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**Conference Paper**

## Strategies for creating an information society in a local region: the case of Merseyside

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**Session:**

- Skilling the lower skilled for the ‘Information Society’
- Using IT to overcome the problems of peripherality in learning and knowledge acquisition

**Focus:**

In this paper we consider two key aspects of the ‘Information Society’:-

- The need to promote skills in information technology in the population as a whole, particularly among those sectors of the population who are currently unemployed with relatively low levels of formal education
- The need to provide access to the technology and thus to the opportunities it offers in all sectors of the community

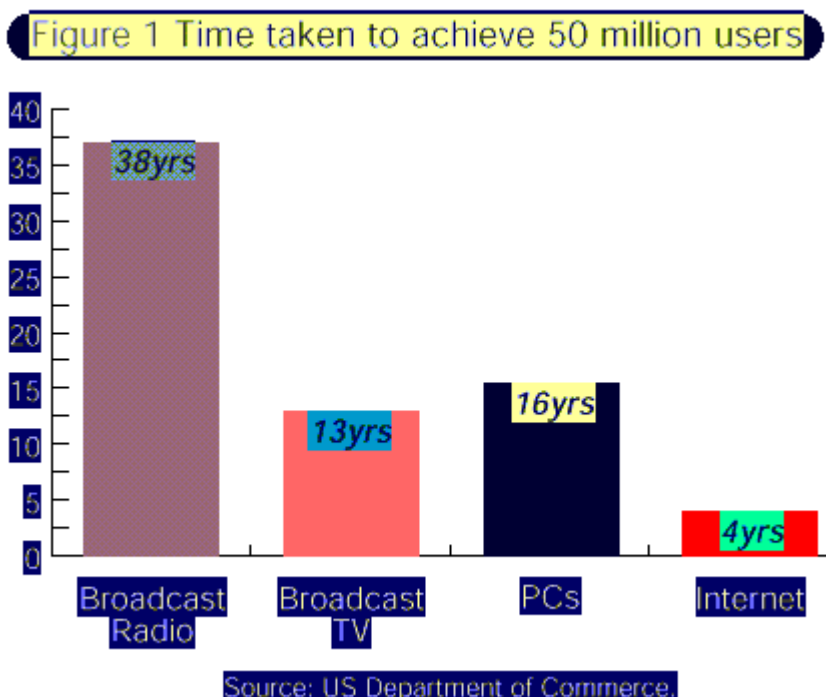
### **Strategies for creating an information society in a local region: the case of Merseyside**

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## **Introduction**

### **Societal implications of the convergence of communications and computing technology**

Considerable attention has been paid in recent years to the impact the convergence of communications and information technology will have on business and on society as a whole (Dyson et al 1996, Falk, 1998). The dramatic growth in the use of the Internet since the invention of the WWW (Internet Domain Survey, 1999, ISOC, 1999) is testament to the power of technology when harnessed appropriately. The speed of adoption of the Internet into general use is unprecedented (Figure 1).



We are, it is claimed, entering the digital age in which the main currency of economic growth will be knowledge.

*“The digital technologies are the key enablers of a modern knowledge driven economy. Electronic business -and in particular electronic commerce- is radically changing the nature of individual businesses, of markets and of entire economies” (UK Government White Paper, 1998).*

Businesses and economies which fail to embrace these technologies and the change associated with their use will fail. Case studies already exist to illustrate this point. For example, in 1997 the London International Financial Futures and Options Exchange (LIFFE) was the global leader in its market. In July 1997 a key competitor, Frankfurt’s Deutsche Terminboerse introduced an on-line trading facility that it distributed freely to futures traders. LIFFE continued to trade conventionally- through an open outcry system whereby traders shout prices and make deals on a managed trading floor. Within 12 months LIFFE’s share of the flagship 10 year old German Bund Market fell from 75% to near zero.

By corollary, businesses that readily embrace these technologies and exploit them creatively to provide new and innovative services will succeed. This can be clearly seen in the emergence of new on-line business successes such as Amazon Bookstore but is also evident in the success of WWW sites belonging to small businesses such as Wigan’s Optimum Designs (quoted in the Digital Economy, 1998) and, in our own region, by firms such as LR Supermarket. The latter is one of the businesses on MerseyWorld that has generated many thousands of pounds worth of income per month from a WWW site presence, <http://www.merseymall.com/merseymall/>.

Indeed, creative exploitation of the digital technologies has been argued to provide new opportunities for businesses which have traditionally been inhibited from expansion due to their geographic location. We can personally attest to the power of the Internet and related technologies in overcoming geographic isolation from our experience of the development of the HP Public Domain Software Archive (PDSA) at Liverpool University (Charlton et al, 1994). Digital technologies have also been argued to present opportunities for the creation of new services and employment outlets. European Policy Documents -such as the Bangemann report (1994), The European Report on Growth, Competitiveness and employment (1994) and the European Initiative in Electronic Commerce (1997) report - have consistently emphasised the importance of electronic commerce to the economic regeneration of deprived regions of the European Community. For example, the establishment of new media industries - digital content creation in particular - is identified as a key area for job growth (European Commission INFO2000 programme, Freeman and Soete, 1994, Fuchs and Wolf, 1997). Call centres are another. Much of the current growth in the US economy has been linked to the exploitation of digital technologies by businesses. We quote Federal Reserve Chairperson, Alan Greenspan:-

*“...our nation has been experiencing a higher rate of productivity ---output per hour worked--in recent years. The dramatic improvements in computing power and communication and information technology appear to have been a major force behind this beneficial trend” (Greenspan, 1998).*

This opinion has been endorsed by the US Government’s 1998 ecommerce survey. In this context it is hardly surprising that governments around the world have devoted a considerable amount of energy to the promotion of the use of digital technologies by businesses.

### **Funding for business to invest in the digital economy**

Within the European Community, since 1995, special funding has been made available through the European Regional Development Fund to establish regional ecommerce centres<sup>1</sup> in Objective 1 regions of the Community. The remit of these centres is to offer advice and training in the skills required to exploit the opportunities presented by the Internet and related technologies to local

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<sup>1</sup> More recently, individual governments in the European Community such as that of the UK have begun to establish local support centres for businesses and to extend the remit of traditional business resource centres - such as Business Links in England and comparable institutions in Scotland, Ireland and Wales- to include ecommerce related advice (UK Government Information Society Initiative, 1999) . TradeUK now offers any UK based business an on-line selling point (**Error! Bookmark not defined.** Private initiatives-such as the Advisors’ Skills Initiative by Microsoft, Intel, Compaq, BT and the DTI- in the UK- are also seeking to establish a network of credited ecommerce advisors.

businesses, particularly small to medium size enterprises. The latter are noted as lacking the necessary in-house computing support required to exploit the trading opportunities offered by digital technologies.

In addition to raising awareness and training businesses in the skills required to use basic Internet applications such as email, these centres, customarily, provide large regional WWW sites. The latter offer local businesses the opportunity to sample the marketing potential of the WWW at zero or low cost. Such regional advisory centres may be seen as meeting many of the required conditions for the successful diffusion of an innovation, in this case the Internet and the WWW, among the business community: - awareness raising, skill development and opportunity for experimentation (Rogers, 1983, Charlton et al, 1997). Well-managed mediation is recognised in a wide variety of computing fields -but particularly those that deal with co-operative technologies- as a useful mechanism for shaping technologies to evolving contexts of use (c.f. Okamura et al 1995).

### **Investing in people: public access and community based training**

Only relatively recently, however, has attention began to be paid at a European level - as for example with the publication of the European Green Paper - or indeed at a national level within the UK - as with the establishment of the IT\_for\_ALL campaign and the National Learning Grid - to the complementary need to educate the general public in the use of Internet based technology. Organisations such as the Morino Institute and proponents of Community Networks in the USA have been concerned with this issue for some time (Morino, 1996, Schuler, 1994, 1996). An information society requires consumers as well as businesses to be network literate (Dyson, 1997). A knowledge driven economy needs a workforce that is constantly updating its skills. As access to learning materials will increasingly involve the use of digital technologies in distance learning courses, these skills must include IT skills. To quote from the UK Government's recent whitepaper on the Knowledge Economy:-

*"A culture, which values ICTs (information and communications technologies), is probably the single, most significant factor for success.....While the UK population is unable to use digital equipment effectively, the market will not grow to its full potential" (Dept of Trade and Industry, UK 1999).*

The need for members of the general public of all ages to have community based access to the new digital technologies and training in the effective use of the technologies is highlighted in numerous reports from community based organisations (Communities On-Line, Partnerships On-line, HomeNet, Kraut 1996a, 1996b, Nielsen, 1997). These organisations point out the prevailing gross inequalities in access to the technology. Available statistics also indicate inequalities in access to and use of digital technologies. For example, GVUs surveys indicate that the initial growth of the Internet and the WWW has been fuelled by large corporations, universities and people who were PC owners prior to the advent of the WWW (GVU 1996). The main publicly available access to the Internet in many countries has been through commercial outlets such as CyberCafes which, in addition to being costly to use, have a marketing focus on youth culture rather than the general population.

For the potential benefits of the Information Society to be realised, regional activities aimed at increasing awareness and network literacy within a local business community require to be supplemented with parallel activities aimed at raising awareness and providing training in the general public (ISF, 1997). Both businesses and the general public require to be trained in use of the technology (*transfer of know-how*) and given the opportunity to try out the technology in the service of business, consumer, educational or community objectives (*opportunity for trial and evaluation*).

## **The Information Society in the Community**

### **Strategies for achieving community based access and training in digital technologies**

Achieving community based access to and training in the use of digital technologies is, however, problematic. Organisations, such as libraries or citizens advice bureaux, which traditionally act as providers of training opportunities and facilitators of public access to information have, until relatively recently, lacked the necessary technical skills to effectively exploit the new technology themselves. They are not sufficiently knowledgeable to train others in its use.

Various strategies can be adopted to resolve this problem. Several are reviewed in the UK Government's whitepaper on the Knowledge Economy. The strategy of particular interest to us in this

paper is the establishment of new partnerships between community educators/community based organisations such as libraries and those with the technical expertise in the new technology in order that community access points can be established and appropriate training in digital technologies provided. Such partnerships are of particular interest in that they are empirical examples of how digital technologies are changing the way societies traditionally function. They instantiate the rhetoric of the Information Society.

### **The focus of this paper**

This paper reports the experience of one partnership, established in the Merseyside region of the UK. The main players in the partnership are Connect, the Internet Centre for Merseyside Businesses, established within the Department of Computer Science at the University of Liverpool in 1995 with funding from the E.R.D.F and E.S.F and some private backing from Hewlett Packard as a centre for the promotion of electronic commerce within small to medium size enterprises; the Leisure and Recreation Services of all the councils on Merseyside and three private technical companies:- Telewest, suppliers of ISDN lines, Hewlett Packard and IBM as suppliers of computing and printing hardware. The strategies that this consortium developed to help promote the information society to members of the general public are described and analysed from the perspective of Diffusion Theory (Rogers, 1983). Our objective in doing so is to contribute to the debate as to the factors which influence to the successful creation of an information society at a local, regional level. No causal model is, however, implied in our analysis.

## **The Merseyside Experience**

### **The organisational structure of the partnership**

The primary remit of the Connect Centre, **Error! Bookmark not defined.**, is to provide training in Internet related technologies to the business community and to develop and maintain a multifaceted WWW site, MerseyWorld, **Error! Bookmark not defined.** . The aim of the latter is to market the business potential of the region electronically (Charlton et al 1997, Charlton et al 1999). The community initiatives described below were funded in part by a grant from the European Social Fund and in part by equipment donation from the consortium's technical partners:- Telewest, Hewlett Packard and IBM. Telewest installed the required ISDN lines without cost in community locations while HP and IBM donated the computers necessary to support access and training at these locations. The Leisure and Recreation Services of all the councils in Merseyside provided access to the public libraries in the region and gave library staff leave to contribute to the projects.

### **The location of the access and training points in the community**

Public Libraries were chosen as the vehicle for the delivery of training in Internet technology to the community as they provided a suitable location for the insertion of ISDN lines and have generally have good relations with local businesses, trade organisations, community organisations and other partnership groups - such as Economic Development Units and the Pathways Projects. It was also felt that the installation of ISDN lines in libraries would be of potential benefit to other initiatives. At the time libraries had been targeted by the European Community Telematics Programme as an important outlet for distance learning materials.

### **The strategy for developing community access to and skills in digital technologies**

Within the framework of Diffusion Theory, our partnership may be viewed as an instrument (change agent) for the process of diffusion of knowledge about and skills in using the Internet and related digital technologies to the communities of Merseyside. The primary purpose of our partnership was to accelerate the creation of an Information society within the Merseyside area by providing members of the community with the requisite IT skills. Our partnership was but one part of a more general regional telematics strategy<sup>2</sup> whose aim was to give Merseyside a competitive edge in the world of ecommerce and related activities which have arisen out of the invention of the new digital technologies.

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<sup>2</sup> The Merseyside Information Society Steering Group, chairperson David Fellows of Knowsley MBC.

From the perspective of Diffusion Theory, the primary goal of any change agent is that of knowledge transfer. Knowledge transfer is a stage-like process which is achieved through activities directed at realising the three key objectives of

- awareness raising,
- provision of know-how knowledge and
- the provision of opportunity for trial and evaluation.

*“Most change agents seem to concentrate their efforts in creating awareness knowledge, although this goal can be achieved most efficiently in many client systems through mass media channels. Change agents could perhaps play their most distinctive and important role in the innovation-decision process if they concentrated on know-how knowledge, which is probably most essential to clients at the trial and decision stage in the process” (Rogers, 1983, p168)*

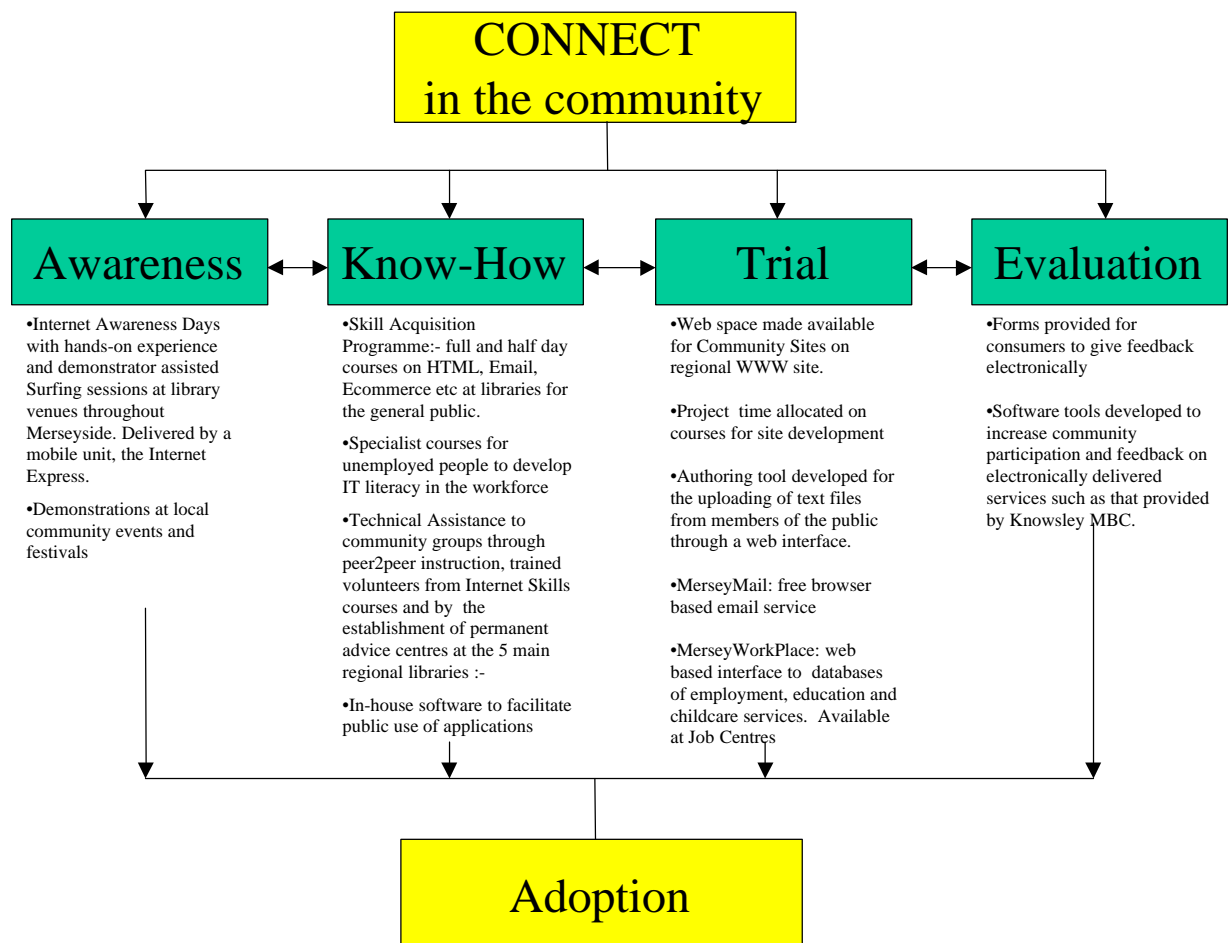
Thus, from the perspective of Diffusion Theory, if our partnership was to succeed in promoting an information society in Merseyside a programme of activities had to be undertaken which realised these objectives. In the context of Merseyside, these requirements have been met at a community level through three projects and various organisational initiatives. The three projects are: -

- The Internet Express: **Error! Bookmark not defined.**
- Connect\_to\_Libraries project: **Error! Bookmark not defined.**
- MerseyWorkplace Project: <http://www.merseyworkplace.com/>

The creation of a Work Experience Programme to help staff these and other initiatives and the creation of an in-house Software Development and Maintenance Unit gave important support to these projects.

Figure 2 illustrates how these various projects meet the requirements of the Diffusion process as described by Rogers. The first two projects involved awareness raising, training and the provision of opportunity for trial and evaluation of the technology. The third provided an important service to the community and a raison d’etre for skill development to the unemployed community. The Work Experience programme provided a mechanism for the reinforcement of learning as well as a means through which the necessary personnel to run the three projects could be guaranteed on a restricted budget. All projects depended on the Software Maintenance and Development Unit for support. Each of these projects is described in detail below.

**Figure 2: Diffusion of awareness and skills within the Merseyside Community**



**The Internet Express Project**

The Internet Express is similar in concept to a roving Internet Café. A suite of 20PCs was rotated at three weekly intervals between libraries in the Merseyside Region (Photograph 1). Occasionally visits were made to Shopping Malls for one-off special events (Photograph 2). When located in a particular library this suite of PCs was used to provide free training in the use of Internet related technologies and in the exploitation of electronic services to find/create employment to members of the general public and library staff. Training of the latter was viewed as particularly important in order to ensure continuation of service after the Internet Express departed from a library. A PC was left in each library which participated in the programme if the library was located in a Pathways area. This PC was intended to act as a seed for locally based initiatives requiring use of the Internet.

**Photograph 1: The Internet Express in action at local libraries**





The training programme provided by staff on the Internet Express was derived from the Short Training Programme which Connect had delivered to over 3,000 members of the Merseyside business community. This programme integrates supervised hands on experience with spoken lecture material. On-line instruction was found to be too demanding for naïve users. A stand-alone user manual accompanied all courses.

**Photograph 2: The Internet Express in one of Liverpool's Shopping Malls**



The courses offered range from a general introductory session on Internet related technology, “The Internet Awareness Day” to more specialised one day instructional courses covering each of the following topics: -The World Wide Web, Email, UseNet news, Connecting to the Internet and File Transfer Protocol and other occasional topics such as Business over the Internet and Information Retrieval on the Internet. The Internet Awareness day was primarily aimed at raising audience awareness of the potential relevance of the medium to many aspects of daily life. It offered participants sampler sessions using email, the WWW etc. The half day courses focus on more detailed skill development in HTML authoring etc. Participants were encouraged to complete personal or community WWW sites during this time and space was made available for free on the central WWW server at Connect to host appropriate community projects.

An Internet Skills Training course, specifically targeted at unemployed people, was also made available. This was a six week course, which in addition to the previously mentioned modules included modules on Employment Resources on the Internet, electronic, and HTML based CV



construction and Home Page design for advertising job related skills. The Employment Resources module focused on the informational retrieval and search skills required to maximise the benefit reaped from exploration of the employment resources on the WWW, see **Error! Bookmark not defined.** and **Error! Bookmark not defined.**/ The latter could be adapted for use by employees and employers alike. This Internet Skills Training course was introduced as a response to the prevailing unemployment problems in the Merseyside area. Both text based and HTML CVs constructed during the course could be entered into a WWW enabled CV database, **Error! Bookmark not defined.**. The latter is part of the MerseyWorkplace project, **Error! Bookmark not defined.** . The latter aims to match employment opportunity to employees' skills in the Merseyside region and is described in full later.

Demonstrators on the courses were drawn from the Work Experience Programme run by Connect for unemployed computing professionals in the Merseyside area **Error! Bookmark not defined.**. Former attendees at the Internet Express who have proven IT competence can also join this programme and thus reinforce their learning through engaging in peer-to-peer tutoring. The latter has proved successful in other community based Internet projects (c.f. Tan, 1997). The Work Experience programme provides a bridge to work for many graduates of the Software Technology Retraining Programme run by the Department of Computer Science who do not immediately find employment. Participants on the programme also help small businesses establish start-up Internet projects. Internet Express Course lecturers are fully qualified salaried staff.

### **Evaluation of the programme**

Evaluation of this programme combined quantitative and qualitative methods, details of which can be found in Charlton et al 1998. Overall the project was extremely well received by members of the public and library staff. Thousands of people across the Merseyside area participated in the programme. This level of interest, in very economic deprived areas of the region, indicates that socio-economic factors such as an income and education are not barriers to use of the Internet but rather to access to it. When access barriers are removed we found, as have Kraut et al 1996, that social demographic factors, gender and generation, are the prime determiners of use.

Until recently, the strongest interest in use of the technology was from the under 20 age group. This occasionally inhibited older users becoming involved with the technology. More recently a large proportion of retired people have attended the courses. A primary motivation appears to be to help grandchildren with their homework and to communicate with distant relatives through email. Little interest was expressed in electronic commerce by either members of the public or members of the local business community. Studies in America **Error! Bookmark not defined.** have also found the public to be more interested in use of the Internet for communications (email) as opposed to information delivery or electronic commerce, as provided through the World Wide Web.

Representatives of local businesses infrequently attended the courses at the library. To explore the reasons for this, a telephone survey of a random sample of local businesses in one library area was conducted. This indicated that the reason for non-attendance was evenly split between lack of interest (computers and the Internet were not perceived as relevant to the business's concerns) and lack of time (too small to release staff during the working day). It had been hoped that members of the community would have used the skills gained on the library courses to develop a WWW site of community activities and business services for local if not international use. Unfortunately, this failed to occur in any sort of cohesive fashion. Motivated individuals have set up WWW sites but not in a co-ordinated fashion.

The Internet Skills Training course was very positively received by those who attended and we have many thank-you letters from individuals who went on to profitably exploit their training in the job market. However, this course also failed to run on many occasions at the libraries as the numbers of unemployed people who showed were often below that required for the course to be administered in a cost effective fashion as funding for this training provision is per trainee. The initial title of the course. Job Seekers Course, may have deterred people as this was the same as a much-resented procedure "The Job-Seekers Allowance" introduced by government at the same time. Other contributory factors appear to be: - the fact that presence on the course explicitly identified a person as being unemployed to their local community; part of the course was held at Connect in the centre of Liverpool and attendance there incurred transport costs; the six week length of the course and the fact

that many people in the areas serviced by this course had been unemployed for a long time and therefore not used to a regular commitment.

The Internet Express took place at a time when libraries were experiencing cuts in funding. Despite this, the majority of the librarians (97%) felt the project to be successful and a worthwhile use of scarce resources (78%). All librarians felt Internet access in a public library to be useful. The majority felt it to be extremely useful. In 97 % of cases, the number of people visiting the library during the Internet Express period was observed to increase, though the exact part that children played in this increase is unknown. A concomitant increase in the number of children visiting the library was noted in 80% of cases. An increased demand for books on the Internet/computing was also noted during this period by 63% of the participating libraries. In the focal group session we ran with the librarians, many staff commented that the increased workload was worth it because of the positive effect the presence of the Internet Express was having on the library's image. Such effects have been noted in other studies **Error! Bookmark not defined.** In some areas, youth, who had not previously set foot in a library, were attracted in by the availability of Internet connectivity. The challenge to community workers is to harness that interest to worthwhile goals.

One of the main problems we faced in this community access programme was providing the general public with instruction in the use of a personal computer per se. Our systems were set up to give easy access to the required applications, web browsers etc, but nonetheless there were those who experienced difficulty. INSINC (1997) flags interface design problems as one of the main barriers to user involvement in the information society. The user friendliness of many applications, including the design of WWW search engines, leave much to be desired. It is important to remember that the Internet and related technologies such as email and FTP were virtually ignored by businesses and members of the public until Tim Berners-Lee (Berners-Lee et al 1994) invented the WWW. The technology was experienced as too difficult to use and was thus perceived as having little relevance to these communities. Unless software is designed to meet the needs of the non-technical user, its potential will not be exploited.

The Internet Express project terminated in February 1999 as grants became available to establish permanent Internet Access points in local libraries. The positive manner in which this project had been received, particularly at local council level, had allowed us to establish Connect\_to\_Libraries in Sept 1998 as a potential successor to the Internet Express. Individual libraries have also been motivated to campaign and seek funding for maintaining Internet Access points as a community service.

**Connect\_to\_Libraries project:** Error! Bookmark not defined.

This is a sequel to the Internet Express and aims to establish permanent Internet access and technology training centres in the central library of each of the five councils in Merseyside. These will provide the public with an opportunity for further trial and evaluation of the technology as well as reinforcement of learning through practice. Four centres have currently been established each of which provides a suite of 10 up-to-date PCs with full Internet access and software including stand-alone packages for CV construction and desk-top publishing. Figure 3 displays the on-line CTL Centre at the Central Library, Liverpool.

Figure 3: The on-line CTL Centre at the Central Library, Liverpool

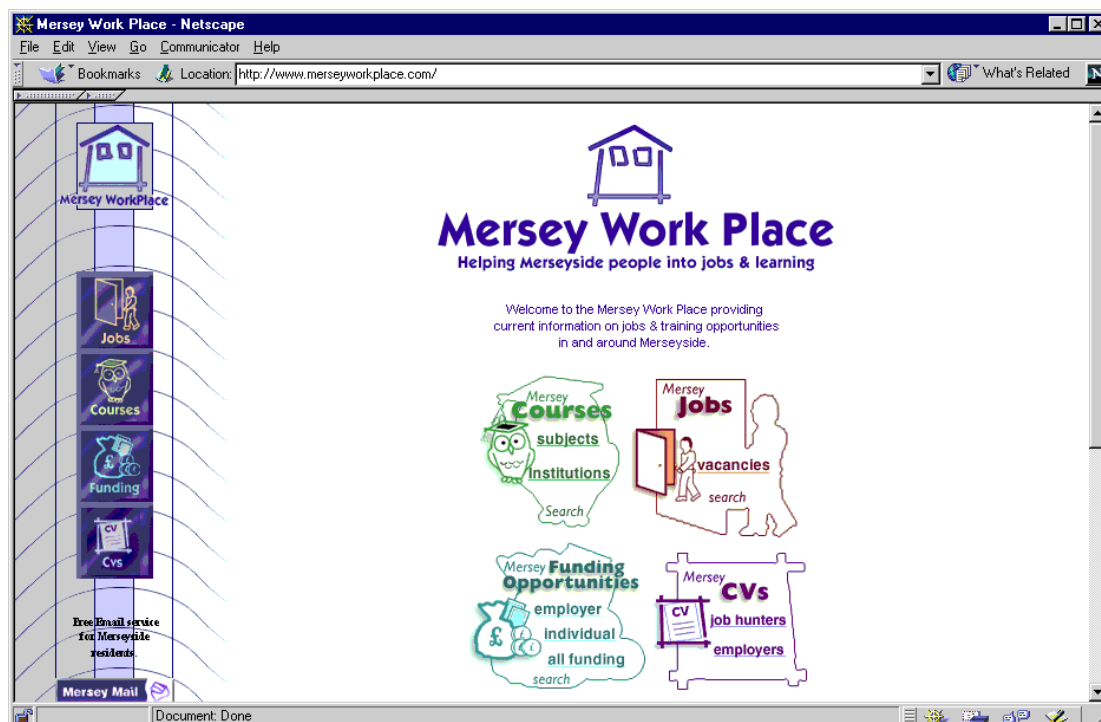


Fully trained staff, supported by work experience personnel, provide group or one to one tutoring at each of the Centres. Training is specially designed for each user group: business, educational or community. Members of the connect Quickstart team - the latter is aimed at developing WWW sites for businesses within two days of an initial consultation - visit the centres regularly to provide additional specialist support to local businesses. Various small businesses have expanded through this service. These Connect\_to\_Libraries Centres act as a resource centre for members of the local community. A considerable emphasis is placed on training users to search effectively on the WWW. A WWW based email service, MerseyMail, has also been developed to further service the needs of the local community (**Error! Bookmark not defined.**)

### MerseyWorkplace project

There is a large proportion of the Merseyside community which is unemployed -hence the region's Objective 1 status in the European Community (European Community, 1994). As we indicated in the introduction to this paper, Internet related skills have been emphasised as important for the creation of new businesses. They are also useful for finding out about employment opportunities. For those seeking employment, whether knowledge workers or low skilled workers in the manufacturing sector or services, IT skills permit access to the wide range of employment resources that are available on the WWW. As indicated we emphasise these opportunities to members of the community (and indeed businesses at other times) during the Internet Skills Training Course for unemployed people. However, for access to this type of information to be truly useful to many people the information about employment opportunity has to be contextualised to a particular region. This has been achieved for the Merseyside region through another initiative: the MerseyWorkplace project, **Error! Bookmark not defined.** (Figure 4)

Figure 4: MerseyWorkplace WWW site



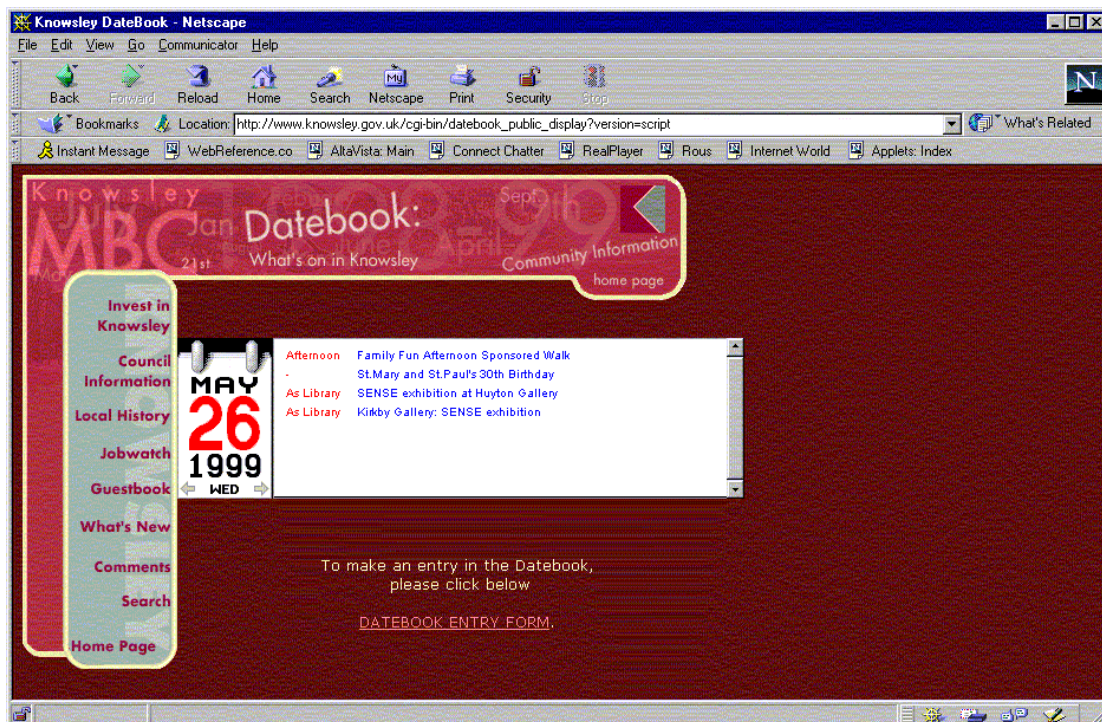
This is a WWW resource that has been specifically designed to reflect employment and training opportunities within the Merseyside Region. Various stand-alone databases that were only accessible at specific locations in the region have been WWW enabled and integrated. A user is thus not only able to query a database of local jobs on-line, s/he is also able, from within the same site, to check-out training opportunities which would enable her/him to become qualified for a particular job. The user can also readily check whether any form of support, monetary or in the form of child-care, is available while training is being undertaken.

#### Software Support for the Community Initiatives

As briefly mentioned above, the user friendliness of many applications, including the design of WWW search engines, still leaves much to be desired. If we re-examine Figure 2, it can be noted that we ourselves as a partnership engaged in a considerable amount of *in-house software development* to support our community based initiatives. For example, much of the success of one of our large community sites, that of the Knowsley Metropolitan Borough Council, **Error! Bookmark not defined.** which recently won the 1999 Global Bangemann Challenge award in Stockholm, stems from the development of in-house software which allows members of the community to easily create and maintain communal WWW based information. Two items of in-house software used on this site illustrate this point.

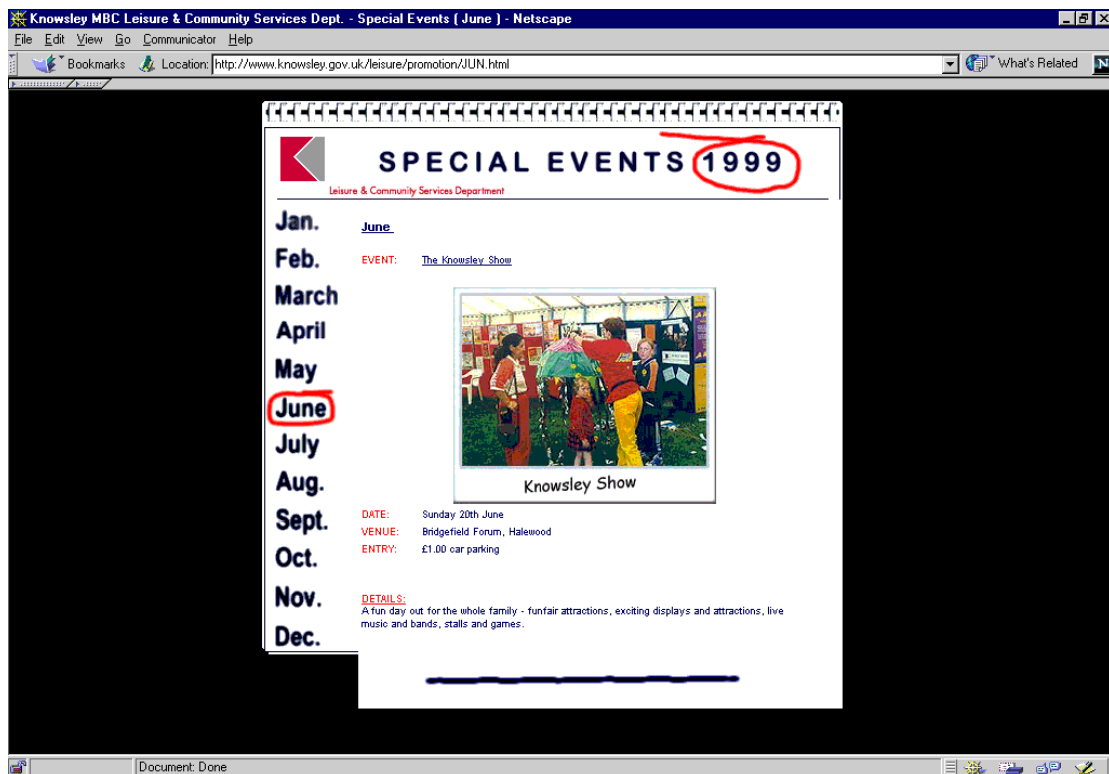
First we have designed the Datebook applet to keep members of the community informed about community events. The Datebook applet is designed to receive input from datafiles. Information can be submitted to these files by a cgi script via a WWW server. Members of the community can thus submit information about a community event by filling in a form on the Knowsley WWW site. This information is screened then added to the applet's data files. The applet itself is designed to be analogous to a desktop calendar (see Figure 5) below. Users can browse the calendar or search for sequences of related events.

Figure 5: The Datebook applet display



Our second example is the on-line Newsletter service we are providing. This is essentially a Web based templating system that allows a community member to interactively create and edit the text of an on-line newsletter. The user need not be concerned about layout considerations or the intricacies of HTML. Users simply insert text into a form like interface or if they use they can upload files from a word processor. All formatting of the text and layout of the newsletter is managed by a suite of background cgi-scripts according to the previously specified style preferences of the user or community group. Users can chose from a variety of templates or can have a template specifically designed for their purpose. Figure 6 displays the Knowsley Events Community Newsletter.

Figure 6: Knowsley Events Community Newsletter



This particular template was designed in conjunction with representatives of the community and is in the form of a calendar. Clicking on the name of a month results in the events associated with that month being displayed in the form of a drop-down page.

This need for in-house software development, emphasises how, in the context of the Information Society, the traditional activities associated with the role of change agent require to be extended. A change agent such as the partnership we have described is required to be *pro-active* and actively create new artefacts of benefit to adopters of the technology.

## In sum

In the context of the Information Society, the innovation, which is being diffused, is a programming environment (The Internet and related technologies) which is of benefit to adoptees by the value they place on the *artefacts* that it can be used to create. If the information or services available on the WWW does not have value to an individual or community, then training in the technical skills required to access that information or service has little point. Similarly if an individual or community is not provided with easy\_to\_use tools for exploitation of the technology, they themselves will not be able to create artefacts of value to their community.

The major lesson learnt from the projects described in this paper, is that for the potential of the new technologies to be harnessed at a local community level, awareness raising and technical instruction in use of the technology must be accompanied by the provision of an appropriate software tools. The latter are necessary if members of the community are to readily exploit the technology to their own ends. Where such tools are not available -either commercially or as freeware- change agents need to create them. By creating such tools, change agents are reducing the learning effort required by clients to exploit the technology and thus promote its adoption.

## Acknowledgements

We acknowledge the contribution of all the staff at Connect and the staff of the councils of Merseyside, particularly librarians, to the success of the projects described in this paper. We also thank our business partners, Telewest, IBM and HP.

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