Information, Knowledge, Wisdom: A Progressive a Value Added Chain

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ABSTRACT

The paper lists problems in defining information and knowledge and also in differentiating between the two. It separately describes physical, economic and cognitive properties of information and knowledge. A long drawn comparative chart of the nature, characteristics and properties of knowledge and information is given. In addition it explains their relation with wisdom. The paper emphasizes that knowledge is only a human preserve. Also it finds common grounds and mutual dependence between information, knowledge and wisdom. The purpose is to clear confusion between knowledge and information, and find their relation with wisdom and tradition by placing these in value added and evolutionary chain: Signals--data-- Information--Knowledge--Wisdom--Tradition.

1. Introduction

Data, facts, information, intelligence, knowledge and wisdom being airy intangibles are elusive entities to define. Comparison is like entering a blind alley. All these consist of the same cerebral stuff that is ideas. Even though the terms are used interchangeably by many (Ranganathan, 1967, Sec.CR21), the entities are different indeed in structure, properties and functions.

2. Information: Definition

Matter and energy are all-pervasive and constitute the only two elemental components of this universe (Satija, 2013). This is what Chapter 13, Verse 26 of the Bhagavadgita means (*see the note*). Next to these two all-pervading entities is the information which is composed of these two. Information is a pattern of matter and energy (Singhal & Roger, 1989). It is the life blood of any system be it mechanical, biological, celestial or social. Despite being all pervasive it is not easy to define information. When used loosely it means everything and nothing. A consensual definition of information is a problematic area of philosophy and science. Its definitional essence

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is elusive due to its all pervasiveness, broadness and vagueness (Weller, 2008, p. 14). It is the most overused but least understood term of our times (Bawden, 2001).

3. Information: Properties

Information and communication are almost synonymous in action. What is communicated is information; information when not communicated is not information *per se*. Information needs a physical medium for its communication and storage. It can be communicated at the speed of light. Its storage density varies with media and increases tremendously with technology (Liu, 2004). In the electronic form it has acquired a few more wonderful properties. Information is a resource as well as a commodity in the information society. It is a resource of all resources and is the ultimate substitute. It is the ultimate input in decision making in every organisation from government to business, and from family affairs to research (Al-Hawamedeh, 2003). Above all it is an essential input for policy making, for governance, and gaining and maintaining power. It is the superior source of power – others being violence and money (Toffler, 1990). No surprise then that a government in any country is the single largest collector, producer, disseminator and controller of information.

4. Knowledge Definition and Properties

"Knowledge is ambiguous, unspecific and dynamic phenomena intrinsically related to meaning, understanding….." (Alvesson & Karreman, 2001). It is a fluid mix of information, experience, skills to provide context or to interpret the new experience and information (Davenport & Prusak, 1998). As to its properties, Ranganthan (1967, Sec.PM7) writes, it is always fragmentary and remains ever in a dynamic continuum. Broadly speaking knowledge is of two kinds: Tacit and expressed.

4.1. Tacit Knowledge is Knowledge per se

Peter Drucker, as quoted by T. Kontzer (2001), aptly says that "Knowledge is between two ears, and *only between two ears*" (Emphasis mine). Tacit knowledge is mostly formed with public knowledge by a ruminating mind. In fact knowledge by definition is implicit or latent. Explicit knowledge is simply information. Knowledge when externalised becomes information. T. D. Wilson (2002) asserts that M. Polanyi who coined the term tacit knowledge had a misunderstanding that tacit knowledge can be managed. All knowledge is rooted in acts of comprehension, which is a sort of inside neuro-physiological process, and is still subject to much speculation in bio and medical sciences. Mental processes of knowledge formation and memorising are not yet fully understood by any one. Being intangible it can only be demonstrated through our acts, both physical and mental. In facts all acts are initiated and controlled by our mental models created by knowledge. Knowledge though personal is not private. Private knowledge is not knowledge *per se*. It could be something spurious claimed by quacks or claimants of esotericism. Intuition and mysticism are two dubious sources of private knowledge.

4.2. Knowledge is Human Dependent

There cannot be any knowledge without a knower. Knowledge is knower dependent. Man is the creator and consumer of information and knowledge. Knowledge is created to solve problems facing mankind. Its creation and use leads to new systems, products, action, services, values, and ultimately the outlook to life and living. Every byte of new knowledge is an addition to human power. The society which is the conservator of knowledge has established libraries and other memory institutions to conserve and preserve it. Education and socialisation perpetuate it.

4.3. Knowledge is our World

It has aptly been said that the distinction between knowledge and action is flimsy and slippery. "Action is knowledge and knowledge is action" (Baumard, 2010, p. 3189). There is nothing so practical as a good theory, paradoxically but aptly said Kurt Lewin (1890-1947). Knowledge leads to form our viewpoints, beliefs and values which ultimately define our worldview. Knowledge in the sense of justified belief guides our behaviour in totality. Jesse. H. Shera (1970, p. 93) quotes Kenneth Boulding to say "Knowledge is the individual's or society's image of the world". This knowledge is indeed individual, so is the world that it is perceived with it. Even when transferred from one individual to another, as in the Knowledge Management process, the transferred knowledge is not the same. That is why every human being is somewhat unique in totality of his/her worldview. It is automatically edited and coloured by the beliefs and values of the receiving individual. In non-literate cultures the knowledge is transmitted orally from generation to generation which is a very slow process and is mostly done in the form of imitating others (following their footsteps), and giving precepts by elders to the chosen ones over a period of time. Orally transmitted knowledge inevitably gets transmuted to some degree, if not corrupted. But ultimately it takes the form of proverbs and folklore for living by norms in a society. It metamorphoses into tradition – a force which helps a society into continuity.

4.3.1. Characteristics of Knowledge

There is a unity in entire knowledge, says Jesse. H. Shera (1903-1981). All assorted chunks of knowledge can be unified into a single big whole. There is a continuity in the evolution of knowledge without any hiatus. In other words, the entire body of knowledge is a dynamic system having its definite characteristics:

- Knowledge is not independent; it is dependent upon the knower, the human being for its creation and use. It resides in the mind and is thus subjective; though personal it cannot be private.
- Knowledge is an intellectual property, and it empowers the holder.
- It is conserved by human society. Thus it is social in character. It is not natural; even the knowledge of the natural world is not natural.
- Technology, social advancements and knowledge creation are mutually dependent.
- Society is the ultimate adjudicator of knowledge.
- Knowledge is never complete. It is eternally fragmentary. It is dynamic, multidimensional and evolving.

It grows and changes with time and society. Growth is both quantitative and qualitative (Satija, Madalli, & Dutta, 2014). If a teacher is teaching the same thing for a long time then either the teacher is not updated or the subject is dead and irrelevant.

- Though its quality improves constantly, quantity of knowledge cannot be measured by any true means. In the present days its growth is in geometric progression.
- It tends to be infinite. Only constraints are the limited span of individual's life, and the unknown but certainly limited capacity of the human brain. Thus it is inexhaustible, i.e. never ending.
- Knowledge growth is pyramidal in structure, especially in so called natural science where knowledge is cumulative. In such areas growth is both qualitative and quantitative. Qualitative growth implies obsolescence of some knowledge.
- Knowledge is a catalyst and enzyme for future knowledge.
- It is non-exclusive. You can give it to someone and you still retain it. More it is used
- communicated or distributed more it grows.
- It is never decimated, though some of it may become obsolete with discovery of new facts.
- Though knower dependent, it finds its own discoverer sooner or later. It is absurd to say that there would have been no knowledge of gravity if Newton were not born, or not sitting under the (apocryphal?) apple tree on that particular day and time. It is not to say knowledge discovery follows fatalism theory. It only means natural phenomena exists though may not be known at a given time. Nature is incremental in revealing its secrets. There seem secrets within secrets lie layers of an onion. Earth did orbit the sun before Galileo discovered and told us.

4.4. Knowledge Formation

Knowledge originates from the environment, both physical and social. Human beings are the knower and knowledge creator. The Nature, including society, is the ultimate source of knowledge. Our sense organs are window to perceive raw knowledge in the form of data and signals, and work as tools to transmit signals as neuro-electrical pulses to our brain (Satija, 2004).

Information is generated when the knower interacts consciously or unconsciously, voluntarily or involuntarily with the environment through the sense organs. Information thus received, gained or intercepted is first given a context by the previously conserved knowledge for its use and validation. Thus knowledge is socio-psycho-biological in nature. Society is the producer and consumer of knowledge, while knowledge is the prime mover of society. Thus society and knowledge are locked in mutual influence on one another. Technology, social advancements and knowledge discovery are mutually dependent. It is not possible to isolate the one way influence. Knowledge grows as society grows; whereas society changes, develops and progresses in multidimensional ways as new knowledge is generated. It is the society which decides which kind of knowledge it is going to have, in which direction and with what speed, and in how much quantity of particular knowledge we need, and also determines the value scales for the different disciplines of knowledge. Particular lines of knowledge are encouraged or impeded by the political, economic and religious interests in particular times and places (Daniels, 1966, p.40). Therefore thrust areas in research to develop new knowledge will depend on the values and priorities of society --which change from time to time. During the

world wars whole of the western industry was intensively engaged in manufacturing defense material. After the war that very industry turned its machines to produce consumer goods and household amenities. That in turn produced a consumer and affluent society. Need for new knowledge is unending for a civilised and progressive society. Conservative and orthodox societies and persons do not live to their full potential.

4.5. Knowledge is Capricious: We do not Know What We Know

Knowledge resides in the human memory — animals, even primates have no knowledge though they have memory. Humans and animals have inborn genetic information in the form of DNA molecules which guides internal (bio) actions while external (daily living) actions are guided by externally acquired information (Satija, 2004). Though every bit of knowledge is memory, but every act of memorising does not create knowledge. The latter requires understanding first and then retention. Knowledge on the other hand is difficult to manage except by the individual knower, that too somewhat imperfectly. How our brain organises and retrieves knowledge is not fully known. This process is ambiguous and amorphous. Paradoxically, it is a common saying that we do not know what we know. Memory mechanism is another hazy area of psycho-biology research. But for certain, there can be no education, no progress of thought and no knowledge without memory. Memory being elusive, capricious and undependable may not recall what may be required at a time. Yet "something may only emerge when we need to employ knowledge to accomplish something" asserts Wilson (2002). On the other hand it is a common experience that we are not able to express exactly what we feel and want to convey. It is mostly due to the fact that knowledge in the form of feelings, emotions and experiences is tacit and very personal while the tool to convey it, which is our language, is common, public and socially shared. Growth of language is slow but that of knowledge is very fast. Thus there is always a gap between thought and its expression. "Between the idea/And the reality/Between the motion/And the act/Falls the Shadow" wrote T S Eliot (1888-1965) in his Hollow Men (1925). All these make creativity a least understood process.

4.5.1. The Chaos and Confusion

In the literature of business management studies, or as used by laypersons, the terms knowledge and information are freely used interchangeably. This makes the term knowledge management somewhat fuzzy, broad and vague. Authors have used it over a wide and diverse range of topics from knowledge engineering, artificial intelligence, networked information, knowledge portals, data mining, tapping indigenous knowledge, knowledge sharing to team learning, and acquiring knowledge for decision support systems. But for a researcher it is imperative to define knowledge usage so that the field of philosophy of information science has a clear and unambiguous vocabulary. This intentional confusion leads to selling ducks for swans and information management easily passes as Knowledge Management. Business and Industry always use high sounding terms as public relations strategy or to aggrandize their products, services and brandname. Professor T D Wilson (2002) castigates that it is knowingly never distinguished between the two by the knowledge management consultancies. No wonder that some library science schools prefer to designate themselves as Schools for KM.

4.5.2. Clearing the confusion

It is ironical to do knowledge management without knowing the nature of knowledge unambiguously or defining it formally. Being a theoretician and LIS professional it quite clear to T D Wilson when he writes "Knowledge is what we know: knowledge involves the mental processes of comprehension, understanding and learning that go on in the mind and only in the mind, however much they involve interaction with the world outside the mind, and interaction with others." The consequence of this analysis is that everything outside the mind that can be manipulated in any way can be defined as 'data', if it consists of simple facts, or as 'information', if the data are embedded in a context of relevance to the recipient. Data and information can be easily managed as we do in databases, libraries, archives or information centres or even at a personal level. But knowledge management is an uncertain process.

4.5.3. Common Grounds

Data, information and knowledge all are comprised of ideas and cannot be neatly separated, as said earlier. However, the following evolutionary chain depicts the increasing maturity, enhanced organisational value and more enduring life span of each link. Though hierarchical in evolution the chain is circular in nature and steps are reversible. They are mutually dependent and are derivable from one another:

Signals → Data → Information → Knowledge → Wisdom → Tradition → Social norms → Laws

Knowledge: Information: A Broad Comparison

• What I know	• What I am able to convey
• Historical and Durable. Sum total of ideas conserved after filtering through value system	• Current and Transient. Message • Data and or Facts
• Information + Knowledge + Experience	• Specific but common
• General and personal	
• Theoretical	• Practical
• Cultural	• Applied/Business like
• Power	• May be Instant power, Subversive
• Descriptive	• Instructive
• Context free, or provides the context	• Context dependent
• Vertical/Hierarchical/cumulative/ Pyramidical	• Horizontal/Additive
• Rule like	• Case like
• Prescriptive	• Diagnostic
• Expresses relations between variables	• Expresses values
• People oriented	• Document oriented
• One could keep it oneself, and ceases with the death of its holder.	• Leaks and ultimately howsoever sealed and secretively it may be kept.
• Resides in the mind	• Resides externally in documents and needs physical media for storage
	• Cultivated with R & D
• Accretes in the mind with experience over time	
• Cannot be replicated absolutely, replication is hyper slow.	• Can be easily, instantly, and perfectly replicated

- When communicated becomes information
- Is harvested through knowledge management (KM)
- Our knowledge makes what we are
- Is the essence of communication and can lead to knowledge formation
- Communicated through numerous media and channels.
- Communication is vital to life socially and biologically.

4.5.4. Comprehension and Understanding

It is clear that information answers questions of what, which, who, how and many other types. Knowledge answers why and how-to questions. Use of information presupposes a perspective and purpose of the enquirer. In medical parlance, diagnosis is information while prescription is knowledge. Understanding is the completion of data processing by the mind. Understanding is comprehension and results in learning. It is explanatory; it answers all questions. Understanding presupposes prior knowledge of the field of input information, and its current relevance. Intelligence is the capacity and efficiency of the brain to apply knowledge and information quickly. It is also defined as capacity to make sense of things and situations and to learn (Baumard, 2010, p. 3185).

4.5.5. Mutual Dependence

Information needs knowledge and experience, in other words, familiarity with the idiom of the field, to give it a context for its effective use. Without knowledge information cannot be used to make decisions or solve problems. Man's judgment, which essentially applies knowledge, cannot be better than the information on which it is based. Knowledge in itself is not only comparatively perennial and of universal value, but also helps to evaluate and enjoy other human values such as goodness and beauty (Radovan, 2013). It increases operative power of the mind. It needs an astronomer to fully appreciate the grandeur and beauty of a starry night. To a botanist a flower looks more a thing of beauty and a peace of wonder than to a layperson. Data tables require background knowledge to be interpreted meaningfully. Information is current, but knowledge is historical. To quote Daniels (1966, p.39) "Since everything that exists in the past is history and since everything we know is already in the past, all knowledge in a way is historical." Without current and authentic input of information mere knowledge may lead to disastrous decisions. To use knowledge without current information is autocratic. That is why it is said history teaches no lesson. Using information without knowledge makes a decision maker priggish. The older generation has knowledge but may lack in current information. It invariably leads to clash of opinions between the older generation and the younger one - the latter has lot of information but less knowledge.

4.6. Knowledge and Wisdom are Exclusively Human Preserves

A computer can store tremendous amounts of data and information, but is not knowledgeable. Not even the entire knowledge in the world can help us to discern the difference and discriminate between the good and the evil. Here only wisdom can help which is the socially correct application of knowledge. Wisdom, being social and cultural, is the preserve of human beings only --- animals and computers have no knowledge and wisdom. What is technically possible with information and

knowledge may not be socially correct and morally acceptable --- human cloning is still banned. Information is received and or transmitted by every system while knowledge is applied only by human beings. Wisdom is mostly advisory and guides in making ethical and socially acceptable judgments by the experienced few.

5. Wisdom

Wisdom is the socially correct application of knowledge. Spiritualist and moralist (very wise people) advise the scientists (knowledgeable people) not to play God. Nobody has made a better distinction in the Info-Knowledge-Wisdom trio than the Nobel laureate poet T S Eliot:

> Where is the wisdom we have lost in knowledge?
> Where is the knowledge we have lost in information?

Knowledge is proud that it knows all, but it is wisdom that makes us a bit humble by informing us of our infinite ignorance.

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• Further Readings

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• Note:

The Bhagvad Gita or the Song Divine, a Hindu scripture is a part or the Hindu ancient Epic Mahabharta. In the Gita Lord Krishna is sermonising on righteous but selfless duty in the war field to his protégé Arjuna, who is reluctant to fight his cousins. The Gita comprises of 700 Sanskrit verses in 18 chapters. The Lord in Chapter 13,verse 26 says:

Arjuna, whatsoever being, the moving or unmoving, is born, know it as emanated through the union of Matter and the Spirit.

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