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A modern scientific awareness of Upanishadic wisdom: Implications to physiological psychology and artificial intelligence.

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Abstract

Upanishads are traditionally commented upon as texts of theology and religion. But the contents of the *Upanishads* can also be viewed and commented from modern science point of view. Elements of modern science present in the *Upanishads* and *Advaita Siddhanta* will be listed.

The nature of *maya* will be discussed with modern scientific awareness. This awareness will be further used in understanding human mental processes and the ways to model them contributing to the natural language comprehension field of artificial intelligence.

The nature of the *Dvaita* and *Advaita* conscious states and their implications to human cognitive processes will be discussed. The use and significance of the 'absence of mind' conscious state will also be presented.

The use of above understanding in modeling human understanding process and its comparison to physiological psychology - the physics and chemistry of psychology - will be proposed.

The *Upanishads* are treasure-houses of ancient Indian wisdom. Together with the *Brahma Sutras* and the *Bhagavatgita*, *Upanishads* have been traditionally commented upon theologically and are considered as texts of religion. Thus we have *Advaita* view revived by Sankara, *Visistadvaita* view of Ramanuja, *Dvaita* view of Madhwa and the *Saktadvaita* view as chief and popular views and sects are created around each of them. *Vedanta Darsana* and *Advaita Siddhanta* have their roots in the *Upanishads*.

Advaita philosophy nurtured and developed by *Vedanta* and *Sabdabrahma* Theory of Patanjali can be usefully viewed as understandings of integrated psychology and natural language processing and hence can be interpreted from modern science point of view. As is known psychology is physiology and physiology is study of physico-chemical processes in the organism. Such a view reveals the scientific content of the *Upanishadic* wisdom. This mine of knowledge can be beneficially applied to the modern scientific disciplines like physiological psychology and artificial intelligence.

Upanishads propose the existence of *Atma* and are source books of *Atma jnana*. *Atma jnana* when studied with an open mind with concentration and further contemplated

deeply, it becomes evident that *Atma jnana* is the software dealing with the structure, origin, function, cessation and control of mind in the four conscious states in which mind functions and ceases to function (concept diagram I).

Atma jnana also provides us with the details of the source of psychic or mental energy and mental time-space. The changes and transformation of psychic wave energy pulses issuing out of *Atma* (the Bio-oscillator, which generates psychic energy pulses) enable us to know, to perceive, to understand, experience and be aware of all these processes, *Atma* guiding and controlling them without itself ever changing. (concept diagrams II, III, and IV)

Table I gives the psychological and scientific meanings of famous *Upanishadic Mahavakyas*.

Formation of Inner-world (prapancham)

From *Atma*—the *Sat - Chit - Ananda*, - a bio-oscillator - which is the result of the breathing process - the psychic energy generator - psychic energy pulses issue out and get reflected in *Medha* as '*maya*'. *Atma* with its characteristic as *Sat* gives us the ability to be conscious of our body, ourselves, within and without of us. With its characteristic as *Chit* gives us the ability to know, to perceive, to think and as *Ananda* to experience, to understand, to know the meanings and as *Sat-Chit-Ananda* gives us the ability to be aware of all these. If we are involved in these, we are *jivatma* and if we witness these as a seer uninvolved and hence unaffected, we are *paramatma*.

The reflected *chit - sakti* pulse series in *Medha* termed as *maya* are virtual (*mithya*) but are same in form and nature as the real *chit - sakti*. *Maya* is also known as *Chit Abhasa* (reflected *chit*) or *Pranavam* (primordial sound)

Maya is the current of awareness pervading the whole body. *Maya* bifurcates (first transformation or change) into '*Divya*' and '*Swara*'. *Divya* is *jnana sakti* - electro-chemical energy - which gets divided into four *antahkaranas* (inner tools) as - *manas*, *buddhi*, *chittam*, and *ahamkaram*. '*Swara*' is the *prana sakti* (mechanical energy) which divides itself into *pancha pranas* - *prana*, *apana*, *vyana*, *udana*, and *samana*. *Jnana sakti* as *manas* activates sense organs and *prana sakti* activates action organs to do respective functions (concept diagrams II and III). From these diagrams we know that mind is a combined operation of *Atma*, *maya*, *antahkaranas*, *panchapranas*, sense organs and action organs. Also mental functions are reversible transformations of *chit - energy pulses* in mental time-space (awareness of mind). Thus the nature and mode of these energy transformations can be easily understood by using concepts in Physics, Electronics and Communication engineering.

Physics is a natural science which deals with actions and interactions concerning matter and energy in Time and Space. Thus the above-cited mental functions can be probed into and understood in terms of matter (bio-materials such as proteins, neurons) and energy (*chit-energy* - electrochemical energy pulses) in the mind- transcending awareness (time



- space - the energy presence) in the body-space. Also concepts developed and used in electronics and communication engineering disciplines can be used to understand and propose a model block- diagram regarding mental functions - creation and retrieval of inner -world (prapancham), experiences (vasanas, meanings, understandings), that help us to know / perceive (think) / experience / understand or cognize and cognition- related happenings that take place during our learnings of all kinds (concept diagrams IV, VA,VB) the normal knowledges, language learnings, and discipline- related knowledges.

In this scheme of understanding, when knowing takes place through sense organs, the input energy forms become aware to the mind through manas. Manas is modulated chit-energy pulse in accordance with input energy form sensed by sense organs. Mind knows through manas, records through manas and retrieves through manas the cognitions. Manas is the medium of knowing. The experiences caused by the cognitions are sensed, stored and retrieved by chittam simultaneous to knowing. Knowing and experiencing are done so quickly to give an impression that they happened simultaneously. When we receive information other than in the language we are familiar with, we do not know anything. Because the process of knowing getting converted into perception, experience / understanding to meaningful experience or experienced meaning does not and cannot take place for want of prior knowledge of the language.

Experiences caused by cognitions are called vasanas. These include the meanings of the words we learn by learning the languages through sense organs(eye, ear) and action organs(hand movement, writing). All the skills we learn using sense and action organs simultaneously. Thus all learnings including languages, disciplines, and skills are happening by the simultaneous action of Jagrat(awakened) and Swapna(dream) conscious states in which the mind alternates between Advaita and Dvaita conscious states. Dvaita state is the state of knowing, perception, experiencing, understanding, and Advaita state is meaningful experience and experienced meaning state.

In the interplay of these conscious states the Chit-abhasa energy pulse undergoes modulation in the expresser and demodulations consecutively in the receiver to give us knowledge, perceptions, experiences, understandings, meanings and skills in the simultaneous use of Atma(awareness) Maya(current of awareness flowing throughout the body), antahkarnas, pancha pranas, sense organs and action organs.

Simply putting our mental functions are the transformations of chit-abhasa pulses, modulated by energies through sense organs and the stored informations as potential energies retrieved (Vasanas first and then Prapancham) and demodulated to give us knowledge, experiences etc.

Cognitions by sense organs are mental processes of human beings and to a less extent, of animals (all the vertebrates which breathe and have spinal chord). Several branches of learning take study of mental processes as one of their subject matters: epistemology, psychology, physi-

ological psychology, neurology, artificial intelligence and cognitive sciences contribute to the study of the mental processes in their own way.

Up to now, however, little has been done to combine the approach- let us say - of the physiological psychologists and neurologists who see cognitive process as a biochemical and biophysical energy transformation with the proponents of Connectionism, who have a lot to say on pattern - recognition memory and learning.

Most of the present attempts aim at modeling machine thinking as an isolated process which is the result of sensing. But if human mental processes are observed, it becomes obvious that thinking is but an intermediary process which transforms sensing into sense and sense into utterance/ expression. Human mental process can be stated sequentially as follows.

1. Sensing through sense organs (knowing).
2. Perception (thinking, reasoning, correlation with already available cognitive data in the brain).
3. Experience / Understanding
4. In the mental time- space.

Thus human mental process is generally held to be a combination and quick successive transformation of following four modes.

Speaker: 1. In mental awareness. 2. Experiencing / Understanding 3. Perception. 4. Utterance /Expression.

Listener: 1. In mental awareness. 2. Knowing (through sense organs) 3. Perceiving 4. Experiencing / Understanding

Language, the chief communication tool of human beings in day to day transactions and also in learnings, understandings and imparting various disciplines and skills, is learnt consciously or otherwise through these four modes..

Human cognitive processes, especially understanding is defined by many proponents of connectionism as a kind of mapping .It will be interesting if due attention were paid to the relevant data of physics - energy and its transformations - coupled with the insight of Upanishads presented here and it will play a vital role in understanding and modeling human - cognitive processes.

Sabdabrahma theory of Indian grammarians is highly significant in this regard. Sabdabrahma theory names four modes of mental processes as - Para(awareness), Pasyanti(understanding/meaning/experience), Madhyama (perception) and Vaikhari (utterance/expression) when language is learnt or spoken. Sabdabrahma theory has Advaita philosophy as its basis. As is discussed here, Advaita philosophy is an integrated psychology which professes the sameness of knower and known in knowing by concerning with BEING and BECOMING in forward and reverse directions.



Cognitive sciences often rediscover philosophical analyses painstakingly. A better policy would be first to learn what Upanishadic wisdom teaches us in this regard and then move on to experimentation and model – building within the scope of positive science.

The aim of this research paper is the presentation of the possibility to develop software which would perform the tasks of the standard connectionist models using Upanishadic wisdom. Application of Upanishadic wisdom helps in clearing conceptual issues to reach the stage of extending connectionist model and translating the software into physiological modeling for which the study of bio-chemicals such as proteins will be useful.

TABLE I
PSYCHOLOGICAL AND SCIENTIFIC MEANINGS OF
CHIEF UPANISHADIC MAHAVAKYAS

1. *Aham Brahma Asmi* The real identity of 'I' is Unoccupied Awareness. 'I' is not a person, thought or not a sense. 'I' is pure (transcending self – consciousness) Consciousness or Divine Consciousness.

'I' is the impersonal Seer which is the source of mental energy and guide of and witness to transformation of mental energy as mental functions but unaffected by them and transcending both mental functions and their cessation.

2. *Tat Tvam Asi* Self and Divine Consciousness are same in nature, content, structure, form (function) and presence.

3. *Ayam Atma Brahma* Atma is Brahma – Unoccupied Awareness – Divine Consciousness – Energy Presence without transformation.

4. *Prajnanam Brahma* Brahma – as Atma – Bio-oscillator – Energy Presence – is Mental Time-Space. (Prajnanam) is Unoccupied Awareness in Divine Consciousness.

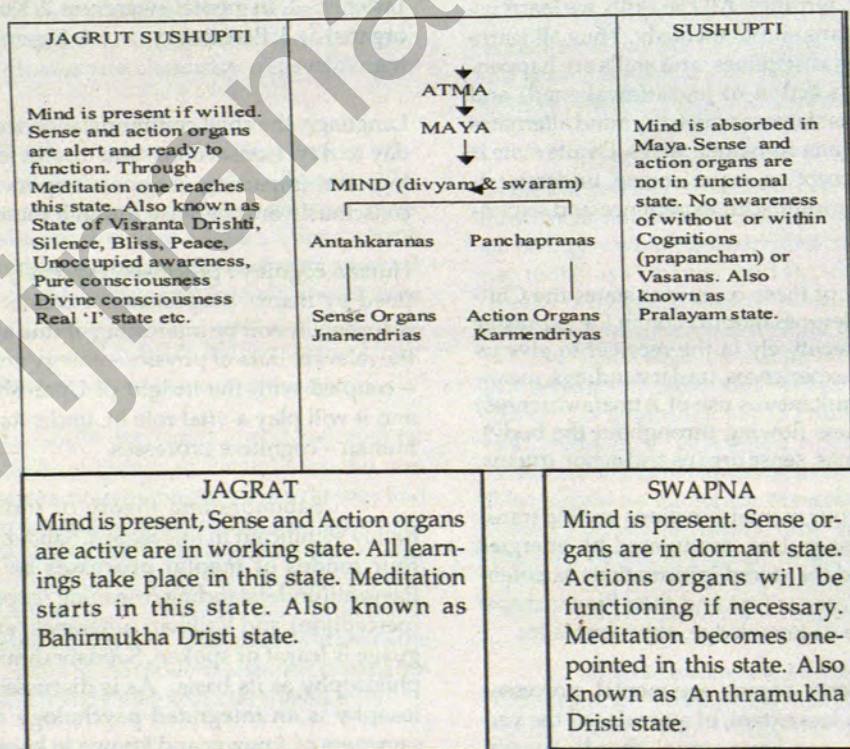
5. *Raso vy Saha* Experience of Essence of the meaning of Maha vakyas, – All Cognition-related experiences in Unoccupied Awareness- Meaningful Experience. Silence. Peace. Bliss. Experienced meaning. Purport.

6. *Anando Brahma* Unoccupied Awareness is bliss.

7. *Sarvam Khalu Idam Brahma* All the world (collections of cognitions sensed by sense organs through the medium of Manas) – is composed in, made up of, sustained by, rests in and ceases to be because of and part and parcel of Psychic energy pulse generator – Atma.

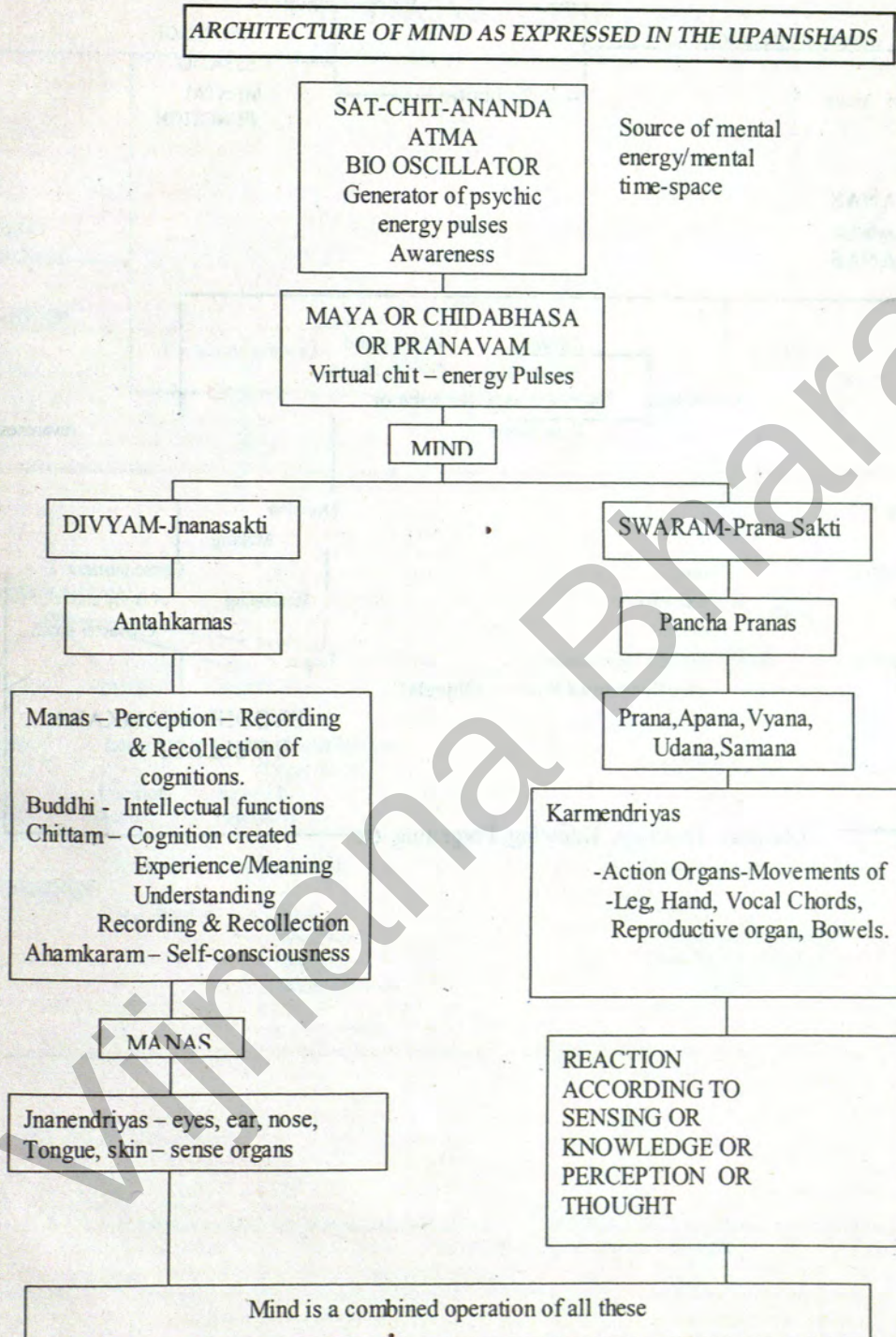
CONCEPT DIAGRAM I

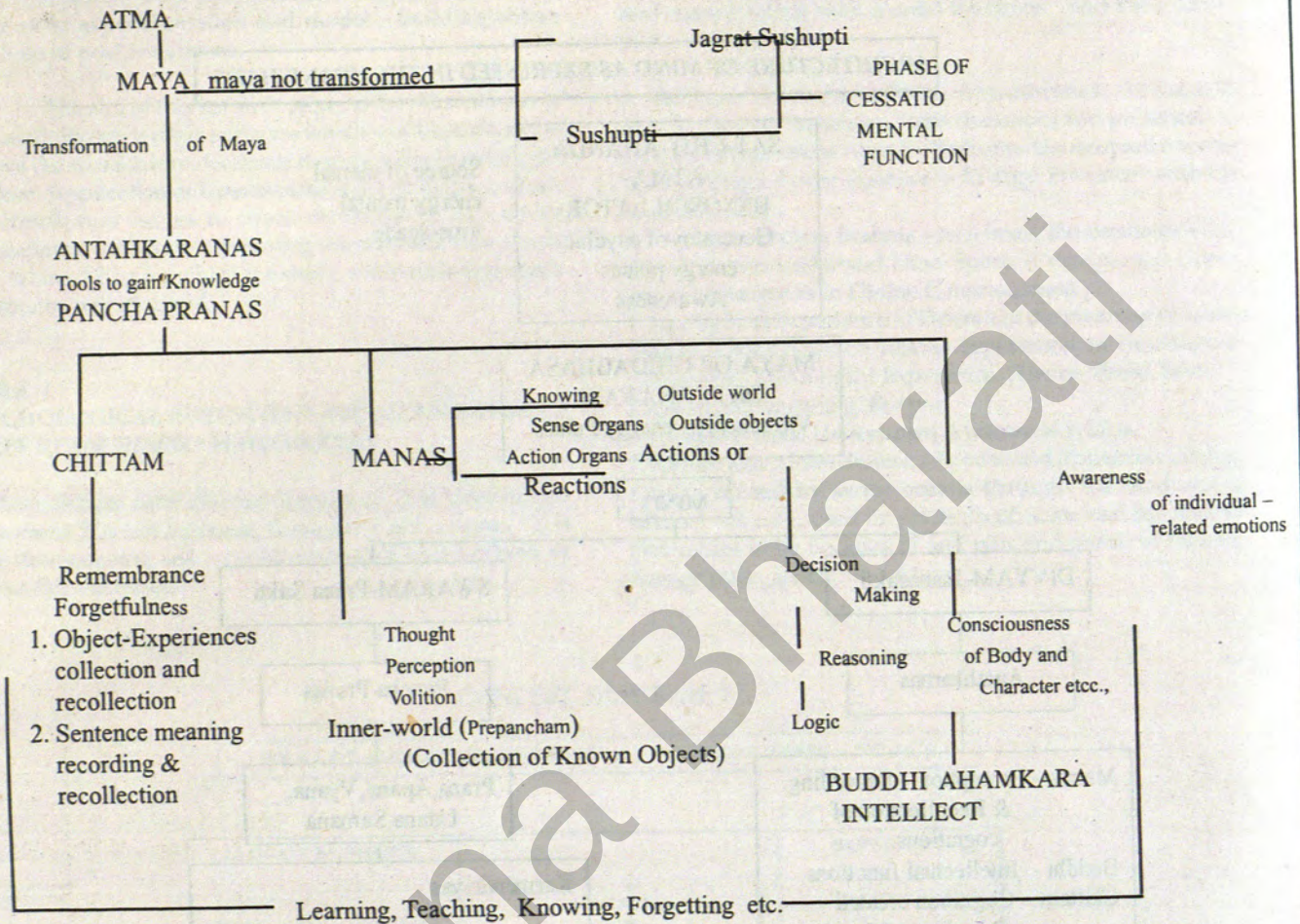
STATES OF CONSCIOUSNESS – MENTAL TIME - SPACE





CONCEPT DIAGRAM II

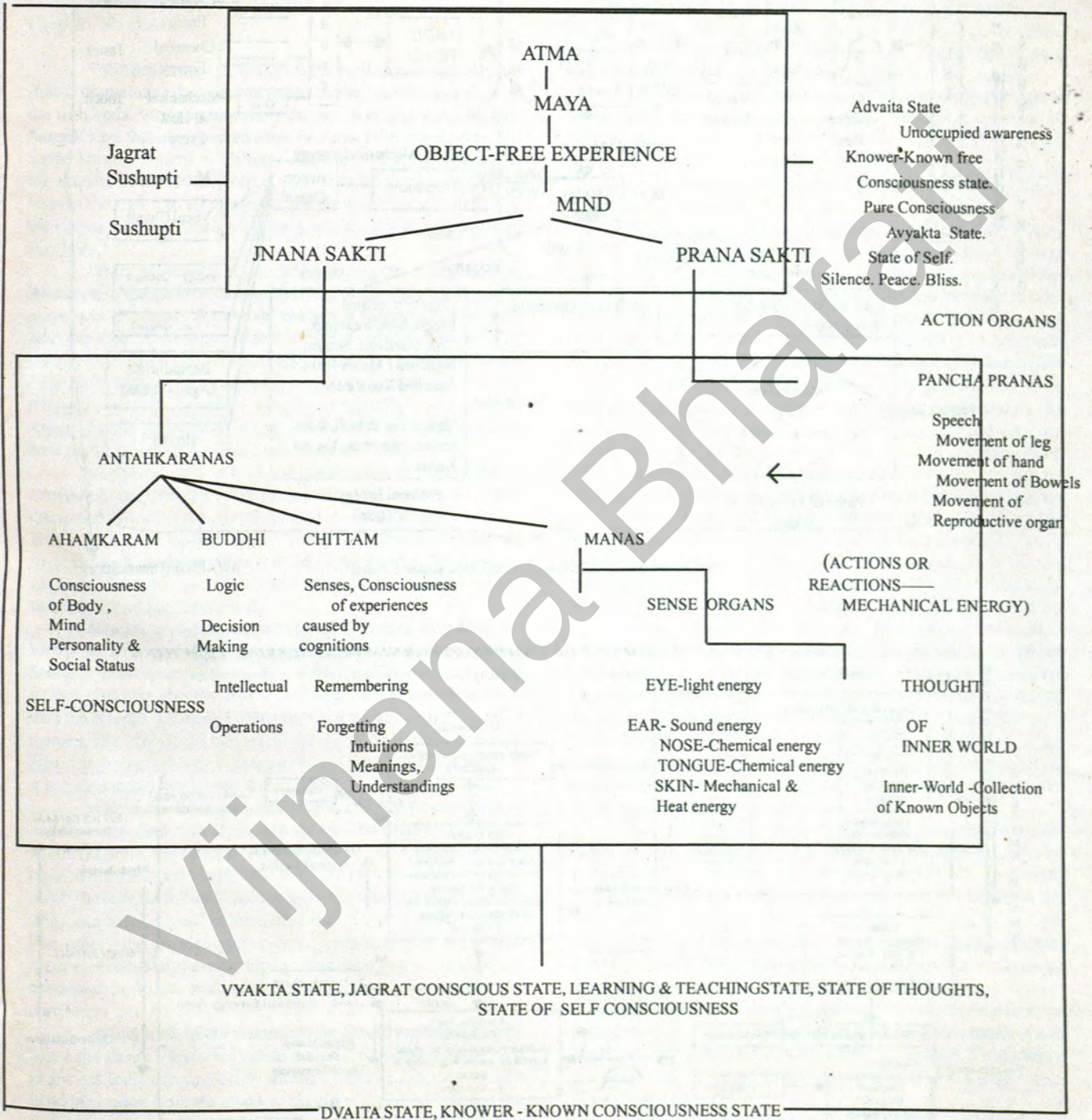






CONCEPT DIAGRAM IV

ARCHITECTURE OF FUNCTION OF MIND DURING LEARNING/KNOWING TEACHING/EXPRESSING

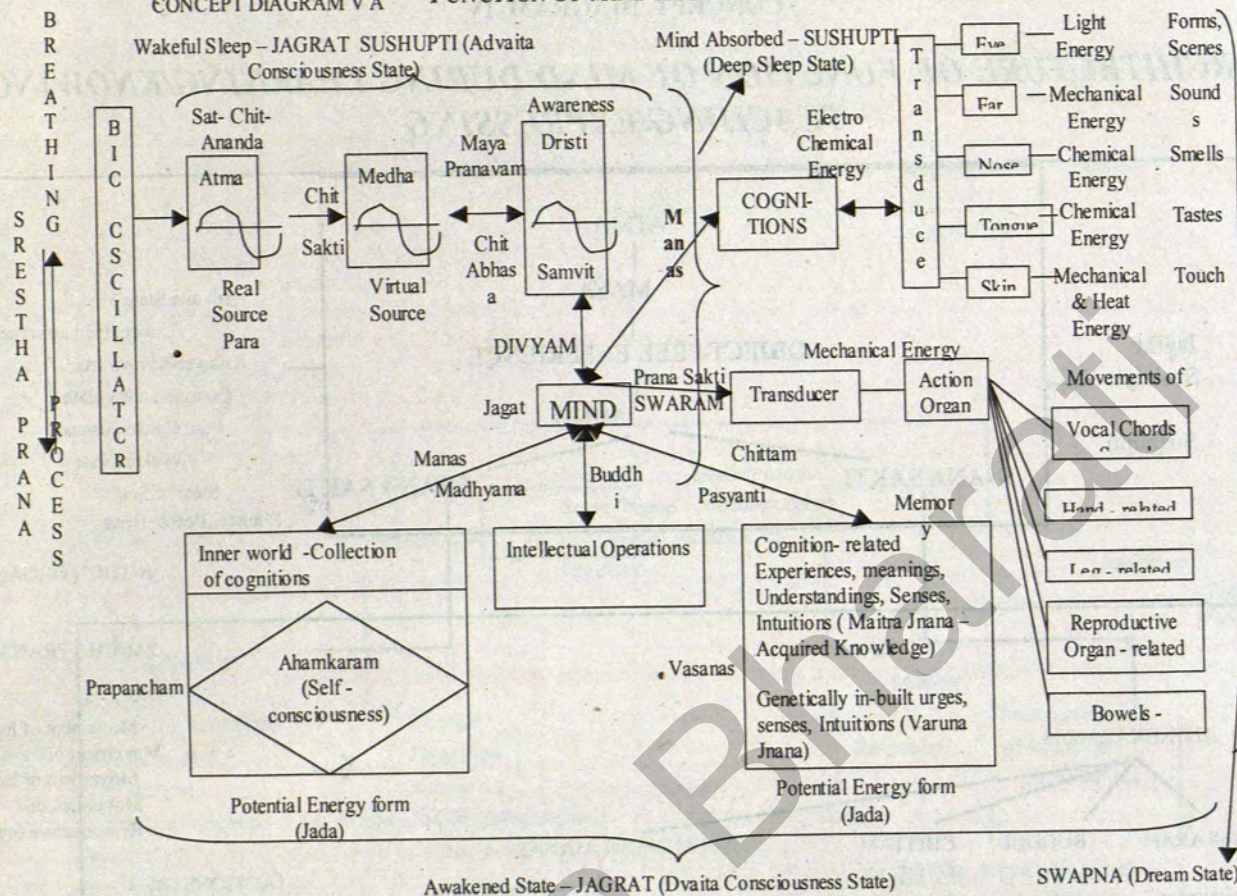


OBJECT: A thing, person or idea (in a sensible/perceivable energy form).



CONCEPT DIAGRAM V A

FUNCTION OF MIND ACCORDING TO UPANISHADS



Concept Diagram V B - BIONICS OF KNOWING/LEARNING-EXPRESSING/TEACHING

