

A pre-Internet view, originally published as the final chapter in *LSE on Freedom*, Edited by Eileen Barker, LSE Books, 1995. Nothing much has changed.

Information Technology and Freedom

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Introduction

Merely mention information technology and freedom in the same breath, and all types of creatures come crawling out of the woodwork. Vicious ‘liberals’ cant the cause of (politically correct=) virtuous victims. Totalitarian ‘technocrats’ insist that we become automata in a utopian absolution of ‘original sin’. Staunch positions are adopted for a fierce confrontation. On one hand, the defenders of civil liberties and the technophobes lash out, cursing technology as an evil agent of subjugation, while on the other, the technophiles vehemently defend their champion, the virtuous machine, extolling it as a unending source of liberty. In their failure to appreciate the complex nature of the application of this technology, both are right and both are wrong. Information technology may be state-of-the-art, but the human condition ensures that nothing has really changed. Look into the swirling mass of chaotic and arbitrary risks and opportunities from new technology, and we see only cynical motives.

There is a clear need to bring to the debate a more balanced understanding of ‘the nature of the beast’. This will not be easy for those involved, since they will have to reject the facile presumptions upon which they bias their arguments, and face up to an uncomfortable reality that raises many more questions than it answers. For, contrary to commonly held belief, it is not possible to specify, control, or predict the outcome of applying information technology with any degree of certainty. Those who seek to do so, are frequently presented with paradoxes by a technology that eludes control and reverses intentions. The best we can hope for is to identify opportunities and threats as events unfold; but it is pure delusion to extrapolate the tidy behaviour of binary logic onto technical applications in the messiness of the real world; look no further than the shambles of the London Stock Exchange Taurus system and the London Ambulance system.

Off with the old, on with the new

Information technology allows us to handle far more data, in many more ways, that are cheaper and faster than was previously dreamed of. This change has been so dramatic that it constitutes more than a simple quantitative increase in volume and speed of transmission, but entails a whole new qualitative change in the nature and role of the technology in society. Increasingly computers are gateways into vast information networks, blurring the traditional boundaries between information activities such as banking, publishing, broadcasting and telecommunications, and the old established order is overturned.

Alongside these developments, there have been sectorial shifts in the economies of advanced capitalist nations. These shifts are perceived as heralding the emergence of 'information societies', where the gathering, processing and dissemination of information become the primary economic activities (Bell, 1974). Many of the formalities of financial transactions have given way to codes and numbers. Cumbersome ledgers and files no longer adorn office shelves. In the information society, information also has an expanding role in supporting everyday life. In France, 7 million homes are able to book and pay for travel services directly with air, rail and sea operators. In the U.S., police, on patrol, no longer bother questioning individuals in detail, they get much of the information within seconds from remote databases.

The individual strikes back

Information technology is averse to fulfilling its intended function, and this makes it a poor tool for either the promotion or suppression of freedom. Information technology has many paradoxical traits. Basically, if individuals can access and manipulate a system designed to control, then they can reap havoc on the intentions behind the technology's introduction.

In 1984, Scott Robinson, a prisoner in Santa Clara County jail managed to log onto the jail's computer and alter his release date. He was discovered just before his release when a suspicious deputy checked the written records (Siegel and Markoff, 1985).

In 1985 a petrol company promised large prizes to customers whose number plates matched those listed at their stations. Some police officers used the police national computer to identify owners of cars with winning number plates and tell them (for a share of the winnings) where they could collect their prizes. In all 19 officers from around the country were disciplined.

The growth of computer crime, and apparent inability of many organisations to halt it, are an indication of the technology's vulnerability to individuals. It is also possible for persons to distort personal information to their advantage and thereby obtain services and privileges that would not ordinarily be available to them. It is very likely that many more 'innovative' uses of information technology go undetected, but we see only the examples that have come to light. Examples of individuals benefiting unduly from errors or distortion are much harder to come by, not because they do not occur, but because we tend to keep quiet about improper gains, and remonstrate vociferously only when we have been wronged.

Given the perverse nature of information technology, it is tempting to ask what all the fuss is about. The civil liberties lobby and the advocates of law enforcement are both missing the point; information technology is not the omnipotent force it is purported to be. Critics and converts alike, confuse conspiracy with cock-up. So, is all this debate so much pointless posturing? Well, yes and no. It is undeniable that information technology is widely misunderstood. However, although the threats and opportunities it presents are difficult to predict or to control, they remain very real.

Information Technology and Work

Information technology is now established and commonplace in the workplace. On the one hand, it has been described as a liberating force that provides workers with more independence in their work, relieving them of the drudgery of mindless repetitive tasks. On the other hand, it has been viewed as deskilling and a means for management to tighten its control over the workforce.

Both sides of the argument, concerning information technology in the workplace are well rehearsed (Strassman, 1985). A theme, commonly submitted by technological proponents, is that of information technology offering employees the possibility of working from their homes. Such 'tele-commuting' is seen as sparing workers the daily ordeal of commuting, freeing them from the inflexibility of office hours and liberating them from the unpleasant aspects of monitoring, office politics, sexual harassment and oppression by superiors.

The typical depiction of tele-work is grossly oversimplified, and ignores the social and other benefits of the office. The few tele-workers that do exist are usually highly skilled, often specialised and operate as independent sub-contracted labour. Home-working can allow management to 'divide and rule'; on balance it is the employees who prefer working from home. Although the supporting technology has been around for some time, there has been very little movement towards home-working, which may suggest that it is employers rather than workers who are uncomfortable with tele-commuting. As long as this remains the case, there is no reason to think that it will ever emerge as the real alternative many of the futurists (Masuda, 1980; Toffler, 1980) would have us believe.

The one form of tele-working that has become a reality is the subcontracting of routine data-entry operations to remote sites. Developing countries with good telecommunications infrastructures and cheap labour are favourite locations for this practice, now common among credit-card companies, airlines, and other large businesses. Often, such activities are advanced as being beneficial to those countries by providing work, foreign currency and a transfer of technology. However, subcontractors can be veritable sweatshops, conducting what is tantamount to computerized slavery.

A small Chinese software company finances its development operations by obtaining foreign currency from data entry performed in Beijing for Californian companies. The data are generally law records, sent by several Californian law firms by air cargo. The documents are keyed onto magnetic tape by temporary workers, teenage girls from high schools who are supposed to obtain their 'computer training' through this work for several months, in exchange for a 'salary' equivalent to US \$15 per month (Castels, 1989).

A capricious technology?

A closer examination suggests that there is nothing intrinsically good or bad about any technology, whatever its form. Whether a technology is repressive or liberating depends very

much on how, where and by whom it is applied. And whether the intended repression or liberation is actually achieved is another question altogether! - although in general it appears that communication technology promotes emancipation whereas storage technology assists control.

Unquestionably, the application of information technology disturbs the existing order of things. It runs roughshod over established checks and balances that are both formal and informal, often in an unpredictable manner. The tendency of technology to demonstrate *emergent* properties and behaviour can be interpreted as if it is developing an independence from those seeking to use it. Information technology's resistance to control gives it a rebellious, headstrong character; and the information systems, resulting from the application of the technology, often appear to have minds of their own.

Information technology is a source of both opportunities and threats to the interests of individuals, groups and society at large. However, far from being the infallible instrument of precision that we are led to believe, much information technology is clumsy and error-prone. It is wrong to isolate the technology from the context in which it operates, and to underestimate the degree of mutual influence exerted by the technology and its environment. The apparent incongruity, that a technology, underpinned by fundamentally logical and predictable processes, should prove so capricious, stems largely from its having to operate in an awkward environment.

Paradoxically, real threats and opportunities to freedom may lie not in the technology achieving its prescribed goal, but in its failure to do so, and in our failure to understand properly its capabilities and limitations. The technology's all too frequent failure to perform in the manner intended may in some cases reverse what originally appear to be threats to freedom and in other cases erode freedom in ways that are unforeseen and frequently unnoticed. This seemingly perverse situation is aggravated by our habit of assuming that computer technology will provide a solution. But "computers are useless, they can only give you answers" (Picasso), and more often than not, the answers they give are irrelevant, or just plain wrong, or they solve the wrong problems. And they create new problems.

Individuals, Organisations and Information Technology

A good way to start considering this perverse complexity is by examining how information technology is influencing the relationships between individuals and large public and private organisations. As the focus of much criticism from the defenders of civil liberties, it takes up a large proportion of the existing comment on information technology and freedom.

Before regarding the possible threat to individuals from the 'informatization' of the society, it is worth considering how individuals' freedom can be enhanced with regard to government and commercial organisations. Supporters of information technology claim that it is an emancipating and liberating technology. It has been used to remove power from a central authority that had previously enjoyed privileged access to information, and a monopoly in its

dissemination. In support of this claim, they point to how the authorities had sought to limit the distribution of personal computers in the Soviet Union, presumably because the unchecked spread of the machines was seen as a potential threat to the State's authority. This is why in the USA, the NSA insists on being able to read all encrypted information leaving the country. The advocates of information technology argue that its relatively low cost makes it possible for individuals and smaller groups to publicise their views and achieve other gains that would previously have been impossible. In the autumn of 1993, the overly paternalistic courts in Canada sought to limit reporting of a sordid murder case, only to see details widely reported on microcomputer bulletin boards.

The French Minitel system is perhaps the only example as yet of an existing widespread interactive network, aimed at the general public, that has emerged from developments in information technology. The system has benefitted individuals in their lifestyles and employment prospects. It has enhanced consumer power by providing greater choice and the means to obtain advice on a wide range of issues. Some subtle changes in the relationship between individuals and the State have begun to emerge, as a result of the system's introduction. Perversely, networks offer some interesting insights into how an information society might develop actually challenging authority. The emergence of 'electronic pornography' has led to 'official' disquiet in Britain over electronic bulletin boards being used to bypass existing censorship controls. The French, clearly more concerned with freedom of speech and revenue, do not appear to share these objections: in September 1990, about 15% of Minitel's traffic was described as 'pink'.

A vision of the future information society shared by many authors, such as Martin (1978) and Toffler (1980), is that information technology will provide the foundation for vast networks of individuals. These 'telecommunities' are seen as providing a countervailing political force against any abuses by authorities and commercial interests. In such a set-up, institutions (both governmental and private) would be closely monitored and held accountable for any infringements and failings. Used in this manner, information technology could provide a safeguard to individual and group freedoms against possible tyranny. Consumer power and citizen rule would become the order of the day. Taking this a step further, one could portend the elimination of all authority, and the creation of 'electronic anarchies'! Enter Cyberpunk!

'Big Brother'

A related scenario (Masuda, 1980; Toffler, 1980) foresees the emergence of fully participatory democracy. The developments in information technology now make it possible, quickly and cheaply, to allow if not all, the large majority of citizens to be involved in areas of decision making that have traditionally been the domain of an elected executive. The technology not only provides a means of electronic polling, but also makes it possible for all relevant information to be available to members of the public in order for them to participate intelligently and benignly. There is, of course, no guarantee that they will do any such thing.

But the future will not be George Orwell's vision of a "Big Brother" state of telescreens and truth ministries. Instead, the excesses of a popular ideological thuggery beckon; the hell of a collectivist heaven will poll the opinions of the herd to reinstate capital punishment, to ban homosexuality and immigration, and to insist on a 'fair' distribution of wealth. Through information technology, the collectivist doctrine that we are all property of the State, or rather of the leaders of the State, is an all too realistic prospect. That we elect our slave masters makes democracy slavery none the less. The seeds of slavery are germinated in any collectivist philosophy, the technology is merely an effective fertilizer.

Examples do exist of information technology being used not only by repressive totalitarian regimes and extremist organisations to curtail individual freedom and political liberty (Siegel and Markoff, 1985), but also by democratic systems. Often, the technology is used to monitor groups or individuals. For example, the cooperation between the British police and travel agents in tracking the movements of football fans travelling from Scotland to Italy for the 1990 World Cup (Davenport and Cronin, 1990), or the use of police or medical data by prospective employers. However, when information technology is used by repressive regimes to maintain power, this tends to be as isolated applications, of limited impact, rather than through the widespread computerization of the State. Furthermore, many of the countries with highly computerized administrations have amongst the best human rights records. It is precisely in these countries, however, that most concern has been expressed.

Debased databases?

Bald data lacks semantic content. When a set of attributes is stored on a database, certain implicit interpretations of what the data represent are made by those designing and working with the database. This interpretation is by no means universal to all people and is even more likely to vary between individuals using the database in differing contexts. The classification of information into data sets is therefore highly problematic.

Even something as physical as a building can pose serious problems for anyone wishing to classify it, as Marche (1991) discovered in trying to develop an company-wide information system for managing the building stock of a Canadian telecommunications firm. In one example, a structure that had been built-up through time, was considered to be three buildings by the accountancy department, one building by the planners responsible for assigning office space, and two buildings under a local building code. Doubtless the maintenance, personnel, switchboard and internal mail departments had their own versions of what this building was, with each department using criteria geared to supporting their own activities. The confusion was further exacerbated in considering the company's small portable equipment offices, which were regarded as buildings if mounted on skids, and as vehicles if mounted on wheels, and as containers when stored. Given the difficulty in developing a company-wide classification for structures, what difficulties should expect when classifying people?

Much of the personal information on databases is gathered indiscriminately and frequently without the individual consenting or even being aware of the process. The information is then

packaged to fit the parameters imposed by the technology and the needs of the collecting organisation. The process often involves reducing any subtle or ambiguous situations into rigidly delineated categories that fail to reflect the full complexity.

Data may also be just plain wrong or become out-of-date. The ease of access permitted by the technology to sometimes highly sensitive, private information also increases the possibility of the information being used in unintended, possibly criminal ways. Since the information held on individuals by any institution is often the only contact the organisation has with the individual, that information effectively is what constitutes that individual in the eyes of the organisation. Any, lack of 'colour', inaccuracy or distortion can therefore be perceived as an attack on an individual's identity. However, this process works both ways and data held on individuals may be interpreted to their advantage.

The processing of personal data, performed using information technology, may involve forms of mass screening, audit, profiling and cross-system matching. Many of these methods are concerned with identifying fraud, deception, tax evasion, criminality and other anti-social behaviour. This can be done by inferring certain patterns of behaviour from different data sets (for example, tax evasion or fraudulent benefit claims from car registration data). The organisations (for example, the police) move from investigating individual cases on grounds of reasonable suspicion, to suspecting and monitoring the entire population from the outset. This in turn promotes a low-trust relationship between the institution and individual, in which the organisation is more reminiscent of a master than a servant.

Private sector organisations tend to be more audacious than public sector ones, both in the nature of the information they request, and in the manner that they process it. Building societies and life-assurance companies require that prospective clients divulge very personal 'lifestyle' information and they are now considering requesting information on clients' genetic codes. Their justification is that such information provides an indication of possible illness, thereby allowing companies to charge lower premiums to 'safer' clients, whereas 'higher risk' clients are charged more, or denied the service altogether (this is illegal in the USA). To the 'liberty lobby', the logic behind such action is questionable, and the encroachment on personal liberty is blatant; they of course fail to see equal charges as a tax on the sober members of society and a subsidy for the degenerate.

Data that is collected for one purpose may be used for another. Simple strings of data are a semantic minefield. If 'secondary processing' is done outside the original collecting agency, this further increases the possibility of misinterpretation, distortion and breaches in security. Computerized blacklists, which can be produced in a subjective manner, of undesirable clients or prospective employees are sold freely. In the US, doctors may obtain updated listings of all people who have taken court actions against other doctors in the past, and landlords can obtain lists of 'troublesome' tenants (Burnham, 1983). In both these cases, there is no reason to believe that it was the patients or tenants who were at fault and not their previous doctors or landlords.

One characteristic of the techniques used is that they are geared to bringing to the attention of the organisations any patterns in personal data that are judged to be atypical. Thus any deviation from the norm in an individual's data-sets immediately raises suspicions against him or her. This, in turn, places hidden pressure on individuals to conform. From a purely theoretical perspective, many of the techniques used are erroneous. Just because two different attributes appear to be statistically related (for example shoe size and criminality) it does not mean that one causes the other (young men, who make up the bulk of the prison population, tend to have big feet, and elderly women, who are relatively under-represented in jails, tend to have small feet). The absurd extrapolation that can be achieved using information technology encourages those using it to confuse correlation with causation.

Privacy or cover-up?

The processing potential of information technology has lured public organisations towards mass surveillance and has led critics (Brown, 1990) to warn against 'creeping authoritarianism'. The fear expressed there is not the one of totalitarianism - undemocratic leadership using the existing structures as a means of repression, although this fear is also expressed (Large, 1986) - but rather of a gradual, generally unnoticed and almost unconscious encroachment of individual privacy and liberty by institutions, under the auspices of improved efficiency.

Personal privacy is frequently exalted as a basic human need. However, it is difficult to establish what exactly constitutes an infringement of privacy, and in what way this constitutes an attack on freedom (Brown, 1990). We expect the State to provide us with protection and support, in the fairest and most economical way possible. Yet, when public organisations attempt to do this, they are accused of authoritarianism. We all suffer from the action of those who cheat the system. The self-righteous ranting of the civil liberties lobby is protecting only unscrupulous swindlers, since, in most democracies, mechanisms exist to rectify the few mistakes that do occur.

If the technology does allow organisations to clamp down on 'undesirables', that should mean lower bank charges, insurance premiums and mortgage rates for the rest of us. Why should the decent, honest, teetotal, celibate, non-smoker have to pick up the tab for the dishonesty and intemperance of others? For differentiation can also single out the abstemious for better treatment. Information technology can offer a means to liberate the responsible and virtuous from the burden of the reckless and deceitful. In addition to hapless decent individuals, companies also fall victim to the treachery of dishonest charlatans. Surely, companies too, have the right to freedom to protect themselves from frauds and malcontents in whatever manner they see fit?

Handling personal information is a fundamental function of much commercial activity and is readily accepted as such. However, most people would not tolerate that information regarding their income, expenditure, travel movements, taste in reading material, hotel bookings or club

membership be made widely available. In reality, most companies do not readily divulge their clients' personal information, partly because they regard such data as an important resource and partly because they would quickly find they no longer had any clients. However, given the vulnerable and unpredictable nature of information technology, the very holding of personal data on computer constitutes a threat to individual privacy and freedom.

“Not Men But Measures...”

Traditionally, notions of freedom are linked with those of responsibility. Far from being free, freedom comes with the price of increased responsibility. If we are given more freedom in how we choose to behave, it is only normal that we be made liable for the consequences of that action. The other side of the equation is that in relinquishing responsibility, we also relinquishes the choice of action linked to that responsibility. Users of information technology can deny their own freedom by passing responsibility onto the technology.

“Not men but measures: a sort of charm by which many people get loose from every honourable engagement” (Edmund Burke). Information technology seems to purify otherwise unpleasant acts. Those operating the technology are encouraged to carry out impersonal actions that affect real people in a detached and insensitive manner. People become numbers upon which operations which can adversely affect them, are mechanistically performed.

Users are often happy to let computers make decisions for them, even when the use of a computer to resolve certain problems is inadequate. In such cases the computer becomes an authority in itself, to which the user has submitted. By letting the technology take decisions for them, users are limiting their own choice of action. This is harmless enough for simple, well-understood applications, but not if those operating the technology see it as a black box. So-called expert systems that are supposed to give users more autonomy may instead be encouraging blind obedience to the technology. Decision support systems, become either decision-taking systems or, in the hands of the shrewd, a means bestowing scientific legitimacy to their claims. Absurdly, the ‘opinions’ of computers are more acceptable than those of people.

We ‘pass the buck’ onto information technology by the anthropomorphic upgrading of its status to that of a free moral agent with a will of its own, and by the laying of blame on it for technical failure. How many times have we heard excuses like “I just did what it told me”, “sorry, the computer is down”, or some combination of the two; “sorry about the mistake, the computer charged another bill to your account”. Information technology is often given human qualities. Is this justified? and what implications does it have for us?

Are computers free?

We have seen that information technology often exhibits a kind of stubborn refusal to behave in the manner in which it is intended. This does not mean that a computer can have ‘a mind of its own’, but rather that it can display behaviour patterns that may be described as being consistent and yet not determinable. If this restricts human freedom, it makes little difference

as to whether the machine is consciously doing so or not; the result is the same. So, whilst rejecting any fantasy of robot rebellion, it is still possible to envisage more subtle forms machine takeover.

In January 1985, city officials in Fayetteville, North Carolina, learned from their switchboard records that somebody appeared to be sneaking into a city building every night and placing hundreds of calls from two extensions. When the police investigated, they found neither burglars nor offending city employees. Instead, two computerized Coca-Cola machines, programmed to phone into the bottling company offices were making the calls (Siegel and Markoff, 1985).

We may think we can control computers, but the empirical evidence does not support this assertion. Information technology constantly defies our control over it. 'Behaving contrary to imposed control' begins to sound like a possible definition of freedom. This, in turn, leads us to the notion that computers have a habit of freeing themselves from their masters. In its own perverse manner, information technology is much better at resisting control than individual humans are. You can curse, cajole, threaten or shout at a computer until you are blue in the face and it will still refuse to cooperate, long after most humans would have complied with your instructions. With humans, "when you've got them by the balls, their hearts and minds will follow" (Richard Nixon) - computers have high-tensile steel ballbearings.

Our own worst enemy?

We tend to use information technology to constrain our own actions. In constraint we find comfort, especially when we perceive it as an impersonal extension of scientific legitimacy. Once we have overcome the initial barriers of learning to use the technology, we are only too happy to let it do as much work as possible for us. This text would be scattered with misspellings and repetitions were it not for the (much appreciated) spell-checker and thesaurus functions of the word-processor package. The problem is that we are all being encouraged to confuse content with packaging, and, in our laziness, letting the technology do our 'thinking' for us. Perhaps the biggest threat to our freedom is our own complacency, idleness and cowardly disengagement from our responsibilities.

One of the main driving forces in our desire for freedom is our very real sense of free-will. We genuinely believe that we are able to influence the world, and we often seek to express that belief. Yet, we jump at the chance to make the world more manageable by constraining our thoughts and actions. Perhaps the greatest attraction and biggest threat to freedom from information technology is that it appeals to our sense of tidy categorization: a kind of (rose tinted) filter that screens us off from the true nature of an increasingly complex and chaotic reality. Then again, maybe this shield plays a key role in safeguarding what little sanity we have.

Conclusion

Information technology is a widespread, constantly developing technology that will doubtless provide a far-reaching influence on society, and upset many established checks and balances. Yet, its resistance of control, technical limitations and the manner in which it itself is embroiled in the problems which it is meant to resolve make it highly problematical. Information technology is not like any other technology. In regarding it, we are confronted with paradoxes; it can be a source of upheaval whilst maintaining inertia, it can restrain those it is meant to liberate, empower those it is meant to rein-in, and, notwithstanding its fundamental obedience to logic, its application continues to elude all attempts at control.

Both the computer luddites and proselytes need to develop a better understanding of the technology. Too often both sides hold simplistic notions of how information technology behaves, falling victim to the 'first step fallacy' (Dreyfus and Dreyfus, 1986) of assuming that information technology will develop capabilities well beyond those they naively believe have already been achieved.

We should not be so absorbed in contemplating the future shape of information technology itself and its impact on human freedom, but rather look to human intentions made possible by the continually changing technology. We are increasingly relying on information technology to provide us with a means of managing the world's complexity and, in doing so, we diminish our own choices in how we interpret, relate to and participate in that world.

Information technology is merely a tool, and like all tools it solves particular problems; but in doing so it increases rather than decreases complexity. To draw a verdict on information technology's past, present and future influence on freedom is inappropriate and mistaken. Rather than fear or embrace the technology, we should seek to understand how it affects, and is affected by, society. It is undeniable that we have choices in prescribing the use of information technology. However, we do not have the same control over the outcomes of that action. Those most likely to benefit from the technology will do so by seizing opportunities when and where they arise, rather than through long-term planning. As for the rest, they will fall to the bottom of the heap.

Information technology has just added another confusing dimension to the continuous power struggle that is the human condition. The more things change, the more they stay the same.

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