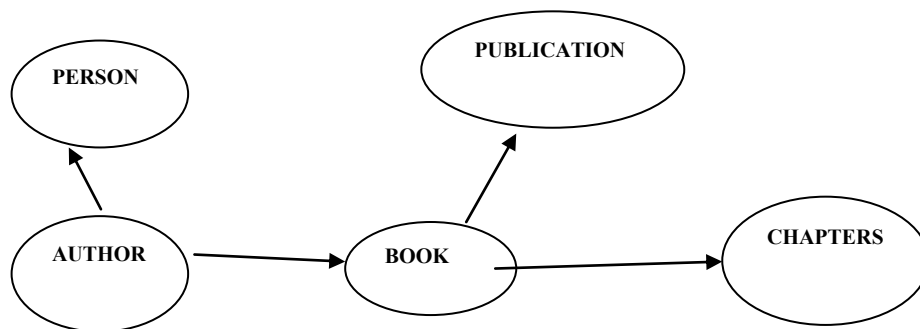
- 1) *Philosophy*: An Ontology means a study of elements of existence in nature.
- 2) *Information Technology*: Ontology is a technical term denoting an artifact that is designed for a purpose, which is to enable the modeling of knowledge about some domain, real or imagined.
- 3) *Library and Information Science*: Ontology means presentation of concepts which show relationship of concepts and their understanding in formal manner, in a limited domain.

In brief, Ontology defines a common vocabulary for researchers who need to share information in a domain. It includes machine-interpretable definitions of basic concepts in the domain and relations among them.

From the above definitions, we can say that Ontology means description of common vocabulary of specific area of knowledge. It is used by the human naturally as well as mechanically with the help of computer.

Meaning

Ontology organizes the information. Researchers who need to use the information from the specific domain collectively, for them Ontology is common vocabulary. It specifies concepts, relations and other factors connected with the specific area of knowledge. This specialty gives meaning to representative vocabulary. All subjects have internal relationship. They are participant of all facets of the same knowledge area. That's why they have common vocabulary. They can be compared and get some conclusions. It is impossible to prepare the same Ontology structure for Mango and Apple, as their limitations are different. Both are not having common concept or vocabulary. If you want to use the concept of Ontology, or to maintain the relationship or to know the basic similarities/differences, then you have to compare Mango with Mango. Ontology helps you to know the whole concept of a specific knowledge area with the help of person or mechanical system. *(See figure -01)*



(figure -01: Total understanding of Specific knowledge Area)

Here author is one person and a book is one publication. But relation never ends here. Author writes the books, it contains many chapters. This relationship can be extended further.

Ontology: Growth and Development

For last some years, the building of Ontology, which makes specialize the specific knowledge domain and relationship, is transforming from artificial intelligence of Laboratory Scientist to Computer Experts of specific knowledge domain. These Computer Experts feel necessary to develop the keywords while in search of information. For that, the efforts are made to develop Ontology. Some other reasons for development of Ontology are as under.

- 01) Distribution of common understanding about information structure to general study or computer software mediators.
- 02) Get access to reuse of knowledge area.
- 03) Separation of applied knowledge from specific topic.
- 04) Analysis of knowledge of specific topic.

Function of Ontology

- 01) Distribute the common background and ability of understanding to the elements of the specific knowledge area.
- 02) To provide common base to those who study the information, related to that specific knowledge area.
- 03) To design the structure of meaningful concepts.
- 04) To make a relational way of general concepts

Steps to build Ontology

Following are the steps to prepare or build Ontology.

- 01) Know the specific area and scope of the topic first for preparing Ontology.
- 02) Understand the present Ontology in use for reuse.
- 03) Collect the relative terms.
- 04) Classify those terms in proper manners.
- 05) Prepare internal relationship among terms (One to many relationships).
- 06) Know the facts of this structure.
- 07) Check and verify this structure.

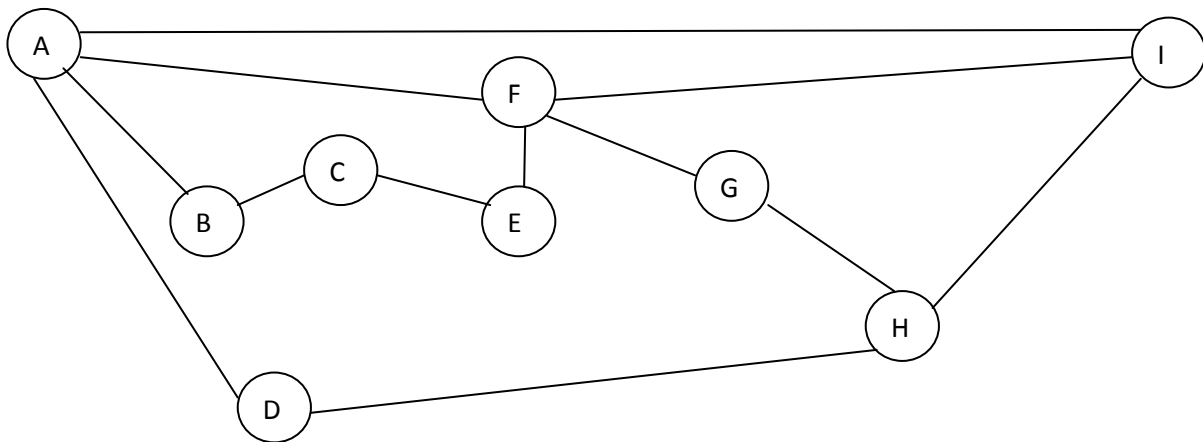
Ontology: Similar Terms

A good summary of artifacts which have been described as Ontology and their relative levels of expressiveness is provided by *Deborah McGuinness* in her '*Ontology Spectrum*' which included Controlled Vocabularies, Thesauri, Classification Schemes, Topic maps etc. Though these terms look like similar, there are some little differences. For e.g. Classification Schemes show one place for one subject, i.e. one to one relation. Thesauri show one to two relationships, i.e. one place and two subjects. Ontology shows one to many relationship, i.e. one place and many subjects. Suppose, there are many subjects like 1,2,3,4,5,6,7... Then relationship among these will be shown by many knowledge management Schemes as under.

- Classification Schemes: In this, one place will be given to subject no 1, subject no 2 and so on.(One place , one subject relationship)

- Thesauri: In this, one place will be given to one subject independently, but its relation with next subject will be given like subject no.1 and subject no.2, subject no. 2 and subject no.3 and so on.(One to one relationship).
- Ontology: In this, one place will be given to one subject independently, but its relation with all subject will be given like subject no 1 with subject no 2 with subject no 3, at the same time subject no.2 with subject no.4 with subject no 6, at the same time subject no 7 with subject no.1 with subject no.3 and so on. (One to many relationship).

Let's take an example to clear the concept. (See figure -02)



(Figure -02: Ontology - similar terms)

In this example, A Courier Boy stands at place A and wants to go to place I. He has to deliver so many parcels in fewer periods of time, efforts and money. Then he has many options in different Knowledge management Systems.

- Classification Schemes will show him only one way from A to I and he will deliver only one parcel.
- Thesauri will show him the route A to F and F to I and he can deliver two parcels.
- Ontology will show him the path A to B, B to C, C to E, E to F, F to G, G to H and H to I and here he will be able to deliver maximum number of parcels i.e. 7.

Use in Library

With the help of information Technology, Ontology can be used in Library very effectively. Let's take an example. Information is the soul of the library. So first you search the

subject which is highly demanded. Expand your search to the micro level of that subject. Then find the reading material available in library on that subject. Prepare a bibliography of it, like books, periodicals, databases, online-offline reference tools etc., with the help of computer. This bibliography itself is Ontology.

Topic for further study

Further study can be possible on the topics given below:

- 01) Preparation of Ontology in Book Format
- 02) Comparative study of Classification Schemes, Thesauri and Ontology in details

Summary

Ontology is rapidly developing system of Knowledge Management. It helps to show the relations of one subject with many. Being a basic part of metaphysics, now it is adopted by library and Information Science like many other subjects.

References

- Jurisica, Igor, Mylopoulos and Yu, Eric (1999), Using Ontologies for Knowledge Management : An Information System Perspective : Annual Conference of the American Society for Information Science, Washington
- Smith, Baeey (2003), Ontology, In *Blackwell Guide to the Philosophy of Computing and Information*, Oxford, p.155-166
- www.Reference.yourdictionary.com Retrieved on 26th August 2012
- www.wikipedi.org/wiki/ontology Retrieved on 26th August 2012
