Cultural Diversity Introduced

The moral and ethical dilemma which is fundamentally 'built in' to all technology at any phase of its conception, use, or maintenance is the issue of how will it be used--to what end? What possible harm will it cause that I can not predict or plan for? Will the device or system cause human, environmental, or other problems which are inappropriate to the task? Are the trade-off's truly unwarranted, let alone morally and ethically off base?

This moral and ethical dilemma is likely the greatest single argument against believing we can ever be totally in control of our technology. Once it has left our production floor, or the structure has been turned over to the owner, or we park the transport device, or the printing press is finished running, the technology is essentially out of our immediate control. Even with the best possible plans and training, we must ultimately recognize that our control is modest at best. Yet, we do, have a reasonable amount of control which we are responsible to exercise. It is simply inappropriate to allow the anti-technologist view to permeate the overall direction and set an agenda for technology that curtails development and general progress in any technology. Progress must be better understood and explored for all participants in the technological culture.

Although everyone who uses or is aware of a technology's function and application have some responsibility for it, the technologists' responsibility is particularly ominous. We will command much of the decision-making. Ignorance is no excuse for making mistakes with regard to technology--but it is a reality which must be dealt with. We cannot take full advantage of the diverse options available if we do not know the options, requirements, needs and other issues and circumstances. It becomes the responsibility of educators to explain what is available, how to use it, and what the potential impacts and implications may be, including what risks are associated with technology and how likely might they be of occurring.

While the educator may be able to present all facts about a given technology, and do it in a relatively 'value free' manner, without judging the technology as good or bad, or presenting personal views directly, it is still incumbent on all users and producers of the technology to determine and control as best we can the use of the technology. Choices we make, decisions we must resolve, and how we act in general relates to diversity in people and technologies. We are under individual and societal pressure to do this fairly, and with a sense of equality and view toward the future.

Diversity is driven by people and the way technology relates to their shared interests and needs. All persons, regardless of race, gender or capability must share a similar vision for the future of the technological culture if we are to successfully arrive together at any shared goals. We must arrive at that vision collectively--determine the technological agenda together and with some reasonable sense of partnership for the future. Not pursuing a shared vision that includes global circumstances will at least result in chaos and confusion, and perhaps various levels and types of significant destruction. The only politically correct approach is to 'level the playing field' with education in the broadest sense and gain a shared vision for the technological future, regardless of how diverse we may be.

This must be done with care and sensitivity, and put into action in the workplace by various professionals, certainly including technologists. While it may not appear difficult at a quick glance, this is clearly one of the most complex tasks facing decision-makers of the future. Even as we are wrestling with how to provide full participation within the technological culture at home on the domestic front, globally many persons are beginning to demand full participation through democratization and other world events on a mass scale. Whether considered on a relatively local scale or on the broader global scale, full technological participation will stretch all resources to the maximum, providing one of the basic challenges to the human
condition of the future. How do we equitably permit full and reasonable participation with technology, safely and with reasonable costs?

Also at question are some of our basic premises as a culture. Issues related to faith and religion, particularly where morality and ethics are discussed, are constantly being challenged by technological advances. Our founding fathers emblazoned the creed "In God We Trust" into virtually all that we are about foundationally. Yet, what does this mean today and what should it mean for the future? When we are divided on such fundamental issues as choice related to life and death, the right to bear arms, prayer in the schools, and sexual freedom, how can we ever expect to reconcile other less controversial matters? Can the traditions inherent in the democracy as we have interpreted them withstand the modern day forces rising, both directly and indirectly, out of the technological culture?

We must question other traditional behaviors, as well. It is imperative that we look with the maximum rationality, disallowing emotion, and not basing decisions totally on tradition and past biases. The way we are raised and the quality of life, including opportunities for broad education and questions of values, will clearly form much of the basis for lifelong learning and behavior. Attitudes and values held as true provide the built-in biases which help determine the way people respond to many circumstances. Perspectives on any number of issues, due in no small part to background and attitude formed through past associations with persons and community, govern to a great extent how people behave in many circumstances, both novel and day-to-day. The degree of rationality we hold in circumstances will be pre-determined to some extent by the attitudes and biases which govern our root thinking. This should not necessarily be viewed as bad or undesirable, but must be recognized for further study and learning as individuals and collectively.

Part of the question which must be dealt with is the extent to which all persons been given equal opportunity to access technology. Traditionally, the norm for most education about technology has greatly slanted to include white Anglo-Saxon males, disallowing to a great extent females and persons from other races and ethnic groups. We must question the educational orientation toward the use and/or application of the technology. We must also question how knowledge about the technology will enhance the likelihood of success in diversifying the culture with respect to technology as well as in other participatory ways. Full participation in the technological culture can only be realized through full understanding of the technology.

Much the same as making money requires money, getting started in technological organization competition may certainly require getting one's foot in the door and getting started. Tradition leans against the non-experienced person or organization, but how can one gain experience without access to the technological tools? Hiring and firing practices in organizations must also come under question. Awarding contracts according to tradition or providing preference based on 'connections' rather than actual credentials, the best bid, or other rational behaviors obviously reflects the 'good old boy' network of doing business. Such practices also raise obvious questions about our attitudes toward change and progress, not to mention quality, productivity and basic competitiveness.

Issues and circumstances related to equality and diversity in the technological organization are not necessarily simple, certainly not straight forward, and they will not be easily dealt with. Persons with technological knowledge will be in leadership positions, and thus, called upon to change the situation to evolve a balance between diversity in organizations representative of the actual broader culture.

Selected Significant Diverse Groups

Race and ethnic groups provide one of the primary focal issues in diversity, if not the historical basis for much of the current discussion. As racial and ethnic groups continue to expand in America, the total culture must become the broadened 'melting pot' American tradition is based in. Characteristics of each diverse group provide opportunities for a rich and fertile enlightened cultural experience, including many opportunities for multiple perspectives, competition for jobs, resources, and other opportunities in the technological culture. Differences can certainly lead to conflicts and hostilities and fester into potential problems. They can also be opportunities for learning and growth. Diversity will have an impact on quality and productivity, both for individuals and collectively for organizations and the culture at large.

Differences in gender, sexual orientation and sexual habits are also part of the diversity in the technological culture. Gender relates to male and female; sexual orientation relates to homosexual and heterosexual; and sexual habits range from sexual conduct in the office to how we evaluate and promote in the organization. While these may each seem relatively straightforward, issues based on gender, sexual orientation, and habits relate to how tolerant we are as individuals and organizations. How far can or should the organization go in determining or using sexual differences as related to work assignments, evaluation, and other situations and circumstances? Is it appropriate to place persons with obvious physical differences equally in all situations, ranging from work to education and elsewhere in the broader culture? Similar to other human sources of diversity in groups and subgroups, the richness and fertility of the organization as well as the
culture at large will clearly be a function of the diversity which is encouraged and tolerated.

How can we assure equality and behaviors in the best interest of all involved? Particularly when presented with differences among subgroups regarding sexual mores and behaviors in the workplace, what constitutes acceptable bounds of policy, discipline, and professional behaviors in general? What are the boundaries and acceptable behaviors on sexual harassment? Not only in the traditional sense of male and female, and supervisor to subordinate, but what about diversity related to orientation other than same sex? Are there appropriate limits on jokes and innuendo? How much should persons of any sexual orientation have to tolerate in terms of pictures on the walls, pressure to go out on dates, performance of suggestive acts, types of clothing worn, assumptions about gender to perform certain types of work, and so on? Regardless of degree of sensitivity, and despite specific rightness or wrongness, we must be prepared to address and deal with diversity and sexual issues in technological organizations.

Diversity encompasses individuals and groups that experience handicaps and diseases. Certainly the technological organization must be prepared to deal with issues concerning handicaps and diseases in the changing technological culture. With the advent of the "Americans With Disabilities Act" and other related efforts to bring persons with disabilities into the workforce and accommodate their needs in virtually all ways possible, technological changes must occur. What constitutes a handicap, and what are appropriate way to address that handicap? And how are these differences based on handicaps to be paid for? Do diseases such as AIDS and alcoholism constitute diversities that must be dealt with in some manner which is equitable by individuals, organizations and the culture at large? In what ways? Will it become reality that pre-existing conditions may likely not be relevant and/or detectable at the time of hiring, but become issues sometimes years after an individual has been a part of an organization? Does the issue of how much responsibility the technological organization has to accommodate an individual with a pre-existing disposition to heart disease, for example, need to be considered as we deal with diversity?

A final area of diversity that the technological organization is concerned with is religious and other special interests, which includes virtually any special interest group which constitutes a separate viewpoint represented in a sub-group in the organization or culture. Political action committees (PACs), unions and other groups who can exert influence on person and organization fall into the category of special interest group. As with other forms of diversity, when viewed individually and apart from the workplace or other functional elements in the technological culture, these diverse and special interest groups are not necessarily undesirable. But when placed in the context of the technological organization, such diversity can prove to be a detriment if not handled correctly.

Examples of complexities in religious and special interests as related to diversity can be seen in issues such as prayer in the schools. While prayer in the schools may seem acceptable to the majority, it may not be acceptable according to the values and views of some minorities. Religious groups often attempt to influence individuals, organizations and the culture at large to adopt their often rather narrow view on issues or circumstances. Such views are not necessarily in the best interest of the broader community or culture regardless of how well meaning the religious organization may be. Likewise, PACs organize to exert influence in the political process and bring diverse views into the broader discussion. Well financed PAC agendas can cause considerable change/influence in directions which are not necessarily in the best interest of all.

Technology, Diversity, Tradition And Obstacles To Change

The only way to control technology is to understand it. Similarly, if we are to ever use the diversity and take full advantage of differences for strengthening our organizations and culture at large, obviously we must better understand the circumstances surrounding diversity in the technological culture. Technology traditionally facilitates the changes, but facilitation can only occur if persons are allowed opportunities to become fluent with the use of the technology. If persons from diverse groups cannot access technology can they gain experience needed to facilitate change? Traditional barriers in organizations, communities, and by individuals who remain locked in to norms and mores of the day must be removed. Obstacles to access technological tools may be:

1. **Stuck in a rut.** Some persons simply are not able to get out of their locale and gain access to the technology. Whether psychological or physical, this barrier can be a very real issue.
2. **Time for existence only.** Persons primarily concerned with living, day-to-day, may lack time or inclination to pursue accessing technology.
3. **Different priorities.** Persons from diverse groups may not have priorities, for various reasons, to place technology at the top.
4. **Barely know tools exist.** Persons from diverse minority groups may barely know tools are out there. How would they have been exposed in the first place?
5. **Leadership role models.** Persons from diverse backgrounds may not have had role models to show them technology.

6. **Separate but equal.** Diverse group persons may not be educated in 'separate but equal' circumstances. Schools may be separate, but they may not always be equal.

7. **Entitlements breed neglect.** Persons who have grown up on welfare or other types of social services may find it difficult to break the cycle of support.

8. **Institutional bias/predisposition.** The system, simply stated, may be prejudiced toward disallowing persons from diverse groups to access technology. While these may not be intentional, they can be very real.

Until opportunity is first afforded the persons from all groups, regardless of how diverse, they simply cannot gain sufficient access leading to experience for facilitation and change. We must also rightfully assign part of the responsibility to the educational system at all levels. Equal opportunity to education about technology will be a major determinant in the build-up of experience necessary for diverse groups to bring to the table of participation and opportunity. Traditionally, we have built our democratic culture through consensus of the majority view. Perhaps choices made in the best interest of the majority are simply not in the best interest of the minority groups. Frequently some needs may simply not be met as well as others in our culture. Part of the debate regarding diversity must ultimately include how much emphasis can and should be placed on individual needs at the possible expense of the majority.

Perhaps equally important, how will new needs and requirements in the 'melting pot' be paid for? Many majority persons may tend to think they are being very rational in pointing to lack of resources and lack of previous participation in the building up of the resource base for deployment as reasons for supporting only majority views and access to technology. If we never afford access to the technology, persons cannot be expected to provide a contribution to the resource pie. Full technological participation may only come through conformance to the technological functions infrastructure. If we do not help persons from diverse backgrounds conform to the technological functions in a productive manner, we can only expect those persons to conform to other mores and values that may be less productive from the technological viewpoint. Many persons may choose instead to participate in gangs, drug wars, prostitution, and other possibly less desirable activities counter to the technological functions infrastructure model.

It takes time to study and learn about technology. Freedom and ability must combine with time to provide the opportunity for change, both among individuals and collectively within cultures. Diverse groups are no different; they require time, freedom, and ability for full participation. It will be incumbent upon persons who are managing the technological systems and functions to help provide opportunities for persons of diverse groups to take advantage of in the technological culture. We need to be planning our response ahead of time to assist all in providing positive and pro-active responses to minorities such as a woman, a black person, a Native American, individuals from any diverse group. Rather than knee-jerk responses that are bound to lead to more problems, we need to create beneficial solutions.

**Political Correctness**

Part of what is driving the whole discussion relating to diversity is the broader arena of political correctness. Political correctness will be defined as *those behaviors or circumstances which seem to be the most readily achieved, or most appropriate to the majority, in a given situation, or at a given point in time.* The problem with this definition, and with political correctness in the broader sense is that what is most readily achieved or most appropriate to the majority, is not necessarily the morally or ethically correct thing to do. The notion and reality of political correctness is that it is almost universally tied to re-election and staying in office, rather than trying to do what is right.

Political behaviors are brought about by a myriad of forces, some good and some less good, but which must be factored into the broader cultural agenda in the democratic participatory society. What is good for the majority may not necessarily always be in the best interest of the diverse constituencies which make up the society. When it is fully understood that part of what makes diversity diverse and different in the first place, may in fact be non-conformity, this can create a particularly difficult situation--making fair, equitable, representation in the political process difficult as well.

Equally as perplexing, determining what is actually right and wrong can be an extremely vexing problem, further complicating the political process. For example, issues such as abortion, euthanasia, and who gets how much health care are highly complex and volatile issues that illustrate how doing what is politically correct--particularly when playing to the majority for re-election--may not necessarily be the morally and ethically correct behavior.

**The Government's Role.** By default as well as design, the government has a responsibility and role in the issue of political correctness as it relates to diversity as well as moral and ethical situations and circumstances. Some may argue that we are overly bureaucratized with checks and balances. But in our system of governing, no one person or group can
generally take full control, as is true in some other governing approaches. Diverse views can still be felt and exercised. And, assuming we elect our best minds and leaders to represent us, we should be able to expect some of our best ideas to surface through the electoral process, largely in the processes of state and federal congressional bodies.

But government and individuals can only lead if persons will follow. If government is not truly representing the views of its constituencies, those representatives will likely not be elected or re-elected. In fact, even if the morally right things are being done, but they are not politically correct, it is very unlikely that a leader will be able to lead. Common sense says that if politicians 'buck the system' too much, they will likely not remain in office too long. Might this be one of the potential flaws in our system?

How do we bring about social change if the status quo, as represented in the government, if we are always shooting for the middle? And does this only further embrace and engender complacency and mediocrity rather than truly help set a change agenda based on high ideals? And how can we reconcile individuals and groups in our culture that wish to be more tolerant of change, such as bringing diversity into the fold, versus those that may wish to uphold strong traditions and values related to the way things have been over time? Does this present strong possibilities for irreconcilable differences between and among the various diverse constituencies which are represented in the United States and in various communities and geographical locations?

Government is always in a balancing act between promoting progressive change and holding back the values and progressive change agenda. Traditionally, some may argue that the so called "conservative right" is represented by the Republican Party and the so called "liberal left" is represented by the Democratic Party in American politics. There is always a gray area between these two seeming extremes, and that many politicians do not any longer fit the traditional liberal versus conservative rubric. The more conservative view generally holds that the less government the better, while the liberal view generally maintains that more governmental intervention is required to have the type and quality of life which will be required for the future. While many argue that diversity and similar issues do not have any business being tampered with by the government, others indicate that far too little is being done. Likewise, some will say that moral and ethical issues are not the business of the government, and should be left to the church or other non-governmental institutions. Still others indicate that there is an absolute place for helping define and enforce morality and ethics through the government.

Perhaps what is most obvious and important is that the government's role is to bring diverse views together into a cohesive voice for unity and strength. A shared vision of the future for American technology world wide is on the horizon. The global view is becoming increasingly important as more and more nations/cultures democratize, requiring our support and nurturing. We have been through most of what they are undertaking, and our leadership as a nation will become in increasing demand.

The government's role must also be sorted out carefully for at least one other reason. Perhaps one person out of five or six is now employed in some type of public function in America. Whether it be a public school, a social agency, a state or local department, we must recognize that this situation is a significant change from the past. We now have a larger proportion of our labor pool aimed at doing our own public business for us, relative to past decades. This situation raises several intriguing and important questions for us:

1. What is the public citizenry role versus the government's? Remember, government is essentially us, as individuals and collectively, at various levels.
2. How much government is healthy and needed? How much should citizens give over, or defer, to persons in government? How do we--or can we--cut back on the amount of "public" government and bureaucracy once it is in place?
3. Does it become more difficult or increasingly easier to govern ourselves with increases in the numbers of persons directly involved--on the public payroll?
4. Do increasing numbers involved in public service, or government, pose an actual threat to democracy? And if yes, what can and should be done about it?
5. Morally and ethically, should more 'public' work be of a voluntary nature, and not for pay? Who would want to do it, particularly as a volunteer, and possibly as a paid function, elected or appointed?
6. What is the role of public education in all of this? What should the relationship of private and public education be in terms of protecting integrity of democracy?
7. Can public education be truly held accountable if it has no competition? And is it a contradiction of the principles of free enterprise to not allow private and public education competition through vouchers and other mechanisms?
8. And yet, how can the basic precepts of the participatory democracy be upheld if not through mandatory public education?

The way we govern ourselves has changed, and will continue to change. This also parallels much of what is
going on in the private sector with reference to how we make private decisions. The 'consensus' approach to management, both in our organizations and in our families, is bringing about many interesting issues related to how to lead and make things happen culturally. As we continue shifting from a dictatorial and autocratic form of leadership to a more team based consensus and democratic model, what are the implications for style and approach to leadership, in any organization? There exists, today, a much more consensus-building, lead by example, and persuasive type circumstance and approach. This will continue shifting, and challenging leaders, for the future.

Citizen Responsibility. The strength in the system truly comes from diversity, even though we must still ultimately have some majority view or direction to help us all move forward. At the basis of the system rests the important and fundamental right and responsibility of all citizens to bring even minority views forward and place them on the agenda right along with other, perhaps better established agenda items. Consider that much of what was once thought to be unusual and different in our culture is now the norm. Many of the ideas that may at first seem strange and unusual may in actuality be the change agenda for the future, as is often the case with technology. Change is at the root of healthy technological circumstances. The dynamic that must be represented technologically for healthy and competitive circumstances to be present is also true for our government, through individuals, involved in the democratic process.

Persons need to be well informed and educated, using their technological and other talents to the fullest. The individual citizen becomes responsible to pursue and uphold technological opportunities for their own, and collective, enhancements to the broader system. If any sub-group, regardless of how diverse, is not afforded the opportunities for involvement and participation, their own individual (and thus the collective) ongoing improvement and well being would seem to be in jeopardy. As a culture we collectively must make some type of moral and ethical commitment to the individual for the collective health and vitality of all.

Organizational Responsibility: What is the organizational responsibility as related to diversity, moral and ethical situations and political correctness? The basic technological organizational responsibility should be to remain consistent with laws as provided by citizens acting through and with their government. It seems reasonable to expect that the technological organization will pay taxes, provide jobs, use natural resources wisely, have an eye to the future for technological opportunities which may help advance the culture, as well as the organization, and so on. There are also other important responsibilities that have to do with organizations being good corporate citizens for the cultural well-being and health of all involved. The relationship which must come to exist between individual citizens, government and organizations is an important one since this must be balanced for all to live and operate harmoniously and productively.

Tokenism and Reverse Discrimination — Making It Right? Doubtless, increasing pressures are being created to diversify the workforce and culture. Is tokenism a legitimate response to these pressures for change, however? If we hire the "token" minority are we patronizing the problem, possibly even aggravating the root of the issue of equality? If, for example, in the process, the person hired does not truly possess the necessary credentials, how can we reconcile the hiring of 'token' minority individuals morally and ethically?

Not only does tokenism raise very real and difficult questions in terms of the leadership of an organization, but it also may place the new employee in a difficult situation. This can also place others whom he or she may have to function with under duress. Is this fair, and if yes, how so? If not, what should be done about it? There are those who will argue that reverse discrimination is at work when recruitment for particular diverse groups of individuals is under way. Reverse discrimination could be of various forms, but some will suggest that if we are seeking one type person, then this disallows others, and in the process, the persons being disallowed are thought to be discriminated against.

It is possible, in some situations that the young white Anglo male is actually at a true disadvantage today. This may be true since many technological organizations are distinctly more interested in persons from other more diverse groups. Assuming this is in fact the case, does this type behavior help or hurt the overall broader diversity situation? Will more animosities and adversities be generated than resolved if in fact this is a mode of operation by some organizations? If this approach is not a legitimate approach to helping 'correct' the situation, how should we work to 'make it right?' If this approach is in fact less than correct, what is the definition of 'affirmative action?' Perhaps more important, assuming we wish to take affirmative action, how do we proceed, both in principle and according to the law?

This section is not to be regarded as a guide for how to, or how not to do affirmative action. The whole area of activity, whether in principle or practice, represents some extremely delicate and sensitive issues and circumstances. We must understand that while strict compliance with the law is required, what is truly needed is to do the right thing morally and ethically, as well. Doing the right thing, therefore, will require careful adherence to reporting and paperwork, as well as proper procedure, to assure that all individuals and communities were in fact aggressively sought out and given
opportunities for review and possible consideration for employment. We will also have to create proper and careful paper trails for review of all persons in our organization to assure that equal and affirmative action has been followed in the ongoing growth and guidance of continuing employees. Careful attention must be paid to treat all persons equitably, and without tokenism, to avoid possible reverse discrimination issues or going too far in any one direction and being fair and equal in all directions. Hiring of a top-notch human resource person to manage these affairs is likely a key part of the answer. The technologist will likely have to make the bottom line decision on hiring—and firing.

**Ethnocentric Versus Holistic Views.**

Ethnocentrism is the technical term used to explain the view that one's own group is the center of everything, and all others are scaled and rated with reference to that ethnocentric view of the world. Ethnocentrism helps explain certain behaviors which we often become very defensive about. The extent to which an individual is incapable of seeing the total culture, or seeing themselves as part of the total culture, could be potentially damaging to the overall culture. It behooves us to explore the issue of ethnocentricity, particularly from the broader view of political correctness and organizational behaviors.

On the one hand it is important for persons to understand their heritage and background, and to uphold the traditions of their history and evolution. But if upholding one's heritage is done at the expense of understanding the broader community and groupings, it might be somewhat counter productive to the broader group. On the other hand, what if the broader culture and group is not tolerant of the sub-group view? The point is that we all must be tolerant and provide an atmosphere that welcomes diversity in a macro view, rather than a micro view.

While it may seem somewhat contradictory to allow all views to be represented in our culture, to disallow any point of view will only weaken the system. Even though many of the views may seemingly be damaging, how can we, in good conscience, disallow any of these? If, for example, a controversial group wishes to hold a public rally to represent its view, regardless of how unpopular, can we uphold our constitution on the one hand without protecting the rights of the minority view on the other hand? And how far can, or should, we go to allow dissent within the fabric of our culture? At what point does anarchy and chaos become the rule, rather than quieting the dissenters who 'rock the boat'?

It can become extremely difficult to govern and manage ourselves if we can not balance healthy differences and diversity of view and approach with the need to move forward with a collective voice and shared vision. The strength of our system comes, ultimately, not from all people thinking the same. Quite the contrary, our strength comes from our diversity. This strength will ultimately be weakened by not allowing challenges to our system. How strong can our system be if we can not ask questions of ourselves and resolve and reconcile the questions and the challenges?

Questions about providing all persons with one national language or history lesson in schools, versus having local/regional ethnic representation only, will likely provide some of the greatest challenges in these areas of discourse as a nation in the future. Similarly, moral and ethical questions about free speech and thought versus allowing prayer in the public schools will likely lead public debate. If persons do not bring their view into the public discussion, but rather divorce themselves from the broader discussion by starting a private or 'home' school or some other practice, and are disallowed from the debate, we all surely will suffer. Democracy requires full participation for healthy governance.

As professionals in technological organizations, we will be expected to uphold the norms of our organization, similar to the way individual citizens must uphold the norms and mores of their culture. Failure to uphold societal and cultural laws, and values and mores, may result in consequences that include extremes such as being fired in the organization to being placed in jail in the society. No doubt professionals will also be placed in various circumstances which will clearly challenge our sense of moral integrity and ethical judgment. The politically correct organizational thing to do may not necessarily be the right thing to do for various persons or sub-groups. For example, if we consistently seek one gender or ethnic group for selected types of work, and do nothing to break barriers for others to gain employment in these or other job types, it may be politically correct within the fiber of the organization, but not the morally and ethically right thing to do.

Part of what must be balanced increasingly in the future is the need for leadership, providing deviations from the norm and the established patterns of behavior. This may mean working to establish scholarships for diverse groups, encouraging organizational employees to mentor diverse youth groups, beginning support mechanisms for diverse groups of employees to assist them in advancing on the job, and bringing the education to the workplace, among others. Clearly, however, to do nothing may well be morally incorrect and ethically devoid of leadership at a time when it is sorely needed and warranted. We must look well ahead to the reality that ignoring diverse groups will likely only throw fuel on the fire. The solution, as with virtually all other issues and circumstances facing technological organizations in the future, lies in creative leadership and providing new and enhanced approaches to dealing
with situations.

**Moral And Ethical Issues**

It becomes increasingly obvious that morality and ethics is foundational to the issue of diversity in the technological culture. Moral and ethical issues formulate some of the most important and difficult areas of thought for technologists, and for the technological culture as a whole. We must come to better understand moral and ethical circumstances if we are going to work technologically. Resolving complex technological issues in meaningful and productive ways requires a firm moral and ethical grounding.

At the turn of the century, W. G. Sumner writing about *Folkways*, (1906) connected the common conception, or view of the day that a culture embraces, as the basis for morality. He also defined 'ethology' as the study of manners, customs, usage, and mores, including where they come from, how they evolve and/or decay, and certainly how they affect the culture overall. The term 'ethology' comes from 'ethos,' defined as the things which pertain to characteristic usage, ideas, standards, and codes by which a group was differentiated and individualized from other groups. Ethics are things which pertain to the ethos, and therefore, the things which are the standard of rightness. The Romans provided the term 'mores' as a practical interpretation of the 'rights and wrongs' and the 'truths and falsehoods' that are upheld in a culture. Mores are interpreted through everyday welfare and well-being of a culture, noted in individual and group behaviors.

Sumner goes on to state that property, marriage and religion are the most primary of institutions to be upheld in cultures. These began in folkways, developed into customs and ultimately became mores through the addition of the philosophy of welfare and general conduct of the day. The mores that have evolved over time, and which are evidenced in the present day culture, demonstrate themselves through the rational and overt creation of institutions by which we live and carry out our affairs. Property, for example, grew out of systems of bartering for goods and services and has evolved over many years into complicated systems of ownership, banking, credit, money and exchange systems, all which form the basis for conducting our business affairs as a culture. Another institution that demonstrates how mores have evolved is legislation, legal activity, and laws for a culture. Strong and effective legislation must be consistent with mores and values of the day. We may believe that legislation seems straight-forward and well defined. However, by the nature of our diverse culture, it must be somewhat elastic and open to interpretation, regardless of the level or application for which it is intended. Examples of contemporary legislation that is difficult or impossible to align with mores of today, and that clearly relates to technology, include: seatbelt laws-how can they be enforced; speed limits--we all disobey this law; drinking and driving--what are the allowable limits?

While difficult to align with the mores of the day, morally and ethically most of us know that we should wear seat belts, obey the speed limits, and not drive while under the influence of alcohol. Obviously, translating morality into workable laws and ethical and acceptable values for everyone is difficult and sometimes impossible. At a practical level then, *ethics* is the 'standard of rightness' while the *morality* is the interpretation of our mores. A majority view tends to provide the base from which ethics and morality are born and judged over time. The overall direction a culture may choose will generally be both changeable and difficult to change. Equally as important, if we are to be a part of the direction setting mechanism, at least organizationally, it is vitally important to understand relationships inherent in ethics and morality.

Moral codes possessed by individuals and reflected in organizations and the culture at large will govern how we behave and make decisions. If an organization has no predetermined moral code, particularly defined and in writing in the form of a mission or policy statement(s), it will be increasingly difficult to know how to behave in various circumstances. For example, if an organization has no written policy on age or gender discrimination, how will managers know how to behave when confronted with a circumstance that place them in an adversarial relationship. While it may seem manageable to have unwritten moral codes of conduct, it can be problematic:

1. What "guide" do managers have to go by when nothing is in writing?
2. How do managers know if their approach in addressing matters of ethics is consistent organizationally, as well as appropriate?
3. What if actual illegal decisions are made, due primarily to inappropriate decisions or lack of guidance in written policy form?
4. What is the manager's responsibility as related to placing this type policy in writing? Should a manager be held liable for not taking action in writing prior to the issue becoming a problem?

Much room for interpretation exists where no written policy is in place. The effective technological organization should provide clear, written procedures to follow for assuring compliance to laws for equal opportunity and other critical steps. The organization's procedures should also be widely known and followed.

**Virtues and Values Orientation and Technology.**

Virtues, or values orientations, play an important role in ethical and moral issues related to technology.
Traditional virtues or values of ‘success’ in the capitalistic culture include self-discipline, compassion, responsibility, friendship, work, courage, perseverance, honesty, loyalty and faith. This was written about by Bennett, in *The Book of Virtues* (1993.) These values assume hard work and responsible orientation to the 'common good' of individuals and of the society as a whole. But what is the impact of technology on these virtues? How do people handle virtues and values within the context of changes in the very ethical fabric of a culture that is becoming increasingly technological--and one in which work and responsibility is being redefined almost on a daily basis? Responsibilities and critical questions about virtues and values issues exist.

**Discipline.** Control of technology assumes discipline, and the very need to understand technology requires education and knowledge. The extent to which we are capable of respecting one another, our properties, and valuables, will reflect our ability as a culture and as individuals to move forward collectively with technology in a systematic and disciplined manner. Individuals left out of the technological loop will become less and less disciplined. This also connects to conformity in the technological culture. A lack of discipline will lead to the deterioration of the system and only contribute further to chaos and detrimental results in the overall system. The value of discipline must be maintained and upgraded, or restored where needed, if progress is to be made in the technological culture, individually and collectively.

**Compassion.** The compassionate individual will try to make conditions better for others. Many may equate this value with the Christian belief that we should look out for others and take care of one another. Individuals who are compassionate are capable of "feeling the pain" of others, and taking action. The technologist generally has a fundamental belief that conditions for individuals and cultures must be improved and enhanced through technology. But as capitalists, what is the motivation for technological improvement--and what should it be? Where does compassion start and leave off in capitalistic and materialistic technological activity? Who gains and who loses when we improve on conditions? Are there ethical limits to technological activities and circumstances under the auspices of compassionate deeds--and, should there be?

**Responsibility.** Similar to other virtues and values, responsibility must be present to effectively provide technological functions and systems. If persons say they will be responsible to carry out certain functions critical to the broader system or functions, it must be done properly to move forward. But, at what point does the organizational responsibility leave off and the individual responsibility begin? Is it possible to be a productive and successful individual while always placing the organizational and societal responsibility first? Can a person be responsible to oneself as an individual and also reflect necessary societal responsibilities at the same time? If the individual consistently places selfish virtues and values ahead of the good of the collective group, how can one develop the compassion virtue? The capitalistic society is based in part on the assumption that individuals will aggressively and assertively pursue the development of technological and other systems for various productive acts and outputs. And some might say that it would, in fact, be irresponsible to not pursue the development of technological and other systems, whether individually or collectively. Does the current democratization occurring increasingly around the world, and the virtual demise of communism and socialism in several cultures, indicate we must be doing it right?

We may question to what extent we are obligated (responsible) to ourselves and others to develop our innate talents and skills, particularly technological, to their maximum level. If I do not push the development of my personal or collective resources, am I in fact not being responsible to myself--or to those around me? Yet if I become so aggressive in the process that I begin to hurt those around me, and perhaps even hurt myself as an individual with self-destructive behaviors, have I necessarily been responsible to myself or the society? When do we know, or how do we know, what the limits are on responsible versus irresponsible behaviors technologically?

**Friendship.** On the one hand, it may be readily argued by some that technology has enhanced friendships through communication systems such as telephones, videos, pictures, and others. On the other hand, increased mobility and pressures to conform to the technology in general have become increasingly detrimental to carrying on personal relationships and friendships. As we have become increasingly technological in our personal belief and value systems, have we become less and less able to have real friendships--one of the top priorities of our lives? Do we increasingly remove ourselves from personal situations which require significant time to develop and maintain--often at the expense of time to study, learn and advance with the changing technological functions and systems? Can we afford time for real friendships, and how can we aggressively and assertively pursue capitalistic activities--moving forward--being friendly in the process? Is this a conflict and contradiction in needs and requirements for individuals and organizations?

**Work.** It is nothing new, both traditionally and currently, for work to be highly regarded is a virtue and value. As the technology has permeated our way of life, the nature of work has changed substantially. Work has transitioned from farm work in a physical sense, requiring strong backs and possibly less than strong minds, to the current scenario which is quite different.
Technology has had an impact on our view of work as most jobs increasingly require strong minds and fewer jobs and work require strong backs. Concurrently, as we have transitioned increasingly toward a service economy, and less and less manufacturing jobs for blue collar workers are available, work has also become less time-clock oriented, further complicating the whole work concept. We now see increasing numbers of persons who are paid via salary, with an unspecified time commitment that often requires increasing amounts of time. And, with the increasing advent of part time and temporary work, as compared to lifetime careers, how will we view work as individuals and culturally in the future? Will persons want to take work seriously? Will we commit substantial time and other resources preparing for work only to find we are not even prepared for the right areas of work--jobs may no longer exist?

What can the impact of work changes on quality and productivity in our culture possibly be as we create massive downsizings and lay-offs in traditional work activities throughout western culture? Should anyone be surprised when people of any age, and from any part of the country, become less than totally excited about doing a good job, knowing fully well that they will likely not have this job for long in the future? What will be the long-term effect of knowing my job will be replaced by automation? Or, that the plant will be closed and moved to Mexico or Puerto Rico for cheaper labor rates? Can people really be expected to change and adapt to these conditions and what can the overall concluding attitude become in the long-term cultural view? Can we expect a positive attitude between management and labor?

**Courage.** The strength to carry on, even in the face of personal danger or adversity, is a highly regarded virtue of many cultures. Certainly, many in the American culture point with pride to courage of Christopher Columbus, the pilgrims, the pioneers, or to Chief Joseph and other Native Americans. Perhaps the answer to the changing nature and value of work in the technological culture, is that we also simply must be strong and move forward with courage and conviction, meeting the demands of the future with a positive and proactive attitude. Any approach not based on courage will only result in counter-productive and negative results. The future requires an increasing emphasis on moral conviction and courage to be different in positive ways, providing often unpopular alternatives to problems and circumstances that will cause change and turmoil regardless of how we approach them.

The reality is that giving birth to new products, providing new and innovative designs, and perhaps making technological decisions in virtually any capacity is not only difficult and often unpopular, but it also often requires tremendous courage. Technological functions and systems are dynamic, and by their very nature, must cause change. It is simply not possible to make improvements in the production system, introduce new products, or make the safer and more efficient model without causing changes in peoples' lives. Change must be knowledge based, as well as carefully planned and implemented. Even so, it will probably be less than totally satisfactory for many persons involved, including the persons who are seemingly in control.

**Perseverance.** Much about technological virtues and values in a changing world relates to persevering in the face of doubt, adversity, and challenge. Some persons simply lack the creativity, ingenuity, and vision to bring technological change to fruition for the betterment of all, or even the majority. Technological change and behaviors will create ’doubting Thomases' who must see and touch it to believe it. Pessimists will insist that 'if man were intended to fly, he would have been born with wings.'

Technology requires the virtue and value of perseverance. Persons with insight and ideas must be tough and continue developing their idea, putting their innovation together in new ways, and keep inching forward, despite what people of little vision and ability may say. Perseverance has to do with progress, and the role of technological leadership is when others cannot see what the future is, or how the technological vision must move, the technological leader must persevere.

**Honesty.** Perhaps in a simple and non-complex set of circumstances the virtue of honesty seems simple and straightforward. We already know that very little about technology is simple, or for that matter, exactly as it may seem. For example, at a macro level, is it honest to knowingly move forward with production, requiring or using energy, as we have done? Have we done this to the extent of building a way of life on a mass scale, using technology that requires energy which is being purchased/refined at unrealistically low rates? And if we build this way of life in such a way as to actually abuse the environment in the process--plundering and extracting resources with virtually reckless abandon--is this honest? If so, honest for whom, and under what circumstances? And how do we assure, either in macro terms or micro day-to-day ways, that all persons globally have an equally fair shot at obtaining and using those resources? Is it honesty to exclude some persons, or is it even reasonable to attempt to address questions of inclusion/exclusion as issues of honesty?

On a much more personal level, if I am in charge of certain technological functions that are perhaps less than safe or have the potential to do harm, how honest can I be? If I engage in technological activities which provide work for persons for some period of time and know that the set of circumstances is going to change, and I do not help the persons prepare for the changes which are inevitable, how honest am I? What are the parameters on honesty for the technological functions and systems of the future? What are my personal
Loyalty. Just as loyalty in personal and family is a virtue and value, loyalty also exists in work relationships. Just as certain, however, is that technological change has implications for loyalty personally and culturally, in the home, workplace and elsewhere. The need for loyalty may have never been greater now than ever before. As technological challenges become increasingly intense due to global resource and environmental issues, democratization, pressures on families, and changes in the workplace, the need for loyalty also increases. Fortunately or unfortunately, people will be loyal only as much as the culture permits—and the lack of loyalty can only undermine the culture’s ability to be productive and innovative. Thus, the lack of loyalty will breed a sort of downward spiral that will only cause additional negative effects. And to what extent can loyalty be bought and sold? Is true loyalty something that should be treated like a commodity and placed on the auction block to the highest bidder?

Faith. Perhaps more than any other virtue, faith may have become an entirely different set of circumstances during recent times, largely due to technology. Part of the nature of faith requires a non-failure orientation. Faith was once a function of belief in God, primarily related to an agricultural need for rain and general dependence upon the elements. Although faith would certainly be tested in various ways, including dry spells, pests and pestilence, and other natural forces and influences, it did not fail. Part of the importance of faith in God or other non-tangible spiritual entities was that this type of faith served as a useful, if not essential, psychological outlet or ‘check valve.’ When everything else would fail, it could be rationalized by saying that it was an ‘act of God.’

The function of faith has shifted from a belief in non-tangible and spiritual entities to a belief in the physical and tangible technology. We no longer look to God to supply rain for crops; we create elaborate irrigation structures. We now put faith in medical science instead of God to create quality of life and to prolong it. But technology will, by its very nature, fail. With the eventual and undeniable failure of technology, we must have serious misgivings about the nature of faith. Psychologically, it would seem critical that we have the ability to believe in some infallible entity. One can only wonder about the long term impact on the persons’ psyche, without the ability to place blind faith in traditional non-fallible entities.

As we come face to face with issues of spiritual reverence, belief in God or faith in technology rather than God and other religious forms, it is important to realize that while technology can feed the body, it can not address the spiritual needs. At least in the deepest and most essential long term ways necessary for mentally healthy persons who can live and appreciate a good quality of life, it would seem that some sense of spiritual direction beyond the technology is critical. The moral and ethical compass that is guided by the technology only is likely to have magnetic attraction that will be pulled in ways which are not altogether bad. However, if not guided by some sense of a higher, elusive, and non-technologically oriented God or other religious form, faith in technology may only lead to a less than totally satisfying life. Faith in God or similar figure or form can not fail in the same way that all technology can, and ultimately will, fail.

Moral and Ethical Relationships to Technology. While the technology in and of itself is not necessarily right or wrong of its own accord, it brings about questions of right or wrong—and of good or bad. While this issue is often uncomfortable, it is also inevitable since people who use the technology will virtually always be forced to determine how it must be used and applied—and the inherent rightness or wrongness will ultimately be a function of the circumstance. Since technology is action oriented, and as things happen resulting from the action, the resulting impact must cause positions to be taken and effects to be felt. People must draw conclusions and be reactive to attempt to be in control. We are compelled to make decisions—often under duress, and without the luxury of time and possibly other helpful and perhaps necessary resources.

The technology gives us the ability to do virtually unlimited things. We often do not fully comprehend the result of technological application, let alone project or assess the ultimate net result. We are frequently under tremendous pressure to make decisions and push the technology into use in various ways without having done even preliminary analysis and assessment of the impact and implication. Thus, in the minds of many, we are using the technology without fully understanding it when, for example, we place it in the hands of consumers. If negative effects occur, can we fault the
producers of technology, the consumer, the government? Or is there a need to establish fault at all?

How much can any of us actually ever expect to know about the technology? It is virtually impossible to fully understand all of the technological nuances and details which seem self-evident, let alone those that are less evident. Even individuals who have studied a given technology for many years will readily indicate their lack of full comprehension and understanding of it. How can those who are only getting started be expected to understand it even enough to be helpful in an organizational sense? And is it ever possible, given the dynamic nature of technology, to be sufficiently knowledgeable? And for that matter what does it mean to be sufficiently knowledgeable? When do we ever know enough, and as each branch is understood might there be another two or three branches uncovered?

When people get hurt, or when technology runs amuck, as it inevitably will, even with the best planning and implementation, we must stand ready to be held accountable. Technologists and technological organizations must do the morally and ethically correct thing. It is only by being fully apprised and informed prior to moving forward that we will be closer to having done the prudent and proper things in preparation for our technology being placed in the consumers hands. This may raise profound and potentially distressing questions about the nature of progress and development. At the core of the issue is our fundamental, and ultimately, very personal moral and ethical responsibility to understand technology we are using and attempting to manage.

Religion and Technology Issues. At the root of the discussion regarding technology and moral and ethical responsibility, and clearly relating to correctness in virtually every sense of the word, is religion. This section is not about judging any form of religion as correct or incorrect. Nor is this about placing any one form of religion under the microscope for examination. Much of the discussion will tend to be more oriented toward what most of us accept as being defined as Christianity simply because many do have experience in this arena. By no means is there any attempt to orient the discussion toward this faith or to disallow others. It is simply that this is the vehicle which often will be used as the means to help us move the discussion forward.

Abundant biblical references to technology, such as the symbols in religion as well as many previously discussed virtues illustrate connections and relationship of religion to technology throughout history. This section addresses the current and future religious connection to technology, and the broader issues which are of a moral and ethical orientation for technologists. Is the materialistic, physical nature of technology, and the desire to accumulate wealth actually becoming a form of religion or religious expression? Is the desire and need to accumulate wealth consistent with basic precepts of Christianity, or most conventional religions?

Is the preoccupation in many cultures, certainly American, with working to get rich rather than working to live an appropriate response to the overall issue of work as it may relate to technology and religion?

Have we interpreted our religious views and interests in such a way to justify capitalistic and materialistic behaviors, including technological activities, as acceptable in terms of Christianity and perhaps other religious orientations? Is religion as it is generally practiced throughout America largely a mechanism to justify our technological activities as morally and ethically acceptable, regardless of consequences? Have we actually placed the technology center stage, justified within the context of religious orientation, and truly sold our very souls in the process? Has technology actually become the god of the current century? Has our dependence on and preoccupation with the technology been a virtual giving over of our entire spiritual focus to one that actually has little room for traditions of religion many of our forefathers practiced?

If one doubts the impact of technology on religion, consider the following points as possibilities:

1. Traditionally many of our ancestors oriented their entire lives around God and their interpretation of the religion of the day. Gradually this orientation has changed for many of us, and we no longer attend church or participate in any form of conventional religious practice.
2. Some years ago, life virtually revolved around the church in most communities in America. Today life revolves around work, running to catch up, trying to get control of our lives, and so on.
3. Our forefathers often relied on prayer or meditation. Are we more likely to do something recreationally, pursue acquisition or understanding of a new type or model of technology, or something related to technology as a form of solace?
4. And when we actually have physical needs, such as illness or hunger, do we generally rely with blind faith on our religious orientation to bring us out of the difficulty? Or is it a technological fix which we seek and ultimately use?
5. Values in the past were primarily formed by the church and religious orientation. Are values today predominantly a function of the technology-including television, mass production, consumerism, the me generation?
6. Traditional culture taught us to look out for others, to watch over our brother, and do for others before taking care of our own situations. Does life in the 'me generation' revolve only, or primarily, around self?
Technology and religion in our culture are largely inseparable and entangled in many ways, with it being difficult to know where one starts and the other leaves off. Is this the way it should be?

There is growing concern about a predominating view that all problems can be solved by technology. Some suggest we should equate technological progress with human progress. Many argue this attitude negatively impacts all of American culture. Consider:

1. The lack of democratic participation in the design and use of technologies that profoundly alter ordinary citizens' lives here and around the world.
2. The threat of global and local ecological crises fueled by technological advances with unforeseen consequences.
3. The increasing isolation of human beings from the rest of the living world, and a technological vision that would make most of the natural world--including most of the human body--obsolete.
4. The weakening of family and local community ties, even as we plug ourselves into machines that encourage long-distance relationships--and a false sense of power over distant events.
5. The tendency for new technologies and global economy to promote centralized political and economic power, and to homogenize and impoverish cultures.

This is basically a anti-technology view, one not held by all. Persons advocating this perspective may conclude that we slow down technological progress, indicating human welfare would be better served by the slowing of the process of innovation. The proposed slowing, and return to values of days gone by, may be consistent with traditional conservative religious foundations.

Religious orientation has been rearranged significantly toward technology over the years. Certainly we have become more materialistic, even greedy. Is this all bad? American culture enjoys one of the best overall standards of living and quality of life of any culture in the world. Most citizens are not trying to leave America, and in fact a fair number of persons are consistently trying to emigrate into America. Thus, even with all of the possible faults in our technological way of life, perhaps we do not have it so bad.

Our lives can be even better by more thoroughly recognizing the changes that are occurring, particularly as related to technology and religion. This raises questions about how we organize and conduct our daily lives and affairs in the technological culture. Our view of development and progress requires that we take a very proactive view of the future, meeting all challenges with the utmost in technological problem solving and aggressive solutions for those who will come after us.

There will remain conflicts between the religion and technology issue, and the notion of what constitutes progress. It is generally accepted that part of what has helped bring about the quality of life which most of us take for granted is reduced population growth through population control and contraception devices, and enhanced food production and medical care. These technologies are pivotal to improving the mortality rate and thus, the overall quality of life. But these techniques--technologies--also represent absolute and indisputable mechanisms for tampering with the natural order and function of our lives. Likewise, abortion and euthanasia represent extremes in the further evolution of manipulating the natural order of our environment and circumstance. Perhaps more than most others, these techniques, or technological procedures will cause many of us to draw more clearly the line on how we view technology and the natural order of things.

The way we approach technology depends on our perception of that technology or technique and our moral, ethical, and religious orientation. While we may consider ourselves to be rather progressive and liberal in our views about some technologies, we may actually be quite anti-technology and conservative in other ways. We may think a nuclear waste dump, land fill, incinerator project to serve a region, the new manufacturing plant, the four lane highway, and so on are all good ideas--as long as they are built in someone else's backyard. We are discussing the reality of a medical procedure such as disconnecting a loved one from the cardiovascular pumping device, the possibility of an unwanted or unhealthy pregnancy, the possibility of having to choose between who gets the expensive medical heart transplant, and other 'tampering' related issues. It is extremely difficult to reconcile what we believe our views to be and what they actually are when placed in one of these situations.

Recognize that religious orientation and our moral and ethical "compasses" actually dictate our technological behavior and functions. And this then provides the fundamental reasoning for aligning our technological philosophy and other views in rather forthright and overt ways rather than waiting until we are confronted with the situations that cause us to have to take technological action. Religion, at least in some form of practice, would appear to be a necessary element within the technological culture. The question is how to handle it alongside the technology, as with all else?

Conflicts of Interest, Rules, and Codes of Conduct. While we may be able to make decisions in a rather straightforward and simple manner for ourselves and our direct family members, it may not always be so simple and straightforward to make decisions in an organizational setting. What may be rather straightforward and conspicuous as a law of the land, such as production or quality rates or specifications, safety guidelines, and so on, may be absolutely contradictory to
what an individual believes according to personal faith. Conflicts will also involve extremely complex issues such as who to hire and/or lay off, and other decisions related to diversity such as whether to locate a new plant— with likely implications for who works in the future and who does not, and so on. The likelihood of any of us avoiding conflicts of interest based on our personal orientation are extremely unlikely.

We will be challenged on a daily basis, in our technological responsibilities and functions, to maneuver through various sets of circumstances which will cause us to be at least uncomfortable if not to question our possible continuation with the technology or organization. If we do the politically or organizationally correct kinds of things, to what extent must we sell our soul to remain a part of that organization or function? As individuals in the technological society or organization, to what extent should we 'prostitute' our beliefs and allow our ethical and moral perspectives to be compromised in an attempt to 'fit in' and do the correct types of things? What if we are criticized as being less than progressive, or being conservative and a 'foot dragger' for pursuing various activities less aggressively because of our religious views? Are we, culturally, on a collision course between religion and capitalism? Can we live and practice our faith in religious conviction terms, given the demands that the technology or organization places us within and upon us? To what extent must we actually compromise our views and convictions to be successful and correct in the technological organization and society?

**Political Issues And Control Of Technology**

The fundamental function of a technological organization is to produce something, a service or consumable good, in a quality manner. As part of this, controlling and managing technology is an important issue facing Americans today, not only in technological organizations, but culturally and individually as well. With all its faults and foibles, our form of democratic participatory government continues to withstand the tests of time. Other cultures throughout the world are now attempting to emulate the American approach to governing and control. It is the special blend of free enterprise participatory government for and by the people which gives both the promise and the responsibility of technology. We tend to demand and require levels of quality which force producers to tow the mark. This is partly a function of the way we govern ourselves, and of course our entire infrastructure as well. We exercise controls on technological organizations through our government, the economy, and individually.

**Government control.** Critics are sure to point out several potential flaws in our governing process. Among other things, the political process tends to become a popularity contest. Rather than bringing forward the leaders with the best ideas and abilities to put forward proposals for dynamic change, we often tend to rely on looks, public speaking abilities, and other personal characteristics that have very little to do with technology and control. Perhaps equally as compelling, the outcomes of elections are significantly influenced by the amount of financing a candidate can garner. Generally speaking, the better financed an individual is, the more likely is the possibility of winning. Equally as telling, incumbents who can change the political fund raising system are the least likely to want to do anything about the system since it would undermine their ability to raise funds and stay in office.

The process affords us all the opportunity to participate and take some degree of control over our lives as individuals and collectively. The concept of one person, one vote, is essentially the bottom line on government in our culture, at least in principle. We vote for representatives to participate in various levels of government, and to carry our voice forward. The beauty of the system is, in part, that if we do not like our representatives, we can work to replace them and vote in those that we think will be more responsive to our needs. At the local, state, and national levels, we generally hold regular elections to bring forward our best candidates for competing posts of varying responsibility.

Another of the key systems for control of technology is the policy, law and regulation function of government. As issues develop related to technology or tangential matters, lawmakers, agency heads, citizens groups and others bring forward concerns and information to assist in the formulation of legislation or other forms of policy to place before the public, appropriate rules and procedures for technological functions. This approach to governing the control of technology, while generally effective, is also problematic in some respects. While the debate and information gathering aspects seeking input on policy and legislation take a substantial amount of time, the pace of technological change can move at a rather substantial clip, perhaps out pacing the regulatory side. For example, as debate on environmental issues continues to rage over the issues of balancing growth and jobs versus degrading the environment, environmental degradation moves forward.

The environmental debate raises some of the most compelling questions about technology control and management. On the one hand, the free enterprise system is very much interested in bringing forward new ideas and innovation, often in the form of technology. On the other hand, how can the culture bring forward new ideas for new industries and jobs when the
government is stifling with control and regulation? Assuming technology and development are occurring at a rampant and virtually uncontrolled rate, how do we assure the citizenry of safe and functional products that are clearly in their best interest?

Some people will argue that the role of government in technology development and control is to create the infrastructure, provide various forms of incentives and stimulus in the forms of tax abatements and technology transfer, and be supportive in other ways. This same group might also suggest that government should take a proactive role in regulating and monitoring technology and its effects in the culture. The proactive view of government role in technology development and control is likely best characterized by the years of the Johnson administration in the 1960s.

The opposing view contends that the government should have very little role in the development or control of technology. This group will argue that development and control of technology is the role of entrepreneurs rather than the government. They will argue that less government is good government, and that free enterprise can only function with less taxes and less government intrusion in the lives of people. This view may be best characterized by the Reagan government of the 1980s.

Regardless of one's point of view, it is no secret that our technological culture has spawned an entire industry of agencies, offices and other types of bureaucracy, presumably in the interest of helping the citizen. While this may be straightforward, much about modern technology defies control by laws in the traditional sense. This is somewhat akin to the issue of 'if no one hears the tree in the forest fall, did it actually fall?' How do we know if people are wearing seat belts, dumping illegal waste products into the environment, using drugs illegally, speeding down the road at a high rate of speed, and so on? What is the role of government in a technological society? Are we to be a "police state" with government intervention at every turn, particularly through electronic surveillance techniques?

Whether we wish to acknowledge it or not, much of what we call government, or infrastructure, is essential as a check and balance against too much growth, too much unscrupulous technological business behavior, and so on. Many of the agencies and departments are direct outgrowths of trying to regulate the food we eat, the industries we work in, the products we buy, and so on. We must remember that many atrocities across the years in meat packing, mining safety, building construction safety, and many others have led, at least in part, to the bureaucracy we now have. We must also recognize that this bureaucratic element of control at various levels in the state and federal government is a clear drain on our resources that could be used in other ways identified with research, development and innovation, leading to new products.

However, we must also understand that freedoms of the culture require responsible and educated users and consumers of the technology. We have compromised the governmental system of controls through the lobbying activities of special interest groups. Lobbying practices say that we 'wine and dine' the politicians to sway their thinking our way. The lobby may offer to make a political campaign contribution in return for their 'consideration' for our point of view on an issue or circumstance. There may be those that will say, oh well, this is just the way the system is and we must accept it and work with it. When lobbyists manipulate elected and appointed officials to approve or facilitate technological situations or circumstances, it may lead to results that are not in the best interest of the overall citizenry.

**Economic control.** Another element of control we exercise over technology is through our economic system. Purchases we all make, individually and collectively, provide direction to our culture. Producers try to respond to what they perceive to be our wants and desires, and then produce to meet the same. Purchasing power shows up in various ways and forms. For example, the purchasing power of a younger generation indicates the popularity of cereals and Saturday morning cartoons, computer and video games, movies, and so on. Similarly, the elderly age group is not only growing but is also increasing in wealth; and coupled with extended retirement and productive years, provides a formidable element in the American purchasing power scene. Just consider the directions of health care, condo developments, and retirement villages. The consumer exercises an element of control over technology and the economic system.

However, power and control can rest with a limited number of people, primarily designers and producers who still hold the ultimate control over what is produced and how it is done. Control as purchasers is implicitly 'rigged' from the outset. In addition, special interest groups and other organizations will place capital for production in areas where they think the best opportunities for a satisfactory return on their investment will be brought to fruition. If special interest groups such as investors, along with other organizations, will not place capital in products and services, it is very difficult if not impossible to bring them forward for production. While selected wants and needs of consumers may be responded to by designers and producers, many areas may also go wanting for various reasons. Our sense of control through purchasing power clearly has limitations, and is tainted by the inability of the system to respond fully, in particular where a profit will not be made, regardless of the nature of the need.
Even the perception of the nature of need may become clouded. Much of what we think we need may not have any real utility value. It may be more a created desire rather than a true need. Often through subliminal persuasion and other 'slick' advertising and marketing techniques, we may buy and consume much that is actually not needed or of any value. This (possible) ignorance appears to be most pronounced with individuals and cultures most lacking in knowledge, experience and information about products and technologies. If little or no real need exists for much of what we consume, can we actually be in control?

**Individual control.** It is true that government and economic controls are sluggish and often unresponsive. Thus, it may be that the single best overall approach to control of technology is accomplished at the local and individual level. However, individual control of technology comes only with a clear understanding of rights and responsibilities, education, and specific commitments and ethics aligned with individual principles and values--possibly differing with others.

Obeying the laws and being a good citizen are basic requirements and responsibilities we all recognize and accept. What about being good technological citizens? Particularly where persons with technological knowledge are concerned, it would seem important to be actively engaged in pursuing rights and responsibilities related to technology. We must consider technologies that are threatening basic freedoms we all expect and take for granted. Are our freedoms of speech being threatened by new communications technologies or surveillance techniques? Are freedoms to "life, liberty and the pursuit of happiness" being threatened by the very lifestyle which we have produced? And what about freedoms associated with feeling a sense of security, and freedom to walk outside one's place of residence without feeling threatened and unsafe? These are at the root of fundamental responsibilities and freedoms we all hold. Particularly where control of technology is concerned, we must stay alert and respond.

Unfortunately, many will not readily respond to the need to control technology, in part, because the control has slipped away so incrementally that they are not sensitive to these issues. Moreover, most have never intellectualized the problems and issues associated with control or lack of control of technology. However, it is simply imperative that we begin to question, in productive and systematic ways, the control and freedom issues associated with technology. Much of the questioning should be occurring through the educational process. We simply can not teach persons to sit idly and permit further incremental control of our lives to be given over to the technology. We must actively pursue ignorance reduction and fully understand technology in very real hands-on ways. It is only by fully understanding technology that we can ever begin to regain control of our lives and culture. As the rest of the world wants to be like us, developed and technologized, the question of world-wide technological control may someday be at question. Education is clearly the key.

Regardless of what type or amount of technology we study, it is imperative that a commitment be made to work diligently to understand the technology. It is equally as important that we use knowledge to help control technology in useful and positive directions for the overall benefit of humankind, including to protect and maintain freedoms we all take for granted. Ethically, persons engaged in various types of technological pursuits must recognize the burden they carry. The care to be exercised by professionals in technological fields can not be sufficiently underscored. We will design, build, control, evaluate and rebuild the technological functions and infrastructure based on our knowledge of the technologies. We also must factor in our values and attitudes about how to direct this massive machine.

**The Technologists' Responsibility**

It may be an oversimplification to suggest that there is a single responsibility for the technologist in all of this. But it does seem reasonable, based on this tool and other information within the toolkit, that one of our basic responsibility is to address human and natural resources issues. Regardless of what else may be involved, everything boils down to impact on people and environment, or resources. Safety, quality, productivity, and technology transfer each provide good examples that demonstrate not only that humans and natural resources are involved in moral and ethical issues in technology, but they also indicate the inherent overlap and broad relationships which exists between humans and nature. People must be cared for and natural resources must be well managed for future worth. It is only a matter of time before we will be held accountable for not being good stewards of our resources.

Social engineering suggests that people can be changed both as individuals and as a culture through the technology. This is true, and may represent one of the essential responsibilities for the technologist. The key is to place people in positive relationships with technology rather than negative ones. This requires a thorough understanding of technology as well as knowing people: an area thought to be a strength for technologists. As technologists, we are traditionally rather effective with people, able to work with them comfortably and in productive ways to achieve competitiveness. Future technologists may participate in social engineering activities such as redesigning the work environment, perhaps introducing new products which remain
consistent with our existing production while also being innovative and increasingly appropriate for workers to build in teams. Such activities might include starting a child care center in the workplace, initiating flexible scheduling for workers, and so on. The central focus is on creating an enhanced work environment with technology being central to the mission and the solution. Social problems crying out for solutions may involve providing better technical training for youth or displaced workers, and providing sufficient good quality housing for the homeless, new and innovative forms of transportation for inner cities as well as rural areas. The list of opportunities for technologists to enrich the future quality of life around the world is virtually staggering.

Another key responsibility for technologists relates to managing persons and organizations within technological functions to achieve maximum competitiveness. Technologists and workers must feel good about themselves within this environment as well as being strong and effective as individuals in their own autonomous technological functions. We must become and remain good solid team players, cooperative and effective with other individuals in cross functional and team circumstances. The challenge is largely to help persons maintain a healthy self identity and not get 'lost' in the organizational culture that tends to impose 'cultural personality' within the technological functions. As technologists, we must accomplish our task without patronizing people. We must always remember that despite our interest in technology, we must keep a top focus on the people. It is only with good people that we can expect to stay competitive.

Technologists must be key decision-makers in the technological organization. Our decisions must have lasting value with solid moral and ethical underpinnings for the future. They must provide incremental improvements not only for the immediate organization but also for the community and region within which our organizations exist. We are responsible to help improve and maintain the infrastructure along with our own functions. Organizations can not function if the infrastructure is inadequate; and workers are not productive in the workplace if they do not have good quality communities with good schools, hospitals, roads and so on. Certainly, part of the way we can impact the broader culture is to become involved in the political and democratic process. We should work to 'give back' some of our talents and resources into the democratic process by volunteering to assist service organizations, schools, and churches as they wrestle to determine their role in the changing technological future. It may be particularly important for technologists to attempt to run for political office wherever possible, providing direct decision making and influence into the process. We must remember that not everyone can bring the special technological perspective to the process.

Looking at the challenges in a positive and proactive manner, seeing them as opportunities, is also part of the technologists' responsibility. Part of the opportunity, and certainly the challenge, is inherent in the democratic process itself. As persons are given increasing responsibility and empowerment in the workplace, we must recognize that they require a much different type of management. Upper management can no longer dictate in traditional ways. Rather, the new upper management, must rely heavily upon powers of persuasion and trust, rather than dictatorial approaches, particularly for bringing about critical attitudinal changes such as are being discussed in this tool.

We must also remember that change takes time. Even with good planning, training, and resources availability we must keep in perspective the need to be patient and to persevere beyond the status quo and mediocrity. It will require leading, teaching, and learning together. Only with solid and mature leadership and knowledge in the broad technological functions can we expect to provide the necessary vision, insights, and direction over the long haul to bring positive change to fruition. And this can only happen with a strong sense of how to put educational programs in place to position all persons in the organization for teaching and learning in cross functional ways at the team level. Everyone becomes a teacher and a learner, ongoing, and everyone grows and changes together.