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CHAPTER 3

REVIEW OF RELATED STUDIES

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CHAPTER 3

REVIEW OF RELATED LITERATURE

It is noticeable that the present study is a multidisciplinary one involving Epistemology, Cybersociety, Information Technology, Information Science, Bible and Quran. The purpose of the study is mainly to find out the theoretical foundations of these on the basis of the Biblical and Quranic approaches towards Information, Knowledge and Wisdom. The review of related literature therefore covers the epistemological aspects of two groups or entities, namely

1. Epistemological/Cognitive foundations of Information Science, Information Technology, Cybersociety,

2. Epistemological/Cognitive foundations of the Bible and the Quran.

Therefore the literature reviewed is given under these two main categories. The first category covers 23 reviews under four subheads-epistemological foundations of Information Science, Information Technology, Cybersociety respectively and Techno-spiritualism. The second category covers 21 reviews under two major heads of the Bible and the Quran.

The ideas like cybersociety and techno-spiritualism are comparatively of recent origin as they are more related to the future. Therefore literature available on these ideas are only very few. However, attempt has been made to cover maximum literature on these concepts also in this chapter.
3.1 EPISTEMOLOGICAL/COGNITIVE FOUNDATIONS OF INFORMATION SCIENCE, INFORMATION TECHNOLOGY AND CYBERSOCIETY

3.1.1 Epistemological/Cognitive foundations of Information Science

This section covers reviews on the epistemological/cognitive foundations of Information/Knowledge and also Information science.

According to Oeser (1995), the fundamental epistemological character of the concept of information became explicit in the technical field when data processing developed into more complex forms of knowledge processing. In biosciences, the turning of the research into higher cognitive functions of living beings, especially human beings have made the epistemological question unavoidable. From the point of view of Information Science, which in its theoretical core is an epistemological point of view, we are confronted with existing knowledge as residing in written documents, in electronic data media or human minds. We are in need of a fundamental theory of information that has to integrate and incorporate both the existing technical theories and biological, and neuropsychological information theories. A synoptic view of cognitive science provides the basis for linking and integrating the technical and neurobiological areas.

Shreider (1992) puts forward cognitive approach through knowledge engineering as a tool to resolve the opposition between technical and cultural aspects of knowledge. Knowledge Engineering works out methods for the conversion of knowledge into information. A knowledge engineer uses the expert’s personal knowledge to develop knowledge – based
systems, thus bridging the gap between personal knowledge, which is implicit and social knowledge (information), which is explicit. Thus through the process of indirect communication, not the text (or computer memory) is conveyed, but the text is used to convey some orientations of the mind (e.g.: communicating prepositions, attitudes, heuristics etc) that cannot be represented in the text. The knowledge base or the text is used as a symbol pointing to particular orientation of mind.

Winfred Godert (1996), in his model for information communication combines the understanding of cognitive information processing as an act of information generation from sense impressions with communication theoretic considerations. In this model, the receiver of information being a human being, acquiring knowledge from an external information system requires a form of reception and any sense perception depends on the act of cognitive information processing. The three important consequences for information ethics are-1) The conceptualization of information as cognitive construction takes human beings into the focus of consideration and not technical means, processes or products.2) Information cannot be seen mainly as raw material or commercial commodity; the value of information has to be assessed only by the human beings themselves and 3) any individuum is responsible for its own cognitive information processing.

Kochen (1969) in his paper entitled "stability in the growth of knowledge" proposes that the heart of Information Science should be what he calls "epistodynamics". The epistemological foundations of Information Science basically lie in the contributions of epistemology to the development
of Information Science. Today, the meaning and field of study of epistemology is more restrictive. It is the science centred on the study of the characteristics of scientific discourse and on the evolution of scientific paradigms. It appears to be a more systematic and methodological reflection on the principal resources used by humans to pursue valid knowledge about reality. Thus epistemology is devoted specifically to scientific knowledge.

Information Science is very much related to Epistemology. Garcia Marco etal. (1993) says that the study of epistemology is quite essential for the design and implementation of better cognitive strategies for guiding the process of documentary analysis, particularly for indexing and abstracting scientific documents. The ordering and classifying of information contained in documents will be improved, thus allowing their effective retrieval only, if it is possible to discover the conceptual framework (terms, concepts, categories, propositions, hypotheses, theories, patterns and paradigms) of their authors from the discursive elements of texts (words, sentences and paragraphs).

As epistemology studies the historical evolution of scientific paradigms, it is concerned with a key element of these paradigms—the mapping and structure of knowledge, as it exists in each particular age. In this field, it is crucial that emphasis be given to the analysis of scientific methodology and the classification strategies of nature through a branch of epistemology called taxonomy. Thus, the theory of taxonomic systems is very relevant to Information Science research. Scientific taxonomy is an aspect of documentary classification, because it shows the relationship of a scientific text to other texts and within its scientific context. Also, it helps to
maintain universal classification systems, thesauri, and terminological databases according to the general evolution of science and of each particular scientific discipline.

Finally, from a historical perspective epistemology is also the study of reflections and theories of science in an abstract and conceptual network, traced between man (subject) and nature (object) in the process of research and knowledge, within the limits and possibilities of understanding reality and its linguistic expression. This is accomplished without misjudgment of the volitional and emotional aspects of cognition. These authors believe that the advances in epistemology in this field make an important contribution to the development of Information Science, especially in its attempts to develop a theory of classification. This is because documentary classification systems are in close relationship with the two principal contemporary Western approaches to human knowledge—rationalism and logical positivism. In this sense, the Dewey Decimal and Universal Decimal Classification systems can be thought of primarily as the results of research in taxonomy as it was developed in the 18th century in the field of the natural sciences together with the development of phenetic hierarchical structures.

Information Science is related to other cognitive sciences as well. Marco (1993) and others in their study says that cognitive psychology is interesting for information scientists for two principal reasons. Firstly, Information Science and cognitive psychology are both cognitive sciences in a broad sense. Both are interested in the way that information produces knowledge, how information is processed and how a better adaptation of
reality is achieved. Secondly, psychological processes mediate the information cycle. This happens mainly in all kinds of interface activities those between humans and machines and those among humans.

Information Science has in some way modeled the representation of knowledge. The problem of Human – Machine Interaction (HMI) puts Information Science into the centre of the information processing sciences because it connects both tendencies: the study of human intelligence and the study of artificial intelligence.

Thus human mind – human being himself is of much relevance in information science. As the social information processes are in fact mediated by psychological processes, the findings of Cognitive Psychology and intensely relevant to Information Science.

3.1.2 Epistemological/Cognitive foundations of Information Technology

While the increase of human knowledge has so far promoted the genesis of technology, technology is now in turn, increasingly influencing the generation, storage, processing, distribution and utilization of knowledge. Knowledge has been technicalized and today, technology and knowledge is being amalgamated into cognitive – technical complexes – the amalgamation has caused the foundations of knowledge technology to become trans disciplinary themselves. A characteristic feature of the concepts of an ‘information society’ is the fact that modern technology has been applied to process knowledge. The epistemological/cognitive foundations of Information Technology lie in the treatment of information, knowledge and its various aspects in the fields of knowledge related to Information

Artificial Intelligence (AI) has been defined in two quite different ways today. AI (1) – The use of computers to solve problems that previously could only be solved by applying human intelligence. AI (2) – The use of a specific set of programming techniques known as heuristic or rule-based programming. In this approach human experts are studied to determine what heuristics or rules of thumb they use in solving problems (Somerville, 1983). Research work in AI has intended to follow two related but distinct paths. One path is the development of knowledge – based computer systems, which can tackle problems that are not amenable to solution by straightforward computational techniques. The other path is the developments of systems, which will help us, understand the nature of knowledge itself.

The search for Artificial Intelligence has improved the understanding of human cognition; it has also produced applied benefits such as Expert Systems. Expert Systems are computer systems with a very large knowledge base, which incorporates the knowledge of a human expert. An expert system is a program that contains a generalized inference engine and a rule base, takes input data and assumptions, explores the inferences derivable from the rule base, yields conclusions and advice, and offers to explain its results by retracing its reasoning for the user. Such programs have been painstakingly developed by computer scientists to who have essentially extracted knowledge in a subject area from a human expert and built into a
computer system designed to apply that knowledge (International Encyclopaedia of Psychology, 1996).

Cybernetics is the scientific study of communication and control as applied to machines and living organisms. It includes the concept of self-regulation mechanisms as in thermostats or feedback circuits in the nervous systems as well as transmission and self-correction of information not only in computers but also in persons who are communicating with each other. (Longman Dictionary of Psychology and Psychiatry, 1984).

Knowledge Engineering, which is patterned on the general principle of engineering sciences, uses human experts' personal knowledge to develop knowledge-based systems. In contrast to epistemology, which deals with the phenomenon of knowledge as such, knowledge engineering works out methods for conversion of knowledge into information. A knowledge engineer first finds out from the expert, which of a set of proposed alternatives he chooses at that stage in his investigation of the case, on the basis of which semi-intuitive rules that the expert reveals in his actions are formulated. This is followed by a formal analysis of the case using the rules obtained and the expert gives his own assessment of this 'semi-finished' knowledge. The process develops as a multistep interaction between the expert and a controlled knowledge base (Shreider, 1992).

Robotics is the science and technology of machines designed to function in place of a human being, especially to carry out tasks automatically. Practical robotics was used for industrial automation to handle parts for dye casting, injection moulding and metal-cutting machines. There
has been a continual evolution in robotics towards robots of greater precision. The main goal of robot research in artificial intelligence is to enable robots to sense and move intelligently around their environment. The third generation intelligent robots are experimental computerized machines designed to use artificial intelligence (the so-called knowledge based systems) to solve problems as human beings do. (Oxford Illustrated Encyclopedia of Invention and Technology, 1992)

Cognitive Science refers to the interdisciplinary study of the acquisition and use of knowledge. It includes as contributing disciplines, artificial intelligence, psychology, linguistics, philosophy, anthropology, neuroscience and education. Cognitive science is a synthesis concerned with the kinds of knowledge that underlie human cognition, details of human cognitive processing and the computational modeling of those processes. Five major areas of cognitive science include knowledge, representation, language, learning, thinking and perception (The Blackwell Dictionary of Cognitive Psychology, 1990).

Cognitive Psychology is concerned with the scientific study of human mental activities involved in the acquisition, storage, retrieval and utilization of information. Among its wide concerns are perception, memory, reasoning, problem solving, intelligence, language and creativity. Researches in these areas have widespread application, especially in the fields of artificial intelligence and law and in everyday world of decision-making. (International Encyclopaedia of Psychology, 1996)
3.1.3 Epistemological/Cognitive foundations of Cybersociety

The nucleus around which the network society is centered is information – information that is generated, stored, retrieved, processed and transmitted. The core of transformation we are experiencing in the current revolution refers to “technologies of information processing and communication”. It is not the centrality of knowledge and information that characterizes the current technological revolution, but the application of such knowledge and information in knowledge generation and information processing/communication devices in a cumulative feedback loop between innovation and the uses of innovation (Hall and Preston, 1988).

Zobel (1998) sees the community of the future as evolving from and through the major forces shaping on lives today. Three of these forces are 1) Information technology and the knowledge society. 2) The emergence of poor nations and a bigger middle class in the global economy and 3) the growing democratization of the world. Knowledge is one of the most powerful glues for human fellowship and sharing. This is because communication is its essence, and communication fosters the sense of community. In a deeper way, knowledge society is bringing individuals a greater sense of common experience. In the new knowledge society, Information Technology has dramatically speeded up and enhanced the process of sharing knowledge. All societies, rich and poor alike can take point in the flow of information and knowledge. Absorption, cataloging, analysis and dissemination of knowledge have become an industry in its own right. Thus as the new technologies of communications and computers get
ever more sophisticated, so will knowledge communities flower around the world.

In the cybersociety, human mind has a very important role to play. For the first time in the history, human-mind is a direct productive force, not just a decisive element of the production system. Thus, computers, communication systems and genetic decoding and programming are all amplifiers and extensions of human mind. What we think and how we think, become expressed in goods, services, material and intellectual output, be it food, shelter, transportation and communication systems, computers, missiles, health, education or images (Castells, 1998).

In her seminal essay, Haraway (1985) theorises a new life form-part cybernetic, part organism, the CYBORG. Accompanying the cyborg is a breakdown in many traditional opposites, thoroughly disrupting our cultural value and meaning systems. As she notes, “late twentieth century machines have made thoroughly ambiguous the difference between natural and artificial, mind and body, self-developing and externally designed, and many other distinctions that used to apply to organisms and machines. Our machines are disturbingly lively, and we ourselves frighteningly inert”.

Howard Rheingold (2001) is still hopeful that informed and committed people can influence the shape of tomorrow's cybersociety in a positive manner, although it has become increasingly clear that democratic outcomes won't emerge automatically. A humane and sustainable cybersociety will only come about if it is deliberately understood, discussed, and planned now -- by a larger proportion of the population, and not just the big business, media, or policy elites. The only thing we can know with any
degree of certainty about tomorrow's world is that technologies will be more powerful than they are today. And communication technologies, because of their ability to influence human perceptions and beliefs as well as their power to command and control automatic machinery, will continue to grow more powerful and persuasive, if not more true, authentic, and humane. It's too difficult to aggregate millions of people, and keep them aggregated, and too easy for people to roll their own online communities. The greatest value of virtual community remains in its self-organizational aspects. Unlike other aspects of the Internet, it takes months, even years, to grow valuable and sustainable virtual communities.

3.1.4 Techno-spiritualism

The idea of techno-spiritualism is of very recent origin. Terms like cyber-sacred and techno-spiritualism have not come into common use today as it is more related to the society of future, the cybersociety. The term denotes the combination of technology and spiritualism. A few literature available on techno-spiritualism have been included in the review chapter.

Margaret Wertheim (2001) says that many cyber-enthusiasts have techno religions yearnings and are convinced that cyberspace is a new kind a spiritual space. In her book 'The Pearly Gates of Cyberspace: A History of space from Dante to the Internet, Wertheim traces the history of western notions of space and how these have been informed by cultural and particularly religions concerns. From Dantes' Inferno to today's Internet, there is a connection in the dualistic Western conception where body and soul are seen as two distinct spheres. Within this tradition, the immaterial has always been equated with the spiritual. The cybernautic dreams of
transcending the limits of the physical body have been fueled by a fundamental philosophical shifts of recent years, the growing view that man is defined not by the atoms of his body, but by an information code – the belief that our essence lies not in our matter, but in an immaterial pattern of data – i.e., at core a human being is reducible to an array of data. While atoms can only construct the physical body, according to this cybernautic view, data can construct both body and mind.

This fantastic view imply that in the end we will not need physical bodies at all, for we will be able to reconstruct ourselves totally in cyberspace. Lest one imagine that cyber mortality fantasies are just in the minds of science fiction writers, we should note that much of the underlying philosophy is emerging from such real-life for fields as cognitive science and information theory. It’s all the part of the same imaginative flux that produces the dream of ‘artificial intelligence’.

A connection between cyberspace and the New Jerusalem has been spelled out explicitly by Michael Benedikt (1991). Religious dreaming about cyberspace begins with the Biblical vision of the Heavenly City from the Book of Revelation – the so-called New Jerusalem – that transcendent crystalline polis whose entrance is the legendary pearly gates. In Cyberspace: First steps, Benedikt explains that like Eden (which humanity experiences at the beginning of time), the New Jerusalem (which the viruous will experience at the end of time), is a place where man will walk in the fullness of God’s grace. But there is a fundamental difference between these two poles of the Christian universe. As he puts it “where Eden (before the Fall) stands for our state of innocence, indeed ignorance, the Heavenly city stands for our state of
Wisdom and Knowledge. The New Jerusalem, then, is quintessentially a place of knowing, a place that, like cyberspace, Benedikt says is rooted in information. According to Benedikt, the Heavenly city could come into existence only as a virtual reality. Indeed, he says, it is nothing less than a 'religious vision of cyberspace'. While Benedikt sees the New Jerusalem as a Christian prevision of cyberspace, reciprocally he suggests that cyberspace could be digital version of the Heavenly City. The impetus towards the Heavenly City remains. It is to be respected, indeed it can usefully flourish.... in cyberspace.

Carnegie Mellon’s Hans Moravec (1988), a world renowned robotics expert, whose lab designs robots with cutting edge vision and 3-D mapping capability has suggested that digital mind-downloading will soon be possible. From the vision of creating an artificial mind inside a computer it is but a short step to imagining treat a human mind also might be made to operate inside a machine. In his book ‘Mind children’, Moravec imagines a scenario in which “a robot brain surgeon gradually transfers a human mind into a waiting computer. As you be there fully conscious, he describes how a robot surgeon would open your brain case and begin downloading your mind layer by layer using high-resolution magnetic resource measurements and other materials. Gradually, as your brain is destroyed, your real self that is your mind-would be transformed into a digital construct”. Moravec writes breathlessly about the day when we will all have back up copies of ourselves stored on computer tape.

According to Davis (1998), with the continued ideological dominance of reductionist science and the socio-cultural dominance of its
technological spawn, the once glorious role of humanism is melting into a silicon sea. We find ourselves trapped on a cyborg sandbank, caught between the old, smoldering campfire stories and the new networks of programming and control. Perhaps the image of man as a machine holds more promise than especially if the image is not allowed to totally dominate our vision. For a certain breed of twentieth century seeker, the ancient goal of awakening is not served by a retreat into romanticism, religions orthodoxy or magical incantations. Instead of denying the mechanistic or automatic aspects of human being, they instead aim the psycho spiritual quest through the image of the machine, using the mechanism, as it were, to trigger its own wake-up alarm. To paraphrase the Sufi mystic, Hazrat Inayat Khan, one aspect of our being is like a machine, and the other aspect is like an engineer. In this view, the first step towards waking up is to recognize how zonked out and automatic we already are, such dispassionate and reductive observations help dispel delusions, reveal genuine possibilities, and thus paradoxically enable us to cultivate some of the most deeply human aspects of being. The machine thus comes to serve as an interactive mirror, an ambiguous. Other we both recognize ourselves in and measure ourselves against. This is the path of the spiritual cyborg, a path whose buzzing circuits and command overrides represent both the perils and promise of techgnosis.

Though possessing considerable variety, most models in cognitive science imagine mind as a construction created through the struggles and alliance of myriad small and densely interconnected symbolic sub-systems and agents, a vision that the artificial intelligence wizard Marvin Minsky calls the “society of mind”. More recently, other cognitive scientists
have served up less hierarchical or symbolically dependent models, these picture the mind as the product of even more primitive and "asocial" mechanisms of sensation, perception, and memory. The ego, the self, the conscious sense of "me", is seen as an "emergent property", a vaporous afterimage of the complex computer-like machinations of glandular data gates, neurochemical sparks, and the logical structures that whir and buzz beneath the surface of thought.

Michel Bauwens (2001) puts forward some hypothesis on the relation between technology and spirituality. They are:

1) **The technological quest is a spiritual quest.**

The quest for the transcendental is in fact 'wired' in the human psyche. Even if we are not spiritually or religiously inclined, we cannot escape thinking about our relationship with the 'totality' of existence, and forbid our souls to yearn for an escape from the humane condition and our inescapable death. The history of human civilization can be characterized by a kind of competition between spiritual transhumanism and materialistic or technological transhumanism. For thousand of years humankind has chosen the first route, believing that there was a transcendental 'supernatural' reality beyond the material world, but which could be accessed through inner development which gave rise to traditional societies. However, what used to be sought in the supernatural, was sought in material reality, and science and technology became a means to a achieve transcendence.
2. **The spiritual unconscious can cause damage if it is not brought to awareness**

Like all unconscious personal and societal content, it can cause damage when it is not brought under the light of reason and consciousness. Hence there is a lot of hubris in current technology (and the social forces promoting it) that could be detrimental to our human future, with an unspoken yearning to go beyond our bodily condition (the theme of the obsoleteness of the body), beyond our minds (replacing it with superior artificial intelligences) and in fact, beyond the human.

3. **Technological transcendence is not real transcendence**

It can be said that even if the current technological transhuman or posthuman aims, and things like extreme longevity, mind downloading, are realizable, this technological transcendence is not real transcendence. Indeed, what techno-transhumanism achieves is longer life, more time; having control over more space, etc. All stays on the horizontal axis, stays within time and space, and doesn’t actually go beyond it, doesn’t move on the vertical axis. Hence technological transhumanism can in no real sense ever replace the need for genuine spirituality.

4. **Technological development can/does stimulate spiritual awareness**

There is a sense in which technology stimulates spiritual awareness. On the evolution of human consciousness through time, establishing a clear link between the psycho-genesis of the individual human mind, and the socio-genesis of civilizations, the globalising technology of the internet will in all likelihood lead to a ‘jump’ towards some kind of more
planetary consciousness, (this process, depending on the human will, maturation, and a host of subjective factors, is of course not automatic, and hence, regression would be possible, and catastrophic, and of course, we can all see the many really regressive forces at work, such as fundamentalism, cultism etc.), or in other words, when the ‘hardware’ changes, the software (our human minds) should follow. The new state of consciousness, which has been Budding during this century and is being stimulated by the new technological infrastructure as “vision-logic”, is the first transpersonal state beyond pure rationality.

5. *Spiritual development is necessary to technological development*

It seems pretty certain that with technology giving us ‘transhuman’ powers over our environment and ourselves, we do need an additional level of spiritual development as well. Technology has many negative influences over the quality of our life (an increase in the ‘speed of life’, is just one), where spiritual techniques can help. The rules of sacred architecture (and its power to create restful minds) could be used to create vivogenic (livable, life-enhancing) cyberspaces, a notion put forward by VRML – founder and techno-pagan Mark Pesce and practiced by Michael Heim. Spiritual psycho-technologies (and body-work techniques) such as meditation, contemplation, relaxation, concentration, yoga and such, will become necessary complements to our sedentary lifestyles, and the stress induced by hyper-technology. Technologies such as the Internet continuously draw out consciousness out to the external material world (or rather, the ‘materialisation of our culture’ in cyberspace format), and made it
ever so difficult to look at ourselves and our functioning, and a counterforce is an absolute necessity for mental and spiritual balance.

6. **Technological and spiritual transhumanism should not be opposed, but integrated**

   Technological transhumanism is totally legitimate and will undoubtedly bring a number of important benefits for our social and bodily wellbeing. (in terms of better health, increased lifespans etc.)

7. **Spiritual transhumanism is equally necessary for our individual and social growth and further evolution**

   Both can be complimentary. The central task of our current epoch is to spiritualise technology (by becoming conscious of the unconscious drives that push it forward, and using it in positive ways) on the one hand, and to ‘technologise’ spirituality on the other hand.

   According to Fr. Vincent Rossi (2001), from the standpoint of Christian hesychasm, the sacred can only mean the presence of the ultimate reality, the absolute, the Tremendum, the Ground, the Real, God. It is not for nothing that the Divine Immanence present in all creation is called in the Christian Tradition the Holy Spirit. This clearly shows recognition that not all spiritual manifestation is holy or good or whole. Human nature is the unifying factor between technology and spirituality. Still, in order to understand the relationship, if any, between the technology of cyberspace and the reality of the sacred, we must clearly distinguish between the two. Technology is to spirituality as science to religion as matter is to spirit. Ultimately, these three pairs of terms point us to the reciprocal but
asymmetric relationship between the outward and the inward in the microcosm, the macrocosm and the metacosm.

The technological quest is not as such an authentic spiritual quest, but as a means of control and dominance of the natural, the human and the spiritual as, in other words, a reduction of the human to forces essentially non-human and artificial – it is a serious distortion of the spiritual quest. The hunger for transcendence which is part of the essence of what it means to be human can and has been channelled into inferior and material projects, so perhaps it is more correct to say that the technological quest is a materialization of the spiritual quest. The evolutionary inevitability of techno-spiritual development is a chimera. We must not let our wishful thinking about technological progress blind us to the hard realities of authentic spiritual growth. Spiritual growth is not an evolutionary process that develops by incremental quantities over time. Genuine spirituality involves through awakening the transcending of time. Time, space and evolution are not functions of spirituality intellect and will in one-pointed concentration attention prayer and meditation, illumination, the breakthrough of the eternal into the temporal, the piercing awareness of the Absolute in the relative - these are the trans-temporal, trans-spatial, transfiguring aspects of a spirituality conscious of the Sacred. To paraphrase the Muslim Shahada, which is very useful as a formula for expressing the inexpressible, there is no sacred if it be not the Sacred. The Sacred is the presence of God or it is nothing genuine.
3.2 EPISTEMOLOGICAL FOUNDATIONS OF THE BIBLE AND THE QURAN

3.2.1 Epistemological foundations of the Bible

The epistemological foundations of the Bible are covered under the following major heads: Christian Education, Knowledge-nature, validity and Importance and Christianity and Science.

3.2.1.1 Christian Education

The basic idea of Christian education is that God is our teacher. Thus the Psalmist writes, "Teach me thy way, O Lord; I will walk in thy truth..." and again, "Teach me good judgement and knowledge..." One may then say that God educates man, if one chooses and if one believes that such special divine revelation is available to us. It seems better to think of God's act of revelation and regeneration as 'gifts' as Christianity itself usually does – as some kind of divine aid to education rather than education itself. This world, among other things, accord with Acquinas' doctrine that faith, hope and love are not acquired by teaching, but by divine infusion. One can argue then, that education is important only because it is necessary or at least helpful as a preparation for God's act of grace; because it enables one to understand his revelation, or because it equips one to do His work in the world (Frankena, 1973).

Many speak against education because Jesus chose uneducated fishermen to preach his Gospel. They assert that He showed preference for the uneducated. But many learned and honorable men believed his teaching.
Had these fearlessly obeyed the convictions of their consciences, they would have followed Him. Their abilities would have been accepted and employed in the service of Christ, had they offered them. Christ was the light of the world. He was the fountain of all knowledge. He was able to qualify the unlearned fishermen to receive the high commission. He would give them. It seemed but a simple thing for Jesus to connect these humble persons with Himself but it was an event productive of tremendous results. Jesus did not despise education. The highest culture of mind, if sanctified through the love and fear of God, receives His fullest approval (White, 1877).

What wisdom of man can compare with the grandeur of the revelation of God? Finite man, who knows not God, may seek to lessen the value of the scriptures, and may bury the truth beneath the supposed knowledge of science. Those who boast of wisdom beyond the teaching of the word of God need to think deeper of the foundation of knowledge, that they may learn their real ignorance. There is a boasted wisdom of men, that is foolishness in the sight of God. This greatest ignorance that now curses the human race is in regard to the binding claims of the law of God, and this ignorance is the result neglecting the study of the word of God. Many pretended friends of education tend to divorce religion from the sciences. They could spare no pains or expense to impart secular knowledge, but they would not mingle with it knowledge of what God has revealed as constituting perfection of character. And yet training in the truth of God would develop the mind, and impart secular knowledge as well; for the very foundation of true education is in the fear of Lord. Says the Psalmist, “The fear of the Lord is the beginning of wisdom” (White, 1888).
3.2.1.2 Knowledge – nature, validity and importance

The understanding of Jesus Self is based on a simple first principle: we have two fundamental ways of knowing and of knowledge – one is factual knowing and knowledge and the other is knowing and knowledge of the spirit. The factual knowledge, the most obvious way of knowing is effective and eminently useful as it transforms our material world daily before our own eyes. But the factual knowledge is humanly injurious, unless coupled with its less obvious partner, knowledge and knowing of the spirit. We see factual knowledge at its most refined in the ‘hard sciences’ and its most demonstrably ‘real’ in the applications of technology in thousands of ways all around is, effecting every moment of our modern lives in a cacophony of persuasion. Factual knowledge possess a quality of discomfort that the more facts we know, the more we find ourselves ignorant, the less we seem in control and are their incomplete all over again. If this kind of knowledge is man’s only hope and if the reality defined and alterable by factual knowledge is the only kind of reality, then human beings are indeed very imperfect and primitive stages.

Once we experience spirit knowing and knowledge, we realize that factual knowing and knowledge has not been and can never be the prime nourishment of our humanness. Spirit knowing the knowledge leads us to acknowledge, not that we are aliens until we make the alien objects and things our own, but that we are in an eternal duality which guarantees us to be ourselves both with and in spite of the alien objects and things our own, but that we are in an eternal duality which guarantees us to be ourselves both with and in spite of the alien objects and things of our universe of man. We,
men and women and things are in firm duality – we and the love that makes us and all things possible. Further, there is no removing, of that duality, except at the cost of undoing our humanness. The spiritual knowledge is the first basic principle of Jesus Self. Without it, the Jesus self cannot be and with the impossibility of the Jesus self is born the despair of humans (Martin, 1975).

The idea of the wisdom (sapentia) of the fool always stand in contrast to the knowledge (scientia) of the learned or the 'wisdom of the worldly'. The classical archetype for the figure of the wise fool is Socrates whom later theorists constantly invoked. Socrates account of human ignorance, in attributing true wisdom only to the divine, anticipates Saint Paul's claim that God has made foolish the wisdom of the world (I Corinthians 1:20, 3:19). The Pauline concept of Fool in Christ, which is given its fullest exposition in the Epistles to the Corinthians, affirms the worthlessness of worldly wisdom in contrast to the wisdom of the Christian, which to the world appears folly. Claiming that we are fools for the Christ's sake but are wise in Christ (I Corinthians 4:10), he argues that "the foolishness of God is wiser than men" (I Corinthians 1:25) and he says of unbelievers "professing themselves to be wise, they become fools" (Romans 1:22). "Let no man deceive himself," he exhorts, "if any man among you seemeth to be wise in this world, let him become a fool, that he may be wise" (I Corinthians 3:18). Christ Himself had exemplified this foolish wisdom, not only when as a child, He answered the doctors in the temple, but also later when He confronted the scribes and Pharisees in their wisdom. Once man has stripped himself of the false claims to wisdom, he becomes a proper
receptacle to receive the wisdom of Christ, which is the only true wisdom (Kaiser, 1973).

Wisdom is personified as a Woman in the Bible. It is represented in several ways throughout the Bible. Where is Wisdom found? Wisdom has divine origins, no less, together of God before anything was created. She is the divine consort (Wisdom 9:4). She is also intensely involved with human beings and world (Job 28:27 appears to indicate that God singled out wisdom to place it in the world that God oversees, v 24). She may even have been a craftswoman or child (Proverb8:30; 3:19 and Wisdom 7:22, suggest some kind of role in creation). She cajoles and preaches to those who stand in need of her, and she even offers to feed them (Proverb1 and 9). The above gives a thumbnail sketch of personified wisdom. Woman wisdom is as worldly as she is divine. She is not merely a communication outwards from God but also can be traced back to God. The wisdom of God is a symbol, not anthropomorphism. It is not a metaphysical description, but a symbol that is ‘ontologically vehement’. Wisdom portrays not a static divinity but a God who is communicative of self. Wisdom has been choked off at the limit of human conduct and experience; anything other than this is dismissed, uneasily perhaps, but safely disregarded. Personified wisdom is, as it were, the limit situation beyond which the mysterious God, ineffable, transcendent, and (paradoxically) impervious to wisdom herself. The bold personification of wisdom as a woman serves to crack open the culturally conditioned language that refers to the Lord in a totally masculine manner (Murphy 1994).
The human soul itself in its basic inclination towards the true and the good is a valid and genuine source of knowledge. This knowledge is a spiritual knowledge, which must be clearly distinguished from all kinds of sensible knowledge and from intellectual knowledge itself, if such knowledge is taken to refer to our ideas, judgements, and reasoning about materials things. Christian philosophy, while retaining interest in the study of the intellect as a chief source of knowledge, has recognised the importance of both sensible knowledge and spiritual knowledge, gained not only by intellectual operations, but by 'natural inclination', which is called connatural knowledge by St.Thomas Aquinas. It can also be called 'knowledge of the heart'. The heart of man is the source of his conscious personality, intelligent and free where the unwritten law resounds and where the action of God in one’s soul is felt. Many preserved the word and mediated on it in her heart (Luke 1, 19, 2, 51). Aristotle has distinguished three distinct operations of mind, which constitute the study of logic; the concept or idea, the judgement and the reasoning process. The knowledge of heart plays its role in the validity of these three operations of kind and of intelligence itself, which is the task of the epistemological part of the philosophy of knowledge. The rise and spread of Christianity had given a new injection to human thought and investigation. As opposed to the skeptics of whatever caliber, Christian philosophers regarded human knowledge including connatural knowledge in its most basic sense as valid, together with that of faith or divine revelation. To discover the truth, one must enter into himself and know himself (Klauder, 1997).

Knowledge exists subject to three conditions, according to Teilhard. (1) It is founded in energy (2) all things are cosmic and (3) all
things evolve. Reflected energy and self-knowledge are identical. Ultimately, all cosmic energy will be reflected or self-aware. The noosphere is an area where cosmic energy is converted into self-knowledge. For full development of self-awareness, the possession of every item of knowledge is essential. Nor is knowledge newly discovered simply added onto self-awareness; it is incorporated in recast self-awareness. The accumulation represents not an addition, but an organic formation. Since one energy pervades the entire cosmos, rooting itself in the past and projecting itself into the future, and since everything is an expression of that energy, then everything must be a representation of the entire cosmos and, theoretically at least, no element may be displaced without rending the web of the universe. It must be understood that all elements are cosmic. There is an existence of a principle which controls and unifies individual perceptions — a cosmic capacity for knowing, an Absolute, a centre which is the centre of all centres, and without which the entire edifice of thought would disintegrate into dust. Everything evolves. Living organisms, ideas, institutions, religions, languages, . . . . . . the constituent elements of matter, physics, sociology, philosophy — all branches of knowledge. Nothing is exempt. Teilhard sees knowledge as subordinate to action. Yet, action is also subordinate to knowledge, for knowledge increases our capacity for action. Knowledge is not objective, but subjective. Because the knower is co-extensive with the cosmos, everything he knows is an extension of himself, an aspect of his own being — a restructuring of energy takes place in the act of knowing (Lavin, 1994).
3.2.1.3 Christianity and Science

The essential philosophical basis of modern science was established during the great scientific revolution in Europe during the sixteenth and seventeenth centuries that was the Reformation period. All the major scientists participating in this revolution were Christians. Some of them were quite devout and some also very learned in the Scriptures. Copernicus, Galelio, Descartes, Kepler, Newton were the prominent figures among them. The post-reformation period, especially nineteenth century, was surnamed as "the great century" in the leading history of Christian missions, that most of the major Christian denominations of the West set out to evangelize the globe. It was from the mission schools founded in the nineteenth century that a disproportionately high number of revolutionary leaders emerged. The confrontation between traditional Christian beliefs and the discoveries of modern science engaged the attention of the churches. The works of Charles Darwin, Origin of species (1859) and Descent of man (1871) called into question the traditional Christian belief in a special creation of the human species in the image of God as based on the Biblical accounts of creation in the book of Genesis (The Encyclopaedia of Religion, 1987).

Teilhard defines knowledge as the systematized perception of total space-time. The branches of knowledge therefore, correspond to angles of vision in the center of perceptions, they are both expressions of reflected energy, and tools by which reflected energy might operate in its environment. Branches of knowledge fall in four categories. In category one are abstraction, logic, choice and invention, all activities of reflection itself. In
category two are science and history, which is considered to be analytic and retrospective. In category three are philosophy, society, life and space-time, all of which seem to deal with the totality. In category four are mathematics and art, branches which seem to epitomize evolution itself. All the four activities in the first category are activities of an energy that knows itself, possesses itself, is able to act upon itself and is concerned with the economy of its own revolution.

Both science and religion attempt to discover the very source of cosmic energy, the source of that energy that is reflected in man. Science, therefore a branch of self-knowledge science made two mistakes in its approach to reality, the first in its point of departure, the second in its method. The quest of science for universal coherence has always begun with matter. It therefore only views the outer crust of things. Science has always subjected matter to the pressure of analysis. Its particular point of departure and method of procedure, has led it deeper and deeper into a world of chance, of large numbers, if the dissipation of energy and of organic collapse. Mathematics is an expression of granular reality, a language and a tool. Structurally, mathematics operates according to the same principle as evolution itself. Art is an expression of cosmic energy; to act is willingly to further evolution through synthesis. Action, refined, becomes research sucks everything into its own self, then it would appear that it is the mechanism by which cosmic energy is converted into reflection (Lavin, 1994).
3.2.2 Epistemological foundations of the Quran

The epistemological foundations of the Quran have been given under the heads-Acquisition of Knowledge, Knowledge-meaning and validity and Islam and Science.

3.3.2.1 Acquisition of Knowledge

Acquisition of knowledge requires firmness, patience, humility and openness of mind, among other sacrifices, but these are well paid for. No one has perfect knowledge. Even the most favoured persons may learn from others. Prophet Musa, who enjoyed special favours from God, was shown a more knowledgeable teacher. Thus, being learned should not be a matter of pride; it should rather enhance humility and kindness to others. The acquired knowledge should be used in the worship of our Lord and Creator, Allah who created humankind precisely for the purpose of that worship. The acquired knowledge should also be extended to others, which may be done by teaching, or by participating in actions of common welfare or both. Quran says that only very little knowledge has been communicated to human beings (Al-Isra, 17:85) and this knowledge has been distributed in such a way that none has a complete share (Bah, 1997).

From the Quranic vantagepoint, the universe is created with a purpose and its meaning and significance can be grasped through empirical probing. It is a firm pronouncement of the Quran that reality of the universe and its purpose can be grasped by every individual if he seeks knowledge in earnest, because the demonstrative proofs of the Lord of the Universe are
scattered allover. In the chapter entitled Ar-Rahman in the Quran, no less than 31 themes of investigation have been recommended as the decisive evidences of the Providence and in different parts of its tact at 13 places, issues of common knowledge have been mentioned followed by “Can you not see it with reason?” ‘Tawhid’ (Oneness of Allah) which is the keynote of the Quran has an ontological implication – the unity of the mundane and the serene. The physical existence is linked up with the spiritual domain so that the life of man is a continuum from pre-mundane through mundane to post mundane, which confers on our lives in this world a meaning. The universe of knowledge is, therefore, comprehensive and unified. It is a sort of spectrum on which the manifest (shahada) and the latent (ghayb) are arranged. Whatever is accessible to humans is the manifest and whatever is beyond their purview is the latent. For example, the science and the art of creation and the total comprehension of the world hereafter lies beyond the human quest for knowledge (Quraishi, 1997).

The basic premise of the Sufi is to know the Final Truth, to know the Creator. Knowledge of truth led Sufi to find its manifestations in the universe. Quest for truth turns the Sufi to his inner self. His knowledge of truth creates in him self-realization and self-discipline. He begins to find himself at peace with all that is related with the Creator. Sufi does not acquire knowledge through words or experimentation, he goes beyond words; he tries to find the spirit. What he arrives at, is no ordinary knowledge, it is spiritual knowledge. The Sufi therefore makes a distinction between worldly knowledge and spiritual knowledge. He sets his eyes on the life hereafter. The spiritual knowledge consists in the realization that Allah is omnipotent and omniscient. Worldly knowledge is acquired by reason (aql), but the
spiritual knowledge is gained through heart (Qalb). Mind distracts, heart concentrates. Therefore in Sufi discourse heart becomes the local point for attaining spiritual knowledge (Jamaluddin, 1995).

The glorious Quran had been a principal motivator of Muslims in their quest for knowledge right from the inception of historical Islam. Islam lays emphasis on attainment of spiritual and secular knowledge as long as such knowledge will be a benefit to mankind and would not encourage a satanic pattern of behavior. Islamic faith regards acquisition of knowledge of prime importance. It considers knowledge as the criterion of superiority of man amongst God’s creatures (The Quran 2: 30-34). On account of Adam’s superiority to the angels in knowledge, they were ordered by God to bow to him even though he was created long after their creation (The Quran, 2: 33-34). The Quran encourages careful and contemplative observation and study of God’s creatures, for such an intellectual exercise is regarded as essential for men of intellect to understand the greatness of God (The Quran, 2:164,24:41-45,30:42). A few of the sayings of the prophet Muhammad on the imperativeness of acquiring knowledge similar to Quranic stipulations are given.

The Prophet says:

1. Seek knowledge even if it is China.
2. The acquisition of knowledge is compulsory for every Muslim male and female
3. Learned people are the heirs of Prophets.
4. For anyone who treads on a path in order to seek knowledge, God will facilitate the path to Paradise.


The very first portion of the Quran to be revealed to the Prophet Muhammad is related to the idea of reading in the Name of Allah, the All-knowing who created man and taught him how to read and write by means of the pen (The Quran, 96: 1-5) (Oscent, 1997).

3.3.2.2 Knowledge – meaning and validity

Revelation is the highest and most authentic form of knowledge, very essential form of knowledge, very essential for the guidance of human reason. Revelation is the highest form of communication on spiritual level between the Creator and His servant who submits his whole self to the Supreme Will. It cannot be acquired by one’s intellectual capabilities; it is not contaminated by any element of human desire, or an idea, or imagination. Hence Holy Quran calls it True knowledge. Intellect, which solves most of the problems of human life, is a valuable faculty that has helped man to rise above the animal level. But there are a number of questions that human intellect cannot answer unless it accepts the validity of a source of knowledge or wisdom, which is in every respect transcendental to itself. Revelation invites man to understand all those laws and principles, that are at work in the phenomenon of Nature. Sama, Basar and Qalb are the gates of knowledge (Haq, 1991).
Of the numerous blessings showered upon man; the most remarkable one is that he is created on the disposition of Allah Himself. As regards mission of man, it is vicegerency of Allah on earth. He is asked to perform this role by establishing and promoting here a civilization, based on high moral standards as well as on the principles of truth, justice and universal brotherhood of mankind in return for which he is promised success both in the world and Hereafter with a view to enabling man to fulfill his responsibility to the fullest possible extent, Islam inspired him to unravel the secrets of Nature. Instead of demanding from him to have blind faith in its message by suspending his rational and intellectual faculties, it seeks to convince them of the truth by sharpening and stimulating them. Quran says, “It is the scholars among His servants who fear Allah alone. Lo Allah is Mighty, Forgiving” (35:28) which shows the scientific spirit of Islam. That man has been urged time and again in the Quran to apply his brain and reason to attain knowledge is clearly evident from the fact that the word ‘ilm’ (knowledge) and its derivatives have occurred 805 times, the word ‘altab’ (mind) has occurred 16 times and the word ‘aql’ (reason) and its derivatives have occurred 49 times in the Book. No one can deny that the first five verse revealed to the Prophet commanded him to read and learn (Ansari, 1999).

From the Islamic point of view, knowledge means the knowledge of Qur’an and Sunnah and all that we can deduce from the two as well as those that assist us in understanding them. The Glorious Quran and the books of Hadith and Sunnah would guide us as to what kind of knowledge we are supposed to cultivate. Knowledge according to Prophet Muhammad means nothing but Islamic knowledge. The ultimate goal in one’s life should not be the material world, but the life Hereafter. The life in
the Hereafter is eternal and lasting compared to this temporal world. Worship of Allah is the very purpose of our existence in this world and in the absolute sense, knowledge means Knowledge regarding Allah, knowledge of the purpose of our creation; the end which will result in the Hereafter (Mababaya, 1996).

The belief in Tauhid and the belief in the life hereafter are the two most important elements of Sufi concept of knowledge. Belief in the oneness of Allah makes the believer resign to the will of Allah and the belief in eternal life makes him do good things despite all odds and temptations of material life. In Sufi epistemology distinction is made between cognition (ilm) of God and feeling (hal) of God. According to Sheikh Hujwiri, Gnosis of God is of two kinds: Cognitional (ilmi) and emotional (hali). The real gist of gnosis is to recognize that to God is the kingdom. When a man knows that all possessions are in the absolute control of God, there is no business with mankind that should be veiled from God by them or by himself. All such veils are the result of ignorance. Knowledge also includes action Hujwiri holds that knowledge and action are complementary to each other (Jamaluddin, 1995).

3.3.2.3 Islam and Science

Islam provides great incentive for the pursuit of empirical knowledge and this should greatly support and facilitate the promotion of science in Muslim societies. Islamic ideology and worldview became the most powerful sources of inspiration of the Muslim people's quest for knowledge. The movement for scientific progress led by Muslims, started
from 8th century AD when the Muslim science and learning began and lasted for several centuries and lowering scientific genius was produced within a relatively short period. George Salton in his "Introduction to the History of Science", has acknowledged the contributions made by Muslims. Naming each half century period after one key scientific figure eg: age of Plato, age or Aristotle, from 750 to 1100 AD, for 350 years he names in unbroken succession the ages of Jabir, Khawrizmi, Razi, Mausdi, Wafa, Al-Beruni, Ibn Sina, Ibn-al Haithan and Omar Khayam. For another 250 years, the honors are still shared by the Muslims with scientists from other nations. Paradigms are starting points, the perspective from which we observe the world. While the Muslims made notable contributions to science and technology during, the millennium starting with the second century Hijra, a period of decline set in from about 7th century Hijra which culminated in near stability by 10th century Hijra. The units and institutes of Futurology, which may be established in the Muslim world, should be manned by technologists, cultural anthropologists, economists and system specialists (Hashmi, 1994).

Ashraf (1997) outlines the current scientific conception of the origin of the universe and the conformation of Quran with these ideas. The conventional notion of the universe was essentially a static system of planets, stars and nebulae held fixed in orderly arrangements. This was drastically changed by Einsteinian revolution, quantum mechanics and Edwin Hubbles' proposal (1925) of an expanding universe. They revealed a state of dynamically changing and evolving universe. The cosmos became debris of gigantic explosion. Observations and discoveries also point out that the universe is an expanding one. Distant galaxies are receding away from each other at a rate that increases with their separation. Discoveries by Bell
Laboratories, New Jersey, USA shows that the whole universe is emitting a background radiation. This discovery also reinforced the theory that universe evolved from an initially dense state of starting temperature of approximately 100 billion degree Celsius. Then explosion took place with a blinding flash, and this Big Bang marked the creation of matter and space. The ideas of Big Bang and expanding universe have been dealt in the following areas of the Quran.

"Do not the disbelievers see that the heavens and the earth were one solid mass which we split them asunder and that we made every living thing out of water?" (21:30).

"We built heavens a manifestation of several of our attributes and surely we go on expanding the universe" (51:48).

After the Big Bang, the universe started to cool down. The early universe was filled with radiation and plenum of matter, originally hydrogen and helium formed from elementary particles in the dense primeval fireball. The Quran speaks as if it were dealing with this situation "He turned to the sky, which was smoke, and to it and to the earth He said, "Come both of you willingly or unwillingly. 'We do come willing', they answered (41:11). Gravity took over and condensed matter into galaxies and stars that compose them. The Quran claims that the origin of universe is neither haphazardly or accidental but based on perfectly determined. "He ordains all things (13:2). We have created all things according to a measure (54:49). The Quran points to the originator with respect to the precise arrangements. "It is Allah who keeps the heavens and earth from falling. Should they fall, none could hold them back but He" (35:41). Today, virtually every scientist
working in particle physics and cosmology is convinced that the world had a beginning.

Science does not conflict with Islam, for anything science can prove has already been mentioned directly or indirectly in the Quran. According to Prophet Muhammad, knowledge consists of three things, the decisive verses (Quran), authentic hadiths and prescriptions rightly deducted from the two (Hadith, Abu Dawud and Ibn Majah). Each field of science is recognized in Islamic education system, each field dealing with one position of the Holy Quran or Hadith. The scientific method required that we suspend our personal opinions and begin studying by observation, experimentation etc. and then draw conclusions, which will remain valid until disproved by scientific study. The same method forms the Islamic foundation also. i.e., if we get rid of personal opinions and make sound observations, we shall see that all things (living and non-living) in the universe are interconnected into a unit, which is governed by a power, which, alone is worth worship. There is no conflict between science and Islam, but that exists is between scientists and Islamic teaching. An example for this is Darwin’s theory of evolution that modern species descend from other species. A recent study on human fossil conducted by British scientists has opposed this theory (CNN News). Similarly the results of another study of bird’s fossils conducted by Kansas University scientists also negate the theory that modern birds have descended from dinosaurs. The scientists who provided such evidence did not aim at confirming any Quranic verse but science did vindicate the truth mentioned in the Quran namely that beings were created separately. “Of them, there are some that creep on their bellies; some that walk on four, Allah creates what He wills; for He has power on all things (Al Nur: 45). There have been
material losses and failures due to scientific innovations, which negates the teachings of Quran, example being the mad cow disease of Britain. Islam forbids eating the meat of animals found dead and, as logically follows, suggests not to feed animals from which we directly get food items, with other animals found dead. The purpose of the innovation feeding dairy and beef cattle with other ruminant’s remains was to increase profits. But the outcome was human and material losses along with repercussions in international relations (Bah, 1997).

The review of related studies show that the epistemological/cognitive foundations of Information Science, Information Technology and Cybersociety stresses on the importance of the human component. Man or the human mind itself is the central factor in all these areas under consideration. Technology and spiritualism are quite related and technological quest can be seen as a materialisation of spiritual quest. Both the Bible and the Quran give utmost importance to knowledge and wisdom and they extensively deal with them. The survey of literature on the epistemological aspects of the Bible and the Quran not only served the purpose of getting a prior idea of the concepts, but also provided very important theoretical information to conduct the study. The review of related studies helped in creating an idea on the epistemological background of the problem under study.