OBE and WA: Understanding the Paradigm Shift on Knowledge Delivery and Management

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I– INTRODUCTION

History of India for scholarly dialogues is replete with the presence of prominent universities of Nalanda, Mohenjodaro, and Taxila. These universities were based on gurukula culture that were designed to make a person well-rounded citizen and contributor to the society. Gurukula (home of the guru, the teacher) has been prevalent for centuries where teachers and students live on the same compound in pursuit of knowledge. At the exit from gurukula, the guru will always give a sermon known as antim pravachan (final word). In return he will ask his disciples to live the life of a quality person as they commence their journey on exit from gurukula. The idea of a final word has been prevalent in many ways in ancient civilization of India, where a dying old person will give his blessings and valued advice to the younger generation. In the epic Ramayana, Rama wins over a very wise demon king, Ravana, who was defeated in a war for kidnapping Rama’s wife Sita. While Ravana was on the deathbed, Rama sent his brother Laksmn to get the final words of wisdom from Ravana, a learned scholar, so his wisdom could be utilized effectively in ruling the kingdom that Rama was soon to take over. That episode tells us that a quality person, as Rama is revered, will always welcome a contrarian point of view in search of fullness (holistic thinking). Just like everyone is rushing to the U. S., A. in search of knowledge and better prospectus, so was the life in ancient India which encouraged Columbus to discover India. Instead, he discovered America and its original inhabitants became Indians.

Where did India lose that culture of educating a quality person? It was at a time when foreign invaders start pounding India. Some came in search for wealth, some for knowledge, and yet others for integrated spirituality buried in the science of karam yoga (integration of work with life style) descending down to the code of ethics. The invaders found tremendous knowledge treasure where engineering a well-rounded citizen in a human enterprise was a natural process in the modus operandi of a kingdom, community, or learning organizations. In order to rule over such a well-educated society, the destroying the knowledge base was necessary. There went the destruction of universities, temples of learning, and libraries. Somehow the remnants of that culture propagated to the West through Greece and Germany and now are coming back to India as Washington Accord (WA) and Outcome-Based Education (OBE). Executed in 1989, the WA is an agreement among the engineering quality assurance organizations of several nations that recognizes the substantial equivalency of programs accredited by those organizations, and recommends that the graduates of an accredited program in any of the signatory countries be recognized by the other countries as having met the academic...
requirements for entry into the practice of engineering. The process is to create graduates who are not only able to adapt to the change but also are able to initiate change as conditions in and out of their organization change. The change is the only constant that traditions do not survive. The OBE is a collection of these ability attributes to embrace change.

The British came to India disguised as traders in the form of the East India Company. Britain saw an opportunity to rule a nation that was fragmented due to the animosity of its regional rulers. In the process of providing cover to the faithful, they created a policy of divide and rule which resulted in mistrust among many segments of society. That policy was clearly visible when the inevitable division of India was being enforced. This continues to be a way of life even after several decades of embracing freedom. The shift in perception towards WA and OBE occurred because many from the Indian diaspora returned to India with practices that made them successful businesspeople in the Silicon Valley. This was the birth of a Silicon Valley in India (Banglore and Hyderabad or Cyberabad). The Indian Silicon Valley is now a popular destination for American companies like Intel, IBM, Microsoft, etc. On the other hand many information technology (IT) firms have propped up to cater to the market in western countries. The United States was an excellent vantage point for the Indian diaspora to form a vision to unleash the vast untapped intellectual capital buried in their spiritual upbringings. The migration of business from America to India, outsourcing as we now know it, is creating new paradigms, e.g., medical tourism, educational tourism, cyber-research, etc. Technology is playing a predominant role. As Americans close their shops at the end of the day, Japan (the land of the rising sun) along with China and India wakes up. The design work that Americans left before retiring for the day is picked up by Asians and then Europeans so the product or process development is now not only global but also round-the-clock activity. Even the United Nations recognized that India should not consider its diaspora as a brain drain, but utilize it as a brain bank. Liberal reforms of the Indian Government are creating a paradigm of mutual cooperation with America and the world in all aspects of global economy. U. S. was in a rush to conclude the nuclear deal with India through the U.S. Congress. Bollywood culture and Indian practices of yoga and medicine and of course its food is now a popular export. The routine and repetitive learning that Britain-based education in India provided is now being replaced by U. S.-based OBE.

Engineering, a process of synthesis, is an engine of innovations, inventions, and growth [1]. To quote Theodore Von Kármán, the California Institute of Technology’s Provost during its formative years: “Scientists discover the world that exists; engineers create the world that never was.” In other words, science is about being driven by curiosity to understand the world. Engineering is about using science to transform the world. An integration of science, engineering, and management is well documented in [1-3]. One cannot be a happy and satisfied person unless the community in which one lives in is in a happy and satisfied mode. Community service or Kar Sewa (service with your own hands) continues to be a hallmark of Indian state of Punjab, whose inhabitants fiercely fought battles with invaders crossing into India through Afghanistan.

A quality organization (including a university) comprises quality people who value quality principles and renew themselves as the conditions change inside and outside their workplace and workspace. The stakeholders in a quality organization have alert minds ready to take initiatives and make things happen even if odds are against them. In fact, they anticipate and are able to manage uncertainty and unforeseen circumstances. Engineering is a process not a discipline as it is normally perceived. Scientists study the world as it exists (a process of analysis) while engineers synthesize ideas to dream up or innovate a process, procedure, design, or product to transform the world around them [1-3]. Engineering is derived from the word engine that drives the multitude of compartments behind it. Engine itself derives from Latin word ingeniotorem meaning ingenious. In that scenario a Chief Executive Officer (CEO) of an organization may be described as an engineer driving the organization to its destination (goal) in a grand journey [3]. How? Not by miracles, but by following common sense and using his ingenuity. There is a lot of common nonsense going on in every organization [4]. An effective and efficient CEO will cultivate teamwork and cooperation in search of win-win thinking paradigms leading the organization of the people by the people and for the people to unprecedented heights. For this enlightened CEO, the success is not derived from a few people in the board room but by the quality people at all levels, no matter what their status and role.

II– WHY PLAN FOR SUCCESS?

When we think of success and wealth, what comes to our minds is our material comforts and their abundance. While such comforts are an integral part of success and wealth, they are meaningless without a consideration of spiritual happiness included in our value systems and modus operandi. Having $200 million or $1 billion isn’t really success if our life is bedeviled by emotional problems or unhappy relationships with our colleagues, family members, or whosoever comes into our circle of influence (loosely called customers). A positive correlation between a happy mind and a healthy body has been shown in a number of studies. True success means material and financial wealth coupled with an enjoyment of one’s life journey, a continued expansion of happiness, and a progressive realization of worthy goals. Motivation towards achieving our goals is the key factor in our success.

America is indeed a land of opportunities and allows each one of us to flourish to one’s full potential, regardless of nationality, religion, or ethnicity. Secular forces pervade the culture of creativity and innovation. In his thought-provoking article Hoodbhoy [5] concludes “Just as important, the practice of
religion must be a matter of choice for the individual, not enforced by the state. This leaves secular humanism, based on common sense and the principles of logic and reason, as our only reasonable choice for governance and progress. Being scientists, we understand this easily. The task is to persuade those who do not.” The persuasion based on secular thoughts must be pervasive in every religion. That itself will open communication channels creating a platform for continued dialog between the teacher and taught, pundit and his/her follower, ruler and those being ruled, employers and employee, and alike. In a recent article America is embracing Hindu way of life (Newsweek, August 31, 2009, Are we Hindus now?).

The article based on research states:

“America is not a Christian nation. We are, it is true, a nation founded by Christians, and according to a 2008 survey, 76 percent of us continue to identify as Christian (still, that’s the lowest percentage in American history). Of course, we are not a Hindu—or Muslim, or Jewish, or Wiccan—nation, either. A million-plus Hindus live in the United States, a fraction of the billion who live on Earth. But recent poll data show that conceptually, at least, we are slowly becoming more like Hindus and less like traditional Christians in the ways we think about God, our selves, each other, and eternity. The Rig Veda, the most ancient Hindu scripture, says this: “Truth is One, but the sages speak of it by many names.” A Hindu believes there are many paths to God. Jesus is one way, the Qur’an is another, yoga practice is a third. None is better than any other; all are equal. The most traditional, conservative Christians have not been taught to think like this. They learn in Sunday school that their religion is true, and others are false. Jesus said, “I am the way, the truth, and the life. No one comes to the father except through me.” Americans are no longer buying it. According to a 2008 Pew Forum survey, 65 percent of us believe that “many religions can lead to eternal life”—including 37 percent of white evangelicals, the group most likely to believe that salvation is theirs alone. Also, the number of people who seek spiritual truth outside church is growing. Thirty percent of Americans call themselves “spiritual, not religious,” according to a 2009 NEWSWEEK Poll, up from 24 percent in 2005. Stephen Prothero, religion professor at Boston University, has long framed the American propensity for “the divine-delicafeteria religion” as very much in the spirit of Hinduism. You’re not picking and choosing from different religions, because they’re all the same,” he says. “It isn’t about orthodoxy. It’s about whatever works. If going to yoga works, great—and if going to Catholic mass works, great. And if going to Catholic mass plus the yoga plus the Buddhist retreat works, that’s great, too.” Then there’s the question of what happens when you die. Christians traditionally believe that bodies and souls are sacred, that together they comprise the “self,” and that at the end of time they will be reunited in the Resurrection. You need both, in other words, and you need them forever. Hindus believe no such thing. At death, the body burns on a pyre, while the spirit—where identity resides—escapes. In reincarnation, central to Hinduism, selves come back to earth again and again in different bodies. So here is another way in which Americans are becoming more Hindus: 24 percent of Americans say they believe in reincarnation, according to a 2008 Harris poll. So agnostic are we about the ultimate fates of our bodies that we’re burning them—like Hindus—after death. More than a third of Americans now choose cremation, according to the Cremation Association of North America, up from 6 percent in 1975. “I do think the more spiritual role of religion tends to de-emphasize some of the more starkly literal interpretations of the Resurrection,” agrees Diana Eck, professor of comparative religion at Harvard. So let us all say om.”

As the above analysis shows, Hindu way of life is indeed synonymous with secular thoughts encouraging dialogue between teachers and taught. This spirit of dialogue is prevalent in secularism buried in Hindu Thinking Processes. Some segments of the world society believe that you are not religious if you do not believe in God. “In God we trust” inscribed on a dollar bill is a testimonial of secularism in America. Secularism and atheism are not synonymous. Secular forces require you to be grateful (kriyghna in Sanskrit) of whatever you have and make best use of the resources endowed upon you. The word shukr expresses the same sense. The opposite of shukr is kuffr. A person who is not grateful to the bounty of nature endowed on him is called kaafir. Kaafir was not meant to be a term for non-believer. It is a terms designed for those who are thankless even after getting so much from their neighborhood, community, or country.

The finding of Newsweek stated above is a clear testimonial of East meeting West, both East travelling to West and West travelling to East in the true spirit of global economy. The American dream is not so much an American. It is also an Indian Dream that is changing to embrace the reality in the form of WA and OBE. Both Indians and Americans are indeed fortunate to live in a free country where comforts and amenities are almost heavenly and we tend to indulge in this freedom without the least restraint. We do not realize that this freedom is essentially built upon intelligent self-restraints and discipline. For instance, the traffic lights on our roads do constrain our freedom but this is a necessary restraint for the orderly flow of traffic. When planning for success and managing quality, we need to understand constraints [4]. Human wants are insatiable and resources limited. If we anticipate the constraints of limited resources, we can create a quality future for ourselves and those in our circle of influence. The algorithm of this process is called design. A design is a process of generating alternatives and choosing the best one by optimizing. Even if resources are plenty, the integration of diverse talents is a must if we are to make continued progress. That is where the Theory of Constraints [4] and the engineering process of optimization comes in. Decision-making is a very important part of planning. An engineer will generate alternatives. Choices can be made by non-analytic means (adequate for less important decisions having limited impact) or analytic means (decisions involving

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t able resources). Decisions can be made under conditions of certainty (perfect information), uncertainty (imperfect information), or risk (outcomes are random but probabilities of outcomes can be reasonably estimated). When planning, the people bring to the table some very brilliant ideas, as we might have heard from several of our colleagues. However, their perception by the intended “audience” is not assessed.

Foreign universities are now making inroads into India (Time, November 1, 2010): “Learning curve. American universities are rushing to set up shop in India. But local entrepreneurs have the inside track.” Charged with the values that Indian market presents, WA is also looking towards India to expand its circle of influence. These foreign universities with the help of Indian Diaspora have good strategic, tactical and operational plans, but they also have very good maintenance plans. As globe shrinks, one immediately identifies the need for planning at all levels to derive synergy from all sources.

III– TOTAL QUALITY MANAGEMENT

Quality is in the eyes of the beholder. Consider, for instance, a glass only half-filled with milk. A pessimist looks at the empty upper half and complains that it is not full. An optimist looks at the filled lower half and enjoys its fullness. In a lighter tone, as quoted by Bill Cosby, the glass is half full or half empty depending on whether you are pouring or drinking. An engineer is a pragmatist. She looks at the resource needed to make the glass and looks at its design and declares that the glass is twice as large as it should be. She responds to capacity management within the constraints of available resources.

While the price one pays for a service or product may be a discriminating factor, quality is often the major factor. Poor quality can be very expensive for the producing organization and the “customer.” Although few of us talk of quality in an organization, most people accept what is being done as a way of life. This is sorrow state of affairs in mushrooming foreign universities with the help of Indian Diaspora have good strategic, tactical and operational plans, but they also have very good maintenance plans. As globe shrinks, one immediately identifies the need for planning at all levels to derive synergy from all sources.

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IV– TEAMWORK AND COMMUNICATION

Working in teams and communicating on a continuing basis allow us to improve not only the standard of living, but also the standard of life for all our colleagues and other peers who are not yet within our circle of influence. A standard of life means feeling the subtle body in a person (including one’s “self”). In Indian scriptures, there is a book entitled Tatavabodha (meaning essence of knowledge). It is written as a dialogue between a teacher and a pupil. In fact, all Indian scriptures are dialogues between a teacher and a taught, as demonstrated by the dialogues between Krishna as a teacher and Arjuna as a student in the most revered Bhagvad Gita.

The fundamental topic is on discriminating power between nitya (the timeless or ever-present permanent) and anitya (the transients or time-bound). This scripture notes three levels of our existence: gross, subtle, and causal body. Each one of us is recognized by one’s gross body, made of five original elements: earth, air, water, space, and fire (temperature). The standard of living relates to the comforts available to that gross body. It is endowed with six folds of modification: it exists, is born, grows, undergoes modifications, decays, and dies. It has five sensors of perception: the ear, the skin, the eye, the tongue, and the nose. Utilizing these sensors, we can tap the subtle body in each one of us. That enhances our communication
channels and, hence, improves the standard of life. The causal body is that which is of the form indefinable and without any beginning. It is the cause of the two bodies (gross and subtle) culminating into our passion, emotions, and motivation. It is that superpower from which all religions originate. It is timeless Atma (loosely defined soul) and it forms a common thread among all living beings and drives us all. In that context, we are all engineered entities. Within each one of us is a kernel of being that does not change (timeless)—a spark of divinity—and this is where infinite potential resides. All human beings have the ability to create anything they want. After all, we all started out as a speck of DNA and from that we have grown into beings with the ability to create space ships, write poems, play the piano, and make babies.

A similarity is seen between the 7 habits of highly effective people as described by Steve Covey [7] and aspirations of WA. Let us first invoke the Hindu trinity (3 forms of a single Superpower) in making/sustaining/renewing an organization. Every organization has Brahma—the Creator, Vishnu—the Preserver and Shiva—the Destroyer (of ignorance!). Once an organization is created, Vishnu takes over. The people look to Vishnu in providing sustenance. Within a few years of creation, most organizations lose sight of their mission and essential role, as they are only interested in sustenance, not innovations. They become focused on efficiencies or doing things right rather than on effectiveness or doing the right things. In any organization, it is Shiva who is to be protected in order to enhance effectiveness and destroy obsolescence so that the renewal is a natural process. In a quotation by Bernard Shaw, it is stated: “A reasonable man adapts himself to the world; an unreasonable man wants the world to adapt to himself; all success depends on the unreasonable man.” While considering renewal for our organization, we should be on the lookout for that Shiva, “the unreasonable man,” who may effect change and promote innovations in an organization to avoid stagnation. In making a case of renewal, Covey strongly advises to move from dependence to independence (private victory) and on to inter-dependence (public victory). It is inter-dependence that is highly valued in a world where information travels at the speed of light. This inter-dependence can truly teach us the value of teamwork in a multicultural and multilingual world.

The first three habits advocated by Covey lead to private victories. These habits are: Be proactive (take initiatives by invoking leadership), begin with the end in mind (define the purpose of your life), and put first things first (manage time by prioritization). The next three habits invoke public victories. These are: Think win-win (create a happy environment for all in your circle of influence), first understand and then be understood (enhance listening skills), and synthesize (make 1 and 1 equal to 11 not 2). These habits will invoke Vishnu in you as people will find you indispensable for finding solutions to their problems. The seventh habit of renewal stands by itself and takes the form of Shiva who destroys obsolescence in favor of innovations and renewal. As Shiva, you should always question current practices and be on lookout of what can be improved. Brahma, Vishnu, and Shiva are thus 3 stages buried in yourself as you evolve from cradle to pyre. This is non-duality.

V–ETHICS, MISSION, VISION, AND VALUES

Embedded in the work place is a belief that individuals working for an organization have somehow lost the will to act ethically. Contrary to that belief, individuals come to work with the intention of doing the best job possible, but are stymied and discouraged at all levels, sometimes by their own peers for personal interests. A strong correlation between the quality of an organization and ethical and moral values held by the management has been shown in the literature. Mahatma Gandhi, the leader credited with the independence of India, had a mission to liberate Indian people from the rulers who were inhibiting their growth by labeling them slaves. A restaurant in England displayed a sign during colonial time: “Dogs and Indians are not allowed.” Gandhi achieved his greatness by practicing ethical principles and staying close to the people, representing their greatness of spirit and moral values. As a law professional, traveling in the first-class compartment in South Africa, he was thrown out of the train by a white supremacist who believed that colored people have no right to travel in first class. Yet, he fought peacefully for human rights, just like Martin Luther King in the United States, and is now touted as the Father of the Nation in a free India.

The mission of an organization is based on shared values and vision. Every nation, community, or organization faces contradictions between the rhetoric contained in the mission and its actions. The leaders say we value democracy, but they reward autocracy. They say we value openness, but they behave in ways that value closeness, hidden agendas, and politicking. They say we value capitalism, but they reward feudalism. They say we value people, but they protect rewards for the privileged class. An effective mission statement should deal with four needs: economic, social (relational), psychological (emotional), and contributory. The strategic path leads from the mission statement and reflects its vision and values and also reflects the ecological realities and trends to avoid obsolete practices and attitudes. When there is an alignment with vision, values, mission, and constitution of an organization, only then does valuing people becomes its top line, as much as staying solvent, the bottom line. To stay solvent, an organization must develop strategies in three areas: finance, marketing, and operations. Shifting paradigms require one to address the contemporary ethical issues as these arise and develop associated strategies to eliminate discrimination in one’s organization. That is where our vision and values come together in support of the mission of our very existence. Creating a group of them versus us will only create more problems, as President Bush found out on waging war with Afghanistan. The Dilbert Principle by Scott Adams [8] states it differently for the workplace: “Incompetent workers are promoted directly to management without ever...
passing through the competency stage.” This is Bhumiputra Syndrome. Bhumiputra (son of land) comprises bhumi for land and putra(i) for son(daughter) in Sanskrit. Bhumiputras claim an entitlement or demand a preferred treatment because of a class (color, creed, religion, status, etc.). Bhumiputra Syndrome’s presence in the professional world stems from the presence of bhumiputras who are unable to keep pace with changing technology and the world, but are shuffled to management positions to minimize damage. An engineering process will conclude just the opposite: It creates the maximum damage since the idiocy of incompetent managers permeates down to the worker level and hence affects the whole organization. Such administrators, pretending to be leaders, are neither able to make competent decisions for implementing innovations or delegating authority, nor are they capable of assuming responsibility of their actions. Professionals working in such an organization become street-smart for personal benefits. Enron and other big companies that went bankrupt recently are examples of such degradation and corruption. Hence, high ethical standards should be emphasized.

To form a clear vision of the future, the application of VCR paradigm [9] developed at Carnegie-Mellon University is one possible platform. V stands for Values and Virtues, C stands for Consequences and Contingencies, and R stands for Rights and Responsibilities. The VCR paradigm allows one to evaluate an action before execution, according to the law of dharma (a Sanskrit word meaning devotion to duties with high ethical standards). It gives an individual a platform on which to assess the values and virtues of the community one lives in. He or she is prepared for the possible consequences of his or her actions and the VCR paradigm gives him or her ammunition to develop associated contingency plans. Furthermore, the VCR paradigm states that right of the leadership role should be given to those who are prepared to take the responsibility of their actions. In training professionals on work ethics, the emphasis should be on finding ways to build strong character in professionals or the organization they serve or will serve with the intent to build trust and enhance trustworthiness among all the stakeholders. After all, an efficient and reliable economic and political system in such an organization become street-smart for personal benefits. Enron and other big companies that went bankrupt recently are examples of such degradation and corruption. Hence, high ethical standards should be emphasized.

VI– THE THINKING MIND - THE INCREDIBLE INFORMATION PROCESSOR

In spite of the vast number of innovations in information technology, the human brain remains an incredible information processor and a remarkable knowledge manager [10]. The present millennium will see enhanced integration of the artificial and the natural at many levels and in varied forms in order to design, maintain and improve quality. We can manage knowledge better if we know diversity of thinking processes in addition to cultural diversity. Multiple objectives are fulfilled while studying and understanding the mind, the information processing capability of the human brain.

Fig. 1  Ned Hermann’s four-quadrant model of the brain with predominance indicated.

The way the top leadership (organization’s brain) manages and processes knowledge, information trickles down to the worker level (heart of an organization) and then into the work place (other parts of an organization). Certainly, the thinking mind can be an important element for administrative setup and in planning strategies for an organization. Actually, a model like this can become an effective advising tool in matching talents of students to the disciplines or careers they are considering. The goal of academic advising is to create models for students to find a field of study that matches their career success and personal fulfillment goals.

In the Bhagavad Gita, Krishna explains: “The Supreme Lord is situated in everyone’s heart, O Arjuna, and is directing the wanderings of all living entities, who are seated as on a machine, made of the material energy.” This ancient philosophy teaches that the individual and the universe coincide. The work proceeds through intellectual knowledge of the playing field (jnana yoga), emotional devotion to the ideal (bhakti yoga), and right action that includes both feeling and knowledge (karma yoga). Individual purification comes with right action. With ongoing purification we approach wisdom. The Bhagavad Gita is a message addressed to each and every individual to help him or her to solve the vexing problem of overcoming the present and progressing towards a bright future. Within its eighteen chapters is revealed a human drama. The text of each chapter is same: Hey that is you (tat twam asi). What you are looking out of you is present within you. To recognize that text of knowledge, each chapter of Bhagwat Gita changes the context in which text can be applied. This is an engineering approach of generating alternatives all leading to the recognition of the self. This text-context is the experience of everyone in this world, the drama of the ascent of man from a state of utter dejection, sorrow and total breakdown and
hopelessness to a state of perfect understanding, clarity, renewed strength and triumph. In any organization, people either produce, manage, or lead. However, a true leader has to perform all these roles. Whole-brain thinking is a must for envisioneering the future while designing a strategic plan. Ned Hermann divides the brain into 4 quadrants: two on the left (quadrant A and B) and two on the right (quadrant C and D), as shown in Figure 1 [10].

The left half works more with logic, words, structures, and analysis. In contrast, the right half works more with emotions, pictures, whole entities, relationship among parts, and synthesis. The left half is sequential and time-bound (masculine); the right is holistic and time-less (feminine). In Asian philosophy, these two aspects form the yin-yang (feminine-masculine) combination. In Indian mythology, this yin-yang culture arises as follows. Brahma-the Creator derives his power from Saraswati, the goddess of knowledge; Vishnu from Laxmi, the goddess of wealth; Shiva from Parvati, the goddess of strength. This duo combination demonstrates the male-female interdependence. No organization is created without knowledge. Once an organization is created, Brahma elopes with Saraswati. And, Vishnu-Laxmi amalgamation takes over as those serving the organization look for sustenance. Shiva-Parvati duo combination is required in search of creativity and innovations and breed new life into an organization. Similarly, the left half of the brain derives its synergy from the right half. A number of yoga and meditation techniques are available to relax the left half so the right half has an opportunity to show its strength. This is true diversity not so much color, caste and creed, but in terms of thinking processes. Whole brain thinking is a must if an organization has to succeed. Most of us, engineers and scientists, are trained to be Quadrant A thinkers who think in terms of numbers and words. A process to move us from Quadrant A to D can be generated to make one an entrepreneur—idea generator. At an individual level, one can obtain mastery in any of these quadrants by continued applications of relevant activities. However, an organization exists when the whole brain is thinking and planning. That is where diversity in a team environment becomes of utmost importance. No single person can have dominance in all four quadrants. However, a diverse team with reasonable overlap of dominance in each quadrant can generate a whole-brain thinking entity. Leadership in a knowledge organization deals with direction (production capability) while management deals with speed (production). An ideal operational paradigm will be: Lead from the right and manage from the left. A courageous leader or his team will climb the tallest tree in a jungle (unknown territory) and cry: “wrong jungle!” even though he is expected to be quiet as his team cruises through the wrong jungle and progress is being reported in terms of mileage covered. OBE thus can be tailored by visionary leaders who have mastered the landscape by using a compass to chart the uncharted territory for which no maps are available. OBE and WA are the processes to generate maps of the landscape by using a compass. This is the ongoing process of engineering design without which no OBE will be successful.

VII– WHERE DO WE GO FROM HERE?

An overview of planning for success following the engineering process is given. Each one of you can develop a programmed approach while solving problems in your natural habitat, may it be in America, India, or somewhere else in the free world. I encourage you to go home with these resolutions and use them to enhance your success for OBE in the inter-connected world:

1. Define the Purpose of our Existence. While leading, planning and innovating, each one of us will consider himself or herself as a contributing member of a larger enterprise. Our success is driven by how we talk, look, write, listen, create ideas, solve problems, motivate, persuade, lead, organize, handle anger and sleaze, and deal with power figures and outside organizations. In this capacity, we will be connoisseurs of talents, more curators than creators. Add motivation and determination to achieve a goal and we will progress toward that goal.

2. Resonate with the Enterprise. We will get out of our cubicle by communicating effectively with people who may or may not think and operate similarly to the way we do. We must realize that human nature is such that silence is deafening and curiosity overwhelming. The silence of a person is an indication that he or she is shaken psychologically and emotionally for a variety of reasons. With enough enthusiasm, we can ignite the curiosity in a silent colleague who is identified as not participating. It is like creating a resonance condition by matching the “frequency” of the driver with the driven.

3. Discover the Future by Forming, Norming, and Storming Teams. We should keep on reminding ourselves as to what is important in engineering our future. Not only will we produce quality ability attributes among our “customers,” but also create a quality educational organization by relating to our colleagues and by forming effective and efficient teams. As members of a team, we will remain intimate allies of our colleagues and peers at large. We may not have the loudest voices but we will have the most attentive ears. The ingredients are a combination of our competence, commitment, caring, fairness, candor, and generosity.

4. Utilize the Power of the Thinking Mind. We will harness the tremendous information processing capability of 3-pound 3-quart-sized internal computer—the brain, estimated to have about 17 billion bytes of storage and astounding speed of the mind. We should use this powerful knowledge-managing resource for creative activities that will advance both our personal and organizational goals.

Indeed, it’s time to heed the deed and proceed with speed to succeed! Agreed? Let us start this journey here and now with design of an effective curriculum that not only propagates desirable attributes or outcomes, but also allows us to design a process to assess the efficacy of these outcomes and put a process
in place for continuous improvement. You cannot be a quality leader unless you develop the process of an integrated human being. In the privacy of your office/home, please fill the questionnaire in the Appendix A. That will tell you which of the trio of leadership, planning and improvement you are dominant. A key to interpret the score can be obtained from the author through e-mail: vijay.arora@wilkes.edu.

Appendix B gives a sample Course Outline of an online course offered in Spring 2011 at Wilkes University. This can be used as a template to design your course with objectives and assessments of outcomes.

VIII– ACKNOWLEDGEMENTS

It is my privilege and pleasure to thank all my customers with whom I have interacted in the past, interacting now in the present, and all those who will appear in my circle of influence. I am appreciative of the company of all my worldwide friends, students, and colleagues, too numerous to name. The tremendous support I received from the Universiti Teknologi Malaysia and from the Brain Gain fellowship of the Academy of Sciences Malaysia is noteworthy.

My colleague and long-time friend Dr. Brian Redmond is a living example of life-long learning: “Training ends with school, but education ends with life.” He ignited in me thought processes by being a guest lecturer in my Professionalism and Ethics classes. I am grateful to him in finding time for editing this manuscript as well as for creating an effective dialogue similar to what occurred between Krishna and Arjuna in the Bhagavadgita. Brian, I value your company in our microcosm.

It is also a good time for me to recollect and acknowledge the wonderful guidance I received from my first mentor and a boss at Wilkes University, Professor Umid R. Nejib. He was one of the Final Word lecturer at Wilkes University and left for his heavenly abode after creating and sustaining a wonderful world of engineering at Wilkes University. May God bless his soul.

Professor Vijay K. Agrawal, Director of National Institute of Technical Teachers’ Training and Research (NITTTTR), shared several happy moments when we were immersed in Japanese way of life by being together at the Tokyo Institute of Technology in 1990-91 academic year. Japanese wisdom originated from India through spread of Buddhism that along with Shintoism remains active in Japan.

Michael L. P. Tan, recent graduate with Ph. D. degree from the University of Cambridge in the U. K. has been most helpful on anumber of occasions in reviewing and formatting papers to the requirements of a journal. I value his assistance for which there is no compensation except a simple Thank you.

When life took a roller coaster ride after the perestroika of 1998 at Wilkes University, Gina Morrison and Josephine Paganib provided tremendous support. I salute both of them in making me recognize a quality person in that subtle body in me that was looking for a purposeful life. The article is outgrowth of a Final Word lecture given at Wilkes University on May 10, 2006. The text, the Power Point, and notable quotes of that Final Word lecture can be downloaded from web.wilkes.edu/vijay.arora/.

References

[7]. S. Covey, 7 Habits of Highly Effective People, Simon and Schuster, New York, 1989

Appendix A

Discovering a Quality Person in Your Subtle Body

The mastery of the art of engineering a fully-functioning quality person in you comes from the mastery of the self—leadership of the self. The process of becoming a leader is the process of being an integrated human being. This exercise is designed for you to identify your “self”, that subtle body in you that uses five sensors to relate to the subtle body of others in your circle of influence.
A. Personal Leadership
1. I treat other people fairly and with respect.
2. I actively listen to other people and don’t interrupt to give my point of view.
3. I take on responsibility for my actions and don’t rely on others to plan my future.
4. I volunteer my services to help others in need.
5. I maintain a healthy, positive outlook on life.
6. I understand my values and apply them in my daily living.
7. My long- and short-term goals are tied to my values to ensure that what I am doing in my life is important to me.
8. My daily activities are in harmony with my values.
9. I enjoy the people and things in my environment.
10. I practice good customer service with all the people whom I come into contact.

B. Planning
1. Every day I take time to plan my daily activities around what is important to me.
2. I try to align my long- and short-term goals with my values to ensure that my daily activities are in harmony with my goals.
3. During my daily planning time, I prioritize both important and routine activities that I need to accomplish.
4. Each day I plan to accomplish only those activities for which I have allocated enough time.
1. I strive for continuous learning and have plans to further my education in areas that interest me.
2. I strive to work up to the standards set by the most accomplished people in areas that interest me.
3. I try to exceed the expectations of all the customers with whom I come into contact in my activities.
4. When I plan my activities, I have knowledge of my environment and take any changing elements into consideration.

<table>
<thead>
<tr>
<th>Rarely</th>
<th>Sometimes</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Total A_______/100
9. I have a good sense of how my personal values, strengths, and weaknesses align with what I am doing.

10. I have thought-out, realistic goals with achievable targets for my major activities.

C. Improvement

1. I can document three major processes that I use in accomplishing my personal goals.

2. I constantly strive to improve my skills, knowledge, and sense of purpose in my life's work.

3. I constantly strive to measure whether I am meeting my personal goals.

4. I constantly strive to eliminate activities that have no value in my life and focus only on activities that enrich my life.

5. I admit my mistakes, acknowledge the reasons, and then move on with the goal to not make the same mistakes again.

6. I celebrate my success and improvements.

7. I measure my success by achieving my goals on time.

8. I constantly strive to improve in areas that are important to me and learn to accept my weaknesses in areas that don’t interest me.

9. I am a role model for continuous improvement in everything I do.

10. I am open to changes in my life that will enable me to learn new things.

Interpreting Your Scores

Please report all the scores here. Please add them to get the grand total.

Total A _____
Total B _____
Total C _____
Grand Total (A+B+C): ________

If you want to assess your effectiveness, as an individual, in making contributions to Wilkes, send me e-mail at vijay.arora@wilkes.edu. I will return you the key with which you can compare yourself.

Questionnaire is adapted from Quality Progress, September 1993, American Society for Quality Control.
Office Hours: TTh 01:00-03:30 PM or by appointment
Walk-in without prior appointment is not encouraged outside the assigned office hours. Students can send an e-mail to the instructor for an appointment with a proposed time and date with alternative options in case the requested time cannot be accommodated. The instructor will promptly confirm the proposed appointment through e-mail. The course questions will be entertained only during the allotted class time in cyberspace: 4:30-7:30 PM on Tuesday. You can ask questions anytime. However, wait for the answer(s) to arrive either during the office hours TTh 01:00-03:30 PM or T 4:30-7:30 PM. This will avoid instructor’s presence in cyberspace 24 hours a day, 7 days a week and resulting peace of mind and soul. The on-campus students are encouraged to avail the office hours in the physical space (SLC237) or request an appointment. Except for requested appointment, all questions for the course will be answered through WebCT shell e-mail where discussion session for requested appointment, all questions for the course will be entertained only during the allotted class time in cyberspace: 4:30-7:30 PM on Tuesday. You can ask questions anytime. However, wait for the answer(s) to arrive either during the office hours TTh 01:00-03:30 PM or T 4:30-7:30 PM. This will avoid instructor’s presence in cyberspace 24 hours a day, 7 days a week and resulting peace of mind and soul. The on-campus students are encouraged to avail the office hours in the physical space (SLC237) or request an appointment. Except for requested appointment, all questions for the course will be answered through WebCT shell e-mail where discussion session etc. will be setup. WebCT e-mail is internal to the shell. It will not clutter our regular mailboxes.

Access to Companion Website for Contemporary Engineering Economics, S/E, Park is required. The instructor will promptly confirm the proposed appointment through e-mail. The course questions will be entertained only during the allotted class time in cyberspace: 4:30-7:30 PM on Tuesday. You can ask questions anytime. However, wait for the answer(s) to arrive either during the office hours TTh 01:00-03:30 PM or T 4:30-7:30 PM. This will avoid instructor’s presence in cyberspace 24 hours a day, 7 days a week and resulting peace of mind and soul. The on-campus students are encouraged to avail the office hours in the physical space (SLC237) or request an appointment. Except for requested appointment, all questions for the course will be answered through WebCT shell e-mail where discussion session etc. will be setup. WebCT e-mail is internal to the shell. It will not clutter our regular mailboxes.

B. CATALOG DESCRIPTION (2010-2011)
EGM 320. Engineering Project Analysis, Three credits,
Economic analysis of evaluating cash flows over time.

OBJECTIVES
At the end of the course, you should be able to:

1. Solve problems that demonstrate a sound understanding of the principles, basic concepts, and methodology of engineering economy. (a, e, g)*
2. Make rational decisions in situations likely to be encountered in the professional practice of engineering. (a-k)
3. Use computer and information tools to design, model, analyze, and interpret the outcomes. (c, k)
4. Communicate comprehension in written reports or through multiple-type questions. (d, h)
5. Solve cases at the crossroads of business/engineering/industry in self-directed work teams. (a, k).

* The letters in parenthesis refer to ABET’s a-k ability attribute outcomes given at the end of course outline.

COURSE OUTCOMES AND ASSESSMENT
The Accreditation Board for Engineering and Technology (ABET), a member of the Washington Accord, accredits Wilkes engineering programs. ABET has identified general ability outcomes in Engineering Criteria 2000 (EC2000) for all graduating engineers, regardless of their discipline or university. These a-k attributes, as these are popularly known, are listed in the Global Attribute Outcomes Assessment Form attached. We need to assess that the learning objectives are in concert with Wilkes University mission, the objectives of the engineering programs, and professional-practice attributes (including those required to be business savvy) contained in EC2000. The difference between engineering and business is that engineering executes and business reports. Unless we are good in communicating the value of engineering and science to those making decisions, we will not succeed in our professional and personal life. You will assess your ability attributes as a result of taking this course. This is a certification process that you covered in the course what was stated in the syllabus.

Another instrument that will be used is the Student Response Survey (SRS) that will measure the scholarship of learning and teaching. The primary goal of this survey is to assure that the students are able to perform well in the profession beyond college.

Both of these surveys, along with the possible team evaluation, will be conducted at the end of semester.

GRADING PROCEDURE
The grading of the course is based on the following components, each component meant to assess one or more of the course objectives given above:
Weekly online quizzes 40
Online discussion and case studies (teams) 10
Review questions from companion website 10
Excel assignments (teams) 20
Final Exam 20
Total 100

(440)
In fairness to all, WebCT will monitor strict adherence to the deadlines.

The following are guaranteed grades if your accumulated percentage over the semester falls into the following ranges: A (90 and above), B+ (85-89%), B (80-84%), C+ (75-79%), C (70-74%), D+ (65-69%), D (60-64%). In the unlikely case of average falling below 80%, the base points will be added to bring it to the 80% level and then grades assigned as given above.

The course runs on an honor system that expects each student to put an honest effort in meeting the learning objectives. The purpose of the homework and team project is to provide a working environment for you to practice creative problem solving, thereby enhancing your analytical, syntactical, computer- and people-oriented skills. Your teamwork performance will be assessed through a peer evaluation form and grades adjusted accordingly. Your ability to integrate mathematical and engineering sciences with skills businesses needs in today’s global economy demonstrates the synthesis character of engineering. Enjoy that wonderful experience when it occurs!

**Operational Details on Enhancing Learning Outcomes**

In thinking about professional and personal goals, remember that each course a student takes at Wilkes University contributes to the overall goals of a university education and the program in which student is enrolled. The goals are sometimes referred to as global or general objectives; likewise, objectives are sometimes referred to as specific goals. The point is that goals are general in nature, while objectives are specific in nature, yet both refer to the desired outcomes—the mileage covered during a journey (objective) towards a given goal. Cognitive domain of most interest to learners involves knowledge acquisition and dissemination, critical thinking, and synthesis. Bloom found that over 95% of the test questions students encounter require them to think only at the lowest possible level, the recall of information. Bloom identified six levels, as shown in Figure 1, within the cognitive domain, from the simple recall or recognition of facts, as the lowest level, through increasingly more complex and abstract mental levels, to the highest order which is classified as evaluation. Action verbs that represent intellectual activity on each level are listed below.

![Fig. 1 Six levels of Bloom’s Taxonomy](image)

1. **Knowledge**—recalling the learned material. One should be able to remember facts, principles, and steps in a sequence, etc. Action verbs to describe this category are: arrange, define, duplicate, label, list, memorize, name, order, recognize, relate, recall, repeat, reproduce, and state.

2. **Comprehension**—understanding the material. At this stage one is able to explain what is known, translates to new forms and symbols and extrapolates. Action verbs to describe this category are: classify, describe, discuss, explain, express, identify, indicate, locate, recognize, report, restate, review, select, and translate.

3. **Applications**—making learning relevant. At this stage, one should be able to use the material in new situations, that is apply concepts, principles, rules, theories, and laws to find solutions to new problems—problems that are new to our circle of influence. Action verbs to describe this category are: apply, choose, demonstrate, dramatize, employ, illustrate, interpret, operate, practice, schedule, sketch, solve, use, and write.

4. **Analysis**—cataloging the learned material. At this level one should be able to break things apart to understand relationships among components. For example, one might analyze a biomedical sensor using what is learned in physical and biological sciences. Action verbs to describe this category are: analyze, appraise, calculate, categorize, compare, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, and test.

5. **Synthesis**—making a system or procedure. One should be able to put together parts to form a new whole—that never was before. Professionals do this when they write proposals, design new procedures, etc. Action verbs to describe this category are: arrange, assemble, collect, compose, construct, create, design, develop, formulate, manage, organize, plan, prepare, propose, set up, and write.

6. **Evaluation**—reviewing the pros and cons. Here one should be able to use what is known about a subject area in making critical judgments, rate ideas or objects and to accept or reflect materials based on standards. The key skill is the ability to make judgments. Action verbs to describe this category are: appraise, argue, assess, attach, choose, compare, defend, estimate, judge, predict, rate, core, select, support, value, and evaluate.

The cognitive platform above explains how this course is structured. The level 1 is listening to lectures or comprehending the reading material and giving reactions by asking insightful questions and well-thought assessments. That is not enough for one to be an informed professional. There is a need to restate ideas in different forms while posing questions in and out of the classroom (level 2). Application part (level 3) comes in when one attacks complex problems or projects, perform surveys, or design experiments. Analysis (level 4) allows one to delineate the steps in doing individual problems/projects that have a single outcome. However, level 5 will bring one to the peak of a profession—generating alternatives towards meeting the goal of a given project. The level 6 brings one to
evaluate alternatives in the context of its usage and also to assess peer’s contributions.

**What is Design?**

Design is the heart of engineering. We live in a chaotic world where resources are limited and human wants insatiable. We must learn to solve problems within the constraints of resources available. Constraints Management is a new paradigm that demands our creativity. It embraces levels 5 and 6 on Bloom’s Taxonomy. Team projects assigned will give you an opportunity to brainstorm those necessary constraints that creep in. The steps to follow in attacking a design project is to define it, explore analogous situations, plan its execution, perform execution, and evaluate the solution in the light of available benchmarks. Although report writing may vary in style and contents, you will be well on your way to exhibiting your communication to peers and public alike.

**Tenets of Cooperative/Collaborative/Team Learning**

You can develop and gain confidence in your team skills and collaborative study habits by following the five tenets of cooperative learning:

*Positive Interdependence.* Team members are obliged to rely on one another to achieve the goal. If any team members fail to do their part, everyone on the team suffers consequences.

*Individual accountability.* All team members are held accountable both for doing their share of work and for understanding everything in the final product (not just the part for which they were primarily responsible).

*Face-to-face promotive interaction.* Although some of the team work may be done individually, some must be done interactively, with team members providing mutual feedback and guidance, challenging one another, and working toward consensus.

*Appropriate use of teamwork skills.* Students are encouraged and helped to develop and exercise leadership, communication, conflict management, and decision-making skills.

*Regular self-assessment of teamwork skills.* Team members set goals, periodically assess how well they are working together, and identify changes for effective functioning in the future.

One will also be able to identify four potential personality types while working as a team: coordinator, quarreler, dominator, and freeloader. Coordinator role must rotate so that everyone gets a chance to understand personality types and make freeloader active.

Total engagement in the course (in fact the program and university life) contributes to student’s success in the professional life beyond college. By working in coordination, one will become a creative and innovative thinker—constructing, discovering, transferring, and extending the knowledge gained by working as a team with the instructor and peers alike. Practicing those skills will make one a life-long learner.

**Course Objectives Assessment Form**

EGM320: Engineering Project Analysis

Please indicate how well you believe these learning outcomes were effective on the scale of 5 = accomplished to 1 = accomplished and 0 = not accomplished.

**Course outcome**

<table>
<thead>
<tr>
<th>How effective was this outcome?</th>
</tr>
</thead>
<tbody>
<tr>
<td>In this course, I was able to:</td>
</tr>
<tr>
<td>Solve problems that demonstrate a sound understanding of the principles, basic concepts, and methodology of engineering economy</td>
</tr>
<tr>
<td>Make rational decisions in situations likely to be encountered in the professional practice of engineering.</td>
</tr>
<tr>
<td>Use computer and information tools to design, model, analyze, and interpret the outcomes.</td>
</tr>
<tr>
<td>Communicate comprehension in written reports or through multiple-type questions.</td>
</tr>
<tr>
<td>Solve cases at the crossroads of business/engineering/industry in self-directed work teams.</td>
</tr>
</tbody>
</table>

**General Remarks**

I would like to make the following suggestions to improve the quality of course offering as it relates to the challenges of the personal and professional life.

**Global Attribute Outcomes Assessment Form**

This course made me acquire a-k ability attributes (listed below) on the scale of 5 = substantial, 1 = noteworthy and 0 = not relevant to the course.

**Attribute outcome**

<table>
<thead>
<tr>
<th>How well was this outcome met?</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. An ability to apply knowledge of mathematics, science, and engineering</td>
</tr>
<tr>
<td>b. An ability to design and conduct experiments as well as to analyze and interpret data</td>
</tr>
</tbody>
</table>
c. An ability to design a system, component, or process to meet desired needs
   5 4 3 2 1 0

d. An ability to function on multidisciplinary teams
   5 4 3 2 1 0

e. An ability to identify, formulate, and solve engineering problems
   5 4 3 2 1 0

f. An understanding of professional and ethical responsibility
   5 4 3 2 1 0

g. The broad education necessary to understand the impact of engineering
   solutions in a global/societal context
   5 4 3 2 1 0

h. An ability to communicate effectively
   5 4 3 2 1 0

i. A recognition of the need for and an ability to engage in lifelong learning
   5 4 3 2 1 0

j. A knowledge of contemporary issues
   5 4 3 2 1 0

k. An ability to use the techniques, skills, and modern engineering tools
   necessary for engineering practice
   5 4 3 2 1 0

Any suggestions? Please record.

<table>
<thead>
<tr>
<th>Student Response Survey (SRS) Assessment Form</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SRS Question</strong></td>
</tr>
<tr>
<td>I. Course Organization</td>
</tr>
<tr>
<td>1 syllabus clarified my responsibilities</td>
</tr>
<tr>
<td>2 syllabus clarified grading procedures</td>
</tr>
<tr>
<td>3 what was done agreed w/ learning objectives</td>
</tr>
<tr>
<td>4 instructor made material relevant to other disciplines</td>
</tr>
<tr>
<td>5 class time used efficiently</td>
</tr>
<tr>
<td>II. Grading</td>
</tr>
<tr>
<td>6 text and/or manuals helped me learn</td>
</tr>
<tr>
<td>7 exams/assignments appropriate to material and objectives</td>
</tr>
<tr>
<td>8 exams/assignments graded fairly</td>
</tr>
<tr>
<td>9 helpful feedback provided on tests and assignments</td>
</tr>
<tr>
<td>III. Instructor Communication</td>
</tr>
<tr>
<td>10 instructor communicated enthusiasm for material</td>
</tr>
<tr>
<td>11 instructor appeared knowledgeable about the subject</td>
</tr>
<tr>
<td>12 instructor answered questions clearly</td>
</tr>
<tr>
<td>IV. Instructor Interaction with the Students</td>
</tr>
<tr>
<td>13 instructor stimulated intellectual curiosity</td>
</tr>
<tr>
<td>14 instructor encouraged student participation</td>
</tr>
<tr>
<td>15 instructor used examples and illustrations</td>
</tr>
<tr>
<td>V. Instructor Interest in Students</td>
</tr>
<tr>
<td>16 instructor treated me with respect</td>
</tr>
<tr>
<td>17 instructor was available for consultation outside class</td>
</tr>
<tr>
<td>VI. Global Items</td>
</tr>
<tr>
<td>18 instructor was an effective teacher</td>
</tr>
<tr>
<td>19 overall quality of course was high</td>
</tr>
</tbody>
</table>
CONFIDENTIAL

Peer Review Assessment on Self-Directed Work Teams

Activity: _Homework and Projects_  
Team Number_________

This peer rating system is designed to account for individual performance in cooperative learning. Team members confidentially rate how well they and each of their teammates fulfilled their responsibilities by receiving a portion of 100 points. Evaluate average points per person: \[ x_{\text{ave}} = \frac{100}{5} = 20 \] Distribute 100–x_{\text{ave}}= 80 among your team members (excluding you). Your points will be filled by the instructor after checking your evaluation. You will receive full x_{\text{ave}} points if it has complete information. Up to 5 points are deducted if names are not in the alphabetic order and your name not highlighted or circled. Up to 5 points are deducted for giving the form without calculating averages. 5 points are deducted for every day the form is turned in late. **Grading scale for your use:** 0 (no show), 0.25 x_{\text{ave}} (superficial), 0.5 x_{\text{ave}} (fair), 0.75 x_{\text{ave}} (good), x_{\text{ave}} (outstanding). Average must be equal to 100-x_{\text{ave}}. 

Indicate personality type of each member: coordinator (C), quarreler (Q), dominator (D), and freeloader (F).

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Name</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Total (not to exceed 100-x_{\text{ave}})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attend all team meetings, arriving on-time or early.</td>
<td>Ahmad Ali</td>
<td>15</td>
<td>20</td>
<td>10</td>
<td>10</td>
<td>15</td>
<td>80</td>
</tr>
<tr>
<td>Responsibly:</td>
<td>Babu Saxena</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>10</td>
<td>30</td>
<td>80</td>
</tr>
<tr>
<td>Has abilities that the team needs. Makes most of the abilities. Gives fully, does not hold back.</td>
<td>Cathy Moore</td>
<td>35</td>
<td>20</td>
<td>20</td>
<td>40</td>
<td>30</td>
<td>80</td>
</tr>
<tr>
<td>Creative, Energetic. Brings energy and excitement to the team. “Can do” attitude. Sparks creativity in others.</td>
<td>Fatimah Noor</td>
<td>10</td>
<td>20</td>
<td>35</td>
<td>20</td>
<td>05</td>
<td>80</td>
</tr>
<tr>
<td>Responsible:</td>
<td>Michael Lee</td>
<td>10</td>
<td>20</td>
<td>35</td>
<td>20</td>
<td>05</td>
<td>80</td>
</tr>
<tr>
<td>Total (not to exceed 100-x_{\text{ave}})</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>80</td>
</tr>
</tbody>
</table>