

The Societal Value of ICT: First Steps Towards an Evaluation Framework

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Abstract: The impact of information and communications technology (ICT) on organisations has been widely discussed in the literature. Its impact on individuals has been less extensively studied, but much good work has still been undertaken. In contrast, the impact of ICT on society as a whole has, as yet, to be examined in any detail in the academic literature. This may be because the question is highly problematic, posing many difficult conceptual and practical questions. This paper is an initial and tentative look at this issue. Starting from a discussion of what constitutes 'the information society', the paper uses concepts from the balanced scorecard as a potential framework for exploring the question of the societal value of ICT and proposes a number of costs and benefits that might be components of such an analysis.

Keywords: Information society, information age, evaluation, value scorecard.

1. Introduction

The term 'The Information Society' has been in vogue for a number of years. It is not certain who first coined the expression (although undoubtedly there will be many who claim to have done so). Whatever the authorship, the expression might be considered as a natural extension or variant of the expression 'information age'. The expression information age was and is used to differentiate the period beginning in the 1950s or 1960s (the exact birth date being a matter of opinion) from the earlier agricultural, industrial and (briefly) service ages. By the mid 1990s, however, the term Information Society had gained widespread currency although for the previous decade at least, it could claim to be a field in its own right in the academic community¹. Indeed, according to the Encyclopaedia Britannica:

Analysis of one of the three traditional divisions of the economy, the service sector, shows a sharp increase in information-intensive activities since the beginning of the 20th century. By 1975 these activities accounted for half of the labour force of the United States giving rise to the so-called information society.

Although much has been written on the Information Society and there is considerable

enthusiasm for it at national and supranational level (*the EU has a Directorate General for the Information Society*²), and while many authors have raised a wide range of issues in this area, to date relatively little academic effort has been made to evaluate the impact of information and communications technology (ICT) on society as a whole. There is certainly no shortage of books on the information society as a quick search of any web based book site will reveal. Books on the information society cover everything from its impact on the Black community to legal, sceptical, historical and sociological perspectives. But there is no (or at least readily locatable) publication which offers a balanced evaluation of the impact of ICT on society. One possible reason for this paucity of serious academic comment is the sheer scale of the task. This paper does not attempt to fill this gap or even define the scale of the task. Instead it suggests a framework of conceptual issues that will need to be addressed in any such evaluation. It is, therefore, only a first step on a road which is yet to be travelled.

2. In search of a definition

Any discussion of an Information Society should start with some level of agreement on what is meant by the word 'society'. 'Society' remains one of those words which, as St. Augustine once said of 'time', everybody understands until they are asked to explain it. A good working definition is given by the Concise Oxford Dictionary, which defines 'society' as:

¹ The Information Society Journal has been published since 1981. See www.indiana.edu/~tisi/. There is also a European Journal of Engineering for Information Society Applications (see www.ejeisa.com/nectar/journal/).

² See http://europa.eu.int/comm/dgs/information_society/in dex_en.htm

the sum of human conditions and activity regarded as a whole functioning interdependently.

What then, in this context, is the 'Information Society'? Here, we find many answers. For example, Ireland's Information Society Commission website uses the following definition:

Information Society is the term that is used to capture the increasing contemporary influence of information and communication technologies (ICTs).

This is quite a different construction from the preceding definition. Looking further into the Irish government's view of the Information Society we find the Minister for the Information Society³ making statements such as:

Exploiting these opportunities, using technology to enhance people's lives, is in my view, what the Information Society is about.

This interprets the information society not as a concept, but almost as a political objective. As such the information society is taken to be a good thing which, like motherhood and apple pie, deserves everybody's support. However the key expression here is 'enhancing people's lives', a phrase fraught with problems for the would-be evaluator. Tempting though it is to simply regard this concept as purely subjective and therefore intractable, it is necessary to confront the problems it presents if progress in evaluating the Information Society is to be achieved.

Another view of this can be found on the European Union's Information Society DG's website which contains the following statement:

The last few years have witnessed a transformation in the industrial landscape of the developed world. Telecommunications liberalisation, the explosive growth of the Internet and a growing tide of mergers between computer, media and telecommunications companies all point to one thing - the birth of the information society.

³ The Minister concerned is Mary Hanafin TD. See website http://www.taoiseach.gov.ie/policy_areas/information/index.asp?lang=ENG&loc=68

Here is yet another view of society, albeit one which does not tell the reader what an Information Society actually is. All this says is that technology leads us into an information society - whatever the latter may be. It is also worth noting that, as far as the EU is concerned, the Information Society is a product of the telecommunication liberalisation and growth of Internet usage during the 1990s. But, as we have seen, in the view of many others, the Information Society was born well before 1995 and the phrase was in use long before 1980.

A more formal approach can be found in the academic literature. The Information Society Journal 'Topics for Discussion' (2003) section makes the following observations:

Since wealth, power and freedom of action derive from control over, access to, and effective use of, information and expertise, the shifting organization of information technologies and social life -- large scale and small scale -- is a major concern. These combined trends have stimulated discussions on the relationships between technological change and social change. The term Information Society has been a key marker for many of these studies and discussions.

This is clearer, but still does not constitute a usable definition. One is reminded of Humpty Dumpty's exasperated observation in *Alice Through the Looking Glass* (Carroll 1992) when he exclaims that: "Words mean what I say they mean, nothing more, nothing less".

We offer two possible working definitions of the Information Society. The first goes back to the concept of the information age. The term 'Information Society' suggests a society in which an important (or even the dominant) economic activity is the production and consumption of information. This is consistent with earlier definitions of industrial or agricultural societies. The industrial society emerged when advances in agricultural production technology meant that the labour requirements of food production dropped to a point where most of the working population did not need to be engaged in this activity. In a similar manner, the Information Society has emerged at a period when the amount of manufacturing labour needed to produce the required level of consumer and production

goods has fallen to such an extent that the labour released can be employed in service and information industries. From this perspective, an information society might be defined thus:

An information society is one where most of the staples of existence: food, shelter and material wants (including education and medicine) are in sufficient supply to satisfy a large proportion of the citizens of that society and where the focus is shifting (or has shifted) to the innovative production and consumption of information as a way of enhancing the quality of life for individuals in that society.

This definition begs numerous questions and raises several issues, including that of 'quality of life'. It also raises the question about the meaning of consumption in this context. One can consume a bottle or wine, a service and (given time) an aircraft or even a building, but much information is not a consumer good in this sense. While some information can be so regarded (a film for example) and some information is volatile or time fragile (e.g. a weather forecast or a stock tip) much information is permanent and indefinitely reusable.

An alternative definition might therefore be:

An Information Society is a society in which the use of information technology plays an important role in how the people live. In the Information Society the peoples lives interface with information technology in the way they work, the way they relax and in other aspects of their lives in a variety of ways.

This avoids using the term 'quality of life' as well as the concept of consumption, but presents different challenges. Using this definition, what is there to evaluate? One answer to this is might be that the evaluation is across the board and does not attempt to focus *per se* on "quality of life". In advanced societies, information technology is used for virtually all record keeping from births and deaths to all medical treatments, from food purchases to electricity supply management. Furthermore information technology is deeply embedded in motorcars, aeroplanes, television sets and many other household devices. Some aspect of a typical citizen of the first world's life

will be facilitated by the use of some aspect of information technology virtually on a continuous basis. But this merely brings us back via a circuitous route to asking in what way, to borrow the Irish Minister's phrase, these developments have enhanced people's lives which brings the question back to quality of life. In other words, and uncomfortable though the idea may be, the problem of 'quality of life' is at the core of this issue and needs to be addressed.

3. A simple answer?

A possible solution to the problem of evaluating the impact of ICT on society is to argue that, were it not beneficial, it would not be used as extensively as it is. Although a useful reflection this is not a convincing argument. One answer to the question of '*Why is information technology being used to the extent that it is?*' is the same one that is frequently given to the question '*Why do mountaineers climb mountains?*' and that is 'because it is/they are there'. There is no doubt that use of the latest information technology is perceived as a dimension of progress. The latest personal computer or the latest mobile telephone is regarded by most as being better than older models. But does this constitute progress? It is not always obvious that it does. Human curiosity pushes technology boundaries. And the result of this is a scramble to convert these new technologies into products which perform faster and deliver more functionality. This is totally irrespective of whether they facilitate a more satisfactory experience for the user of the product and those around them or whether their long-term societal effects are good or bad. ICT companies are not in existence primarily as social benefactor or good deed doers. They are entrepreneurial organisations driven by the profit motive. The information technology industry has a need to sell and has an interest in creating demand, if necessary for what is unnecessary. A recent critique of the food industry (Brownell & Horgan 2003) has argued that the plague of obesity now threatening western society comes from the desperate need of the food industry to sell us more than we require for healthy nutrition. Many of those who are now suffering the effects of many years of eating fast food, would once, no doubt, have seen fast food as a form of 'progress'. The question is could the same be said of ICT, i.e. that in relentlessly pushing technology into people's lives the industry is creating a form of information obesity? From this reflection alone it should be clear that the

availability of contemporary ICT will not of necessity enhance people's lives.

4. In search of metrics: Quality of life?

It has already been noted that the concept of quality of life is difficult. Quality of life can, like beauty, be in the eye of the beholder. One man's favourite occupation is another's idea of hell. Most people like children, but there are people who find even the most endearing children tiresome. Some people like to live in crowded urban environments; others prefer to live in rural settings. This variety of reaction is also true of ICT – there will be developments which some perceive to be advantageous but which others will consider to be a step backwards. The desirability of a given technology development will depend on to whom one is talking at the time. Trying to use the notion of the enhancement of people's lives or of the quality of life in general is therefore highly problematical from an academic point of view because of, as mentioned above, the quintessentially subjective nature of these concepts. In such circumstances, it can be argued, objective evaluation is a chimera, because any evaluation has to be based on a viewpoint and, as a post-modernist would doubtless point out, there is no privileged perspective.

Our answer to this line of reasoning is based on grounds of pragmatism and aggregate behaviour and effect. This is the basis of the case developed in this paper. To the question, what do we mean by 'quality of life', a simple answer is that, at the level of the individual, quality of life is directly proportional to the degree of satisfaction and enjoyment people have in the way they live. At the most basic level, there are certain aspects of the notion of the quality of life on which many people are at least to some extent in agreement and about which there is also some consensus on priorities. A well-known example of this is Maslow's hierarchy of needs (Maslow 1970). Maslow asserts that physical needs must be met first. A person who is starving is unlikely to be unduly concerned about his need for social acceptance. From the physical necessities, Maslow suggests that humans move through a succession of progressively deeper psychological needs. As food, clothing, shelter and basic survival requirements are satisfied, human needs progress to such things as safety, relationships, status/esteem, fulfilling work and 'self realisation'. This is fine in theory. Although it become progressively more difficult

to measure improvements as one moves up the triangle and in particular from the physical to the psychological, Prowse (2003) argues that capitalist economic systems depend on this phenomenon and the fact most people do not reflect too deeply on it.

One definition of something, which improves 'quality of life', might, therefore, be something that moves one nearer to the apex of Maslow's triangle. Somebody who has food to eat has a better quality of life than somebody who is starving. Somebody who is able to realise him or herself has a higher quality of life than somebody who is still struggling to make ends meet (Handy 1994).

It also needs to be noted that people's judgement and values change; what is considered valuable by one generation or society may not be so by the next. There is also the problem whereby something which is good for one individual may when made available to a larger group, become a disadvantage to all. Perceptions of what makes for a good life are not always objective or rational - people are often driven by irrational fears or misjudgements of long term consequences. If, for example, Joe is the only person with a car, Joe gets to work, faster. If everybody has a car, everybody, including Joe, gets to work slower. In type of circumstance, the negative impacts of new technology may not become evident for some time. The singer Joni Mitchell summed up this latter phenomenon evocatively when she wrote:

*"Don't it always seem the same
that you don't know what you've
got till it's gone. They've paved
paradise, put up a parking lot"*

Based on this brief review, the following conclusions are tentatively proposed:

- Within a given society and culture (assuming reasonable homogeneity), there will be developments which most people will consider to improve their quality of life of, or are beneficial to, the community or of individuals or groups within that community in such a way as to give a net benefit to the society as a whole;
- There will always be subjectivity, but when dealing with aggregate effects on a basis of pragmatism, this does not significantly weaken the above claim;
- Some developments which are initially perceived as improvements in the quality of life are actually, or may turn out to be, disimprovements. It may sometimes be

difficult to see this at the time of implementation;

One approach to evaluating the information society is, therefore, to measure improvements in the aggregate citizen perception of satisfaction with life over time and within a society. Comparisons between societies and between individuals within a society are further complications which will not be addressed here.

5. A suitable case for multiple perspectives

The complexity of evaluation here suggests the need for a multi-perspective approach. A number of authors have suggested multiple perspective approaches to evaluation of information systems. These include Symons' multiple perspectives (1994), Cronk's concept of holistic construal (Cronk 1999), Farbey et al's meta methodology (1993), Coleman and Jamieson's 'all benefits' method (1994), Remenyi *et al* (2000) and others. Outside information systems, one of the most influential models for general business evaluation and appraisal of recent years has been the balanced scorecard (Kaplan & Norton 1992; 1993; 2001). Of these options, holistic construal might eventually offer the most powerful analytical tool for this problem, but given the enormous complexity of the issues involved and the relatively embryonic state of this concept in ICT, the simpler and better established approach of a balanced scorecard may be the most appropriate model for this task.

There are three initial challenges which need to be addressed when evaluation the impact of ICT on a society as a whole:

- First there is the problem of cost. The substantial literature on IT evaluation generally deals with situations where there is a clear object to be evaluated. This may be a system, an application, a business unit or the entire ICT infrastructure of an organisation over a long period. In each of these cases there is an identifiable entity with boundaries which, if not always crystal clear, are well enough defined for most practical purposes. Thus, while identifying all of the financial costs of ICT itself poses problems (Bannister & McCabe 1999), the source of the funding is normally clear and the benefits to this entity, individual or group can be weighed against this cost. This is not true of a society. The financial investment in the information society is

borne by a long list of stakeholders. This may include public utilities, the taxpayer (i.e. government), businesses, individuals and social groups. It is probably incalculable.

Thus for practicable purposes it may be appropriate to put aside the evaluation of the financial cost of the information society and look at the other costs and benefits of ICT to society as a whole. A number of authors have examined this theme from various angles over the years including Martin (1970), Sanders (1981), Rosenberg (1985), Kelly (1995), Gates *et al* (1996), Cooper (1999) and Graham and Marvin (2002). The views of these authors vary from the evangelical to the vaguely apocalyptic.

- Secondly there is the problem of net benefits and the related question of time. I has already been noted that that the impact of ICT in the long-term may be quite different from the impact in the short-term. A clear example of this may be seen in the use of information technology in the development of more efficient organisational processes over the past few decades or so. The record of ICT in business has largely been to do with making organisations more efficient, i.e. leaner and meaner, or more effective or strategically superior and this has time and again resulted in economic and social disruption and casualties. One impact of ICT has been to remove the need for unskilled labour and/or to de-skill existing jobs. In the financial services sector alone, hundreds of thousands of jobs⁴ have been eliminated by technology. It can even be argued that the application of e-Government is primarily to do with making the delivery of Government services more efficient than it is about enhancing ordinary people's lives. The history of organisational thinking in the past 20 to 30 years at least has been dominated by a search for improved efficiency. In the last decade this has taken the form of downsizing and the activity. In this context, it is worth remembering the comment of Stephen Roach⁵ of Morgan Stanley when he said (1995):

⁴ See <http://business.iafrica.com/news/260862.htm> , <http://www2.guardian.co.uk/uk/20030904/rsa.html>, etc. Key job losses financial sector into Google.

⁵ See <http://www.css.edu/users/dswenson/web/Dnsize2.htm>

The slash-and-burn restructuring is not a permanent solution. Tactics of open-ended downsizing and real wage compression are ultimately recipes for industrial extinction...If all you do is cut, then you will eventually be left with nothing, with no market share...If you compete by building, you have a future: if you compete by cutting, you don't...At the end of the day, you can create wealth only if you've got a corporate sector that has its act together and takes a long term strategic point of view...The debate itself is a healthy one. It goes to the core of what it takes to compete and boost standards of living. Do we get there by growing? Or – which is what we've been doing – by hollowing out companies.

In the West being more efficient has become a holy cow against which it is a mortal sin to speak out. As long as this is the case, ICT and the Information Society has some sort of privileged respectability. But there clearly has to be a limit to the acceptability of efficiency. What would we do if we were able to find Aladdin's genie and, as a result, we no longer needed any labour to produce the goods and services and keep the records we need? Would we continue to survive if our only purpose in life was leisure?

This is explored in more detail below.

- Thirdly, there is the problem of defining the boundaries of ICT itself in this context. There are certain components of ICT, from mainframes to the Internet, on whose inclusion all would agree. But should we include DVD players? What about television, radar, superhet radios, the Morse telegraph? Those who talk of the information society as a 1990s phenomenon sometimes appear to equate this development with the explosion in commercial and personal use of the Internet c. 1995. There is a good case to be made that the modern, electricity based information society began in the 19th century.

<http://www.aph.gov.au/library/pubs/CIB/1995-96/96cib21.htm>

<http://www.morganstanley.com/GEFdata/digests/19960307-thu.html>

- For the purposes of this remainder of this paper, ICT will be defined as technology which uses computers and/or networks technology. Broadcast technologies, such as television and radio and non PC based home entertainment technologies will be excluded from the discussion except where those technologies are a direct spin off or result of developments in ICT (such as DVDs and game boxes) or are differently enabled by ICT.

6. What's on the scorecard?

As already stated, the approach used in this paper is loosely based on the concept of the balanced scorecard⁶. As a first step in this process, this section sets out a list of benefits and disbenefits resulting from the impact of ICT on society. The objective here is to try to distil out those effects, which can be attributed either entirely to ICT or substantively to ICT. We start with benefits.

6.1 Benefits

The benefits of the Information Society can be classified into a number of broad headings. These headings are not mutually exclusive, but are a useful way of grouping issues. The following are not in any particular order of importance:

- Economic. Although it has proved impossible to prove with the mathematical rigour that some academic researchers demand (see Loveman (1994), Brynjolfsson 1993, Brynjolfsson and Hitt 1994; 1999 for valiant attempts at this) there is a broad agreement that ICT has improved productivity and consequently economic wealth over the past forty years (though a few still deny this). In areas as diverse as health and aviation, the contribution of ICT to improvements in safety and quality are enormous.
- Educational. This is not simply a result of the availability of distance learning, but is due to the ability of people, from schoolchildren to post doctoral researchers to use the web for research and to buy interactive CDs or DVDs. The economics and reach of learning have been and are being transformed.
- Convenience and time. Developments in information technology have greatly reduced the tedium of day-to-day tasks for many citizens. Their impact here may be less than that of the automobile or even

⁶ We are aware that this technique is not without its critics, but it provides a useful framework here.

- the washing machine, but are not negligible. From pre-programmable DVD recorders to paying taxes on-line, technology has eliminated innumerable time-consuming ways of doing uninteresting things.
- Entertainment. This covers a range of areas from more interesting jobs for many, to access to a wide array of entertainment. Any reader of the novels of, say, Jane Austin or William Thackeray, will soon realise that a problem of even the wealthier classes in the 17th and 18th centuries was boredom. - no radio, TV, etc.
 - Communication. ICT has opened up new channels of communication. In a society which is increasing mobile and fragmented, technology offers a way of strengthening the social fabric and cohesion. Communication also enables specialist interest groups to connect and exchange information and to the establishment of so-called virtual communities.
 - Access to information. The web in particular has opened up new vistas enabling the ready acquisition of information (and, of course, the dissemination of information). This has wide implications from choice of TV channel to the distribution of power within society - even at the most basic levels. For example, it is not unknown for lay people walking into their local surgery with an unusual complaint, to know more about their condition and its treatment than their doctor.
 - Political and democratic. ICT has created new freedoms by enabling, for example, freedom of information access and ability to communicate and mobilise political resources. Developments in e-democracy, while still embryonic hold out the promise of a more engaged community with the social benefits that should flow from this. The demand on government to be able to immediately respond to questions and criticism is also seen as a development of the Information Society.
 - Reduction in risk. ICT has reduced life risks both directly and indirectly in numerous ways from medical technology to better weather forecasting. The ability of computer modelling to simulate and predict events such as earthquakes is still at a primitive stage, but these and many other problems may be solved in time.

- Ecological. This is a mixed effect, but, in theory at least use of communications technology reduces use of paper and to some degree the need to travel. To be balanced, there are negative impacts as well from the toxic nature of components like circuit boards which are hard to dispose of in an environmentally friendly manner.
- Information ecology. Developments such as narrowcasting, customer relationship management, targeted and permission marketing enable organisations to confine the information sent to customers and clients to what it wanted and relevant. True, this is still in the embryonic stages and is currently overwhelmed by spam, but in the longer term it will improve everybody's life.

Falling cost and rising affluence have made information available to almost all. Unlike other consumer goods such as up-market cars or exclusive wines, information comes at low, in many cases more or less zero, cost. The only barrier is education, as local libraries will provide the access to the web for free and Internet cafes, often open 24/7, mean no capital investment is required to join the party.

6.2 Disbenefits

It has already been suggested that the impact of the information society had not (or may not be) entirely positive. Once again, it is useful to classify these and again not necessarily in order of importance.

- Information overload. This is well documented (Shenk (1997); Wurman et al (2001)). There is a school of thought that says that people are often happier or at least more content when their options are limited. While some people revel in freedom and anarchy, many people prefer to have many decisions taken for them.
- Unwanted information. This is at its more obvious in the form of spam, but it is also manifest in the vast volume of advertising that clutters up web sites and television channels. At an altogether more serious level is the unwanted pornography and other trash that comes in, unwanted, through the electronic door.
- Information inaccuracy. On its home page Google points out that it is currently searching well in excess of three billion web pages. There is no quality or content control on the vast bulk of this. As the saying goes, on the Internet, nobody knows that you are a dog.

- New forms of crime. The Internet in particular has enhanced the ability of certain types of criminal to operate. Fraud, identity theft and blackmail are examples of crimes that have been extended by technology. A particularly horrific type of crime is the use of the Internet for child pornography.
 - Collateral economic damage. This is related to the preceding point and occurs where illegal use of technology undermines a whole industry or social structure. A good example of the former is the music industry which has suffered enormously not just from traditional piracy, but from wholesale exchanges of material by individuals. This needs to be clearly distinguished from normal casualties of new technology where industries are displaced by legitimate substitution.
 - Vulnerability. Societies are increasingly dependent on complex system to work. If such systems fail, there can be major problems, a phenomenon foreseen by Forster (Burton et al 1974) and vividly illustrated by the problems in 2003 with the electricity grid in the northeast US and by the Sobig.F virus and the havoc it played with e-mail systems around the world. Concerns are increasing being expressed that viruses will contaminate machines without even requiring a mail to be read or an attachment opened.
 - Disruption and displacement. Peters (1991) celebrated this in his book, *Thriving on Chaos*. Grove coined the phrase 'Only the Paranoid Survive' (Grove 1997). But most people do not welcome chaos. Choice can be stressful and too much choice can lead to other problems, not least of which might be who gets to determine which television channel to watch!
 - Destruction of 'social capital'. A phenomenon some observers have commented is 'cocooning'. This is the increasing tendency of people to communicate electronically rather than personally. Electronic communication (notwithstanding the use of smiley symbols used in e-mails and text messaging) is an impoverished form of communication when compared to face-to-face contact. The most vivid description of this phenomenon can be found in Putnam (2000). Putnam does not blame information technology for this problem although he includes it as a key culprit.
- Ellis' (1995) bleak portrait of an affluent and bored culture is another side of this phenomenon.
- Increased economic competition for advanced societies. One's view of this depends on one's political perspective, but it can be argued that, as a good, information is much more difficult to control than physical goods and it knows no frontiers. This means that developing countries can offer services remotely which undercut more advanced economies. A good example is outsourcing of computer centres to third world countries.
 - Reductions in (or at least threats to) civil liberties. This covers a number of headings from CCTV to electronic snooping (both state and private). As our society becomes more dependent on ICT, it becomes progressively easier to track what people do. The current proposal to put chips into all motor vehicles would enable the police to detect when a vehicle was parked illegally or broke the speed limit. Some may regard this as quite right, many if not most would find the idea that the police can always know where we are an unacceptable prospect.
 - Globalisation of culture. The entire world becomes a giant exercise in branding. People buy into global 'lifestyles' which are relentlessly hawked through the cyberspace of web, television, radio and mobile phone. The world is not so much becoming a McLuhan's global village, as a global shopping mall.
 - Lower quality employment. Certain developments, notably call centres, have been criticised as the sweat shops of the 21st century. By removing the personal and social aspects of employment and by reducing employees to extension of their machines, instead of vice versa, the quality of life of many young people is reduced. Despite all the machinery, people are still working longer hours (CGIU 1999).
 - Health risks. This is divisible into the known and the unknown. The known includes repetitive injury strain, eye strain and other effects of poor ergonomics. The unknown includes the impact of continuous low levels of electromagnetic radiation (particularly from mobile phones) on the body. The risks in the latter case may be small, but the potential consequences are enormous.

If asked, most people in the developed world would be of the view that ICT has been a good thing. It would be a brave parent who would try to separate their fifteen-year-old from her mobile phone. The purpose of this article is not even to suggest that there is a potentially negative net impact. However there are negative impacts and the lack of balanced analysis is a serious gap in the literature. For many years, the world has steamed ahead with the development and deployment of new ICTs without any serious academic questioning of the long term impact of this. As this preliminary analysis has shown, the news is not all good. There are questions that need to be asked.

7. Conclusion

This paper has not provided definitive method with which to evaluate the information society. Its primary purpose was to explore the extent of the problems involved in this endeavour. Modern society is materially wealthier and better informed than ever before, yet some subversive authors have argued that we are actually worse off in terms of the sum of human happiness (Douthwaite 2000). From an ICT perspective, there is no doubt that that an Information Society is richer than previous societies in many ways. It offers new worlds of knowledge, increases choice, provides greater freedom of expression, simplified processes, saves time and money and in general empowers the citizen and the consumer. On the other hand, it deluges the citizen with information of doubtful quality, creates anxieties associated with having too many options, allows intrusive freedom of expression to those from whom people may not wish not to hear and threatens the privacy and civil liberties of the citizen. Furthermore, it can be argued that just because there is a demand for more, satisfying that demand will lead to better things. It is not, therefore, obvious, that more is always better.

As often in these areas, this problem is most vividly captured by the artist rather than the scientist or academic. Several writers of fiction have already been cited and we will conclude with another. In his short story, *Come, Follow Me*, the Irish author Jack Harte (1986) tells of a street in a town where people played cards with each other every evening. It was a social event that all enjoyed and in which all participated. One day a mysterious stranger comes to the street and innocently suggests that games would be more interesting if they were played for money. At first this does make things more interesting, but soon greed takes over and vicious rivalries, enmities and

accusations ensue. When, at the end of the story, the mysterious stranger departs, he leaves behind the wreckage of a contented society - where there was once harmony and contentment, there remains nothing but misery and bitterness. Harte's parable depicts a fundamental problem with progress. We need continually be persuaded not only to want more, but be convinced that having it enhances our quality of life. But the motives of the persuaders are not always pure and the consequences may not always be a better life or a healthier society.

If we are to be sure that what we are being offered will improve our lives we need a reliable means of assessing what we are being offered. We need the tools to evaluate the Information Society. This paper has offered some initial ideas. Much more remains to be done.

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