

Impact of IT on society in the new century

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Zürich, February 28th 2001

Abstract

Describing the impact that Information Technology will have on society in the new century is indeed something which could fill books, due to the fact that there will be so many inventions in the area of information technology that we can't even think of at this stage and the sheer volume of things included in the term *society*. This work will focus on industrial societies only and will describe the two impacts of Information Technology on society in the new century that are considered to be the most drastic.

First, the society in the developed countries will be divided into two major groups: On the one hand, there will be *technophile* people, who embrace the new possibilities which Information Technology offers to their lives. On the other hand, there will be *technophobic* people, who will obstruct the inroads of Information Technology into their daily lives. Contrary to what most people would think, this part of the population will not only consist of ecologists, but also of conservative people who see technology as something unnatural for humanity, people who don't immediately profit from technological progress such as the rural population and people who are simply overwhelmed by the new technologies and cannot keep up with the pace anymore. This group of technophobic people has a potential to grow temporarily to at most 25% of the total population.

Secondly, the *definition of society* for the 75% of the population who will embrace Information Technology will change radically. What makes a society today will not be of much importance in the future. People would these days agree that a society is defined mostly by location, language, culture, political system, shared customs, standard of living and common history. Most of these things will fade in importance, instead other things will be much more important, namely personal preferences and interests. Due to the new technical possibilities, societies will look different and consist of different people.

1 Introduction

Before describing the impact of Information Technology (from now on simply referred to as *IT*) on society, one has to be sure what the term *society* really stands for. *Society* is commonly used in two ways:

1. Society as in THE society, meaning the circumstances under which all people on earth live. This can be seen as the "top-level" society, as a melting pot of all societies as described in point 2:
2. Society as in A society, describing people forming a certain kind of group where the people in the group share similar customs, have a common history and commonly have a similar standard of living among other things. For example, when someone mentions the *Swiss society*, clearly this type of society is meant.

For feasibility reasons, this work will only focus on a society of type 2 mentioned above, an *industrial type* of society, namely it will omit the impact of IT on societies in the second or third world.

There are many definitions of society as in point 2 above, which is not surprising since each of us is a part of a society and thus cannot be truly objective on the topic, but inherently always has a biased view. Most commonly though, people would agree that today there are a few main attributes which make up a society:

- Shared Customs
People in a society share the same or very similar customs
- Territory
A society commonly consist of people living in the same region
- Political System
A society consists of people living under the same political system (e.g. democracy, military junta)
- Standard of living
People in a society usually share a certain degree of wealth and comfort

- Common history
People in a society share a common past
- Culture
People in a society consider themselves to have the same culture
- Institutions/Organisations
People in a society belong to or know certain institutions or organisations (e.g. Church, Army)
- Language
People in a society commonly speak the same language

As an example, people in France share similar customs, live in the country France, their political system is a parliamentary democracy, share more or less the same type of living, consider the "Grand Nation" to be a fantastic thing, pretend to know what good food and wine is and speak French¹.

Having set out the background for the investigation, the second crucial part is, of course, the developments in IT in the new century. Dreaming of the possible inventions in the century in the area of information technology could probably fill books. Certainly, the variation in expectations is large, which is not surprising when considering for example the development in the area of CPU (Central Processing Unit) power in the last 30 years, leading from a mere Intel 8008 CPU with a couple of megahertz 30 years ago to a gigahertz processor these days, many thousand times faster. Just recently major processor manufacturers announced that contrary to expectations, Moore's Law² will hold for at least another 10 years before reaching the end of the life-cycle of the current design for CPU's. This example illustrates how much has happened in the last 30 and will happen in the next couple of years, but it also shows that describing IT in 30 or 50 or 100 years can only be a case of vague speculation. It is very difficult to say what exactly will happen in this century in the

¹Of course, the author is exaggerating vastly here, but you get the point

²Moore's law states that a doubling of integrated circuit capacity happens every 18 months

area of IT; the author doesn't know, and is sure that nobody else does either. Hence, the focus of this work will not be to describe all the exciting new developments: new developments will just be demonstrated to illustrate the arguments made about the impact on the *new society* (see section 3).

2 Technophile versus technophobic society

A first interesting and very profound influence IT will have on society in this century is that the population of industrial societies will split into two major groups. We will be confronted with a divided society, there will be a *technophile* population on the one hand and a *technophobic* population on the other hand:

1. Technophile Population

A vast majority of the population will continue to lead their lives as now. They will adapt to technological advances and will consider them as natural, as being part of a benevolent process. Innovations are expected with joy and embraced for use in daily life. The significant influence of IT on daily life will be accepted, the determination of one's life by IT will be tolerated. As today, the goal will still be to make life as simple and pleasant as possible, subordinating everything else.

2. Technophobic Population

A second part of the population will try to keep out of the advances in technology. These people will think they will only be able to find their body's physical and psychical balance through reduction of complexity in their lives. IT will be viewed as being evil, unnatural, blasphemous and humanity-despising. This movement has a potential to grow temporarily to a maximum of about 25% of the total population in an industrial society.

Traditionally seen, it is not surprising that there will be a revolt against technological advances. At the

time when railways were introduced, a significant part of the population thought them to be devilish and despicable. It took time until it was eventually accepted as a useful means of transport. Also, the negative view on IT is nothing new: in the United States at the time of the Vietnam war (late sixties), parts of the population (i.e. people in the anti-war movement) considered computers to be a means of making war. This led to a situation where MIT (Massachusetts Institute of Technology) began to bar their computing rooms with heavy armour, since they expected the worst: an assault of protesters on their computing facilities. It will thus not be for the first time that people start an opposition against information technology. Indeed, this opposition will probably be more intense than the opposition against computers during the late sixties, more intense in the sense that the *only* target of the opposition will be technology, not as before when it was only on the fringes of a resistance movement. The opposition will also be more intense because every single person will get in contact with IT, the penetration of daily life by IT will be much stronger. During the sixties, computers were huge, massive pieces, filling a class room easily, thus for most people they were not relevant at all.

The assertion made above that this technophobic population will be able to recruit a 25% share of the population stems from the fact that it will consist of a melting pot of people from various social backgrounds and with different political ideas:

- Ecologists
It is fairly obvious that a movement which opposes technology will find support in the camp of ecologists. Especially "Back to the Roots"-type people will support such a movement.
- Ultra Conservatives
Ultra conservative people may be overwhelmed by the rapid advances in technology and rather abide by the things they know and trust. Digital devices may be seen as distrustful and bad for personal freedom.
- Rural, elderly population

Population which tends to profit less from technological progress may turn its back toward it. Especially in the rural areas, where new technologies take longer to catch on, people may feel neglected and become suspicious towards IT, adopting a destructive position.

- **Overstrained People**

Technological progress is very demanding for the average population. Some people's LCDs on the video recorder still blink 00:00, it may be impossible for them to handle devices which are tenfold more sophisticated. Thus a retreat not due to confirmed opinion, but due to necessity.

It is interesting that today, it seems almost impossible that all these people will be part of the same pool, fighting for the same case.

Summing up these people, it seems reasonable that a maximum of 25% of the population could form themselves into such a movement. If the considerations were not only focused on the first but also extended to the second and third world, a majority of the world's population would have to be considered technophobic.

Explicitly, a *temporary* maximum of 25% of the population was declared before, as it seems likely that exactly the same will happen to the opposition as what has happened in history: at the beginning, new inventions might be considered evil and bad, then people learn to understand them better and how to deal with them and eventually people don't want to miss the invention anymore. The same happened to railways, to computers and the same will happen to the new technologies in the new century. Although the influence of IT on daily life will be massive, for some even painful, while others will only give in reluctantly, it will be accepted widely eventually, because the integration of IT into daily life will be much more seamless than it is now. The future will bring much more sophisticated devices than we know up to now. They will be much simpler to handle, install and use; they won't be criticised as being disturbing, unfamiliar or strange as people won't notice the technology behind. If engineers manage to make technology easy to install and

trivial to handle, fit it seamlessly into human life, the opposition will lose momentum since the reasons for opposing technology will more and more disappear as technology can gradually be accepted as being natural and non-disturbing. The only ones who will still be supportive of the movement will be purists.

The society of the other 75% of the population, the part of the population embracing all the technological changes and letting them penetrate their lives, will change drastically.

3 New society

Whereas the definition of technology as described in section 1 is still valid for the part of the population that opposes technological progress, it will be mostly obsolete for the technophile part. The reason is that many factors that nowadays define a society and that make people feel part of a society will be of lower or no importance at all in the future. For example the factors territory, government, culture and shared customs will lose significantly among the things which make people feel part of a society. Below are a couple of examples of technologies perhaps possible in the future which will have a significant impact on the definition of society and on how societies are composed:

- **HUD**

First, it will be HUDs (Head Up Displays), which will present the user with a *virtual reality*, later on probably much more advanced and more seamlessly integrated devices (e.g. one could think of a device projecting images (perhaps from glasses) directly onto the lens of a human's eye), allowing people to disregard their surroundings. It will not matter whether a person is physically or virtually at a different place. The better the integration of the technology, the more likely the difference will be indistinguishable. This will allow people to travel virtually, e.g. one could go on holidays just by playing a certain program, relax there, walk around, take it easy, etcetera. Or one can attend business meetings

without having to be there physically. The business partners in such a virtual meeting will be able to see and hear each other as if they were real. Mobility may be very important these days, however, in the new century, the need to travel physically will decrease significantly, instead of flying to a meeting in New York one will just attend the meeting virtually and save a lot of time and money (and protect the environment).

- Ubiquitous Computing

Everything will be dominated by IT in the future, IT is going to be at every place, at any time. Through a technology change from the simple client-server based computing today to a truly distributed next generation Internet, based on intelligent mobile agents, there will be a more scalable Internet which will not only incorporate computers, but also all sorts of other technical devices one can imagine. Doorlocks, 'phones, mobile televisions, coffee machines, you name it. All this will only be possible by using mobile code components travelling to the devices instead of using thousands of request-response pairs as in the client-server model. This will enable people to do business from anywhere in the world, at any time, on stationary or mobile devices. The state where the trade happens will be totally irrelevant. This puts a big question mark behind states as they exist now, as the main foundation pillar of their finances, the tax system, will be undermined. Income taxes the way they exist now will be impossible to collect, the new digital technology will encourage tax evasion. States as they are existing now are unlikely to be around in the future. Possibly other organisations will take their place, however it is too difficult to say how these organisations will look.

- Diversified Contacts

The previous points already explained the impact of IT on society in terms of territory and organisations/institutions, the examples made there

will also have a noticeable impact on culture and shared customs. Contact with other people will only happen if desired by a person, everything else will be done by technology. As an example, nobody will need to go shopping anymore, one will order things needed via some special sophisticated devices which are easy to handle and understand. One can display the goods, possibly even smell, feel or hear them. Basic nutrition can also be automatically ordered by the refrigerator, as it will detect addition and removal of foods³. The goods will then be delivered to your place. Another example is the virtual insurance broker, one will not need to talk to a person anymore, smart software will be able to tell you what you need and how to reduce costs. This will have the effect that everyone can fully determine their own social environment. There will be no need to talk to people if this is not desired, no need to get into a discussion with an insurance broker, no need to talk to the cashier at the local supermarket.

Also into the same direction goes the possibility of attending school over the Internet. Learning over the network will make it possible to pass down culture and traditions only over various media and not over direct social contacts anymore. Many things which account for the culture and tradition today was taught to the people by their parents or fellow men in various situations in life. Through the lack of diversified contacts, parts of the culture and traditions which cannot be learned from books, but only through experience, will be lost. Your social environment will be reduced to the few people you want to stay in contact with.

It is most interesting to see that there can be certain parallels drawn to the situation in the middle ages, where a society was *closed*, determined by the factors family, clan, quarter, village, nation (if you ever managed to leave your village at all!) and church. Mobility

³Such a device already exists now

was very limited indeed. These days, society is considered to be *open*, determined by mass media, trends, mobility and various ideologies. Indeed, the social interchange is considerable, one is not at all limited as in the middle ages. However, societies may close up again as they will only be defined by one's own self-determined environment. Everything unpleasant or unnecessary will be factored out to technology, only the people one wants to get in contact with will be important. This will result in many, many mini-societies, mostly independent of each other. It will remain up to psychologists to assess the impact this will have on the personality of every single human, however (as a side note) the author tends to believe that there will be an alarming impoverishment of individuals due to a lack of demanding social contacts.

4 Conclusions

The following conclusions can be drawn:

1. Technological research has to pay attention in the sense that there can be no advance in technical areas without considering the social impacts an innovation has. As has been shown, not all developments will be received with pleasure by all people, but they are a force to be reckoned with when releasing new technologies. Researchers have to try and make technology fit as seamlessly as possible into the lives of humans. IT should be seen as something useful and not as a necessary evil otherwise researchers may end up as scapegoats for a significant part of the population.
2. Having said that, when looking at the market today, there are already some technologies which were badly accepted by the population, such as the WAP (Wireless Application Protocol) services. The people simply didn't see the benefit behind. This time it was the mistake of marketing people, but it is foreseeable that technologies will fail in the future because they are not accepted by the population for social reasons. The

conclusion that can be drawn from this is that it might make sense to start setting up a field of study (e.g. at universities or research laboratories) which focuses on the impact of (technological) innovation. It seems important that researchers not only focus on their field of study, but also be aware of the social consequences of their work.

3. Mobility will be, contrary to popular belief, less important in the new century, mainly due to the fact that most business contacts can be handled via virtual reality, without the need to travel constantly around the world. Also, depending on how far the virtual travelling possibility grows, leisure time traffic may also be reduced. This raises questions about the current direction of traffic policy, building more and more new roads and airports, which may be obsolete sooner than we think.