

Pandora's box revisited?

On information technology, technostress, virtual addiction and the effects of information overload

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The fear of being left behind

Information technology (abbreviated as IT in the following) is increasingly hailed by politicians as one of the most essential means by which a society is to develop. The availability of such technology is currently considered a key-component in determining the potential of economical growth in a region (e.g. Poignant, 1994). “Information technology provides new opportunities”, Swedish local politicians argue in an application for funding to develop their IT-strategies. They continue to state that “with knowledge of IT local enterprising will reach new markets, a higher degree of efficiency through new technology, connect to wider networks and may also market themselves electronically. By investing in information technology a better infra-structure will be created and will allow for growth and development of new enterprising. The result will inevitably be an increasing number of new jobs” (as quoted by Riis, Jedeskog, Axelsson *et al.*, 1997, p. 22).

The market speaks similarly of IT and also announces of a shift of paradigm. Information technology is now growing out of its first era, during which time IT mainly served the purpose of reducing clerical costs and increase general efficiency. In the words of Tapscott and Caston (1993), “we are entering a *second era of information technology* in which the business applications of computers, the nature of the technology itself, and the leadership for use of technology are all going through profound change. Organisations that cannot understand the new era and navigate a path through the transition are vulnerable and will be bypassed” (p. 13). During this emerging second era, at least in the realm of business, IT-use is changing from personal to work-group computing, from separate systems to integrated systems and from merely internal computing to inter-enterprise computing. In addition use is shifting from the hands of specialists and is becoming increasingly the domain of the common citizen also.

Irrefutably the development of IT holds a number of promises for the future. It would appear, however, that information technology with its current *raison d'être* to develop, is to some extent incompatible with certain aspects of human nature. It is important to observe then, that politicians and representatives of the market generally appear motivated to develop and implement information technology out of fear of losing the competitive edge in conquering the purchase-power of consumers, rather than being driven by the more humane desire to use new technology to facilitate human existence and potentially increase Quality of Life (cf. Durning, 1992; Brown, 1998). To the extent that this is indeed the case new technology inevitably becomes an *instrument of power*, which in the interest of commerce and competition wields its influence for greater economical growth but at times also to the detriment of individuals who, for a variety of reasons, cannot or will not adopt IT and its implementations on the same premise as many politicians and actors on the market appear to do.

In the wake of this development there are important aspects of the IT-revolution which need to be addressed and taken seriously. There is nothing novel about market-based economies striving to grow and expand and in so doing exemplifying well the principles of Social Darwinism—only the strong survive! With the emergence of information technology, however, markets—and the individuals controlling them—have been given an exceedingly powerful instrument of efficiency and control which have no historical antecedents. It has become possible, as American sociologist George Ritzer (1993) puts it, to more or less globally “McDonaldisé” society; i.e. to implement the process by which the principles of the fast-food franchise restaurants are increasingly influencing enterprising and its human resource management on a global scale. The principles as discussed by Ritzer are control, efficiency, calculability and predictability. These rationalistic tenets leave little room for individual consideration, preference,

interests, development—and more significantly—they leave little room for individual *needs*. It comes as no surprise therefore that concurrent with the rapid growth of new technology there are emerging new health hazards to the psychological well-being of the human existence also. To judge from the increasing number of articles published on the potentially detrimental effects of IT—scholarly as well as media footage—there would seem to exist a number of casualties in the wake of the emerging Information Society.

This development prompts the essential question whether information technology should indeed be made the societal basis of *everyone's* future. Should we allow society to develop into a state where the individual citizen becomes increasingly vulnerable to decisions made for the benefit of technology and its promise of rational control? Human responses as expressed in newly coined terms such as technostress, computer-related stress, computerphobia, computer addiction, internet addiction, information overload, communication overload, info-stress and most recently: “data smog” (Shenk, 1997), have arrived on the scene of human distress and potential pathology.

This chapter addresses the potential psychological dangers in the interaction between the human mind, its identity and information technology—or more specifically: the significance of *motives* behind development and implementation. Information technology as a constituent rather than an aspect of environment is discussed. The crucial issue of pace of change and adaption and the related issues of technostress, addiction and cognitive overload as emerging problems of human and information technology interaction are focussed. The chapter is introduced, however, by showing historically that aversive reactions to new technology is not a new phenomenon in the history of mankind. The perceived threat of new technologies and inventions caused insurrections amongst the workers of Northern England during the most expansive years of the First Industrial Era.

Ned Ludd and the rise of Luddism

Scotsman James Watt's considerable improvement of the already existing steam engine in 1763 was crucial to the momentous changes of society which swept England and gradually all over Europe during the final decades of the 18th century and on into the following century. More than anything else the steam engine prompted the development of new technologies, new industrial and natural resource exploitations and a social restructuring of society. In 1760, for example, the English cotton industry employed 40.000 people, in 1785 the number had risen to 80.000 only to soar to over 800.000 in 1838. Similarly the production of iron increased six-fold from 1750 to 1796 (Frisch, 1961).

The development of the new technology had considerable repercussions not only on society and societal structures but also affected workers' morale and sense of identity. Reactions were particularly strong in the textile industry in the North of England and in the Midlands during 1811 to 1813 where the implementation of new —and more efficient—knitting and weaving machinery put a vast number of workers out of their already badly paid jobs.

Militant groups were formed, starting in Nottinghamshire, which raided factories and broke certain types of machinery (not all machinery!) Leader for this insurrection was Edward (Ned) Ludd or "General Ludd", whose real existence historians have not been able to verify. Raids and intimidations made by enraged workers towards factory owners and their protectors, however, were usually done in Ludd's name. It is also by this name the industrial rebellion has become known as *Luddism*, which is characterised by pseudonymous and intimidating letters, nightly raids, quasi-military operations, secrecy, solidarity and a campaign to instigate fear or dread in those whom actions are aimed at (Sale, 1996).

The rebellion did not go unnoticed by authorities. They struck back fiercely, even to the extent of legislation protecting in law the integrity of certain machinery, which it became punishable by hanging to destroy. The illustrious Poet Laureate Lord Byron, also a member of the House of Lords, spoke up in the House to defend the Luddites but to little avail. The refusal of his peers to listen and understand was later bitterly commented by Lord Byron in a London newspaper on March the 2nd 1812 (in Sale, 1996, p. 99):

Some folks for certain have thought it was shocking,
when famine appeals, and when Poverty groans,
that life should be valued at less than a stocking,
and breaking of frames lead to breaking of bones.

If it should prove so, I trust, by this token,
(and who will refuse to partake in the hope?)
that the frames of the fools may be first to be broken,
who, when asked for a remedy, send down a rope.

During the Luddite protests and the battles between Luddites and the legislating authorities 15 were killed in action, 24 were strung to the gallows, 24 were incarcerated and 51 sentenced for deportation to Australia (where incidentally some of them after served sentence did very well; much better than what would have been possible should they have remained in England).

It is of some significance to note that Luddites where *not* reacting to the new machinery as such. Sale (1996) points out that although the destruction of some technology was an objective, grievances were rather aimed at what the machinery *represented*. In other words, the textile workers of early 19th Century England largely reacted to loss of control over their own lives, loss of influence and the feeling of alienation to a *rapid* change for which most of the workers could not successfully adapt. Adaption could most likely have been facilitated by understanding and

proper support but few in authority could apparently care less and refused to understand the repercussions of decisions taken to continue industrial development at any cost.

In focussing aversive reactions to the information technology revolution in the following and its potential repercussions on the human mind, identity and social circumstances, it is inevitable not to compare Industrialisation by means of steam, coal and iron of previous eras and current industrialisation by means of information technology. Both eras have similarities that merit serious attention if we wish to avoid earlier mistakes and implement new technologies without threatening individual integrity and identity.

Information technology as environment

Computers function as triggers of stress in a variety of ways depending on situation, computer function and the person making use of the technology. Research has shown that computer stress may be divided into several operationally distinct categories: computer alienation, computer anxiety, IT's impact on society, computer technology hassles and computerphobia. Although an effort has been made to arrive at one or at least fewer, measures of IT-induced stress as represented by these category labels, the complex human response patterns to computers and new technology would seem to remain (cf. Ray & Minch, 1990).

It is perhaps no surprise that it is difficult to find a single parsimonious scale by which to identify or explore IT-induced aversive reactions. While the new technology itself is usually described and discussed in everyday-life in terms of being a tool, it is often neglected that the computer and the technology following its continued development has increasingly shifted emphasis from being one *aspect* of environment to becoming a *constituent* of environment.

Webster's dictionary interestingly defines environment as "surroundings, especially the material and spiritual influences which affect the growth, development and existence of a living being".

In the context of work during and after the current shift of paradigm information technology—as discussed by Tapscott and Caston (1993)—the computer is no longer only a tool to get the job done. It is in a sense becoming environment itself. A "technosphere" is emerging.

Information technology increasingly defines the parameters within which to work in terms of pace, accuracy and efficiency, thereby creating a certain *dependency*. The human reaction to dependency is always multi-faceted and individual. When environment and its constituents therefore change individuals are challenged to adapt. And if change for some reason is beyond individual control and exceeds individual tolerance stress is the inevitable human response.

Note that Lazarus and Folkman (1984), for example, defines psychological stress as a *relationship* between a person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being.

The difficulty in IT development and the rapidly changing society because of it lies to a large extent in what Freeman (1987) terms *technological determinism*. He points out that "new technological systems can offer such great technical and economic advantages in a wide range of industries and services that their adoption becomes a necessity in any economy exposed to competitive economic, social, political and military pressures" (p. 5). In other words, some technological systems and their economical context determine development and the pace by which it takes place, rather than considerations of the needs and reactions of individuals in that context. Once set in motion these systems become indispensable creating infra-structural dependency. One might actually pose the question, therefore, whether technological systems exist for the benefit of society or whether society exists for the benefit of these systems! This is

strikingly exemplified by Brod (1982) who in an effort to describe the virtues of “Technostress Training” describes the commonplace resistance to swift change in work conditions due to new technologies amongst business managers and their staff. While acknowledging the problem he also significantly points out that such resistance is *costly*: “Delayed schedules, decreased performance and limited productivity all work to reduce profitability. Since capital expenditures per employee often double when a computer system is installed, and the cost of skilled labour is high, losses can be substantial. In addition, this sort of resistance limits the possibilities for using the technology in new ways” (p. 753).

Individuals who for lack of knowledge, experience or will to acquaint themselves with new computer systems and the technosphere which they constitute—in a context such as that described by Brod—are interestingly not seen as individuals in need of help and support. They are rather construed by Brod as compromising profitability and productivity and therefore seen as victimising the system. *They* need to be changed to fit the system not the system be made to fit and profit individuals!

The components of technostress

Researchers Minch and Ray (1986) discuss *alienation* as an important construct in understanding computer user attitudes. Alienation in this context is in a sense an existential reaction to information technology and entails the feeling of powerlessness (to be controlled by computers) and normlessness (computers encourage unethical practices and are depriving people of their jobs). Alienation also includes a sense of meaninglessness caused by little understanding of what computers achieve and how they work.

However, social isolation contributes to alienation also. Working in a computerised environment may well cause employees to interact less with each other at work and in some circumstances social relationships are prevented because of how technology has restructured the environment.

Minch and Ray also discuss a sense of estrangement as an important variable in understanding general technostress. Computers would appear to be understood by some individuals as entities with a “life” of their own with the ability to either enhance a task or a position or deprive them of it. The computer also becomes the object of values. Estrangement may be the result of taking a stand and argue that society values computers too highly.

Computer anxiety, on the other hand, is unlike alienation a construct focussing on the reactions to the practical use and operation of computers (Raub, 1981). It would seem that important aspects of anxiety are fears of either mistakes or causing damage. Some individuals report hesitation to operate and learn to use computers because they are afraid either of making mistakes which cannot be corrected or to use the computer in such a way it will be damaged beyond repair. Behind both fears, of course, are lack of experience, knowledge and understanding.

Raub (1981) established in his research that *Impact on society* is a separate component to be included into the general understanding of technostress also. Impact outlines individuals’ reflections on societal control, impact on the availability of jobs, making the world a place run more by technology than human nature and human judgement.

Richard Hudiburg (1989a; 1989b; 1991a) of the University of North Alabama has spent a considerable research effort in trying to chart attitudes and reactions to computers and computer use. One contribution to the literature is The Computer Technology Hassles Scale comprising 69

different items of *computer hassles* at work as well as in daily life creating various degrees of stress. The ten most frequently mentioned frustrations are—in rank order—computerised junk mail, computer system is down, lack of computer expertise, optical price scanning in grocery stores, keyboard typing errors, computerised mailing lists, needs to update computer skills, programming errors, needs to learn new software and lack of help with a computer problem.

One significant finding is that while computers may cause stress for a variety of reasons such computer-associated stress resulting from interacting with information technology is apparently *not* related to computerphobia: the fear of computers (Hudiberg, 1990; Rosen, Sears & Weil, 1987). There are therefore at least two groups of individuals in society, both prone to IT-induced stress but for different reasons. Some individuals refuse the new technology possibly because of what it represents to them and are distressed by it, which is not without its historical antecedents (cf. Sale, 1995), whereas the other group more or less has accepted the new technology but the possible discrepancy between developmental pace and demands on efficiency at times create frustrations.

It has been shown that computer hassles are not necessarily related to the degree of experience that one has to use and interact with computers (Ballance & Ballance, 1993). Note also that men tend to be more favourable towards computers than women (Badagliacco, 1990), or at the very least have different types of concerns and attitudes towards IT (Canada & Brusca, 1991), which may well suggest that women are generally more prone to computer stress than men.

When change is too swift and human adaption too slow

Some of us think for a long time before investing in either a first computer or a new computer to replace an older model. As we ponder on performance, use, software and model we shop around to find the best bargain: most computer power for the least amount of expense. However, if you are like me and take good time to decide, you will find that your potential candidate for purchase may be out-dated. By the time you finally make up your mind to go for a certain model it might well have already been succeeded by newer models, faster, more powerful and with improved efficiency. Antiquity comes swiftly in the world of computers and the inadequacies of old age become apparent all too quickly. The speed of regeneration within the computer industry is astounding and the development of new and creative applications is staggering. So much so that even individuals working professionally with computer development and training are reacting with frustration. Ken Truffit (1994) of the Professional Training Institute in Australia makes the following reflection:

The problem is, things are changing just too fast! A very few years ago, you could spend six months getting up to speed in a certain development environment, then look forward to several years where you could stay at the leading edge with only a modest amount of reading to keep up to date with the latest developments. Today, any environment that is not upgraded annually is considered to be languishing in the wings. And we don't mean minor upgrades, either. VB 2.0 introduced ODBC; barely six months later VB 3.0 introduced the JET engine. Before this year is out, VB 4.0 will see significant changes in the way OLE is implemented. And that's just VB. Try keeping up to date with C/C++ (including MFC and OWL)! It is not a matter of the ability of our brains to store this information. The problem is one of the rate at which it must be absorbed.

If you as reader felt some frustration over the fact you did not understand some of the terminology used by Truffit (i.e. VB, JET, ODBC, OWL, OLE, MFC and so on) then you have just experienced a degree of technostress! With IT-development comes not only fast-changing applications and software but also a rapidly changing terminology needed to describe new functions. This terminology is in my experience seldom readily communicated to potential users.

Producers and software engineers all too often take for granted that application users know their own professional language.

Not only is change per se an important factor when addressing aversive reactions to information technology but also *the pace* by which change is taking place. While change in itself may well be the spice of life for a number of people—and more so for some than others—the pace by which IT-development takes place is crucial for whether the common citizen of any nation will embrace it, adapt and develop—or resist it, cope and be victimised by it. Individuals instrumental in enforcing the IT-revolution within organisations and societies to preserve competitiveness, marketability and/or profit are by no means immune to the distress of drastic changes themselves. One of the most potent stress factor, for example, of the Stock Exchange Dealers of London City appears to be too rapid a change in the way the Dealers are asked to perform their work (Kahn & Cooper, 1993).

Adaption has always played a key-role in evolution. Successful adaption to new circumstances is essential to the survival of any species, and as far as the human species is concerned it gives some perspective on the issue at hand to know that intelligence, in spite of numerous understandings of the theoretical construct as such, is basically defined as the ability to profit from experience. While evolutionary adaption is critical to the full extent of development of biological life, however, short-term adaption in which coping with technological change is a part, is just as critical but more limited to individual life-spans and generations. At some level the two are related (see Plomin, 1994). The significance of short-term human adaption then, could be exemplified by the following situations: encountering a foreign culture, a natural disaster and so-called life-change events. While these examples may seem overly dramatic and perhaps far-fetched in a discussion of information technology, I have chosen them nevertheless to make a

serious and in my view a valid point: change in circumstance, be it complete or marginal, expected with confidence or dreaded, will inevitably affect the human psyche and as a result also our well-being. It will always take time to adapt to novel situations, more so for some than others depending on personality, capacity, background and experience. In some cases—for a variety of reasons—we adapt badly or not at all. Dramatic change and lack of time, opportunity or will to readjust is always related to stress. Therefore, IT-development, if badly implemented breaking personal and social integrity and superseding cognitive boundaries, most certainly has the potential to unleash disaster—personal or collective, which is no less real because it is not visible in the same way as an earthquake or immediately felt as the direct impact of a life-change event.

One afternoon in 1989 a major earthquake struck San Francisco and its devastating effects were quickly wired across the globe to appear in news broadcasts and newspapers worldwide. Almost immediately researchers launched a study on 800 randomly chosen people in the San Francisco area to find out how they were able to cope with the disaster. Pennebaker and Harber (1991) identified three distinctive phases in coping behaviour over a time period of about one year. During the emergency phase (first three to four weeks) social contact, anxiety and obsessive thoughts about the earthquake increased. Then followed the inhibition phase (three to eight weeks after the earthquake), which was characterised by a sudden decline in mentioning or even thinking about the disaster. Dreams about it increased however. In the adaption phase (from two months and on), finally, the psychological effects of the earthquake were over for most people, but approximately 20 per cent of residents remained worried also one year after the experience.

Another example of the human need to adapt is the acculturation process into another culture. It is known that this process often follows a U-shaped function clearly divisible into four phases over time (Hofstede, 1991). First there is a brief period of positive feelings or even

euphoria, which is abruptly followed by a culture shock. The new culture's values, traditions and structure may be completely foreign to the long-term visitor, immigrant or refugee. In a sense it is like becoming a child yet again, having to learn new behaviours from scratch. Three outcomes of the acculturation process appear to exist: the individual never arrives at a stage where he or she feels accepted and embraced by the new circumstance; he or she is successfully adapting and the end state is just as acceptable as the beginning state; and the individual may "go native" and becomes—in terms of culture—even more native than the natives themselves. The interesting aspect of this adaption process is the time scale. Hofstede points out that people of short foreign assignments report all phases of the process within three months, whereas employees on prolonged assignments abroad report the culture shock phase to last about a year or more before the acculturation process sets in.

The third example of significance of the adaption process concerns the influence of major incidents or events during a life-span, which has been the focus of extensive study. Different events have different degrees of impact and it is generally agreed that the demise of a close family member is the event with the greatest impact, followed in significance by the death of a close friend, divorce between parents, a prison term, major personal injury or illness, marriage, being fired from a job, failing an important course in training, change in health of family member, pregnancy and so on (as outlined in Zimbardo, McDermott, Jansz & Metaal, 1993). Note that life-change events certainly may be blissful occasions and not necessarily negative or detrimental and that their impact is a function of adaption (or rather readjustment). That is, in average terms the more severe—or the more joyous—the event the longer it takes to readjust to normality (cf. Holmes & Rahe, 1967). One reason that readjustment has interested researchers is that there has been shown to exist a relationship between major life-events and medical

problems—becoming more or less susceptible or more resistant to illness. It is known, for example, that grief or bereavement affects the immune system (Schliefer, Keller *et al.*, 1983).

The pace of change is inevitably an essential component in understanding aversive reactions to information technology. But it is not the only component that is potentially deleterious to the human psyche. There is also the information technology as a means to identity reconstruction addiction—and in the words of social psychologists Roy Baumeister (1991)—a means to flight from the burden of selfhood!

On being addicted to the Internet

Do you like to “surf”¹ Cyberspace and spend hours on end communicating with others in so-called chat rooms or engaging in games played between several players simultaneously over the internet? Do you spend considerable time downloading software you scarcely need, sample the ever-increasing numbers of new “sites” and check your electronic mailbox incessantly throughout the day (and you probably have several addresses)? Do you get up in the middle of the night just to meet someone in cyberspace? If you for one day should forgo these activities and feel irritable, dissatisfied and cannot wait to get back “on-line”, then, according to an increasing concern as expressed mainly in the popular media, you may well be showing signs of becoming a “webaholic” (e.g. Henderson, 1996).

The notion of being able to develop an addiction to information technology however, and more specifically to the internet, has fuelled a discussion amongst clinical researchers since it is often argued that addictive behaviour should be applied mainly to substance abuse. Gelder, Gath and Mayou (1993), for example, are reluctant to speak of dependency in any other context than in

¹ To surf is the commonly used term to explore the internet. Rauterberg (1996) defines the term as an “aimless search for attractive and desirable information”.

reference to alcohol and drug abuse. They do not refer to addiction as a valid term at all nor does the manual of mental disorders: DSM-IV (APA, 1994). Clinicians and counselling centres at university campuses, however, are receiving an increasing number of clients who feel they need assistance to remedy their excessive use of the internet. As far as university students are concerned they become worried when they realise they start missing classes and appointments, forget to do their papers and assignments and more or less lose contact with family and friends in favour of spending excessive time by the computer (Murray, 1996a; 1996b).

This phenomenon has not yet received much attention by clinical researchers, although this is changing. A scientific journal—*CyberPsychology & Behavior*—was recently launched to stimulate much needed research in this field. The possibility of internet addiction, however, has received a great deal of attention on the internet itself. There exist for example the Webaholics Support Group, The Internet Addiction Support Group as lead by psychiatrist Ivan Goldberg, who also appear to have been the first to propose diagnostic criteria for Internet Addiction Disorder (IAD)—later changed to Pathological Computer Use (cf. King, 1996). More recently, however, Kimberly Young—a psychologist of the University of Pittsburgh—has opened the Centre for On-Line Addiction² (COLA) on the internet which, according to Young, is “the first on-line counselling service, consultation firm and training institute for Internet addiction”. Young’s effort is a result of her own research on computer use and abuse realising there are individuals who more or less suffer from excessive time spent on-line.

Although nomenclature is not yet formally established nor criteria to include information technology into the many ways in which an individual may be considered abnormally dependent, abuse of IT leading to the deterioration of personal responsibilities and commitments are real and

² <http://netaddiction.com>

is becoming a serious problem to an increasing number of individuals. Companies too are starting to raise their voices in concern that the Internet is used for other purposes than what companies actually intended it for. Machlis (1997), for example, reports one company which decided to track all traffic over their own internet connection over a period of time and discovered that only 23 per cent of on-line traffic was business related!

In a recent preliminary survey by Brenner (1997), administered over the internet, the average “surfer” is 32 years old, twice as likely to be male than female and spends on average 21 hours per week on the internet. However, 17 per cent of these respondents spend more than 40 hours per week on-line, 50 per cent of all respondents feel that their work has suffered as a result and almost all, according to Brenner, seem to have exhibited some addiction-like behaviours at some point.

A similar but larger study was done by Swiss researchers (Egger & Rautenberg, 1996; Rautenberg, 1996). In an international survey, also administered over the internet, they received 450 complete responses to their questionnaire on internet behaviour and addiction. A majority of the participants were male (84 per cent) and 16 per cent were female. Average age of the respondents was 30 and age ranged from 13 to 72. The group is also evenly divided between occupational categories such as students, computer users at work, academics/scientists and other professions. In terms of time spent on-line one per cent spends *more* than 20 hours a day surfing. Two per cent estimate their time on-line to between 10 - 20 hours. Seven per cent believe they surf five to ten hours a day and the large majority of the group (i.e. 90 per cent) spends no more than five hours a day on-line. Interestingly, 11 per cent of respondents consider themselves to be “addicted” to the Internet. One important finding in the study is the difference between the group of respondents who consider themselves as inordinately dependent and other “normal” Internet

users in how the Internet is used. The dependent group makes more social acquaintances on the Internet than in everyday-life, stays much longer on-line than they originally planned when commencing the session. They lose track of time whilst on-line and try to hide to others (i.e. close family and friends) the real cause for their absence—even to the extent of lying. They emphasise so-called chat rooms and aimless and serendipitous surfing in using the internet, show a decrease in their use of other more traditional sources of information (i.e. libraries) and experience that their time on-line has a negative impact on work and their financial situation. The group is also more often to be found in self-help groups and more frequently pose questions that require professional and/or medical advice.

Diagnosis: Pathological Internet Use (PIU)

If then internet dependence is regarded as a true behavioural disorder which are the criteria for Internet addiction? While there currently exist several similar suggestions it would seem that the diagnostic screening instrument developed by Young (in press), as adapted from the DSM-IV diagnosis of Pathological Gambling, is—although tentative—the most workable one and also has the advantage of being tried in research. To model Internet addiction after Pathological Gambling makes the condition an impulse-control disorder which does not involve intoxicating substances (The eight-item diagnostic questionnaire is listed in Table 1). He or she who answers “yes” to five or more of listed critical questions in the screening instrument may be considered addicted and suffering from Pathological Internet Use (PIU); a diagnostic criterion which is consistent also with the Pathological Gambling disorder.

Table 1. *Diagnostic screening criteria for Internet addiction: Pathological Internet Use (Young, 1996; in press)*

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1. Do you feel preoccupied with the Internet (think about previous on-line activity or anticipate next on-line session)?
 2. Do you feel the need to use the Internet with increasing amounts of time in order to achieve satisfaction?
 3. Have you repeatedly made unsuccessful efforts to control, cut back or stop Internet use?
 4. Do you feel restless, moody, depressed or irritable when attempting to cut down or stop Internet use?
 5. Do you stay on-line longer than originally intended?
 6. Have you jeopardised or risked the loss of significant relationships, job, educational or career opportunity because of the Internet?
 7. Have you lied to family members, therapist or others to conceal the extent of involvement with the Internet?
 8. Do you use the Internet as a way of escaping from problems or of relieving a dysphoric mood (e.g. feelings of helplessness, guilt, anxiety, depression)?
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Young's (1997) research unveils many a disturbing facet of the potential misuse of information technology. Individuals who suffer from PIU are likely to spend between 40 - 80 hours per week on-line, and single sessions sometimes last up to 20 hours, which is consistent also with other studies done so far. If much time is spent on-line sleep patterns are typically disrupted and individuals will have difficulties in coping with school or work. Family life may be affected also and spouses have even been reported to become "cyberwidows" as husbands go on an "internet binge". So much so that lawyers have noted a rise in numbers of divorce cases due to the fact that some husbands spend more time with cyber-partners than with their real-life wives (Quittner, 1997).

About 90 per cent of the dependents in Young's research become dependent of Internet *communication* functions (i.e. chat rooms, MUDs, news groups and/or electronic mail), and most of these became dependent as fairly new to the Internet having been on-line for no more than one year. Young identifies three main areas of attraction pertaining to these communication functions, namely social support, sexual fulfilment and creating a persona (for a more exhaustive description of the internet as a meeting place, see Svenningsson this volume).

Social support is easily obtained on the Internet where there are interest groups for all conceivable persuasions and creeds. The Internet allows individuals to express feelings and details about their own beliefs, convictions and personal dreams, that they for a variety of reasons would rarely or never express in real life. On the Internet it is possible to obtain the feeling of closeness with others but *without* having to reveal your true identity and simultaneously to obtain the illusion of companionship without having to commit to the demands of friendship (Turkle, 1995). Anonymity is therefore one of the major attractive features of the Internet for the addicted individual.

Anonymity and the feeling of safety are important also for individuals devoting themselves to "cybersex". Kimberley Young reports that dependents felt free to carry out illicit sexual impulses and were able to act in ways that differed from real life conduct *without* fear of repercussions. "The ability to enter into a bodiless state of communication", Young points out, "enabled users to explore altered sexual states of being which fostered emotions that were new and richly exciting" (p. 5). One of the dependent respondents in the study, who frequented a sexual chat room under the assumed nickname of "The Stud", explains that "I am a 49 year old balding overweight man. But I tell young ladies in Cyberspace that I am 23, muscular, blond hair

and blue eyes. Otherwise, I know that they aren't going to have sex with an old, fat guy" (in Young, 1997, p. 5).

The addicted individuals also appear to be persons who have a poor self-concept. A cyber-life allows them to "re-invent" their own identity by manipulating looks, circumstances, background, education or any other characteristic that the person feel is desirable. Adopting a new and fictitious persona in a virtual reality makes it possible for the individual to explore what it would be like to be someone else. This in turn offers an escape from everyday-life and stress and an exploration of repressed aspects of their personality. Young takes Tony as an example- He has been married for three years and have one 18 month old daughter. He became addicted to an on-line game (DOOM-II) and explains, that "by day I am a mild-mannered husband, but at night I become the most aggressive bastard on-line"(p. 6). Tony grew up as a fairly neglected middle-child and built up a considerable resentment towards parents and siblings for this neglect. While he would not allow himself to show such resentment openly, he will allow the pent-up aggression to take shape in becoming "an aggressive on-line bastard" at night.

Needless to say, not everyone becomes addicted to the Internet nor does using it - and specifically its communication functions - necessarily create inordinate dependence. But the Internet offers an alternative reality into which some individuals escape and ties to reality are then increasingly severed. How dependents and non-dependents use the Internet is revealing. Information technology offers a seductive means to escape a stressful environment and means to create a cyberworld ideal to individuals who seek to live out social desires, needs and dreams but who for a variety of reasons cannot make these explorations overtly in their everyday-lives.

In this perspective addiction should perhaps not necessarily be seen as “pathological” in the traditional sense, although it may well be disruptive to responsibilities and commitments in the addicted individual’s life. It would rather seem that these individuals have needs that the environment in which they exist is not able to aid or satisfy - perhaps not even understand. It is equally possible to say that individuals identified as suffering from PIU have become dependent of a certain *coping behaviour*. Shotton (1991), for example, points out as a conclusion of her own research, that “the need to have control over aspects of one’s environment seems especially necessary for those who have not been loved unconditionally while young. From the results it could be concluded that the need to control the computer is neither neurotic nor pathological, but provides an admirable means of coping for those who may previously have felt inadequately fulfilled” (p. 229).

Internet addiction, therefore, is doubtlessly as real in overt behaviour as is any other type of clinically diagnosed addiction, but paradoxically it may well also offer an opportunity for some to safely explore intra-personal conflicts by role-playing, which is a mean used by, for example, dramatherapists for a patient to discover and come to terms with different aspects of one’s personality (cf. Gordon, 1988). In considering the incidence of PIU however - although so far tentative - it may well be more appropriate in some circumstances to speak of the *environment* as disordered rather than the individual. Ill-conceived technological environments do not only have the potential to create social isolation by making it less necessary to interact with other people in a more traditional sense as discussed above (cf. Minch & Ray, 1986; Smith & Wield, 1987). They also inadvertently offer a potential substitute for real friendships and relationships. As a result, it would appear, both the employer and the employee may come to suffer. The socially deprived computer terminal user escapes into virtual reality where another social reality is on

offer. Simultaneously the employer grieves the slow or falling rates of production and efficiency insisting, perhaps, on an even more socially deprived and computerised environments only to increase production and efficiency...

More is not always better!

It is interesting that the current and very rapid development of technology is often referred to as the development of *information* technology. The possibility to seek out and access needed information and to do it efficiently and quickly is a main concern in this development. However, consider the fact that the average (American) office worker daily receives 32 phone calls, 11 messages on their answering machine, receives 9 faxes and reads 14 e-mails, and the fact that 48 per cent of these professionals consider the internet as their foremost source of stress (Reuter Business Information, 1997). In addition, note that a manager on average sends and receives 178 documents a day through a variety of media (IFTF, 1997), that there were approximately 12 billion messages left on American voice mailboxes in 1993 and that there has been an increase of 26 million number of e-mail accounts since 1987. This is reason enough for Tetzli (1994) to speak of the emerging “Infobog”. It is not surprising, therefore, that too much information and the numerous avenues available by which information may be conveyed or retrieved are also problems arising in the wake of the IT-revolution.

The research on human perceptual and cognitive limitations and too much information or the processing of complex information is not new per se, but it has been the domain of Engineering psychology and its concern for human factors in technological designs (Wickens, 1992).

Originating in the study of unexplicably crashing airplanes by well-trained pilots during World

War II, the study of “The Human Factor” was launched; that is, the study of human errors as caused by flawed designs providing too much and complex information for the human mind to process in certain circumstances. Aircraft pilots and their cockpit environment are still an important target for study. A pilot must process a multitude of visual signals bearing on the status of the aircraft while listening to the voices of air traffic control and the status of other aircraft nearby. In fact, as a result of research no aircraft currently produced is sold without a so-called workload metric (Lerner, 1983). It is a fundamental issue in this type of science to quantify the flow of information in terms that allow the diverse tasks to be compared to the capacities of the human operator.

While the notion of mental workload is well established the related and emerging construct of Information Fatigue Syndrome (or alternatively Information Overload, Info-stress or Communication Overload) is attracting increasing attention. Engineering psychology has mainly been devoted to design issues in *critical* environments where human error may cause loss of life or environmental cataclysm. In this scenario the individual is the *agent* in causing potential disaster. In reference to Information overload, on the other hand, the individual subject to a certain mental workload is the potential *victim*. The crucial factor in both perspectives is amount of information exceeding human capacity in certain environments. Observe that while mental workload mainly describes physiological processing limitations, Info-stress—inevitably dependent on such fundamental boundaries also—rather needs to be understood as the inability of making rational and meaningful choices when a critical level of information saturation from an inundation of possibilities has been reached. One anonymous and frustrated individual expresses the dilemma in the following way: “How does a sane business person sift through and make sense of the stacks of junk mail, e-mail, voice mail, magazines and newspapers - not to mention

the advertising? More difficult yet, how can you make sensible business decisions based on the flood of seemingly random and often unsolicited advice?” (LBSi, 1998).

The effect of information overload may well be critical when for example important decisions are to be made. Research has found that as the number of cues provided to a decision maker beyond approximately 10 items of information decision performance gradually falls (Streufert, 1973), and the greater the diversity of the information provided the greater also the information overload effect (Iselin, 1989), Confusion is the inevitable outcome of too much information in too short a period of time (Bergström, 1995), since being exposed to information, reaching beyond a certain critical level, leads to *information saturation* (Sowell, 1980).

Overload in the context of an office with access to multiple means of communication, John Gundry (1997) argues, tend to occur for three reasons: First, individuals usually do not know how to use communication tools responsibly. E-mail is a significant culprit because of the temptation to make use of distribution lists where information is sent “for information”. Second, different media meet different communication needs. Managers, according to Gundry, often use the wrong tool for dealing with their staff. Some means are good for negotiating or discussing issues of a more personal nature whereas others are better suited for conveying facts. Third and lastly, companies tend to have limited awareness of the difference between pushing information at people through e-mails and messages on paper, and allowing them to retrieve the information themselves when they feel they need it. We experience more information overload, Gundry argues, when information is pushed at us, since we are not in control of the flow of information ourselves.

In summary, the inundation of information everywhere in society as a result of IT-development is creating a societal problem with no historical antecedents. In past historical events and processes a case can often be made to argue that there was not enough information available, or information was withheld for a variety of reasons, and a situation developed historically in a certain direction. At present and presumably in the future we paradoxically have the opposite dilemma. We run the risk of being exposed to too much information, the result of which in badly designed environments may lead to saturation, confusion, irresponsible decisions and crucial errors. Austrian researchers Földy and Ringel (1993) widen the scope of the problem and include media in general as a much-overlooked cause of psychological depression. Day by day, they argue, media tend to *seduce* us into a replacement reality. In order to emphasise the potential seriousness of this “seduction” the researchers coin the expression “Mind-Kidnapping”. Information overload could also lead to, which Buse (1997) cogently points out, the fact that we increasingly come to *distrust* the information we receive.

It may well be, however, that much information is beneficial and positive and serves a good purpose. But in order to reap the benefits of the abundance of information the persons seeking it must probably be allowed to do so in their own time and on their own terms (Rudd & Rudd, 1986), which is not always the case in the emerging technospheres in which most of us live, go to school and work.

The rise of Neo-Luddism

Whilst research into human interaction with IT at present is tentative at best and many reactions to current societal development are more or less anecdotal, it is interestingly not as much the technology itself that emerges as a potential nemesis. It is rather the dynamics of development

that pose a dilemma: the incentives to develop technology and the objectives for which technology is developed. The implementation of these, in many cases, has clearly violated individual human integrity or prompted individuals to paradoxically using the technology as an illusory means to cope. The conclusion therefore of this brief overview must inevitably be that implementation of information technology is often done indiscriminately with little regard to human capacity and fundamental human needs, which was more or less the case also in the early decades of Eighteenth Century England.

The reason for such insensitive implementation appears two-fold: mere ignorance which easily can be remedied with proper training, and rationalistic product-orientation which is a much more complex phenomenon and also more difficult to change. The urge to manufacture products to sell or trade for profit in order to gain individual or national advantage is powerful motivation. We are all more or less intrinsically egocentric—for good and for worse (Greenwald, 1980). With the obtaining of power and influence, however, self-interest may cause considerable havoc amongst individuals of lesser power and influence unless decisions made are based on ethical grounds where individual human rights and welfare are considered supreme and non-negotiable whatever the cost. Information technology is likely to be the most potent instrument ever invented and adopted to wield such power—be it either out of self-interest or with the welfare of humanity in mind. Technological determinism excluding human sentiments, needs and limitations, can only exist where self-interest is more important than the welfare of others! As the second Industrial Revolution gains momentum through information technology we should be wary not to make the same mistakes as those of the first Industrial Revolution. As historian David Noble (1984) puts it: We have “a second Industrial Revolution [in which] capital is moving decisively now to enlarge and to consolidate the social dominance it secured in the first, [only

now on a global scale and] with the new technology as a weapon... in the quest for more potent vehicles of investment and exploitation... Once again the machines of industry have taken centre stage in the historical drama, as the drive for ever more automatic processes becomes a historical stampede” (as quoted by Sale, 1996, p. 207). Not surprisingly there has arisen a second Luddite movement: The Neo-Luddites, who unlike their predecessors have arisen amongst academics rather than (office) workers (e.g. Boal, 1995; Freeman, 1987; Kiesler, Siegel & McGuire, 1987; Neil, 1995; Robbins & Webster, 1987; Sale, 1996; Stoll, 1995; Turkle, 1987; 1995)³.

Chellis Glendenning (1990a), an American psychologist, launched a research project in which she had decided to study “technological survivors”; individuals who had suffered injury or illness after having been exposed to toxic technologies at home or at work. Injuries were caused for example by nuclear radiation, pesticides, asbestos, means of birth control and so on. Glendenning’s findings reminded her of the Luddite insurrection, and she concluded the individuals in some way harmed by technology experience disruption, loss, uncertainty and a sense of betrayal by the system that touts technological “progress”. According to Glendenning, victims understand their inflicted predicament as symptoms of a whole system gone awry—much like the followers of the fictitious Ned Ludd! Shortly after the publication of her research findings, she also published “Notes toward a Neo-Luddite manifesto” (Glendenning, 1990b), whose three stated principles expresses the sentiments and direction of Neo-Luddism and also much encapsulates the human - machine interaction dilemma. Neo-Luddism entails (as rendered by Sale, 1996, p. 237-238):

³ Note that I consider all critical voices in this context as in some sense “Neo-Luddite”. That is not to say, however, that voices of raised concern consider themselves as Neo-Luddites, nor that they are indeed aware of this neologism.

- Opposition to technologies that emanate from a worldview that sees rationality as the key to human potential, material acquisition as the key to human fulfilment and technological development as the key to social progress.
- Recognition that, since all technologies are political, the technologies created by mass technological society, far from being neutral tools that can be used for good or for evil, inevitably are those that serve the perpetuation of that society and its goals of efficiency, production, marketing and profits.
- Establishment of a critique of technology by fully examining its sociological context, economic ramifications and political meanings from the perspective not only of human use but of its impact on other living beings, natural systems and the environment.

Pandora's Box revisited?

New developments, inventions, styles, attitudes and so on have always evoked fear and ridicule (cf. Chaib, this volume). Critics are always plentiful when something new and unknown emerges. But there has usually been enough time for society to adjust to novelty; to assimilate it and thereby accepting it—or at the very least learn to live with it. As far as information technology is concerned, however, society is making itself increasingly dependent upon it and governments and industry are subjecting citizens to its far-reaching impact whether or not they have chosen to accept it. Preliminary reports suggest that the speed of current change is too rapid and is creating casualties. It is perhaps time to seriously reconsider the direction which current development are taking and even consider the limitations of the bases on which modern society has—and is continuing—to construct itself (cf. Heilbroner, 1975).

Information technology can in itself not be considered intrinsically neither harmful nor beneficial. The dilemma is in how and why it is applied and implemented. IT could perhaps be likened to Pandora's Box of Misfortunes: The Greek myth in which Prometheus stole fire from Zeus and brought it to Earth. As punishment Zeus created and sent Pandora to Earth with a gift to Prometheus: a box, which when opened would let loose all human misfortune. In the box, however, Zeus had also concealed Hope. The box was opened, although not by Prometheus but by his younger brother Epimetheus, and the world was filled with plagues, sufferings and misfortunes. Discovering the horrendous content of the box Epimetheus quickly closed it—never to discover that he failed to let Hope out of the box by closing it too quickly. A myth but not without merit and message: Information technology being the main force in the second Industrial Revolution, may well bring welfare and constructive and beneficial development. But it is equally possible that as an instrument of power it may “plague” humanity by ignorance of how to best implement it, or by allowing implementation to be governed by self-interest either overtly or covertly. Progress, in other words, if indeed it should qualify as progress in the interest of humankind over a long period of time, need always be *preceded* by the question at what cost to human existence, integrity and dignity?

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