Ontologies in Knowledge Management: A conceptual schema for knowledge transactions

Mayukh Biswas

Junior Research Fellow, University Grants Commission,
Department of Library and Information Science,
University of Calcutta, Kolkata, INDIA

[mayukhbiswas@hotmail.com]

Abstract: *A schematic framework for knowledge exchange in an organizational setup is discussed in this paper. This framework rests upon semantic web based technologies for its implementation. For any knowledge transaction within an organization, ontologies and standards like PIMO and Dublin core (DC) is used for its categorization. Any organization that wants to go for automation would get benefited and in turn would operate more smoothly.*

1. Introduction

In any organization, it is an untold fact and implied truth that it produces knowledge at every stage and there exists numerous varieties of the same. This knowledge, be it in whatever form is used for product development and service escalation. This knowledge is also beneficial for providing expertise and consultation. Moreover when this very knowledge is documented, then it can be used for solving countless issues over and over again, but unfortunately it is not possible on every occasion. A large chunk of knowledge is passed on and disseminated verbally, mails, personal interactions, seminars, conferences or in any informal way. Knowledge exists both in tacit and explicit form but its management and preservation is a mammoth task and has been a challenge for knowledge managers since ages. Although being an integral part it comes with many issues for which there exists a continuous endeavour to solve the issue.

2. Exchange of Knowledge in an Institution

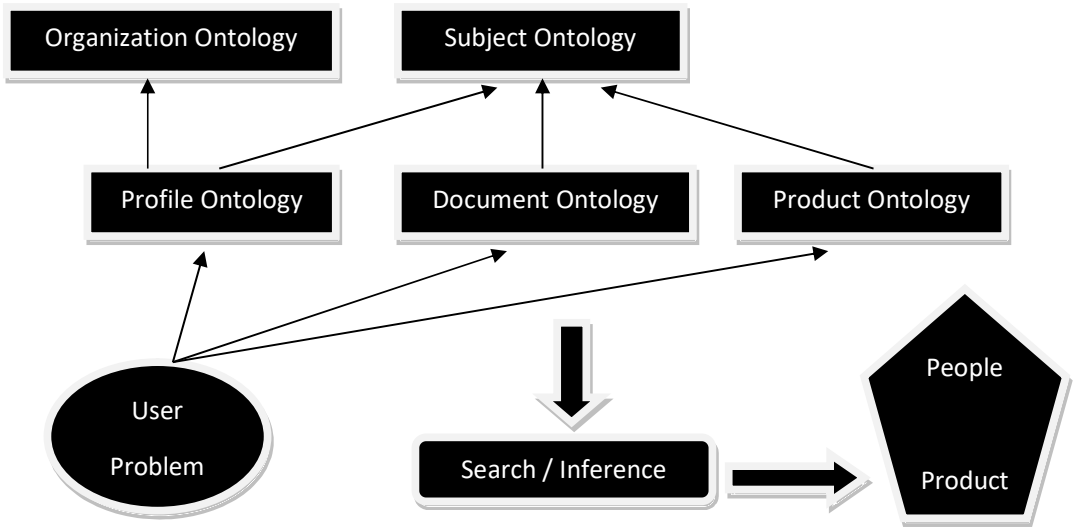
Any institution must take measures to ensure that they are able to capture knowledge be it tacit or explicit. This individuals related, associated or involved to the knowledge article are benefited by this knowledge. The knowledge must be well documented and organized to that its search and retrieval becomes effortless. Also the knowledge seekers would be greatly benefited by these efforts so that they could resolve and troubleshoot issues, solve problems and develop products. For efficient knowledge organization, it is very crucial that the constituents involved in the process of knowledge transaction must be known. Due to the involvement of various people and processes in the formation of knowledge, complex formal and informal transaction of knowledge takes place. The intricacies so involved are deciphered with the aid of an model which specifies all the components and are able to define the webbed complexities between concepts.

3. Schema for Knowledge Transaction

A schema for a semantic web based system for management of knowledge that helps in searching the knowledge spread within an organization is tried to be realised to the best efforts possible. This proposed model helps in searching knowledge base within an institution in the form of documents, expertise, service or product available explicitly. It functions as an intelligent support system for the associated individuals with the system. To have a better perspective and understand the system well enough, we need to formalize the specifications required to define them explicitly. Another important role is the inter-relationship that exists among various concepts in the knowledge. In this scenario ontology comes as a saviour helps to solve these issues to a large extent. Thus, this schema is based on ontology and it is one of the components of semantic web technology. In the context of sharing of knowledge, ontology is defined as "a specification of a representational vocabulary for a shared domain of discourse – definitions of classes, relations, functions, and other objects." They define data models in terms of classes, subclasses and properties. Ontology is based on semantic nets used in artificial intelligence. In simple terms it can be said that ontology is the definition of entities and their relationship among each other.

4. Knowledge Transaction in an Institution

The components of the workflow of knowledge transaction in an organization involve people, product and services. Each component has its own attribute which is somewhat dependent on the other one. These inter-relationships among concepts can be explicitly defined by ontology.



4. Ontology-based Conceptual Framework

For the description of document, product, subject and institution, Dublin Core metadata standard is advised. This framework uses PIMO, Personal Information Model of a user to express personal information models of a user. It is based on Resource Description Framework and the NEPOMUK Representational Language (NRL) and other similar semantic web technologies. The PIMO ontology is both RDF vocabulary and upper ontology to express such model and defining basic classes and properties respectively. Data stored in files is used for Enterprise Resource Planning (ERP) within the scope of PIMO. Not only the above mentioned, but also abstract concepts could also be represented in need arises.

5. Conclusion

The above concepts are derived from the semantic web and thus the establishment of this kind of framework is possible. Such systems would prove beneficial to institutions who wish to go for automation. The system classifies it into two categories namely standards for categorization and description for every single object. This framework can work across institutions thereby creating interoperability which will further lead to data extraction and reusability. Such systems can prove beneficial to e-governance as agencies for data collection can be dispensed thereby saving man power and resources.

References

1. W3C Semantic Web Activity.
2. Resource Description Framework (RDF) of the W3C Consortium.
3. Nepomuk Representational Language Specification, Semantic Desktop.
4. Tripathi, A. and Patel, D., Conceptual framework for knowledge transactions within an organization.
5. Gruber, T. R., A Translation Approach to portable ontology specifications.
6. Personal Information Model (PIMO) Ontology Guide, NEPOMUK Recommendation v1.1
7. Ontology. http://en.wikipedia.org/wiki/Ontology_(information_science)