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PHASE I

Information Society Project
Projet: Société Informatisée

SOCIAL IMPLICATIONS OF
THE INFORMATION ECONOMY

AN INITIAL ASSESSMENT AND
GUIDING FRAMEWORK FOR IMPACT STUDIES

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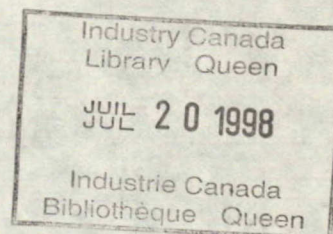
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PAPER NO. 5

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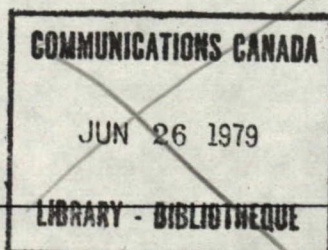## AN INITIAL ASSESSMENT AND

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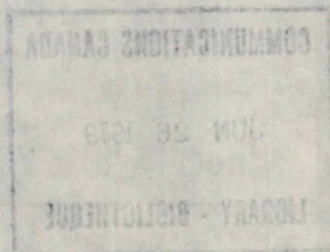Suite 210, 3535 Queen Mary Road
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SOCIAL IMPLICATIONS OF THE INFORMATION ECONOMY

EXECUTIVE SUMMARY

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OBJECTIVES

The purpose of this paper is threefold: firstly, by explicating assumptions, to propose a way of thinking about the potential social impacts of the emerging information economy; secondly, to offer a preliminary assessment of those impacts; and thirdly, to provide a guiding framework for further empirical research to be conducted in phase II of this project.

PRINCIPAL FINDINGS

The paper makes the following points:

I) Information-Overload is not a danger: indeed, there are several severely constraining economic, political and human limits to the availability of information for any given set of people at any particular point in time. Information, as it becomes entrenched as an economic commodity, i.e. as it acquires a price, will become subject to the same exigiencies as other commodities passing through the input-output transformation sequence, or the "throughput" cycle.

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2) "Informatization", adapted from the French is, in English, a misnomer. The historical process which is creating the information economy is really the increasing mediation of the processing, storage and transmission of information by technological means - or "informediation" as we have dubbed it.

3) The level of "informediation" probable on a mass scale in Canada within ten to fifteen years can be characterized roughly as "videotex-plus at home and microprocessors elsewhere".

4) Canada is not more advanced in the process of "informediation" than the U.K., France, the U.S. and Japan but,given its low population density and climate,has considerably more scope for further "informediation".

5) Even a preliminary assessment of social costs and benefits requires a well-defined and explicated choice of units of social organization(as the receptors of those costs and benefits) and also of judgement criteria. We have assumed a close association of Canadian public interest with the satisfaction of individual basic needs and also with the social need for communication. The 'basic needs approach', yielding a hierarchy, is much favoured in contemporary thinking on national and international development.

6) In order to provide a framework for conceptual clarity and for further research, a guiding matrix for choice of priority themes for social impact studies has been constructed. The matrix, in effect, provides

a plan for further work: it is a starting, not an end, point and should be continuously refined as applied. The final two chapters draw on the matrix and constitute preliminary assessment of and some speculation on the social impact of "informediation" via the provision of goods and services, education, interpersonal communication and individual homeostasis.

7) The conclusion offers an outline of the most immanent social effects of "informediation" and, pending the other studies results, offers a preliminary list of issues for further consideration.

RECOMMENDATIONS

It is recommended that the Federal government initiate a comphehensive program of study into the social costs and benefits of 'informediation' along the lines suggested in the above matrix.

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INTRODUCTION:

The emergence of the Information Economy is having, and will have, deep ramifications on the quality of life in Canada. We cannot say that there is more "information", as such, than at any other time in history unless we were to quantify information as a function of the number of human minds involved and, therefore identify its increase with rising population and with increasing communications with other societies. Notions of increasing, decreasing or stable quantities of information in the universe involve metaphysical assumptions which fortunately are unnecessary for our purposes, here.

What we do know is that information is increasingly being communicated, processed and stored by technological means and, decreasingly, by and in the human mind, operating independently. The use of information is becoming progressively less limited by geographical distance, the organizing abilities of the human brain or by the death of individuals' memories. We also know that many of our society's functions, previously performed by individuals, are being taken over, partially or wholly, by "information" devices. Being less closely tied to the human sender or receiver, information has become a discrete commodity, is measurable in 'bits', is commanding a market price and has become part of the national accounts. Further, it is

clear that the wholesale transfer of information across nation state borders, especially via mass-media broadcasting, makes fuzzy even the definition, itself, of "a society".

The more obvious social costs and benefits of the emerging information economy are those which have direct impact on a majority: television sets becoming substitute parents, family and friends, electronic games as entertainment, pocket calculators as surrogate brains; dealing with computerized government departments and retail outlets. Less obvious perhaps, except to those directly affected, are the automation of industry, the use of bugging devices, and subliminally communicated messages carrying threats of unemployment, loss of privacy and mind-control, respectively. Further along the obscurity scale is the struggle for control of the media among governments and industries. Most obscure of all is the role which "informatization" is playing in the production of material goods; few people realize that even exploration for natural resources is now computerized.

To think exclusively in terms of direct impacts on individuals, and on society comprised of them, of innovation of information technologies (e.g. more leisure, more 'knowledge') is insufficient. Much of a society's activity is conducted via institutions which interact with one another and with individuals in complex relationships so that the impact of change is transferred from one level and type of social organization to another. The social reverberations of the information economy through economic, judicial, political, bureaucratic and industrial institutions will be as profound as the 'direct' impact of the availability of the new information

technologies in the home, school and workplace. That means that important social costs and benefits will ultimately result from the institutional effects which are considered in the other studies in this project.

To take account of these reverberations without being able to anticipate the other studies' findings, we must assume the heavy trends indicated by the available literature, including that deriving from other countries, notably Britain, the U.S., France and Japan. We will rely on subsequent corelation to render the respective impacts on individuals and on Canada more specific and detailed. This study therefore presents a framework for policy studies of indirect as well as direct social implications of the emerging information economy. Of course, the potential of information devices is such that it is possible to construct imaginative, even wild, scenarios but we stay within what seems technologically, economically and institutionally feasible for Canada over the next ten to fifteen years and consider activities where federal policy can have influence,if not jurisdiction or control ,over individual Canadian lives.

We can consider the impact of the information society on the individual in several aspects of his or her being: his inner equilibrium or homeostasis,his interpersonal relationships and his relationship to the physical environment which include those mediated by government and other institutions . If we consider all these, we will surely cover the subject or at least indicate the extent of what is to be covered. Such a classifica- tion subsumes a more rigorous one of individual 'needs' satisfied by these

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relationships which can be employed where impacts could or should be
specifically detailed. The probable increase in instability of inter-
personal relationships and geographically-based groupings, as it forbids
the use of certain units of social organization for consideration also
limits the approaches we can take in this investigation. There really
is not much point in a careful step-by-step analysis of the family, the
village,the neighbourhood, the district, etc.,if these units are rapidly
diminishing in significance. Nor does it seem sensible to structure a
study around local installations such as home, school and workplace if
these will tend to merge and, in effect, fade in importance by virtue
of the very phenomenon we are studying.

If we are to choose a framework for analysis of a situation
in flux, we must build it only on constant elements, or at least on those
whose own changes are not materially affected by the change under study.
It would appear that, just as the only known common and unchangeable aspects
of the individual human being are basic needs ,the only constant characteristics
of a society are the activities which are pursued in satisfaction of human
needs. A change in the way information is handled will affect the conduct
of these activities and ultimately the satisfaction and frustration of needs.
These activities are either pursued by large numbers of individuals within
the society, by few on behalf of many, by many on behalf of few, or directly
for one another. Since we are mainly interested in the impact on 'the many'
i.e. social effects, we will regard them as "societal activities". It would
be nice to limit this study's scope to only those activities which are

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directly concerned with information movement but brief consideration makes it clear that almost all pursuits, even the most materialistic, will be profoundly affected by the emerging information society. To keep before us a coherent picture of the probable impacts on human need satisfaction of changes wrought in the conduct of these activities by the use of information devices, we will work from a matrix. Some immediate foreseeable impacts will be discussed, others, more remote, will be speculated upon and recommendations for further investigation will be made.

The main purpose of this study is to present a guiding framework indicating themes for impact studies which themselves would ultimately assess the social costs and benefits of the recent and ongoing change ∩in the way information is communicated and utilized in Canada; we will ask the relevant questions and indicate how they can be answered.

CHAPTER I

INFORMATION OVERLOAD? THE LIMITS OF AVAILABLE INFORMATION.

I.I INFORMATION OVERLOAD?

A recent report contends that the Japanese are suffering from information-overload, that "the consumption rate of information by the general public in 1960 marked 40% of the entire information supplied.... and ten years later the figure began to stabilize at around 10%." The report goes on to say "We can hardly overlook the undesirable social trend that 90% of the information provided... has been 'wasted'". What has been "wasted" surely, by inappropriate choice of content or mode of presentation, is the human, mechanical and electrical energy devoted to programming, storage and dissemination of that regrettable 90%. Obviously, since human beings can take in only so many 'bits' per minute and therefore 'select' and 'reject', increasing the entire supply available also increases the proportion unused . We may as well remark that unseen art, unread poetry and unrequited love are "wasted" to a greater or lesser extent: or as Gray's "Elegy Written in a Country Churchyard" puts it:

> "Full many a gem of purest ray serene
> The dark unfathomed caves of ocean bear
> Full many a flower is born to blush unseen
> And waste its sweetness on the desert air."

The problem with the word "information" is that it is commonplace; it refers,in different contexts, to many different things. It means 'data', it means anything which is instructive; it often refers to something processed in a computer and measured in bits; it means knowledge to satisfy curiosity and knowledge required for specific purposes; it even includes as a referrent that which is transmitted and received via mass media as entertainment. Information can be received by any of the five (known) senses and perhaps by others: it need only be communicable by any means whatever to deserve the name: later in this paper, it will be pointed out that "information" is also the essential element in shaping parts of the physical environment to create technological devices. The Japanese report, of course, is referring to information which is computerized and is transmitted via the mass media. The danger inherent in the widespread use of these technological capabilities is not 'information-overload' as such, but rather possible damage to the individual psyche from too much communication with machines and concomitantly too little with other people; the loss of personal privacy; the disorientation of societies as communications rapidly cease to be geographically-based, and others which will be later discussed in this paper.

The expansion of the meaning of the term "information", paradoxically enough, helps to focus on the limits to information itself.

I.2 THE LIMITS TO AVAILABLE INFORMATION

We must remember that as we talk about more information becoming available to more people by computerization and mass media, we are referring to an amorphous body of information which has been built-up through countless centuries by word of mouth, by being recorded in one fashion or another, by being cross-referenced with other information. It is not homogeneously correct - or for that matter, useful. A great deal has been 'lost' in the process; some is added every moment; much of it is highly repetitious. At any given point, in time there is not, in fact, unlimited information available:even Einstein's concept of the universe is a provisional one which top scientists admit is good enough to be going along with but,which like Newton's before it,will probably have to be displaced by a finer understanding. This does not prevent the search for data - the pulsars, the satellites,the telescopes, with the people and computers connected to them, are trained on the heavens nonetheless - but it certainly conditions the assumptions made, the areas of inquiry selected. Most 'information' is, in fact, only opinion; it is the result of people observing themselves, other people and the environment with all the subjectivity and Heisenberg effects inherent in those processes. The 'prevailing opinion', the 'conventional wisdom','common knowledge' are not only changeable with time and place: they are often dictated by contemporary 'powers that be', Data which is recorded on the basis of available information is arranged to elicit more information which sometimes cancels the validity of information accepted

as reliable during the data-gathering process.

The search for new data, as it comes to involve more and increasingly complex and expensive equipment, is conditioned by economic power. Once it becomes obvious that information has trade routes on a mass scale its supply could become subject to the same exigiencies as any other commodity - suppliers may withold certain information to push up its price - 'nations', whatever configuration they take, could put tarifs on imports to safeguard the local product; cartels may be formed. Certainly information will be used as a power source. Another limit to information mediated through technological devices is the possible economic manipulation of the appropriate hardware and the resources to build it.

These are the limits which cannot be set or be overcome by individual nations. There are others - the very nature of the commodity is such that it cannot be made widely available without being too much so; it is very easily pirated. The fears expressed in this regard are immediate evidence that information has already ceased to be a free good shared equally among nations and people. At any given moment in time, and for any particular group of people therefore, 'available information' is severely limited both in quantity and in quality by several constraints: there is an outer limit to what is understood about the universe and its workings; there are several economic and political limits which are likely to come into play concerning equipment for data search, the base information or software for the data search, and market manipulation: there is a trade-off between spread versus

containment; quality is limited since most of it is only opinion, much of the rest is just wrong.

The possible social consequences, particularly the impact on inter-personal communications, of information becoming a economic commodity and acquiring a price are discussed in Chapter 6 . We might even postulate a concept of "information throughput" and thus account for discovery, processing, wholesale, retail, discarding, waste, recycling, as with material commodities. Can a work of art, or the information conveyed by it be considered a potentially renewable resource to be enjoyed by millions over centuries - whereas data such as a company's quarterly expenses are akin to non-renewables? Once used, as the fuel in an automobile is burnt-up, do the residuals pollute? Certainly there is information which we tend to keep and that which we tend to discard, and not only on the basis of preference. An obsolete tax-guide is thrown-out not simply because it was 'bad news' or because it was wrong but because its information, the 'hard facts' have usefulness limited in time. The only person who would not discard it is the specialist, the tax historian, who sees the information in the larger context of a continuing process. The specialist nature of some information indicates yet another limit: just as a tax-guide has limited usefulness in time, many information sources are of interest to only a limited number, a particular set of people.

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To summarize, information itself, for all present intents
and purposes, is unlimited: the capacity of the brain to absorb information,
however, is limited, so we need not worry about information—overload.
Indeed the available pool is constrained by so many economic, political
and simply human limits that we are unlikely to reach a condition where
every individual has all the information he wants exactly when it is wanted.
The phenomenon confronting us is not increasing information but rather the
increasing mediation of information by technological devices and, correspondingly,
the decreasing mediation of information by and in human minds.

CHAPTER II

INFORMEDIATION

2.I THE EVOLUTION OF THE INFORMATION SOCIETY

What, then, are we to call this phenomenon? "Informatization" besides being an ugly word, seems to connote an actual increase in information which, as pointed out in the previous chapter, we cannot assume; we do not increase information by opening up an 'electronic highway' any more than we create more land by building a road to a remote spot; in both cases the only "increase" is in accessibility. Nor do we "increase" information when we correlate two pieces of information to "produce" a third, as in the process of deduction: we simply have illuminated, for our own benefit, information which existed before we began. The same applies when a computer, programmed with our deductive faculty, appears to make additional 'bits'. We are really talking about the mediation of the transfer, processing and storage of information using man-made, or technological, devices, something which we might call (for want of a less ugly word) "informediation". We could say

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that a society's activities are being 'informediated' as individual thought and direct interpersonal communications give way to technologically mediated processes. Presumably informediation has something to do with technological innovation. If we consider the evolution of technology in general, perhaps we can illuminate in what senses the new wonders like videotex and microprocessors are in the smooth sequence of technology development and in what senses they represent a departure. In so doing, we may come closer to understanding how informediation will affect our society.

The simplest most primitive flint, shaped so as to break up rocks, is, in fact, an informed device. The wheel, the pulley, the blast furnace, the steam engine, the automobile and the aeroplane are all also adapted parts of the physical environment, shaped, "informed" by human knowledge for human purposes. Each and every one of these technologies replaces or eases physical labour by virtue of a transfer of information from mind to matter.

An additional purpose was served by such innovations as the clock, the barometer, the compass, the spirit-level which, subsumed by the larger category of "informed devices" not only 'hold' information, but also give back data concerning the physical environment, thus facilitating the humanity/environment interaction: these we might call 'data-yielding devices' . The computer (with its forerunner, the abacus) represents a development along these lines but also a departure since it not only yields data but, having been informed (by software) can take-in and process data. This innovation duplicates the more elementary and laborious mental functions

such as calculation and memory and thus potentially replaces much human labour: they are <u>computational devices.</u>

A third category including 'cave wall with rock', 'pen with paper', the telegraph, the telephone, CB radio,are parts of the physical environment 'informed' so as to facilitate interrelationships among individuals: they are <u>interpersonal communications devices</u>. The church bell, the loud hailer, the radio and the television broadcasting systems are parts of the environment informed such as to ease one-to-many communications: they are <u>mass communications devices</u>. We can see, from this rough categorisation which, incidentally, does not pretend to be exhaustive or accurate as to sequence of innovation in time, that information moves from the human brain to the environment to shape devices which influence relationships between humanity and environment and among individuals.

To talk of the brain as the starting point in this process is probably not quite valid since man may never have thought of the flint if something very like a flint were not thrown-up by his environment. The information therefore starts in a convergence of environment and brain - a flash or a spark or something. The deliberate pursuit of these flashes is called scientific research. We are, in fact, educated by the environment and never so faultily as by our own formations of its substance. The popular and current conception of the brain as a computer probably reflects reality no more accurately than the ancient Greeks' conception of the human heart as a furnace. This is all leading up to a caveat: the danger of the

incestuous interplay by which human invents technology and technology "discovers" the human is of short-circuiting the process if we underestimate and undermine not just the automatic functioning of organs like the heart but the "conscious" process of thought.. This is related to another large and long-term question regarding the abrogation of human functions to the non-human environment: Is there a threshold beyond which the development of information technologies will allow and/or demand humans' release from the intellectual labour which helps to create technology. Will old capabilities atrophy, or will "higher" capabilities evolve? Will the information 'end-up' in the environment with humanity regressed to a primitive condition or will we (if we live that long) soar to unimaginable glory with telekinesis, extra-sensory perception and other "supernatural" powers? What evidence is there of unused but usable capacity of the human brain?

These questions are, however, too esoteric to be immediate policy considerations: let us move on by returning to the categorization of informed and information technologies. The transfer of information to parts of the environment and from one person to another via adapted parts of the environment has been going on for a long time. The emergence of the Information Society, however, as it is disdussed in government reports and scientific journals, dates back no more than thirty years to the early 1950s when the first commercial computers and domestic television sets came into use and radios and telephones were already common place. The information explosion since that time, is really a matter of simultaneous increase in many of the variables involved: distance covered in transfer, the number of

senders and receivers, computer storage and processing capabilities. There
have been many innovations which promise (or threaten) a further boom in
communications and computational capacity: fibre optics, cable and satellites
in broadcasting and microelectronics in computer technology are among the
more significant. The other important development on the horizon is the
convergence of these technologies, in some cases in the actual hardware,
in others in their simultaneous utilization on a mass scale and in yet
others, in both hardware and utilization.

Let us simplify this enormously complex picture by imagining
that the majority of Canadian households are equipped with a home information
system, something like videotex-plus, capable of acting as:

- video-phone,broadcast and cable television; and radio receiver
- viewdata system, with a smart terminal,
  linked to a central data-bank;
  and that, at the same time, the bulk of our industrial processes are
controlled or guided by microprocessors. Technologically speaking, this is
by no means an unlikely scenario: videotex-plus is only a convergence in
the actual hardware of several tried and tested devices; microprocessors,
at least according to a recent British report, are capable of controlling
massive industrial plants and machinery,industrial measurement and analysis,
and office machines, including the word processor and electronic funds transfer
—the possible applications are too numerous to mention.[2]

In terms of our rough categorization of technologies and
their effects, we would have a situation where communications at both the inter-

personal and 'mass' levels, for private and commercial matters, advertising, education and entertainment would be technologically mediated, profoundly affecting the inter-relationships among individuals which make up a society. The impact on the humanity/environment interaction would be no less significant: whereas the production and distribution of goods and services has, since the first flint, been gradually facilitated by a convergence of informed, data-yielding and computational devices, these social processes could now be given over almost entirely to micro-processor-controlled devices. Much of the mental as well as physical labour previously involved could be avoided. The technology for "informediation" is available: the following section will attempt to indicate to what extent it is desirable and desired in Canada.

2.2 CANADA:AN INFORMATION SOCIETY?

There are several logistic factors which would suggest that Canada <u>should</u> take advantage of the emerging information technologies. Canada has an overall population density which is roughly one-tenth of that of our nearest neighbour, the United States. When it is considered that almost two-thirds of Canada's population is concentrated in the provinces of Ontario and Quebec which together comprise only one-quarter of the nation's land area; and that more than 80% of these two populations is described as "urban", the relative low density seems an even more significant factor. Canada's long severe winter which makes passenger travel and goods transportation difficult if not hazardous would also militate in favour of the use of 'information' over the use of energy, wherever possible. In this regard, it need hardly be

mentioned that in an era of dwindling energy supplies, Canada has as much interest as any other nation in substituting 'bits' for B.T.Us. The traditional low-density distribution problems of Canada's book and magazine publishing industries would suggest the substitution by electronic communication, wherever appropriate. Canada's ethnic pluralism and official bilingualism may also be better served, in some cases, by information systems with built-in translation capability.

In a slightly different vein, Canada's close proximity, and particularly the proximity of the major part of its population, to the United States, is a significant factor. Without any special effort, the United States can "inform", therefore "form" and absorb Canada unless our own communications systems serve Canadian needs adequately and are dynamic enough to retain some degree of autonomy. Also, it is only by keeping-up and "linking-up" with the relatively distant Japan and Western Europe, which are unquestionably embracing "informediation", that Canada can counterbalance the inevitable U.S. influence.

To what extent is Canada already an 'information society'? The most popularly quoted statistic is that 97% of Canadian households are equipped with telephones. This is true but not very exceptional: Canada, in fact, ranks fourth behind the U.S., Sweden and Switzerland in 'phones per 100 population'.[3] A comparison with the U.S. of use of telegraph services would however imply that Canadians are more enthusiastic in that regard: during 1975 Canadians sent about 250 telegrams (domestic and foreign) per 1000 inhabitants while Americans sent only 195 per tousand.[4] As far as mail

is concerned however, the picture is reversed: in 1973, Canadians sent only 238 pieces of domestic and foreign mail per head of population whereas the American figure is 421.[5] Whether slow and inefficient mail service is a cause or an effect (or perhaps both) this apparent reluctance to use the mail service may be an indication of the need for electronic media for inter-personal communications. It may be, of course, that Canadians actually use the telephone more than their U.S. neighbours: there does seem to be an annual increase in Canadian local calls of approximately five per cent, and in toll calls of 8%,but figures for the U.S. would be needed to make a meaningful comparison; during 1977, Canadians made almost 1000 telephone calls per head of population.[6]

As far as braodcasting is concerned, Canada ranks second to, but far behind, the U.S. in television and radio receivers per 1000 inhabitants: the U.S. figure is 571, the Canadian is 366.[7] (This does not imply that we need more). According to the latest Statistics Canada figures, slightly more than half of Canadian households have Cable-TV installed. Almost eighty per cent possess record-playing equipment.[8]

No nationwide figures or international comparisons are yet available on such relatively recent innovations as electronic TV games, pocket calculators, home computers and terminals ,tele-conferencing and electronic funds transfer. Citizens' Band radios seem to have experienced such a sudden upsurge in popularity that even statistics referring to 1975 or '76 would give a very false picture of present use. Possession and use of bugging devices,

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by their very nature, are not amenable to statistical analysis.

This,then,is the "consumption" picture: it would imply that although Canadians are enthusiastic communicators they are not significantly more so than other societies of similar socio-economic status. Given Canada's relatively low population density and geographical and climatic features, already mentioned, it would appear that there is considerable scope for expansion in the information field. Canada's position as a world leader in data communications, and especially in development of software is well-documented. Every one of a dozen information industry executives interviewed recently for the journal "Canadian Data-System" predict a continuing bright future for communications and data processing.[9]

CHAPTER III

INDIVIDUAL AND SOCIAL NEEDS AS POLICY GUIDES.

On what 'unit' of social organization and by what criteria should we estimate the social costs and benefits of "informediation"? There are several units which could have been chosen for consideration. The family, for example, as the traditional unit of social organization is tremendously important. Even with the alleged disintegration of legal and sacramental marriage, the family tends to be perpetuated in similar groupings which attempt to substitute for it on the basis of less orthodox relationships. The ongoing changes in 'the family', its diminishing size, the changing structure of male and female roles, the aging of the family (inevitable with the aging of the population) however ,render it too variable and varied for consideration as a unit of society.

The neighbourhood, the village, the municipality, the province, the region are also important units which, no doubt, will be discernibly affected by the advent of "informediation". In Canada, however, ethnic urban/rural, provincial and regional differences are such as to forbid analysis on the basis of any of these as common units. Another reason for not choosing units which depend on interpersonal or geographical relationships for their maintenance is the possibility that these may themselves be changed by the phenomenon under consideration. By far the greatest and potentially most enduring commonality is found in the psychological and physiological make-up of the individual inhabitants, at least in so far as they are the beneficiaries, if not creators, of federal government policy. The advantage of choosing the individual as a 'unit' for initial study is that we can retain that unit as common within any group selected for further investigation.

The changes potentially to be wrought by informediation with other 'development' phenomena therefore, leave only the individual as a stable unit for consideration: and we must limit, even 'the individual' to the 'individual as a member of the society'. i.e. insofar as a he or she has characteristics common to all members of the society. (Uniqueness itself may be taken to be a common characteristic). That leaves us with the question: Which characteristics? The prime boast of all democratic societies is 'equality of rights'. That would imply that human rights, and in this case particularly Canadian rights, should be the judgement criteria. Declarations of rights, however, tend to be defensive, after-the-fact documents created to protect implicit rights which have been violated or seriously threatened:

this is the reason that such documents being presently drawn up, refer
mainly to discrimination and violation of privacy. In Canada, particularly,
there is the problem of confusion and clashing between federal and provincial
jurisdictions: notwithstanding the new Canadian Human Rights Act (1977),
Canadians still do not have a common set of constitutionally entrenched
rights. In fact, rights themselves are manifestations of commonly felt or
expressed needs: we might say that they are 'legitimated' needs. If we
use established rights as judgement-criteria, we run the risk of ignoring
common needs about to be threatened by the very phenomenon being judged.
The rapidly increasing capacity for computer storage has generated great
concern about privacy and access to information about oneself: microprocessors
loom as a much-discussed threat to paid employment: Very little effort,
however, has been directed to discovering what happens to individuals who
communicate largely with machines or with one another via machines: what
happens to human relationships when verbal communication acquires a price?
What happens to a territorially based and organized society when distance
becomes less significant a factor in its passage of information? In other
words, there has been small attention paid to the fact that while informe-
diation opens up some new avenues for satisfaction and frustration of needs,
it also closes-off others. Even 'basic needs', however, are by no means a
simple set of criteria.

A great deal of research has been devoted during the past
two decades to discovering what people "need". Human needs have been listed,
categorized, classified and hierarchized, ad nauseam, in an attempt to

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establish priorities for individual action, for community goals, for
national public policy and for international aid and cooperation. The reason
that so much time and energy has and is being devoted to understanding human
needs is that dreadful blunders have occurred in even well-meaning attempts
to banish want. It has been discovered that to give a month's supply of
fish to a peasant rather than to teach him to fish is, at best, a stop-gap
measure, which does not satisfy his need for the next month's fish or for
this month's self-respect. It has been realized that money or other material
goods is inadequate compensation for the loss of cultural continuity occa-
sioned by displacing human communities on behalf of dam-building, road
construction, power projects, etc. No less, it has become obvious that a
commodity which satisfies a need in one set of people does not necessarily
satisfy the same need in another set of people; to ship vast quantities of
milk to a starving community which has never consumed dairy products is less
than useless. It will be noted that in all three examples, the 'fish', the
' dams' and the 'milk' are material commodities whose value is seriously
diminished by the lack of appropriate information.

Further, it is now understood that the configuration of
wants, (or active needs), even at the most elementary level of the individual
is a shifting, changing, inconsistent thing; no sooner is the person provided
with food, shelter, clothing and security than he or she conceives desires
for affection, self-respect and then 'self-actualization'. To complicate the
matter, some needs become consciously-perceived 'wants' in one person only
when they are seen to be satisfied in another; "relative deprivation" is the

popular name for that particular problem; it is a moot point whether it 'creates' needs or merely stimulates wants.

A current preoccupation of the international social science community is the fear that 'underdeveloped' countries, by virtue of mass broadcasting, are adopting those needs which are satisfied, at present in the First World, only by the profligate use of material resources; concomitantly, it is feared that the 'overdeveloped' First World, in its mad pursuit of superficial pleasures is neglecting needs for emotional and spiritual satisfactions. In other words, development is being pursued in an unbalanced fashion with the economic, urban and industrial aspects being emphasized at the expense of 'human' development.

There are two associated insights at the base of the new scepticism: the first is that what appears good for the society is not necessarily also good for its individual members: economic growth which looks good on the national accounts can be identified with an increase in quality of life only when the current needs of a population are for such material commodities as food, clothing and housing and only when there is even distribution of these commodities and perhaps not even then; the concomitant realization is that economic indicators such as GNP are not always reliable indicators of a society's health or happiness. These insights have focussed research efforts such as the Goals, Processes and Indicators of Development project (or G.P.I.D.) on understanding human needs, the distinction between needs and satisfiers; and on measuring and indicating 'Quality of Life'. The thinking, measuring, indicating, presenting of papers and debate continues.

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One thing which has become clear is that the transfer of information within nations and across national boundaries is not only essential in aiding co-operative survival efforts; it also tends to equalize needs and aspirations on a global scale.

The attemps to describe human needs has naturally led to consideration of the 'highest common factor', that set of needs which is experienced by each individual human being, independently of time, location, sex, age, culture or other variables. Individuals of course, have additional specific needs; the diabetic, for example, may need insulin more than shelter. Public policy however, must be guided primarily by needs which are common within the society. It has even been argued that policy decisions should answer to 'social needs' as distinct from individual human needs. The perception of 'group' or social needs is presumably predicated on the understanding of a society as a living organism seeking satisfaction of needs which reside not in its individual members but in the connections or relationships among them. For the sake of conceptual clarity, it should be considered that groups, communities, societies or whatever are formed and maintained in response to common individual needs: the need for group affi-liation, although it may be satisfied only in the group, is felt in the individual person; the trading of skills and goods, although it requires interpersonal cooperation, also answers to individual needs; even economies of scale, possible only in satisfying the needs of more than one person, cater, finally, to the individual. 'National identity', GNP-Growth and such entities should therefore be viewed as 'social satisfiers' which cater to individual needs. Some of the confusion which exists between

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the concept of 'needs' and the concept of 'satisfiers' clears up if it is
accepted that needs are experienced by the individual; satisfaction is
pursued by one person, groups of two or more persons, families, communities,
societies, nations, etc. Pursuing the public interest, at the level of the
nation, therefore means facilitating availability of some satisfiers and
non-interference with the availability of other satisfiers best procured
by individuals or by groupings other than the nation.

Interestingly enough, in the context of "informediation",
the only individual need which could be identified also as a social need
is that for communications itself: the passage of information does indeed
take place in the connections among its individual members. It is only
by communications between a society and its environment and among its
members that the society is created and maintained. Concern which is often
voiced in Canada over failures of national unity or national identity is a
recognition of the society's need for a high level of intra-communications
of certain types of information: only certain types, however. The social
need is balanced by the individual member's opposite and reacting need for
privacy: a person needs both communication and non-communication. Just as the
individual requires this balance to exist autonomously within a society,
the society, in the international context, needs both communications and
"privacy". The change from the traditional to the information society
is simply a new way of conducting the necessary passage of information,
a new way of creating or maintaining the whole (which is, of course, 'greater
than the sum of the parts').

We have, then, individual needs and a single, but vital, social need. Humans need things ranging all the way from the obvious and material 'food, shelter and clothing' to such esoteric entities as Frankl's 'meaning'. Such is the arbitrariness of the standards by which needs have been investigated, interpreted and defined that there are as many proposed hierarchies as there are definitions of 'well-being'. Among the few attempts to clarify the situation is the work of philosopher Franz Oppacher. He has collated into a master list, excluding repetitions and items which appear only once, the hierarchies proposed by Maslow, Cantril, Malinowski, Tolman, Fromm, Linton, Thomas, Young, Montagu, Cattell, McDougall, Kurtz, Stagner and Karwoski. His idea was to mine the richness of the work (carried out since the nineteen- fifties) of these philosophers, psychologists and anthropologists so as to crystallize their agreement on the question — a sort of Delphi in retrospect. Where perhaps no one is right, they all, in unison, might be right. The 'law of large numbers' may well apply to social scientists because the result of the collating, seven sets of related needs ranked by prepotency, is very difficult to refute. Emphasizing that such a hierarchy can never be anything more than tentative, it can be pre-sented, briefly, as in the following table.[10]

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TABLE I

SETS OF RELATED NEEDS	SOME CORRESPONDING SATISFIERS (AUTHOR'S NOTES)
I) Physiological/Maintenance	Food, shelter, clothing, water, air absence of pollution.
2) Physical security	Freedom from illness, injury, attack
3) Psychological security	Stability, freedom from anxiety, powerlessness
4) Love/Belonging/Cooperation	Identity, sense of community, emotional attachments, absence of alienation.
5) Self-respect/personal dignity	Worthwhile long-range goals, job satisfaction
6) Self-actualization/growth/ competence	Novelty, increasingly complex skills, creative activity
7) Understanding/Purpose	Order, meaning, understanding, information

CHAPTER IV

A GUIDING FRAMEWORK FOR SOCIAL IMPACT STUDIES

If we are to approach an understanding of the social effects of "informediation", we must first examine the activities by which needs are satisfied. In a modern industrial society like Canada's individuals pursue satisfaction of most of their needs in an indirect fashion: by division of labour, remunerated employment and payment for services we largely give over to others the tasks which sustain life and happiness. That means that virtually every individual is a beneficiary of many activities in which he is not directly engaged. A radical change in the way these activities are conducted carries with it the promise or threat of change in the satisfaction of his needs. Assuming the highly probable scenario (introduced in Chapter 2) which could be designated as 'videotex plus at home and microprocessors elsewhere', each and all of the activities listed in the following table will be "informediated" i.e. the processing, storage and transmission of information concerned in these activities will be partially

or wholly mediated by technological devices (including those already
commonplace). These rough divisions of activity in Canadian society
are chosen because they satisfy three essential conditions: each
category will probably employ a different technology-mix; the 'informediation'
of each category will have an impact on need satisfaction differentiable
from that of the others; and each is amenable in a different way, or to a
different extent, to federal government control on influence.

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TABLE 2

SOCIETAL ACTIVITIES	BRIEF CLARIFICATION
I. Production, Distribution - (of material goods such as food, shelter and clothing).	Includes exploration and development of resources, manufacturing, storage, transportation, distribution, wholesale, and retail in which computerization, telex, viewdata and microprocessors are used.
2. Service (information-intensive - but providing primarily non-information commodities).	Includes government services, banking, insurance, credit cards, professional services in law, medecine, etc.
3. Advertizing	Includes 'print' radio, television, videotex
4. Education and useful information -	Includes 'informative' cable and network television and radio broadcasting, non-fiction books, journals, videotex-plus ,pocket calculators, teaching machines, etc.
5. Entertainment -	Includes 'entertaining' broadcasting, stereos, tape recorders, books, film, electronic games and microprocessors.
6. Interpersonal communication -	Includes telephone, mail videotex-plus, CB radio, teleconferencing, but also "bugging" devices.
7. International aspects -	Main impact differentiable from domestic aspects, is probably by the Information and Entertainment channels as in 4 and 5 above. However, since such a large proportion of our 'domestic' industry is foreign-owned, channels I, 2 and 3 are also relevant.

What we want to discover is: will further technological mediation of information within these activities impact positively or negatively on the satisfaction of needs in Canada? or is the suggested scenario socially desirable? We can create a format for components of an answer to this question by constructing a matrix (Fig. 3) with columns representing societal activities (see Table 2) and rows representing sets of related needs (see Table I). The upper left half of the 'boxes' thus formed depicts satisfaction of needs, the lower right half, frustration of needs. The expression 'components of an answer' is used advisedly since this is a highly reductionist approach which would require a synthesis of positive and negative impacts before the policy decision stage. However, whether the whole picture of informediation is judged to be socially desirable or not, it is as well to know in advance the probable social consequences of policy decisions. One observation more on the reductionist technique: there is a good case for suggesting that only social scientists and 'decision makers perceive or have any interest in categorization of needs, or activities, that people know better in a diffuse undifferentiated fashion how much they like something than they know why. While some changes, current and imminent, in the physiological and psychological health of society's members can be inferred from objective data, complementary subjective responses.(through sampling) would be needed to complete the picture.

The matrix is intended as a conceptual map for the problematique and ultimately ,therefore, as a guiding framework for choice of social impact studies. Two versions of the matrix can be used to compare scenarios of different levels of 'informediation' e.g. the status quo versus the scenario suggested in Chapter 2.

The matrix may be used as the basis for a Delphi-type questionnaire: Experts could be asked to "fill-in the boxes", assessing impacts, and their own competence to do so, perhaps on an ordinal (I-10) scale.

Columns, rows or even boxes may be isolated and expanded to detail and ,in some cases, quantify impacts.

The whole matrix could be used to study the social impact of a particular technology (eg microprocessors) whose application in many activities is forecast.

The following two chapters demonstrate the use of the matrix and probe the problematique at selected points to indicate sub-themes for a 'social implications' policy study.

(Incomplete)

GUIDING MATRIX FOR IDENTIFICATION OF THEMES FOR IMPACT STUDIES ON SOCIAL COSTS AND BENEFITS OF INFORMEDIATION

SOCIETAL ACTIVITIES — INTERNATIONAL ASPECTS

RELATED SETS OF NEEDS	PRODUCTION & DISTRIBUTION	SERVICE	ADVERTISING	EDUCATION OR USEFUL INFORMATION	ENTERTAINMENT	INTERPERSONAL COMMUNICATION
Physiological maintenance	Availability of goods/ labour saving; passivity; unemployment	Convenience	Knowledge of goods & services. Over-consumption			Clinical effects; Clinical effects
Physical security	Physical safety	Security				
Psychological security					Escape from problems	
Love/belonging cooperation	Alienation			National unity & National identity	National unity & National identity	Friendship
Self-respect/ Personal dignity	Unemployment	Independence	Relative deprivation	Achievement		
Self-actualization/growth/ competence	Unemployment	Learning skills by doing		Learning new skills		
Understanding/ purpose	Alienation	Knowledge; Alienation		Knowledge		
Devices employed	C X T M	CXT MVRO	V R P F O T H	V R P F	F R P F S E M	T O B H

C - COMPUTERS
X - TELEX
T - TELEPHONE

V - TELEVISION
R - RADIO
P - PRINT

F - FILM
O - POST OFFICE (MAIL)
B - BUGGING DEVICES

S - STEREO, TAPES
E - ELECTRONIC GAMES CALCULATORS
M - MICRO-PROCESSORS
H - HOME COMPUTER TERMINALS

CHAPTER V

PRELIMINARY ASSESSMENT OF SOME PROBABLE

SOCIAL COSTS AND BENEFITS: GOODS AND SERVICES.

5.1 PRODUCTION AND DISTRIBUTION OF MATERIAL GOODS

Canadian industry is already highly informediated: computer automated machinery, telex and telephones are widely used at all stages of the production and distribution processes. One development on the horizon, however, the introduction of microprocessors, is expected to have a more profound effect than all these three "traditional" technologies put together. The invention of the silicon chip is even compared to that of the wheel in its potential social impact. One publication lists thirty-four examples of 'multitudious' possible industrial applications, including such diverse processes as metallurgical analysis, robotics, coil-winding machines control.

and dairy management.[11] Clearly such a versatile and cheap technology has the potential to revolutionize the employment picture. It would appear, at first glance at least, that massive unemployment looms on the horizon but the outlook, for a number of reasons, is not quite that clear. A paper produced by the Central Policy Review-Staff, a British government think-tank, attempts to argue that in spite of the myriad of possible applications the silicon chip is not a major threat to employment. The paper indicates, as main impacts, improvement in quality and reliability, reduction of stock levels, savings in raw materials and energy and development of improved services and product range. This may all be true but it is difficult to see how such salutary effects can be achieved unless the microprocessor efficiently takes over tasks such as testing, counting, measuring, assessing, calculating, presently carried out more haphazardly by human beings . In other words, we might ask, as a basic question: why employ microprocessors except to replace human labour? The answer would appear to be outside the direct social and employment implications and to be based on the admittedly serious grounds of the perceived need to compete internationally and economically. Although the paper raises interesting points, it can scarcely masquerade as a policy guide concerning the social and employment consequences of microelectronics: the introduction lists the British government's activities in the field as:firstly, 'encouraging the development of the semiconductor industry'; secondly, 'promoting the application of microelectronics'; and thirdly, (and lastly) 'an examination of the employment and social consequences'[12]. The policy decision is already made irrespective of these latter consequences.

If Canadian policy decisions are to be based, even partially, on expected impact on need-satisfaction, several questions concerning the widespread use of microelectronics in industry must first be answered.

I. Which are the applications which will replace dull, boring, repetitive, even dangerous work and which are merely gimmicky? Which will allow appreciable quality improvement?

2. What are the energy and mineral depletion implications of such applications as 'robotics';microprocessors may replace the 'thinking human' element in many tasks but also require the addition of non-human energy. Allied to that, what are the energy savings to be expected from waste reduction and increased efficiency? Is it possible to sell, buy or run out of silicon?

3. What prospects are there of unemployment, underemployment, reduced working day, week, season, year or life? What plans could be made for retraining, re-education, reemployment of those whose work would be taken over? What anticipatory adjustments can be made in education of youth?

4. What would be the psychological effects on those whose work is 'modified' by the microprocessor? In order to work closely with a machine one must become, to some extent, machine-like.

5. To what extent does the unemployed or underemployed person experience feelings of powerlessness, alienation, loss of 'belonging' and cooperation, loss of personal dignity. What scope would there be for self-actualization, and sense of purpose?

These are some of the questions which should be answered by a study of the social impact of microprocessors on the production and distribution of material goods. Some of the same questions could be asked

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in relation to the "services" sector where word-processors, electronic funds transfer, teleconferencing, commercial viewdata, etc. are liable to have similar employment effects. It is interesting to note, in this context, a recent paper entitled "Les conséquences sociales de la bureautique, un scénario québécois" which envisions the gradual changeover from 'downtown office with secretary' to 'suburban secretary-staffed text producing workshops' to 'all-purpose home terminal' between now and 1995.[13]

It should be pointed out that unemployment may arise not only in particular industries which adopt the microprocessor but possibly also from a falling-off in production of traditional information-related industries. A.R.Megarry, from the point of view of the industrial strategist, has asked what will happen in the long term to the two industries where Canada has achieved international stature - pulp and paper and business forms.[14]

5.2 SERVICES.

As was mentioned in the previous chapter, there are a number of different approaches which could be taken to using the matrix to focus on relevant social impact studies. We could, for example, isolate the highly diverse 'services' sector and examine the probable impact of informediation on the practice of particular professions or occupations within it. One of the fears expressed concerning the advent of the cheap microprocessor is standardization and anonymity of paid employment. It would appear, however, that,

informedby a microprocessor-equipped terminal linked to a central data bank, the individual may be able to perform, on his own behalf, many tasks which are currently carried out by 'professionals'. Indeed, if large numbers of active people become unemployed or underemployed, they may be inclined to turn to the do-it-yourself mode of providing some services: Law is an "information" process. The impact of informediation on the judicial process could be considerable. Already, 'do-it-yourself divorce' kits, class action suits, rental boards, small claims courts, and tariff appeal boards have demystified and popularized dealing with 'the law'. The addition of legal information at the fingertips whereby one can discover not only the law but 'precedence' by a simple relevance-tree search from a push button terminal may make lawyers, except in very complex cases, all but obsolete. Lawyers, after all, mediate between individuals and corporations and between individuals and legal governing bodies by virtue of the possession of encyclopaedic knowledge and awareness of procedures. One suspects that, in the vast majority of cases, with the appropriate information, the individual need not be "represented". He could deal directly with the dispensers of justice. One could perhaps even envisage asking for 'justice' via a teleconferencing technique giving references to documents recorded in a common data bank - or that even the human decision-making process could be by-passed with the computer acting as judge and jury, dispensing justice according to its recorded and stored precedence and the "facts" of the case. Could punishment for criminal offences become deprivation of freedom 'to inform and be informed' rather the freedom for movement outside four walls? 'Isolation'

in an information society could be solitary confinement in ignorance.

Medecine.

These services are or could be information-intensive.
We are liable to see, at last, the development of preventive medecine,
something which would be in the logical sequence of development after
nineteenth-century public health amelioration. Presently, there is a
haphazard plethora of information, mostly of the warning kind, and without
any standards of reliability. What is needed, and is possible with wide
dissemination and computerization is a simple well-structured body of
information on nutrition, health hazards,symptoms,preventive cures with
scientific documentation. Health could become part of the individual's
general knowledge, an integral part of the education curriculum. The old
Chinese custom of paying the physician while one is well and ceasing to
pay at the onset of illness was recognition that medicine should be preventive
and not a technique for occasional crisis management. Preliminary diagnosis
can be carried out by computer,perhaps even through a home terminal,with
the human doctor giving a second opinion. The surgeon's job , to deal
with the inevitable failures of the system and with accidents, would not
become obsolete but could become easier as the result of vital body signs
being monitored by highly accurate devices equipped with microprocessors.

RELIGION

Religion, by its very nature, is a commodity which lends
itself to "informediation." Already, electronic evangelists minister and
administer profitably to the spiritual and probably emotional needs of millions.

The established churches, after a decline during the iconoclastic sixties, are experiencing something of a revival but their potential congregations are rapidly being eroded by attachment to the charismatic broadcasting clergy and the new cult leaders. The question is:will the established institutions respond to that challenge by taking advantage of the ever-increasing array of information facilities. A link-up, for example, is possible between a church leader speaking occasionally on the national network and the lesser clergy ministering by cable or rebroadcasting facilities at the local level. Videotex could be used to provide religiously based advice and texts and, linked with 'electronic funds transfer', could also 'take up the collection'. Incidentally, the making and taking of pledges, donations, etc.for any purpose would be greatly facilitated.

The configuration of religious institutions could change even more radically with"informediation". Churches could, for example, make an effort to achieve ownership of broadcasting facilities as they have traditionally done with respect to land. Divisions, schisms, new factions could be formed by proselytizing of ideas via the media rather than by direct contact with geographically-based congregations.

POLITICAL ORGANIZATION.

If interactive electronic media span the country, the already diminishing justification for parliamentary constituencies being geographically based will be further reduced. Already, in order to fulfil a mere formality, candidates are 'parachuted' into ridings with which they have

had no previous experience or association. The personnel attached to political parties are shuffled and even the ridings themselves are 'reorganized' to conform to some appearance of 'geographical representation'. which nobody takes very seriously. To some extent, in Canada, although more so in the United States, consumer advocates like Ralph Nader, are in effect, lobbying for widely dispersed interest groups.

Just as the territorial division of constituencies is eroding the centre/periphery relationship itself is undergoing change by "informediation." Referenda, already becoming indispensable for major issues, would be facilitated by a technology like videotex and could be employed to aid in policy decision-making on lesser matters, thus by-passing the local representation by member of parliament. Broadcasting of parliamentary proceedings subjects to scrutiny the sometimes obscure nature of actual political differences among parties; television demands a new kind of 'performance', personality and perhaps even politics. We may eventually see the present two-party system giving way to representation of interest groups which are presently only locally organized, at least for effective action. If access to interactive narrow-and broadcasting become a reality, women, the elderly, youth, the ecological left, ethnic groups, consumers of certain commodities and other such groups may become aware of common needs and the political power to pursue their satisfaction.

International communications has already made possible some degree of cohesion of interest groups, such as the recently formed federation of indigenous minorities gathered from Canada, the U.S., Australia, Africa

and Asia. Representatives of activist groups do not hesitate to cross borders to protest activities like the seal hunt in Newfoundland.

This demotion of 'physical proximity' as the prime determining factor in formation of groups, even in areas distinct from politics itself, is an extremely demanding and complex question basic to an investigation of "informediation": the formation of non territorially-based constituencies certainly merits a study of its own.

These professions or occupations, of course, do not fill the 'services' sector but the foregoing brief discussion of the possible effects on them of "informediation" perhaps illustrates the profound social impacts to be expected. In general, we see the scope for and probability of greater active participation by the ordinary individual in the conduct of his or her affairs. In terms of the needs axis of the matrix, that participation promises increased psychological security, self-respect and self-actualization, perhaps offsetting some of the negative effects of unemployment or underemployment in the production and distribution sector, and in the 'services' sector itself. There would be 'white collar' unemployment of those involved in law, medecine, religion and politics as well as for accountants, travel agents, real estate sales people, stock brokers — indeed, in any service which has high verbal or numerical content. The changeover would have, of course, important ramifications in the content of education, the conduct of which we will discuss briefly in the next chapter.

CHAPTER VI

PRELIMINARY ASSESSMENT OF SOME PROBABLE SOCIAL COSTS

AND BENEFITS:EDUCATION AND INTERPERSONAL COMMUNICATION

6.1 EDUCATION

Education is already undergoing rapid evolution, if not revolution. The many diverse attempts to establish lifelong learning systems via cable and network radio and television are manifestations of the demand for access to and control of ongoing education.[15] The Open University of Great Britain ,probably the prototype of advanced-level structured education via the mass media ,has operated for several years with great success. UNESCO, in its attempts to furnish the developing countries with library and information systems, has discovered that information creates the demand for more information.

The smart home terminal linked to an omniscient data
bank (or perhaps several specialized data banks) and furnished with lesson
tapes and the 'enquiry' facility would offer almost unlimited scope for
continuing education, but even before that stage is reached the classroom
terminal will probably reduce the teacher's role. A gradual phasing-down
to 'guidance' and then 'supervision' is probable but even the latter might
become less necessary as ,increasingly, mothers (and fathers) perform their
'work', be it paid employment or otherwise ,from home terminals.

The education sector is extremely complex and liable
to become more so as technologies develop, intermesh and become widely
available. Lifelong learning for personal satisfaction and enrichment and
idiosyncratic education ,are concepts which should be studied in advance.

6.2 INTERPERSONAL COMMUNICATION

This "sector" is a difficult one to consider since a good
portion of its content has traditionally belonged in the other sectors,
production and distribution, services, advertising, etc. One of the major
implications of "informediation" however, is the radical reduction of personal
contact involved in these other sectors and its effective shrinking to what
might be called 'interpersonal communication for its own sake'. The
everyday encounters involved in work, in gaining an education and in seeking
services of all kinds are liable to reduce for a large number of people,
so that there may be a tendency to try to compensate in purely personal

relationships. Since television is already seen as the villain in destroying conversation and, some say, even the family relationship, and since videotex-plus would increasingly dominate the home scene it is not easy to see where and how these personal relationships will be found.

The latter is a well-recognized problem associated with the mediation of information by technological means but there is another more insidious and perhaps more profound problem specifically associated with information acquiring a price. It will be argued that information is not like other commodities since if A tells B something, B gains and A does not lose: he still has the information Indeed by transferring information A probably gains prestige. However, before labour became exclusively an economic commodity, a strong man asked to lift a heavy load (and put it down again) would have been delighted to show his prowess and further exercise and increase his strength by doing so: it would have been difficult to explain to him how he lost in the transaction. Now, such physical labour, jealously guarded, measured in man-hours, and perhaps soon in man-minutes, is sold or witheld to best advantage.

As information becomes an economic commodity, A will realize that it takes time and mental energy to tell B anything; that while A was acquiring the said commodity B was acquiring another and A could have been doing likewise. If A has actually paid a sum of money, through Videotex-plus or whatever, he will surely be conscious of the price which he has paid and B has not. Moreover he will become aware that his own storage, processing

and transmission capacity or some one of these (hooked or unhooked
to a terminal and perhaps a central data bank) has limited capacity: in all
probability he will conceive of himself as losing if he allows this capacity
to be utilized freely on behalf of B. We can envisage the situation where
to ask the time of day from a passing stranger will be just as offensive
or dangerous as it is now to ask someone to carry a grocery bag.
Paradoxically enough, as a commodity becomes widely available and sufficiently
dominant in an economy to become, for example, 'the life-blood of a nation'
it contemporaneously becomes scarce to individuals or groups within that
'nation'. Perhaps one way to understand this process is to view it in the
light of General Systems Theory - we could investigate the implications of
having open and/or closed systems, of the apparent overall abundance and
scarcity to individual elements of a commodity which 'holds' the system
together.

Presently, it might be said, we have something between
an information barter and a free-information society. People give one
another data about the time, the weather, the location of lost people,
places, objects about how to operate machinery, about personal feelings,
opinions - all manner of things. Some of this is on a rough exchange basis
depending on the level of personal involvement, some is on a free-gift basis -
but will it always be so? As it becomes clear that information such as
'how one enjoyed one's summer vacation in a distant country'could be
sold to that country as an exclusive input into its data bank perhaps,
when the question 'how was your vacation?' is asked, the answer will be

'No, I'm afraid I've sold that' or 'A copy will cost you ten cents'.

The implications, if this becomes even only partially true, for interpersonal communication are overwhelming. One eminent scientist in the field has expressed as an advantage of the information utility the probability that individuals will apply less to one another and more to data banks for information, the latter being 'more reliable'.[16]

They may do so also because the economics of the situation will intervene between the individuals. What will happen to interpersonal communications? Conversation could be somewhat limited; on a bit-for-bit basis, greetings, exclamations, anecdotes, opinion, advice, jokes, enquiries after one's health might dwindle considerably. Will we charge one another for information which has a market price at the data bank? Will we revert to tactile communication ; a mode which is not readily utilizable by the information system? Will we take refuge in 'higher' modes such as extra-sensory perception?

There is another long-term but important psychological and social implication of "informediation" or indeed any major change in the way a society's members mind their business - a new standard of normalcy and therefore a new set of deviations from it. Interacting with 'thinking machines' requires a different set of skills from those involved in independent thought and interpersonal communication: some people are better at using a pocket calculator than they are at mental arithmetic; and others, vice-versa. What we must expect, in the long run, is a new notion of 'intelligence' and the

lack of it and correspondingly a new set of handicaps.

The most fundamental question concerns the human brain which is, after all, our last resort if we run into trouble: referring back to the roads and land analogy of Chapter I, we might wonder if the brain, as the intersection point of many electronic highways,will be deprived of working-space and effectively jammed?

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CONCLUSION AND RECOMMENDATIONS FOR FURTHER RESEARCH

This study has, perforce, been definitional, theoretical, methodological and, in its last two chapters, speculative. We have 'explicated our assumptions' by making it clear that we are dealing, not with 'information overload' or even with a simple increase in information but with the increasing technological mediation of the processing, storage and transmission of information, or "informediation", as we have called it. We have introduced and briefly described, a technologically feasible scenario, or level of "informediation" probable within the next ten to fifteen years. We have indicated briefly, to what extent the process of "informediation" is going on and could go on in Canada.

In the methodological part of the study, we have isolated the individual and the society as 'destinations' or receptors of the social impacts of 'informediation', we have discussed the use of basic needs and social needs as a policy guide; and presented a hierarchy of needs as one axis of a framework for illumination of social impacts; we have introduced a categorization of the societal activities which attempt to

satisfy those needs, as the second axis. Using these two axes, we have

constructed a matrix which 'covers' and discloses the problematique, i.e.

it creates a framework for studying the impact on basic needs satisfaction

of "informediation" of those activities in the society which are amenable

to federal influence, if not control. A close association of need-

satisfaction with social health, or the public interest, is implied, here,

but that assumption seems valid given that the sets of needs chosen for

study are the broadly-based ones generally accepted as normal and common

within Canada, and indeed most of the world. Finally, we have used the

matrix to focus on some important social impacts, we have speculated

on the nature and extent of these and set-out some unanswered questions

for further study.

As a general conclusion, it could be said that the

social implications of further "informediation" would emanate from increasing

contact with information devices and concomitantly decreasing direct contact

among individuals with a corresponding demotion of physical proximity as

the prime determining factor in formation of personal relationships, of

institutions, and perhaps of societies themselves.

The decision about which 'impacts' ought to be subjected

to further examination depends on knowing the actual and expected extent

of "informediation" in each of the society's activities (such as 'production

and distribution of material goods'.). In other words, before we could

present a complete and detailed research design, we would need the descriptive

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and empirical results of the other studies in this project. However, at this stage, we can suggest that the following topics certainly deserve further study. Working across the columns of the matrix and therefore under the headings of the "societal activities":

I. PRODUCTION AND DISTRIBUTION OF MATERIAL GOODS

- Availability of goods: including convenience of access possible increased specialization vs. mass production.

- Labour saving. vs physical passivity.

- Security systems i.e. given the use of microprocessor-equipped machines for alarm systems, robotics for nuclear handling, bomb disposal, etc. but also the potential criminal and terrorist uses.

- Employment - unemployment - underemployment. answering questions posed in Chapter 5.

- Reduced contact with material objects in work.

2. SERVICES

- Convenience

- Security, e.g. by use of communications systems by police forces, fire fighters, ambulance services.

- Privacy

- Independence, growth, competence and knowledge associated with greater individual participation in dealing with the law, preventive medicine and in political activity, banking, accountancy, etc.

- Employment - unemployment - underemployment.

- Reorganization of cities, new urban/rural distribution. Merging of home/school/workplace. Reorientation of levels of government.

3. ADVERTISING

- Contrasting social effects of increased advertising for mass consumption of the 'network' and 'print' variety with on-demand advertising, catering to specialized needs, possible with videotex-plus.

- Use of subliminal advertising.

4. EDUCATION

- Content in creation of National Unity and National Identity.

- Creation of communications among non-territorially determined interest groups

- Lifelong learning systems with scope for on-demand lessons responding to idiosyncratic intellectual needs and scope

- Education in new skills required by informediation

5. ENTERTAINMENT

- Content in Creation of National Identity and National Unity.
- Possible increased "informediation" appropriate to an 'aging society'

6. INTERPERSONAL COMMUNICATION

- Effects of information acquiring a price - possible exacerbation of existing socio-economic tensions.
- To what extent can information machines substitute for other people? Clinical effects of communicating with fingers via the push button terminal and receiving information visually on a screen as opposed to the more diffuse traditional modes of interpersonal communication
- remoteness of material objects.

- Psychological/clinical effects of being linked to many 'electronic highways' - deterioration and development of skills - effects of 'bugging' and subliminal messages.

7. <u>INTERNATIONAL ASPECTS</u>*

   - Study of content, mainly of U.S. network television, as it
     undermines national identity, and of Canadian output
     in mass media to other countries.

   - National Defense

   - Aid to developing countries

   - Socio-economic implications of Canada not becoming an
     information economy while the rest of the world does.

   * Of course, since such a high proportion of Canadian industry
     is foreign owned, the activities of first three columns,
     production and distribution, services and advertising
     have tremendously important international impacts. They are
     not differentiated here since "informediation" would have much
     the same ultimate social impact, whether it is adopted in
     domestic or foreign owned industries.

8. <u>IMPACT ON INDIVIDUALS AS PERCEIVED BY INDIVIDUALS</u>

   This approach is recommended as a counter-balance to the

   reductionist methodology proposed in the study. Broad random

   sampling asking individuals who 'experience' using, for

   example, microprocessor-guided machinery or videotex. Such

   'open questions' as 'How do you like using this machine?'

   'Do you think it is useful?' 'How do you think you would

   use leisure time made available by its labour saving?'

   This bare 'question and answer' mode could be extended to the

   dialogue technique where the respondent creates new questions

   by expressing opinions, feelings, etc. This method of research,

   part of a move to involve 'real people' in sociological research,

   is being used in international projects like the GPID (Goals,

   Processes and Indicators of Development).

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