THEORETICAL FOUNDATIONS OF KNOWMATICS AND KNOWLEDGE TECHNOLOGY

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Knowmatics & Knowledge Technology

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What is Knowmatics?

Knowmatics is a new scientific and engineering discipline to study the structure, properties, behavior, representation and communication of knowledge so as to develop algorithms to process knowledge. All the advancements in Information Technology are confined to data or information processing. No technology has been developed so far to process and organize knowledge. Though terms like Knowledge Management, Knowledge Organization, and Data Mining etc have been used widely, they are limited to one form or another of data processing.

Information and Knowledge

Information and Knowledge are not the same. They are different. Information is a set of processed data, organized and presented symbolically for communication. Communication involves verbal, textual or digital flow of information so that the receiver gets what the sender intends.

Knowledge is a set of inter-related information, theories and insights and experiences confined to a particular domain, organized in a systematic way, with well specified structures and symbols so that we could retain and recollect them for use in the specific social context. Knowledge can be split into information and then to data as data can be integrated to form information and then knowledge.

Inter-disciplinary Nature of Knowmatics

Knowmatics is interdisciplinary in nature. It is the result of the integration of several disciplines like Epistemology, Cognitive Science, Informatics, Brain Research, Mathematics, Engineering, Computer Science, Library Science, and Networking. Knowmatics provides the theoretical basis and Methodological tools for the developing algorithms for Knowledge Processing and Knowledge Handling and thereby developing Knowledge Technology.

Structure of Knowledge

All domains of Knowledge have a common structure very much similar to the thinking pattern of the human brain and the way in which the brain processes information so as to make them the integral part of the knowledge base subjected to frequent revision and updating based on new evidences or experiences. Hence a network-like structure passing through all the domains of knowledge.

In order to understand the thinking pattern of the brain and how knowledge is formed and transferred or communicated from one to another, the easiest way is to study of the oral tradition of knowledge transfer even before the invention of printing. All the traditional knowledge in religion or spirituality, medical care and literature are well structured and presented in a way so that people can easily learn, remember, recollect, revise and use them. It can further be seen that all the modern knowledge are presented in the similar way. In other words, all domains of knowledge have a common mega structure very much similar to the structure of the universe ranging from gene to cosmic. An understanding of such a mega structure was called as brahmanjana by sages of India. According to them, brahmanjana leads to the knowledge of all.

Further, the structure of knowledge can be understood by studying the way in which children acquire knowledge from a series of pieces of data or information obtained through observation and listening irrespective of the culture ideology or faith or language of their parents.

By analytically studying the structure of all traditional systems of knowledge varying from religion, literature, medicine, black magic etc of the various civilizations, we could find that they are structured in a particular way so that people could learn, recollect and use or even update them for contextual use. While people find it difficult to learn or recollect a data base like a telephone directory or a dictionary in total, for most people to learn a work of knowledge having greater in size, for example the Bible, the Vedas, the Astangahridayam, the Sankundalam, Othello etc is not a difficult task. By developing sophisticated computer programs it is possible to study the structure of all such works of knowledge and to give mathematical models for them so as to develop algorithms for knowledge processing. It must be emphasized that while data structure is static and one-dimensional, knowledge structure is multi- dimensional and dynamic in nature.

Need for Knowledge Technology

IT facilitates the processing and retrieval of millions of data within a short span of time. In order to use such downloaded-data, a lot of human energy and time is needed for filtering them, coordinating them.

Knowledge Technology is the empowered or Value-Added Information Technology for Enabling Knowledge Processing and Knowledge Handling so as to deliver Knowledge -based Products and Services in diverse forms at different levels or standards, globally.

Origin and Development

R. M. Mathew has been conducting research on knowledge as a commodity for consumption and production for the last twenty-five years since the publication of his book, "**Library Resource Allocation**" in 1981 from England and the USA by the MCB University Press.

In 1984 he had formulated two general theories of Knowledge/ Informatics/ Information Technology that got published from Moscow by the USSR Academy of Sciences in 1985.

These theories are known as Mathew's Theories Knowledge or Information Technology and two doctoral degrees have been awarded based on these theories, besides they formed part of the M. Phil Syllabi. Knowmatics and Knowledge Technology are the extensions of Mathew's theories of Knowledge.

Definition of Knowmatics

- Knowmatics is a scientific, mathematical and engineering study of the structure, organization, representation, preservation, and communication of diverse domains of knowledge so as to formulate algorithms to process and handle knowledge by the combined application of human brain and machines. With the formulations of algorithms, software could be developed for knowledge processing.

- Knowmatics provides the methodological and theoretical tools for Knowledge Technology to process and handle knowledge in diverse domains at different levels by knowledge workers and experts so as to develop Knowledge Industry to bring out knowledge based products, packages and services, as tradable commodities, for the global market.

- Every cultural, scientific and technological advancements make the society knowledge intensive and necessitate the creation of new forms of knowledge that are easily useable by all sections of society including common man and experts alike. Knowledge-intensive. People need different products, packages and services of knowledge according to their needs and levels of understanding.

- Provision of such knowledge products and services on a global basis leads to the emergence of Knowledge Industry capable of meeting the ever expanding knowledge needs of humanity. Knowledge Industry would emerge as the dominant Industry that determines the COI,lrse of all other industries, services and social activities.

Knowledge Processing

Knowledge is as old as humanity. From the very beginning man realizes the value and importance of knowledge and developed several technology related to the preservation and use of knowledge. But no technology has so far been developed for processing knowledge. Hence all activities related to knowledge are slow, inefficient and-time consuming.

In a modem society, like any other activity, processing, production and consumption of knowledge too must be made efficient, speedy and less expensive. In other words technology must be developed for knowledge processing, knowledge repackaging and knowledge consumption and knowledge marketing.

Any technology that facilitates the processing, repackaging and marketing of knowledge in diverse forms for mass consumption can be termed as Knowledge Technology.

- Any industry that could render knowledge based products and services by the application of Knowledge Technology can be called as Knowledge Industry.

- Knowledge Technology is not an alternative or a substitute for the human brain. KT could make the brain free from the laborious or monotonous mechanical tasks of knowledge processing so that it could concentrate on thinking and creating new knowledge. Processing knowledge through filtering, extracting the contents and organizing the information in a well defined pattern and presenting them is basically mechanical, time consuming and laborious as is in the case of mathematical calculations for which we could effectively make use of calculator or computer.