INFORMATION SERVICES FOR RURAL COMMUNITIES: THE "TELECOTTAGE" PROJECT

Steve Harrison and Lars Qvortrup

The establishment of a network of 'telecottages' or community teleservice centres in Scandinavia commenced in 1985. These centres provide public access to computers and a broad range of software, databases, communications, distance education and other services, and are now making an important contribution to economic, social and cultural development, particularly in more isolated rural communities. Similar installations are being planned or contemplated in several European countries (France, Spain, Portugal, Wales and Scotland), in Canada, and in the developing countries of Bhutan, Benin and Sri Lanka. The telecottage concept has appeal for Australia and New Zealand, where rural isolation is relatively great. This paper discusses the rationale and history of the telecottage project, the services provided, achievements to date and future prospects. The relevance of the concept for Australasia is then examined. The material presented here is based on visits by the authors to a number of telecottages in Denmark, and has drawn on findings reported by Qvortrup.[1]

Keywords: telecottage, telematics, community teleservice centres

THE HISTORY OF TELECOTTAGES

In Europe, as in Australia, there has been a drift of population to the cities, with accompanying centralisation of economic and political power. Reduced employment opportunities, loss of social cohesion, and relatively poor access to telecommunications and information sources have become apparent in some rural areas. At the same time, it has been recognized that access to information technology (IT) is an important prerequisite to rural economic and social development.[2] Two recent innovations are having a major impact on telecommunications worldwide.[3] One is 'telematics', or the introduction of computers into communications networks. This is associated with digitisation for transmission of data, including sound and pictures. The other innovation is broadband transmission, using fibre optics, satellites and microwave. A variety of new telecommunications services is becoming available, but these are not readily accessible to communities distant from the major cities.

Several initiatives have been taken in Europe to improve access to new information technology in rural communities.[4] Included in these are:

- use of satellites for low-cost night-time transmission of farming

and training programs, to be recorded on domestic video-recorders for viewing during the day;

- telecommunications centres developed within the European Economic Community (EEC) programme of Special Telecommunications Action for Regional Development (STAR). This is a five-year programme started in 1987 and designed for business users, with particular emphasis on small and medium sized enterprises (SMEs); and
- the telecottage project operating in Scandinavian countries (of which only Denmark is within the EEC).

The third of these initiatives, which is the most wide ranging, is the focus of this paper. The creation of rural teleservice centres was proposed in Fjaltring, Denmark, in the early 1980s, and the first installation was established in Sweden in 1985. The name 'telecottage' was coined by Qvortrup and others in an early poster presentation of the project. Official names include Community Tele-Service Centres (CTSCs) and Information and Service Centres. These installations are aimed equally at private, professional and commercial users, and are designed to counter the economic, educational and cultural disadvantages of rural communities. At present, the telecottage project is still considered a social experiment in information technology, although new centres continue to be established. The number of telecottages in operation and still planned in Scandinavia as at September 1988 was as in Table 1.[5]

Table 1

Numbers of Scandinavian telecottages

Country	Number existing	Number still planned
Denmark	8	0
Finland	4	2
Norway	9	3
Sweden	7	21
Total	28	26

FACILITIES AND SERVICES OFFERED

The components of a community teleservice centre include premises, staff and equipment. The centres are located in schools, libraries, local authority buildings, and converted houses, and they normally contain an office, a classroom, workspace for users and a small kitchen with coffee-making facilities. A minimal staff typically is a full-time director (an information technology expert or 'IT-caretaker') responsible for the day-to-day running of the centre, assisted by a part-time secretary/

librarian. Equipment items vary between centres, but may include the following:

Hardware

- microcomputers (ranging in sophistication from Commodore 64 to IBM PS/2 machines) and at least 2 to 5 PCs with hard disks
- printers, typically 1 or 2
- modems, for connection to the telephone network
- telephone and facsimile machines
- video-production and editing equipment
- television sets and video recorders
- sometimes facilities for broadcasting of local radio and television
- occasionally facilities for two-way video communication
- ancillary equipment such as electronic projection panels and reference books

Within each centre, the microcomputers usually are linked together in a network. Also, the centres within a region usually are networked, allowing shared access to software and high capacity local area network communication between centres.

Software

A wide range of software products are provided, which may include wordprocessors and desktop publishing software; spreadsheets and integrated packages; graphics and computer aided design software; programming languages; accounting packages; and farm data recording and livestock management programs.

Services offered

The services provided vary considerable between countries and between centres within countries, but may include the following:

- training courses, workshops and demonstrations in information technology
- consultancy services
- computing facilities for spreadsheets, professional (agricultural, business) programmes, programming, and so on
- wordprocessing and desktop publishing
- information services, with access to regional, national and international databases
- communications, including fax and electronic mail
- distance education
- distance working
- teleconferencing
- hiring of video-production equipment
- rooms and equipment for meetings, films and other entertainment.

PLANNING, FINANCE AND MANAGEMENT

Preliminary discussions regarding the teleservice project began about three years before the first centres became operational. The first centre in Sweden, in Vemdalen, started only six months after the local introduction of the concept. Normally, however, a good deal of preparation and effort has been required to determine local needs, generate interest and support, arrange funding, secure premises, decide on and acquire appropriate equipment, hire staff and so on. Most of the centres are organised as independent and self-governing institutions, with substantial funding from the local authority as dominant shareholder. Funds of the order of approximately $A100,000 to $A200,000 are needed to establish a centre, much of which has been provided by national governments. The Danish government made $A2 million available in 1986 to assist in the establishment of centres. Some centres, including those in Denmark, operate as community amenities associated with municipal institutions, and charge only token prices for services. Premises are provided and staff salaries supported by local authorities. However, a number of centres (including the majority of those in Sweden) are run as profit-making enterprises independent of public institutions.

The centres are managed by local committees (or business managers in the case of profit-oriented centres), but with monitoring by national governments. For example, in Denmark where the project is currently funded until the end of 1989 only, research on the impact of telecottages is carried out through a number of research institutions, among which is the Telematics Project at the University of Odense.

BENEFITS DERIVED FROM TELECOTTAGES

A number of benefits (business, social and cultural) may be identified from provision of teleservice centres, the more important of which are now discussed.

Computer Literacy and Adaption to Technological Change

People in rural areas often have difficulty in coming to grips with computers and information technology, because awareness, access, training and support for use of this technology are limited. As well, resistance to change has been an obstacle to more widespread adoption. The teleservice centres alert potential users (firms, administrations, community and cultural organisations and individuals) to the opportunities brought by new technology. They have obviously played a major part in bringing computer knowledge and skills to a large number of people, through training courses, workshops and visits by individuals. Experience has been gained on a variety of computers, a

wide range of software packages, spreadsheet and database concepts, electronic mail, and so on. Users have been able to experiment with new technology in familiar surroundings, and in relation to applications they have chosen themselves, but with professional advice readily available when needed. Large numbers of users are sometimes present, especially when centres are open in the evening, and IT-caretakers have experienced strong demand for their assistance.

Decision Support and Business Efficiency

Computers can now play an important role in the management of medium sized and even small firms. For example, on-farm computers and farm management bureau services have been adopted by substantial numbers of farmers in some countries.[6] A wide range of information useful when making business decisions is available through videotex services, such as commodity and financial market reports, and weather forecasts. Farm management packages are available at some telecottages (at Fjaltring in Denmark, for example), and packages for planning pig feeding and selling strategies, and for determining crop fertiliser requirements have proved popular. Provision of decision-support software through telecottages has all the advantages of in-house computing, (flexibility, quick turn-around, confidentiality of data). As well, individual firms do not need to outlay capital on computers, printers and software, and a wider range of expensive software packages is accessible. Further, a venue is provided for decision makers to learn computer skills, share experiences in mastering software and compare business performance, as well as obtain consultancy advice about what computer facilities to purchase. An opportunity has been made available to 'try before you buy' in the context of user decision problems, with respect to computers and popular commercial software, and facsimile machines.

Access to Expertise

The networking of centres has meant that experts in various disciplines are accessible from a wide catchment area. One important application of this 'network of competence' has been in the access to traditionally isolated fishery research in northern Norway. Also, translation of documents between various languages as a networking activity between geographically separated linguists has been trialled.

Distance Working

The opportunity for people to live in one district and work elsewhere, known variously as 'distance working', 'tele-working' or 'tele-commuting', is one of the exciting possibilities of recent telematics developments. This opportunity exists at both the managerial and clerical /secretarial levels. Distance working facilities allow people to live in a

rural environment yet participate in city employment, say to avoid high housing costs and traffic congestion, or for family reasons. A distinction is drawn between distance working and 'home working'. The latter may increase isolation and lead to employees not having the protection of normal industrial awards. It is clearly better to attract real firms to an area than to provide workstations for employees of distant companies.

Developments in communications have created the possibility for competence-based network services. Many educated people want to live in a rural community if they can earn sufficient income there. And today, using the facilities of a teleservice centre, it has become possible to live as say, an architect, a business consultant, a database expert, or a researcher in a rural village with access to regularly updated, high-level information and training programmes, interaction with colleagues and companies, and with facilities to produce and transfer reports and so on to clients.

Distance Education

Tertiary education courses are being made available through community teleservice centres. In Denmark, courses in computing, mathematics and geography are provided from educational institutions at Aarhus. As a matter of fact, an open university system has been established offering computer supported educational courses at a distance. The teleservice centres and other similar institutions are expected to become important elements in this system because they provide the students not only with technical facilities but also with the advantages of belonging to a study group. While such courses could be made available in a correspondence format, the opportunity for students to correspond with each other and with teaching staff through electronic mail makes them more attractive. Availability of continuing education courses is viewed as important in retaining young professional people in the community, and allowing them to keep up date with new developments in their disciplines.

Attraction of New Firms and Employment Creation

Access to advanced information, communications and data processing facilities provides a stimulus to retain existing firms, attract new firms and provide additional employment. This may help prevent movement of young people to cities in pursuit of jobs. It is not clear how much success has been achieved in creating employment in the few years that telecottages have been in operation.

Decentralisation

Rural areas and their communities in Europe are recognised as playing a vital role for the society as a whole, as a buffer area and refuge for recreation, and in the protection of a fragile environment and maintenance of the countryside.[7] As the relative importance of

agriculture declines, policies need to be framed to maintain a minimum population and minimum business and social activity to ensure survival of rural communities. Improving telecommunications increases both the risk of centralisation of economic and political power, and the opportunity for real decentralisation of industry. Through improved communications, business executives in cities are able to operate over larger territories. On the other hand, less costly communications and the opportunity for distance working make the regional location of firms or branches more feasible, with the potential to overcome some of the diseconomies of large metropolitan areas. Office space is less costly in smaller rural centres, there is less travel time and parking expense, and salary loadings are not needed to compensate for high accommodation costs. The telecottage project is providing useful experience on opportunities for genuine infrastructural and organisational decentralisation.

Access to Community Information and Services

Teleservice centres combine a range of traditionally separated community services. In some cases, a number of centres are closely co-ordinated within a single local authority area, to provide 'decentralised town hall facilities'. Library book selection and ordering can be placed 'on line', and potential exists for the introduction of home-banking and home-shopping. They may function as resource centres for health services, agricultural extension and other community information.

Social Cohesion and Quality of Rural Life

A telecottages may be regarded as an 'electronic village hall' which:

> plays a key role in the political, social and cultural life of a village, particularly through its provision of meeting rooms, local and regional news, and the opportunity for the population to gather to watch films or television programmes broadcast by domestic or foreign channels.[8]

The centres have become important meeting venues, and 'user groups' for various services have formed; a positive contribution is being made to the quality of life, especially in smaller rural communities.

It would be difficult to carry out any formal cost/benefit analysis of the telecottage project, particularly with respect to placing a value on benefits. However, observation and recorded statistics on numbers of users indicate that the various services offered are popular, and that the centres provide a significant focus for community social interaction. The project is considered an overall success by the EEC.[9]

EXPERIENCES GAINED

The experience of the last four years has provided a number of lessons concerning the use of telecottage facilities. A good deal of systematic

analysis is being carried out, reports of which will become available in due course, but some of the initial findings and immediate impressions may be summarised.

Where to Locate Facilities

Most of the telecottages have been located in towns and villages away from the large centres of population. Some of the more successful installations have been in Sweden, where distances between population centres are relatively great. In Norway and in Denmark, centres have been established on islands without road access to the mainland.

It is not yet clear whether there is a particular village size in terms of population for which the benefits are highest. Amount of use will depend on closeness of surrounding settlement, proximity to a large population centre, type of farming engaged in, current standard of communications, and other factors. In Denmark, centres have been established in villages with a population as small as 350, and in cities with up to 50,000 inhabitants. Facilities appear to have been heavily used in communities with a population of around 1000. However, a population of under 500 may be too small to justify establishment and running costs of full-time telecottages. Consequently, a smaller part-time model is being tried out with network access to a centre in the region with full-time staff service and with a well-equipped software library. These facilities can be tailored to local needs; for example, an installation in a small village may be integrated with a school, library or civic centre, and have limited equipment and a part-time caretaker working say two days a week. In the cities, it has been found that benefits of a different type are derived; in particular, provision of constructive ways for young people to spend leisure time.

Planning for the Introduction of Teleservice Centres

It has been found that teleservice centres cannot simply be introduced into a community overnight. A long lead time is needed for reasons mentioned above, and proper planning and the securing enthusiasm of the local community are vital for success. The centres need to be closely integrated with local social, political and cultural organisations.

Financial Requirements

Apart from the establishment cost, centres require on-going funding for premises, staff salaries, software updates, and periodic purchase of new equipment. For example, more powerful microcomputers have been required to meet the greater computing demands of desktop publishing and document scanning (optical character recognition). Centres in Sweden where substantial charges are made for services have been found to break even, in terms of annual (if not establishment) costs, after about three to four years.

How Should Centres be Controlled?

The telecottages generally have local organisational autonomy, which is considered desirable for securing community support and achieving high usage of facilities. Being part of the community social structure makes them more influential in promoting positive attitudes to, and increased knowledge about, information technology.

Who Are the Main Users?

It has been found that a wide variety of people make use of the facilities; these include children, high school students, business and professional people, farmers, local authorities, service organisations and theatrical groups. The user population is not static; for example, it has been found that business people who use equipment at teleservice centres often subsequently purchase similar equipment and become self-sufficient.

What Equipment is Needed?

A range of hardware and software items have been found useful, built around microcomputers and popular commercial software. It has been found that the equipment does not need to be state of the art. Information technology developments are far ahead of practical applications in rural communities. Relatively sophisticated equipment was first installed, and the range has been progressively simplified. With regard to software, different groups of users have been found to favour different types of packages; for example, wordprocessors are popular with student users, but not with business people (including farmers, for whom accounting and management software are of more interest). It has been found that computer games, while an effective vehicle for introducing young people to computers, can lead to equipment being tied up with inconvenience to more serious users.

An important requirement for videotex and teleconferencing is high speed data transmission. In Denmark, transmission at 1200 baud rate is guaranteed by the (private) telephone companies, and many of the lines are capable of transmission at 4800 baud rate. Experiments are being conducted on audio-visual transmission using fibre optic cable donated by one of the telecommunications companies. However, audio-visual transmission would at present be too expensive for widespread use. Also, in a distance learning environment the visual component may be of limited benefit because people have their back to the transmission screen much of the time while sitting at computer workstations and need only intermittent assistance. New developments in 'electronic blackboards' may be more cost effective from a teaching viewpoint.

What Services Need to be Offered?

No two Scandinavian telecottages are identical in terms of equipment available and services offered; facilities are tailored to local requirements

and preferences. Some centres are at local high schools, and have a strong emphasis on educational activities. Others are more oriented towards business services. Two centres in Sweden are based on computer consultancy firms.

Certain services have been found to be more popular than expected, while others have low demand. There has been strong demand for facsimile transmission, consultancy services (especially concerning appropriate computer equipment to purchase), introductory training courses in the use of computers, and business-related workshops (for example, data processing in agriculture). As well, unexpectedly strong demand has been experienced for hiring of video-production equipment by schools, local theatre groups and local organisations. Videotex services have been less popular than anticipated. Distance working in the traditional sense, meaning clerical/secretarial service at a distance from the telecottage, has not been a success. Companies in the urban centres prefer to recruit local people, rather than employ unknown persons at a distance. To offer unskilled secretarial services from the rural regions to companies in the urban centres, would just re-establish the traditional relationship of dependency between the outskirts and the centre.

Demand patterns suggest that the basis for a telecottage should be its professional relevance, and in particular the focus should be on business services and professionally oriented training and education programs. The IT caretaker has been found to play a vital role in assisting new computer users who have problems mastering equipment and software. The enthusiasm, patience and communication skills of this expert strongly affect the number of people using the centre. A person who is a local, who people feel is easy to approach and readily available, is preferred for this role.

FUTURE PROSPECTS

The success to date of the Scandinavian telecottage project has ensured these facilities will continue to be available, even though their method of funding and range of services may change over time. A good deal of interest in the project is being taken by other countries. For example, Sri Lanka is planning to install the first telecottage in a developing country.[10] The Commission of the European Communities has recommended:

> that the Scandinavian tele-cottage experiment be examined closely, and the possibilities of using the idea in the Community, with any necessary changes, be investigated.[11]

The Spanish, Greek and Portuguese authorities have obtained information on the project from the Danish government, with a view to establishing their own centres.[12] A centre is being trialled near

Aberdeen in Scotland, and the concept is being examined in Wales. Visitors from Australia, Canada and China recently inspected a number of telecottages in Denmark.[13] An international organisation to promote the concept has now been formed (the International Association of Community Tele-Service Centres), with a formal constitution and headquarters in Geneva.

Continuing rapid advances in information technology will open up new opportunities and create new demands for teleservices in rural communities. For example, rapid progress has taken place in the development of expert systems as management aids in agriculture,[14] and it is likely that in the future expert systems will become accessible 'on line' for farmers through their local teleservice centres.

RELEVANCE TO AUSTRALASIA

Telecottages are a growing movement in Europe, and their achievements to date have been impressive. Relative to Scandinavian countries, Australia and New Zealand rural communities suffer from a high degree of isolation. Distances of many communities from decision centres are great, both in geographic and socio-cultural terms. Amenities taken for granted by city people are often lacking. A drift to the cities with declining rural populations is apparent in some areas.[15] Communications are inferior and access to information is more restricted than in urban areas. While little reliable data are available, adoption of computers appears to have been relatively slow.[16] Creation of facilities similar to the Scandinavian telecottages could play a useful social and cultural as well as economic role. Obviously, a good deal is already being done in this area. Short courses on word processing and other aspects of computing are provided as part of adult education programs, though these are concentrated in the larger population centres. Computer courses are provided through local schools. However, a comprehensive development plan would have a number of advantages. It would provide a focus for the development of telematics services in rural areas, and promote the availability of a broader range of equipment and training. Rural professional and business people (including farmers) would have the opportunity to use computers, accounting packages and other software, to access databases, and so on, and the training to do so, before committing funds to purchase of their own equipment. The experience available at a public-access teleservice centre, together with technical advice from an IT expert, would allow them to make more informed decisions about appropriate purchases. By helping to retain existing firms and attract new ones, such centres would promote regional economic development, and could encourage decentralisation of industry.

Community teleservice centres could help redress the trend of depopulation and loss of 'community' feeling in rural areas by increasing employment opportunities and providing a focus and venue for people

to meet and interact, sharing common interests and experiences, with an emphasis on information technology. Further, teleservice centres would allow experiments to be made with new information technologies in a practical setting, and assist generally in community adoption of rapidly changing technology with respect to provision of information and decision support.

Such a programme could not be implemented quickly. Teleservice centres take a good deal of time to set up; many meetings and much building up of community interest and support and attracting local funding would be required. Initiatives could be taken by city, shire or district councils, business houses and service organisations. Schools, Technical and Further Education (TAFE) colleges, libraries and local authority offices and civic centres are potential locations for teleservice centres. A pilot project could be conducted with, say, two or three networked centres to demonstrate the utility of such facilities in a local context, and to identify any obstacles and pitfalls.

A good deal of finance would be needed to establish a comprehensive network of teleservice centres, including some government funding. Also, it would be necessary to make provision for the ongoing costs, such as salaries, equipment and software updates, and introduction of new technologies and services. Revenues from courses, consultancy, and such services as fax and photocopying could help to defray some of these recurrent costs. However, the effectiveness of the teleservice centres would be greatly reduced if they were viewed simply as additional business service centres for which the user-pays principle must apply. These centres can provide important and substantial cultural, educational and economic benefits for a modest cost.

REFERENCES

1. L. Qvortrup, 'Telecottages: Scandinavian information and community service centres for rural communities', paper presented to the International Conference on Information Technology in Agriculture, Food and Rural Development, Dublin, 1988; *idem.*, 'The Nordic telecottages: community teleservice centres for rural regions'. *Telecommunications Policy,* 13, 1, pp. 59-68.
2. ITU, *The Missing Link,* Report of the Independent Commission for the World-Wide Telecommunication Development, Geneva, 1984; L. Engvall, *Teleservices to Sparsely Populated Areas,* Geneva, 1988.
3. Commission of the European Communities, *Telecommunications and Europe's Future,* Brussels, 1986; H. Ungerer and N.P. Costello, *Telecommunications in Europe,* Commission of the European Communities, Brussels, 1988.
4. Commission of the European Communities, *The Future of Rural Society,* Bulletin of the European Commissions, Supplement 4/88, Brussels, 1988.
5. L. Qvortrup, 1989, *op. cit.*
6. S.R. Harrison, 'Electronic technology and management information in agriculture', *Prometheus,* 4, 2, 1986, pp. 344-65.
7. Commission of the European Communities, 1988, *op. cit.*
8. *ibid,* pp. 54-55.
9. *ibid,* p. 54.

10. Qvortrup, 1989, *op. cit.*
11. Commission of the European Communities, 1988, *op. cit.*, p. 55.
12. *ibid,* p. 55.
13. A. Damgaard, 'Gaester fra Australien, Kina og Canada sa Lemvigs tre telehuse' (Guests from Australia, China and Canada see Lemvig's three telehouses), *Lemvig Folkeblad*, 11 May 1989 (in Danish).
14. For example, see DLG, *Knowledge Based Systems in Agriculture — Prospects for Application*, Proceedings of the International DLG Conference for Computer Technology, Frankfurt a.M. — Bad Soden, 1988.
15. E.g., see S.R. Harrison and P.C. Sharma, 'Social impacts of changing land use in the brigalow region' in A. Bailey, (ed.), *The Brigalow Belt in Australia*, Royal Society of Queensland, 1984, pp. 215-56.
16. Harrison, *op. cit.*