Quantum Flow Theory of Knowledge (C)

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Abstract—In this paper, we propose a methodology for quantifying the flow of knowledge based on simple rules of flow that govern the flow of current, heat or fluids. Knowledge being radically different from any of these established down to earth concepts starts to display that the approach based on conduction theory soon become ineffective, if not futile to be very precise in the quantification the flow of knowledge. However, the inroads the these discipline carved out over many decades offer a rough mapping of potentials, resistances, path impedances, work done and energies transferred. At the outset, knowledge does not abide by universal law of conservation of energy nor by the basic laws of fluid mechanics, instead knowledge needs its own laws and precepts to quantify its flow, rate of flow, and energies transferred one knowledge centric object (KCO) to another.

The conceptual framework evolved in this paper, together with the tools of characterization of KCOs in any given discipline offers the explanation that the knowledge potential acquired by anyone depends on the differences of knowledge potentials, the duration of interaction, and the resistance to flow of knowledge between the participants. Concepts developed here are generic and they can be used most disciplines and in most places. The paper also identifies the makeup of the “source” and the “receptor” KCOs and addresses the process of knowledge transfer wherein the constitution of the KCOs is altered and adjusted by the “work done” during the knowledge energy transfer. By adapting and enhancing equations from heat-current or fluid-flow laws of physics, electrical engineering or fluid mechanics, we propose the knowledge flow be similarly quantified. Though simple and direct, this approach is coarse and approximate. It yields values for knowledge entities that happen at subconsciously level for human minds and for animate objects and at data- and knowledge levels in intelligent communication systems and machines.

Keywords—Knowledge Flow, Knowledge Centric Objects, Object-Object Communication, Kether Space, Kuanta of Knowledge

I. INTRODUCTION

Four papers [1-4] are proposed in this Journal. Part A deals with the simplest theory to quantify knowledge as we measure the current, fluid-flow, heat, magnetic fields, etc. Part B deals with flow of knowledge, as we would quantify current and voltage signals in transmission media and filters with their own characteristics in electrical communication theory. Part C deals with the flow of knowledge elements and based on the based on the kuantum theory where an individual kuantum of knowledge (a kel) can interact with the medium it is traversing. Finally, Part D deals with the inspirational basis for the transfer of knowledge without any media but between transmitters and receptors with matching characteristics. Part D is based on the principle that incremental knowledge is derived when one noun object interact (in any way) with other noun objects by exchanging verb functions between them in a fashion (i.e., a convolution) subject to the rules of the behavioral grammar. This Part C, also presents that knowledge can be reduced to tiny elemental cells constituted by the quantized noun objects, quantized convolutions and quantized verb functions. Most species deal with modules or kuanta of rudimentary knowledge in order to gratify their routine needs and acquire them to make life easier. Most elite learn to deal with and manipulate more advanced kuanta of sophisticated knowledge in order to gratify their special needs and learn them to satisfy their needs, environment, and their circumstances. Kels do indeed have a hierarchical structure. Like nature itself, knowledge exists in all textures, sizes and forms. Human senses that operate in real and physical space offer a very tiny glance of a much more intricate and sophisticated universe of knowledge that can be sensed by perception and resolved by programming and/or mathematical tools. To deal with reality and use in the knowledge era, the structure of knowledge needs careful adjustment, alignment and association, especially if it is to be deployed in computational environment.

In order to be practical and concurrently wise, we explore the quantum theory of knowledge whereby the protocol for the knowledge paths between smallest knowledge centric objects (kco’s) and the larger knowledge centric objects (KCO’s) are transported. A continuum of noun objects (no’s), verb functions (vf’s), and the associated convolutions (“’s) is thus retained. This continuum is searched out by segmented knowledge machines that operate between the smaller kco’s and the larger KCO’s in any given domain or direction of knowledge. Dewey Decimal System
(DDS) [5], and Library of Congress (LoC) [6], offer two established methodologies to classify the various domains of knowledge. One or more pathways exist in the chain of evolution of the subject matter and related inventions that have occurred around practical and real modules of knowledge in the range of any smaller kco to the larger KCO. All modalities of knowledge representation (images, documents, graphs, presentations, etc.) need investigation to complete the pathway(s) between kco’s and KCO’s.

Minute constituents (i.e., no’s, *’s and vf’s) of kels can and do interact with the social and cultural character of the medium that carries them. In a very sense, the statistical properties of the medium alters the genesis, the transmission and the retention of these kels thus offering the vast varieties of lives, decay and death of knowledge in different societies and cultures. All the principles for the transmission of knowledge presented in Part B of this four part series of papers becomes applicable in this paper. Even though human beings may be daunted by such intricacy, knowledge machine can routinely handle tracking, transmission, attenuation and dispersion of knowledge in most societies.

The origin of kel (to represent knowledge cell) is derived from the word pixel to stand for picture element (i.e., picture-cell, written as pixel). In addition, there is a resounding similarity between kel and the naturally elements in chemistry at the atomic, molecular and at a reactionary level. For instance, the chemical elements also consist of neutrons, positrons and electrons that play an adaptive role as the elements form molecules, and complex chains of organic, inorganic compounds, and acids. Nature has provided an innate intelligence for the world of materials to exist.

In a closely correlated methodology, kels also play such a complex role. kels can share noun objects and convolutions as much as atoms can share the nuclear elements, electrons and valency bonds. The particularly adaptive role of atoms to form varieties of compounds is evident when kels can arrange and rearrange their structures of no’s, *’s and vf’s, to form different configurations of knowledge of chain of kels to form minor kco’s and major KCO’s. The analogy is evident to treat the chemical world as a type of knowledge society or culture where the no’s, *’s and vf’s are the basic building blocks and these kels are formed and unformed depending on the dynamic social setting and the setting. At a very microscopic level, change in the chemistry of every atom is as real as the change of every kel!

The role of a kel is as fundamental as the role of seminal biological cell in all species. The two chromosome pairs formed as xx (female) and/or an xx or xy (male) chromosomes to constitute the female and male genetic cell evolves after the genetic code in the male (no1)-kel penetrates and ruptures (vf(s) in a distinctly unique fashion(*)) the female (no2)-kel. A new kel5 and a new no1 (the baby) is thus formed that carries the genetic code of both no1 and no2 as the no3-kel. One, twins, and multiple babies are all formed from the process 1 (no; * vf, also see Fig. 1). In a very oblique sense, the inception of knowledge and the origin of life get intertwined.

II. REPRESENTATION OF THE GENERAL FORMAT OF INTERACTIONS

A. Physical and Mental Spaces

The impression of physical space in instilled in the human mind since inception. Estimation of distances is an inborn skill and evident as infants grab things. The dimensions in physical space are readily computable in machines. Mental space is acquired soon after infancy to deal with others, need-gratifying objects, environment, and self. The environment, others and the self soon start to exert influence on the reactions and responses from children and adults and as a link between self and environment is by action (or verb function) such as an infant crying/or trying to communicate because of some outstanding need. The relation of objects in the environment, others in the society with respect one’s own self starts to play a part in dealing with the physical space, reality and relationships.

Mental space is dominated by objects, convolutions and verb functions. In the most rudimentary format, these three entities are constantly arranged, rearranged, formatted and reformatted to make to gratify all-pervasive human needs. Needs that initiate motivation, also supply the psychological and physical energy to find means to gratify the most outstanding need at any instant of time. However, objects, actions and the convolutions that bind the two together all play a seminal role as to how and how well the need is gratified.

In reality and perceptions, noun objects can be as large as cosmic objects and continents or as small as electrons and photons. The object size (such as a meal to gratify hunger to a cartload of grain) can vary vastly. The object type (like drinking water sip to quench the thirst to a lake to drink from) can also vary. In a similar mode, the convolution (type of action) can range (from taste, sip, gulp, rip, imibe, slurp, to knock back, etc.) and verb function can range (from gulp down, drink, taste, to swallow or gobble). The range of variations can become too immense for the mind or machines to comprehend or process all variations, all at once. To seek a solution within the rational mind or by a programmable machine, we suggest

1 The more precise representation of the entire set of processes is represented as (qno1→q*1; qv1→q*2→qno2) where the prefix q denotes a kuantum of the genetic code in each kel. Genetic sciences elaborate the processes that follow.
that the solution to any given problem specify that
bounds for (no’s, *’s and vf’s) to a range that the
mind may offer a satisfactory solution and the
machines may offer an optimal (or at least a near
optimal) solution. Quantization of (no’s, *’s and
vf’s) within the range thus becomes feasible.

B. Mental and Computer Spaces

The association between (noun) objects (who),
verb functions (what) and their convolutions (how)
gets associated with needs (why) in the mind of
infants and adults alike. The association with time
(when and how long) are generally associated with
now and as long as it takes. These linkages are
also formed in the minds of infants since time is
now and how long depends on the gratification of
the need (why). The mental space forms a basis
of social relations. Social objects traverse these
mental spaces like clouds in the sky where some
major need gratifying objects (such as parents,
schools, universities, jobs, etc,) retain permanent
coordinates with all six questions are answered (at
least partially) in the hyper dimensional spaces in
the mind. Human beings generally do not conceive
social objects in precise coordinate systems, but
the subconscious linkages persist in the short and
long-term memories. The subconscious that
provides a platform for the life, supplies the mental
coordinates and working space for meaningful
relations between objects (no’s), the associated
verbs (vf’s) and the formats (*’s) of interactions and
the formats of tasks in human life in any given
society and culture. Kels form a coherency for such
tasks, as time forms a bondage between them. Knowledge and time thus get intertwined in
the fabric of human activity that is tractable in the as
tasks in the CPU of computer systems. Both forms
of tasks need time to complete. However the silicon speed of chips being much faster, can also
optimize the execution of human tasks and provide
a predictive plan for human activity. In the
computational domain the human beings can
benefit from the intelligent peripherals of an already
intelligent Internet.

Such mental associations can be reworked in
computer systems like telephone numbers are
worked into switching systems that provide
channels of communications in networks. A
scientific model becomes essential and
mathematical relationships become necessary to
optimize the chain of need(s), action(s),
response(s) to gratify such needs. More than that,
in a social setting, the socially acceptable norms
play a part and culturally variable factors make the
programming of social machines more demanding
than the programming of plain old scientific
computers based on already optimized
mathematical algorithms.

III. ATOM AND KNOWLEDGE ELEMENT

The diagrammatic representations of a kel and
of a Carbon² atom are shown in Fig. 1. Fig. 2
depicts the atoms for Gold and Hassium. These
two elements have radically different properties.
Atoms can and do exist in many atomic weights as
much as kels can and do exist in many “kel
weights” (like atomic weights) depending on the
utility of the knowledge embedded in the kel. Kels
can exist freely in nature (as atoms in gold), or
machine generated (as atoms of Hassium). For
instance the atomic weights of the noble metals is
higher than one, since the energy contained in their
atoms is far greater than in the hydrogen atom with
an atomic weight of 1.0078, [7]). The kel-weight
of a brain surgeon (a noun object) performing a (vf)
transplant of the brain (if it is possible), in a very
specific way (*) would be much higher than the kel-
weight of a monkey eating peanuts. The
knowledge society is thus a very ordered
environment of kels represented and integrated as
µk’s, ∂k’s, ∆k’s, ∑ks, ∑∑k’s, …, and then of µK’s,
∂K’s, ∆K’s, ∑Ks, ∑∑K’s, etc³. Chemistry also
displays simple and complex to very, complex
chains of distribution of atoms in the real world.

IV. MOLECULAR WEIGHTS OF CARBON COMPOUNDS
AND LARGER KNOWLEDGE ELEMENTS

The behaviors of a Carbon atom and a kel are
depicted in Figures 3 and 4. Kels can combine with
themselves, (one or more) kels, and form chains of
kels as in human dialogs where every step in the
interactive process modifies the status of the
present kel. Kels retain the history of modifications
like a symbol in a series of steps of mathematical
derivation or like a numeric symbol in
computational processing. In a sense, like human
objects, kels have a life of their own. Sometimes
they live and die in the perception of human
counterparts and sometime they as real as
sentences and procedures documented in
textbooks.

The variety of kels can be as large as the
number of molecules and compounds in the real
world. Kels can be as transitory as the fleeting
passion or as (semi-) permanent as the written
word. In most cases kels have a utilitarian value.
This utilitarian value is indicative of the kel-weight.
The utility if a kel depends on the need that it
gratifies. Thus, a kel to represent a monkey eating
peanuts would fall well below the kel as a
programmer developing new software.

Knowledge space encompasses physical space as
much as memory time spans real time and as much as

² Carbon atom is chosen as an example, but any element
that forms molecules and compounds would exhibit
similar properties and traits.

³ In increasing order of complexity of kels. For example, if
µk is grocery item, then µk will be a grocery store and
∑∑K would be worldwide chain of food stores, global
banking corporations, etc.
perception spans cosmic time. The order of complexity of knowledge space is greatly enhanced because every noun-object, verb-function and their combination are unique to the quantum of knowledge being pursued and the human being processing it. Moreover, the psychological and mental coordinates of space and time are socially and culturally variable.

Structure of a \( \textit{kel} \) constituted as the knowledge when a noun object \( \textit{no} \) convolves (*) with a verb function \( \textit{vf} \) in a specific convolution \( * \) format.

Fig. 1. Configuration of an element of knowledge, \( \textit{kel} \) formed from a set of the tinniest but flexible and dynamic entities (\( \textit{no}, * \) and \( \textit{vf} \)). The \( \textit{kels} \) become comparable to atoms made up of neutrons, protons and electrons. The basic building blocks can be shared and enhanced to form new \( \textit{kels} \) during social interactions or in knowledge processing machines.

The Structures of Gold (Au) and Hassium (Hs) Atoms

Fig. 2. The structures of the Gold (Atomic weight = 196.966) with 2,8,18,32,18,1 electrons in an Au atom and then the radio-active Hassium (Atomic weight 277) with 2,8,18,32,32,14,2 electrons. These elements have radically different properties. The \( \textit{kels} \) in Fig. 1 are comparable to atom made up of electrons, protons and neutrons. The basic building blocks can be shared and enhanced to form other elements or during chemical interactions/radio-active and or forced processes as much as \( \textit{kels} \) are altered in social/cultural and/or hostile interactions.

The Behavior of a Carbon Atom in Interaction with Hydrogen Atoms to form various Molecules

(i) A Carbon Atom a bond angle Alkane of 109.5°  (ii) Methane  
(iii) \( \text{CH}_4 \), \( \text{CCl}_4 \) and \( \text{C}_2\text{H}_6 \) Structures,  
(iv) With tetrahedral bond angle of 109.5°,  
(v) A Branded with chain

Fig. 3. The Alkane (\( \text{C}_n\text{H}_{2n+2} \)) Family (Methane, Ethane, Propane, Butane, Pentane, Hexane, etc.) and the adaptive role of the Carbon Atom (C).
The Behavior of a *kel* in Interaction with other *kels* to form new Artificial and Natural Knowledge

<table>
<thead>
<tr>
<th>Kel&amp;laflex; like an atom</th>
<th>All kel&amp;laflex;'s are feasible</th>
<th>All kel⊂i⊂j⊂k's are also feasible</th>
<th>...... Complex kel⊂ij⊂k ⊂etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kel* (no * vf)</td>
<td>Kel* (no * vf)</td>
<td>Kel* (no * vf)</td>
<td>kel⊂yz &amp;+= kel⊂i⊂j⊂k's</td>
</tr>
<tr>
<td>Quantized noun object</td>
<td>Quantized noun object</td>
<td>Quantized noun object</td>
<td>Quantized noun object</td>
</tr>
<tr>
<td>Convolution (+)</td>
<td>Convolution (+)</td>
<td>Convolution (+)</td>
<td>Convolution (+)</td>
</tr>
<tr>
<td>Verb function (vf)</td>
<td>Verb function (vf)</td>
<td>Verb function (vf)</td>
<td>Verb function (vf)</td>
</tr>
</tbody>
</table>
| *(i)* Quantum kel = knowledge cell *compri*ning of knowledge when noun object acts verb function *vf in a specific convolution *.

Fig. 4. The chain of new knowledge structures generated when a basic *kel* (such as the knowledge in a invention (e.g., 2-D computer memories)) starts to interact other *kels* such as 2½-D memories to leading the Architectures of 3-D memories. Numerous other examples also exist such as the discovery of Penicillin by Fleming has led to the development of other specific chain of antibiotics, such as the invention of internal combustion engine has led to the turbo charged automobile engines, etc.

Hence, it becomes necessary to limit the definition of *kuantum* to “sensible” size and to be practical locations in setting the object-size of the *kuanta*, the size of the verb-function to be discernible and type of convolution (*) to be in the realm of human comprehension. Only the unique combination of these three “kuants” constitutes the *kels* in its own particular setting at a given instant ’t’.

Initially the *kuantum* of knowledge can be limited to most useful noun objects and verb functions. Two examples follow. In a down to earth format, a *kuantum* of knowledge can be stated as (food (*n*), eat (*v*), restaurant (*x, y, z*), date and time (*f*). At the other extreme, a cosmic *kuantum* can be stated as (spaceship A (*n*), explores (*v*), and coordinates- Planet B (*x, y, z*), cosmic calendar date and time (*f*). The need to be practical and limit the programming complexity, it becomes a necessity to deal with kuantized knowledge within the realm of computation. Even so, the content of the knowledge so gathered (i.e., the food eaten in the restaurant or the data collected by the space ship) is not communicated in this representation. The flow of the entirety of knowledge needs more numerous smaller *kuanta* (*kco’s*) to be complete by the global *kuanta* of knowledge (or KCO).

The recent changes in the Internet age are catalyzed by gating functions in the silicon chips and wave mechanics of photons in the optical fibers. This unprecedented synergy in silicon-based computation with glass-based communication has elated the human thought to new levels of intellectual activity and scientific exploration. The mental processes still hold an almost mystical execution of neural programs to mould concepts, knowledge and wisdom with learning, behavior and adaptation. Machines to implement such functions are just appearing in the society.

Even though thought processes are associated with neural space, the computational processes are associated with physical and Pentium space [8]. These intermediate linkages bridge reality and physical spaces with the human psyche dealing with objects, their actions, interactions and their effects. Human beings have learned to cross these spaces readily by mind and thought control, a wink, or even a gesture of the face. Such fine processes are hard, if not impossible to program in the software of social machines. Quantized knowledge between human minds and machines can be established by controlling the quantized noun-objects, the convolutions, the verb function, and their timings. These four entities makeup the computational space as the mind would alter them in the psychological space to accomplish most social functions or processes. The quantized social machine would alter the status of the elemental noun-objects and their entropies accordingly. Thus, the machine could in a limited sense track, follow and duplicate the minute mental and psychological processes of a human mind at a quantum level.

A. Atomic and Molecular Weights from Chemistry

Atomic weight consists of three weights, weights of the protons, neutrons and electrons. Thus, the heavy metals have a more complex atomic structure than the higher metals. Similarly, complex compounds can be substantially heavier than simple molecules. For example, the atomic structure of a Gold atom (atomic weight of 197) has 79 Protons, 118 neutron and 112 electrons in 7 Electron shells [7]. The molecular weights of compounds also exhibit similar characteristics.

The Hassium atom formed during radio-active fusion exhibits fundamentally different properties from those of Gold, Carbon or even Lead. *Kels* also “genetically” inherit properties based on the type and nature of the *kenergy* that was expended in generating these *kel*-elements. Humans and animals may have common physiological functions have different “genes of knowledge” to make them radically different.
A disorganized kco e.g., an ad hoc group people  

Organized kco e.g., an structure of an organization  

Fig. 5. Formation of an knowledge centric object kco form a set of kels. A kco or a kel is a human being with its own personality (a noun objects, no) functional capabilities (convolutions *) and unique tasks (verb functions vF's). These three constituents can be further fragmented to ascertain the appropriateness of the kels.

Fig. 6. The properties the carbon atom as it forms compounds with other elements, H, O, N, etc.

<table>
<thead>
<tr>
<th>Six Basic Alkanes</th>
<th>Molecular Weight $^\text{x}$</th>
<th>Gross Energy$^\text{y} = \text{kJ/mol}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methane CH$_4$</td>
<td>16.04 g/mol</td>
<td>889</td>
</tr>
<tr>
<td>Ethane C$_2$H$_6$</td>
<td>30.07 g/mol</td>
<td>1560</td>
</tr>
<tr>
<td>Propane C$_3$H$_8$</td>
<td>44.16 g/mol</td>
<td>2220</td>
</tr>
<tr>
<td>Butane C$<em>4$H$</em>{10}$</td>
<td>58.12 g/mol</td>
<td>2877</td>
</tr>
<tr>
<td>Pentane C$<em>5$H$</em>{12}$</td>
<td>72.15 g/mol</td>
<td>3507</td>
</tr>
<tr>
<td>Heptane C$<em>7$H$</em>{16}$</td>
<td>100.20 g/mol</td>
<td>$\approx$ 4824</td>
</tr>
<tr>
<td>Any Allkane C$<em>n$H$</em>{2n+2}$</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

Notes: $^\text{x}$ The numbers are approximate, since the atomic weight of H is 1.00789 and the standard atomic weight of C is 12.011.

$^\text{y}$ The quantity known as higher heating value (HHV) (or gross energy or upper heating value or gross calorific value (GCV) or higher calorific value (HCV)). It can also be expressed as MJ/kg.

is determined by bringing all the products of combustion back to the original pre-combustion temperature, and in particular condensing any vapor produced. Such measurements often use a standard temperature of 25 °C (77 °F). This is the same as the thermodynamic heat of combustion since the enthalpy change for the reaction assumes a common temperature of the compounds before and after combustion, in which case the water produced by combustion is liquid.

The higher heating value takes into account the latent heat of vaporization of water in the combustion products, and is useful in calculating heating values for fuels where condensation of the reaction products is practical (e.g., in a gas-fired boiler used for space heat). In other words, HHV assumes the entire water component is in liquid state at the end of combustion (in product of combustion) and that heat below 150 °C can be put to use.
In Fig. 6, the Carbon atom and its molecules are used to indicate the chain of compounds derived from Carbon atoms on the left side. Carbon atoms combine with other elements, and metals to form elaborate arrays of compounds. The alkane chain is used to depict the molecular weights on the right side. The molecular weights in g/mol increase as the chain of hydrocarbons becomes longer in column 2 and the energy contained expressed as in kJ/mol also increases. As seen in the Sections B and C, and depicted in Fig. 7, kels and kco’s also exhibit similar properties.

B. Atomic/Molecular Weight of Kels in Society.
Kel atomic/molecular weight consists of three (kel) atomic weights (a) no (or no’s), * (’s) or (vf’s), thus complex or chained kels such as a surgeon (a no) performing a surgery, can be substantially heavier than simple kels such as a monkey (no) eating (vf and * together), peanuts (secondary noun object). Kel atomic/molecular-weights can be positive for constructive knowledge elements enhancing utility (such as X helps Y) or zero (such X does nothing to/for Y) and even negative (such as X hurts Y), for non-constructive or destructive knowledge elements decreasing utility (such as X bothers Y). The three components (no (no’s), * (’s) and vf, (vf’s)) all determine the utility. In a sense, human values in the society and culture are ingrained in utility. If construction, reconstruction and peace are on the positive scale, then destruction, terrorizing and war are on the negative scale. Thus, the kel balance can swing and fluctuate with time and social setting. Nations have examined this abstract notion by examining the extent of knowledge that propagates health, happiness and welfare in the society to the extent of Mafia, war and terrorizing knowledge disintegrated over a finite duration of time such as the Presidency of US Presidents. The measure though not precise is still indicative of the utility of any President for the country. Documented periods of war (Churchill (WWII), Nixon and Johnson (Vietnam war) and Bush (Iraq war) Presidencies) are disfavored in comparison with the years of reconstruction and social reform that followed such Presidential years engaged in social reform, public and global welfare and other constructive actions (verb functions vf’s) bear high positive utility for the President.

<table>
<thead>
<tr>
<th>Some Basic Elements in 3 and 4</th>
<th>Mean &amp; Variance from Populous</th>
<th>Satisfaction $^3$ = Achievement X Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Pref. = $P_w$</td>
<td>$\mu = \mu_w$, $\sigma = \sigma_w$</td>
<td>$S_w = P_w \cdot \mu_w \cdot Years_w$</td>
</tr>
<tr>
<td>Personal Pref. = $P_p$</td>
<td>$\mu = \mu_p$, $\sigma = \sigma_p$</td>
<td>$S_p = P_p \cdot \mu_p \cdot Years_p$</td>
</tr>
<tr>
<td>Personal Pref. = $P_t$</td>
<td>$\mu = \mu_t$, $\sigma = \sigma_t$</td>
<td>$S_t = P_t \cdot \mu_t \cdot Years_t$</td>
</tr>
<tr>
<td>Personal Pref. = $P_s$</td>
<td>$\mu = \mu_s$, $\sigma = \sigma_s$</td>
<td>$S_s = P_s \cdot \mu_s \cdot Years_s$</td>
</tr>
<tr>
<td>Personal Pref. = $P_p'$</td>
<td>$\mu = \mu_p'$, $\sigma = \sigma_p'$</td>
<td>$S_p' = P_p' \cdot \mu_p' \cdot Years_p'$</td>
</tr>
<tr>
<td>Personal Pref. = $P_t$</td>
<td>$\mu = \mu_t$, $\sigma = \sigma_t$</td>
<td>$S_t = P_t \cdot \mu_t \cdot Years_t$</td>
</tr>
</tbody>
</table>

Integrated Sum of Achievements of an individual. Dynamic and Society/Culture Dependent

$$S_i = \sum S_i = w, p, f, s, p', r$$

Notes: $^a$ The numbers are approximate, and based on statistical Averages of wealthy and successful segment of the population at any given time frame or decade in any given culture/society.

$^b$ The satisfaction or integrated achievement of kel can be considered as the sum of individual achievements and the duration over which they last. The personal preference factors ($P_w$, $P_p$, $P_t$, $P_s$, $P_p'$, and $P_t$) are also dynamic but indicative of the individual’s personality profile. There is no quantitative measure for satisfaction and happiness but it can be a perceptual entity that the kel (individual) can “feel”.

Fig. 7. The properties kels and KCOs as they forms new combinations with other traits (such as loving and kind $\rightarrow$ considerate) in the Social domain. These properties are further explained Sections B and C.
C. Statistical Properties of kels and KCOs in Society

Kels those resident in human beings for long periods of time substantially shape the personality of the host. For example, a human being (no) with a subject matter specially in physics and teaches (* and v) it for decades, becomes a physics teacher (a KEL or KCO). Other examples are also evident. For this reason, the evolution of a kel to a KCO becomes evident in almost all circumstances and situations. In the case of inanimate kels, petroleum in gasoline becomes petrol. The terminology becomes less important than the evolutionary chain of kels to KELs, and then on to kcons and KCOs.

Complex KELs in large associations with other kels have high "molecular weights". For example, a highly sociable person or a subject matter expert will have higher "mo weight" than an introvert or a high school student. Such kels can be classified according to their "mo weights". The highly valuable kels also at the top of a hierarchical structure gratify the most wanted human and social needs. If such needs are themselves classified (as in Maslow's Need Pyramid), then the kels to gratify these human needs, can be rearranged accordingly. The kels that satisfy the realization, social, and ego[9] needs (from Maslow's Hierarchy) of humans and societies will have their highest kel-atomic/molecular weights. The diagrammatic arrangement of Needs, their kels are shown in Fig. 7.

V. CONCLUSIONS

We have proposed that knowledge should be considered reducible into their finest quantum sized elements. The quantized elements of knowledge behave as elements in chemistry and constitute the building blocks of larger bodies of knowledge, much as the elements in nature combine to become compounds and molecules. In the knowledge domain, the constitution of kels and their behavior is dramatically more flexible and individualistic, but exhibit statistical properties that makes communication (exchange of knowledge) possible across social and cultural barriers. In this paper, we trace the similarity between the elements of knowledge and elements in chemistry. It is feasible only to a certain extent since the structure and modality of kels becomes radically different than those for the elements in chemistry. In the later case, the Periodic Tables precisely and rigidly dictate the properties and behavior of chemical elements.

In the knowledge domain, the syntactic and semantic laws the kel composition for the exchange of knowledge depend on the individuals, society, culture, time and the information content in the knowledge being exchanged. The capacity of the modern computers and hand held devices is by and large sufficient to offer individual users pathways and byways through the knowledge domain to deal with the exchange of information precise, optimal and efficient. In this vein, we suggest that choice of their particular elements of knowledge of individual users be towards the achievement of their long-term goals like wealth, status, power, etc.

REFERENCES


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1 It is hard to justify that an egotist would be classified as a highly placed kel, unless the ego also serves a molecular association with other beneficial kels. As another example, a Mafia boss, though well connected with other members of mafia cult would have a high negative mol-weight. It becomes necessary to associate the social welfare with mol-weights to be positive. In the current social setting, leaders such as Gandhi, Carter and King would have a high rank positive in the hierarchy. Negative mol-weights are and should be associated with torrents, terrorists and dictators such as Mao in China, Hitler in Germany, Johnson in Vietnam, Bush in Iraq, Netanyahu in Palestine who have brought shame to humankind.