

Guest Editarticle

Lessons From Star Trek: Examining the Social Values Embedded in Technological Programs

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Mr. Spock: "The needs of the many outweigh..."

Captain Kirk: "...the needs of the few..."

Mr. Spock: "...or the one." (Bennett, 1982)

The movies *Star Trek II: The Wrath of Kahn* and *Star Trek III: The Search for Spock* provide this dialogue and serve as the catalyst for reflecting on the interplay between human liberty and technology and how these concepts relate to technological literacy.

Recall that the "Genesis Project" in the movies was a technology to create living planets out of desolate planets. The Federation saw the technology as a means for creation; the Klingons saw technology as a weapon of power. Compare the Federation's relentless search for a planet without life forms so that they might not be damaged and the Klingons' vision of a weapon against life so that they might dominate. The Klingon mentality forces into view the "dark" side of extending our powers over nature through technologies; they can become instruments of power over others. In the apex of the battle to control a technology that can (a) create new worlds out of desolate unpopulated planets or (b) annihilate populated planets, Mr. Spock sacrificed his life for the lives of his shipmates. We see the archetype of reason and rationality manifesting the archetype of human virtue, the sacrificing of his life for others. The crew's exhilaration at their enemy's defeat was pallied by the loss of the virtuous Mr. Spock. We are humbled as we recognize that Mr. Spock demonstrated the epitome of nobility. In his eulogistic reflections on his dead comrade, Captain Kirk stated: "I feel I have left the noblest part of myself behind."

Within these scenes, we see the battle that rages between (a) the appropriate objectives of technology and (b) the exercise of personal liberty. Are these concepts

related, as Roddenberry, the author of *Star Trek*, hints, or are they virginal concepts that must retain their independence and purity? To thrust us further into the quagmire, we observe a different demonstration of virtue in *Star Trek III: The Search for Spock*. Valchris, a Klingon warrior, acquires secret information about the Genesis project and provides it to her commander; she looks at the information and thereby sacrifices her life. She willingly accepts taking her life, by her commander, for the common good. Her demonstration of virtue demanded the relinquishing of her liberty, and ultimately her life, by the imposition of the "state's" power to determine the common good. Spock's demonstration of virtue illuminates, on the other hand, the freewill decision to sacrifice his life for his shipmates.

It is the supposition of this article that the concepts of personal liberty and technology exploitation are inseparably intertwined and that literacy in technology must include the issues of power, liberty, and virtue. Lewis (1996) suggested in his essay on *The Abolition of Man* that "what we call man's power over Nature turns out to be a power exercised by some men over men with Nature as its instrument" (p. 66). As a result of their ability to apply and withhold technology, some nations will have power over other nations, majorities will have power over minorities, and governments will have power over people (Lewis, 1996).

Kasson (1986), in an analysis of the interplay between American independence and American industrialization between 1776 and 1900, provided insight into the often overlooked relationships between personal liberty and the exploitation of technology. Kasson meticulously analyzed the transition that occurred as "technology came to be regarded as essential to American democratic civiliza-

tion” (p. 3). This paper reflects on the salient points identified by Kasson and their possible manifestations in modern life.

First, the ideology of republicanism (Kasson, 1986), as it appeared in the 18th and 19th centuries:

... began with a conception of the relationships among power, liberty, and virtue. The balance among these elements ... remained delicate and uneasy at best. Power, as they [Americans] conceived it, whether wielded by an executive or by the people, was essentially aggressive, forever in danger of menacing its natural prey, liberty or right. To safeguard the boundaries between the two stood the fundamental principles and protections, the “constitution,” of government. Yet this entire equilibrium depended upon the strictest rectitude both within government and among the people at large. To the eighteenth-century mind republicanism denoted a political and moral condition of rare purity, one that had never been successfully sustained by any major nation. It demanded extraordinary social restraint, what the age called “public virtue,” by which each individual would repress his personal desires for the greater good of the whole. Public virtue, in turn, flowed from men’s private virtues, so that each individual vice represented a potential threat to the republican order. Republicanism, like Puritanism before it, preached the importance of social service, industry, frugality, and restraint. Their opposing vices—selfishness, idleness, luxury, and licentiousness—were inimical to the public good, and if left unchecked, would lead to disorder, corruption and ultimately, tyranny. The foundation of a just republic consisted of a virtuous and harmonious society, whose members were bound together by mutual responsibility. (p. 4)

This description of republican virtue maintained that the greater good of the people could be encouraged when individual members of society set aside their personal desires. Voluntarily relinquishing personal desires for the common good was the freedom of choice that personal liberty sought to maintain. The protection of this right

was bound up in a precarious balance between the rights and responsibilities of individuals, organizations, and governments.

Kasson (1986) described several factors that caused changes in America’s conception of republican values. These factors were related to the adoption of technology during the period of American industrialization. Kasson presented a clear understanding that Americans believed the advocacy of manufacturing technology was a means of achieving liberation from English oppression. English oppression manifested itself in a forced American dependency on imported goods. America exported raw material to England where it was processed into finished goods and then reintroduced to America, at a higher price. Americans felt that the economic dependency on English manufacturing for finished goods was a threat to their personal liberty and, thus, a threat to republicanism and the very success of the United States.

The American response was to emphasize the contradictory relationship of republicanism and economic dependency as a result of the importation of manufactured goods. Resistance to a dependency on imported goods manifested itself through renewed adherence to the republican values of frugality, personal industry, and, now, domestic manufacturing. Americans could demonstrate their virtue by refusing to consume English goods and purchasing only American goods even though the American goods were higher priced and of inferior quality. As a result, “technology emerged as not merely the agent of material progress and prosperity but the defender of liberty and instrument of republican virtue” (Kasson, 1986, p. 8).

Once technology, as a tool for resistance, had served its purpose, American values underwent additional modifications in its support of technology. America viewed itself as a nation that acquired its virtue from agrarian endeavors. To work and conquer the land was a true demonstration of republican virtue, vitality, and godliness (Kasson, 1986). Many perceived manufacturing as a threat to republican virtue since it was not agrarian. Manufacturers fought to establish the relationship between manufacturing and the control or submission of nature, which was the intended purpose of humankind. In their eyes, manufacturing and farming were both capable of

fulfilling the human purpose: to harness, to control, to exploit, and to subdue the land. Frugality and industry, it was argued, required the pursuit of both agriculture and manufacturing.

However, due to the shortage of skilled farm labor, many were concerned that manufacturing would draw the skilled workers away from the farms and into the cities. Manufacturers countered with the suggestion that the development of labor-saving devices would help alleviate the shortage of skilled labor on the farm and in the factory. Technology was portrayed as essential to the fulfillment of America's purpose, and the new technology of manufacturing was believed to be the solution to not only a shortage of skilled labor but to the ultimate fulfillment of America's destiny.

Manufacturing advocates continued to stress the threat to republican values and American strength from an economy based on the exportation of raw materials and the importation of finished goods. They stressed that public virtue could best be achieved through an autonomous and balanced economy based on domestic manufacturing. Buying American goods and refusing to purchase English goods was an exhibition of patriotism. Thus, patriotism became linked to republican values and to domestic manufacturing. This linkage also resulted in a stronger national government dedicated to developing manufacturing technology and republicanism.

Labor abuses, as evidenced in English manufactories during this period, were identified as being technological in nature and could be remedied in American manufactories through the purposeful application of technology. Improvements in diet and living conditions were two of the suggested technological solutions. Tenche Coxe, an 18th-century planner of industrial towns, articulated his position that manufacturing would be able to employ the unemployed and the marginal workers and thus keep them from contributing to the social problems that were evident at the time (Kasson, 1986). Technology was perceived as a remedy for social problems and as a positive agent for promoting social virtue.

During the later half of the 18th century reliance on the self-restraint of individuals could no longer be relied on. This absence of self-control threatened republican virtue. The factory setting, though, with its regularity, uniformity, and subordination was viewed as the solution,

capable of exercising social control on the undisciplined. Factories were organized so that they might exert complete control over the person's work environment, and also over their home and social environments. Company officials used this social control to reject shorter working hours. They sought to limit any form of individuality because uniformity promoted their vision of the common good. The precarious equilibrium of rights and responsibilities of individuals, organizations, and government, on which republicanism depended, tilted in favor of those who controlled the technology.

Technology, promoted as a tool for liberation, was transformed into a tool for domination. Those who were in control and sought to capitalize on their positions of power perpetuated this transformation. Instead of fostering the ideology of republican virtue, technology, through its owners, became an agent of social control. Individuals lost their right to participate in the process of freedom. Individual liberty was reduced rather than increased. The result was the antithesis of republican virtue. Individuals no longer had a choice as to how they could exhibit their republican virtue. Those in power, those who owned the technology, mandated it.

In describing the writers of utopian literature during the 19th century, Kasson (1986) stated:

In a society whose republican purposes had been obscured or corrupted, these writers emphasized that technology itself might serve as an instrument not of liberty but of repression, not order but chaos, not creation but destruction. The hopeful vision of an integrated technological republic struggled against the dreadful anticipation of technological tyranny and holocaust.
(p. 191)

Did republican values influence the application of technology so that social justice, participatory freedom, and democratic ideals were upheld or did the utilitarian use of technology compromise republicanism? Through the 18th and 19th centuries America attempted to moderate and influence technology through its adherence to republican values. What one finds, though, is that the application of technology for production purposes, with a justifying agenda of social control for the common good, influenced and modified republican values. Technology, in essence, was not just more resilient to external influ-

ences than was republicanism, than was American culture, it was in fact the initiator of cultural change. Republicanism, the dominant ideology of the period, succumbed to the promises of the technology system designers. The interplay between power, liberty, and virtue mutated into a mentality that the virtuous ones, those who had the common good in mind and who also had the power of technology firmly in hand, were justified in exerting their influence over the liberty of the individuals. And the worker unknowingly traded his or her liberty for the promise of employment, comfort, and security.

The American revolutionaries sought to establish a land where authoritarian control of the masses by kings would no longer occur. Kingdoms, as organizations, were effective in establishing order and providing military protection and stable reserves of food. They were effective systems for maintaining and extending the effective influence of the king. However, kingdoms also developed systems of forced labor, forced military conscription, and bureaucracies that used people for its divinely empowered kings (Hughes, 1989). These systems were accepted because they offered, through the effective unifying of scattered and diversified human activities, security and an economy of controlled abundance. The construction of systems to provide “unity from diversity, centralization in the face of pluralism, and coherence from chaos” (Hughes, 1989, p. 52) frequently involves the destruction of preexisting systems.

Mumford (1991) wrote:

At the very moment Western nations threw off the ancient regime of absolute government, operating under a once-divine king, they were restoring this same system in a far more effective form in their technology, reintroducing coercions of a military character no less strict in the organization of a factory than in that of the new drilled, uniformed, and regimented army. (p. 375)

The solution to the problem that confronted early Americans was the establishment of a stable economy that would, in turn, foster independence. To this end, domestic manufacturing was promoted. The promotion of manufacturing included its alignment with the republican values of frugality, industry, and restraint as well as its alignment with agriculture as a means to harness and

exploit nature. Initially, the republican value system was perceived as the context in which manufacturing technology was applied and not a system variable. Hughes (1989) in an analysis of the evolution of large systems stated, “Over time, technological systems manage increasingly to incorporate environment into the system, thereby eliminating sources of uncertainty...” (p. 53). Kasson’s (1986) description indicates that the republican value system eventually came under the control of the system designers. Hughes suggested that as external factors become interdependent components of the system, system builders “have tended to bureaucratize, deskill, and routinize in order to minimize the voluntary role of workers and administrative personnel in a system” (p. 54).

As the manufacturing system matured in American history, one observes that personal values conflicted with the promotion of the common good; efforts were then directed at changing people’s values through the development and application of manufacturing technology. The social foundation of republicanism shifted from a contextual environment to a variable of the system under the control of the system designers.

Thus, liberty (as an element of technological literacy) became entwined with the choice to extend or restrict personal freedom. In his book *Ethics in an Age of Technology*, Barbour (1993) described two sides of freedom: (a) the absence of external constraints and (b) the presence of opportunities for choice. The absence of external constraints offers freedom from external coercion and direct interference by other persons or organizations. This aspect of freedom tends to focus on limiting the power of organizations to constrain the individual. The presence of opportunities for choice seeks to provide genuine alternatives and “the power to act to further the alternative chosen” (Barbour, 1993, p. 39) This aspect of freedom relates to the autonomy of the individual and the equal access to choices. Whichever side of freedom one chooses to emphasize, it is apparent that as technology develops, opportunities arise, which limit personal freedom by those in control of the technology—whether it is by direct interference and coercion by the organization or by limiting the opportunities for legitimate decision making. Kasson’s (1986) analysis indicated that the advocates of manufacturing technology in early America exercised coercive influence to change American values and also

sought to limit their opportunities for real choice. One wonders if this is also true for modern Americans.

Modern day influences of technology on American culture today are so prevalent as to go virtually unnoticed. The technological environment deadens one's senses to its influence. Ralph Waldo Emerson, enamored with his first train ride, noticed how railway workers were "impervious" to the presence of a train when it passed by (as cited in Kasson, 1986). As technology surrounds us, we grow indifferent to its presence, to its novelty. Liking technology to a painkiller or narcotic, Shallis (1984) suggested that numbness is a reaction induced by technology. Riding in a train or a car, one becomes numb to the surroundings. In a technological world where the only constant is change, novelty and innovation quickly become banal. Our lowered sensitivity to the multidirectional aspects of technology development and application masks the damage that may be inflicted on the unsuspecting.

Another effect of a narcotic is addiction (Shallis, 1984). We are unable to do without technology. We use it even when we don't need it. In a staff meeting held in a sunlit room, my supervisor asked if we should turn on the lights. We drive to the mailbox and use calculators for simple math. We are unable to turn off the television after only one show. We populate our houses with remote control devices for our entertainment technology and scurry about frantically searching for the television remote control when it would have been quicker to walk across the room and change the channel. We talk on the phone while walking, playing, shopping, and driving. People now carry beepers and phones wherever they go.

We have become addicted to technology. We then unconsciously adapt ourselves to the technology. We purchase products based not on our needs, but on the novelty of a product. We get a "rush" from the new acquisition. Then we search for another fix. For example, the proliferation of cellular phones raises interesting questions. Was it the need to communicate instantaneously that promoted cellular phone development? Or has the technology influenced our values? Have we developed the need to communicate instantaneously because the technology was promoted? We are seduced into complacency by technological development without philosophically examining our material choices.

The early part of the 20th century was the advent of the consumer economy. [B]usiness leaders realized that in order to make people "want" things they had never previously desired, they had to create "the dissatisfied customer." Charles Kettering of General Motors was among the first to preach the new gospel of consumption. GM had already begun to introduce annual model changes in its automobiles and launched a vigorous advertising campaign designed to make consumers discontent with the car they already owned. "The key to economic prosperity," Kettering said, "is the organized creation of dissatisfaction." (Rifkin, 1995, p. 20)

This addiction to technology may be a result of the deliberate manipulation of the republican American values to promote the agenda of manufacturing. Today, that same restraint—frugality and even intelligence—are seen as sales resistance (Lewis, 1996) and not as virtues.

Have we lost our ability to make decisions about the development and application of technology and its systems? Are decisions now made for us that we do not know about? We tacitly accept the mundane limitations of choice (i.e., "Why must we buy four AA batteries when we only need one? Why do we have to have VCR+ on our new VCRs?). Are the controllers of technology systems determined to limit our choices we have to the selection of features, color, and quality through the altering of our value systems?

Technologically literate citizens must ask: "Are our values influencing the development and application of technology, or are our values being influenced by the designers of technology systems for objectives other than the pursuit of happiness, liberty, and life?" We might even want to ask, "Are our values changing simply because the technology is now available?"

Machines do not decide how a product should be packaged or manufactured, but the owners and managers of the technology do. I can have any color I want, "so long as it's black." I can use any Internet browser I want, but this one can't be removed from the operating system. Others are making the decisions for me, based on their perception of what is right or best for me, based on their perception of the "greater good." Our ability to make decisions has been usurped; we did not even realize that

we gave up our rights.

Admittedly, I gained some immediate gratification and even some long-term benefits. My liberty has been restricted but I am content, as long as there are batteries to buy and free Internet browsers. As long as there is an abundant supply of goods, I am not likely to rebel against the technological tyranny that has usurped my freedom. As long as there is access to whatever I desire, I am not aware or even concerned that my freedom has been usurped. In fact, I am content with the situation and live under the false belief that I have total liberty because I have an abundance of opportunities for choice.

The bargain we are being asked to ratify takes the form of a magnificent bribe. Under the democratic-authoritarian social contract, each member of the community may claim every material advantage, every intellectual and emotional stimulus he may desire, in quantities hardly available hitherto even for a restricted minority: food, housing, swift transportation, instantaneous communication, medical care, entertainment, education. But on one condition: that one must not merely ask for nothing that the system does not provide, but likewise agree to take everything offered, duly processed and fabricated, homogenized and equalized, in the precise quantities that the system, rather than the person requires. Once one opts for the system no further choice remains. (Mumford, 1991, p. 376)

Synthesizing Kasson (1986), Mumford (1991), and Hughes (1990), one sees that the value system of a group is more appropriately viewed as a variable of the system—since it is under the control of others—and not as the environment of the problem. One finds that human values, as a variable of a technological system, became an output variable of a subsystem within the larger technological system (Hughes, 1990). In essence, the means became the ends. In discussing technical activities and human aspirations DeVore (n.d.) stated:

Technology is a very human thing because man created it. But it creates cultural and social problems which must be understood if man is to attain both order and freedom. In essence, the problem is how to have the best of both the technical and the social worlds, how to realize the

potentialities of technology without subordinating the ends to the means. (p. 13)

As advocates of technology we must analyze the complexity of the technological systems we support. We must seriously ask if the legitimate output and evaluation of any technology system should be limited to a simple plethora of material choices. We must move beyond the belief that the totality of “human needs and wants” we so adamantly include in the definitions of technology are limited to artifacts and their consumption.

As *human* technologists, we should also consider the legitimate outcomes of our technological activities as those that dignify rather than degrade, that humanize rather than dehumanize, that liberate rather than oppress. The study of how technology is developed and applied to meet “human needs and wants” should not be constrained to the techniques of designing, using, and producing artifacts and systems but must include the promotion of the “inalienable rights” of all human beings: life, liberty, and the pursuit of happiness. The technologies, the systems, and the owners that impinge on these rights must be rigorously scrutinized. The opportunity and ability to scrutinize technology is a right and a responsibility of all, and it must be *the* foundational skill of a technologically literate person.

In this article, I have attempted to illuminate the relationship between technology, power, and liberty during the formative years of the United States. The past, present, and, indeed, the future are linked by the opportunity to exercise personal liberty (Marcus & Segal, 1989). Have modern Americans, just as the early Americans, had their liberties unknowingly expropriated? Are we, to some extent, analogous to the Klingon warrior Valchris, who exercised choice but had lost freedom? We believe we have freedom, but we really only have predetermined choices.

This is the central danger of technological illiteracy: that we do not know how others are using our dependence on technology to encroach on our liberty.

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