

BENTLEY COLLEGE

Center for Business Ethics
175 Forest Street
Waltham, Massachusetts
02452-4705

www.bentley.edu

Verizon

Visiting
Professorship
in Business Ethics
and Information
Technology

Leadership, Ethics, and the Information Imperative

Richard O. Mason

Carr P. Collins Distinguished Professor
of Management Information Sciences,
and Director of the Cary M. Maguire
Center for Ethics and Public Responsibility
Southern Methodist University

Center for Business Ethics

Tel: 781/891-2981
Fax: 781/891-2988
E-mail: cbeinfo@bentley.edu
On the Web:
www.bentley.edu/cbe

**CENTER FOR
BUSINESS ETHICS
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BENTLEY COLLEGE

BENTLEY COLLEGE is a business university. Focused on education and research in business and related professions, Bentley blends the breadth and technological strength of a large university with the values and student orientation of a small college. An undergraduate education combines business study with a strong foundation in the arts and sciences. A broad array of Information Age MBA, Master of Science, and certificate programs at the McCallum Graduate School emphasize the impact of technology on business practice. Enrolling approximately 3,800 full-time undergraduate, 490 adult part-time undergraduate, and 1,300 graduate students, Bentley College is located in Waltham, Massachusetts, 10 miles west of Boston.

The Center for Business Ethics is dedicated to promoting ethical business conduct in contemporary society. With a vast network of practitioners and scholars, and an expansive multimedia library, the center provides an international forum for benchmarking and research in business ethics.

The center helps corporations and other organizations strengthen their ethical culture through educational programming such as the Verizon Visiting Professorship.



The visiting professorship in business ethics and information technology at Bentley College is made possible through the generous support of Verizon. The work of the Center for Business Ethics is furthered by this educational initiative, which engages students, faculty and corporate partners in an important dialogue.

The Verizon Visiting Professorship enhances the college's mission of creating an environment that blends business studies and information technology. In addition, it gives prominence to the ethical dimension of business, so that students learn to recognize and understand its fundamental importance.

We were honored to have Dr. Richard O. Mason as our fourth visiting professor in the Verizon series. Dr. Mason is the director of the Cary Maguire Center for Ethics and Responsibility at the Elwin L. Cox School of Business of the Southern Methodist University in Dallas, Texas. He has applied his expertise in business ethics to the new ethical dilemmas we now face in the Information Age, having consulted to numerous corporations and served on a commission advising the former Soviet government.

The Center for Business Ethics will continue to strengthen the business ethics movement through programming such as the Verizon Visiting Professorship in Business Ethics and Information Technology. We are grateful to the Bentley community, to Verizon, to Richard Mason and to everyone connected with the center, whose support makes these initiatives a success.

W. Michael Hoffman
Executive Director
Center for Business Ethics
Bentley College

The Verizon Visiting Professorship in Business Ethics and Information Technology at Bentley College is made possible by Verizon Communications Inc. Verizon Communications, (NYSE: VZ), formed by the merger of Bell Atlantic and GTE, is one of the world's leading providers of high-growth communications services. Verizon companies are the largest providers of wireline and wireless communications in the United States, with nearly 135 million access line equivalents and over 30 million wireless customers. Verizon is also the world's largest provider of print and online directory information. A Fortune 10 company with more than 241,000 employees and \$67 billion in 2001 revenues, Verizon has a global presence that extends to 45 countries in the Americas, Europe, Asia and the Pacific. More information on Verizon can be found at www.verizon.com.



DR. RICHARD O. MASON is the director of the Cary Maguire Center for Ethics and Responsibility at the Elwin L. Cox School of Business of the Southern Methodist University in Dallas, Texas. After receiving his BS degree (1956) from Oregon State University in business and technology and his PhD (1968) from the University of California, Berkeley in business administration, Dr. Mason was named a Carr P. Collins Professor of Management Information Sciences.

Dr. Mason's academic publications have included, but are not limited to, *Ethics of Information Management* (1995), co-authored with F. Mason and M. Culnan; *Waves of Change* (1995), co-authored by J. McKenney and D. Copeland; *FrameBreak: The Radical Redesign of American Business* (1994), co-authored by I.I. Mitroff and C.M. Peterson; and *Strategic Management: A Methodological Approach* (1994), co-authored by A. Rowe and K. Dickel.

Dr. Mason's current areas of teaching include Corporate Ethics and Responsibility, Global Business Environment and Managing Emerging Technologies. While researching the areas of business strategy and information systems, social and ethical implications of information systems, and the history of information systems, Dr. Mason completed his three-year term on the GMAC Commission delegated to the U.S.S.R. to review Soviet plans for the "Informatization of Soviet Society." In 1992, Dr. Mason was elected as a foreign member of the Russian Academy of Natural Sciences in the "Information and Cybernetics" sector. Dr. Mason has consulted with numerous corporations including General Motors, Hughes Aircraft, Kodak, the U.S. Census Bureau, the U.S. Forest Service, Wells Fargo Bank and Xerox. He is currently a member of the board of the Hopi Foundation and serves in an advisory capacity to Parkland Hospital, the City of Dallas, and the AAS "Project 2061 - Education for a Changing Future" in San Antonio, Texas.

Leadership, Ethics, and the Information Imperative¹

Richard O. Mason

Carr P. Collins Distinguished Professor of Management Information Sciences, and Director of the Cary M. Maguire Center for Ethics and Public Responsibility

Southern Methodist University

“Being finely aware and richly responsible” — Henry James

Communications and Intentions

It’s a question of intention. If an organization intends to be ethical, what kinds of knowledge, information and communication systems does it need? Communication is the glue of organizations. It allows the component parts to work together to produce a joint result. All organizations have a system of communication. Their members apply particular habits of thought to information and materials that ultimately result in decisions. Decisions, when acted upon, produce behavior.ⁱⁱ Some of this behavior is praiseworthy, most morally neutral, but some organizational behavior is, simply put, *bad*.

In this lecture, I will argue that some of this unethical behavior stems from deficiencies in an organization’s communications and information systems. I will suggest a framework and some remedies for improving organizational performance through the application of information technology. My lecture has four parts.

First, I’ll review some attempts at setting ethical guidelines for organizations and pit those against a few dramatic and classic cases in which these organizations fell far short of acceptable behavior. People were harmed and, importantly, warning signs were available in the system that went unheeded.

Second, I’ll summarize some of the lessons learned in managing *High-Reliability Organizations* (HROs) such as nuclear aircraft carriers and nuclear power plants. These organizations live by the core ethical premise that they should not only “do no harm,” but should make every effort possible to prevent harm from occurring to their members, customers and community. Consequently, HROs have learned to deal with the unexpected and avoid massive disasters. The fundamental principle underlying HRO practices is mindfulness.

Third, I’m going to describe a general model for implementing mindfulness in organizations.

Finally, the last section of my lecture will sketch out an approach and will identify several information technologies that may be used to improve the ethical mind-

fulness of an organization. This section contains an ideal wish list of technologies, although no organization will be expected to use them all. Implementing these information systems for the purpose of improving an organization’s ethical performance, however, is what I mean by the information imperative. It is a challenge to leadership.

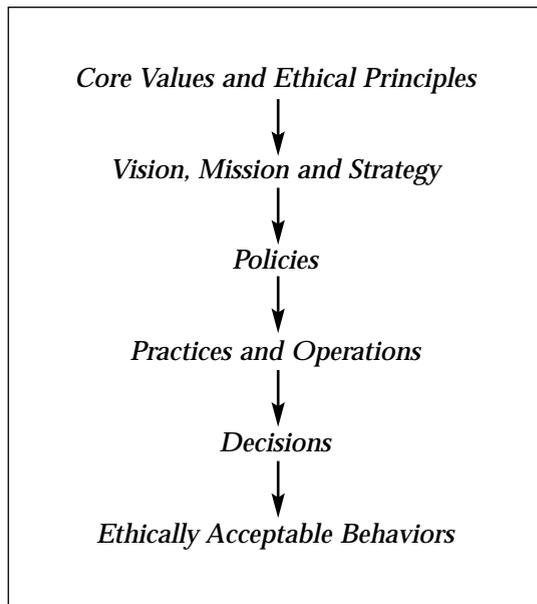
Part One: Great Intentions, Deficient Actions

Few, if any, organizations set out purposely to be unethical. Most pursue goals consistent with high social and professional standards. Their leaders have a sincere desire to promote corporate and community wellbeing. These aspirations are often articulated in the organization’s vision and values statement, or in its code of ethics, code of conduct, statement of beliefs, general business principles, or credo.

Texas Instruments, for example, stresses “Innovation, Integrity, and Commitment” and alerts all of its employees to the importance of these values. Motorola centers on just one value: “Uncompromising Integrity.” Johnson & Johnson’s Credo describes the company’s commitments in priority order. First come customers, then employees, management, the community, and finally, stockholders. Royal Dutch/Shell has nine principles that “describe the behavior expected of every employee.”ⁱⁱⁱ The principles pertain to the company’s objectives, its areas of responsibility, the economic principles it follows, business integrity, political activities, health, safety and the environment, the community, competition, and open communications.

In 1977, Dow Corning Corporation instituted its code of conduct, “A Matter of Integrity.” Dow’s code included two key provisions: (1) “Dow Corning will be responsible for the impact of its technology upon the environment” (which some executives interpreted to include their ultimate consumers, doctors, employees and members of the communities in which the company operated) and (2) “We will continually strive to assure that our products and services are safe, efficacious and accurately represented in our literature, advertising and package identification. Product characteristics, including toxicity and potential hazards, will be made known to those who produce, package, transport, use and dispose of Dow Corning products.”^{iv}

These kinds of company statements are typical. A 1999 survey of Fortune 1000 firms found that 98 percent of the responding firms addressed ethics or conduct issues by means of some kind of formal documents. Of these firms, 78 percent had a separate code of ethics or conduct. Most distributed their ethical policies statements widely throughout the organization.^v



These value statements should be used to guide literally millions of day-to-day decisions and actions that are taken by as few as ten or as many as thousands of people. When it works well, the process follows a contingent sequence, outlined above.

The path by which core values influence behavior, especially in large organizations, is a snaky trail that is both arduous and perilous to travel. It is akin to Bunyan's *Pilgrim's Progress*. There are perils at every step. Sometimes things go awry. Untoward or bad things happen. An organization's actual behaviors turn out to be inconsistent with its core values. They don't jibe with its espoused theory.^{vi}

Here are a few classic cases — often used to teach business ethics — in which an organization's behavior failed to comply with its espoused values:

- On January 28, 1986, the space shuttle *Challenger* exploded. Seven astronauts died because two rubber O-rings leaked.
- On December 3, 1984, a leak of methyl isocyanate from Union Carbide's Bhopal, India plant killed an estimated 3,800 people and injured 300,000 — 20,000 seriously.
- By 1988, A.H. Robins' Dalkon Shield, a product marketed from January 1971 until June 1974, had resulted in at least 20 deaths and 12,000 lawsuits costing more than \$2.5 billion.

- On May 15, 1995, Dow Corning filed for federal bankruptcy protection after a federal judge found that the company was significantly underfunded — given a \$4.23 billion court judgment against it — to handle at least 440,000 claims brought by women who received silicon breast implants. Their complaints were numerous, including autoimmune diseases such as lupus and rheumatoid arthritis, connective tissues diseases, scleroderma, cancer, and various other symptoms such as pain, fatigue, insomnia, memory loss, and headaches.
- On August 8, 2000, executives from Firestone (at the time a wholly owned U.S. subsidiary of the Japanese firm, Bridgestone Corporation), the Ford Motor Company, and the National Highway Transportation Safety Board (NHTSA) met and decided to recall approximately 6.5 million tires originally installed on the Ford Explorer. At that time NHTSA reported that 46 deaths, 80 injuries and 270 complaints in the United States were directly linked to failures in Firestone tires. Most incidents involved rollovers of the Ford Explorer. By June 2001, these figures would grow to 203 deaths, more than 700 injuries and over 6,000 complaints.

In each of these cases, warning signs emerged early enough for corrective action to have been taken. These signs were either ignored, suppressed or handled in such a fragmented way that their meaning was obscured.

- Beginning with the second shuttle flight in November 1981, more than 30 O-ring-type seals had been partially eroded by rapid compression on the inside of the boosters. Sealing was believed to be “poor or nonexistent below 40 degrees.” The ambient temperature at the time of the *Challenger* launch was only 36 degrees. Morton Thiokol, Inc., the booster's manufacturer, and NASA, after some discussion, ignored these warnings and refused to delay the launching.^{vii} The *Report of the Presidential Commission on the Space Shuttle Challenger Accident* contains a summary of warning memos that failed to reach top decision-makers. One poignantly starts with a cry for “Help!”
- At Bhopal, there was a fairly long history of poor maintenance and safety violations prior to the disaster. In 1981, a phosgene mustard gas leak at the plant killed one worker. An Indian journalist wrote a series of articles pointing out the potential dangers the plant presented to the population. In 1982, a second phosgene leak forced the evacuation of some surrounding areas. Following this, a safety survey cited 50 safety defects, although most were judged to be minor. Safety expert James Reason

describes the situation as “a tangled story of botched maintenance, improvised bypass pipes, failed defenses, drought and flawed decision-making on the part of both management and politicians.”^{viii}

- Based on an initially favorable research report by Dr. Hugh Davis, A.H. Robins began marketing the Dalkon Shield, an intrauterine device (IUD), in January 1971. This decision was made counter to the views of several of its top executives who strongly recommended that additional data on pregnancy rates and complications were needed. When the follow-up studies were finally conducted, the results were devastating. Robins had initially advertised and promoted a pregnancy rate of only 1.1 percent. By August 1975, however, the recorded pregnancy rate had reached 5.5 percent — five times higher — and appeared to be rising. In addition to these statistical warnings, the company was also receiving complaints from individual practicing physicians reporting that Shield users had a higher incidence of uterine or pelvic bacterial infections and other medical problems. All this, taken together with other data from controlled clinical experimental reports, indicated that the Shield was neither effective nor safe. Moreover, communication was poor within the firm (although some managers may have been pleading ignorance). Judge Frank This describes how the managers failed both to inform one another and to accept responsibility:

- The project manager for Dalkon Shield explains that a particular question should have gone to the medical department...
- The medical department representative explains that the question was really the bailiwick of the quality control department...
- The quality control department representative explains that the project manager was the one with the authority to make the decision on that question.

The judge concludes: It is not at all unusual for the hard questions posed in Dalkon Shield cases to be unanswerable by anyone from [A. H.] Robins.^{ix}

- Firestone had a history of tire recalls, including one in 1978 when NHTSA persuaded the company to recall between 13 million and 14 million “500” tires due to their faulty manufacture. In addition, Ford had endured the Pinto disaster. Thus, both companies should have been on alert when reports began to come in from Saudi Arabia, Venezuela, and Argentina that the Ford Explorer had a tendency to roll over when the tread on its

original equipment Firestone tires separated and peeled off. The majority of the incidents occurred in states with hot weather, such as Texas. A significant and growing number of incidents were reported during the summer months of 1999 and 2000. Ford engineers and executives also had prepared internal documents raising crucial questions about the car’s safety. As reported in *Time*, June 4, 2001,^x in May 1989, engineers reported that the Explorer prototype tended to tip during turns made at speeds of up to 55 mph:

“The [Explorer] prototype demonstrated a rollover response; established by observing two wheels off the ground and/or outrigger contact, with a number of tire, tire pressure, suspension configurations at the heavy load condition.”

This was followed by a warning that an SUV, fitted with a precursor of the Wilderness AT tire, might fail a Consumers Union (CU) test:

“I believe that management is aware of the potential risk w/P235 tires and has accepted the risk. CU test is generally unrepresentative of the real world and I see no ‘real’ risk in failing except what may result in way of spurious litigation.”

Other documents reported incidents of “light truck rollovers [that were] two to four times the car rate.” Ford engineers listed four options for improving the stability of the SUV: (1) widening the chassis by two inches, (2) lowering the engine, (3) lowering the tire pressure, and (4) stiffening the springs. The designers chose the latter two. They recommended a tire pressure of 26 p.s.i. rather than the normal 30 to 35 p.s.i. Firestone originally recommended. Lower tire pressure produced more road-gripping force, but it also created additional friction, increasing the probability that the tires would wear down and shear.

- At Dow Corning, tests conducted on rabbits and monkeys in February 1975 reported “mild to occasionally moderate acute inflammatory reaction” to the insertion of silicon gel.^{xi} By 1976, the company was receiving numerous complaints from doctors who had observed severe inflammatory reactions in patients after receiving implants. Company memos dated in 1976 call for an in-depth study of DCC’s gel, envelope, and the bleed phenomenon. Later that year a study found that silicon gel produced cancerous tumors in as many as 80 percent of the rats tested. In

1984, Maria Stern sued Dow Corning for failing to disclose the risks associated with implants and was awarded \$1.5 million in punitive damages. An internal memo dated in 1984 showed “an increased incidence of fibrosarcomas at the implant site.” In 1991, the company lost another lawsuit.

A theme running through these snippets is that early warning signs of untoward behaviors were present, both within each organization and in its environment, yet they went unheeded. Importantly, this information took many diverse forms: letters, internal memos, statistical reports, documents, articles in the media, discussions in meetings, phone calls, e-mails and the like. A common difficulty was that these disparate sources of information were not brought together at a central point and examined. The division of labor employed in each of these organizations unduly narrowed its members’ focus of attention, impeded communications, and made evasion of personal responsibility possible. Consequently, the warning signals they were receiving were either not picked up or seemed so weak that they could be easily ignored.

Part Two: Lessons Learned from High-Reliability Organizations

High-Reliability Organizations (HROs) have found solutions to this organizational problem. They are extraordinarily effective at turning weak signals into strong responses — before things get out of hand. According to Weick and Sutcliffe, HROs “organize themselves in such a way that they are better able to notice the unexpected in the making and halt its development.”^{xii} The authors call this heightened organizational awareness “mindfulness.” It entails “continuous updating and deepening of increasingly plausible interpretations of what the context is, what problems define it and what remedies it contains.”^{xiii} The essential points are that these organizations are continuously looking for the unexpected, interpreting it in context, identifying the potential problems it raises, and initiating solutions. They do all of this at the least provocation and with dispatch.

“Such organizations do not have a ‘shoot the messenger’ mentality, but rather encourage their members to raise problems quickly and readily.”^{xiv} Communication is key. Risk is mitigated by ensuring that pivotal decision-makers constantly receive the information they need to envision the “big picture.” Information about emerging risks and uncertainties is communicated very quickly to relevant decision-makers in as clear a form as possible. These parties, in turn, “can put together warning signals from various areas of the organization, thus forming a picture of a risky or hazardous situation in its early stages of development.”^{xv}

An example is U.S. Navy aircraft carriers, where every day presents thousands of opportunities for major accidents to occur as thousands of sailors work in confined and dangerous conditions. Yet these carriers have a remarkably low accident record. One measure of this is the “crunch rate” — the number of times two aircraft touch or come close to touching while being moved on either the flight or hangar deck. The Navy’s overall crunch rate is about one in 8,000 moves. During the six months organizational researcher Gene Rochlin studied the carrier *Carl Vinson*, no “crunches” were observed. He summarizes:

“Almost everyone involved in bringing aircraft on board is part of one of several constant loops of conversation and verification, taking place over several different channels at once. At first, little of this chatter seems coherent, let alone substantive, to the outside observer. With experience, one discovers that seasoned personnel do not “listen” so much as they monitor for deviation, reacting almost instantaneously to anything that does not fit their expectations of the correct routine. This constant flow of information about each safety-critical activity is designed specifically to assure that any critical element that is out of place will be discovered or noticed by someone before it causes a problem.”^{xvi}

To support this commitment to vigilance, the ship’s control tower is connected to more than 20 communication devices, ranging from radios to sound-powered telephones.

The core principles of mindfulness in HROs may be summarized as follows:

1. Preoccupation with failure — constant awareness of the fact that something can go wrong and a willingness to track down any anomaly.
2. Deep understanding of the complexity of the world the organization faces, and consequently, a strong reluctance to simplify interpretations of observations.
3. Focus on and sensitivity to operations and day-to-day business practices. At Dallas-based TDIndustries, for example, this concern is elevated to a “passion for operations.”
4. Commitment to resilience and to responding quickly to contain any incipient problem.
5. Respect for and deference to relevant expertise, especially local expertise, wherever it resides. That is, listen to all pertinent points of view and let the best, most knowledgeable person handle the situation, regardless of rank or status.

A prerequisite for acting on these principles is open, transparent, and filter-free information flow. Questions, insights, hypotheses, observations and evidence must move unimpeded throughout the organization. HROs eliminate the barriers to this information flow and seek to avoid what James March and Herbert Simon once called “uncertainty absorption” — that is, the passing on of inferences drawn from a body of evidence rather than supplying the underlying evidence itself.

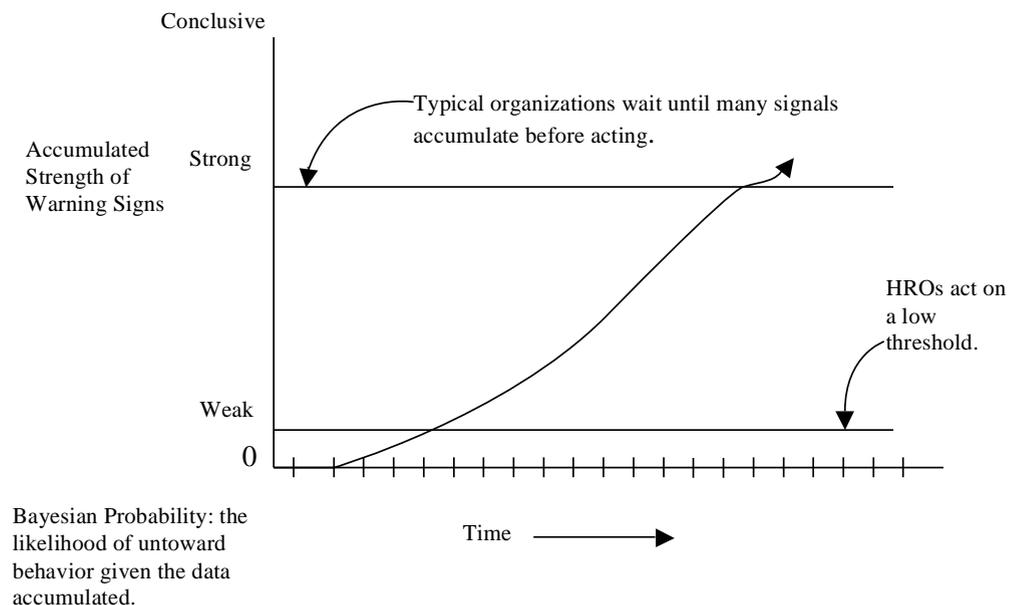
This means that mindfulness requires — and HROs possess — considerable ability to handle information. Such information must be both broad in “reach” or scope — that is, incorporate all relevant stakeholders — and deep in richness. Such information is characterized as clear, comprehensive, timely, reliable, valid, and interactive. Moreover, it potentially resides in many different forms of media. Historically, information economics required that a trade-off be made between the richness of information and its reach. Uncertainty of absorption, therefore, became a necessary path to efficiency. But as Evans and Wurster observe, modern information technology and the spread of connectivity and common standards have, in their metaphor, “blown” this assumption “to bits.”^{xvii} Today it is possible for organizations to operate with information that is both broad in reach and deep in richness.

The data collection and analysis techniques employed by HROs have one central purpose: to produce signals concerning impending or incipient ethical issues. HROs generate strong, corrective responses to even the very weakest signals they receive. Compare this with the behavior in the five cases of ethical lapse cited above. In each, the warning signs were available to the company prior to the time that they were recognized and interpreted as ethical problems or crises. That is, several ethical moments of truth or defining moments occurred before the moment the organization consciously recognized the problem and took action.

Most organizations implicitly set a high threshold for the accumulated strength of signals they receive. This threshold must be crossed before they become concerned. Firestone and Ford, for example, had received numerous reports of tires peeling and other indications of problems before February 7, 2000, but did little until public interest in the tire blowout problem was aroused by Anna Warner, David Raziq, and Chris Henao’s investigative report on KHOU-TV in Houston, Texas. This and other negative media exposure finally goaded the companies into action. But by the time the moment of recognition took place, the problem had already grown to crisis proportions.

HROs intuitively process signals in a Bayesian manner. Each weak signal received, in their view, increases the likelihood that something untoward is happening. These

Diagram 1: Setting a Low Threshold for Response



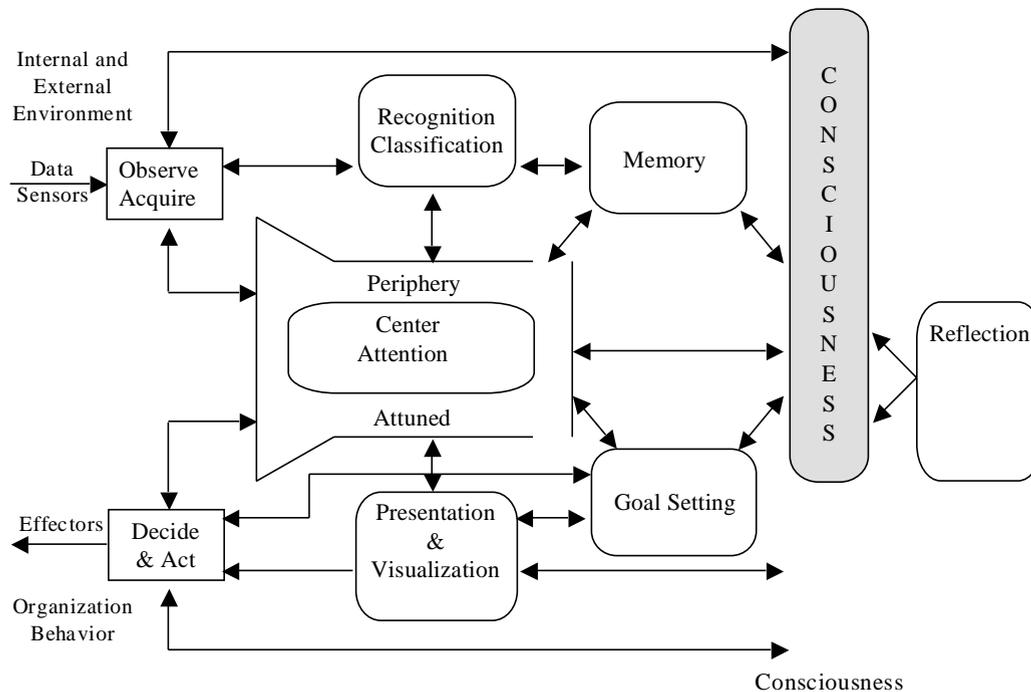
organizations are triggered to move into action whenever they sense even low probabilities of failure. They consider these scant indicators to be harbingers of greater, future problems — tips of a dangerous iceberg. Organizations with a less ethical orientation let the signals accumulate to relatively high levels before they take corrective action. At this point, corrective action is often costly. (See Diagram 1)

In summary, HROs have learned how to overcome barriers to organizational communication and how to act on weak warning signs in order to reduce their propensity for accidents or ethical lapses. Many information technologies are available today that can be used to act on the organizational, information and communication lessons learned from HROs. The new challenging question is how best to deploy these technologies to bring mindfulness to any organization that intends to be ethical.

Part Three: A General Model of a Mindful Organization

The model in Diagram 2 (on the next page) is based on a communications model originally put forward by the political theorist Karl Deutsch and has been

Diagram 2: Organization Attention, Consciousness, Reflection
A General Model



supplemented with ideas contributed by John Seely Brown, Mark Weisner, Gilbert Ryle, Karl Weick, Karlene Roberts and Kathleen M. Sutcliffe. It also draws on the knowledge management framework of Lloyd Baird and John Henderson.^{xviii}

To paraphrase William James, organizations are surrounded by a “great blooming, buzzing confusion” of stimuli and incipient signals. The potential volume is nearly infinite and far exceeds any organization’s ability to handle it all. Information processing limitations force organizations to choose what raw signals will actually be acquired and which will be ignored.

Yet in a complex environment, the data that should be acquired are still substantial. Ideally, an organization aligns with its environment in accordance with Ashby’s Law of Requisite Variety. That is to say, in order to respond effectively, an organization must be able to take at least as many different distinct actions as the number of different conditions its environment can assume.^{xix} This means that an organization must be able to detect and interpret all of those signals necessary to determine

precisely which action from among its array of possible alternatives should be taken in a given situation. The more complex the environment, the more actions are required and, consequently, the more comprehensive and discriminating the information system needed. When organizations have less variety than is required to cope with their environment, according to Weick, “they miss important information, their diagnoses are incomplete, and their remedies are short-sighted and can magnify, rather than reduce, a problem.”^{xx}

Reaching requisite variety in a complex environment, however, comes at a cost. A mindful organization needs an enormous number of data sensors and must employ substantial resources just to observe and acquire the data it needs. The task is to sift and sort this mountain of data and make operational sense of it. Attention is the mechanism an organism uses to do this.

Attention, however, is a very scarce resource. If attended to in its entirety, the sheer magnitude of the volume of potential data an organization can receive will engulf and paralyze it. Generally speaking, when an organization is attending to one thing, it cannot simultaneously attend to something else. Limitations on cognitive time, cognitive space, and its processing capability restrict its capacity for attention. What an organization chooses to attend to, consequently, reflects its operative values. Highly reliable organizations, for instance, seek out and attend to signals related to safety and constancy of operations. Highly ethical organizations attend to signals related to their ability to achieve their ethical values. But what then is to be done about the masses of data that are potentially relevant to the organization but not directly attended to?

In their musings on “calm technology” Xerox PARC visionaries Mark Weisner and John Seely Brown draw an essential distinction between the “center” and the “periphery” of one’s attention.

We use “periphery” to name what we are attuned to without attending to it explicitly. Ordinarily, when we are driving our attention is on the road, the radio, our passenger, but not the noise of the engine. But an unusual noise is noticed immediately, showing that we were attuned to the noise in the periphery and could come quickly to attend to it.

Periphery does not mean on the fringe or unimportant, however. What is in the periphery at one moment may in the next be at the center of our attention and therefore crucial.^{xxi}

Diagram 3: Data attended to, attuned to and not observed

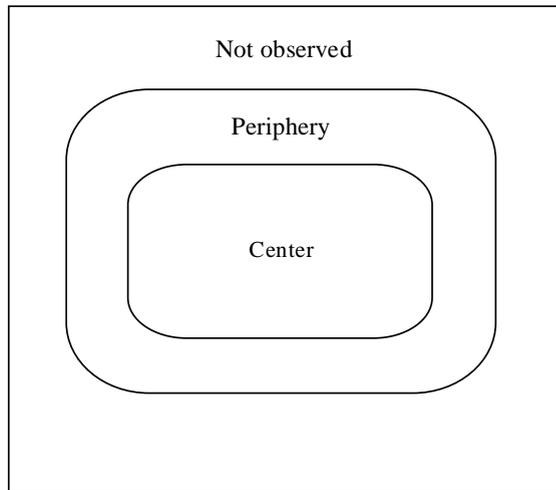
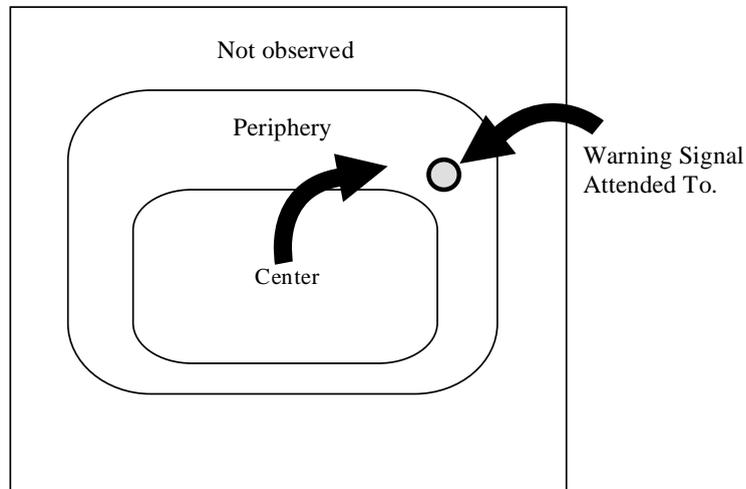


Diagram 4: Shifting Attention to Include a Warning Signal at the Periphery



Diagrams 3 and 4, on the preceding page, display this relationship.

During a presentation at HICSS-34 in Maui, Hawaii, John Seely Brown, a cyclist as well as chief scientist at Xerox, described the way people deal with the masses of sensory data they encounter in their context by using the metaphor of a motorcycle ride. The motorcyclist dons her helmet, twists the throttle, kicks back the stand and roars onto the road. As she speeds along, her attention is focused on the road. Changes in road conditions prompt changes in her steering. But she is also bombarded by a panorama of sensory experiences — weather, smells, light, subtle or quick movements — that hover near her conscious awareness. This process of sensing but not attending to is what Brown and Weisner mean by “attuning.” For example, while the rider’s attention is riveted on the road she is also attuned to the movement of a small rubber ball rolling out between two cars. She shifts her center of attention to the ball and recalls that sometimes a small child, upon losing a ball, may follow it into the street. The motorcyclist slams on the brakes or adjusts the bike’s path to avoid the possibility of hitting the child without ever actually having seen the child. Later, the motorcyclist senses in the periphery, a change in the wind and temperature. She addresses her attention to these changing conditions, and by accessing other data in the periphery, such as a squall line and cloud formations, decides to change her course to avoid a storm.

Athletes who play team sports understand the distinction. On offense, for example, a football player must attend to his assignment. A pulling guard must remember that on the snap count he is to plant his right foot back about 18 inches and bring his fists to his chest as he moves forward toward the hole, bend his knees and explode into the onrushing end as the running back cuts behind him. All of this as detailed in the play-book. Failure to attend to this means a botched assignment and a broken play. Yet at the same time he must also be attuned to what is happening on the rest of the field. A sudden blitz by the safety may cause him to change his course. A fumble means that he must abandon his original assignment and move hastily towards the ball. Transition ability, the ability to quickly and effectively change one’s focus of attention from the center to an emerging important event in the periphery, is one of the hallmarks of a great athlete.

Placing things in the periphery overcomes information overload in two ways. First, it means an organization is able to attune to many more things than it could if everything was in the center. Second, by recentring something in the periphery, it can still maintain control over it.

The Weiser/Brown metaphor suggests three levels of awareness: the center that is attended to, the periphery that is attuned to, and an area not observed. By attuning to a wider range of experience, organizations can become aware of possible new occurrences and shift their attention accordingly. That is, latent but operative values can be brought to bear on a changing situation and attention concentrated on the new conditions.

Attention controls what is admitted into, and maintained in, an organization's central nerve center — consciousness. Consciousness is the capacity for awareness. Here, multiple individual data sources are combined into a unified multi-dimensional representation of the state of the organization and its environment. In principle, organizations are capable of being aware of almost anything. So consciousness, too, must be guided by what the organization attends to and what its goals and aspirations are. Consciousness is where crucial functions like imagining, thinking, remembering, believing, doubting, asserting, and willing take place. It energizes the organization's goal-setting, its data acquisition and its decision-making and action-taking processes. In general, signals are picked up from within the organization or the external world, attended to and integrated into consciousness. If they meet expectations, a message is sent to “decide and act.” Much of this task is accomplished by routine or habit. In organizations, this means by standard operating procedures (SOP).

In well-defined, routine situations, signals are acquired and formed into *data*. These data are recognized and interpreted with the aid of memory, forming *information*. The information is transmitted to the unit responsible for deciding and acting. Appropriate action is taken and a particular behavior results. The act chosen may be contingent on many possible incoming signals, but is nevertheless programmed. This is akin to the role of habitual responses in people. Reliable and ethical organizations, it turns out, have effective habits.

But reliable organizations also know when not to react by habit, and understand when SOPs should be violated. In complex and changing environments, an organization's programmed responses may be ineffective or even dangerous. The data it attempts to recognize are noisy, equivocal, ambiguous, or uncertain — just as the motorcyclist's first awareness of changes in weather were not fully understood. An organization's consciousness must first detect the differences in the data and try to make sense of these differences. It does this by carefully and critically acquiring more data, searching memory for related past experiences, reviewing goals, and engaging in reflection.

Reflection involves thinking about the data in order to validate it, place it in context, and give it meaning. It seeks to cope with the unknowns, make sense out of them, and craft responses. This requires applying more than one just one perspective to the data. Situations must be examined from more than one point-of-view. Dialogue, discussion and debate are the principal processes used to energize reflection. Usually, but not necessarily, additional people are required to gain needed variety in perspective. (Note that this imposes additional requirements on an organization. Russell Ackoff observes that forming groups of people can be variety-decreasing as well as variety-increasing.^{xxii} “Groupthink” is one possible outcome.) Highly reliable and ethical organizations that perceive small amounts of equivocality or noise in their periphery — the feeling that something is not right — shift these items to the center of attention, and trigger processes of reflection in order to understand them. Relevant parties are informed and these organizations are able to confer on issues quickly and effectively. This is how they are able to translate weak warning signs into strong responses.

Central to the overall model is the concept of mindfulness. Mindfulness is the result of focusing an organization's members' attention and attuning capacity on crucial elements of their experience. Planners at Texas Instruments refer to these elements as “care abouts.” The psychologist Gilbert Ryle used the term “heed concepts” to describe them. He included “noticing, taking care, attending, applying one's mind, concentrating, putting one's heart into something, thinking what one is doing, alertness, interest, intentness, studying, and trying” as descriptors.^{xxiii} Mindfulness has been described more elaborately and operationally as “the combination of:

- Ongoing scrutiny of existing expectations,
- Continuous refinement and differentiation of expectations based on newer experiences,
- Willingness and capability to invent new expectations that make sense of unprecedented events,
- A more nuanced appreciation of context and ways to deal with it, and
- Identification of new dimensions of context that improve foresight and current functioning.”^{xxiv}

Typical organizations attend to data that are certain, factual, explicit, expected, confirming, consensual, and pleasant. Mindful organizations include in their periphery data that are uncertain, probable, implicit, irrelevant, disconfirming, contested, and unpleasant and they shift their data to the center quickly for examination whenever a threat to their fundamental values is perceived.

Most organizations require technological support to implement this abstract model of mindfulness.

Part Four: Walking the Talk — Implementing the Model with an Ethical Inquiry Center

Members of organizations often work from habitual “scripts” that obscure some of their moral responsibilities. The fundamental mission of an ethical inquiry center is to evaluate “what is” in light of “what ought to be.” That is, the workings of such a center break through scripts by interpreting incoming data through an appropriate moral lens. Imposing a moral lens is essential but often difficult to do well, as Dennis Gioice, who was a principal in the Pinto fuel tank explosion case, describes. He maintains that he had become so acculturated by his working experience at Ford that he had adopted a very narrow view of his responsibilities. The corporate “script,” he recalls, “influenced me to perceive recall issues in terms of the prevailing decision environment and to unconsciously overlook key features of the Pinto case, mainly because they did not fit an existing script. Although the outcomes of the case carry, retrospectively, obvious ethical overtones, the schemas driving my perceptions and actions precluded consideration of the issues in ethical terms because the scripts did not include ethical dimensions.”^{xv} In other words, he did not think about ethics initially at all.

Whenever a small gap is sensed — a feeling that something is not right — the center directs energy toward bringing the organization’s actions into alignment with its ethical ideals. Several steps must be taken to bring an inquiry center into being:

1. Develop a culture with a filter-free flow of information, one in which every stakeholder has the ability to express his or her view of the world and is continually involved in raising questions about his or her own practices, and the practice of others. The bearer of bad news is not “shot” but often praised. Such a culture thrives on dialogical discourse.
2. Encourage mindfulness and vigilance on the part of all stakeholders, outside of as well as within the organization, so that they are attuned to and attend to relevant occurrences in their environment.
3. Provide opportunities and incentives for all stakeholders to contribute relevant information to the center.
4. Design and implement an inquiring, learning, and knowledge system that (a) acquires, transmits, retrieves, and stores information; (b) analyzes, shares, discusses, and debates that information; and (c) retrieves, formats, and structures results into actionable information and

distributes it to responsible and accountable decision makers in a form they can understand and are encouraged to act on.

There are six basic functions an inquiry center must accomplish: (1) define the potential ethical problems and model them, (2) acquire morally relevant data as identified, (3) bring the disparate multi-media data together and produce indicators, (4) reflect on the ambiguities and anomalies, (5) visualize, present, and share the information, and (6) implement an organizational system for informing relevant parties.

What tools are available for carrying out these functions? A wide variety of methods and technologies are at hand that, when incorporated in a functioning system, can be used to support mindful inquiry in an organization.

1. **Problem definition and modeling.** The mindful organization needs tools to help it focus on and be alert to changes in its situation that may affect its ability to achieve its ethical goals.
 - a. **Critical Success Factors Method.**^{xxvi} Using this method, an organization first states its central ethical values or “care abouts,” such as those contained in its code of ethics. Second, it asks the question: “What must go right in the organization’s sphere of influence in order for its values to be realized?” The answers identify critical success factors. Next, indicators or measures of performance are created that measure how well the organization is doing in achieving its success factors. For example, the U.S. Navy has strong values for safety and readiness on its aircraft carriers. Keeping planes from colliding or even touching each other is a key factor in achieving this goal. The “crunch rate” is an indication of how well they are doing. “Crunches” are recorded and reported on board and accumulated for fleet statistics. Thus, the final step in the CSF approach is to collect and report the indicators and act accordingly.
 - b. **Causal Texture Modeling:** Ethically mindful organizations focus on operations and probe deeply into underlying and sometimes distant factors that contribute to untoward behavior. That is, they not only consider the “sharp-edge,” but also attend to what human factors researcher James Reason calls “latent conditions.” Conditions such as low morale, high turnover, shortfalls in training, poor work design, breaks in supervision, defects, maintenance failings, deteriorating infrastructure, stress on cost-cutting, extraordinary

Diagram 5: A Simplified Model of the Systems Dynamics of the Bhopal Accident

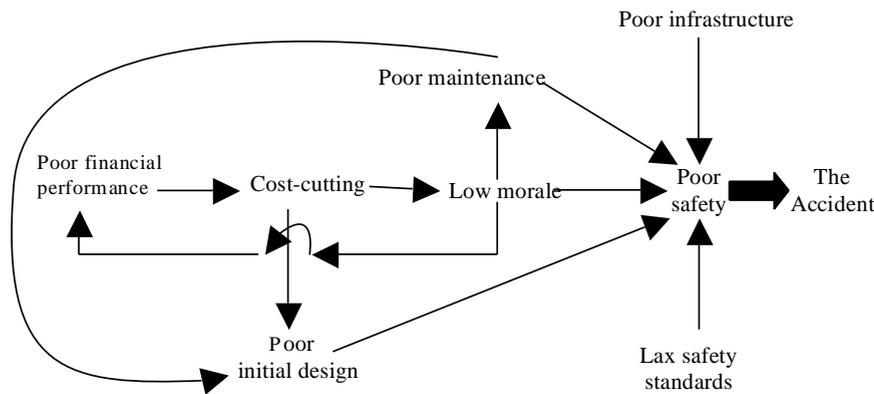
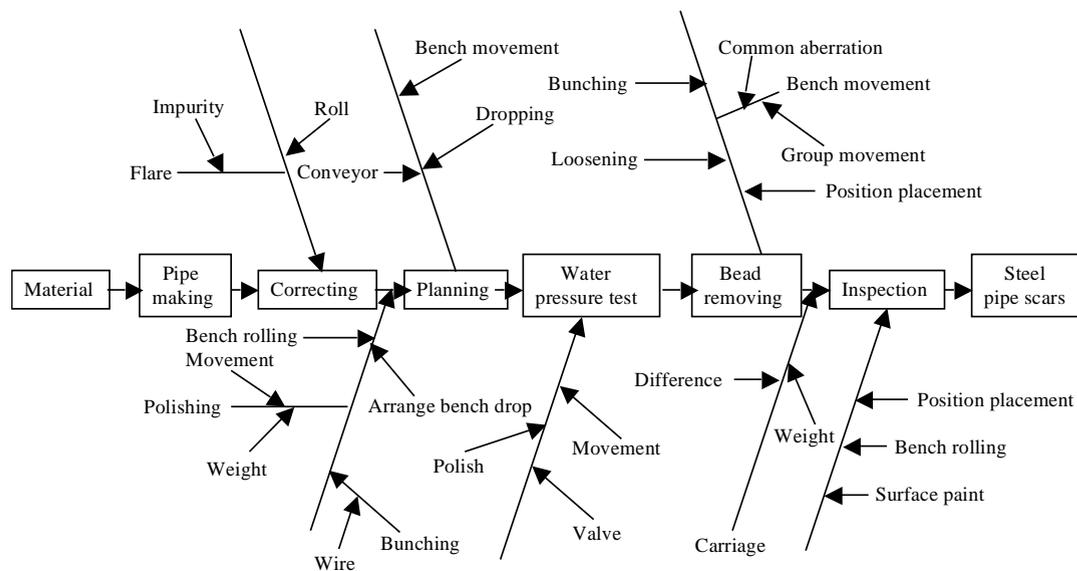


Diagram 6: Ishikawa's Fish Bone



stress on making profitability goals, inadequate tools or equipment, and lax enforcement of standards can contribute to a member making a bad decision or taking a wrong action.^{xxvii} Pauchant and Mitroff provide a simplified causal texture model to identify some of the latent factors at work leading to the Bhopal accident.^{xxviii} A denser approach is to employ the “fish bone” diagramming technique pioneered by quality control expert Kaoru Ishikawa.^{xxix} Data are collected for each of the nodes in the causal texture model to develop indicators of potential problem areas.

c. **Scenario-writing:** Peter Schwartz describes scenario-writing as “a tool for ordering one’s perceptions about alternative future environments in which one’s decisions might be played out.”^{xxx} Royal Dutch/Shell has successfully used this technique to anticipate and prepare for future events affecting its business, helping it cope effectively with the OPEC price shock in the early 1970s. The method, however, did not fully prepare the company for actions launched by Greenpeace at the Brent Spar oil-rig platform nor for the fallout from the execution of Nigerian tribal leader Ken Saro-Wiwa in 1995. At the time the company was not asking those ethically sensitive kinds of questions. Useful scenarios must continue to probe new and evolving possibilities.

d. **After-Action-Reviews:** Scenarios look to the future, whereas after-action-reviews, such as those conducted by the U.S. Army, are post mortems designed to learn from the past. They address such questions as: What was the intent of the action taken? What actually happened? Based on previous experience what have we learned? What should be done now? Who should be informed? The answers often are recorded in the form of stories and compiled into the organization’s database. Subsequently, these stories are made available to decision-makers to guide future actions.^{xxxi}

2. **Acquire Morally Relevant Data.** A mindful organization constantly scans its operations and environment to detect events or conditions that might indicate an impending situation with ethical implications. Such raw data come from myriad sources.

a. **Internal:** Data and documents are collected from operating systems including warranty data, complaints, accident reports, employee surveys, and turnover and exit interviews. Memoranda exchanged between members of the organization are a good source of potential

issues or emerging problems. Customer satisfaction measurements such as the “Service Excellence Dashboard” used by EDS may contain early clues to issues.^{xxxii} Mail, e-mail, phone calls to helplines, and other internal communications directed to human resources, legal, or ethics offices contain valuable tips about changing conditions.

b. **External:** Many organizational threats requiring ethical response emanate from the organization’s environment. An issues-tracking system that monitors items appearing in the press, radio or TV will pick up emerging trends just as weather monitors onboard aircraft carriers alert the ship’s navigators to impending problems. One very effective way to tap the moral climate of an organization is to engage in dialogue with external parties. Surveys, town halls, and focus groups are familiar means of doing this. For example, as part of its post-1995 transformation, Royal Dutch/Shell has initiated a series of World Wide Web forums called “Tell Shell.” These web forums invite comments and dialogue on such topics as Shell’s values and business principles, environmental issues, social issues and the company’s performance, issues involving technology, and other feedback or concerns. The forums are uncensored, filter-free and, in fact, contain many scathing remarks from people unhappy with the company as well as occasional comments in support of the company’s policies. Typical objects of scorn are Shell’s actions and human rights policies in Nigeria, sustainable development and energy sources, and pricing policies. Also recorded are such seemingly mundane issues as treatment of customers in service stations, including a claim that a Shell station refused to help an elderly woman with a flat tire or let her use the phone and sent her into the freezing cold. The threads of dialogue contained in the Tell Shell forums contain many messages that should alert the company to current and incipient ethical issues.

3. **Bring Disparate, Multi-media Data Together and Produce Indicators.**

The data sources discussed are massive, varied, and rich. They reflect the considerable complexity that most organizations face. Increasingly, however, much of the data of an organization’s experience are, or can be, digitized. Herein lies a potential solution to coping with its enormity. Several technologies can be used to distill relevant information out of the morass.

a. **Search Engines:** Search engines can be seeded with key terms that emerge from the problem definition phase and are sent out in quest of relevant information. This is a “pull” type approach.

b. **Intelligent Agents:** Small computer programs such as Java applets can be launched on the network, and working in the background of other processes, can be directed to seek out events or conditions that have ethical significance. Among the tasks they might perform are to scan e-mail, to sort and filter data in the database to identify trends or surprises, or to serve as an interface agent by scanning articles, documents, and other sources to produce a daily news report.^{xxxiii} PointCast is illustrative of this “push” type approach.

c. **Text-mining:** Neural network clustering algorithms may be deployed to organize, interpret and synthesize the vast array of data expressed in various and eclectic media forms. Linguistic and natural language processing techniques are applied to text, followed frequently by co-occurrence analysis and/or clustering and categorization routines. The results are used to create organizational knowledge maps or concept yellow pages.^{xxxiv} One promising technology for performing this function is the self-organization map (SOM) algorithm of Kohonen.^{xxxv} The output is a two-dimensional map that shows the amount of activity around an issue by means of the size of the area devoted to it and the closeness of relationships by means of proximity. This provides a quick visualization of issues being tracked.

4. **Reflection.** The sensing of warning signals or equivocal messages calls for a pause to reflect. In the case of the *Challenger*, for example, pressure for efficiency short-circuited a more thoughtful examination of the situation. Reflection is the active process of thinking about a situation and wrestling meaning out of it. The process by which data are converted into information and information into knowledge requires bringing to bear a point of view or worldview — that is, a shared mental model — on elemental observations. All knowledge contains such a worldview. Worldviews are used to order, select, structure, interpret, and censor observations. Thus, information is not value free. It may be, as the economist Amartya Sen suggests, “positionally objective.”^{xxxvi} That is, other persons in the same position would make similar sense out of it — some call it “groupthink.”^{xxxvii} But such information is never totally free of bias. For example, based on his analysis of Diablo Canyon

nuclear power plant, Schulman argues that to achieve high reliability an organization must develop “conceptual slack.” That is, it needs a “divergence in analytical perspectives among [its] members ... over theories, models, or causal assumptions pertaining to its technology or production processes.”^{xxxviii} This diversity of perspective is the best antidote for groupthink and hubris. The challenge is to elevate the organization’s thinking so it can interpret the available information at the highest level and within the most encompassing framework possible. This requires multiple perspectives and the pitting of different “positionally objective” positions against one another. At the outset this may introduce higher degrees of ambiguity and equivocality. Consequently, rich media with broad bandwidths are needed to cope with the complexity. Dialogues, discussions, debates and dialectics are methods that potentially provide the requisite amount of richness and differing points-of-view. Collaborative systems are the technologies to be used in this case. According to Daft and Lengel, information richness is highest when people work face-to-face. In far-flung organizations, however, face-to-face meetings are not always possible or economically feasible. More distance-spanning technologies are needed. Information richness, however, tends to decline with the use of channels such as telephone; written personal communications, such as letters or memos; written formal communiqués, such as bulletins or documents; and numeric formal reports.^{xxxix}

Among the information technology tools available for this purpose are:

- a. **Video- and teleconferencing**
- b. **Lotus Notes:** This groupware system allows users to combine data and viewpoints and communicate interactively with each other. A variety of objects such as spreadsheets, graphs, word documents, and voice annotations can be shared and modified. A database enables users to search for key words, phrases, comments, or other objects.
- c. **Electronic brainstorming**
- d. **Chat rooms and online discussion sessions**
- e. **Group Support Systems:** A GSS system, such as that developed at the University of Arizona and used by IBM and the U.S. Navy, provides facilities such as large display, electronic brainstorming, topic commenting, issue analysis, voting, and the ranking of alternatives. By using GSS, some tasks involving Naval intelligence

that normally take 30 minutes have been accomplished in as little as 30 seconds.^{xi}

- f. **Simulated debates from known ethical positions:** It is possible to bring well-reasoned ethical positions to bear on a situation by accessing a real or computerized role player. For example, during a class at the U.S. Naval Academy, a case was discussed in which a midshipman had been treated badly by his classmates because he missed the winning field goal in an Army-Navy game. The instructor had the class examine the situation and suggest remedies. Then, referring to a reading from John Stuart Mill that had been assigned, asked a plebe, “You’re Captain Mill. What would you do?” The plebe stated that he would not intervene or interfere because he believed in granting people the greatest liberty possible, given that no bodily harm was imminent. He cited passages to support his view. A second plebe was asked to assume the role of Edmund Burke: “What would Captain Burke do?” He argued for intervening and gave as his argument the belief that it was right to restrain people in the interests of social order, because the bounds of liberty should be enlarged with great caution and very gradually. With these two opposing views on the table the instructor then turned to another plebe and asked, “You are the superintendent. You have listened carefully to these arguments. What action should you take?” The plebe reviewed the various arguments and then gave a reasoned argument for a minor controlled intervention, one that in his view preserved necessary order while granting the corps of midshipmen as much freedom as possible. In this case, the level of reflective discourse was raised by bringing in known ethical perspectives, as well as the points of view of class members. This helped the participants reach what Sen called a “Trans-positional view.” It is possible, with the aid of technology, to apply well-developed ethical perspectives to emerging situations in order to broaden the base of dialogue.

5. **Presentation, Visualization and Information Structuring.** “[K]nowledge,” C. West Churchman observes, “resides in the user and not in the collection. It’s how the user reacts to the collection of information that matters.”^{xli} Acquiring and analyzing data has no value unless it influences people’s actions. Structuring consolidates and organizes knowledge so that it is as “attractive, usable, and accessible as

possible.”^{xiii} Once structured, it has to be displayed in sensory form, usually visual and/or auditory. In short, the recipient needs a map. “You cannot perceive anything without a map,” opines Richard Saul Wurman in *Information Anxiety*. “A map provides people with the means to share in the perceptions of others. It is a pattern made understandable...”^{xliii}

Edward Tufte, a noted author on statistical evidence and information design, argues that knowledge must be represented in a way that reveals its underlying modality — cause and effect, motion, mechanisms, rates and processes — if users are to act effectively on it. “Clear and precise seeing becomes as one with clear and precise thinking.”^{xliv} Tufte describes two cases in which the mode of presentation materially affected decision-makers’ actions. One was the classic epidemiology case of the 1854 London cholera epidemic in which John Snow, Queen Victoria’s anesthesiologist, converted a collection of time series data into a map showing how deaths were associated with the area’s 11 community pumpwells. It became immediately evident that the Broad Street pump was the likely culprit. The epidemic ended once the Broad Street pump-handle was removed. Effective display had provided decision-makers with a plausible explanation and they acted accordingly.^{xlv}

The second case — NASA’s fateful *Challenger* — records a failure in Tufte’s view. Recall that the Morton Thiokol’s engineers had originally recommended against the launch. The predicted temperature at launch was between 26 and 36 degrees Fahrenheit, but the limited data they had available showed that O-ring erosion and blow-by had occurred at temperatures as high as 53 degrees Fahrenheit. Thirteen charts were provided in support of the recommendation not to launch. At this point, NASA’s officials shifted the burden of proof and requested evidence that the launch was doomed to fail. Since the engineers could not prove that it would fail, they finally gave their approval. The charts and the engineers’ rationale were unconvincing to the NASA officials who were under strong pressure to launch. Weick and others have suggested that the lack of rich information — such as a face-to-face conversation instead of a conference telephone call — contributed to the misjudgment. Groupthink has also been mentioned. Tufte blames poor information structuring and visualization. “Regardless of the indirect cultural causes of the accident,” he avers, “there was a clear proximate cause: an inability to assess the link between cool temperature and O-ring damage on earlier flights.”^{xlvi} This link could have been made clear, Tufte believes, by means of a simple scatter-plot or an ordered table that showed how cooler temperatures were

associated with O-ring damage. Thus, the engineers had failed to provide an effective, perspicuous visualization of the data. And consequently, the decision makers did not grasp the truth of the situation and failed to make the right decision. Tufte holds the engineers morally culpable for failing to use the best presentation method possible. His view is extreme but one worth contemplating.

6. **Organizational Systems.** The technological tools chosen must be brought together and integrated into a managerial system. The Navy with its aircraft carriers and the Army with its Center for Army Lessons Learned serve as possible models. Royal Dutch/Shell with “Tell Shell,” the “Tripod-Beta” system for detecting latent failures, and the “Tripod-Delta” system, which measures and controls general failure types, suggests other approaches. War rooms in which incoming data are collected, analyzed, and displayed, such as those operated by military and defense organizations (and like CEO Jacques Nasser set up at Ford well after the crisis began), are a possibility.

EDS, which recently was awarded the Business Ethics Award by the Society of Financial Services Professionals, has adopted a management system under the leadership of CEO Dick Brown that may be another template. Brown stresses the need for filter-free information flow. He e-mails every employee twice a month to share his perspectives and direction, and he encourages comments by return e-mail. On at least two occasions during the last year, his e-mails disclosed that an employee had been terminated for violations of the firm’s ethical code, and preserving the perpetrator’s anonymity, described what the offense was and suggested how to prevent it in the future. Brown’s e-mails are sent following the executive operations team meeting, also held twice a month, at which the top 10 or so EDS executives confer — face-to-face when feasible — on issues facing the company, and develop policies. Three times a year, all of the firm’s senior leadership meet to address issues. Monthly performance calls, either in person or by telephone, are made by each major leader, to his or her subordinates and to key customers. Meanwhile, the Service Excellence Dashboard is constantly reporting on the current status of customer satisfaction. Other systems are used to collect routine and ad hoc data. This “Social Software” system is used to integrate decisions across the organization, reinforce norms of behavior, surface and resolve conflicting priorities, and point out weaknesses in communications. If the company’s actions are proving inadequate, the operating mechanism quickly exposes

this fact, too. Communications are coming unfiltered, direct from the front lines and from clients themselves, and this keeps the firm on alert.^{xlvii}

Conclusion

The question “If an organization intends to be ethical, what kind of knowledge, information, and communications system does it need?” has been examined. It is assumed that most organizations want to behave ethically. Indicators of this include their codes of ethics or conduct. Yet during the difficult journey from stating core values to actually engaging in behavior, something often goes awry in a far-flung organization. Untoward behaviors occur.

Among the classic cases of this happening are the tragic explosion on the space shuttle *Challenger*, the accident at Union Carbides’s Bhopal plant, A.H. Robins’ damaging Dalkon Shield, Dow Corning’s dangerous silicon breast implants, and the faulty Firestone tires on rollover-prone Ford Explorers. In each of these cases, early warning signs were available that, if presented to the decision-makers in a timely and effective way, could have been used to avoid — or at least contain — the harm done to their customers, employees, community, and the company.

Nearly two decades of study of High Reliability Organizations (HROs) demonstrate that it is possible to implement management approaches that avoid or contain value threatening activities. The lessons learned are summarized in several principles. The root concept from which all of these principles spring is “mindfulness,” — that is, attuning to, attending to, and heeding crucial warning signs that come from the organization’s operations and environment.

A general model of a mindful organization was developed. Attention (the point of central focus), attuning (the scope of raw data acquisition in the periphery) and consciousness (the central nerve center) are the chief building blocks of the model. These functions determine how data are acquired, recognized, compared with and/or stored in the organization’s memory; how values and goals are interpreted or changed; and how decisions are rendered and actions taken. Most actions are the result of programmed or habitual response; but organizations must also be able to sniff out incongruous events or other warning signs. A process of reflection — thinking about the situation and applying various points of view to it — is then required before an appropriate course of action can be decided on.

It is proposed that organizations create an Ethical Inquiry Center to implement the model and to promote mindfulness. The first step is to develop a culture of openness and transparency. Then currently available technologies can be used to

support the center’s activities of problem definition and modeling; acquiring morally relevant data; bringing disparate, multi-media data together and producing indicators; reflecting on unusual occurrences; and visualizing and structuring information so that it is presented in an understandable and actionable form. Some examples of organizational systems that might serve as templates were discussed.

There is a caveat, however. Nietzsche once observed that the tree whose branches reach high also plunges its roots deeply. The more good that can be done, the more evil that is also possible. The systems discussed here that are intended to produce ethical results can also be used in unethical ways. Enron’s CEO Kenneth Lay, for example, effectively used the company’s “chat room” to convince the employees that the company was financially sound, about a month after he learned of the accounting irregularities from vice president Sherron Watkins, while at the same time he was selling some of his own holdings. Ultimately, an organization still relies on its members’ moral compasses.

Thus, creating the ethically mindful organization requires leadership. Leadership without ethics is potentially evil, as Enron and other cases suggest. Ethics without leadership, however, is impotent. Both leadership and ethics rest on a foundation of information and communication. Building that base is the information imperative.

References

- ⁱ The author expresses appreciation to Karl Weick, John Henderson, John Seely Brown, Eric Harvey and David Reid for valuable comments on an earlier version of this manuscript.
- ⁱⁱ James Miller, March and Simon, Jay Galbraith, Peter French, Paul Diesing.
A broad system view is provided in Miller, James G.
• “Living Systems: Basic Concepts,” *Behavioral Science*, 1965, pages 193-237.
• “The Nature of Living Systems,” *Behavioral Science*, 1971, pages 222-301.
• “Living Systems: The Group,” *Behavioral Science*, 1971, pages 302-398.
• “Living Systems: The Organization,” *Behavioral Science*, 1972, pages 1-182.
A theory of organizations is found in March, James G. and Herbert A. Simon. *Organizations*, New York, John Wiley, 1958.
Decision-making structures — the system of communication within which particular habits of thought are applied in organizations to materials to result in decisions — is developed in Diesing, Paul. *Reason in Society*, Westport, Connecticut: Greenwood Press, 1962, especially pages 171-176.
Legal and ethical issues with organizational decision-making are discussed in Stone, Christopher D. *Where the Law Ends: The Social Control of Corporate Behavior*, New York: Harper & Row, 1975. See especially Part IV, “Controlling the Corporation: Putting the Model to Work.” Pages 122-248.
A theory for the role of information and communication in organization design is discussed in Galbraith, Jay R. *Organization Design*, Reading, MA: Addison Wesley, 1977.
Corporate internal decision structures are discussed from an ethical point of view in French, Peter A. *Corporate Ethics*, Fort Worth, TX: Harcourt Brace, 1995.
- ⁱⁱⁱ www.shell.com

- ^{iv} Quote is from the Dow Corning Corporation Code of Conduct. See Byrne, John A. *Informed Consent: A Story of Personal Tragedy and Corporate Betrayal — Inside the Silicone Breast Implant Crisis*. New York: McGraw-Hill, 1996 page 34 and passim.
- ^v See Trevino, Linda Klebe, Gary R. Weaver, David G. Gibson, and Barbara Ley Toffler, "Managing Ethics and Legal Compliance: What Works and What Hurts," *California Management Review*, Winter 1999.
- ^{vi} See Argyris, Chris and Donald A. Schon, *Theory in Practice: Increasing Professional Effectiveness*. San Francisco: Jossey-Bass, 1974.
- ^{vii} See, "Shuttle Inquiry Focuses on Weather, Rubber Seals, and Unheeded Advice," *Science*, Vol. 23, 28 February 1986. Pages 909-911.
- ^{viii} Reason, James *Managing the Risks of Organizational Accidents*, Burlington, VT: Ashgate Publishing Company, 2000, page 89.
- ^{ix} In re A.H. Robins Co. "Dalkon Shield," IUD Prods Liab., Litig., 575 F. Supp 718, 724 (D. Kan. 1983)
- ^x *Time*, June 4, 2001, pages 52-3
- ^{xi} Hilts, Philip, "Maker of Implants Balked at Testing, Its Records Show." *New York Times*, 13 January 1992, page 1.
- ^{xii} Weick, Karl E. and Kathleen M. Sutcliffe, *Managing the Unexpected*, San Francisco: Jossey-Bass, 2001, page 3.
- ^{xiii} Op cit., page 3.
- ^{xiv} Roberts, Karlene H. and Carolyn Libuser, "From Bhopal to Banking: Organizational Design Can Mitigate Risk," *Organizational Dynamics*, Vol 21, pages 15–26; quote from page 25.
- ^{xv} Roberts, Karlene H. and Carolyn Libuser, "From Bhopal to Banking: Organizational Design Can Mitigate Risk," *Organizational Dynamics*, Vol 21, pages 15–26; quote from page 25.
- ^{xvi} Rochlin, Gene I. "Informal Organizational Networking as a Crisis-Avoidance Strategy: U.S. Naval Flight Operations as a Case Study," *Industrial Crisis Quarterly*, Vol 3, 1989, pages 159-176; quote on page 167.
- ^{xvii} Evans, Philip and Thomas S. Wurster, *Blown to Bits: How the New Economics of Information Transforms Strategy*, Boston: Harvard Business School Press, 2000.
- ^{xviii} Deutsch, Karl W. "On Communication Models in the Social Sciences," *Public Opinion Quarterly*, Vol. 16, 1952, pages 356-380; Ryle, Gilbert, *The Concept of Mind*, Chicago: University of Chicago Press, 1949; Weick, Karl E. and Karlene H. Roberts, "Collective Mind in Organizations: Heedful Interrelating on Flight Decks," *Administrative Science Quarterly*, Vol. 38, 1993, pages 357-381; Weick, Karl E. and Kathleen M. Sutcliffe, *Managing the Unexpected*, San Francisco: Jossey-Bass, 2001. Baird, Lloyd and John C. Henderson, *The Knowledge Engine: How to Create Fast Cycles of Knowledge-to-Performance and Performance-to-Knowledge*, San Francisco: Berrett-Koehler, 2001.
- ^{xix} Ashby, W. R., *Introduction to Cybernetics*, New York: Wiley, 1963.
- ^{xx} Weick, Karl E. "Organizational Culture as a Source of High Reliability," *California Management Review*, Vol. XXIX, No. 2, Winter 1987, pages 112-127; quote on page 112.
- ^{xxi} Weisner, Mark and John Seely Brown, "The Coming Age of Calm Technology," in Denning, Peter J. and Robert M. Metcalfe, *Beyond Calculation: The Next Fifty Years of Computing*, New York: Springer-Verlag, 1998.
- ^{xxii} Ackoff, Russell L. and Fred E. Emery, *On Purposeful Systems*, Chicago: Aldine-Atherton, 1972, pages 215-220.
- ^{xxiii} Ryle, pages 135-136.
- ^{xxiv} Weick and Sutcliffe, page 42.
- ^{xxv} Gioice, Dennis A., "Pinto Fires and Personal Ethics: A Script Analysis & Missed Opportunity," *Journal of Business Ethics*, Vol. 11, pages 379-389, 1992. (Quote from page 385.)
- ^{xxvi} Rockart, John F., "Chief Executives Define Their Own Data Needs," *Harvard Business Review*, March-April 1979, pages 81-92.
- ^{xxvii} Reason, James, *Managing the Risks of Organizational Accidents*, Burlington, VT: Ashgate, 1997
- ^{xxviii} Pauchant, Thierry C. and Ian I. Mitroff, *Transforming the Crisis-Prone Organization*, San Francisco: Jossey-Bass, 1992.
- ^{xxix} Ishikawa, Kaoru, *Guide to Quality Control*, Asian Productivity Organization, available from White Plains, New York: Quality Resources. 1982.
- ^{xxx} Schwartz, Peter, *The Art of the Long View*, New York: Doubleday, 1991.
- ^{xxxi} Baird, Lloyd and John C. Henderson, *The Knowledge Engine: How to Create Fast Cycles of Knowledge-to-Performance and Performance-to-Knowledge*, San Francisco: Berrett-Koehler, 2001.
- ^{xxxii} Charan, Ram, *Action, Urgency, Excellence*, Dallas: EDS, 2000.
- ^{xxxiii} See for example: Negroponte, Nicolas, "Less is More: Interface Agents as Digital Butlers," *Wired*, June 1994, page 142, and Mais, Patricia, "Agents that reduce work and information overload," *Communications of the ACM*, Vol. 37, No. 7, 1994, pages 31-40.
- ^{xxxiv} Gartner Group, *Knowledge Management Report*, Summer 1999.
- ^{xxxv} http://www.cis.hut.fi/~sami/thesis/thesis_tohtml.html
- ^{xxxvi} Sen, Amartya, "Positional Objectivity," *Philosophy and Public Affairs*, 1993.
- ^{xxxvii} Janis, Irving L., *Groupthink*, Boston: Houghton Mifflin, 1982. According to Janis, "Members tend to evolve informal norms to preserve friendly intragroup relations and these become part of the hidden agenda at their meetings." Page 7. It refers to "a mode of thinking that people engage in when they are deeply involved in a cohesive in-group, when the members' strivings for unanimity override their motivation to realistically appraise alternative courses of action." Page 9.
- ^{xxxviii} Schulman, Paul R., "The Negotiated Order of Organization Reliability," *Administration & Society*, Vol. 25, No. 3, Nov., 1993, pages 353-372; quote page 364.
- ^{xxxix} Daft, Richard L. and R. H. Lengel, "Information Richness: A New Approach to Manager Information Processing and Organization Design," in Barry Staw and Larry L. Cummings, eds., *Research in Organizational Behavior*, Vol. 6, Greenwich, CT: JAI Press 1984, pages 191-233.
- ^{xl} Dennis, Alan R., et. al. "Information Technology to Support Meetings," *MIS Quarterly*, Dec. 1988, pages 183-196 and Nunamaker, Jay, et. al., "Experiences at IBM with Group Support Systems: A Field Study," *Decision Support Systems*, Vol. 5, No. 2., June 1989, pages 183-196.
- ^{xli} Churchman, C. West, *Design of Inquiring Systems: Basic Concepts of Systems and Organizations*, New York: Basic Books, 1971, page 10.
- ^{xlii} Baird and Henderson, page 61.
- ^{xliii} Wurman, Richard Saul, *Information Anxiety: What to Do When Information Doesn't Tell You What You Need to Know*, New York: Bantam Books, 1990, page 260.
- ^{xliv} Tufte, Edward R., *Visual Explanations: Images and Quantities, Evidence and Narrative*, Cheshire, Connecticut: Graphics Press, 1997, page 53.
- ^{xlv} Tufte, Edward R., *Visual Explanations: Images and Quantities, Evidence and Narrative*, Cheshire, Connecticut: Graphics Press, 1997.
- ^{xlvi} Tufte, op cit., page 40.
- ^{xlvii} Charan, Ram, *Action, Urgency, Excellence: Seizing Leadership in the Digital Economy*, EDS, 2000, page 166.

Below are the highlights of Richard Mason's question and answer session.

Question:

How does your ethical framework deal with the inevitable conflicts presented by globalization, as companies find themselves operating in a variety of cultural and moral contexts, often with very different rules and standards? For instance, bribery is not objectionable in some countries but illegal in others.

Richard Mason:

In situations where the local culture has different ethical standards from that to which a company may be accustomed, where perhaps bribery is an accepted part of business, one approach is that adopted by companies like EDS and TI. They have certain minimum standards that they adhere to around the globe, no matter what. It is very hard to come up with global ethical standards, but this is a first step. Some companies, like Levi Strauss, have addressed their concerns about ethical differences by saying simply: "We won't do business in this country." With Levi's, the ethical issue was child labor laws and abuses. Companies all have different frameworks. Some organizations aspire to standards but concede that, on the ground in some communities, they may have to make judgments that are not necessarily consistent with what they do in other countries. Right now, this is the challenge of every global company.

Question:

I was particularly interested in the visualization step you mentioned, as a means of dealing with information overload. We need enough information to feel we can make an effective decision yet when the information becomes very complex we are hampered in making that decision. This seems to have happened in the Ford Explorer case. How do you recommend dealing with this paradox and how do you visualize the process?

Richard Mason:

In the Firestone/Ford Explorer case, there was some clear information available quite early on, certainly sufficient to act upon. It seems that the decision makers waited until the information level was way up the curve that I showed you in Diagram 1 before they were willing to act. Acting on minimal information is one of the keys to being a High-Reliability Organization. It doesn't take a lot of information, just a few significant clues to the fact that there may be a problem, before the HRO moves into action. It's not necessary to wait until every possible

piece of information has been gathered and we have 100 percent confidence. The point is to recognize the signs of a problem as early as possible and respond to them as quickly as possible.

Question:

Some cultures, particularly in parts of Asia, do not look kindly on passing bad news up the hierarchy. Do you have any suggestions as to how one can be sensitive to this, to avoid losing face on both sides, while still facilitating effective decision-making?

Richard Mason:

No, actually I don't. I think this is a critical cross-cultural issue for global companies, as well as a leadership challenge, but I can't point to any research on the subject. Given what we now know of the culture at Enron, you might say the situation is little different from employees at Enron not wanting to confront superiors with ethical concerns for fear of losing their jobs. Therefore, information did not move up and was not acted upon. I know that many companies will be thinking about how to ensure that they operate effectively yet with cultural sensitivity, and this is a considerable challenge.

Question:

Many of the tools for discovering information that can avoid or mitigate ethical problems could, it seems to me, also be used to engage in unethical behavior. Can you give examples of guidelines for acceptable use of information that would work in the systems you have discussed?

Richard Mason:

You have to start with your core values, which I hope would include honesty or integrity. These must be what drive your acquisition and use of information. Ideally, the core values of the business would inform a code of ethics, which would give guidance on the appropriate use of technology to gather and utilize information. Most large companies now have a code of ethics or business conduct, but it has to be underpinned by the core values to be effective.

Question:

In an economic downturn, like the one we are experiencing, companies try to cut costs. I sense that some companies might view business ethics as a luxury rather than a necessity and they dispense with the ethics office to save costs. What are your thoughts on this?

Richard Mason:

Whether ethics is a luxury or a necessity is a debate going on in very many companies right now. I believe that ethics is a necessity. In my opinion, that does not mean that an organization must have an ethics office, but it does mean that a company should operate according to ethical principles. This is all the more important when there is an economic downturn. TD Industries, a construction company whose CEO my center recently gave an award to, does not have an ethics office. The company says that ethics has to be everywhere in the organization and believes that it has an ingrained ethical culture. The CEO says that one of the most painful things in business is having to decide to lay off workers, which is not uncommon in the construction industry. The company has a process that helps it decide how best to do this in an ethical and compassionate manner. Other companies worthy of note for valuing employees are Southwest Airlines and The Container Store. Enron, by contrast, was a company that paid lip service to values with its “Vision and Values Statement” and professed concern for employees. The reality was the “rank and yank” policy of summarily dismissing employees who did not measure up in the periodic reviews.

Question:

Business often finds it uncomfortable to contemplate failure. A corporate culture that is preoccupied with success would seem to risk shutting out danger signals. Do you think planning for failure scenarios can help business avoid failing?

Richard Mason:

Ken Lay, the disgraced former Enron chairman and CEO, was always thinking and talking positives. This is so engrained in Western culture and I’m not sure how we change that. I do think that we need to acknowledge that, as individuals and as businesses, we are fallible. This helps us to see where our vulnerabilities lie and to anticipate problems. We need to move towards a culture in which, as soon as we make a mistake or realize something is wrong, we should not try to cover it up but do something about it.

Question:

I understand one of your main points to be that organizations need to pay more attention to information related to ethics. Do you think this means that organizations need to pay less attention to other things and, if so, what should get less emphasis?

Richard Mason:

Well, there is an assumption in what you say that ethical information is totally separate from other information. Of course, if you are going to stay in business,

you need to take into account the economic situation. But I used to teach a business strategy class in which I divided the students into two groups. I asked the first group to prepare a case study focusing on the economic factors. The second group would be asked to look at it from the ethics standpoint. We found the group focusing on ethics came up with a better strategy standpoint simply because it analyzed what was the *right* thing to do and anticipated other people’s responses to the strategy. In some cases, they also identified things that were potentially unethical, which had the potential to destroy the business. So, I don’t think that “objective” information and “ethical” information are totally separate. I don’t have a formal model for this, but I believe we can make the two work together without doubling the required effort. If we stop to examine whether business or organizational decisions have an ethical dimension, we do not add substantially to our costs and indeed are adding value to the decision because we give ourselves the opportunity to eliminate the risks inherent in being unethical. Overall, it is a better decision.

