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Abstract

Is strategic foresight art or science? Identifying opportunities and innovations in the future is a critical competence and an important ingredient for success. A system for the idea creation can be an important contribution to moving the field of futurism forward. This article presents a model for strategic foresight using the theory of multisociative thinking to stimulate the interactive and convergent methodology for trend analysis and brainstorming new ideas. This systematic approach to idea creation will help managers and futurist create perpetual innovative cultures, develop new markets, products, and services in the commercial sector, as well as initiate new policies and programs in the social sector.

Strategic Foresight: Art or Science?

Is the anticipation of future possibilities the artful province of a few enlightened and creative thinkers? Or can the future be scientifically quantified, extrapolated, and simulated using complex algorithms, data mining, computer simulations, and gaming theory?

According to a special report from the World Future Society published in an issue of The Futurist (May-June, 2004), “the art of foresight” is the secret ingredient of success because it helps us prepare for a rapidly changing future. If it is indeed the secret formula of success, strategic foresight can be the source of new knowledge that can evolve into rare, valuable, and inimitable resources that establish sustainable competitive advantages for organizations and their stakeholders. In fact, new knowledge is the source of wealth-creation based upon intellectual assets, collaborative learning networks and effective infusion of advanced technology. Nurturing and managing the flow of knowledge may be the most important competence of the future to develop new or sustain existing commercial competitive advantages and national comparative advantages.

Emergent idea creation that creates new knowledge is an important function in organizations for stimulating innovation. One of the primary purposes of innovation is the creation and conversion of ideas into viable commercial products in addition to building a foundation for future sustainable growth. In this context it is knowledge, not technology or capital, that is the core component of innovation.

Innovation in the private sector focuses on the entrepreneur’s ability to recognize opportunities to commercialize new technologies, inventions to exploit new markets and develop new ventures. It enables managers and stakeholders to anticipate technological disruptions and discontinuities in existing markets.

Another purpose of innovation is the transfer of science and knowledge to the public sector. But because of the lack of huge potential rewards typically associated with marketing commercial intellectual property, the application of innovation in the public sector tends to be overlooked or unappreciated. Innovation in the public sector enables to administrators and social change agents to create new program initiatives and initiate new public policy.

Although innovation has been increasingly cited as the salvation for the United States global competitiveness, there are some alarming trends emerging. Between 1990 and 2003 high technology products positively contributed \$243 million to the U.S. balance of trade, while all other goods resulted in a negative cumulative total of \$3.4 billion. But the trend is dramatically declining and has been negative during each year of the 21st century. Our global share of high tech industrial output has declined from 31% in 1980 to 18% in 2001.

The largely unresolved issue is whether scientific approaches can be applied to creativity and innovation. Some very innovative people, such as Steve Jobs of Apple and Next fame, question whether innovation can be systematized. In fact, most existing knowledge “systems” manage, store, and disseminate information, but fail to provide a replicable methodology for new idea creation and opportunity recognition. A true system of innovation not only allows it to be replicated in diverse industries and problematic challenges, but it stimulates the creative potential in more diverse sectors of society and varied hierarchies within the organization. The unique diversity of human intellect and its ability to create may soon be mankind’s last competitive advantage over the microprocessor-based machine. Harvesting this capacity and challenging this unlimited human potential should yield immeasurable possibilities for the future. As expressed in the universal law popularized by the fictional character, Dr. Spock (Star Trek), “from Infinite Diversity comes Infinite Combinations”.

But if accessing the infinite combinations of ideas that are possible from the efficient application of human intellect is so important, leaving it to the unsystematic randomness that is characteristic of art seems to be an inefficient means of creating intellectual capital. Organizations invest billions of dollars in systems to research and develop new products and processes, acquire new markets, and deliver new products or services. If that is so, why are there so few systems for new knowledge and idea creation?

To establish the need for such a system, we first analyze the ‘state of the art’ relative to strategic foresight. We propose an innovation algorithm based on the theory of bisociative and multisociative thinking as a methodological bridge between the subjectivity of art and unimagined science. We suggest this analogical alternative that can evolve the art of foresight into a more systematic methodology.

State of the Art: The Discovery Process

The discovery process highlighted in Figure 1 focuses on **Emergent Ideas**, which manifest in a range of uniqueness, based on whether the idea preserves the current paradigm or significantly modifies the existing paradigm. These emergent ideas also fall along a time horizon continuum that can range from problem solving (historical) to strategic visioning (futuristic). These emergent ideas can also apply to other popular organizational change models, such as continuous improvement, re-engineering, and strategic planning.

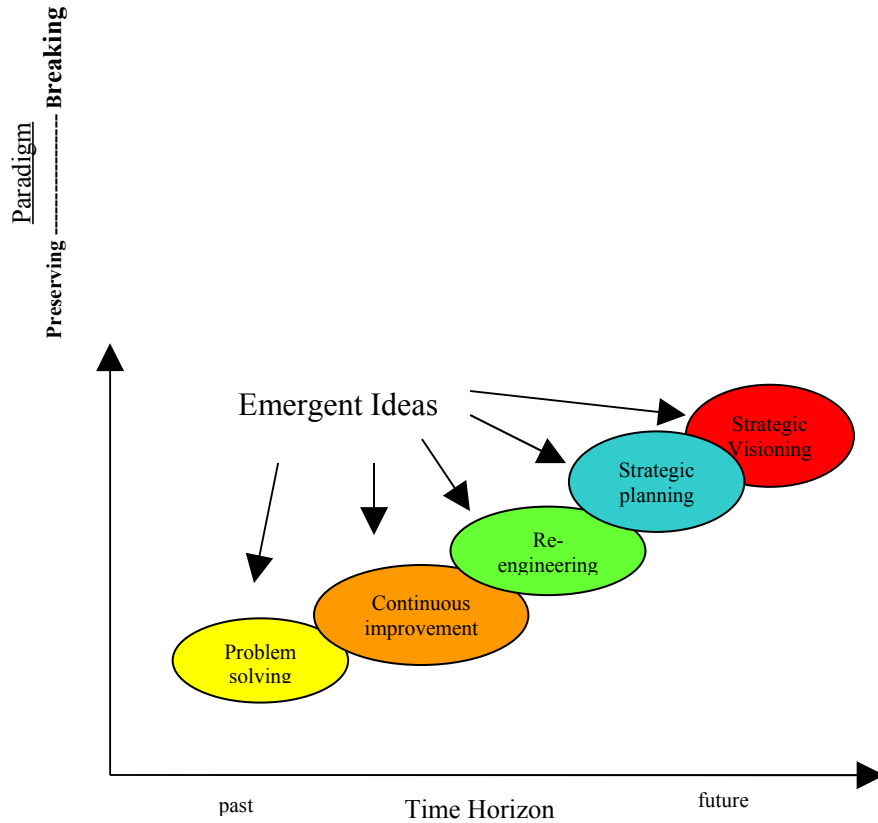


Figure 1
The Discovery Process

Management tools have primarily focused on the lower level aspects of discovery. Managers and staff tend to focus on their immediate tasks and challenges, in the form of problem solving, process improvement and productivity enhancement, as reflected in lower left sector of the graph. Nature dictates that humans will, unless stimulated otherwise, address issues that are temporally current and within their control. It usually takes external stimulus to go beyond the every day task or current agenda to a futurist perspective as reflected in strategic planning and strategic visioning activities. The process of strategic planning has been well documented and explored in textbooks, research, and practice. Strategic foresight and strategic visioning has been the ‘fuzzy front end’ of discovery and therefore more challenging to formulate and implement.

State of the Art: Strategic Foresight

The art of foresight has produced many useful techniques such as trend identification and analysis; scenario development; brainstorming; and strategic

visioning. The environmental scanning process, which includes analyzing, monitoring, and projecting trends, has been a staple of futurist techniques. Scenario development and analysis has also been used to imagine future possibilities based on things we know. Brainstorming has been useful methodology for idea-generation or problem solving to help identify opportunities and challenges. Many of these techniques have been used in discovery process.

Although these techniques have withstood the test of time, the art of foresight needs to evolve to accommodate the complexities and hyper-speed of change in the new millennium. An enlightened technique for foresight may not be the “holy grail” of futurism, but it can advance a more systematic approach beyond the implicitly ambiguous nature of art.

Strategic Visioning using Bisociation Brainstorming

According to some researchers, predicting future technological trends cannot be accomplished using only a scientific perspective. More surprising predictions for the future can be realized by looking at interactive events and the divergence and convergence of technologies with other phenomena in the environment. Creativity in business should not be a random event, nor should it only occur in an isolated environmental context such as a research and development (R&D) department of a major company.

This paper presents a model of discovering the future that breaks the barriers of mundane, associative and one-dimensional thinking processes that has limited the creative potential that distinguishes human’s remaining intellectual advantage over machines. The proposed Strategic Visioning System model is a systematic discovery of the future based on bisociative thinking. This higher order thinking process provides a methodology of idea creation that incorporates the common techniques of foresight: scanning, scenario development, brainstorming and visioning on a multi-dimensional platform, but stimulates the creative brainstorming process by looking at how trends, predictions, scenarios interact with each other.

Infinite intelligence—Infinite possibilities

Considering there is infinite intelligence in the universe, the interactive convergence of idea creates infinite possibilities. Creating a system to train humans to think about the diversity of phenomena and events and track these infinite combinations can further the science of strategic foresight. The Strategic Visioning System tracks the interaction of environmental variables, at the macro, industry, and organizational level.

The Strategic Visioning System introduces a systematic multi-dimensional approach to the innovative process, called Bisociation Brainstorming®. This concept of bisociation in the creative process first introduced by Koestler (1964)

holds tremendous promise for explaining the “how” of entrepreneurial innovation from multiple environmental perspectives.

Bisociation is a term coined by the author Arthur Koestler, the most-cited authority on creativity, in his book "The Act of Creation." According to Koestler, there are many different manifestations of creativity, but the common thread is combining previously unrelated ideas in new ways. Koestler invented this term to distinguish the type of analogical thinking that leads to the acts of great creativity from the more pedestrian associative (purely logical) thinking, with which we are so familiar in our everyday lives. He contrasts bisociation with association, suggesting that association refers to previously established connections among ideas but that bisociation involves making entirely new connections among ideas. Although Koestler's definition addresses all forms of creativity, whether in art or science, a commercial application of this concept for the purpose of innovation or strategic foresight has not been previously attempted.

By definition, bisociation is the mixture in one human mind of visual physiognomies from two contexts or categories of objects that are normally considered separate categories by the literal processes of the mind. This thinking process is the functional basis for metaphoric thinking. Bisociation incorporates the concept of intersecting ideas from two seemingly unrelated things to produce that “ah-ha” sensation in the market place. According to Koestler, bisociation refers to “the pattern of perceiving of a situation or idea in two self-consistent but habitually incompatible frames of reference.” This concept of bisociation is “distinct from the routine skills of thinking on a single plane and the creative act, which...always operates on more than one plane.” These planes are otherwise described as frames of reference, associative contexts, types of logic, codes of behavior, and universes of discourse. When two independent matrices of perception or reasoning interact with each other the result is “...their fusion in a new intellectual synthesis,...which can produce intellectually challenging effects.”

These matrices articulate any ability, habit, skill, or any pattern of ordered behavior governed by a code of fixed rules. Koestler claimed that the more independent the matrices, the more unexpected and impressive the achievement, and therefore the more novel the discovery. In contrast to organizational learning, which is the acquisition of a new skill, bisociation is the combination, re-shuffling and re-structuring of skills. The term bisociation is meant to point to the independent, autonomous character of the matrices, which are brought into contact in the creative act, whereas associative thought operates among members of a single pre-existing matrix.

Cross Impact Matrix

Interactive effects of variables have been analyzed within the strategic management paradigm using the well-established SWOT (strengths, weaknesses, opportunities, and threats) matrix to discover alternative strategies

that match the firm's internal and external factors. However, this technique has not been applied to the discovery of the external factors (opportunities and threats) that compose the SWOT analysis.

The typical process of scanning the external environment involves the identification of external strategic factors, defined as key environmental trends or forces that have medium to high probability of occurrence and impact on the firm or industry. Based on priority ranking of the probability of occurrence and degree of impact, these strategic factors are then categorized as opportunities or threats (challenges). This approach involves the higher order of thinking required by the bisociation of independent external trends and forces to discover new ideas, in the form opportunities and threats, unique to a particular combination of environmental variables.

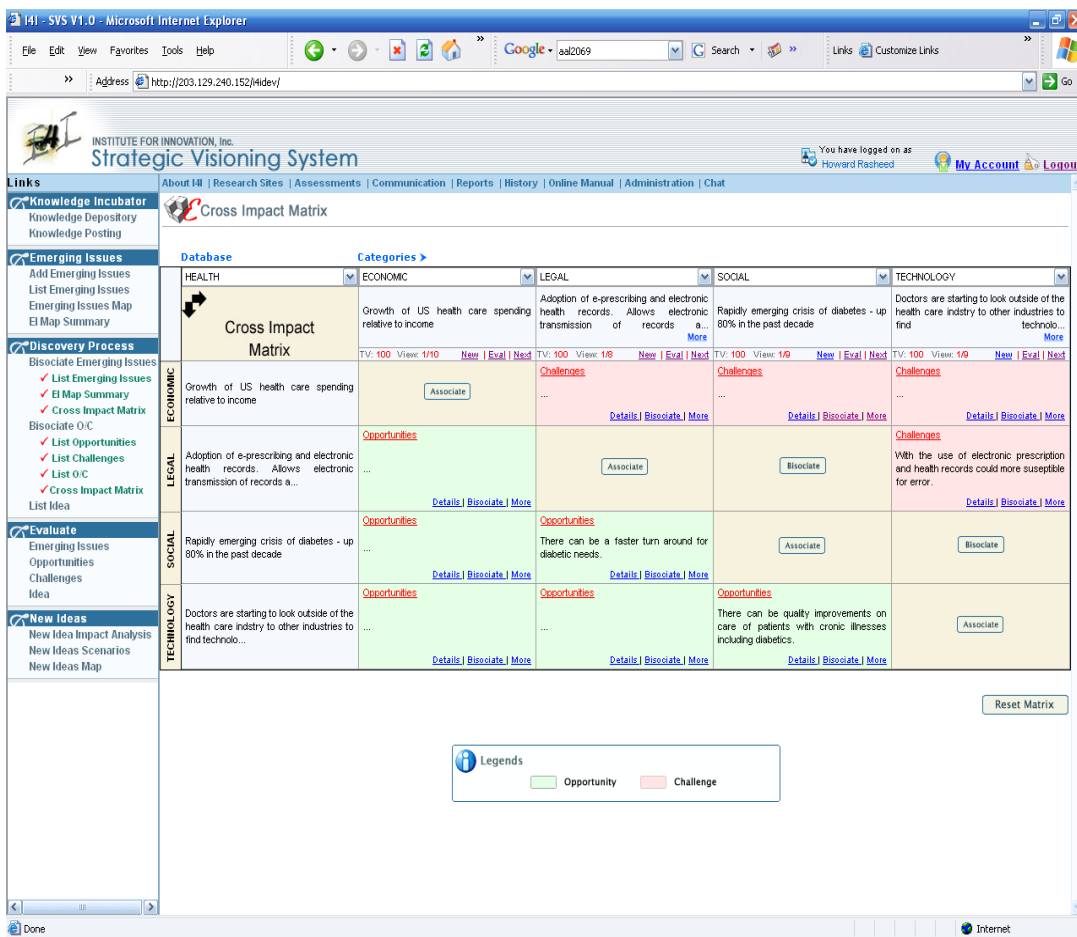


Figure 2
Cross Impact Matrix

Based on the theory of bisociation, the Cross Impact Matrix (Figure 2) featured in a group decision support software articulates the interaction of the environmental factors mentioned earlier— economic, socio-cultural, legal/regulatory, and technological—which are displayed across the top row and first column. On the left part of the matrix six strategic opportunities and on the right side, six strategic threats are produced from creatively brainstorming ideas that derive from the intersection of the external factors, taken two at a time.

The development of the cross-impact matrix in the strategic planning session involves identifying trends from each of the four categories, assigning a probability and impact score and brainstorming possible opportunities and challenges. In a group session these trends would be presented, discussed, and assigned a numerical value that is the product score of the probability of occurrence and the relative impact on the industry or firm. A cumulative, weighted, or average score from all participating stakeholders voting on other participants' input would establish relative priority ranking. In the brainstorming phase participants and group would focus on the highest-ranking trends and develop original ideas associated with the interaction of these trends or forces taken two at a time.

Two outputs from this bisociation phase of the environmental scanning process are anticipated opportunities and threats (challenges) in the organization's task environment. Opportunities are a favorable set of circumstances in which gains are likely and over which the organization has limited control; and challenges are an unfavorable set of circumstances in which losses are likely and over which the organization has relatively little control.

In general, strategists primarily focus environmental scanning efforts on searching for opportunities, whereas challenges are often minimized. More specifically, firms engaged in proactive strategy implementation look for opportunities, whereas reactive managers will scan for challenges. Of course, a natural tendency for growth-oriented firms and new ventures is to focus on opportunities in the entrepreneurial planning process. The resulting opportunities and challenges could be further prioritized based on the product scores of the interacting trends.

In a brainstorming session of 20 participants, each with one emerging issue in each of four categories would result in 80 trends, predictions, or scenario statements. Based on permutation math, these 80 issues could result in 2,160 opportunities and 2,160 challenges. Each challenge and opportunity could, in turn could generate a new idea. Even at this basic level of input, the need for software to track and prioritize important issues is apparent. Content analysis software can cluster similar issues for the benefit of parsimony would be an added benefit.

Strategic Visioning Process

In an example of the proposed strategic visioning process, stakeholders would first conduct an environmental scan of trends, predictions, and emerging issues in at the macro-environmental level. One such a prevailing trend in technology is the dramatic increase in the use of home computers, particularly since the advent of graphic user interface on the Internet, first introduced by Netscape in 1995. Using associative logic one would assume that manufacturing personal computers would be a good entrepreneurial opportunity. Based on the example of IBM's recent divestment of its personal computer (PC) manufacturing division to a Chinese firm, low profit margins would present a problem for establishing a production facility in a high wage country. Another trend is more people are traveling, despite the threat of terrorism. Using associative logic, one would assume the travel agency business would be a good new venture opportunity. Considering the disruption in this industry caused by major airlines changing their revenue models for travel agents booking flight, this could also be a very challenging market. However, if you bisociated the two trends, a new business model of self-service online reservations introduced by firms like Expedia and Travelocity would become an apparent business opportunity. What if you were first to market with such a paradigm-changing business model?

The ability to anticipate the “next big thing” and create a new products, services, or business models, could provide invaluable first mover advantages. New inventions or technology discoveries could provide invaluable sources of intellectual property. The ability to anticipate technology disruptions and paradigm shifts and recognize opportunities is what separates good organizations and leaders from great ones. Using an applicable sports metaphor, Wayne Gretzky, arguably the greatest hockey player was questioned on the reason for his success. His reply was: “Because I skate to where the puck is going to be, not to where the puck is”.

This analogical approach of bisociative thinking can be expanded to a more advanced technique called Multisociative Brainstorming™. This process involves using more than two emerging issues in the brainstorming process. The process was demonstrated in a presentation by the author to a prominent research institution currently engaged in nanotechnology commercialization projects. One technology trend considered was the accelerating proliferation of cellular technology. Another technology trend from technology was the dramatic evolution of nanotechnology implants for humans. A prominent social/cultural issue considered was the aging baby boomers' increasing health consciousness and subsequent demand for more advanced medical interventions. The resulting opportunity suggested by one of their researchers was a nano-implant that sent a signal to the patient/client's cellular device or via a wi-fi network to a health monitoring organization. An alert could indicate whether the patient was experiencing a health emergency that was not readily apparent, such as heart attack, stroke, or drop in blood sugar. Based on the information transmitted the

health monitors could send an ambulance or advise the patient/client to seek health care base on the severity of the problem.

Not to be outdone, another researcher in the group appended the first opportunity by suggesting that the alert could trigger the administration of an immediate medical intervention through implants or the release of a pharmaceutical regiment. When another researcher introduced a fifth legal/regulatory trend, the growing concern of medical privacy, the possibilities suggested by Dr. Spock's quote—infinite diversity, infinite combinations—became apparent and we adjourned for lunch.

Another application of this discovery process is applying multisociation to the intersection or convergence of two or more opportunities and/or two or more challenges. The result of the convergence of two opportunities or challenges can yield mega opportunities and challenges. Using a Cross Impact Matrix for Opportunity/Challenge bisociation can therefore yield dramatic results for ideas solution, and strategic foresights. Of course the more disparate the opportunities or challenges, the more sensational the possible ideas produced.

Anticipating the “Next Big Thing”: Ideas, Solutions, and Strategies

The brainstorming of opportunities and challenges from a strategic visioning session facilitates the generation of new ideas, innovations, solutions and strategies. These new ideas capitalize on new opportunities or mitigate related challenges, resulting in potential innovations. Innovations can be articulated as potential new markets, applications, processes, products, supply sources, services, organizational structures or new combinations of transaction architecture and exchange mechanisms for electronic commerce. For the public sector new ideas for programs and policy can be an illustration of innovation. The final stages of the strategic visioning process could involve an analysis of the impact on the organization, department or functional area. The development of a scenario statement could illuminate the implications for the society or the organization's industry.

Although this process generates an infinite number of ideas, they must be also be evaluated in light of the organization's capabilities and core competences. The organization's relevant internal factors (strengths and weaknesses) can be subsequently used to assess the feasibility of the innovation as part of the overall strategy formulation and implementation process. Common methodologies such as cost-benefit analyses, feasibility studies, and technology assessment, and commercialization plans would determine the viability of the idea.

From this assessment, feasible radical and incremental innovations and supportive infrastructure and systems, are endorsed that are relevant to the firms core competences. Consequently, brainstorming efforts produce radical innovations of new value-added products or services that can be commercialized

and new markets that can be developed. Incremental innovations of new processes, supply sources, and exchange mechanisms can be exploited. Support infrastructure for innovations can materialize as new organizational structures and information systems, as well as human resources. Organizations can reinvent their business models and develop new strategies, new strategic alliances, outsourcing arrangements, cost cutting and efficiency enhancing initiatives, problem solutions, and corporate policy.

Artful Science or Scientific Art?

Although bisociative thinking is not new, the application to idea creation and innovation adds a new dimension to strategic foresight process. Prior uses of the cross impact matrix have been primarily restricted to looking at the interaction of events, only confirming connections between events or issues. There is no documentation that bisociative thinking has been used to extend strategic foresight methodology.

For example, one of the most popular tools for strategic foresight has been scenario development. The multisociative approach could be used to consider possible permutations of scenarios rather than a one-dimensional approach to scenario analysis. Also, methodologies that consider second or third order implications assume the correct or most important idea has been discovered. The methodology presented in this essay focuses on the fuzzy front to ensure that as many possible ideas are considered before an analysis of their subsequent implications.

In conclusion, the Strategic Visioning System provides a unique and systematic approach to new idea creation and strategic foresight. It is a unique innovation algorithm based on the theory of bisociative and multisociative thinking as a methodological bridge between the subjectivity of art and unimaginative science. It addresses the unresolved question of whether innovation can be systematized. Considering the antiquity of the art form, a new approach may be appropriate to move the “discipline” of strategic foresight more toward science. We therefore suggest this analogical alternative can evolve the art of foresight into a more systematic methodology. Multisociative thinking for the purpose of strategic foresight may not be just art or just science, but it may be a step toward artful science *and* scientific art.

References

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1): 99-120.

Berman, S. (2005). Scenario Envisioning, Institute for Business Value, Scenario Envisioning (www.ibm.com/partnerworld)

Ko & Butler (2004). Bisociation: *The Missing Link between Prior Knowledge and Recognition of Entrepreneurial Opportunities in Asian Technology-Based Firms*. Presented at the 2004 Babson Entrepreneurial Conference.

Koestler, A. (1949). *Insight and Outlook: An Inquiry into the Common Foundations of Science, Art and Social Ethics*. New York: MacMillan Company.

Koestler, A. (1964) *The Act of Creation*. London: Hutchinson.

The Futurist (2004) The Art of Foresight: Preparing for a changing world, a special report, May-June, p. 31-37.

Biography

Howard Rasheed is Associate Professor of Management at the University of North Carolina Wilmington and holds a Ph.D. from The Florida State University in Strategic, International, & Entrepreneurial Management. Dr. Rasheed has written over 22 academic publications in the areas of: Innovation, E-commerce, Business Strategy, and Entrepreneurship. Dr. Rasheed currently teaches courses in Strategic Management and Managing Innovation and Technology.

Dr. Howard Rasheed is the Managing Director and Founder of Institute for Innovations, specializing in training in strategic visioning concepts for innovation and creative thinking. He is the co-inventor of the Internet-based Strategic Visioning Software® based on the patented Bisociation Brainstorming™ process.

Dr. Rasheed has owned a consulting firm for 30 years that provides consultative service to small and mid-size entrepreneurial firms. The firm has written and competitively won over \$16 million public and private contracts and grants.

His firm also specializes in developing, implementing and evaluating youth entrepreneurship programs for minority and disadvantaged youth. Previous positions include Chief Financial Officer of a 410 employee, \$20 million aerospace manufacturer; and Account Executive for BellSouth.