INFORMATION TECHNOLOGY AND REGIONAL DEVELOPMENT: PROMISES AND PROSPECTS

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I. INTRODUCTION

We live in an age where all problems have a technological solution. We also live in the information age, where information is the modern currency of exchange. Small wonder, then, that the combination of the two into Information Technology is a potent talisman indeed. Computers and telecommunications, in tandem, offer a powerful vision of the future.

As a peripheral, and less economically developed, part of the European Community, Ireland is particularly interested in Information Technology. There is a concern that, especially as 1992 approaches, Ireland is becoming more peripheral to Europe, rather than more integrated into Europe. Irish and EC policy is concerned with both the fate of peripheral parts of Europe and the role of Information Technology in avoiding that fate. The following quote exemplifies this:

"...information and communications technology essentially provide a means of communicating and processing information, [thus] the economic constraints imposed by geographical location which have characterised rural areas will become less significant. This will provide an opportunity for revitalizing economic activity in rural areas." (Commission of the European Communities, 1989.)

There is significant EC and Irish funding for investment in IT (e.g., STAR, Telematique, ORA and RACE). It is hoped this will improve the economic position of Ireland, and especially the rural areas of Ireland. The decentralisation of bureaucracy, use of communications technology in tourism and agriculture, greater use of IT by small businesses, improved individual access to government services are all ways in which IT should make the Less Favoured Regions more economically viable.

The vision of Ireland conveyed by IT is decentralized and environmentally friendly. Rural businesses mean lower population density and less congestion in urban areas. This reduces transport costs, reducing both the use of fuel for automobiles and trains and the consequent atmospheric pollution. Better yet, if one can work at home, it also means less office construction. With fewer offices, there is less energy wasted heating those offices, less space needed for car parking, less demand for public transport, and so on. The growth of cities can be slowed, and rural areas can be maintained. We can be 'green' and 'new age' and still have jobs as well.

II. IT AND DECENTRALISATION

IT is seen as an agent for decentralisation because it frees organisations and individuals from the constraint of geography. However, the utopian vision of Information Technology has faded over the past decade; the reality has often not lived up to the promise. There are fierce debates about whether information technology will ameliorate economic, social, and regional inequalities, or simply enhance them (see Lyon, 1988; Forrester, 1989; Dunlop and Kling, 1991).

For manufacturing firms, an important benefit of new communications technologies has been the reduction in co-ordination costs. It is now possible for multi-nationals to establish manufacturing branches in rural areas that need industrial investment, and still co-ordinate the activities of branches in diverse locations. However, this does not mean factories scattered throughout Ireland; decentralisation still requires a local infrastructure able to provide some supplies for those branches, and sufficient services for employees of those branches. Furthermore, there is actually a trend away from large, vertically integrated, organisations. Decreased co-ordination costs encourage the development of smaller organisations, with flexible links between them. This trend towards networked co-ordination has been observed in Japan, Northern Italy, Germany, and Scandinavia (Grimes, 1991; Malone and Rockart, 1991). In these cases, however, the organisations tend to concentrate in one locale; there seems to be a minimum 'critical mass' needed for viability. Even though reduced co-ordination costs reduce


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the administrative costs, suppliers still have transport costs in the delivery of goods. This encourages suppliers and producers to locate near each other. It may also be that electronic networks are not sufficient to create and maintain the links necessary for such flexible organisations; personal contacts and informal associations may also be necessary. Thus, only Dublin, and a few locales like Cork, Limerick, and Galway, benefit from this decentralisation.

New technology also permits administrative decentralisation. While this can mean greater local autonomy and power for branch offices, it can also lead to greater central control. Managers can now do, from headquarters, what they previously could only do on the spot. The result is local branches staffed by less-skilled employees who have little individual discretion. Information-intensive industries often have little capital investment in particular locations; they move from one location to another, depending on local conditions. Thus, the world-wide spread of information jobs has often meant only underpaid white-collar workers doing routine work like entering data, often in peripheral countries where labour is cheap.

This is not to minimize the significance of IT, as companies re-organize their internal tasks and external relations with the marketplace. The growth of IT acronyms like CNC, EDI, EFT, JIT, CAM, CIM, and EFTPoS

2 is sufficient evidence of that. However, Information Technology is not a general purpose solution for the problems of peripheral rural regions; the best that can be said is that, in conjunction with other policy decisions, IT can contribute to an overall policy goal. As one study concluded, “To the extent that information technology makes some activities less tied to specific locations, it may make some policies easier to effect, although the key issues will often be associated with other locational factors, such as infrastructure, environment and economies of scale” (Williams, Jeffrey and Joyce, 1982).

III. IT AND THE LIBERATION OF THE INDIVIDUAL?

Perhaps the most potent image of the electronic revolution has been the ‘electronic cottage’ (Toffler, 1980). In this image, individuals are linked to the outside world electronically. Teleworking, tele-banking, tele-shopping permits people to live anywhere, including rural areas, while still participating fully in society. The reality has been quite different; consumers have not found IT-based services to be cheaper, usable, or useful — nor do they fulfill their psychological needs.

Teleworking has been a major IT casualty of the last decade. Studies in the 1970s estimated up to 85 percent of work could be done at home via computer links. Yet, in 1987, only about 15,000 people in the UK and 100,000 people in the US were working at home in this way (Mulgarn, 1991). Many firms that experimented with teleworking have abandoned them or reduced their scale. It now seems that teleworking is limited to particular kinds of jobs, and particular personalities. The psychological problems of working at home were underestimated, and there was often a perceived lack of participation in the organisation: workers felt marginalized with fewer promotion possibilities (Forrester, 1989). It has also become clear that only tasks with little need for co-ordination are amenable to home work; exploratory discussions, policy making, and solving disputes are not suitable for electronic communication (Sproull and Kiesler, 1991).

Other features of the electronic cottage have also become less attractive. Banking by phone was also seen as a breakthrough, yet has had little market penetration. In the United States, Bank of America has 15,000 subscribers and Chemical Bank in NY has 21,000 (Forrester, 1989). This is a far cry from initial expectations, and many other banks have dropped their planned services. Why the failure? Unlike cash machines, the ubiquitous ‘hole-in-the-wall’, home banking can’t be used for cash transactions, and rarely is there sufficient volume of funds transfers or account balance reporting to justify the cost for individual users.

Home shopping has fared no better. While the late 1970s and early 1980s saw a number of plans for home shopping in the United States, most have since been discontinued (Forrester, 1989). Only in France does it appear that home shopping, via Minitel, has had some success. Elsewhere, the failure of home shopping is partially the result of complicated user interfaces, but, most of all, because it just does not fulfill the same functions as shopping in person. Anyone who thinks that shopping malls are successful only because they are cost effective for consumers should spend some time observing who actually goes to malls and why. People go shopping to get out of the house, to see friends, to observe what other people are doing and wearing, and not just to buy a specific item.

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2. The meanings of these abbreviations are as follows: CNC (Computer Numerically Controlled Machines), EDI (Electronic Data Interchange), EFT (Electronic Funds Transfer), JIT (Just In Time), CAM (Computer Aided Manufacturing), CIM (Computer Integrated Manufacturing), and EFTPoS (Electronic Funds Transfer at Point of Sale).
IV. IT EQUALS POWER?

It is necessary to question some assumptions made about Information Technology. There is a syllogism — power comes from information, information comes from technology, therefore technology is going to make individuals more powerful. There are problems with the premises of this syllogism.

Firstly, information has no intrinsic value; and more information is not necessarily better information. For some businesses, lack of current information can mean lost profits, therefore up-to-date information has a market value. On the individual level, individuals may not avail of a social welfare entitlement simply because they don’t know of its existence. Lack of information deprives them of their benefit. But, for many organisations and individuals, the ‘value’ of information is less clear. Instant information may be handy, but rarely vital.

A pilot project in Ireland (AgriLine) illustrates this. Using computers and modems, farmers could avail of the latest information on prices, weather, market conditions and so on. The service was viable only with financial subsidy; farmers were unwilling to pay the actual economic price for up-to-date information. There were a number of reasons for this (some of which the introduction of Minitel to Ireland addresses), but one problem was that up-to-date information was simply not worth the money — farmers could afford wait the few days for farming journals or newsletters to provide their information (National Board for Science and Technology, 1987).

Secondly, information is not knowledge. Enhanced technology leads to vast amounts of information, but it also leads to greater complexity in procedures to process that information. Indeed, technology encourages greater complexity than previously existed. Technology enables bureaucratic procedures to become more complex than the individual’s ability to make sense of that complexity. This complexity can serve to maintain ignorance and thus dependence on those with the necessary tools to understand the system.

Finally, knowledge is not power. One can know something is happening, yet be powerless to alter events. One can be unable to obtain social welfare entitlements, even if one knows they exist. Knowledge does not necessarily abolish or prevent social and economic inequality.

Thus, one can propose a contradictory quasi-syllogism: dependency comes from ignorance, ignorance comes from complexity, complexity comes from technology, therefore technology is going to make people more dependent. To turn the phrase around, is the future an electronic cottage or an electronic cage?

V. ANTHROPOLOGICAL PERSPECTIVES ON TECHNOLOGICAL CHANGE

Technological change does not proceed independently of the existing social and cultural context. How best can that context be incorporated into the process of change? Anthropological studies of change are relevant here. One lesson from such studies has already been learned: latent, as well as manifest, functions of existing behaviours must be considered when introducing new technology. Home shopping and teleworking failed to consider latent functions. In the case of tele-shopping, the social dimension of shopping was not considered. In the case of teleworking, the realities of work at home as well as office politics were ignored. In office automation, it often transpires that insufficient attention is paid to existing social practices (e.g., informal gossip, exchange of assistance, emotional support, existing patterns of authority), and how they will be affected by new technology (Kling and Iacono, 1989). For an innovation to be successful, latent functions as well as manifest functions must be allowed for.

To provide a relevant contemporary example, rural post offices are places to mail letters. They also function as social centres, where information and social support is provided. If post offices are replaced by letter boxes, what will provide the social contact now missing? Networks of friendship and kinship are often maintained by exchanges of goods and services. With the introduction of Information Technology, does one run the risk of minimizing social contacts, by removing the economic exchanges that help maintain social cohesion?

A second lesson from studies of social change is the importance of ‘felt needs’. Those who design technology and those who implement it are not the ones who use the technology. Innovation is more efficient when the innovation is perceived as beneficial by the users. Without individual and organizational motivation, then the technology is not used for the intended purpose. By the same token, when there is sufficient interest, then technology develops quickly.

An example of this is electronic mail (e-mail). Electronic mail is the computer equivalent of sending a letter. It is virtually a mobile answering machine, capable of sending or receiving messages from anywhere. Unlike a letter or a phone call, it is also possible to communicate with members of special interest groups, many of whom are not even known to the sender. The interesting thing about electronic mail is that, as a technology, it is user-driven. It has developed as a result of user demand, and technology has often lagged behind demand.
Historically, e-mail was a side-effect of computer networks. When the United States Government initially introduced computer networks, it was to enable scientists to access large and expensive computers from distant universities and research laboratories that could not afford such hardware. The facility to exchange mail messages was almost an afterthought (Sproull and Kiesler, 1991). Yet, demand for that service quickly made it a major feature of the new ARPANET. Similarly, in the academic world, e-mail started out as an ad-hoc, voluntary, collaboration between individuals in various universities. The original academic network was called BITNET, supposedly derived from the phrase “Because It’s There”. Now, universities invest in external network links simply to meet the user demand for electronic mail, and electronic networks are now an integral feature of university life. E-mail’s attractions are indicated by the term which e-mail fanatics apply to regular postal mail: “snail-mail”.

One benefit unique to electronic mail is the ability to participate in discussion groups. The topics range from specialized academic subjects to computer games to the discussion of Dorothy Sayers’ novels, and participants come from all parts of the world. There are over 2300 such lists at present on the largest of the networks (Internet, comprising academic, commercial and military organisations), and, in the last six months alone, the number of lists has grown by more than 25 percent.

Two reasons for the success of electronic mail are immediately relevant. Like answering machines and facsimile machines, e-mail permits contacts between people who work at different times and at different locations. It is asynchronous communication; people do not need simultaneous contact with each other. Given many people’s daily schedules, this is crucial, as people suffering from ‘telephone-lag’ appreciate. Special interest groups are another reason for its success; the benefits of instant and inexpensive access to a world-wide pool of experts are obvious.

By the same token, e-mail is not used by all. Many people who have access to the technology do not use electronic mail. Either they see no need for it or they find it is too complicated to use. Many prefer, instead, facsimile machines. Indeed, the success of facsimile machines provides an instructive example of innovation. It is popular because, in order to use it, one only needs to know how to write a message on paper and how to dial a phone number: two behaviours which everyone has already learned. The fax is a good instance of perceived need combining with minimal training requirements to guarantee technological success.

A related example is the success of Minitel in France. Initially, authorities saw Minitel only as a provider of information, rather than a medium for personal communication. The fact that phone directories were available only via Minitel assisted in its modest success, but that alone would not have made it very profitable. Then came the ‘kiosque’ concept, which provided communication groups for individuals. Traffic increased from 1.5 million hours in December 1985 to 3.5 million hours in June 1986, and ‘le kiosk’ was generating 70 percent of that traffic (National Board for Science and Technology, 1987; de Lacy, 1989).

VI. PROSPECTS IN IRELAND

The lesson from electronic mail, Minitel in France, and facsimile machines is that, when technology benefits the user, it is not a question of encouraging change — it is a question of keeping up with user demand. Can this lesson be applied to Ireland? In this regard, the introduction of the videotex Minitel in Ireland is interesting. Inexpensive rental combined with access to a sophisticated communications network (Eirpac, the X.25 public packet switched data network), means that Minitel offers a low cost, user-friendly, means of accessing information, transferring data, and obtaining services. If it is successful, it will reduce the information cost of living in rural areas. However, will users consider the benefits to be worth the cost of the services? There is, to some extent, an expectation that information should be freely provided, or in exchange for other services; many people do not see information as a market commodity. People will be willing to pay only if it fulfills a need for individuals as well as businesses. Minitel must be ‘cheaper’ (either in time or money) than the alternatives, or it must provide services that are not otherwise available (such as electronic mailboxes or remote computational facilities). If so, then it will offer a significant benefit for those in rural areas, by reducing communications and information costs.

On a related issue, the potential contribution of information specialists should not be neglected. One attraction of IT has been its potential to ‘empower’ individuals by eliminating the need for brokers or middlemen: people should be able to find out their own bank balance, book their own tickets, or do their own payroll calculations. More often than not, however, this has not happened; experts are still needed to help the individual navigate through the information maze. Although contrary to initial visions of IT, this should not be regarded as a failure. The benefits of ‘empowered’ information specialists, serving local communities, can be considerable. Such specialists combine personal contact with high-tech communication; they act as brokers, but they provide the information that can help ensure the viability of rural communities. In line with this, a few EC-funded centres to encourage the
exchange of information in rural areas have been established in the Community on a trial basis (one of which is in Galway). Supporting local information specialists, who can then act as brokers, is probably a more effective goal for new technology than the more romantic goals of ‘electronic cottages’ and ‘information rich’ individuals.

Perhaps the major problems with Information Technology have been consistent underestimation of the cost of IT for users, in both money and time, as well as an overestimation of the benefits derived from the new technology. Rarely do the immediate costs outweigh the supposed benefits. If technology fulfills a ‘felt need’, and latent as well as manifest functions of the behaviours being replaced are considered, then Information Technology may help fulfill the goal of decentralisation, with its attendant environmental benefits. However, one must beware the symbolic attraction of technology and information; the benefits of investment in communications technology are often less than first supposed. It is still the case that, for many people, both urban and rural, the benefits of joining the information society are not worth the membership fee.

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3. However, additional EC funding to continue and expand the number of such centres has not been forthcoming. The expanded scheme (MIRIAM - Model Scheme for Information on Rural Development Initiatives and Agricultural Markets) would have provided three types of information: 1) EC measures that had an impact on agriculture, especially in the context of CAP; 2) market information for agricultural products, and 3) advice on economic diversification.
REFERENCES


