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Can Cyberspace Be Just?

[Portions of this paper were presented at the Conference for the Design for Values: Ethical, Social, and Political Dimensions of Information Technology held at Princeton University, February 28 - March 1, 1998.]

The Growth of Computing and Cyberspace

In 1965 Gordon E. Moore, who co-founded Intel, noticed that each new computer chip contained roughly twice the capacity of its predecessor. Computing power seemed to be doubling approximately every two years.

This relationship or prediction is now known as Moore's Law. It has held true for over three decades. If anything, the rate of increased computing power is accelerating so that computing power is now doubling each year. Recently, Apple Computers announced the G4 chip that operates at a gigaflop (a billion floating point operations / second) and that will be available in its line of personal computers. There is a debate about how much Moore's law describes the development of computer chips and how much awareness of it may create pressures to make it true. And, there is disagreement about how much longer it can remain true. But there is no disagreement about the surge in computing power available to millions of people. When the average person can put a supercomputer (a gigaflop processor) on her desktop at moderate price, impressive computational possibilities are no longer relegated just to the super rich.

Another growth area in computing is, of course, the web. The internet, which began for military and scientific purposes, has been around for three decades. But the development of part of the internet, the world wide web, during the past ten years is revolutionizing the way we communicate, check the news, and buy merchandise. By one estimate in 1998 there were 200 million internet users and the expectation is that by 2003 there will be over 500 million internet

users. Cyberspace is no longer just a black and white engineering world but a colorful and diverse stage for human interaction. The transmission of information over the internet today is as likely to be a color digital picture of a new grandchild as a coded military message.

With the exponential increase in computing power and interconnectivity on the internet the web promises to have a striking and unimaginable cultural impact during the coming century. Even with current capabilities we can foresee that everyone on the web will be able to publish an updated, personal magazine of information and have a subscription to a gigantic, updated and at least partially indexed world magazine of information. Everyone on the web will be able to broadcast personal audio and visual programs and receive millions of others. Everyone will be able to monitor and control processes and events over great distances through the web. The internet, particularly the web, has become a supermedium. Such is the power of the malleable computer. We are obviously on the threshold of a massive revolution in communication. What effect will the potential capability of billions of people world wide (and perhaps eventually solar system wide) to interact act with each other on a one on one basis have on cultures and individuals? Though it is difficult to predict this technologically enhanced future precisely, who can deny that significant cultural impacts on our societies are coming because of the development of the net?

I continue to be optimistic that the development of the web will have a positive effect on humankind. Here I will borrow some insights from John Stuart Mill to justify my optimism about the web. However, I also wish to raise some cautionary concerns about some of the problems of the web. Finally, I will discuss two factors about the web that make it ripe for unethical activity and hence two factors that should be considered in setting policies for the ethical use of the web. Finally, I want to suggest how justice might get a start in cyberspace.

Mill's Dream Machine

John Stuart Mill is appropriately famous for his defense of individual freedom in his essay, *On Liberty*. In his essay Mill articulates the

nature of freedom and offers a justification of its fundamental importance. On Mill's view we are entitled to three basic freedoms: first, the freedom of thought and discussion; second, the freedom of tastes and pursuit of plans to suit one's character as long as others are not harmed; and third, the freedom of uniting for any purpose except to harm others. Mill was a classical utilitarian who believed that the degree and quality of happiness was the ultimate measure of ethical actions, and it may seem strange for him to have written a treatise *On Liberty*. Why not write *On Happiness*? The answer is that Mill believed that broad freedoms are essential to obtaining widespread happiness. Without freedom of expression and action, humans cannot fully seek and achieve happiness and particularly the intellectual happiness upon which Mill placed such great value. Moreover, Mill appreciated that happiness is elusive if sought directly, but if people are free to pursue their goals, happiness often follows. Freedom is not an unrestrained good. Mill maintained that individuals should have as much freedom as possible commensurate with happiness and freedom for others.

Freedom, or as I would prefer to say "autonomy" [Moor, 1999], requires more than merely the absence of constraint. To exercise freedom properly humans must have abilities, resources, and opportunities to share their ideas and activities with others. It does little good to have the freedom to mail letters without the ability to send them, the freedom to learn without resources of information or the freedom to vote without the opportunity to cast a ballot. Just as freedom is necessary for knowledge and happiness so abilities, resources, and opportunities are necessary for the expression of freedom.

The world wide web amplifies our abilities, increases our resources, and generates numerous opportunities for exercise of a wide range of freedoms. The web is a freedom amplifier. The web allows not only the members of one society, but people around the world, to express their views, to pursue their interests, and to unite with others. No other technology does this as democratically and thoroughly as the web. The web is Mill's dream machine. The web, like no other technology, supports freedom of discussion, freedom of action, and freedom of assembly – Mill's three fundamental freedoms. Mill's defense of liberty

is the philosophical justification of the web. One does not have to accept Mill's classical utilitarianism with happiness as the ultimate value to accept Mill's strong philosophical defense of liberty. On any plausible account of human flourishing, human freedom will be a core value. [Moor, 1998]

Freedom of expression and publication is inseparable from freedom of thought. Our thinking grows and matures by interacting with others. If we cannot speak out, our thinking is suppressed and intimidated. Our understanding of the world can develop only if our ideas are expressed and subjected to criticisms by others. Free speech is necessary because we are, as Mill reminded us, fallible creatures who need to exchange information in order to test and correct ideas. The web like no other forum provides opportunities for the expression and criticism of all ideas from all points of view. Chatrooms and alternative web sites abound on the web. Often traditional institutions are criticized at counter web sites critical of the established views. These multiple and widely accessible positions and counterpositions are important in establishing well-grounded knowledge. Debates and the distribution of information within pure and applied sciences can occur quickly on the web. Speedy, inexpensive publication with world wide distribution of opinion gives the web significant advantages over traditional books, journals, newspapers, television, radio, and mail. The exchange of ideas over web is an inspiring realization of Mill's call for free speech for everyone.

An obvious disadvantage of allowing anyone to publish any crazy idea on the web is that anyone can publish any crazy idea. Where is the quality control? How do we know which claims are true? Mill's response a century and a half ago is still the right one. We never know absolutely which claims are correct. We can learn to identify reliable sources over time. However, ideas that are regarded as absurd during one era sometimes become accepted scientific fact at a later time. Our best course of action is to allow competition among ideas to see which survive criticism. And the web provides opportunities for a wide range criticism. Naturally, not all ideas found on the web should be taken with equal weight, but no idea should be forbidden. Everyone should have the right to speak out. Mill put the point nicely, "If all mankind minus one were of one opinion, and only one person were of

the contrary opinion, mankind would be no more justified in silencing that one person, than he, if he had the power, would be justified in silencing mankind." A buyer must beware in the marketplace of ideas, but the marketplace itself must be open to all.

Thus, the Clinton Administration's attempt to regulate the internet with the Communications Decency Act in 1996 was ill-advised and this act passed by Congress was quite properly struck down by the U.S. Supreme Court. Even if some technological mechanism were available which screened ideas successfully, such a device would be inappropriate for adult users. I know of no idea that causes so much harm that it must be censored from normal adults. Even a wacky idea such as the Heaven's Gate Cult belief that an incoming comet was concealing an alien spaceship coming to pick them up should be permitted to exist on the web. It is better to allow some falsehoods than to forbid the truth.

Fortunately, the democratic nature of the web today undermines censorship. A few years ago when the Serbian government controlled television, censored the news, and closed down rival radio and television stations, opponents of the Serbian government went to the web to disseminate information. The government couldn't close down the web and eventually relented in trying to control all of the news.

Free action, as well as free speech, is enhanced by the web. Information sent through the web can control devices from telescopes in space to robotic labs in remote oceans. But the major increase in freedom of action on the web is in the sizeable growth in its commercial use. Ugly hieroglyphics of web addresses are ubiquitous in advertising everywhere. On the web one can buy or sell almost anything from stocks to stockings. And, of course, such business activity takes place on a world wide basis. The commercial business on the web for 1998 has been estimated at \$43 billion and another estimate puts it at \$1.3 trillion by 2003. Obviously, dangers exist in the cyberspace marketplace of goods and services just as elsewhere. A cyberbusiness can fold its virtual tent instantly. Buyers must be sophisticated consumers of products and services just as they must be sophisticated consumers of ideas. The cost of our enhanced freedom with the web is more vigilance.

The Power and Access Problems

Thus far, I have suggested some technological and social forces that have supported the rapid expansion of the internet and some philosophical reasons in favor of its use and continuing expansion based on the importance of human freedom. The web, Mill's dream machine, enables free speech and action as nothing else does. But, as Mill emphasized, freedom is not unlimited. A web user is not free to harm others. How do we decide how much freedom people should have on the web? And how do we enforce these limits? These issues are not merely abstract considerations as many are flocking to the web to make considerable sums of money and make them quickly. Ethics in cyberspace may not be everybody's prime concern. A recent cover of the *Time* newsmagazine expressed the current attraction of the web well with the banner headline, "GetRich.Com". Internet stocks are soaring and some sales of internet properties are breathtaking. A short time ago, the domain name "altavista.com", which took about \$70 to register originally, was sold for \$3,350,000. With profits like this to be made the web may come to resemble a Hobbesian state of nature more than a civilized Millian domain. How can justice prevail in cyberspace?

The Power Problem: Because the web is such an increasingly powerful resource some individuals, corporations, and nations seek to monopolize or control aspects of cyberspace. This seizing of power can be subtle such as Microsoft's bundling its Internet Explorer browser in its Windows 95 software. Power moves can be more overt such as China's and the Church of Scientology's attempts to censor their internet critics. In the future the group that controls the net will control what the world thinks and does. The power wars over who will be master of the web have only just begun. Justice requires defense against those with excess power on the web.

The Access Problem: Although use of the internet is surging, the number of users comprise less than 4% of the world's population. And these users are not spread evenly throughout the world. What about the other 96% of the people in the world who do not have access to the web? Web access is a luxury of the technological elite. To make the glib assumption that once information is on the web everyone can access it is surely mistaken. Web access requires hardware,

software, and telecommunications that are not evenly available throughout the world. Moreover, barriers to web use can remain even after one has overcome the technical issues. For example, most web sites are in English. And only those English speakers who are literate can read them. Giving large numbers of people in the world access to the web to enable Mill's freedoms remains a major challenge.

The problems of power and access are not insurmountable, but they are and will be increasing serious ethical problems in achieving justice on the web. Of these two problems, I regard the lack of access as the more serious. Without access discussions of freedom and justice are moot. Improper power can always be challenged if people have access.

The Invisibility and Unreality Factors

There are two factors that are salient in computing which exacerbate the problem of ensuring justice on the net – the invisibility factor and the unreality factor. The invisibility factor [Moor, 1985] focuses on the feature of computers that much of their operations are invisible. Of course, this is an important advantage in using computers most of the time. We don't want to be burdened with monitoring computer operations most of the time nor can we when computers operate at the gigaflop level. Nevertheless, this invisibility, especially in cases of complex calculation, can hide important errors. For example, a few years ago Intel's Pentium chip made very selective errors in division. The problem when unnoticed for a long time until Thomas Nicely, a number theorist, pushed the calculating power of the chip and discovered that the results of a complex calculation did not match the results of the calculation when run on another computer. Nicely estimated that the chip got roughly one in a billion reciprocals wrong. Of course, errors in software can be equally invisible until a major malfunction occurs. For instance, in 1990 a software bug that had been invisible in AT&T's phone network closed down the phone system for millions of users for nine hours.

The Invisibility Factor also applies to hidden values in computer operations. When computers are programmed, choices have to be made about what to do in what order. Preferences are given to some states and procedures and not others. This is not to suggest

something sinister must be happening. Human activity of all kinds requires that choices be made. However, as these programming preferences are implemented on a computer, they are typically invisible to users. For example, when different search engines search the web for the same item, they often return with different listing of the most relevant sites. Clearly, the search engines have embedded in them different criteria to determine relevancy. The user may find it impossible to know on what basis the list of search engine hits is generated. Or the programmer of a web site may believe it is important to deposit a cookie of information on the user's computer for future reference though the user may not know the cookie has been sent or what it does.

The part of the invisibility factor that is most clearly unethical is invisible abuse. Invisible abuse is the intentional use of the invisible features of computer technology to engage in unethical conduct. A common example is hacking. Numerous web sites have been hacked. A few years ago the United States Department of Justice's web site had a cover page citing the United States Department of Injustice complete with a swastika. Pentagon computers have been hacked over the net resulting in the loss of information about missile guidance systems. And, of course, commercial enterprises such as banking computers have been hacked over the internet resulting in the loss of money.

The invisibility of computer activity can allow someone with unethical objectives to strike undetected at others using the net. Invisibility in computing creates the Gyges Effect. In *The Republic* (II.359d sq.; X.612b) Plato tells the story of a shepherd who finds a ring that has the power to make him invisible. The shepherd abuses this power of invisibility by killing the king and taking control of the kingdom. The purpose of the story for Plato is to raise the question "Why be ethical? if one can get away with being unethical?" Computing technology has the power of granting invisibility as well. The analogous question exists for us. "If one can be invisible in cyberspace, why be ethical?"

In addition, to the Invisibility Factor computing technology presents us with another confounding factor, the Unreality Factor. Computers are logically malleable. That's what makes computers special technology and creates the possibility of the computer revolution. If there is an

effective procedure for accomplishing a task, a computer in principle can follow the procedure and accomplish the task. And indeed, more and more applications are found for computers everyday. But computers are not only syntactically malleable, they are semantically malleable. The states of a computer can be interpreted in unlimited ways. Computer states can be used by us to represent anything from a birthday card to an atomic explosion.

Semantic flexibility in describing computer states lends itself to the creation of virtual entities and simulations. Computer technology, particularly with today's interfaces, is remarkably effective in producing simulations. Anyone who has ever played a computer game knows that these simulations are real enough in appearance to capture one's imagination and draw one into the game. For example, in a program called "Flight Simulator" one can simulate piloting a plane. At a web site for Land's End, a clothing retailer, a buyer can create a model of herself to try on clothing before making a purchase. Virtual reality patients have been used to teach operational procedures to physicians. When a dinosaur skeleton was recently digitalized to create a three dimensional computerized replica for study, it was determined using the replica that *Triceratops horridus* could lock its elbows, a simple fact but something unknown previously as the actual skeleton was too large to manipulate. Obviously, the game player is not really flying a plane, a model is not really wearing clothing, a patient is not really lying on the operating table, and a dinosaur is not really moving its limbs in the computer. These are wonderful simulations to promote enjoyment, better decision making, skill acquisition, and scientific investigation but they are only simulations.

This semantic flexibility that is so useful for simulations, may mislead some into thinking that computer processes are always mere simulations or unreal in some way. Computer processes are physical processes so they are clearly real in that sense. Moreover, as interpreted processes they may be connected closely enough with a given context or consequences to be as real as any other social entity or process. A promise sent over e-mail is a real promise. One cannot get out of the promise by claiming that it was only a virtual promise and not a real one. Similarly, spending cybermoney to buy

merchandise is really spending money. When computers fly large commercial jets, they are really flying the planes – not, I trust, merely simulating flying planes. When Kasparov played chess with Deep Blue, he was really playing chess.

The fact that a process is a computer process and subject to interpretation does not automatically make it unreal. Sometimes interpretation is fixed enough by convention or consequence that the logical possibility alternative semantics does not undermine its reality as a social object. It is real in every sense that matters. Moreover, even when cyberactivity is a simulation, an ethical critique is still possible, for one must consider the consequences of the cyberactivity even if a simulation.

When cyberactivity is regarded as unreal or disconnected from the real world, then norms may not seem to apply and responsibility may lose its grip. For example, recently on eBay, an auction web site, bidding reached \$109,100 for an unborn baby. The bidding was stopped and a spokesperson said afterwards, "It is illegal to sell a body, an unborn baby or a body part on eBay just as it is in the land-based world." I would emphasize further that cyberspace is always physical and is already part of the "land-based world".

Freedom in the Defense of Justice

I have mentioned four considerations that threaten the existence of justice in cyberspace. Lack of access to the net, unfair power distribution on the net, the Invisibility Factor (especially the Gyges Effect), and the Unreality Factor. How can justice in cyberspace be generated and maintained? There is no cybergovernment that rules cyberspace. Where are the sanctions when people lack access or the powerful abuse their power or fraud occurs under the cloak of invisibility, or netizens don't acknowledge the consequences of their cyberactivity? These are very difficult problems, and frankly, I am not certain justice will be achieved. What gives me hope that justice will triumph is the hyperliberty that cyberspace offers individuals. People want the advantages of cyberspace and need protection from harm. Hence, I expect mechanisms will evolve over the coming years to

provide the reliability and security that people need in order to function safely on the internet. In others words, justice may evolve from the bottom up, rather than being dictated from the top down.

Outside of cyberspace people are usually closely associated with local groups, but on the internet people are free to roam and to associate with other groups. If their current group isn't acting fairly, they can go elsewhere. People want to live in a just social settings. They want at least their own rights respected. If just social arrangements appear on the internet, people will be drawn to them. When the social arrangements cease to be just, people can use the internet to notify others and people are free to take their social and economic activities elsewhere.

When the French government informed Georgia Institute of Technology that it had to convert its foreign study web site into French, Georgia Institute of Technology decided it could keep its web site in English and simply move it, but not its foreign study program, out of France. Because the web is world wide, it didn't matter where the Georgia Institute of Technology web site was physically located. Though I encourage more diversity in languages on the internet, leaving a web site aimed primarily at English speakers in English does seem more useful. Freedom makes it own way in cyberspace.

The internet, especially the web, is Mill's dream machine. It enhances liberty like nothing else, and it is precisely the enhanced individual liberty that provides the most promise in making and keeping cyberspace just.

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