# KO systems based on Human needs Approach - to bring Harmony between homogeneity and heterogeneity of future information environment

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**Abstract :** Latest developments in the field of telecommunications combined with the Internet and the World Wide Web, have enabled us to transmit huge volumes of data, in wide range of forms and formats in an information environment which cuts across the geographic as well as political boundaries of the world. According to a study done by IDC, worldwide proliferation of PCs and smart phones, increased internet access and the boost in capturing data from machines such as surveillance cameras or smart meters has contributed to the exponential growth of digital data. By 2020, IDC projects that the digital universe will reach 40 ZB. However, currently majority of this data is untagged and unstructured (EMC Press release Dec 11, 2012). As of today only 3 percent of this potentially useful data is tagged, and even less is analyzed. Effective and Efficient KO tools play a major role in realizing the full potential of Big Data.

Realizing the significance of knowledge organization, efforts are going on both fronts i.e. revising the conventional knowledge organization tools such as bibliographic classification systems, controlled vocabularies etc (Smiraglia, R.P. 2002), (Kwasnik, H.B.1999) as well as designing new tools such as ontologies, semantic networks, and topic maps etc. However having originated from the epistemological view developed by philosophers, all these KO tools have some common features such as tendency to conform to the established scientific consensus resulting in time lag while inducting ever growing new concepts in to the system (DESIRE Project); tendency to follow top down approach and follow subject-based approach. On the other hand with the web enabled collaboration, the user communities have started annotating the information resources on their own thus giving rise to new tools called folksonomies. While traditional KO tools are lacking flexibility, modern tools like ontologies are domain specific and folksonomies are subjective in their approach (Matthes, F., 2012). Therefore fail to address issues like interoperability and scaling up. Intensive research is under way to develop frameworks which help in homogenization of data organization and representation in order to make machines understand, integrate and reuse the data across various applications. However attempts of homogenization have to deal with issues such as security and privacy of businesses and society at large; and preserving the socio-cultural diversity and freedom of indigenous and traditional knowledge systems (Birdsall, W.F., 2007).

This paper while discussing the limitations of the existing KO tools in meeting the demands of the digital universe, suggests that the way forward lies in developing standards for harmonization rather than homogenization of data and explains that organizing external knowledge bases in synchrony with the semantic relationships used by the human mind to organize knowledge will bring harmonization of data and help in making machines understand data. Finally the paper presents a framework for knowledge organization based on the fundamental human needs, the forces that drive human mind to seek knowledge and incorporates the semantic relationships used by the human mind.

**1. Introduction:** Latest developments in the field of telecommunications combined with the Internet and the World Wide Web, have enabled us to transmit huge volumes of data, in wide range of forms and formats in an information environment which cuts across the geographic as well as political boundaries of the world. According to a study done by IDC, worldwide proliferation of PCs and smart phones, increased internet access and the boost in capturing data from machines such as surveillance cameras or smart meters has contributed to the exponential growth of digital data. It's not at all an exaggeration, if we say the 21$^{st}$ century is the century of Big Data. Today thanks to the technological developments, in a broad range of application areas, data is being collected at unprecedented scale. Decisions that previously were based on guesswork, or on painstakingly constructed models of reality, can now be made based on the data itself. One of the prevalent notions is that Big Data is more relevant to marketing, financial and insurance sectors than to the conventional academic and research activities. Decisions that previously were based on guesswork, or on painstakingly constructed models of reality, can now be made based on the data itself. Big Data analysis now drives nearly every aspect of our modern society, including mobile services, retail, manufacturing, financial services, life sciences, and physical sciences. By 2020, IDC projects that the digital universe will reach 40 ZB. Another prevalent notion is that Big Data and knowledge organization has nothing in common as Big Data deals with huge volumes of data bits, knowledge organization deals with structuring and ordering of concepts based on certain canons and principles. However knowledge organization forms the foundation for developing effective and efficient analytical models that are used in processing the Big Data. Describing the significance of Big Data, Jonathan Shaw of Harvard Magazine quotes Professor Gary King of the Weatherhead University, who says "it is not the *quantity* of data that is revolutionary. But the idea that we can do something with this data is revolutionary" (Shaw, J. 2014) According to Prof. King, finding new ways of linking data sets from seemingly disparate disciplines is the key to get new insights and create new knowledge. Knowledge Organization forms a crucial role in finding those new ways of linking data. While the potential benefits of Big Data are real and significant, there remain many technical challenges such as heterogeneity of data types, representation, and semantic interpretation which have to be addressed to fully realize this potential. Currently majority of this data is untagged and unstructured (EMC Press release Dec 11, 2012). As of today only 3 percent of this potentially useful data is tagged, and even less is analyzed. Even when it is tagged or structured there is lot of variation in the way the data has been tagged or structured leading to incompatibility.

Realizing the significance of knowledge organization, efforts are going on both fronts i.e. revising the conventional knowledge organization tools such as bibliographic classification systems, controlled vocabularies etc (Smiraglia, R.P. 2002), (Kwasnik, H.B.1999) as well as designing new tools such as ontologies, semantic networks, and topic maps etc. On the other hand with the web enabled collaboration, the user communities have started annotating the information resources on their own thus giving rise to new tools called folksonomies. While folksonomies are subjective in their approach (Matthes, F., 2012), traditional KO tools, having

originated from the epistemological view developed by the western philosophers, tend to conform to the established scientific consensus resulting in time lag while inducting ever growing new concepts in to the system (DESIRE Project); tendency to follow top down approach and subject-based approach thus lacking flexibility. Modern tools like ontologies being domain specific, fail to address issues like interoperability and scaling up. Intensive research is under way to develop frameworks which help in homogenization of data organization and representation in order to make machines understand, integrate and reuse the data across various applications. The need for homogenization has renewed the interest in General Classification Systems, which for a long time have provided universal and umbrella schemes to organize knowledge accumulated over centuries.

**2. Resistance to Homogenization:** However attempts of homogenization through revising and updating universal knowledge organization systems such as UDC, DDC, etc which are based on western theories of knowledge, are getting resistance from indigenous and traditional knowledge systems, because according them, these universal knowledge systems incorporate new knowledge which is striving to attain the status of science such as knowledge organization itself (Dahlberg, 2006) otherwise relegate other ways of knowing as less objective therefore less valid (Birdsall, W.F., 2007). They also feel as expressed by Antonio GARCÍA GUTIÉRREZ in his article titled "Desclassification in knowledge organization: a post-epistemological essay" the digital network, together with incessant and routine classifying operations promoted by Western culture, acts upon an open space in which other civilizations and cultures - also important producers of knowledge and memories - become more vulnerable. This occurs because the West, as a hegemonic "culture", is profoundly convinced that its categories of local organization are necessarily of universal interest, without understanding the hostile, marginal or astonished attitudes to its proposals shown by other cultures and minorities.

It is not only the traditional and indigenous knowledge systems that are resisting homogeneization of knowledge organization by western universal knowledge organization systems, even the sections of the society such as activists, development workers academicians and professionals working on certain less familiar areas in the otherwise established fields of study such as social sciences and medicine etc, also feel that the mainstream and so called universal knowledge organization systems are failing to understand their perspectives on knowledge and therefore failing to address their information requirements. Disillusioned by this inability of the standard classification systems, many people are resorted to develop their own classification schemes to suit their specifics needs, "SATIS"[i](Socially Appropriate Technologies Information System) classification scheme, "Akshara[ii]", SCNM classification scheme [iii] are some such initiatives in this direction, All these trends are bringing more complexity, variation and heterogeneity to knowledge organization and posing more challenges to homogenization efforts.

Such being the reality on the ground, immediate and important challenge lying in front of all the stake holders is how to bring standardization while addressing the issues raised by different user communities. This paper while discussing the reasons that brought this conflict in the first place, suggests that the way forward lies in developing standards for harmonization rather than homogenization of data and explains that organizing external knowledge bases in synchrony with the semantic relationships used by the human mind to organize knowledge will bring

harmonization of data and help in making machines understand data. Finally the paper presents a framework for knowledge organization based on the fundamental human needs, the forces that drive human mind to seek knowledge and incorporates the semantic relationships used by the human mind.

**2.1 Reasons for Resistance:** The primary and fundamental reason is due to the conflict between the purpose of knowledge organization and the process of knowledge organization. The purpose of any knowledge organization system is to organize materials for the purpose of retrieval and to manage a collection whether in the conventional library environment or in the digital environment and to serve as a bridge between the user's information need and corpus of knowledge. As we all aware of the fact information needs are always context dependent and contexts in turn are influenced by socio, cultural values, beliefs and perspectives. In other words, information needs are subjective. But while organizing knowledge, the prevalent approach adopted is to organize concepts as objectively as possible removing all subjective interpretations.

Second is due to the ambiguity in the definition of "knowledge" itself. A peep into the developments that took place in epistemology reveals that starting from ancient Greek philosophers to the present day scientists, have defined the knowledge in different ways and the ambiguity is still persisting and ambiguity is bound to create conflict (Mitchell, 2013). Whatever may be the focus all these theories of knowledge, all those theories tried to define " WHAT IS " Knowledge. It is justified as far as epistemology is concerned, but when it comes to devising a system to organize knowledge, apart from the "what" aspect of Knowledge, the "WHY" and "HOW" aspects of knowledge i.e. Why knowledge is sought and how human mind organizes the knowledge so acquired are also very vital because providing links to sources that contain information about the objects (those objects could be about tangible entities or intangible and abstract ideas, beliefs etc.) to subjects i.e. human beings working under various socio-cultural, economic and political environments.

**3. Why does human mind seek Knowledge?** To live and grow are the fundamental instincts of all living beings. Other living forms are able to survive and grow because of the biological instincts. But in human beings their aspiration is the key for their survival and growth. Man seeks knowledge to fulfill his aspiration – to attain perfection, freedom and happiness (Saint-Hilaries, 1990). To achieve happiness, man aims to fulfill his fundamental needs including basic needs such food shelter, health etc, cognitive needs such curiosity to know and understand mysteries of the nature, expressing through various forms of arts and culture, sharing his knowledge with other members of the society etc; and social and emotional needs such as religion, customs rituals, and institutionalizing all these activities etc. All these fundamental needs are interdependent and impact and get impacted by each other.

Professor György Márkus[1] while systematizing the ideas of Karl Marx on human needs describes "humans are different from other animals because their vital activity, work, is mediated

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[1] A Hungarian philosopher, the above excerpt was taken from the following link
http://www.jornada.unam.mx/2007/03/09/index.php?section=opinion&article=026o1eco

to the satisfaction of needs, which makes a human being a universal natural being capable to turn the whole nature into the subject of his/her needs and his/her activity, and develops his/her needs and abilities (essential human forces) and develops himself/herself, a historical-universal being. Work generates the breach of the animal subject-object fusion, thus generating the possibility of human conscience and self-conscience, which tend to universality (the universal conscious being). A human being's conditions as a social being are given by work, but not only by work as it is not possible to live as a human being without a relationship with others: work is social because human beings work for each other with means and abilities produced by prior generations. Human beings are also free entities able to accomplish, during their lifetime, the objective possibilities generated by social evolution, on the basis of their conscious decisions. Freedom should be understood both in a negative (freedom to decide and to establish relationships) and a positive sense (dominion over natural forces and development of human creativity, of the essential human forces. To sum up, the essential interrelated traits of human beings are: a) work is their vital activity; b) human beings are conscious beings; c) human beings are social beings; d) human beings tend to universality, which manifests in the three previous traits and make human beings natural-historical-universal, social-universal and universal conscious entities, and e) human beings are free". In other words human beings perceive "Nature" as a source to fulfill their needs of self and of the society.

Similarly McGarry (1993) in his book titled "The Changing Context of Information" explains the reasons for the growth of disciplines. He says, "No matter how theoretical a discipline may be its origins lie in a social need of some kind and it also satisfies some of the social needs of its members. Not least among these needs are intellectual curiosity and self esteem". Even Peter Drucker (1992) the management guru of 20th century also expresses the same view when he says, "Knowledge like electricity or money is a form of energy that exists only when doing work." Thus man through a continuous process of learning seeks knowledge to sustain and improve the quality of life as an individual and of the society as a whole not only for the present but for future too. Thus at the physical level the knowledge has two purposes firstly to enable humans to use the knowledge to solve their individual, social and societal needs, secondly to pass on the knowledge accumulated while solving the human needs to next generations, through education and also as a knowledge base. At a level higher than physical, the purpose of knowledge is to enable human being to know himself.

**3.1 Constituents of Knowledge**: This being the reason why human being seeks knowledge, then knowledge constitutes facts, perspectives, concepts, beliefs, judgments and expectations, methodologies, and know-how and much more. With its unique characteristics, mind is capable of dwelling on physical objects or non-physical phenomena without resorting to the aid of the physical senses and the channel of sensation that accumulates observed facts. This is the beginning of the birth of knowledge. All knowledge is founded upon assumptions, perspectives information and previous understanding that consciously or subconsciously determine the pattern of our observation and understanding and, thereby, govern the acquisition of further knowledge. (Jacobs, 1994)

Development of these mental reference models are conditioned by various social, economic, political, cultural situations in which human beings perform; and also the kind of functional roles performed by human beings in the society within the geographical spaces and time frames.
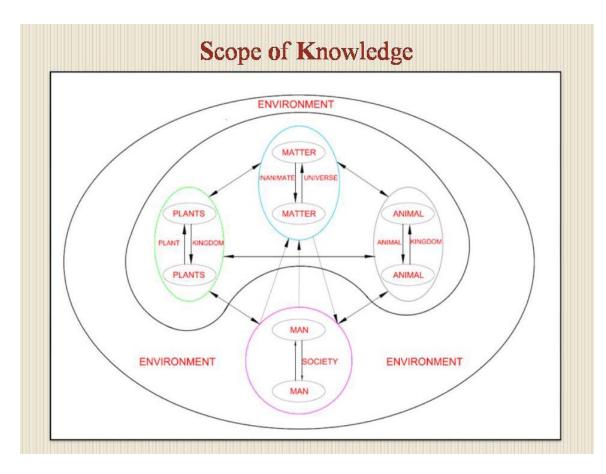
As depicted in the figure given below, this universe with all its components like matter, meta matter, plants, animals, human being himself (as an individual and as a collective), planets and planetary systems is the source for fulfilling his needs. In order to use these sources as a means to fulfill his needs, man seeks knowledge about these sources in terms of

o    their fundamental composition,

o    their intrinsic properties, behaviour,

- the dynamic relationships those exist among these various components of the universe and their influence and impact on each other[2].
- the ways and means by which these components of the universe can be used to fulfill the type of his needs (for eg: certain plants can be used to meet his needs of hunger, certain plants can be used to cure his disease and keep him healthy and certain other plants can be used to cover his body etc.)

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[2] **The dynamic relationships those exist between various components of the universe**

Each of components depicted in the figure above, while creating an environment with in the same type of components become the environment to the other components belonging to other categories (eg. Entire plant kingdom becomes the environment for other plants of same type and different types as well as for animals, matter, and human being, similarly animals. For human beings, the human society becomes the environment for human beings with in themselves and also for other components namely matter, plants and animals). Each of these components will have either direct or indirect linkages among themselves and impact each other either positively or negatively in one of the following ways:

- Enriching both the components involved in the relationship (symbiotic and synergetic relationship)
- One of the components gets enriched, while the other component deteriorates (parasitic relationship – This is one of the most important reason for conflicts between various components of universe. Some of common conflicts seen today are man versus environment conflicts, ethnic conflicts, gender conflicts, socio, economic and political conflicts, and religious conflicts etc.)
- One of the components causes a change in the other but does not get effected (catalytic relationship)
- Detrimental to both the components involved in a relationship
- No apparent impact on either of the components (peaceful coexistence)

## Scope of Knowledge

In other words "Human need" is the fundamental link between human mind and knowledge. Human mind perceives everything in this universe including man himself as a means to fulfill his needs and the knowledge so created when shared with others becomes the '*universe of knowledge*'. The knowledge so formed when shared among other members of the society or community, it becomes external knowledge.

4.  **Knowledge Organisation by Human mind**: Human mind tries to know about things of the external world by dividing them into small parts and viewing each part as a whole in its own right. The process of learning includes understanding facts and phenomena about self, surroundings, and environments and also learning about personal, individual, social and societal needs and problems, etc, and forming opinions, values, beliefs etc. Understanding is at primary level. Evaluation, analysis and comparison are at higher levels (Bloom, 1956.) Thus human mind learns and understands by division. However while finding solutions to human needs, human mind does so by integrating the knowledge acquired by division. In other words while working on solutions to human needs, mind with its unique abilities like combining and recombining different types of knowledge and information in order to gain new understanding; applying the solution of one problem to a new and different situation retrieves information from all the relevant components of the knowledge base cutting across all arbitrary divisions like natural sciences, physical sciences, social sciences etc. Molecular biology, artificial intelligence and biotechnology are some of the examples that illustrate

these unique abilities of human mind. Similarly with it's another unique ability of using a single system of thought in multiple ways and translating knowledge from one context to another human mind[3], applies same knowledge in different contexts to address different needs. For example human mind is capable of using music, which is a form of art for recreation, for therapeutic purpose in medicine, may use it as an income generating activity or may use it as a tool for creating awareness so on and so forth. These complex cognitive processes are possible because human mind recalls information through commonality and associations (semantic relationships) that are established among different phenomena rather than by any other organization (Pacifico).

**4.1 Semantic relationships used by Human mind:** Of the many semantic relationships identified by psychologists, linguists and computer scientists, semantic relationships such as genus-species, part-whole, instance of, paradigmatic, causal relationships are the ones most often used for organizing knowledge both by conventional KO tools such as taxonomies, thesauri and classification systems as well as advanced KO tools like semantic networks (Broghton,) (Hjørland, B.). All of them are developed based on "is a" relationship to represent super ordinate and subordinate, cause and effect relationships. These semantic relationships form the core in understanding "what is knowledge".

However human mind, apart from "is a" relationship, organizes knowledge based on another important relationship namely "required for" because, the fundamental purpose of seeking knowledge is to fulfill the needs, i.e. all phenomena are fundamentally perceived, evaluated based on their capacity to fulfill various human needs. Human mind due to its unique capabilities simultaneously organizes knowledge in more than one way. During the process of learning and understanding these associations are organized hierarchically, while applying that knowledge to fulfill the needs the same phenomena are associated with each other as networks based on "required for" relationship. For example both cotton plant and lady finger (okra) plant belong to the family *Malvacea*e. While understanding about these plants, it organizes them together hierarchically based on "is a" relationships. However while evaluating their usability, mind associates cotton plant for fulfilling the clothing needs, whereas okra (lady finger) is associated with food based on "required for" relationship.

**5 Organizing knowledge based on 'Human Needs'- An alternative to Subject-based approach:** Since human needs are eternal, universal and the motivators for humans to seek knowledge. Organizing knowledge based on 'human needs" provides an efficient alternative to subject-based approach. Throughout the history of mankind, human needs remained constant,

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[3] Marc D. Hauser, an American professor of psychology, evolutionary biology, and biological anthropology, who has written widely on human and animal cognition, summarizes the distinguishing characteristics of human thought under four broad capacities. These include: the ability to combine and recombine different types of knowledge and information in order to gain new understanding; the ability to apply the solution for one problem to a new and different situation; the ability to create and easily understand symbolic representation of computation and sensory input; and the ability to detach modes of thought from raw sensory and perceptual input.

because human being the 'Homosapien" is same since its origin, however the means adopted by humans to fulfill and meet their needs have kept on changing as man went on acquiring more and more knowledge. Human needs are universal in nature and the aspiration of human beings to fulfill those needs are same irrespective of national boundaries, economic status of nations, religions, beliefs and cultures followed by populations of the world. Hence knowledge organization model based on human needs will have

- universal applicability,
- adaptability,
- scalability,
- interoperability and
- suitability to both electronic as well as conventional environments.

Human needs are multi-dimensional and multifaceted because they originate, and operate within the social and natural environments in which human being lives and as a response to the dynamic interactions and relationships human being develops with its environments. Thus whatever may be the level and type of the human need. It will always influence and be influenced by social, economic, environmental, political, scientific, technological situations and factors of the society at physical level and judged by beliefs, values, opinions at higher level within the context of space and time. As a result the external knowledge created by man will also be multi-faceted and multidimensional. If we consider 'human-needs' as the basis for designing knowledge organization and information retrieval tools then the tools so developed will be able to represent and accommodate these intricate and complex relationships that operate in the society.

**6. FRAMEWORK OF THE PROPOSED SCHEME:** The Frame work is developed based on the understanding that

- Fundamental needs are the primary force for human mind to create knowledge,
- Real world is the source which provides all the resources required for fulfilling all human needs.
- Driven by the aspiration to fulfill its needs, human mind creates a mental reference model of the real world phenomena, reinforces the dynamic real world relationships those exist among various phenomena or establishes to new relationships among them as required.
- There is no hierarchy among these fundamental needs and these needs operate simultaneously at different levels,
- Each fundamental need has its own independent existence, yet interdependent on each other need, so each need is required for fulfilling each other need. Thus each need becomes an essential aspect of each other need,
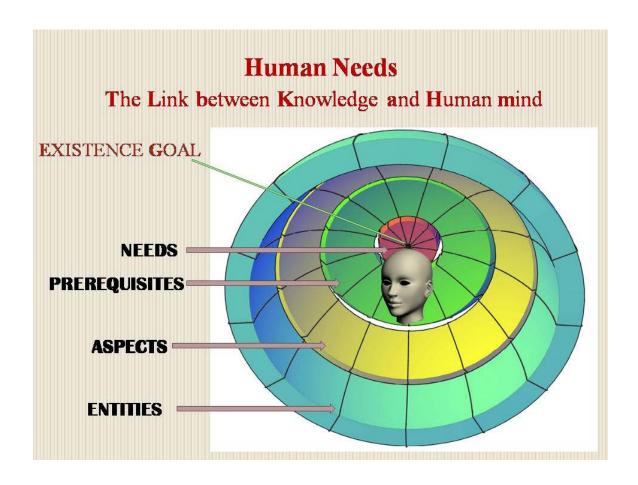
The framework Knowledge is organized in four levels. Fundamental needs are placed at level 0, followed by pre-requisites at level 1, Aspects at level 2 and entities at level 3.

Fundamental Needs Level 0

Pre-requisites Level 1

Aspects Level 2

Entities Level 3



*Basic Needs – the fundamental categories*: Since fulfillment of human needs is prime motivator of knowledge, all the basic needs become the first level categories, which are called as the "Fundamental Categories". The universe of knowledge is then placed under these categories depending upon the fundamental need they fulfill. Figure 2 gives a diagrammatic representation of the basic framework for organizing knowledge based on "human needs" approach.

**Table. 1 Fundamental Categories**

| |
|---|
| Health |
| Food |
| Clothing (includes personal care and beautification etc) |
| Human Settlements (shelter) |
| Knowledge Acquisition and Communication |
| Recreation, Entertainment, Creativity |
| Environment and natural resources |
| Philosophy/Religion |
| Society (demograpSocial Security, includes governance, law&order, public administration ) |
| Emotional Security (social relations, culture, rituals, life styles) |
| Economy, Industry, employment and resource optimization and management |
| Infrastructure |
| Trade, Commerce, Business |

*Pre-requisits*: There will be certain pre-requisits to fulfill the human needs. All those components, which are essential to fulfill the needs, are placed under each fundamental category.

For example Health is one of the fundamental need. Diet, exercises, hygiene, diseases, prevention/curing systems etc are some of the "Essential Components" required to achieve the objective of Health. Besides these essential components, other needs such as culture, religion, economics, social status, social order, infrastructure, industry, knowledge, management and administration of medical facilities, role of government/NGOs/ other organisations etc, are also essential for achieving health at an individual level and also at the collective level

Aspects: The core facets of each of the pre- requisites.

For example, while Diet is one of the pre-requisite to fulfill the need of health. The diet may have the following core facets (*an illustration*)

| |
|---|
| Dietary types |
| Dietary Habits |
| Specific Dietary Regimens (specific Age, sex, physical condition, occupation etc.) |
| Developmental Nutrition |
| Nutrition Policy/planning/programs |
| Nutrition Education |
| Nutritional Requirements |
| Nutrition Productivity |
| Envionmental Aspects of Nutrition |
| Nutrition Indicators/ Surveys/ Statistics |
| Socio-economic, cultural, religious influences on diet |

Entities –All individual entities in each of the facets will be grouped at this level.

For example the entities of diet types will be as follows

Diet types based on

- Chemical composition (Carbohydrates, Proteins, Fats, Vitamins, Minerals etc.)
- Source of the diet (vegetarian, non vegetarian etc.)

## 7. Advantages of this approach:

**Permanency and Sustainability**: Social needs do not change with the changing times. What change are the means adopted to fulfill these needs For example, health is a basic need of the man from times immemorial and it will remain so even in future. However the means adopted by man to have good health have certainly changed with the changing times. Earlier man used to believe in superstitions and mystical to cure his ailments. Today he uses more scientific means such as medicines and other such means to cure his diseases. So if we structure our knowledge based upon the fundamental needs, it can sustain itself through the changing times.

**Proactive:** The divisions and categories of the scheme are natural and developed based upon the human and societal needs, whatever be the growth of the knowledge it just fits into the scheme.

**Holistic and Comprehensive**: By this approach all the subjects and disciplines whether basic or applied which fulfill a particular fundamental need are brought together. This enables users to see a particular concept in its totality and give due importance to the concept depending on the role it plays to fulfill the fundamental need. This approach also helps in understanding the concept better and its relation with other concepts and also provides more options to deal with problems. As Millis (1997) an advocate of the educational value of classification puts it, "Classification structures assist seekers of information realize the connectedness of concepts in a store of information, … It presents a clear picture not only of the concepts involved but also of their generic contexts and their syntactic relation."

## 8. Conclusion:

Ever since human beings originated on this earth as a race and as individuals irrespective of the developmental stages, political, geographical boundaries, socio-cultural and religious values and belief systems, are try to fulfill their needs. Human needs are universal and eternal. Attempt to create comprehensive and universal knowledge organization systems based on the human needs approach, will be able to address the concerns raised by traditional and indigenous knowledge system and at the same time it will help in homogenization of knowledge organization which in turn help in finding new ways of linking data sets from seemingly disparate disciplines is the key to get new insights and create new knowledge as envisaged by the Big Data experts and analysts. Such KO tools will provide comprehensive and stable framework to organize knowledge both in physical as well as in digital environments.

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The role of classification schemes in Internet resource description and discovery
*Work Package 3 of Telematics for Research project DESIRE (RE 1004)*
(http://www.ukoln.ac.uk/metadata/desire/classification/class_tc.htm)

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[i] SATIS is an organisation founded in 1982 with its headquarets in Amsterdam, Netherlands, at the peak of non-governmental organisation movement. SATIS (Socially Appropriate Technologies Information System) was formed with the objective of promoting economic and social improvement in rural and marginal urban by providing a series of technological and consultancy services to local development agencies, peasant women and self enterpreneur groups. SATIS had developed its own classification with an orintation towards sustainable development.

[ii] Akshra is an indigenous classification scheme developed in 1979 by the Centre for Education and Documentation based in Mumbai. This alternative classification has a specific agenda, theoretical bias towards feminist principles and the women's movement to be used by women, activists and students.

[iii] Daniela Solomon, in the paper titled "Curriculum based classification – A case study at Southwest college of Naturopathic Medicine Library' (URL: dlist.sir.arizona.edu/1070/02/CURRICULUM-BASED_CLASSIFICATION_-.ppt) describes an alternative classification system developed to suit the information requirements of staff and students of a naturopathic medicine library at Southwest college of Naturopathic Medicine. The classification system used LCSH and NLM schemes as its base and modified scheme as per the requirements.