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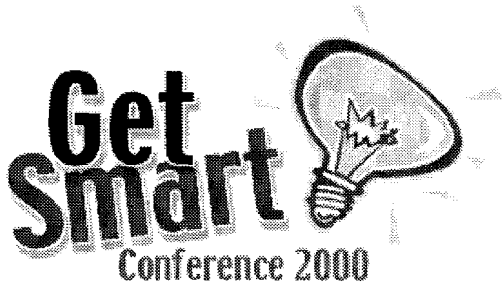

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Get Smart 2000 Conference Committee

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PREFACE

The major focus of this conference is on Community Informatics, which can be defined as a technology strategy or a discipline which links economic and social development efforts at the community level with emerging opportunities in such areas as electronic commerce, community and civic networks and telecentres, electronic democracy and on-line participation, self-help and virtual health communities, advocacy, cultural enhancement and others (Michael Gurstein, 2000).

It is becoming evident that for a variety of reasons, including cost, infrastructure, literacy, and attitudes, a "digital divide" is developing between those who are in a position to take advantage of technology enabled opportunities and those who are not. The major objective of the conference is to discuss the role of Community Informatics as a means for regional transformation, enabling regional communities to close the digital divide.

The papers in this volume are from the Second International Get Smart conference held in December 2000 in Rockhampton, Australia. As with the first conference held in December 1999 in Rockhampton, this volume and its affiliated publications seeks to bring together current insights from philosophy, communication theory, sociology, community planning and psychology in an interdisciplinary dialogue. The papers presented here represent the cutting edge of research on community informatics, including papers from some of the leading scholars in this area such as: Roy Colle from Cornell University, Paul Licker from the University of Cape Town, Bijan Gillani from California State University, Hayward and Dineh Davis from University of Hawai'i at Mano'a. This volume not only addresses theoretical issues underpinning the practise of Community Informatics but also provides a useful sample of the variety of practical applications in a range of community settings across Australia, South Africa, the United States and the United Kingdom.

The papers in the volume are grouped under headings which correspond to the major sessions in the conference, including a section on Telecentres in communities, Community Informatics in Developing Countries, Flexible and On-line Education, Community Informatics and Minorities, Community Informatics and the Digital Divide, and Strategic Issues in Community Informatics. The volume combines papers that contain analysis of seminal issues in community informatics, as well as, lessons from practical case studies from around the world.

All papers in this volume were reviewed by the editors. We would like to thank the Faculty of Informatics and Communication at Central Queensland University, and, particularly the Dean, Professor Stewart Marshall for their support. We would particularly like to acknowledge the sponsorship of AIRM International and Dr Philip Tsang of the Open University of Hong Kong Our thanks also go to Cheryl Scott of CyberAdmin Services and to Carmel Bargen for enthusiastic administrative support for the conference. Special thanks go to the Rockhampton City Council for their sponsorship and support.

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TELECENTRES AS VEHICLES FOR COMMUNITY INFORMATICS

Ten Themes for the ICT Movement

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Abstract. *Efforts to provide communities with meaningful access to information and communication technology for individual and community well-being has resulted in a strong, well-financed telecentre movement around the world. Emerging out of experiences with telecentres from Australia to North America are themes that entrants to the field can consider as they launch new initiatives.*

1. The telecentre movement

Around the world, you can see enormous effort and resources going into accessing the new information and communication technologies. In some cases it is individual investment; in others it is public investment, or a mix of the two. The latest data in the United States show that individual computer ownership is rising steadily to where now more than 50% of American households have computers and 41.5% of the homes are connected to the Internet. In the U.S., Asian Americans and Pacific Islanders have the highest Internet penetration, almost 60%. Increased access there by people on the "wrong" side of the "digital divide" is afforded by government and private initiatives to put these technologies into community public-access telecentres where people can share their use.

Elsewhere in North America, Canada undertook a six-year programme to make itself "the most connected country in the world." A major part of Canada's initiative is the Community Access Programme (CAP), which set a deadline of March 31, 2001 to establish 10,000 computer and Internet sites across the nation. Initially a rural-oriented effort involving about 5,000 sites, political leaders stunned CAP personnel by insisting on a comparable programme for urban areas.

In Europe, the Hungarian government supports a robust eight-year old telecentre programme that has resulted in more than 150 sites, and, in an optimal scenario, within 5 years about 500 to 800 telecottages will "blanket" the country. (Bihari and Jókay, 1999:13)

The Costa Rican Government has recently decided that it wants all its people to have access to information and communication technologies (ICT) — so it is embarking on a project to have telecentres in each of its 89 *municipios*.

From Australia to South Africa, governments are taking steps to bring people with reach of computers, the Internet and other 21st century communication technologies. "The important point about the digital divide," says Mark Cooper in a recent report,

" is not simply that some people have the technology and others do not, but that not having it puts people at a disadvantage and cuts them off from participation in important economic, social, cultural and political activities." (Cooper, 2000)

2. Ten themes for telecentre initiatives

We are less than ten years into the real telecentre movement although there were many prominent ancestors including, for example, the telecottages in Scandinavia in the mid-1980s and the Open Learning Centres in Queensland in the late 1980s. But it was the Internet along with significant advances in computer technology and comparatively lower prices in the mid-1990s that set the movement off. It propelled big international players onto the telecentre frontier: the International Telecommunications Union, the Food and Agriculture Organization, the World Bank, the International Development Research Centre, the U. S. Agency for International Development, and others who believed that access to the Internet was vital to a nation's well-being. The dot-coms, dot-orgs, dot-govs and dot-edus showed the potential of making huge collections of information about products and services available at the click of a mouse at home or in downtown Derby.

So here we are into the 21st century with telecentres springing up all around us, and what can we say about our experience to date? What can we say to those start-up initiatives in Costa Rica or Eastern Europe or the Philippines besides confirming that some telecentres are thriving and some have already failed? Our research team has visited telecentre programmes in Canada, the U.S., Hungary, South Africa, and India, and we have studied reports from Australia, Tunisia, Peru, and other countries on the way to preparing a management manual for telecentre personnel. There are many differences among these operations, but we perceive some themes that may be useful guides in telecentre development:

2.1 ***The power of a national commitment by policy-makers who recognize the value of connecting the people of the country through the modern tools of the Information Society, and follow that commitment with funding and organizational support for multi-year programs.***

The Canadian Government went beyond the rhetoric of an Information Society and committed people and funding to making the Internet affordable in rural and urban communities across the nation through its 10,000 Community Access Program (CAP). With a six-year commitment, it made start-up money available and created an infrastructure to help local organizations make it work. While the resources offered are not enough for a complete comprehensive multi-purpose telecentres, the *imprimatur* of the national government combined with some serious money significantly motivated a nationwide community-based effort that commanded provincial, regional and local participation.

Similarly, in Australia the Federal Government's policy to create the "Networking the Nation" fund has been instrumental, among other various activities, in Tasmania's development of 59 Open Access Centres, and a programme in New South Wales to set up 55 multi-purpose "Technology Centres". (Short and Latchem, 2000) In South Africa, the 1996 Telecommunications Act created the Universal Service Agency, which has been the key actor in establishing telecentres in under-served and rural areas of the country. (Fuchs, 1998) Besides the direct funding available and the administrative push, a national policy can also be instrumental in providing a favorable regulatory and tariff climate. And in supporting its policy goal of becoming an Information Society superpower, the Indian government doubled the number of persons it would graduate from its technology training institutes.

Thus a national policy can give visibility and help mobilize resources for a building the infrastructure and programmes that promote access and use of information and communication technologies.

2.2 ***The importance of partnerships in translating national policy into action through governmental and non-governmental bodies at the regional and local levels.***

National policy and national government funding does not necessarily translate into centralized planning and operations. Hungary has demonstrated that a former socialist country steeped in centralized planning could develop a "telecottage" system built on local non-governmental organizations (NGO) with community ownership and management. It is called a "civic initiative" with its emphasis on local NGOs applying for government telecottage grants and showing that they have the support of local governments or private organizations. Industry Canada built into the CAP application process an explicit recommendation that community organizations proposing access sites seek out partners who can share technical, financial and personnel resources. In some provinces, a partnership with a library opened the way for the CAP site to obtain free computers from a Gates Foundation grant.

In the health field, various international organizations are setting up ICT systems that could be partnered with community multi-purpose telecentres. For example, in 2000, the organization Health Information for Development (HID) in the United Kingdom laid out a plan to set up — particularly in developing nations — health- information-resource centres called Information Waystations. These are backed by information-collecting-and-processing "hubs" called Staging Posts. The intent is to funnel appropriate health information from nations in the North and the South to individuals and local health workers in developing nations using locally relevant terms. About the same time, the World Health Organization presented a seven-year plan to establish the Health InterNetwork Project. It is an initiative to facilitate the

flow of health information worldwide using Internet technologies. Among its provisions are reliable and relevant local and international public health content and 10,000 to 14,000 new public health information access points, linked an electronic/Internet-based HealthInterNetwork portal. With the significant interest in the health field on producing, packaging and distributing digital health information, there seems ample opportunity for partnerships to emerge between local health organizations and telecentre people.

2.3 ***The value of having local "champions" (innovators) who can mobilize others (early adopters, opinion leaders) to accept the vision of an ICT telecentre the programme.***

The obscurity and abstractness of the "Information Society" requires the missionary zeal of individuals who can translate and demonstrate the relevance and application of these kinds of concepts to the realities of the community. And for the innovator to be from the community itself increases the credibility of the telecentre initiative. The professional literature on the diffusion of innovations points out the importance of the innovator. "The innovator," says Professor Everett Rogers, "plays an important role in the diffusion process: That of launching the new idea in the system by importing the innovation from outside the system's boundaries" and igniting "early adopters." (Rogers, 1995)

2.4 ***The significant value of community volunteers in operating telecentres***

In literature describing CAP, Industry Canada says: "Volunteers, volunteers, volunteers....a CAP site requires the support of many dedicated and talented volunteers." In most communities, volunteers offer a variety of benefits to the programmes. They contribute to the day-in, day-out supervision of the facilities — a potential personnel expense that many community-based communication centres could not afford. But the volunteer has deeper significance: the variety of volunteers in a system provides telecentre clientele with models with whom they can identify and feel comfortable with. In telecentres throughout the world, one can find high school and college students, retired business people, active school teachers and others providing one-on-one and group training and assistance. Volunteers can also contribute to enlightened decision-making in the telecentre because they reflect a variety of community constituencies. The challenge for telecentres is to move from largely spontaneous use and management of volunteers to developing an explicit strategic plan for recruiting, training, retaining and rewarding volunteers.

2.5 ***The advantages of clusters or networks of telecentres working together in a region to develop and share a variety of resources.***

The Western Australia Telecentre Network Support Unit illustrates well what

can be done when telecentres are combined in some way so that they share a support system. The Support Unit lobbies, seeks funding, develops initiatives, and carries out a variety of other management functions for the 76 members of the Network. In Canada, the CAP administrative system includes provision for regional coordinators who supervise sites in their geographic areas. In some cases, the coordinators have successfully aggregated CAP sites for carrying out joint projects. These projects may involve training, sharing of resources, problem solving, and other activities. In some cases, joint projects to develop locally-relevant information and data bases (for example, French language ones in heavily English language Canada) would help sites increase their relevance to their communities. In Canada and Hungary, telecentre sites themselves and joined together to initiate collaborative projects, achieving some economy-of-scale advantages. These efforts have sometimes resulted in a formal membership body. Architects of telecentre systems should build such support components into their systems, and devise a method for funding them, such as member fees.

2.6 ***The importance of popularizing the belief that information and ICTs can be a valuable resource for individuals, families, organizations and communities.***

Computer giant Bill Gates startled many in the information technology field when he declared in the Guardian newspaper that "the world's poorest two billion people desperately need healthcare, not laptops." (Helmore and McKie, 2000) And one hears a message around the world: it's no "field of dreams" — referring to the appearance of telecentres in a community and the absence of many users. Both of these situations reflect that many people — including Bill Gates — may see little significant connection between information technology and direct benefits to a family's or a community's needs. However, there is another perspective represented by a report in *The New York Times*. It tells of a district in India's state of Madhya Pradesh where villages buy a computer system and the state picks a young person with at least a 10th grade education to print out and sell information from the state's computer network. The story tells us:

> For 25 to 35 cents, villagers buy printouts of documents that they might have spent days trying to get from local bureaucrats: land records, caste certificates and proof of income, among others.
>
> For another 25 cents, any citizen can send a complaint to the state by e-mail — my pension didn't arrive, my child's teacher didn't show up, my village hand pump doesn't work — and the state guarantees a reply within a week. And for 10 cents, a farmer can get a printout listing the prices of any agricultural commodity sold at surrounding markets. (Dugger, 2000:10)

In the village of Bagdi, the farmers collect the day's price lists for wheat, garlic, and other crops and use these to negotiate with middleman. "If the price he offers suits me, I'll sell to him," says one farmer. Otherwise I'll take it to market myself."

Government or private sector initiatives targeting popular participation in the Information Society should consider planning vigorous campaigns to illustrate the benefits of information as an important resource for daily living — assuming they, themselves, are reasonably convinced. (Johan Ernberg, formerly with the ITU, argues for the relevance of ICT to a nation's health and welfare on a more macro level in Ernberg, 1998a).

2.7 ***The role of research in creating a viable telecentre enterprise.***

We see relatively little time or resources devoted to research in telecentre initiatives. The ITU's multi-purpose telecentre initiative begun in the late 1990s crated multi-purpose telecentres and called them pilot projects, making them somewhat research-related. And former ITU expert Johan Ernberg has raised a list of questions that might be answered by the pilot projects. These range from how do we get international and national organizations to cooperate to who pays for new telecentres and what is their impact. (Ernberg, 1998b) Some of these are quite large and complicated research questions, perhaps appropriate for university people. But research needs to be done at the individual telecentre level. Telecentre personnel should have simple, reliable tools to use in on-going operations — tools that help them discover and continuously monitor the needs of the community, and help check systematically on outcomes and consequences. This goes beyond counting the number of users, although this is an important statistic. The IDRC's Ann Whyte has contributed to this process with her manual entitled *Assessing Community Telecentres, Guidelines for Researchers* (2000) but it will take considerable dedication for telecentre personnel to digest and use it unless there are significant incentives to do so.

2.8 ***Telecentres need for long term sustainability and business plans that fit the culture of the community.***

Most telecentres operate in a not-for-profit mode, but that does not mean not-for-income. Typically donor agencies reduce or discontinue financial support for telecentres after an initial incubation period. Few of the telecentres across Australia have guaranteed on-going funding. Western Australia is the exception where the state government has incorporated telecentre support into at least a four-year commitment — through 2003. (Short and Latchem, 2000) Other programmes in Australia and the Hungarian system have been innovative in developing income-come producing activities to support telecentre operations. The Queensland Open Learning Network's Learning Centres offers training courses that are paid for by trainees' employers or by

the individuals themselves. Businesses and industry groups pay for use of the teleconferencing facilities, and institutions in the community pay membership fees to the Centres. In Hungary, a major source of support for telecottages are the contracts that they obtain from government agencies, thus becoming (for a fee) extensions for government services. In contrast, there is the telecentre getting three year funding but has no current effort toward income generation. It expects to expire after the government funding ends.

In our research on telecentre training (in which we surveyed a panel of experts from around the world), one of the most frequently suggested areas of training for telecentre managers was in the area of business planning aimed at making telecentres self-sufficient and sustainable. (Roman, 2000)
In approaching the issue of sustainability, telecentres face the question of how they can generate income yet serve those in the community who cannot afford to pay for "public goods" kinds of services. (like access to health information). Some centres use the income from user fees and other income services to make public goods affordable or free. (We have used the name Communication Shop to denote the commercial possibilities of community-based communication centres. See Colle, 2000.)

2.9 ***Focusing on information services rather than on computers and the Internet alone to build a local institution more fully woven into the fabric of the community, with a larger base for generating income.***

One of the lessons learned during the early stages of the Western Australia Telecentre Network was "that to look upon these centres as simply educational providers or access centres was a flawed model." (Short and Latchem, 2000) Similarly, others — like those in Canada's CAP, the Community Learning Centres (CLC) supported by the U. S. Agency for International Development, and the Hungarian telecottages — take the position that telecentres need to be significantly more than computers and the Internet to meet fully the potential of these institutions. "A robust center," say some, "will provide a range of traditional , non-electronic resources as well." (Dorsey, Hess and Fuchs, 2000) Tasmania's Open Access Centres offer services to local businesses, act as gateways to Federal and State Government online services, and provide lifelong learning and training opportunities. (Short and Latchem, 2000) Among the telecottages in Hungary, there are more than 50 different services offered to the community. These range from blood-pressure measurement (provided by 25% of the telecottages in 1999) to computer games (offered by 94%) and social services assistance (44%). (Bihari and Jókay, 1999)

Mature telecentres must be in the information and communication business (or the community development business), not only the computer and Internet business. They can systematically assess community information needs and the communication needs of other local organizations, and be creative and entrepreneurial in dealing with these needs. It is this broader approach to the

Information Society that helps centres become more firmly woven into the fabric of the community and puts them on the road to self-sufficiency.

2.10 ***Participation as an important goal that requires a strategic approach.***

With widespread interest in the "digital divide" issue, broad-based community participation may become part of the telecentres' mandate. This may present a challenge in reaching out to ethnic minorities, women, children and the elderly who are often on the minus side of the divide. Sometimes the "learning" label on a centre, or the technology, or its location in a library or school intimidates those who might benefit from the services. So physical connectivity may not equal sociological access.

It is generally accepted that conscientious attention to participation can yield benefits in such activities as assessment of information needs, planning, and operations. The value of participation is woven throughout the Industry Canada philosophy and procedures for CAP. This is illustrated, for example, in its emphasis on volunteers, and the requirements that applicants have local councils and evidence of community support. It is also illustrated by comments by CAP site people who say that they know participation is important but they haven't worked on it yet.

Part of the problem results from the ambiguity of the participation *concept,* and the need to translate it into concrete action terms. It is not something that managers do spontaneously or naturally. A strategic approach to community participation would produce explicit plans that answer such questions as: *why* participation? *who* should participate? *how* can they participate? and how can we get them to participate? And these would guide telecentre personnel in making telecentres more inclusive and more relevant to the community.

3. The role of training

We end with what could be listed as number 11 on the above list, but, in fact, it runs through several of those items: it is training. Telecentres need a variety of skills to insure that it contributes successfully to community informatics. These include: financial and business skills, computer and other ICT technical skills, teaching and training skills, information management, research leadership, participation, communication and human resource management skills. (Roman, 2000). Experience around the world suggests that training or recruiting to bring these skills into a telecentre is a key to dealing effectively with the emerging themes in this paper. Thus, a telecentre initiative is likely to be successful to the extent that it incorporates training in its start-up and continuing operations.

Acknowledgments

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TASMANIAN COMMUNITY NETWORK
www.tcn.net.au

A rural demand creation initiative for Information and Communications Technologies.

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Abstract. *In 1998, Australia's information economy had reached an annual worth of billions. Business customers were increasingly demanding to transact online. In Tasmania, it had become apparent that the State could not continue to compete in this new economy without using information and communications technologies (ICT) effectively.*

The Tasmanian Government realised the challenge for the Tasmanian community was to harness its local energy and finances and to develop a community supported ICT culture of both people-networks and technology-networks. The Tasmanian Community Network (TCN) initiative was created to take a comprehensive approach to developing shared telecommunications networks and address the following key concerns for the entire Tasmanian community:

- *A Common Vision for, and across, Tasmania*
- *Economic Development*
- *Increasing Employment Opportunities*
- *Marketing Tasmania and Tasmanians*
- *Accessibility and Awareness of IT*
- *Affordable and Accessible Health Care*
- *Access to Life Long Learning*
- *Government Efficiency*

Keeping in mind these key concerns, the TCN has connected people to a unique network of community, business and government which provide gateways to online technologies and services. Individuals, community groups and businesses were brought together to determine their community's circumstances and needs. Plans were created to develop solutions using ICTs to address those needs, bring positive change and create self reliant communities.

This process is managed by the TCN project team who provide a human face to the networking process. Strategies supporting this process include: face-to-face meetings; facilitation of working groups; partnerships with local government (for example, to develop web portals); development of community leaders and champions; support to existing groups; and some seed funding to get projects started.

The TCN continues to bring the benefits of ICT to all Tasmanians through local understanding and use of these technologies, by breaking down the fear of ICT in the community; and fully using and expanding the current ICT networks and services.

The TCN is supported by the Commonwealth Government through the Department of Communications, Information Technology and the Arts' Networking the Nation program and Telstra.

1. Introduction

This paper outlines the development of the Tasmanian Community Network (TCN) project. It describes the progress over the last two and a half years and what we are doing now.

2. What is the TCN?

The TCN is a community project that:
connects people *to...*

- a unique network of community, business and government *which...*
- provides a gateway to online technologies and services *and...*
- develops awareness and encourages the use of online technologies.

The TCN is about bringing the benefits of ICT to all Tasmanians through local understanding and *use* of these technologies. This includes breaking down the fear of ICT in the community; and fully using and expanding the current ICT networks and services.

The TCN is supported by the Commonwealth Government through the Department of Communications, Information Technology and the Arts' *Networking the Nation* program and Telstra.

3. The TCN Principles

The TCN is underpinned by the following principles:

- Connect people
- Include everybody
- Collaborate with each other
- Encourage partnerships
- Develop community leaders
- Self reliance

4. Who is involved? The TCN'S Stakeholders

4.1 Community groups and individuals

These include Communities of Interest and established committees, Service clubs, Sporting Clubs, Service providers.

4.2 State and Commonwealth Government

The TCN is an initiative of the Tasmanian State Government and is part of the *e*Services Group within the Tasmanian Department of Premier and Cabinet. It has formed important links with key government departments including the Departments of Education, State Development, and Health and Human Services.

It has received four years funding from the Commonwealth's *Networking the Nation*, Regional Telecommunications Infrastructure Fund (RTIF). The RTIF provides funding for regional, rural and remote communities to identify their ICT needs, and develop and implement projects that meet those needs.

The Tasmanian State Government is focused on IT industry development and has outlined the following major target areas in its ICT Policy Framework:

- Industry Growth
- Skills Development
- Government as Lead User

- Access and Equity
- Telecommunications Enhancement

4.3 Industry and Business

The TCN works with Telstra, many small businesses and industry associations such as the Tasmanian Chamber of Commerce and Industry, the Tasmanian Electronic Commerce Centre, Business Enterprise Centres and Education and Training Providers.

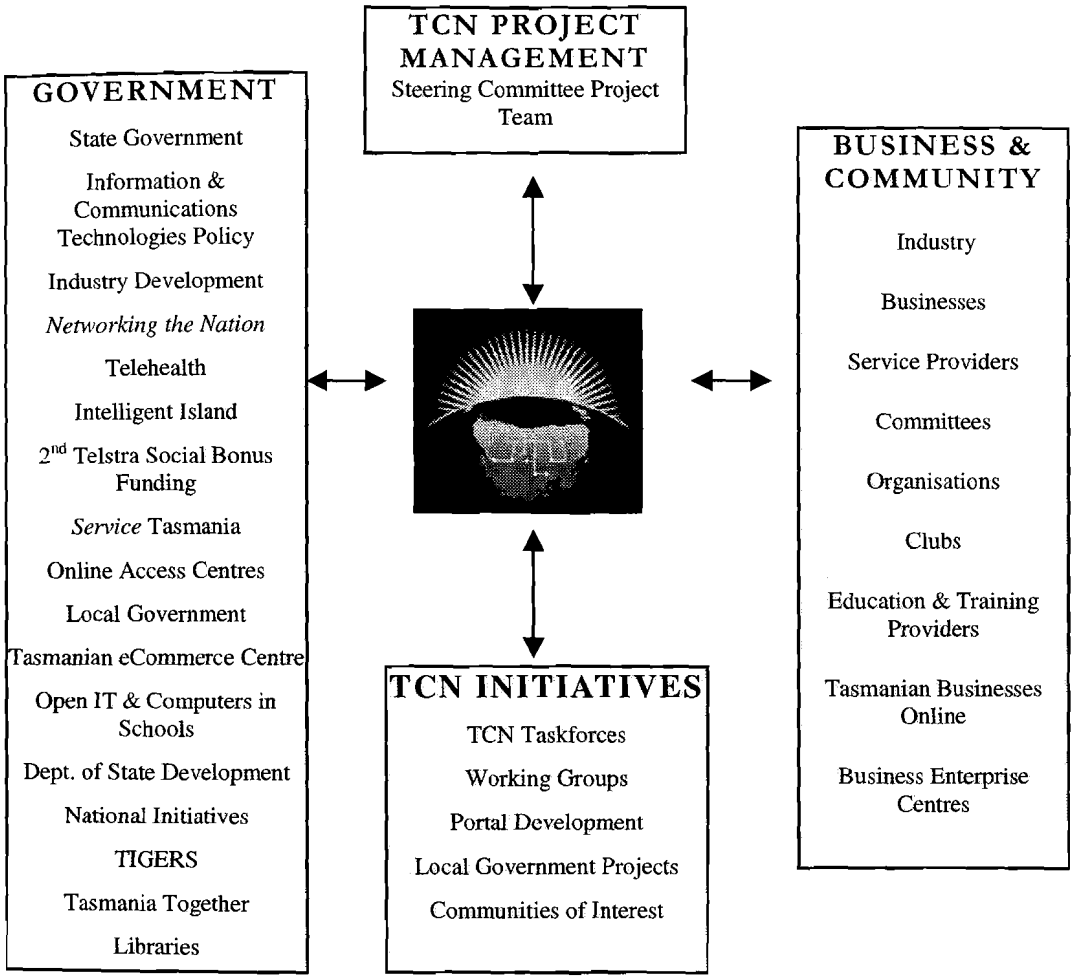
4.4 TCN Supports Other Organisations

The TCN works with organisations such as:

- Department of Communications, Information Technology and the Arts;
- Community Online Access Centres;
- Adult Education;
- *Service* Tasmania;
- National Office for the Information Economy;
- Integrated Community Networks;
- State Libraries;
- University of Tasmania;
- TAFE; *and*
- Office for Government Online

Many of the organisations and stakeholders listed above are represented on TCN taskforces and working groups.

4.5 Government and Community Linkages to the TCN



5. Tcn Phase 1 – Policy Development And Implementation(February 1998 - August 1998)

At the beginning of Phase 1 in February 1998, over 300 community and business representatives statewide were consulted. Within focus groups at regional meetings they identified a list of issues critical to developing Tasmania and Tasmanians in a technological age.

These issues were:

- Economic development;
- Competitiveness in new markets;
- Identification of a common vision for, and across, Tasmania;
- Employment opportunities, especially for youth;
- Access to lifelong learning and training;
- Youth health and access to youth services;
- Capitalising on local resources and expertise;
- Maintaining a local identity within a State and global system; and
- Access and awareness of Information and Communication Technologies (ICT) for all Tasmanians.

Subsequently, during that first year, the TCN regional taskforces were formed from a wide range of businesses, service groups, community and sectoral interest groups. The aim was to ensure all regions and as many groups as possible were represented in the process of addressing the identified community needs and issues.

The taskforces determined some solutions to these issues and the demand, if any, for such solutions using IT applications. They established working groups to steer particular projects, and to build the necessary long-term partnerships between business, government agencies, service providers and community organisations. This work was continued during Phase II.

5.1 Regional Taskforce Projects

Table 1. Keys Concerns and Projects

Key Concern	**Completed Project**
Economic Development	IT Business Clusters Planning
eCommerce	Import Replacement Service
Employment and Job Creation	Career Planning Advisory Service
IT Awareness Programs	Publications Bridging the Generations
Business Development	Online Advantage for Small Business and Small Business Online Training

5.2 Northern Tasmania

5.21 IT BUSINESS CLUSTERS PLANNING

Working with Business North and major industries, this project developed an environment for Tasmanian IT businesses to form consortia which will provide major customers and local businesses with effective and competitive sources of IT products and services.

5.22 CAREER PLANNING ADVISORY SERVICE NOW CALLED "SPRINGABOARD"

www.springaboard.com.au
An online resource for individuals planning a career path, seeking work or upgrading skills, this service includes businesses, service providers and educational institutions addressing current and anticipated skills needs. It is now supported through the Launceston City Council.

5.3 Southern Tasmania

5.3.1 IMPORT REPLACEMENT

This project was designed to assist small businesses to replace imports with Tasmanian goods and services wherever possible. Using ICT services, small business and government would be able to access registers of Tasmanian business capabilities, government procurement processes and new business opportunities.

5.3.2 IT AWARENESS PROJECTS

A number of IT awareness resources have been produced to dispel the fear of ICT and encourage the use of online technologies.

Some of the resources are:

- The Talking Technology Series (two videos produced);
- Videoconferencing - Meetings of the Future (resource booklet);
- Computers Won't Byte (video);
- How to Find and Buy your First Computer and get on the Internet (resource booklet);
- Site Bytes (an email and Internet address book); *and*
- "Bridging the Generation Gap" - an innovative pilot program involving Grade 9 students from St Michael's

Collegiate School sharing their computing skills with the elderly residents of St Ann's Residential Home.

5.4 North West and Statewide

5.4.1 ONLINE ADVANTAGE FOR SMALL BUSINESS

A model for IT access and training for small business was developed, supported by the TCN and the Devonport Online Access Centre. Sessions were run on e-commerce, computer and web development, and all were fully subscribed.

A total of 16 further online training sessions involving over 100 small businesses were held around Tasmania, supported by the TCN in partnership with the Tasmanian Chamber of Commerce and Industry (TCCI).

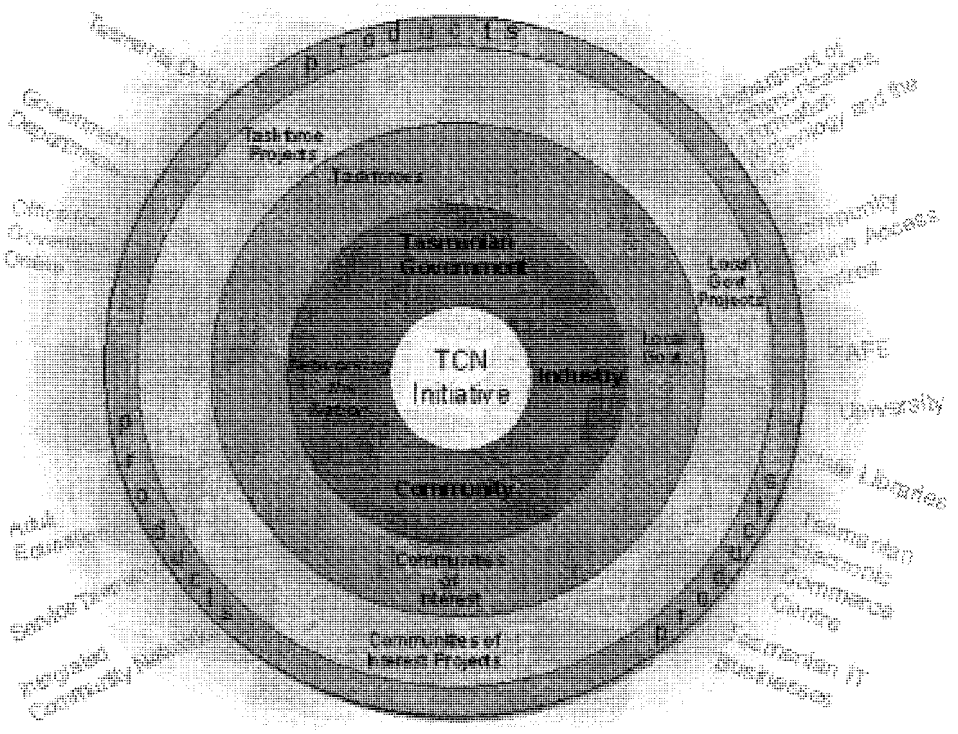
6. TCN Phase 2 – Development (September 1998 - January 2000)

Phase 2 continued to develop the taskforce and working group solutions, ready for implementation. Communities of Interest such as seniors, youth, women in agriculture and people with disabilities joined the TCN process and established or joined projects that addressed their own group's needs.

Several local governments also joined the TCN process, and actively developed ICT solutions for key economic development issues identified in their regions.

A review of the TCN, at a statewide meeting of community and business representatives in June 1999, agreed that Phase 2 had addressed the issues identified at the outset to some extent. The review set in place directions and guidelines to carry the process forward. It was agreed that the process was only just beginning to gain momentum and needed to continue.

Figure 1. TCN's Partners, Stakeholders, Supporting Organisations & Projects as at the end of Phase II



6.1 Local Government and Community Portals

6.1.1 TASMANIA CENTRAL PORTAL www.tasmaniacentral.tas.gov.au

A joint project covering the municipal boundaries of Central Highlands, Northern Midlands and Southern Midlands is a web site that will promote the Central Tasmanian community and its industrial, commercial, community and tourism opportunities. It will enable people to do business over the Internet in the region. Other councils are now looking at similar initiatives for their regions.

6.1.2 MEANDER VALLEY COMMUNITY PORTAL

A similar project to the one above is being driven by the three Online Access Centres managers in the Meander Valley region. It is

supported by local businesses, Local Council, the Business Enterprise Centre, community representatives, educational institutions, service clubs and providers. The initiative has begun with all tourism businesses online and will extend to all regional commerce and community activities.

6.1.3 Circular Head Council/Government Partnership Agreement

The Circular Head Council is using the TCN process to identify opportunities for the use of ICT in the region, in the context of the first partnership agreement between State and Local Government. A 'Taste IT' Fair was held on 25 March 2000, bringing all sectors of the community together to encourage the use of online technologies in the region, to share resources and to begin a regional audit of ICT. The Fair was managed by the Business Enterprise Centre with support from the Local Council, schools, TAFE and the TCN.

6.1.4 Communities Of Interest

A number of Communities of Interest (working Statewide) have formed part of the TCN initiative. These are:

- Leading Edge Youth Advisory Service;
- Non-Government Organisation Online Network;
- Connecting Seniors - SeniorLink Tasmania;
- Tasmanian Women in Agriculture;
- eLaunceston; *and*
- King and Flinders Islands.

6.1.4.1 Leading Edge Youth Advisory Service

www.youthscene.tased.edu.au

The Office of Youth Affairs now has funding to introduce multi-media advisory services, particularly out-of-hours services for young people in rural and isolated areas.

6.1.4.2 Non-Government Organisations Online Network

Funding, training, access problems and lack of information have all been identified as barriers to ICT uptake in the welfare sector. Key non-government organisations are working on an ICT Statewide strategy to address this problem, by linking as many other special-needs providers in the State. The aim is to provide and sustain ICT support for the businesses and clients in this sector.

6.1.4.3 SeniorLink Tasmania

Supported by the TCN, SeniorLink Tasmania promotes companionship and interaction among seniors through providing opportunities for gaining skills and confidence in ICT. SeniorLink supports retirees who have or intend to buy a home computer, including linking them with buddies who are computer literate. Their membership is growing rapidly.

6.1.4.4 Tasmanian Women in Agriculture

Working with the TCN, this network of rural women surveyed the level of knowledge and use of ICT in rural Tasmania. A number of 'Taste IT' (Information Technology) days have also been held to encourage the rural community to use ICT and to discover the benefits it can bring to the farm. More have been planned.

6.1.4.5 eLaunceston

This Telstra Research Laboratories project aims to better understand the factors that motivate people to use the Internet, with a focus on access to local content. Telstra has collaborated on this project with the Launceston community and other key stakeholders, including TCN.

6.1.4.6 Flinders and King Islands

The TCN works with residents, businesses and the Local Governments of the two island communities to improve access to electronic services and telecommunications on those islands.

6.1.4.7 'Taste IT' Days

'Taste IT' Days are friendly, practical gatherings that introduce participants to the benefits of information technology (IT). These days introduce online technologies such as using: computers and websites; online banking; electronic commerce; *Service* Tasmania and Online Access Centres. By getting a 'taste' of what IT can do for you many myths regarding IT can be dispelled. The Tasmanian Community Network (TCN) facilitates these days together with other groups and projects.

7. Phase 3 - Online Usage & Sustainability (February 2000 - January 2002)

This phase is fostering and sustaining an online culture in Tasmania and increasing usage of existing online services.

The key messages we are communicating to TCN stakeholders in Phase III are: -

- TCN is a community-based ICT demand creation strategy that provides a gateway to online technologies and services through its unique people network of community, business and government.
- Isolation and disadvantage can be addressed by communities adopting online technologies.
- The web offers more than just web site browsing.
- Tasmania has many services, facilities and programs available to assist groups and individuals get online.

The following strategies and activities assist the TCN communicate these messages and achieve the aims for this phase:

An interactive TCN web site (**www.tcn.net.au**) is used as a marketing, communication and information tool. Ultimately this assists communities to continue online collaboration and learning beyond TCN funding. It features the following:

- Interactive online meetings and community-owned forums.
- Links to relevant web sites, information and resources.
- General promotion of web technologies.

The TCN team continues to work with groups to establish of web portals and other online activities. For example:

- Local Governments who are developing web portals for their region such as the Tasmanian Central Portal, consisting of three councils, and Meander Valley Online.
- The State Government in partnership with Local Governments to develop IT strategies for their own business and for their region to ensure an aggregated demand for services and avoid unnecessary duplication of resources and effort. (To date we have worked with five individual Councils and a regional group comprising eight Councils.)
- Connecting groups together who are working on similar and/or complimentary projects.
- Connecting people with available education and training services and opportunities in the IT area in partnership with relevant organisations such as Tasmanian Chamber of Commerce and Industry, Telstra, University of Tasmania, Adult Education, TAFE, Tasmanian Farmers and Graziers Association, Tasmanian Women In Agriculture, Online Access Centres and private providers.

- Targeting non-information-technology users and introduce them to the benefits of information and communications technologies. For example, hold 'Taste IT' (Information Technology) days.
- Connecting Tasmanians to existing online services and programs established as a result of major Tasmanian Government initiatives and the *Networking the Nation* program. This will support the sustainability of services such as: Community Online Access Centres; *Service* Tasmania; Telehealth; Tasmania Online; Open IT, Tasmanian Business Online and the Tasmanian Electronic Commerce Centre.

8. Conclusion

The list of issues identified in the community consultation process provided earlier in this paper are common to practically all regional communities to some extent, and Governments at all levels have developed numerous strategic approaches and programs to address them. While there have been many successes to a greater or lesser extent, many of the problems are entrenched and to date are a persistent feature of regional communities.

By taking a fundamentally different, community-directed approach through the TCN, and setting the strategic solutions to community issues alongside its existing ICT Framework and resulting programs, the Tasmanian State Government has tested a novel way of creating demand for and developing creative solutions to community needs.

The TCN management team facilitates and mentors throughout this exercise; providing resources, advice and information, but not direction. Project ownership is generally outside the TCN; with a community group, local government, business association etc, or a combination of these.

While many of the solutions that have emerged relate to ways of introducing ICT to regional communities—for example the 'Taste IT' Days and the 'Online Advantage' programs—others take advantage of new technologies in order to manage community and business needs; for example the "Springaboard" Career Planning Information Service and the Import Replacement service.

The TCN project has achieved many of its original objectives but has not yet reached its full potential. So far, it has established a widely accepted process, involved communities in identifying THEIR most pressing needs, and facilitated the development of strategic solutions by regional taskforces during phases 1 and 2.

The ongoing commitment and involvement in the TCN by key regional organisations (such as local government, business organisations, education, health providers and service organisations) is essential. By integrating strategies and

services with existing regional programs and encouraging the spreading of responsibility and delegating leadership throughout the community, we are now seeing projects that are meeting identified needs and priorities.

One of the TCN key principles is that a community, region or community of interest must have services that people want and that they have identified as necessary (i.e. strongly identified demand), so people will want to access the infrastructure (supply). The aim is to develop integrated, user-friendly solutions, that are affordable and easily available for all people.

In the short term, the Tasmanian Community Network has been proactive, well-received and effective. The TCN has proved to be an effective model for governments to involve communities - in not only identifying their needs but also in developing policy and programs. "Tasmania Together" is based on such a model, to identify a common vision for Tasmania and is supported by all political parties.

CASE STUDY: COMMUNITY INFORMATICS AT WORK ON THE CENTRAL HIGHLANDS OF CENTRAL QUEENSLAND

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Abstract. *This report is a case study of the CH Connect project conducted on the Central Highlands of Central Queensland, Australia. The discussion asks the question "What makes a successful project?" and offers the criteria outlined by Elizabeth Nunn (2000) and Mal Bryce(2000), who both have had experience in dealing with successful projects in the past.*

Elizabeth Nunn states that those NtN projects that are successful have the following characteristics –

Led by experienced Project Managers who:

- *Are NOT information technology specialists*
- *Remain focused on their communities*
- *Remain focused on reasons for projects*
- *Network generously with other NtN projects*
- *Collaborate with other projects and programs*

Whilst Mal Bryce states that some of the keys to success are -

1. *Support from the top is critical*
2. *Start small and grow fast*
3. *Don't allow the project to be developed as an IT project*
4. *Strategic partners are very important*
5. *Define the WIIFM ("What's in it for me?)*
6. *Design projects which can be managed and maintained afterwards*
7. *Collaborative learning is a vital part of the process*
8. *Be prepared to be highly flexible, innovative and wrong*
9. *Remember an internet year is only three months*
10. *Remember every company and community is different. Therefore responses, resources and priorities will be different.*

The discussion will show that the CH Connect project has favourably addressed each of the criteria offered by E. Nunn and M. Bryce. A successful combination of community consultation and support, Local Government support, strategic partnerships and Project Coordinator appointment, along with Federal Government funding, has resulted in ten communities taking up new technologies – Community Informatics at work.

1. Introduction

The Central Highlands is a unique and industrious region lying west of Rockhampton, in the Central Queensland area of Australia. The region encapsulates seven Local Government Shires - Bauhinia, Belyando, Broadsound, Emerald, Jericho, Nebo and Peak Downs and is a thriving hub of community and commercial activities.

Major industries are coal (opencut and underground) and agriculture (including grains, cattle, horticulture, dryland and irrigated cotton) production. The region is rich in natural resources, ie coal, but also supports a strong primary production sector by service industries, manufacturing and retail operations.

In June, 1998, the Central Highlands Development Corporation (CHDC), an incorporated body comprising the Shires of Bauhinia, Emerald, Jericho and Peak Downs, applied for funding assistance from the Commonwealth Department of Communication, Information Technology and the Arts (DoCITA) – specifically the Department's Networking the Nation (NtN) fund. The purpose of the application was funding for implementation of the "CH Connect" project. The CH Connect project's primary goal was to rollout videoconferencing and internet facilities, as well as training and support for ten communities across the seven Local Government Shires.

Rationale for the project included - that people in the region generally suffered from the "tyranny of distance"; were disadvantaged by isolation with interpersonal communication and access to services often involving travel long distances (with the associated costs of time and money); and that people were generally unable to participate in important decision-making forums of relevance to them. It was believed that the provision of modern communication tools (ie internet and videoconferencing) would significantly benefit the people in the region by giving them greater opportunities to interact with others (intra-regionally, inter-regionally, nationally and globally), and give them greater access to important services (financial, medical, social) through electronic means.

Community support for the project was widespread with the list of stakeholders including Queensland State Government Departments (eg Natural Resources), Local Government (ie the seven Shire Councils), Human Services Sector (eg Teen Challenge, Domestic Violence Service), Pastoral/Grazing Sector (eg Graingrowers Association), Conservation Sector (eg Conservation Council), Indigenous Groups (eg Aboriginal Council), and Education Providers (eg Central Queensland University).

An interesting point to note is that the funding application was made by a body incorporated under four of the seven shires, ie the Central Highlands Development Corporation (CHDC). At a point prior to the final application being submitted, the three northern shires (Belyando, Broadsound and Nebo) placed a preliminary

application with NtN. Ms Lynda Pollock (Rural Support Worker, Middlemount) undertook extensive consultations with stakeholders in these three shires. However, as there appeared to be similarities between the two applications, a decision was made to the effect that a single all-encompassing application would be made by the CHDC, with the expectation that it would have a greater chance of success. Factors supporting this decision included the CHDC's project management capability and ongoing administrative support. The collaboration shown by the seven shires highlights the strong community support for the CH Connect project.

Shortly thereafter, in August, 1998, it was announced through DoCITA's Regional Telecommunications Infrastructure Fund (RTIF) Secretariat that the project application was successful with the provision of up to $548,700 for the project implementation.

At the time, Cr Paul Bell (Mayor Emerald Shire), declared "The CH Connect project is a boon to our region – it brings employment opportunities; community access to technology; training in technology and opportunities for closer coordination between Shires in the Central Highlands region."

The project was to be implemented across the townships of Springsure, Emerald, Alpha, Capella, Clermont, Tieri, Middlemount, Dysart, Moranbah and Nebo in three phases:

Phase 1 - Rollout (January 1999 – June 1999) – Site and supplier selection, furbishing and equipping of CH Connect Centres, host education and awareness, preparation of support literature and training materials.

Phase 2 – Implementation (July 1999 – December 1999) – Facilitation of CH Connect Centres into the community, broad public awareness and training focus, empowerment of community groups in use and benefits of the technology. Broad promotion of the availability of CH Connect Centres throughout the region, establishment of networks with other public videoconferencing facilities.

Phase 3 – Handover (December 1999 – June 2000) – Scaled down management of CH Connect and focus on empowering host organisations in the ongoing promotion, training and sustainability of CH Connect Centres.

However, a number of delays were experienced which resulted in the project commencing in July 1999, with the appointment of the Project Coordinator, Ms Kerrie-Ann Kuhle. The nature of the delays included – a federal government election which saw all departments in caretaker mode, delays in finalisation of the Grant Deed between the Commonwealth and the CHDC, and withdrawal of the successful candidate for the Project Coordinator's position resulting in readvertising, new round of interviews etc.

Since July 1999, the project has progressed to the point today (November 2000) where all ten videoconferencing sites are operational, two of the ten internet sites are installed, and in excess of 150 Central Highland residents have undertaken training in the new technologies.

Community support for the project is still strong to the point where in the last round of NtN funding (September, 2000) an application for an additional $541,000 top up funding was made. The application consisted of funding for –

1. 12 port multipoint videoconferencing bridge;
2. videoconferencing equipment for Glenden and St Lawrence;
3. videoconferencing equipment for the Dysart Family Support Centre, CQ Domestic Violence Service, and CHDC's Multimedia Trainee (CH Connect);
4. Top-up funding for existing videoconferencing equipment, additional peripherals and insurance;
5. additional training;
6. funding to support ongoing management for a further nine months.

The rationale used to support this application for additional funding included - to ensure ongoing sustainability and viability of the project; and to build upon and enhance the network already established. A decision on the success or otherwise of this application will not be known until early December 2000.

2. Discussion and Conclusions

So how is the success of a project measured? What makes a project successful?

To answer the first question, a project could be deemed successful if it achieves the activities and milestones it sets out to do. The CH Connect project has endeavoured to complete all of these through timely project management. Regular reporting to the CHDC Board, as well as periodic contact with the major stakeholders, has ensured that all parties are well informed. This has enabled all parties to be part of the decision making process, with all points of view, venue requirements, and community needs taken into consideration.

To answer the second question is a much more difficult process.

2.1 *What makes a project successful?*

Elizabeth Nunn, State Coordinator, RTIF (2000) has stated that those NtN projects that are successful have the following characteristics –

Led by experienced Project Managers who:

- Are NOT information technology specialists
- Remain focused on their communities

- Remain focused on reasons for projects
- Network generously with other NtN projects
- Collaborate with other projects and programs

Further, Mal Bryce (AO, BA, Hon DTech, FAICD, FAIM) – former Minister for Industry & Technology, and Deputy Premier of Western Australia (2000), states that some of the keys to success are –

1. Support from the top is critical
2. Start small and grow fast
3. Don't allow the project to be developed as an IT project
4. Strategic partners are very important
5. Define the WIIFM ("What's in it for me?)
6. Design projects which can be managed and maintained afterwards
7. Collaborative learning is a vital part of the process
8. Be prepared to be highly flexible, innovative and wrong
9. Remember an internet year is only three months
10. Remember every company and community is different. Therefore responses, resources and priorities will be different.

So the question is then asked – Does the CH Connect project fit all these criteria? And the answer would be – Yes.

2.1.1 Discussion of Elizabeth Nunn's criteria

To expand, firstly, using Elizabeth Nunn's criteria that focuses on the characteristics, management style and networking skills displayed by the Project Coordinator.

The CH Connect Project Coordinator, Ms Kerrie-Ann Kuhle, had previously managed a successful VET Sector project involving the training of young, unemployed rural people. Although Ms Kuhle is studying IT, she is not an IT specialist. However, she does have extensive practical IT and Training experience. Ms Kuhle has lived in the Central Highlands region for 18 of the past 20 years. This commitment to the local region demonstrates her ability to remain focused on the communities involved, and therefore, to remain focused on the reasons for the project.

Ms Kuhle has endeavoured to network with other NtN projects, and to collaborate with other projects and programs in a number of ways. Initially, contact with other NtN (and potential NtN projects) was instigated by attendance at the Charters Towers NtN Forum held within two weeks of Ms Kuhle's appointment. So, very early in the life of the

project, contact was made with other projects, such as "Networking North Queensland", and "Dawson Callide Net".

Further, face-to-face contact was made with the NtN Secretariat. This was an extremely important meeting since the opportunity to meet with the project secretariat assisted to build rapport that would have been virtually impossible over the telephone.

March 2000 saw the CH Connect project host the Emerald NtN Mini-Forum with Project Coordinators from around the state attending either in person or via videoconferencing. This exercise was instrumental in cementing the project's place within the NtN network. The success of the networking activities is due in no small part to Ms Kuhle's ability to draw people together.

The CH Connect project is an integral component of another NtN project – Qe.Net, with Ms Kuhle selected to deliver two levels of E-Commerce workshops in the Emerald area. These workshops complement the training already delivered by the project, and are another example of generous networking with other NtN projects. Further information on the Qe.Net project can be found - www.businessonline.statedevelopment.qld.gov.au\qenet

Further integration with other NtN projects has occurred with similarities and geographical overlaps between the CH Connect project and Mackay Regionlink (being delivered by Mackay Region Tourism and Development Board), as well as the CH Connect project and CQEST (delivered by Queensland Health through the Proserpine Hospital). In both instances, the CH Connect project has maintained close links to ensure the projects take advantage of any synergies, and that a duplication of services does not occur.

Ms Kuhle has also looked at the "bigger picture", looking outside of the NtN program to develop networks. An example of this is the Community Tele-Services Association (CTSA), of which Ms Kuhle is the National Vice-Chair. The CTSA's brief is to represent rural and regional Telecentres, Rural Transaction Centres, Online Access Centres and any other community-based teleservice centres. The Association objectives include:

- Represent and advocate on behalf of teleservices centres to the government and the community.
- Encourage and support the development of teleservices centres and assist them in their operations.

- Develop a strong profile to promote the role of teleservices centres within the community throughout Australia.
- Contribute to the development of best practice in teleservices centres by setting and monitoring service standards and quality assurance mechanisms.
- Disseminate relevant information to teleservices centres across Australia.
- Provide a mechanism to represent the views and needs of teleservices centres in each State and Territory at a national level.
- Establish links with international teleservices.

Further information regarding the CTSA can be found at - www.teleservices.net.au This level of networking provides the CH Connect project with another view of the opportunities available for the communities involved.

2.1.2 DISCUSSION OF MAL BRYCE'S CRITERIA

Secondly, examining Mal Bryce's criteria, which focuses on various elements –

2.1.2.1 Support from the top is critical

The support shown to the project from the seven Local Government Shire Councils has been unwavering. All councils have been enthusiastic in grasping the new technologies and have been more than willing to assist with the rollout of equipment and training. An example of this is in Nebo Shire, where the Council have been wholeheartedly behind the concept and actualisation of the project for their community.

2.1.2.2 Start small and grow fast

It was decided to "start small" with the small township of Capella selected as the "test site". This came about due to a couple of reasons.

Firstly, the proximity of Capella to Emerald (CHDC's base) with Capella being only 50km north. This allowed for technical and administrative support to be close at hand. Secondly, the venue facilities at Capella are second to none. The meeting room at the Capella Aquatic Centre was already

carpeted, air-conditioned and furnished with chairs and desks. The site fit out process was relatively straightforward with only phone lines and power points to be fitted in the appropriate position.

Once the site was complete, the community training phase ran relatively smoothly with enormous support from the local High School.

The "grow fast" component then occurred with videoconferencing equipment ordered and installed at the other locations within a relatively short time. Training in use of this equipment then followed.

2.1.2.3 Don't allow the project to be developed as an IT project

The CH Connect Project has never been seen as an IT project. This is in part due to the fact that the Central Highlands Development Corporation's mission is to deliver economic and social benefits to the region. Further, the project is seen to be delivering community needs – greater access to technology, therefore bridging the gap between communities.

2.1.2.4 Strategic partners are very important

The project has engaged several strategic partners in the form of VTEL Corporation and the Futuregroup company. VTEL (Austin, Texas, USA) is the manufacturer of the state-of-the-art videoconferencing equipment installed in all ten sites, with Futuregroup being the local supplier. More information regarding these two companies can be found on the Internet at www.vtel.com and www.futuregroup.com.au respectively.

Further, the seven Shire Councils could also been seen as strategic partners since the ongoing cooperation between the councils and the project staff has been instrumental in the success of the project.

2.1.2.5 Define the WIIFM ("What's in it for me?)

The CH Connect project very quickly identified the WIIFM for the communities involved – access to new technology and training workshops in these new technologies.

Of particular note was the decision to conduct five workshops – Introduction to Computers, Internet/Email, E-Commerce,

Web Page Authoring, and Videoconferencing. This range of workshops, catering for users from the lowest level to the more advanced, appealed to the general community as offering something for everyone.

2.1.2.6 Design projects which can be managed and maintained afterwards

The CH Connect project uses a number of strategies to ensure its long term manageability.

Firstly, the cooperation of the Shire Councils to become custodians of the equipment and facilities. This will ensure that the infrastructure is kept within the communities.

Secondly, the flexibility of the equipment installed. The videoconferencing equipment (VTEL's Work Group 500) is pc-based architecture and placed on a movable "smart cart". This means that the equipment is much more flexible in the short term, being completely mobile and offering an additional pc for council usage. This also means that in the longer-term this equipment can be easily upgraded, offering a less financial burden for the custodians.

2.1.2.7 Collaborative learning is a vital part of the process

The project has undertaken collaborative learning by intense networking with other projects – both NtN projects and others. The process of watching and learning from other projects that are more at a more advanced state is a valuable one. Information has been gleaned from projects such as "Women's Justice Network", "Networking North Queensland", and "Dawson Callide Net".

2.1.2.8 Be prepared to be highly flexible, innovative and wrong

Once again, this holds true for the CH Connect project. Flexibility and innovation were seen as issues as far as the type of videoconferencing equipment was concerned. The custodians didn't want to be locked into the situation where a dedicated videoconferencing room was required. The innovative solution was to acquire state-of-the-art equipment from the US.

The project has made mistakes also. One of particular note regards the timing of training workshops in Tieri. At the time this community was besieged by a prowler, resulting in the townsfolk being apprehensive about venturing out at night, or leaving their wives at home alone. This resulted in a significant reduction in the number of workshop participants. The Project Coordinator was aware of this issue, but failed to take it into account when organising the workshops. As a result, additional workshops will need to be conducted in the future to make up for the lack of community response the first time around.

2.1.2.9 Remember an internet year is only three months

The CH Connect project has taken this into consideration when conducting workshops by ensuring that all material is thoroughly researched and up-to-the-minute information is delivered. An example of this would be the Internet/Email workshop where participants work through seven internet-based exercises. The exercise workbooks are printed the day preceding the workshop, after each internet site is checked for content.

2.1.2.10 Remember every company and community is different. Therefore responses, resources and priorities will be different

This also holds true for the CH Connect project. The project has attempted to address each community's needs through thorough community consultation. Each community was asked, through its Shire Council, what its requirements were, suitable location(s), type of training needed etc.

A favourable outcome, particularly regarding the videoconferencing equipment, came down to flexibility of the equipment. As discussed previously, the equipment is pc-based architecture offering greater flexibility to the communities.

The broad range of workshops offered was a reaction to the general community response that highlighted the need for low level, low cost workshops delivered in a non-threatening environment.

3. Conclusion

Throughout the preceding discussion, it can be seen that the CH Connect project has favourably addressed each of the criteria offered by E. Nunn and M. Bryce. A successful combination of community consultation and support, Local Government support, strategic partnerships and Project Coordinator appointment, along with Federal Government funding, has resulted in ten communities taking up new technologies – Community Informatics at work.

Acknowledgements

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SUSTAINABLE TELEWORK

Choices, Preferences, and Performance Indicators

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Abstract. *Technological, social, economic, and organisational factors are converging to facilitate remote or distributed work trends. Telecommuting--working at home or at some other remote location and using communication technologies in lieu of the requirement to travel to the office – is the best known of the distributed work options. Telework is another term to describe the collective set of distributed work practices in the European context.*

The purposes of this paper are two-fold: firstly, to examine telework trends in the corporate world, drawing on findings from existing data; and, secondly, to establish preliminary linkages (as part of emergent research) between telework in the corporate sector and telework in the university sector. A core aim is to underscore how demographic, personal, work, organizational, domestic, and technological factors have been shown to contribute to the 'proxy' indicators of sustainable telecommuting in corporate sectors; namely, telecommuter job satisfaction, telecommuter lifestyle satisfaction, and telecommuter productivity. Drawing on recent qualitative and quantitative research data, the experiences of 189 Australian and United States 'corporate' teleworkers are linked to these proxy indicators. Attention is drawn to similar inventories exist elsewhere in the telework literature. Also indicated are the broad generic descriptors of 'sustainable teleworking' as a framework by which similar enquiries may be pursued regarding telework in the university sector.

Conclusions for policy planners focusing on the introduction of telework in university settings are also offered in the context of on-going research.

1 Introduction

Telecommuting or, in the broader context, telework involves working at home or at some other remote location and using communications technologies in *lieu* of travel to the office (for useful overviews of these trends, see Gray, Hobson & Gordon, 1993; Hill, 1995; Huws, Korte & Robinson, 1990; Jackson & Van Der Wielen, 1998; Kugelmass, 1995; Nilles, 1998; Switzer, 1996). Yet these work options are not new. They have been touted for well over twenty years as compelling work options. Telecommuting, in particular, has also been actively promoted as a powerful tool to reduce traffic congestion, save on energy consumption, and cut back on pollution (Mokhtarian, 1997). It has been further suggested that telecommuting can reduce office space and other costly overheads, increase worker productivity, and make organisations more competitive. Telecommuting, most intriguingly, has been cited as a means to reconcile conflicts between 'work' and 'home', and significantly address 'quality of life' concerns.

Difficulties nonetheless persist with respect to deciding what the term 'telecommuting' means. For instance, Telecommuting has been variously described as 'telework', 'electronic homework', the 'electronic cottage', 'location-independent work', and 'flexiplace' (Huws, 1991; Kugelmass, 1995; Reymers, 1996). An addition to this confusing list is 'worksteading' (Farmanfarmaian, 1989).

The competing definitions of 'telework' and 'telecommuting' are particularly worth noting. Broadly speaking, 'telework' is used as a generic descriptor to refer to all forms of remote work and in this general context embraces self-employed home-based workers, independent contractors, as well as 'telecommuters' (e.g., Huws, Korte & Robinson, 1990; International Labour Office, 1990). Another example of interchangeability comes from Jack Nilles who coined the term 'telecommuting' (Nilles, Carlson, Gray, & Hanneman, 1976), but who more recently has acceded to both 'telework' and 'telecommuting' when describing current developments (Nilles, 1998). Although 'telecommuting' to many writers (i.e., Kugelmass, 1995) remains the preferred term, the practices have been sufficiently adopted industry-wide across the private sector in Australia by Hewlett-Packard, IBM, Lend Lease Australia and BP Oil as well as by public sector organisations such as the Brisbane City Council, ENERGEX Queensland, the Road Transport Authority of New South Wales, and TELSTRA Corporation Ltd. have formalised arrangements encouraging staff to telework.

Sufficient precedents exist to use the terms 'telecommuting' and 'teleworking' interchangeably. Therefore, 'telecommuters' or 'teleworkers' are, first and foremost as far as Australian organisations are concerned, either full-time, part-time, or contract corporate employees (versus fully self-employed home-based workers).

Finally, 'telecommuters' and 'teleworkers' need to meet three other core criteria:

(i) they have sufficient autonomy in their work arrangements to combine flexiplace (they may work at home or at some other remote location as well as in the traditional office);

(ii) they often have relative control of the time aspects of their work (i.e., flexibility in choosing actually when to work); and lastly,

(iii) in varying degrees, they rely on electronic communications to achieve work outcomes (Kugelmass, 1995, pp.20-22).

Therefore, in the interests of simplicity the term 'telework' is the centrepoint for discussion in this paper.

2 Telework Growth Trends

Teleworking in both Australia and across other 'information' societies is on the increase. In May, 1999 nearly 5% of employed Australian adults (0.4 million persons) self-reported that they had a formal telecommuting arrangement with their employers to work from home, compared to only 2% (0.1 million of employed persons) in May, 1998 (Australian Bureau of Statistics, Year Book Australia 2000, p. 632). Conceivably, such estimates may be only represent the 'tip of the iceberg' given that informal telecommuting arrangements, based on overseas trends, is reasonably extensive. In any case, more Australian organisations appear willing to embrace telecommuting as an adjunct to other flexible work options. Accordingly, in its 2001 Census, the Australian Bureau of Statistics will significantly expand its range of questions on 'telework' in order to capture actual figures.

In the United States, Apgar (1998) and Conrad and Poole (1998) concurred that the number of teleworkers may be as high as 15 million. Downsizing and outsourcing; along with ongoing refinements to information communication technologies; (ICT's); the promise of higher employee productivity; as well as projected savings on costly downtown office space; and an increase in employee needs for work and lifestyle flexibility are recognised as contributory factors accentuating future growth projections of telecommuting in the U.S. (Apgar, 1998).

Such growth projections can also be usefully viewed within a three-tiered typology or framework. The initial stage comprises 'volunteer' telecommuters (for the most part, valued professionals and some clerical workers) able to negotiate flexible work-at-home arrangements with their employers. The second tier comprises 'mandatory mobiles' (sales and servicing staff). Such workers – building on their earlier work-place traditions – are currently required to spend even more time in the field for more direct client contact (Apgar, 1998). After moving its sales staff into home offices, for example, the Compaq Computer Corporation reportedly was able to triple its revenue per person in two years (Compaq, cited in Hill, 1995, p.30). More recently, a third tier of telecommuter has emerged – the cybernetters, who are telecommuters adapting themselves to other unique demands of the virtual office

(for overviews see Grenier and Metes, 1995; Lipnack and Stamps, 1997; Meyers, 1997). In such work environments, teams and customers work together in flexible 'virtual' environments; they exchange ideas and information electronically; they may never meet face to face. Some writers (Hearn, Manderville & Anthony, 1998, Lipnack & Stamps, 1997) have similarly forecast new marriages of technology, markets, and work sharing arrangements. These writers have also forecast wide-ranging expansion in electronic work activities, which is likely to contribute to further increases in the incidence of teleworking.

3 Who are the Corporate-Private Sector Teleworkers?

Overall, information workers – because their work is knowledge-based and less location-based – are likely to remain at the forefront of private sector remote work developments. Typically, employees who telecommute are (a) a mixture of professionals (e.g., project officers, consultants, systems designers, research specialists, salespersons, academics, and others); and (b) clerical and support staff (*e.g.*, people doing routine and repetitive works such as data entry, word processing, or telephone-oriented jobs). As well-supported in the literature, significant differences regarding work autonomy and overall work conditions exist among these two broad categories of teleworkers, both with respect to the status of the employee and to the type of teleworking tasks being performed.

Despite growing employee interest in telework (as well as employer-motivated trends towards 'mandatory' telework) adoption rates for telework have not been large and appear to be constrained by two over-riding factors. For example, as empirically established by Mokhtarian and Salomon (1994) from their sample of 628 City of San Diego employees, these two factors are:

- external variables, *i.e.*, extent of awareness about telecommuting, employer-related awareness, job unsuitability, and management resistance/disapproval, as well as
- internal (psychosocial) variables such as the desire for social or professional interaction, lack of self-discipline, risk aversion, and household distractions

For 71% of the sample, it was reported that at least one of these 'external' constraints was binding; whereas, among the remainder of the respondents, about 50% said they would not choose teleworking because of perceived 'internal' constraints. Broadly stated, both types of constraints are extensively mirrored elsewhere in the literature (e.g., Huws et al., 1990; Kraut, 1989; Kugelmass, 1995; Meyers, 1999; Meyers & Hearn, 2000).

Accordingly, for both private and public sectors, adoption of telework should not be seen as automatic; rather, perceived constraints (in the eyes of potential teleworkers) are likely to significantly impact on levels of adoption.

4 Choices and Preferences for Telework

The notion of 'choice' has emerged as an important construct in the psychological literature and is a frequently cited determinant of whether or not individuals feel there is sufficient latitude in their personal lives and work contexts to achieve important outcomes. The exercise of 'choice' is also a critical measure of whether or not individuals feel they are 'pawns' bound by the exigencies of superordinates or 'controllers' of their own work-related agendas, as they evaluate alternatives as well as make choices among them, with respect to work issues and personal domains (Perlmuter & Monty, 1979). As extensively overviewed in Meyers (1999), a rich corpus of literature exists which demonstrates that motivation for control – and the ability to exercise choice – play an crucial part in human behaviour and that, generally speaking, individuals will be motivated to control important aspects of their work environment. Satisfaction of needs for personal autonomy in work environments and personal domains can also be empirically linked to satisfaction with telework outcomes (Meyers, 1999). Based on similar findings, it has been further suggested that individuals with high needs for autonomy are likely to be the most successful candidates for voluntary teleworking (Meyers, 1999).

Translated to the world of telework, volunteer teleworkers frequently make choices to exert control over important aspects of their work and lifestyle environments. For example, recent research (Meyers & Hearn, 2000; Meyers, 1999) has confirmed that employees volunteer to telework in order to:

- *Satisfy needs for autonomy* (work free) – Almost 71% of 150 respondents (Meyers, 1999) rated this as important in their choice to telework. Other research confirms the importance of this construct in telework situations (as representatively reported in Bernardino, 1986; Huws *et al.*, 1990; Korte *et al.*, 1988'; Olson, 1989)

- *Achieve more control of work outcomes* – A high degree of control over work has similarly been reported as achievable through telework (almost a third of respondents in Meyers, 1999 rating this as 'very important' and another 50% as 'moderately important'. This is a consistent finding in the telecommuting literature (as empirically found in Bernardino, 1996; Huws *et al.*, 1990; Kraut, 1989; Mannering & Mokhtarian, 1995; Mokhtarian *et al.*, 1999; Reymers, 1996).

- *Save on commuting time and costs* – Altogether 70% of respondents (Meyers, 1999 reported this aspect (including cost savings) as important, while other researchers (*e.g.*, Kraut, 1989; Mokhtarian *et al.*, 1999) have observed similar preferences.

- *Have flexibility of hours to meet personal lifestyle or family demands* – As recently confirmed (Meyers, 1999), 77% of teleworkers rate this as 'important' to 'very important' compared with 91% of teleworkers (as reported by Huws *et al.*, 1990). Interestingly, statistical cross tabulations did lend support for gender

differences, given the often-expressed viewpoint that the promise of teleworking to offer greater flexibility appeals more specifically to women than to men (*e.g.*, see Mokhtarian, *et al.*, 1999).

However, such choices in favour telework cannot be viewed in isolation; they need to be conceptualised in terms of performance indicators for telework within specific organisational contexts.

5 Performance Indicators for Telework in the Private Sector

Performance indicators linked to sustainable telecommuting can usefully be viewed at both the personal and environmental level.

Personal Factors

A full inventory of coping behaviours earlier empirically validated (Meyers, 1999) extends beyond the confines of the present paper. From a psychological viewpoint, however, teleworkers need approximately fifteen core coping behaviours in order to successfully self-regulate their behaviours, achieve work outcomes, effectively interact with co-workers "back in the office", and successfully maintain boundaries between "work" and "home" (Meyers, 1999). In short, the exercise of appropriate coping behaviours are the means by which teleworkers say that they exercise control of work outcomes as well as achieve work and lifestyle outcomes (the three 'proxy' indicators of sustainable telework in corporate sectors). The extent to which teleworkers perceived that their person-centred needs were being met through telework (and their desire to continue to telework) is summarised in the following table.

Table 1: Preferred duration of teleworking

Desired	Another 2-5 years	Permanently	Stop right now	Intermittently	Other
Respondents	12%	70%	1%	10%	7%

Source: (Meyers, 1999)

Likewise, teleworkers were overwhelmingly favourable in their endorsement of telework as a contributor to their job satisfaction (N=120 reporting "satisfied" or "very satisfied"); gave similar endorsement to telework as a contributor to their lifestyle satisfaction (N=119 reporting either "satisfied" or "very satisfied"); and also reported (N=112 respondents) that they were "more productivity' when teleworking.

Work Factors

Task characteristics, as noted from the telecommuting literature overviewed in Hartman, Stoner & Arora (1991), are important mediators of teleworker job satisfaction as well as teleworking sustainability. For example, several writers (e.g., Burch, 1991; Kinsman, 1987; Olson, 1983 among others) are unanimous that the very feasibility of the telework arrangement hinges on task suitability and the extent to which such tasks are location-independent (or can be made location-independent). More recent data (Meyers, 1999) underscores this importance of task suitability. Based on job characteristics, respondents (N=150) reported that the following proportions of their work were actually suited to teleworking.

Based on job characteristics, respondents reported that the following proportions of their work were actually suited to teleworking:

Table 2: Teleworkers: Work suitability

Proportion of work suitable For telecommuting (%)	Respondents (%)
00-30%	29%
31-50%	19%
51-70%	20%
71- 100%	32%
	100%

Source: (Meyers, 1999)

Respondents also indicated reasonable to high levels of flexibility in being able to choose when, where, and how to work:

Table 3: Teleworkers: Autonomy in work arrangements

	Choice in Work Scheduling	**Choice in Work Location**	**Choice in Task Selection**
Complete flexibility	N=35(24.5%)	N=28(19.4%)	N=33(22.8%)
Great deal of flexibility	N=72(50.3%)	N=55(38.2%)	N=70(48.2%)
Some flexibility	N=30(21%)	N=42(29.2%)	N=33(22.8%)
Very little flexibility	N=6(4.2%)	N= 15(10.4%)	N= 7(4.8%)
No flexibility		N= 4(2.8%)	N= 2(1.4%)

Source: (Meyers, 1999)

As indicated from the above tables, teleworkers, overall, reported that they had significant levels of control over their work arrangements; this contributed, in turn, to significant control of actual work outcomes

Control of other factors

Respondents also reported relatively high degrees of perceived control over work, organisational, and domestic factors they deemed mot important to their teleworking effectiveness as summarised in the following table

Table 4: Telecommuters' perceived control of work, organisational, and domestic factors.

TC's extent of perceived control	Work Factors	Organisational Factors	Domestic Factors
Almost no control	N=3(2%)	N=14(9.5%)	N=5(3.4%)
Slight control	N=13(8.8%)	N=31(21.1%)	N=5(3.4%)
Moderate control	N=49(33.1%)	N=57(38.8%)	N=42(28.6%)
A lot of control	N=59(39.9%)	N=33(22.4%)	N=66(44%)
Almost complete control	N=24(16.2%)	N=12(8.2%)	N=29(19.7%)
	148	147	147
Missing responses	2	3	3
	150	150	150

Source: (Meyers, 1999)

6 Summary: Proxy Indicators of Sustainable Telework in the Public Sector

Telework in the corporate (private sector) world continues to develop as employees seek more "choices" in their work and personal domains and so elect to telework at least on a part-time basis. Furthermore, trends in 'mandatory telework' suggest that employers will attempt to use telework to reduce costly office space, ensure employees have more direct client contact, or in other ways adopt telework as means to increase both employee productivity and job satisfaction. ICTs (most recently, multi-media technologies) are also becoming more sophisticated and elegant as "enablers" of future telework.

However, as indicated in Table 4, each organisation contemplating to introduce telework (or wishing to review its existing telework arrangements) might usefully begin by adopting a "control inventory" approach within each of the domains that contribute to telework 'sustainability' – teleworker productivity, teleworker job

satisfaction, and teleworker lifestyle satisfaction. A full listing of the factors that were qualitatively and quantitatively tested in the research (Meyers, 1999), as well as a list of all items respectively loading in the "personal", "work", "organisational" and "domestic" domains, are beyond the scope of the present discussion (although enquiries to the authors are welcome).

The point worth re-asserting is that adequate similar inventories exist elsewhere in the telework literature. What has been offered here is a focus on one study (Meyers, 1999) that illustrate the broad generic descriptors of 'sustainable teleworking' – thereby suggesting a framework by which similar enquiries may be pursued regarding telework in a traditional public sector organisation like a university.

However, it is useful to examine the extent to which these changes may be impacting on universities as organisations engaged in a total reassessment of their functional purposes, as well as pinpoint particular 'drivers' compelling academics to negotiate greater degrees of flexibility or control over their work – as precursors to the ongoing research outlined in the next section.

7 Sustainable telework in a specified public sector organisation – the university.

A cursory review of the International Dissertation Abstracts on Telework reveals a disproportionate level of research interest in private (commercial) sector projects. The proportion of private sector to public sector is in the order of 10:1. Indeed, there is less a handful of published manuscripts that have anything to say about telework in higher educational institutions. The disparity is disturbing for a number of reasons given the increased focus on ICTs on educational delivery, and the scope for telework in an emerging new order in higher education (Cunningham, 2000), particularly in Australia. More curiously, however, the gap in research in public sector organisations is out of pace with demographic trends and the increasing numbers of teleworkers across both private and public (government) sectors, in the US and in Europe. It would seem, also, that the shortfall in research only serves to distort attempts to institutionalise or implement telework initiatives per se. Notwithstanding the legitimate concerns underscoring the less than optimal prospects for empirical research in telework (Clark, 1998; Duxbury, 1998; McCloskey, 1998; Mokhtarian, 1997), it is clear that the impact of global information revolution and the economic imperatives which derive from renewed emphasis in ICT enabled work and productivity, the fact remains that organisations and institutions across private and public sectors operate according to different sets of assumptions. This fact has to be kept in mind because one purpose of research is to isolate the effect of ICTs beyond large-scale aggregates (Kling, 2000; Carnoy, 1997).

Since the inception of Nilles (1976) frame breaking research into commuter tradeoffs, telework has remain fluid. In someway this explains the overly optimistic narratives about ICT enabled work, when impact assessments remain largely qualified, and investigations into location-independent modes of working keep face

formidable challenges as technology advances. The gap in expectations is probably only matched by the level of enthusiasm for the next interesting idea into how interpersonal communication, interpersonal interaction is going to be changed irrevocably. The proxy indicators of sustainable telework appreciably provide an operational framework for identifying as part of preliminary research how telework might be assessed in a public sector organisation. The opportunity to focus on the higher education sector in Australia is in many ways timely, if not compelling. On this last point, Mannering and Mokhtarian (1995) have noted:

> The structure of work in modern organisations is a result of the myriad of interconnecting policies, laws, operating procedures, and social customs that often do not permit telecommuting-- even though the nature of the work itself and desire of the worker would suggest otherwise (p.61)

Thus, within any university setting, quite specific constraints might be seen to exist with respect to telework adoption rates.

In this case, following on from research undertaken in the US principally (Loher, 1987; Goldberg, 1993; Alston, 1997; Barbas, 1988; Cook, 1995; Cox, 1995) where academics have embraced the use of ICTs to support teaching, research, and administrative tasks, follow-on research may actually uncover whether needs for autonomy and choice impact on the decision to telework. More significantly, however, presumptions of choice may indeed be linked to a range of organisational attributes which impact on the salient issues underpinning work options for academics.

For the bulk of its history, higher education has been public property in Australia primarily due to "legislative protection" and strong financial support on the part of the Federal and State governments (Stanley, 1997; Reid, 1996). More recently, however, the higher education sector has undergone a number of major reviews and reforms, effectively replacing direct government control with free market forces. Incorporated with the move towards challenging the "traditional preserve of universities" have been the structural adjustments necessitated by "converging media and information technologies" which offer the prospect of knowledge transmission not limited by time and space" (Stanley, 1997, p. 239). Notwithstanding such developments it is quite likely (in terms of technical, administrative, and other support) germane to Australian university work environments, that purposive understanding of intervening organisational variables will go someway to furthering appreciation of telework adoption patterns. With the Australian higher education sector moving towards a quasi-commercial footing (Cunningham, 2000), interest in the changing nature of academic work beyond the confines of the office, the lecture theatre, and classroom has become more than topical.

8 Telework in Universities: Future Research Implications

In the present context, not much is known with regard to telework practices in Australian universities. Accordingly, further research will also entail sufficient description of methods or processes to support both objective analysis and interpretation of academic predisposition towards telework, given the shift in emphasis brought on by forces emanating from a deregulated sector, as well as calls for refinements in educational delivery mechanisms. Furthermore, with the increased use of ICTs more attention is expected to be focused on servicing the needs of remote learners, and, potentially, the use of collaborative or 'virtual' teams in university research projects.

Nonetheless, some interim conclusions can be drawn. Firstly, as already indicated in this paper with regard to corporate (private sector) telework, the theoretical discourse underpinning "sustainable teleworking" in the university setting, is contingent upon a balanced analysis of: "computerization and the quality of worklife (Kling, 1996, p.4). In short, university telework – along with private sector corporate telework – is likely to be particularly appealing to employees who see telework as instrumental to (i) resolve their work and lifestyle needs, and (ii) potentially satisfy their needs for autonomy.

Secondly, the question arises whether such 'proxy' indicators as exist for telework in the private corporate sector may also be transferable to the university sector. Our intuitive 'hunch', in the absence of other data, is that they should be. University administrators and policy makers are, it is argued, unlikely to agree on the adoption of telework without assurances that teleworker (in this case, university academic or university administrator) will give an undertaking that productivity will at least be maintained at levels comparable to non-teleworking arrangements. Similarly, teleworker volunteers are unlikely to persevere with telework unless they can achieve control of work outcomes. Moreover, the third 'proxy' indicator of telework sustainability – lifestyle satisfaction – will also have to be achieved if university employees wish to continue their telework arrangements.

Such 'proxy indicators of telework sustainability will have to be addressed (by university policy makers) if matters central to policy and planning telework initiatives are to be given any credence. So, what might a working definition of sustainable teleworking include? The answer need not be simplistic, but it is possible to presuppose, given the implications, that assessments of telework and its sustainability will be predicated on work and social policy initiatives that are an effective departure from present forms of work design; and that the processes of development are continuous, rather than discontinuous.

Conceivably, a working definition of sustainable teleworking would necessarily include: (i) demonstrable improvements in work practice brought on by the introduction of ICT's, (ii) enhanced opportunities for collaboration between those providing services (labour) and the recipients of those services, (iii) increased efficiency or flexibility aimed at improving not only productivity, but also the

quality of work experience, and (iv) replication or adaptation (proliferation) of methods to similar work contexts elsewhere.

Finally, the issue of telework remains an important for university employees as well as their policy makers. Interim research directions have been broadly indicated as the basis for continuing work.

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COMMUNITY INFORMATICS IN DEVELOPING COUNTRIES

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Abstract. *This keynote lecture intends to explore the intersection of three concepts: community, informatics, and developing countries. The paper mentions what, if anything, these concepts have to do with one another and why the intersection is of interest. It then goes on to develop some of the challenges that can provoke discussion in a forum such as this. It ends end with some wild-eyed recommendations about community informatics as a general model of the adoption and use of information technology, especially in developing countries.*

The purpose of this paper is explore the intersection of three concepts: community, informatics, and developing countries. We'll see what, if anything, these concepts have to do with one another, why the intersection is of interest, talk about what is going on, and mention some of the challenges that can provoke discussion in a forum such as this. I'll end with some wild-eyed recommendations that our august participants can "unpack" while I watch, sort of like intellectual drawing and quartering. While I can hardly claim to be an expert on community informatics in developing countries, I have explored most of the sub-intersections in recent years and find the concept rewarding intellectually while remaining a practical challenge.

1. The Basic Concepts

First, the major components (Figure 1). Here are some commonsense definitions

Community: A group of people who associate somehow with one another

Informatics: The development, adoption, use and management of ICTs (Information and Communication Technology)

Developing country: A geopolitical region that doesn't quite measure up to some arbitrary standard.

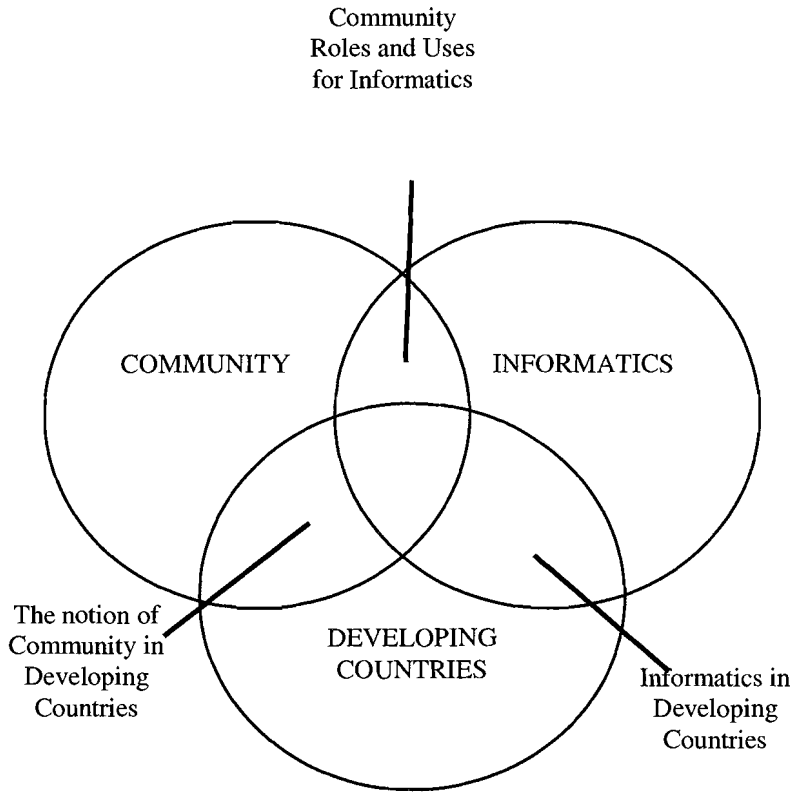

Figure 1. Intersection of Concepts

Now I want you to note quite carefully that these concepts are not particularly new. We've had communities forever it seems. Information and its processing have been important aspects of civilization for the same period. And all countries have been developing countries at some point in their histories, sometimes several times. For instance, consider Iran (ancient Persia), Egypt, and China. Development paths have been different (but has this difference been due to intrinsic – country – or extrinsic – contextual – factors?). There are also some folk beliefs or syllogisms about development and how the world is divided into different classes of "development". One of these beliefs is that "We are civilized, and others are barbarians." Another is a cluster of beliefs that our path towards development is imposable on others, that we should do the imposing and we are the best to decide how to impose it. A third syllogism is that our kind and degree of development is the "best", the "best possible" or "God-given", unique, and determined.

Here, the term "development" is used in its most inclusive sense: economics, culture, religion, society, education. There are also intellectual theories about development, sitting poles apart, that might be labeled Marxist approaches and the New World Economic Order.

Two interesting phenomena are now working to negate established theories of development. First, ICTs are making it almost impossible to speak about countries as entities any longer. Of course, in many cases, perhaps most, a "country" is a fiction of nineteenth century post-Waterloo politics, especially in Africa. Most of the country-like entities with which we are familiar with cities or collections of cities, held together by a variety of interests, mostly commercial or political/military -- a kind of commerce -- or religious -- yet another kind of commerce, of course. ICTs are bringing about multinational, multi-interest identifications, communities of interest that are both transcending as well as transecting traditional national interests. This is well known and well researched.

What must be taken into account is the vast web of people and talent that is making the concept of nation almost useless or at least operationally difficult. Those who "count" – and later I'll speak about "marginalisation" -- are voting with their electronic feet working here and there, bringing up children hither and yon, investing the fruits of their labors in this and that. The idea of a nation developing uniformly is kaput! Just as the HIV virus was (and probably still is) hollowing out the demographic/reproductive centre of East Africa, the economic liberalisation of the flow of capital mediated and energized by the Internet is bringing about a hollowing out of the human resource/skill transfer centre of much of the developing world. It's not a brain drain; it's a brain transfer.

And the effect of this is to alter, probably forever, what anyone can mean by "nation". For the first time, outside conditions of empire, a great many, maybe the majority, of people that influence thinking in the world, the knowledge workers, the productive professionals, know one another, are in continuous contact, exchange vital, interesting information with one another. When there is empire there's a brain drain from the periphery to the center, at least during the heyday of the Empire. Consider Rome, Britain, France, the Soviet Union. Those in the know already know one another. But there is no geopolitical empire now; it resides in the Internet. I know, and affiliate with, far more people I have never met than those whom I see daily, because I transact with them over meaningful issues daily on the Internet.

Similarly the idea of community is mutating considerably and I'm not just referring to electronic communities. One of the really annoying and most interesting traits of people in informatics is how they are all smarty pants who know everything and think that they've invented new concepts when the electronic form is just a minor variation on an important and powerful human concept. The term "Community" has been around for aeons; both testaments of the Bible refer to communities in it's non-proximal sense. Computer scientists didn't invent that. And others continue to reinvent this sense.

Consider a recent protest march organised by the University of Cape Town Muslim Students Association to protest the treatment of Palestinians by Israelis (presumably Israeli soldiers). What was interesting was their choice of focus for their anger. That was the Kaplan Centre for Jewish Studies. Now fifteen microseconds of

neuronic exercise will tell you that this makes as much sense as picketing a mosque to protest the behaviour of Indonesian soldiers in East Timor. But that's not the point; people make mistakes like this. It's the *pattern of mistakes that* is interesting. First of all, there couldn't have been more than a rew Palestinians in the group of probably a hundred students. But the crowd formed a community for a while, despite the fact that most Muslim students at UCT are descendants of Indonesian (incorrectly called Malay) slaves brought over in the 17th century to the Dutch colony and not the least bit related by blood, culture, ancestry or even closely similar religious practice to the Palestinians, half of whom are Christians, and all of whom are Semites closely related to the Jews of Israel. And even more interesting is the "induction of community" on the part of the protestors onto the mass of UCT Jewish scholars at the Kaplan Centre who, after all, are not Israelis, don't live in Israel, maybe don't even support Israel politically or economically, and in some cases would be treated as second-class citizens were they to wake up in Israel tomorrow.

Never mind all those problems with "community". Here are two created communities, both mediated by an idea. No ICTs are involved, no community informatics; it's just plain old politics as the sage would say, but there aren't real communities here. They coalesce around issues. But isn't that what it's always been about anyway? Now, hold that thought in mind: community as a social manifestation of the "issue" construct. We'll return to that later in the context of "developing country".

I don't want to spend time deconstructing "informatics", because others have done a better job than I. But I do want to point out that there are at least three separate and only partially intersecting concepts here that need to be battled out. The first is the ***technology*** itself. The second is the ***use of the technology***. The third is the socially constructed idea of ***informatics as a discipline***.

Technology exists independent of its users, no doubt. But it's not much fun in that state. However, most of us from first-world environments have bought so heavily into the idea of technological determinism that we've stopped being able to see technology as just a lifeless thing. We've reified the idea of tool to that of shaper of the tool user. That's not quite right, of course; there are Luddites among us who keep us sharp, on our toes, and in analysis. But technological determinism[1] runs strong in developing countries. A recent form (the "super-strong" form, perhaps) is that we must have technology and increasing and increasingly powerful kinds and amounts of it in order to get and stay developed.

[1] There are two forms. The strong form says that technology determines non-technological outcomes. The weak form avers that technology is necessary for progress. The press is the primary booster for the strong form and various governments and NGOs and universities push the weak form. Normally we'd distrust any salesman who says "You just gotta have it", but for some reason, we buy the line, with hook and sinker.

Another interesting idea is technological fatalism[2], the idea that technology is unstoppable. If technology makes things happen, inexorably, and these things are shaping us, then our *own* evolution is in the hands of something, perhaps created initially (and irrelevantly) by us, but now with its own agenda. This is the stuff of nightmare.

More compelling is the idea of technology being a latent skill that takes form in the hands (eyes, brain -- less frequently, body) of the user. Technology is emergent. You have to mix in user motivation, skill, and experience in order to get anything. According to this tradition, to understand anything about the technology you have to understand the users and pretty much everything about them. There's no such thing as bad technology, only bad users. After all, Adam and Eve were punished, not the apple (in fact, I think apples were rewarded with the special skill to keep doctors, but not Ph. D.s, away). Our feelings about technology use are closely aligned to our values concerning our environments and the human role. To many of the Woodstock generation, dickering with the information environment seems cleaner and more environmentally friendly than dickering with our physical, social or chemical environments. Western religion has always preached that humanity has been given stewardship over the physical environment; God has hegemony over our informational (soul, psyche) environment, so we approach Godliness through using information technology. Milgram's (1974) research in the 1960s showed that these feelings are entirely transferable to the lives of those under our control and it remains to be seen whether or not we succeed in this third attempt to become gods[3] (after the apple and the tower of Babel).

Finally, one interesting concept is that of the field of informatics itself. Notwithstanding the cosmetic shift of names for data processing to electronic data processing to information services to information technology and so forth, there has

[2] There are also two forms here. One, the weak form, is that technology is going to happen, so lie back and enjoy it. The strong form is that technology is going to happen *all by itself*, so lie back and be frightened. Clearly these two views have strong roots in European culture, the first appealing to our need to worship and the second to our fear of the *deus ex machina*, the god that doesn't need our worshiping!

[3] Robert Milgram used a clever ruse to induce normal, middle-class people to "kill" others under instruction from people who merely appeared to be scientists. Space doesn't permit going over the research design, but Milgram showed unequivocally that given the right circumstances, people would voluntarily give up important decision-making rights (he termed this the "agentic shift") to those who appeared to have the right kind of authority. Although he didn't use computerized equipment, the appearance of technology clearly enhanced the apparent "validity" of a situation in which volunteer subjects were induced to deliver apparently lethal voltages to others. Milgram was seriously censured for his deceptive research, but his lesson lives on in the excuses people make for their behaviour because of computer "failure" or other computer-originated activities.

been a movement towards increasing intellectualisation of what we do. Originally we manipulated numbers, either numbers representing missile trajectories or accounting figure in the earliest days. More recently we've moved up the management chain (to MIS to DSS, to GDSS, to ESS and EIS, to SIS[4]) and out to wider societal arenas (to BIS, to CIS and BCIS[5], to informatics, to social informatics and a variety of computational fields such as computational linguistics, computational biology, soon computational missionary informatics—you heard it first here!).

But in biology, the true sign of maturity is sexual maturity. Whereas 20 years ago when I reentered this field from communication I taught about our "reference disciplines" (computer science and psychology, for examples), now we have spawned our own daughter disciplines. There is no limit to the power of metaphor and the term "discipline" or "field" brings with it a panoply of goods and advantages that "job" didn't. Not only is the term "informatics" sexy and slick, it also conjures up a variety of powerful, intuitive images (to inform, to automate, to study, to direct). One could be without soap for a while, but now in business and increasingly in government one can't be without one's informatics, can one? For a field without unified theory, grand goals, or its own intellectual history, informatics has achieved quite a cachet. Psychology took 100 years, as did management studies itself. Maybe this is another sign of the speeding up of the intellectual clock. And speaking of the clock, it's time to move on to what the concepts of informatics, community and development have to do with one another.

2. What these concepts have to do with one another

Community Informatics: "A technology strategy or discipline that focuses on the use of Information Technology by territorial communities" (Romm & Taylor, 2000).

Developing Country Informatics: The use of ICTs in developing countries.

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[4] "MIS" is "management information systems", the use of information systems to aid management especially in decision making. "DSS" is "Decision Support Sysetms", the use of computers and the like to aid decision making *per se*. "GDSS" is "*Group* Decision Support Systems", the application of information systems to group decision making processes. "ESS" is "Executive Support Systems", aiding executives in their work of developing and executing strategy. "EIS" means "Executive *Information* Systems" and is mostly synonymous with ESS. Finally "SIS" is "Strategic Information Systems" or the use of information systems in strategic fashion, for example, to increase competitiveness".

[5] "BIS" is "Business Information Systems", "CIS" is "Computer Information Systems" and "BCIS" is the hybrid "Business Computer Information Systems." They essentially mean the same thing, but serious fights break out when that assertion is made among academics!

Developing Country Community: A group of people in a third-world country, probably related geographically but far more likely related ethnically or by interest, class, caste or historical or physical accident

These definitions inherit problems from their elements but they will form the bulk of what I'm going to be challenging you with today. I'm going to use the ARI (Romm &Taylor, 2000) model to illustrate the problematics and derive challenges for you. And I'll recommend at the end that we have a long, long way to go before community informatics in developing countries means anything practical. A few things are obvious about these intersections.

First, communities have always been held together by informatics. As I mentioned before (and Webster backs me up on this), it is commonality of interests rather than propinquity that defines a community. A community is the physical, sometimes (often, really) geographical instances of interest (again, often physical). Hence one should expect communities to act in ways that interest dictates. For example, interest depends on information, information flows and precision. Without information, interest is vague, whimsical, uncontrolled. With unreliable information, an interest is dispositional, more like an opinion or attitude than belief. Cement the information with precision and validity of content, guarantee of access, and predictability of delivery (i.e., all those things that "informatics" promise) and you've got manageable interest.

If the interest is geographically confined, you have the classical community, but if the interest is neither geographically, geopolitically, or geosynchronically confined, then you've got a virtual community. And because people can hold many, often conflicting interests, people can belong to many and conflicting informationally-mediated communities. In fact, the very same people can belong to manifold communities partitioned in a variety of ways by issue (see the star in Figure 2). In this example you can see how interests, perhaps mediated by information, dictate multi-layered, overlapping, mutually antagonistic and even schizoid communities. Unfortunately, "Developing country informatics" is a very small set. I'll return to this later, because of the odd state of "development path" theory vis-à-vis informatics.

The final intersection is developing country community. Now here's a problem. Because we think of countries like Gabon or Mozambique as "developing" we lose sight of the fact that in fact they have been developing for centuries. Our myopic focus on economic or democratic-political development leaves us blind to the fact that social and political development has been going on relentlessly in developing countries forever. In fact these countries are as "developed" in any real sense (outside "political" development) of the word as any so-called "developed" country. Hence the idea of community, while thought of as something trendy to be interested in in North America and Europe, is just as developed, complex, sophisticated, tied into the social fabric, functional, useful, interesting, fascinating and valuable as any idea we may have.

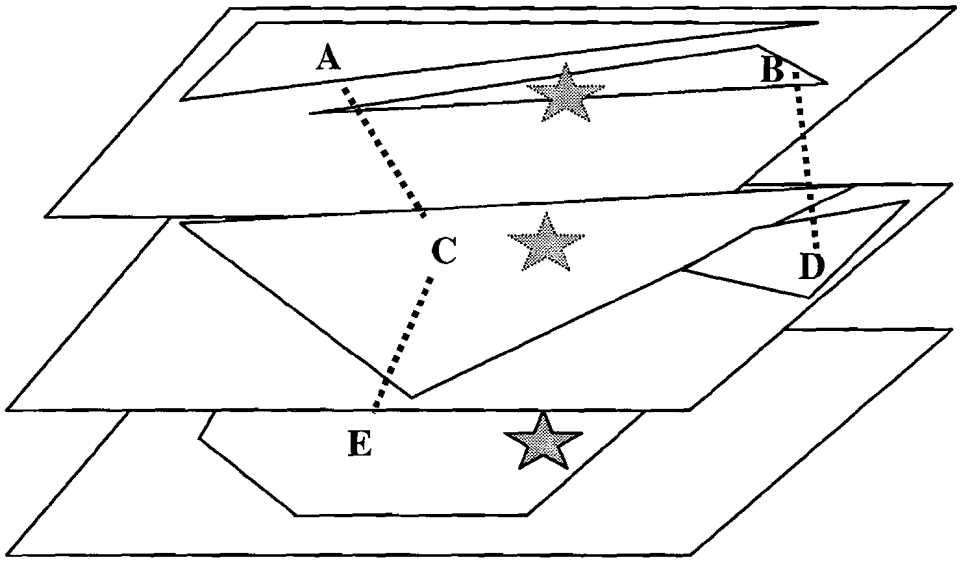

Figure 2. How Interests (and Information) Determine Communities and Community Conflict

As I've traveled around Africa – and I am by no means an experienced traveler; others have more stories to tell – I've been impressed with how complex the notion of community is among my informants. OK, there may have been something lost in the translation and perhaps there's a bit of what psychologists call "experimenter expectancy" going on, but surely, for example, the idea that a man I met in Tanzania supports distant relatives (and we're not talking small donations, we're talking 50% of his salary) because he was supported as a youngster is as delightful an idea of community as any coming from the community development literature.

So communities in developing countries must be regarded as every bit as complex, sophisticated and interesting as those in the developed world. In fact, one might say that communities in Africa, for example, are probably more highly developed in some senses than those in America, since people do look out for those in their communities without prodding, public information campaigns or public guilt. What they do to their neighbours of other ethnic groups is another story. Perhaps our only advantage in the first world in terms of community is the papering over of tribalism. Of course, don't say that to an Afrikaner in South Africa or a Canadian of Ukranian descent.

3. Why the Intersection is of Interest

Now that we've covered the two-way intersections, let's look at the three-way intersection: community informatics in the Developing World. What can this concept mean?

One thing the joint concept means is that ideas of community development either are completely generalisable across all development milieu or, in fact, are sensitive to levels of development. In other words, why would we expect the three-way intersection to be any more restrictive than the two-way one? The common arguments are these:

Access: In the third world, there is uneven and far lower density of access to the technology

Infrastructure: Also, the hardware, software, and netware infrastructure is lacking, inadequate, unreliable, too expensive, etc.; the banking infrastructure isn't there, the legislative infrastructure isn't there, etc.

Knowledge: Human resources are not available to train, maintain, and develop uses of community informatics to their full potential

I put these up as straw persons in order to have you ask the question: maybe "it ain't necessarily so." Perhaps even if there were access, infrastructure and knowledge, there still wouldn't be appropriate uses of informatics for community creation and development in the developing world. Or you could see it another way: what is the minimum access/infrastructure/knowledge portfolio (s) necessary to reach a certain level of community informatics?

This latter question is approached, albeit obliquely in the Romm & Taylor (2000) ARI model (Figure 3). As with many other informatics questions, causality and necessity are often conflated. The ARI model speaks of sufficient conditions in a virtuous cycle that builds community informatics (measured presumably through the integration or aggregation phase) by creating supply for the demand. The model is useful because it spells out exogenous influences that shape action (supply), reaction (demand) and integration (aggregation) or provide a context. Clearly these contextual influences are appropriate to speak of in a developing countries context. In addition, it indicates endogenous characteristics of communities that might explain differences in adoption of CI, such as culture, politics, or individual motivation. There is even room there for what has been called, in typical 1950s sexist fashion, the "great man theory" of leadership, but which has now been refashioned into the "IS Champion" idea.

One of the most charming aspects of the ARI model is its insistence that demand precede supply. Or more precisely "demand related activities should take precedence." This is charming because it recognises that the way communities adopt technology might be different from baseball fields and soap. That group IS

adoption, especially groups of untutored individuals with raging but unformed and uninformed needs might not act as a traditional market and "demand" what they are being supplied. More to the point, communities in developing countries might indeed have **very sophisticated needs** that are simply being unmet by the relatively simple technological solutions in search of problems.

Consider E-commerce, for example. When I proposed to a journal editor that we do a special issue on E-commerce in Africa, he retorted with a comment similar to Gertrude Stein's description of Oakland, California ("There's no there, there"): "What E-commerce?" I have to agree. E-commerce as we see it is really an emanation and creature of North American business at this time. In a variety of ways, E-commerce meets a significant proportion of commerce needs now in North America (and probably Europe and maybe elsewhere). Ditto for community informatics, especially in rural Canada (there's LOTS of there, there) and Australia.

But that is a really simple-minded way of viewing E-commerce and Africa. Think for a moment about Africa. It's been there a long time. Commerce has been there a long time, longer than in America. Business culture, the movement of goods, supplier-buyer relationships, competitive and cooperative business modes: these are all there in abundance and in complexity and sophistication. Why hasn't E-commerce caught on yet in Africa? And don't say it's access, infrastructure and knowledge. These are necessary conditions, but we actually don't know in what proportions and what portfolios work and what doesn't work. What's sufficient?

Clearly there's a need to conduct business but not in the North American mode. If we assume for the moment that the big three (access, infrastructure and knowledge) are actually there in places or will be soon enough, what are the forces that will **make** E-commerce successful in Africa? Demand. The need to conduct business electronically. The need to have verifiable transactions with reliable content. The need for speed to beat the competition. The need for unfalsifiable audit trails. Not the **ability** to access these, but the **need**. And how will we find out the need? By studying African business, not by forcing what goes on in Africa into an American or British or Australian mode.

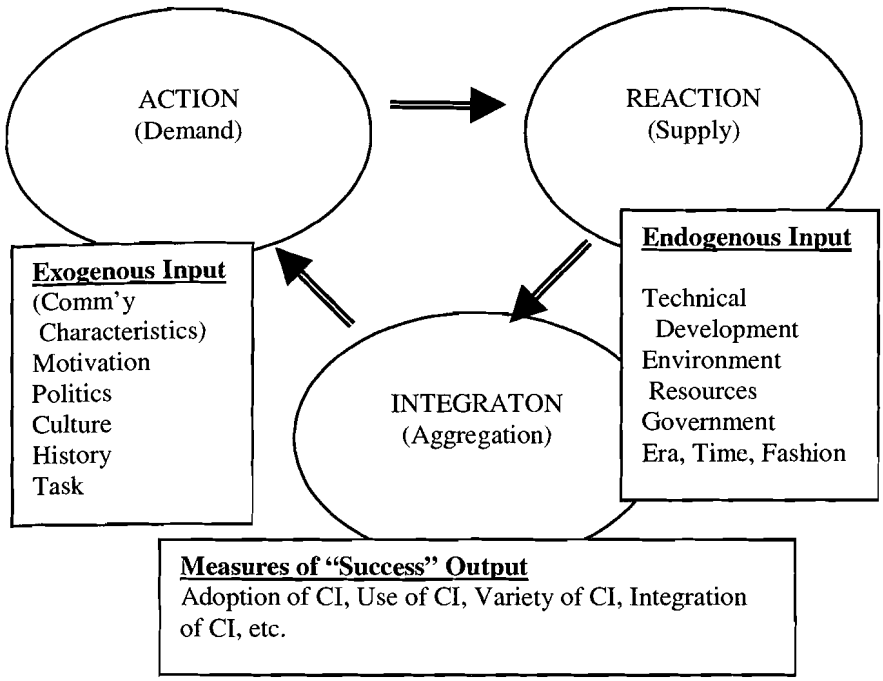

Figure 3. ARI Model (after Romm & Taylor, 2000)

So the ARI model is a more general model of all communities. It's cybernetic, goal-oriented, knowledge based and takes into account more of what it means to be active in a community of others pursuing similar (if conflicting) goals than the common business model. We need to expand our repertoire of models, taking into account that communities are issue based rather than merely geographical, that they are multilayer, that communities run on conflict as well as cooperation. When this is done, intellectual models such as ARI will help us understand all aspects of informatics in a community environment, even E-commerce.

4. The Challenges to CI, You, and This Session

Now I've rambled through many fields of play and I'd like to bring them together with a single example of what interests me and my colleagues and students. Back in Cape Town, I run a taught doctoral program which is unique in Africa, probably in the world. We've brought together a multidisciplinary team of Associates (i.e., people formerly known as "students") to examine the appropriateness of the applicability of information systems[6] to national development goals. In today's forum, it might be best to say that we're concerned with business community informatics in developing country mileux.

Our first research project is funded by the International Development Research Council and most of us are looking at some aspect of the question of whether or not E-commerce is going to marginalise some or all Africans, and if so, how, and how to avoid this or prepare for the fallout. Elsewhere (Licker, 2000a, b, 1999, 1998a, b, c; Licker & Motts, 2000) I've addressed the problematic concept of marginalisation, so I won't review that here. But for this group, I can rephrase our research interest at looking at why and how E-commerce will succeed or fail to advance (business) community interests in Africa.

In order to do this we are adopting two novel approaches, looking at e-commerce models as:

- as models for community rather than as ways of doing business only and
- as models of development rather than merely as ways of making money

You see, if we are to avoid marginalisation of any particular group in Africa, we've got to see how that group can be kept "in" in some sense. There are two ways of being "in" and one of them, assimilation, has already been demonstrated to work rather effectively in America – we don't need to go there; it's not so interesting. The other way of being "in" is "integration" at the community model level, taking the needs of community (in our case, business community) groups into account through the power of informatics. So we're interested in the community aspects of business (such as the ways e-commerce can build markets to satisfy the needs to sell products) and the development aspects of e-commerce (such as the ways e-commerce can create equity markets for micro-entrepreneurs and micro-investors). Our projects examine e-commerce as a vehicle for education in

[6] I completely give up in trying to distinguish "information systems" and "information technology." The latter usually refers to the boxes and wires and programs, the things; the former often refers to systems or organisms that accomplish non-electronic goals in larger milieux and includes people, organisations, etc. Most of my colleagues admit that it's often useful to blur this distinction, as do almost all textbooks, consultants, and professors. The only people who still seem to care are NGOs who cannot afford whole systems and must make do with the boxes and wires!

entrepreneurship, e-commerce readiness as a component of e-commerce success, and distinctly African business modes as expressed in the language of e-commerce. Much of this work is conceptual; we are only just beginning to collect data. Our efforts have borne fruit so far in a successful lecture series available on the web soon, a number of working papers, and several almost-ready doctoral proposals.

So my challenges to you are the same as I throw at my doctoral Associates. What is there about technology, specifically information technology, that can help us understand business, commerce, community in the developing world? How can a community's appropriation of a technology be advanced or hindered by information technology as it pursues development goals? Which development goals are antithetical to specific information technologies or uses of information technology? What are the hidden cultural, political and economic assumptions behind any particular appropriation of any particular information technology? What is our role as developers of individuals (i.e., lecturers and professors) with regard to this technology? Whose interests (i.e., which communities) are being furthered by specific uses of specific information technology or all information technology? How are specific models of development across a broad spectrum impacted by the new kinds of technology available? And finally, who is the developing country here? And where is it? And when?

5. Summary

This ramble across the dictionary began with independent ideas of informatics, community and developing countries and has ended with a call to adopt a community informatics approach to all employment of IT, including the newest IT fad, E-commerce. I've spelled out an ambitious research program we're undertaking through our doctoral program in Information Systems and National Development at the University of Cape Town. This program seeks to explore the concept of marginalisation in order to prevent "decommunitisation" of various people, groups, and institutions with respect to E-commerce. I invite you to participate with us, to enrich our business models with community development models and to provide a broader menu of choices for development of all sort.

Acknowledgements

We would like to acknowledge the financial support of the International Development Research Centre (the Johannesburg office of this Canadian organization based in Ottawa and one of the most important and visible organizations supporting research into development and technology, among other topics, most notably through its Acacia project) and the Associates of our doctoral program for their kind comments and suggestions concerning this paper. Thanks also to my life partner Susannah for her incomparable help in editing and sensemaking.

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AN INTERNET BASED MODEL FOR BUILDING A LOCAL COMMODITY/ TRADE EXCHANGE FOR A RURAL WOMEN'S ORGANISATION.

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Abstract. *This paper explores and discusses a proposed process to assemble an Internet based tool to develop markets: A model that can be replicated to create a product (the commodity/ trade exchange) which rural telecentres can use to increase local economic activity and harvest income to sustain the telecentre. The starting point is a review of the environment and the organisational success indicators of the Rural Women's Association (RWA). This is followed by an examination of two models, a marketing model (as it has been identified that lack of access to and knowledge of markets is an economic growth inhibitor): And an extended E-conomy business model of the infomediary (to consider the use of e commerce in empowering the marketing model in a remote and rural context). The perceived capabilities of the RWA are mapped in relation to these two models and the resulting requirements versus competency gaps are analysed as a prelude to further research. Recommendations on the way forward are made.*

1. Introduction and Context

Various sources (WorldBank, 2000: CIA 2000) bear out that South Africa is still battling to overcome its legacy of apartheid. What this translates into is increasing poverty and continual job losses. The South African Government estimates that in the past 7 years around 500 000 jobs have been lost. This exacerbates poverty in the area served by the RWA as many of the migrant labour workers are redundant and can no longer remit wages back to the village. Added to this, is the increased economic burden of caring for the growing tide of HIV+/AIDS migrant workers returning home to die. Government resources are stretched and often misused and stolen. Many communities sit powerlessly calling on government to provide jobs and support. The RWA realises that the only way out of poverty is through themselves and their capacity to find markets to trade with. In 1992 Sister Lydia Pardeller of the Franciscan order of nuns was charged with finding the "poorest of the poor" community in South Africa to work with to improve the lives of women and children. Her search led her to the village of Apel in Sekhukhuneland, Northern Province South Africa. Apel is 120km to the South East of Pietersburg. The village has around 15000 inhabitants (E. Dijk 1996) with about 125 000 people living within a 25Km radius. Sekhuhkuneland (a previous homeland under the apartheid government) has suffered years of neglect, inadequate investment, maldevelopment, mismanagement, corruption and apartheid policy. The area is characterised by extreme poverty with the highest unemployment rate in the country (estimated at

around 70%). It has a migrant labour force (a remnant from the apartheid era) with the majority of men absent from the village but remitting paltry wages back to their families. The area has the highest infant mortality rate in SA and is a drought area. The task of improving the quality of life falls mainly on the shoulders of the women who remain resident in the Apel area. Apel is a remote village in Sekhukhuneland with a predominantly Bapedi (Northern - Sotho) population. The village is 30 kilometres off a main road and is accessed by a dirt track that is at times impassable.

After 6 months of consulting with the community Sister Lydia identified a number of influential village women in the region and together they conducted a comprehensive, inclusive and participatory community needs assessment. The results informed the launch of the Rural Women Association (RWA- a section 21 not for Profit Company) in 1992. Eight years on whilst Sekhuhkuneland remains one of the poorest areas in South Africa the women of Apel have significantly improved their lives through the activities of the RWA.

2. The Telecentre

The RWA's range of sustainable income generation projects has been incapable of significantly improving the economic circumstances of its members, partly because until now the women have focussed on food security and planting the seeds of education and literacy development. However, having achieved this objective the organisation is ready to move into a trading scenario. The objective is to generate income for both individual economic enrichment as well as generating further development funds for the RWA economic sustainability programmes. The RWA recently (1998) became the recipient of a Universal Service Agency (USA) Telecentre (an initiative resulting from the 1996 South African Telecommunications Bill) which provided computers, telephones, fax, photocopying and the Internet.

The Telecentre programme has been heralded as one of the most important initiatives of the 1990s to ensure that developing communities can make use of modern ICTs. Through the communal provision of technology the gap between the haves and havenots can be narrowed leading to growth opportunities and poverty elimination. Telecentres are believed to be the vehicles through which micro and small enterprises can seek out and evaluate timely market information as well as assist micro entrepreneurs to source better and less costly inputs" (NTCA). For these commendable beliefs to become reality telecentre resources must be applied creatively. To date there seem to be no models that can create "products" for telecentres to economically empower communities. Many telecentres are struggling to achieve financial sustainability (many are dysfunctional and the equipment can become obsolete before it is used). Literature on the impact of telecentres apropos social, political, economic development is scarce (NTCA). The difficulty is that no one in the community seems to know how to leverage the so- called

"transformative" power of the telecentre to give birth to economic development. Acknowledging that the telecentre movement is still experimental and that the service providers may view the telecentres as tools, in the village there does not seem to be a vision of the telecentre as a means to an end rather but as an end in itself. As a result the telecentre has been seriously under utilised and has been unable to raise income to support operational expenditure.

The USA is the body charged with implementing the South African government Universal Access strategy. This programme is committed to providing sustainable telecentres and socio- economic information services to disadvantaged communities. The RWA telecentre is one of 60 plus telecentres placed in remote and rural areas. Of the 60 only three are functional and only four have on line Internet. Few of the centres make sufficient income to pay salaries or to provide for equipment depreciation (Benjamin and Stavrou). The capital outlay of the USA telecentre model is around R200 000 and often usage of and potential for income generation does not always warrant such capital outlay. The majority of the USA telecentres are heavily dependent on donor support and many are threatened with closure. The Telecentre 2000 report (Benjamin and Stavrou) recommends that " the potential for telecentres to become community information centres needs to be exploited". It is the intention of this paper to explore how to leverage telecentre in conjunction with the use of local for economic development.

The RWA telecentre is located in the RWA resource centre and is in close proximity to the restaurant, the Montessori teachers training office, a nursery school, a sewing and design school and walking distance from the local high school, the primary health clinic and the post office. It has 4 computers (two with Internet, which will be operational once the lines are connected), 6 telephone lines and a photocopier. In Jan 1998 the equipment was installed and two RWA members received 6 weeks training on how to run a telecentre. Since then (in the RWA telecentre) there has been minimal support and guidance on how telecentre resources can be used to mobilise the community.

3. Observations

3.1. The RWA development model

The success of the RWA is known and commented on in many quarters, (as evidenced by articles written by the University of the North researchers, an assessment of the Success factors and sustainability carried out by the International Water Management Institute in 1999, personal endorsement from the Northern Province Premier Mr. Abel Ramakhlodi, CNN media coverage, articles in the largest South African national daily paper - The Star- and the winning of Premier and Presidential awards for agriculture and education. development) . The surrounding villagers refer to Apel (the head office of the RWA) as a "little piece of heaven" and as the "Apel miracle. "

Its success is not being questioned in this paper rather this success is analysed in order to build it into the next stage of development and economic expansion, The following list (not exhaustive) of success indicators shows evidence of tangible economic development. The resulting products can " fill" the reservoir of " trading stock" to fuel a local commodity exchange.

- **A resource centre with conference facilities and numerous units to house entrepreneurial activities.**
- **30 organised, legally constituted groups (each with between 50 and 80 women members)**
- **16 vegetable gardens (with around 80 women benefiting from each garden).**
- **Agricultural - Maize production**
- **2 restaurants**
- **Continuous poultry production**
- **Wire Fencing production**
- **Brick production**
- **House construction**
- **10 adult literacy projects**
- **A carpentry shop producing Montessori pre school teaching aids**
- **14 sewing projects supply local school uniforms and traditional and modern dress design**
- **1 shop (used for training women in accounting and financial skills)**
- **Community ABET (Adult basic education training) education theory and life skills training programmes**
- **Vocational and business skills training programmes in partnership with the Department of Labour**

3.2. Success determinant factors

This paper intends to build on the existing foundation of RWA economic development by leading the organisation into the next development phase of expanded economic growth. A brief overview of the success determinants is considered necessary here. Factoring in the success determinants (the human factors such as leadership, organisation, and local support and gender issues) that created the RWA can increase the probability of a successful commodity/trade exchange model being accepted and adopted by the community.

Need Identification and Leadership: Sister Lydia Pardeller spent the first 17 months in Apel doing little other than listening. Her 36 years of development experience in Africa proves her hypotheses that nothing sustainable can be developed until the right potential leadership and support is both identified and nurtured to the point of "buy in" and authentic needs identified and prioritised. Whilst textbooks promote this approach it is rare to find it in reality. Where it does exist success seems more sustainable.

Incorporation of Tribal Authority: From inception local chiefs have been involved, respected and consulted. Their very generous donation of land (all rural land is held in tribal trust) proves the success of this approach. The support of the chiefs has provided much needed support to the RWA in enlisting the support of top male politicians such as the Premier of the Province.

No Donor Driven Funding: Donor funding is unequivocally declined where it is seen to interfere with the autonomy of the organisation. This strategy contributed significantly to creating authentic leadership and control.

Donor Money Spent Exclusively On Project Implementation: Many of the RWA members have given months and years of volunteer work to the RWA. No one has been paid a salary. All donor money is spent on project seed funding. The women are schooled in the philosophy that sustainable income must be generated from business activities.

Support Begins with Members: R2000 towards start up project costs per group (co-operative) is a mandatory requirement before members are offered RWA assistance. This approach ensures that sustainability project plans are in place at inception and the projects are less likely to collapse if donor support is suddenly withdrawn.

Tight Financial Controls: The RWA leadership underwent 6 years of financial training and mentoring prior to assuming full financial control of the organisation. This has engendered trust between the RWA, its donors and partners. Further more a spirit of strict financial discipline amongst the RWA membership and projects groups has achieved.

Organisation Structure: It is postulated by researchers (Lange et al) that authentically deploying the values of group cohesion, joint effort and social mobilisation has empowered the RWA to achieve its success. This value system underpins the organisational structure. The project groups are autonomous and supported by the RWA with capacity building to evolve into self-sufficient co-operatives.

Sister Lydia Pardeller: A great deal of the RWA success can be attributed to the methods, leadership, mentoring and discipline provided by Sister Lydia. 12 months ago Sister Lydia was recalled to her order in Italy. Since her departure it has been heartening to observe that its core leadership (a group of four women) has capably managed the RWA. All projects are continuing and some areas have expanded.

4. Gender issues

The RWA focuses on female economic empowerment as women in South Africa have been triply oppressed (black, female and poor) and are still generally on the bottom of the inequity pile in the country. Sotshongaye and Moller (2000) confirm through their research that it is still rural women in particular who bear the largest burden of poverty in South Africa. They further note that often women's projects remain " marginal to the mainstream of development efforts" and that any strategy to empower rural women must strive to overcome the developmental constraints such as sustained financial viability, capacity to grow and expand and the ability to replicate.

Whilst some may question the merit of excluding men from the organisation (actually they are allowed to join but not to become full members which ensures they do not gain control) it is considered prudent at this point to maintain a gender approach to development. In time it is anticipated that the strength of rural women will grow to the point that they will not need the protection of a women only organisation. Prath (1990) would seem to back this notion. He notes that the bulk of the domestically consumed food in rural Africa is produced by women and that they play a crucial role in the support of "domestic solidarity", serve practically as head of household and set the pace for the adoption and diffusion of technological innovations. He further notes that much of the informal learning takes place through the interaction between women. This indicates that special care must be taken to ensure women's meaningful involvement in all stages of the development effort. In many cases male social dominance continues to seriously inhibit the economic liberation of women. There is little empirical research that focuses on the economic impact of the integration of ICTs with women's entrepreneurial and revenue generating activities. Richardson (cited in rural Access to information and Communication technologies: The challenge to Africa 2000) conducted evaluations which show that women with access to ICT services increase their ability to generate income and are enabled to help empower other rural women. It has been recommended (AFRE-FEM 1998) that there is a crucial need for programmes which target women for improved ICT access and training and the use of internet applications.

5. The Missing Link to Expanding Economic Development

Research in the rural district of Semonkong, Lesotho (Phororo and Prasad) where 61% of farmers are female and 70% of produce is farmed in home gardens identified marketing weakness as the major constraint to expanding economic activity. Sotshongaye and Moller (March 2000) in their research into the self assessed development needs of rural women in KwaZulu Natal found a number of major obstacles to sustaining community projects . These were, the lack of capital resources, the lack of markets and the restrictions imposed by a poor access road and limited transport. Similarly the women of Apel are struggling to increase

economic activity in the face of an undeveloped market place, no transport and bad roads. The Sekhukhune area does not have a physical market place. As the RWA has no transport facilities all produce and goods are sold locally (within a couple of kilometres). This results in a buyers market and keeps prices low. Local buyers (other rural women) have limited income (relying mainly on limited pension payouts and meagre repatriated wages) and often crops and goods (such as bricks, fencing and furniture) are sold for less than the input values (e.g. seeds, fertiliser water, labour). This situation sometimes leads to a system of bartering. Whilst there are proponents of this method, this author believes that in the long run economic success will be depressed by bartering. The searching process is costly and usually one of the parties (the weaker one) gets an unfair deal in the transaction.

The women are relatively new to business concepts and have little experience of how to identify and develop markets. They have no information on average produce and goods prices and do not know the value of their crops and goods or what crops and goods are in demand. Information on who wants to buy what and who has what to sell is scarce. There is no transport system (other than a few public taxies per week) in and out of the village.

The bottom line is that generally, produce and goods are sold at low prices and the economic activity in the area does not result in significant poverty eradication.

Cypher (1997, p.402) remarks that " the significance of technological change to economic growth and development has been verified again and again in empirical studies" and that research points to a "residual" (which includes technology) that contributes over and above the basic factors of production to increased productivity.

The research question is that needs to be addressed is ***how can the RWA and the rural community of Sekhuhkuneland harness the potential of ITCs to effect the "missing link" to propel the RWA into an accelerated economic growth pattern?***

The following section suggests a methodological approach, to the development of a local commodity exchange.

6. Methodology

Two models will be examined in this section in order to generate input for a commodity exchange model. The first is a marketing model (Kotler 1980). It has been established that marketing is a deficient skill in the RWA and that without marketing it will be difficult to trade meaningfully. The second model is an extended e-conomy business model - the infomediary (Hartman 2000). The literature on e- commerce is filled with rising optimism and silver bullet scenarios on how trade can be enabled electronically; How space and time can be compressed to the point of irrelevance: How remote underdeveloped communities can leap into

a 21st century trading environment through the auspicious use of e tools and in so doing radically alter some economic activities and the surrounding social environment. The infomediary model will be examined to assess the potential of ICTs to overcome barriers to trade involved with time and space and how it can empower marketing activities.

6.1. *The Marketing model*

Kotler defines marketing as the human activity directed at satisfying needs and wants through exchange processes. Exchange is the act of obtaining a desired object from someone by offering something in return. Transactions are the exchange unit of measurement and the notion of multiple transactions leads to the concept of a market. A market is the set of all actual and potential buyers of a product. Markets develop in stages starting with self-sufficiency (which is the RWA position) where producers are ready to trade surplus. This can occur decentrally (where one seller sells to number of other self-sufficient traders), or it can happen centrally (where one merchant sells the surplus goods of many self-sufficient producers). Central marketing increases transactional efficiency by reducing the total number of transactions required to meet a given volume of exchange. It is the concept of markets that defines marketing. If a marketer does a good job of identifying consumer needs, developing products, pricing, distributing and promoting them effectively Kotler concludes that the goods will sell very easily.

Kotler defines the basic model of marketing as involving the following tasks:

- Searching for buyers and identifying buyers needs- Market research
- Designing appropriate products (or modifying existing ones)
- Promoting products.
- Distribution of products. - Transport
- Communicating the product range and value to the target market.
- Pricing of the products.
- Service and after service.

This list is useful as a starting point to map what the existing RWA capabilities are in executing core-marketing activities.

The objective of the marketing model is to enhance local peoples potential to find markets and deliver their products. This involves uncovering local and indigenous knowledge. The RWA is well placed to uncover embedded knowledge from the social and cultural structures (albeit it gathering the information manually and transmitting the data orally). However once accessed the RWA will struggle to store, process, transfer and communicate the knowledge in a real time context.

6.2. The Infomediary Model

The infomediary model will be examined to explore how it can mitigate the problems of managing information for marketing purposes. Hartman's (2000) infomediary model (below) is used here to illustrate the basis of a community based commodity exchange.

The infomediary is defined as an entity that brokers content, information, knowledge or experiences that add value to a particular E business transaction. It can also be termed a content aggregator that brings together buyers and sellers. The infomediary brings together buyers and sellers and provides value by offering advice and personal service. One of the major advantages of the model is that the infomediary does not need to own inventory or the means of production. However because it owns little the infomediary has to rely on partners to succeed. An infomediary will typically focus on developing numerous partnerships, developing extensive local content and promoting the web site to an ever-increasing number of buyers. An infomediary in effect creates an e-marketplace. Many examples of infomediaries can be found in the business world such as travel aggregators (www.travelocity.com) and NetBuy (www.netbuy.com) a business which enables real-time intercompany electronic supply chains through a comprehensive on line service for standard electronic components from a variety of suppliers. South Africa is beginning to see a number of infomediaries around the area of aggregating business suppliers. Currently Datatcentrix (Business Report) a local IT company is piloting a project to link all of South Africa's fast moving consumer goods retailers with distributors and suppliers via a central product catalogue. Whilst it describes itself as a Vasp (value added service provider) it is similar to an infomediary. A survey released by Sterling commerce (Business Report) found that over 25% of companies surveyed mentioned that they were planning to participate in an e-marketplace within the next year.

The infomediary model can support the marketing function in its capacity to provide extensive processing and communication power thereby increasing transactional efficiency by reducing the total number of transactions required to meet a given volume of exchange. It is often the case that rural producers spend unproductive time trying to (often unsuccessfully) create markets for their produce and the time taken to market has to be taken from the time available to produce. In this model, local producers would need only to communicate with a central infomediary (The RWA) in place of decentral marketing.

The advantage for the infomediary is the opportunity to generate revenues for marketing activities and make a profit for the RWA, its members, local entrepreneurs and the telecentre through commissions from sales, subscriptions and membership fees and advertising.

The following figure represents Hartmans infomediary model. The boxes connected by arrows into the centre of the diagram link what Hartman perceives as the key concepts of an infomediary model. This model will be used to map what the perceived RWA capabilities are in relation to the capabilities needed to implement an infomediary model.

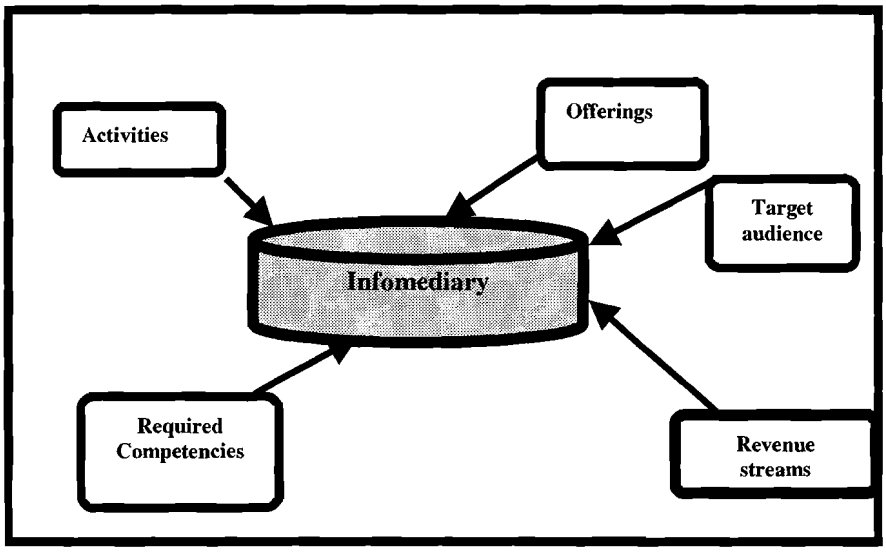

Figure 1. Hartmans infomediary model

Table one expands on the above model by considering each variable in the model and by looking at the RWA as an infomediary and what activities and functions in each part of the model may be.

Table 1. The RWA as an infomediary

VARIABLE	THE RWA AS AN INFOMEDIARY
Offerings	❑ Transport scheduling ❑ Transporting opportunities for micro entrepreneurs ❑ Aggregation services ❑ Match making between buyers and sellers needs ❑ Content around the economic structure of the region ❑ Vocational skills training scheduling ❑ Connection to poverty alleviation and economic empowerment government desks ❑ Banking facilities ❑ Financial transaction facilities ❑ Notification services (as to when facilities, products and services available.

VARIABLE	THE RWA AS AN INFOMEDIARY
Target audience	❑ RWA members ❑ RWA backed income generation projects ❑ Government departments ❑ Community residents ❑ Wholesalers ❑ Niche markets (e.g. organic vegetable retailers, Urban diaspora) ❑ Schools ❑ Clinics ❑ Hospitals
Activities	❑ Leadership and negotiation ❑ Banking facilities for transactions (the trust infomediary) ❑ Arranging transportation ❑ Teaching marketing skills to the community micro entrepreneurs ❑ Harnessing mobilising and organising community power ❑ Bulk buying ❑ Input provider (e.g. chicks vaccine, cement wire) ❑ Lobbying local government
Competencies required	❑ Billing ❑ Order processing ❑ Order fulfilment ❑ Payment collection mechanisms ❑ Computer literacy to update, expand and amend the web site ❑ Human resources ❑ Data collection- Access to indigenous knowledge ❑ Inventory of local buyers and sellers ❑ Negotiation skills ❑ An understanding of marketing models ❑ Multiple relationship management ❑ Scalability to meet evolving challenges
Revenue streams potential	❑ Discounts from suppliers ❑ Commissions from sales ❑ Government Tenders ❑ Subscriptions

Primarily, the infomediary model offers a technological approach to creating markets by harnessing and disseminating information in a cost-effective way. Using technology successfully to provide a solution will include the incorporation of such factors as skill development, education and training into the model. This view fits with Cyphers' (1997) who notes that technology is a difficult concept to define because it is not an object but rather, it is a way of doing things which translates to a way of thinking. He further states that " in a significant sense, then, it can be said that economic development is indistinguishable from the on going application of technological knowledge to production "(pp 404). And that in the absence of a continuous application of technological change development will inevitably falter.

Step one in exploring if the combination of the marketing model and the infomediary model can translate into a local commodity exchange is shown in the following table. The table uses observed information from three areas, one, the success determinants of the RWA, two the marketing model above and three the infomediary model above. The intention is to map this derived information against the authors perceived competencies of the RWA and in so doing critique the practicability and feasibility of the model within context. Most of the information used at this stage is based on observation. The next step of the research will be to verify these concepts with the RWA and its community.

Table 2. Marketing requirements versus capability

MARKETING MODEL ACTIVITIES REQUIREMENTS	*RWA CAPABILTY*
Searching for buyers	Yes
Identifying buyers needs	Partially
Designing appropriate products	Yes
Transportation and distribution	No
Communication	Limited
Pricing	Yes
Service	Partially

Table 3. Infomediary requirements versus capabilities

INFOMEDIARY MODEL ACTIVITIES REQUIREMENTS	*RWA CAPABILTY*
Electronic billing	no
Electronic order fulfilment	no
Database management	no
Payment collection mechanisms	no
Computer literacy	Partial
Multiple relationship management	Partial
Harnessing community power	yes
Creating buyers/and sellers inventory	Yes
Scalability of the system	No
Aggregation services	Yes
Access to indigenous data	Yes
Understanding marketing models	No
Negotiation skills	Partial

The RWA is deficient in over 70% (does not have or only partially has) of the capabilities necessary to implement marketing functions. The infomediary model can assist it to be proficient in some of these activities. For example, the lack of transport is a major weakness as the RWA is unable to move its

products to market. The infomediary through its aggregation capability can be used to schedule transport and offer the opportunity for a small vehicle owner to transport the RWA goods. The information on product readiness with transport deadlines can be accessed from any location that has Internet access. The information collected by the RWA can be directed by the RWA to connect buyers and sellers spatially and temporally through the medium of email.

7. The RWA as the commodity exchange infomediary

The RWA has the ability to facilitate the transition of information into knowledge as it is well positioned (history, track record and connections) to harvest information and add value through prioritising, translating, customising, aggregating and updating. Added to this, the RWA is a natural trust infomediary choice for the region (i.e. the entity that creates the trust and whose bank account can facilitate transactions for the countless entrepreneurs who have no access to banking facilities).

Making the right information available to people at the right time in a comprehensive manner will enable the buyers and sellers to connect and exchange. This valuable information requires protection from the potential abuse of powerful and sophisticated organisations that may become interested in trading in the area once markets develop and can be easily accessed. The RWA is an appropriate repository to house the information and ensure that it remains a community asset.

Whilst the infomediary and the marketing model can provide a strong base for the initial development of a local commodity exchange, this brief analysis highlights many impediments, one being the lack of technological skills to provide the online business transactions. This suggests that there may be a missing variable that needs to be factored in the model. This missing variable may be an Application Service Provider (ASP).

7.1. The Application Service Provider

An ASP is defined here as an intermediary that can provide and maintain all of the software and hardware that may be needed to run the offerings and activities of the infomediary. It is highly unlikely that the IT skills and expertise will be available at village level to provide many of the infomediary competencies such as billing, order processing, and data base management. It makes more sense to outsource these activities to the "experts" and pay a fee based on transactions. The RWA resource centre and satellite offices can communicate with each other and with the ASP through email via the telecentre. The costs can be transaction based which means that minimal costs are incurred if no transactions happen. This way the RWA will pay for only

the services it uses as well as having the added advantage of owning the minimum of equipment and minimising obsolescence costs.

The following diagram schematically shows the players in the commodity exchange scenario and displays the profit distribution. The arrows indicate directional flows of communication between the players and directional flow of profit distribution.

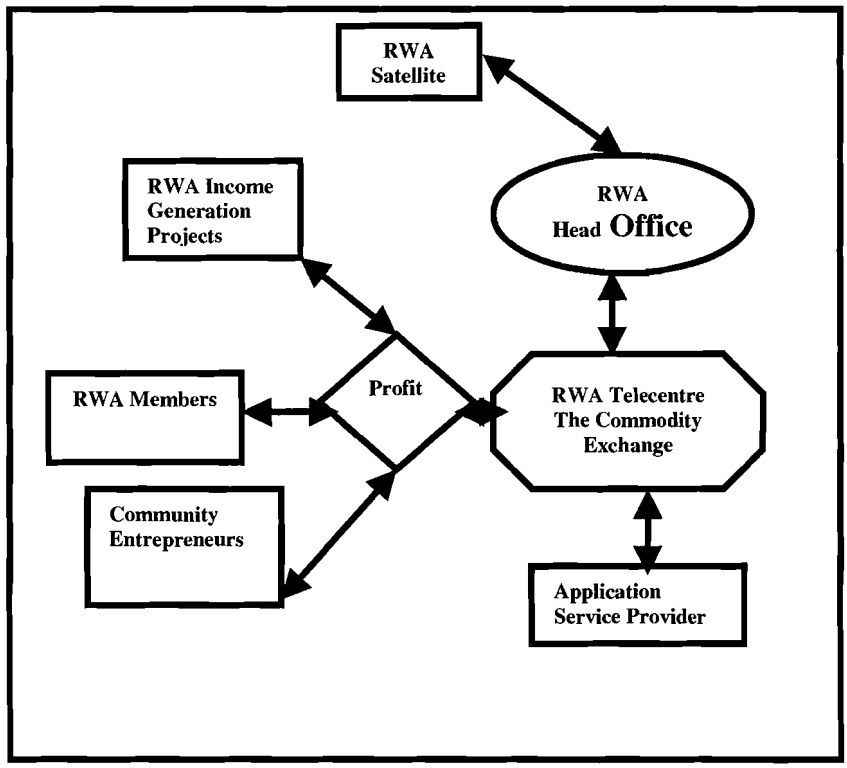

Figure 2. The commodity exchange players

It is senseless at this stage of South Africa's development to expect to train and retain skilled personnel to operate, maintain and upgrade interactive databases. Those who develop technological skills generally leave the village when a job opportunity presents. Our current experience of training women in the village bears this out and the RWA becomes a perpetual free training institution for government and business.

An ASP could negate a number of the potential technological and skill shortage problems (problems that could condemn the idea to failure before it start). The ASP can handle issues such as scalability, standard architecture,

system redesign, data management and data transactions (for example billing and payment using the RWA banking account), new application systems and software, system interoperability. This has the added benefit of providing continuos audit trails, which will be a useful arbiter if transaction and payment disputes arise. The ASP can focus on technological issues allowing the RWA to focus on its core competencies. Using an ASP model the RWA will not need to own extra equipment above and beyond the current telecentre. This method may provide the potential to accelerate the creation of "born on the web" rural micro enterprise.

The next section will expand this analysis and suggest what some of the other variables may be in the commodity exchange model equation.

8. The Proposition - A community based economically sustainable commodity exchange

It is unlikely that information technology communication (ITC) will be a sufficient condition for creating rural markets for economic upliftment. If one considers technology as a process of knowledge in practice (Cypher) then it can be a short step to understanding that technology may be an important driver of sustainability but not the sole driver. Whilst the combination of technology, marketing theory and the infomediary model may turn out to be very significant in the pursuance of a sustainable commodity exchange model it is unlikely that this is a complete model. The infomediary and the marketing model may provide a strong base for the initial development of a local commodity exchange but this exploration raises many more research questions. The following issues (not intended to be exhaustive) have arisen from the literature review, from the analysis of the marketing and infomediary model and from my lengthy association with the RWA .In my humble opinion they may significantly impact on building a prototype commodity exchange.

8.1. Sustainability

What is meant by sustainable in a community development context is open to many interpretations. The USA telecentres are based on a sustainable model but to find and apply appropriate definitions is challenging. One can argue that sustainability refers to the provision of universal access and is not related to economics because communities cannot pay for the services. However this is less than useful as when donor money is exhausted the telecentre risks closure. Sustainable economic development focuses on people, engages them in assessing needs, planning and implementing development initiatives. Goldsmith and Brinkerhoff (1990) define sustainability as a condition in which " institutions outputs are valued highly enough that their inputs continue". Sustainability results where the community gets something that it considers to be of value. Whilst the argument is forwarded that rural people

cannot pay for ICT services, this can be countered by an example from the Apel region where there are around 30 "poor" village mothers who find R50 per month to pay for computer classes for their four years olds. (As this is seen as having adequate value to trade for an economic consideration).

8.2. Where do sustainable development and rural ICTS meet?

There are very few critical appraisals or evaluations concerning rural ICT use, (Information and communication technology, defined here as electronic means of capturing, processing, storing and communicating information) access and its impact on sustainable development (Rural access to Information and communication Technologies Report). What research exists seems to converge on the notion that it is the involvement of the local communities, which surround the projects along with training and capacity building issues that create sustainability. Some of the issues relating to developing a sustainable commodity exchange may include the following

8.3. Demand driven initiatives and appropriate research methodology

The rural access to ITCs report findings show that projects, which successfully contribute to rural poverty alleviation and socio economic development, are predominantly demand -driven. Sustainable demand driven approaches develop from the bottom up rather than top down and in so doing fulfil user needs (rather than other stakeholder needs such as the donors). The process to develop a bottom up model will be predominately driven through research methodology. A participatory research approach identifies the information and training requirements of the local population whilst uncovering local skills and knowledge that will assist in making technology useful and appropriate to local people. The research must be an integral part of creating community mobilisation. Inclusion of research findings to precipitate actions that reverse inequalities and transform society is a research objective. This way power is invested in grass roots organisations and individuals.

The research must focus attention on community mobilisation by including community members in data collection to identify conditions, problems, effects, impacts, and the causes of such conditions and in generating solutions as to how the situation can be improved. The research must result in action in which local people will actively participate to build the local commodity exchange through focusing on the applications that are relevant to the community and by moving focus away from the technological solution.

8.4. Culture

The net culture and rural culture differ in many significant ways. The cultural issues may impact when trying to develop a net business in a rural context. Many people talk about the cultural problems of transferring a technological environment into a predominately illiterate rural environment. Prath (1990) cites Hensman, as saying that peasant conservatism inhibiting developmental change is a myth. Rather, he concludes that imposed solutions from above tend to evoke resistance, which can be seen as a cultural blockage. (Reinforcing the need for a bottom up demand driven approach). However this may not fully eradicate cultural difficulties as the e-conomy is characterised by different attributes to industrial society and to rural society. Hartman characterises the e-conomy as driven by a" free for all, real time execution.....encouraging experimentation and where failure is expected and accepted" There is a culture of continuous change, things are never "done" they are always beginning. The e- conomy world has different rules to the rural world. Rural life is characterised by a resistance to change and a submission to authority. Questioning decisions and directions is not pervasive. Thrusting unprepared rural people into this scenario could be like thrusting them onto an intergalactic roller coaster ride. Key to the successful implementation of technology as a driver of economic development may be the identification of the cultural patterns of behaviour that underpins the acceptance and use of technological innovation.

8.5. Leadership.

Is the current RWA leadership style conducive to the development and implementation of a commodity exchange? Hartman believes that the leadership of an organisation must empower every corner of an organisation for the net approach to business to be most effective. However there is a not a tradition of empowering those out of the "authority circle" in rural areas. How can this issue be managed to develop leadership that incorporates the factors that currently make the RWA successful whilst incorporating the leadership styles that support successful net business?

8.6. Governance

This area spans the domain of rules, regulations, legal entities, control, accountability, responsibilities and authority. The governance structure determines the nature of relationships within the organisation. Net ready businesses need to be able to tolerate high levels of ambiguity and chaos. Rural areas are characterised by rigid hierarchies of tribal authority and male dominance. There is resistance to change that is more entrenched than in the urban areas. Tribal authority has vested interest in entrenching the status quo

as change in this area can threaten their power and influence. These issues need to be factored into the design of the commodity exchange

8.7. Technology and The Telecentre Model

The current telecentre model may not support the proposed commodity exchange. The technology is becoming obsolete, no funds are being set aside for depreciation and hence it is unlikely that equipment and hardware will be upgraded. Many of the required transactional competencies such as billing and on line ordering transactions are not found in remote rural areas. An enhancement of the current model through the use of an application service provider can provide a realistic solution to the technological difficulties. Using an appropriate ASP (what appropriate means is a whole new research question) can reduce the need for expanding telecentre assets (which would be a great advantage to solving the pervasive theft problem.) Capital investment of the telecentres has been on average R200 000. Perhaps this investment may be more powerfully employed in supporting the cost of ASP transactions during a set up period.

8.8. Illiteracy and Language

Prath asserts that increasingly African scholars are arguing for the return to African languages and that language barriers constitute a serious threat to the extension and spread of innovative ideas. He opinions that if African languages are developed to include modern science and technology they will hasten the pace of transformation. The commodity exchange will serve a number of diverse language and cultural groups. How will language issues be settled to cater for all needs?

8.9. Partnerships and Relationship Building

The Rural Access to ICT report suggests that due to the relatively high costs and complexity of implementing ICTs in rural areas there are not many organisations that can proceed alone and expect to be successful. Collective resources, experiences and knowledge will leverage greater ICT opportunities. Creating partnerships, strategic alliances and collaborations that will better equip the RWA with human, technical and financial resources can significantly contribute to sustainability. Who are the stakeholders to include in the relationship building programme? Intermediary organisations, which can serve as linkages between technology and rural women, need to be identified and included. Does an ASP exist to service the needs of a rural local Internet commodity exchange? How can one be developed to sustain a number of rural communities on a cost-effective basis? How can remote volunteering (retired business people) be harnessed to supply some of the very vital start up skills to the community?

8.10. Local Communication Networks

As the dissemination of the commodity exchange information to the largest possible population will be a key success factor there is a need to research how to utilise the strengths of both new and traditional media to do this. How can local informal communication fit with new electronic communication networks? A good understanding of local communication patterns and processes is essential to ensure appropriate applications of technologies and content to the local situation and for harmonisation and integration with existing communication channels and processes. This includes investigating cultural and social norms, where and how people communicate, what is communicated and by whom? It is not intended for digital communication to replace local communication but for it to enhance build on and support what is already in place.

9. The way forward

This paper has generated a number of ideas and issues that may shape and impact on rural economic growth. The ideas result from the syntheses of model exploration (as a mechanism to evaluate the RWA competencies against the model requirements) and the writers observations resulting from her involvement of the last five years with the RWA.

The use of ICTs as an effective rural development tool is presently inconclusive with scarce research available to support or deny this proposition. Added to this is the issue of limited funding available for development and the competition from other development priorities (clean water, sanitation, schools and clinics). A venture such as a commodity exchange runs the risk of joining other "white elephants" of development disasters that litter the African continent. Ethical issues are involved when working with low power communities who can be unwittingly led into inadequately understood ventures whilst having immense expectations as to what transformative power the project will have on their economic and social lives.

These concerns dictate that the road forward is travelled with great caution and with the full involvement of the community players. The community will dictate the pace of research and development and not a western notion of a project plan.

The next phase will be to test these conjectures with community based field research and a direct focus on the question of developing and accessing crucial information about markets that can create income for the local community. No amount of technology will market the goods and services of the community. The technology can only enable, enhance and expand and increase the effectiveness of marketing activity. The appreciation of how the components of the marketing

model operate need to be transmitted to the community before a technological solution is mapped on to the marketing solution.

The starting point will be to incorporate as many of the processes and strengths that have been used in the last five years to propel the RWA to where it is today. This indicates that the beginning point is to conduct a comprehensive and inclusive participatory community needs assessment, which will mobilise and organise the community around the problem of marketing. It is anticipated that the assessment will: -

- Identify all the potential stakeholders who can contribute to the development of a rural Internet based commodity exchange,
- Use action research methodology to teach the players about marketing concepts,
- Identify core competencies and map the competency gaps in terms of marketing and infomediary requirements.
- Uncover the local value systems and cultural patterns that may impact on the model (this will provide ammunition to avoid the imposition of external cultural values).
- Locate and identify local communication networks.
- Mobilise the community.
- Position the RWA to input into government policy around development and technology

Concurrent to the needs assessment will be research into the feasibility of developing a national ASP, which can serve the needs of rural communities with telecentres. Part of the research will be to identify what government policy, funding and attitudes may affect this development and what policy changes are needed to support the initiative.

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INCREASING INFORMATION LITERACY: A CASE FROM VICTORIA, AUSTRALIA.

NICOLE FAHEY

Abstract. *The rise of the information revolution has led to information becoming a major producer of wealth. This revolution has increased the importance of being able to access and utilise information from a variety of sources, including information published electronically. The Skills.net program was designed to increase information literacy skills by providing free or low cost access to training in on-line services and the Internet for those in the community who are least likely to have access. (Cavill and Miller, 1998) This study found that the Skills.net program did increase information literacy. However, the program was not as successful as it could have been, as it did not adequately address the accepted training needs of its participants.*

1. Introduction

The global economy is currently being transformed from an industrial economy into an information driven economy where information is a major producer of wealth. The utilisation and transformation of information is now a desirable way to produce wealth, and there is a growing importance for individuals to be able to access and interpret information from a variety of sources. (Kling 1996)

As the shift towards an information society progresses, information impoverished individuals will be unable to compete in the information economy, and as a consequence the gap between information 'haves' and 'have nots' will widen. (d'Orville 1998) These have nots will be faced with information poverty.

Information poverty is a form of relative poverty that leads to people being unable to participate in the global information economy and society. (Fahey 1999) There are many factors that contribute to information poverty including language, culture, poor English literacy skills, lack of access to telecommunications, the inability to use software and the lack of a recognised need to access electronic information.

In an attempt to reduce information poverty many nations have pledged to develop a Global Information Infrastructure, which if achieved will enable universal access to telecommunications. Many programs around the world have implemented programs to improve general literacy skills in their communities such as reading, writing and mathematical skills.

Some governments and government agencies, such as the Victorian government, the Canadian National Literacy Secretariat, the UK established National Council for Educational Technology and the Singapore Ministry for Education have implemented information literacy programs. (Miller 1997) These information

literacy programs aim to increase a person's ability to use electronic means to extract and apply information.

The Victorian government and Multimedia Victoria's (MMV) designed Community Skills and Networking Program (Skills.net) aims "to provide free of charge or at a low cost access to training in on-line services and the Internet for those in the community who would otherwise not have access." (Cavill and Miller, 1998)

The Skills.net program is attempting to reduce the widening gap between information rich and poor individuals by providing participants with training and access to computing facilities, thus allowing them to develop some degree of information literacy. Information literacy is described by Charles McClure as "the ability to locate, process, and use information effectively regardless of delivery mechanisms and the type of format in which that information appears; that is, to be literate, one must be literate with both print and electronic formats." (McClure 1994) This definition of information literacy will be used throughout this paper as it encompasses many important aspects of information literacy.

This study aims to identify whether the training provided by the Skills.net program empowers participants by enabling them to develop a degree of information literacy.

2. Research on Information Literacy Training

Although information literacy is extensively discussed in information systems, education and librarianship literature there has been no specific definition of the exact skills required to achieve information literacy.

In their report titled, 'Essential Skills for Information Literacy' (WLMA 1996), the Washington Library Media Association (WLMA) outlined what they identified as essential skills for information literacy. These essential skills are particularly relevant to this study because WLMA's skills relate specifically to the development of information skills.

The WLMA guidelines on skills for information literacy were used to assess whether Skills.net addresses accepted training needs and provides participants with the skills required to become information literate.

The three WLMA information skills used in this assessment were chosen because they can be directly related to the Web searching and email skills taught by Skills.net. These skill areas are discussed below.

2.1 *Construct strategies for locating information.*

Skills.net attempt to enhance participants' strategies for locating information by providing them with knowledge of additional information resources including the Web and email.

2.2 *Locate and access information.*

Skills.net training aims to enable the location and accession of information via Internet searching and email.

2.3 *Evaluate and extract information.*

This skill relates to the participant's ability to identify whether information obtained is suitable to their need. Extraction of the information may simply be the ability to read and assimilate the information. However in this study extraction of information will relate to the participants ability to access information via electronic sources and locate it again for future use. Some of the methods which may be used to extract information are downloading, bookmarking and printing.

Three of Kirk and Todd's (in Booker 1993) guidelines for underpinning information literacy programs, were used to evaluate the ability of Skills.net to meet user needs throughout the design, development and delivery stages of training.

1. Information literacy is relative to the individual, a particular need and the situation of the individual. Therefore Skills.net training should be sensitive to participants needs.
2. Planning and development of the information literacy programs will be based on needs as determined by the users, not defined by the organisation.
3. Program evaluation needs to be evaluated in terms of users' needs, and the benefit and satisfaction derived.

3. Research Objectives

The main objective of this research was to investigate the ability of Skills.net to increase the information literacy of program participants while decreasing their relative information poverty.
In order to determine the success of the Skills.net project and identify some underlying issues affecting its success it was necessary to develop a major research question as well as a set of sub questions to answer specific sub-issues. The formal research question is as follows:

Does Skills.net training empower users?

This question identifies whether Skills.net training meets participants' information literacy training needs by addressing a set of sub-questions.

The sub questions address specific issues that have arisen out of a literature examination of the Skills.net program, including:

Is Skills.net addressing accepted needs for training?

Do Skills.net trainers believe they are achieving their goals of training?

Do Skills.net participants think they are achieving their goals through Skills.net training? Are they satisfied with the skills they are taught?

This research attempts to contribute to the understanding of the effects of information literacy and information poverty. Also explored is the ability of access and training programs to counteract the effect of these phenomena.

4. Skills.net Overview

Skills.net was provided with five million dollars by MMV to be spent over three years in order to create a network of more than one hundred self-sustainable projects across Victoria. These projects originally aimed to provide forty thousand people with the skills and resources they need to understand and use the Internet. (Cavill and Miller 1998) The Skills.net network currently consists of two hundred and eighteen projects across Victoria, which has provided training to around forty five thousand participants. (Skills.net 2000)

The Skills.net participants are currently trained by Leader Projects, which are provided with one hundred thousand dollars to train one thousand participants, or General Projects, which receive ten thousand dollars to train one hundred participants. Both types of projects are meant to provide five hours of training in the use of on-line technology, as well as, ten hours of access to the Internet for each participant. Original Skills.net projects known as pilot projects were only required to provide two hours of on-line training and ten hours of Internet access.

All applicants for Skills.net training must complete a survey, which asks the following.

- Do you have access to Internet services?
- Did you have access to Internet for 5 hours or more over the last six months?
- Do you have a multimedia computer at home, which has at any stage been connected to the Internet?

If the applicant answers yes to any of the above questions they may not eligible for Skills.net training.

5. Skills.net Training Goals

The training goals developed by MMV and VICNET suggest that all projects should provide training in Web browsing, email, downloading files and creating Web pages.

However, there is general agreement amongst the projects that they can not cover this amount of training in the time allowed. (CIRCIT 1998) Therefore some projects have altered the training time and / or the type of training delivered.

According to a prior evaluation of Skills.net the most common format for the five-hour training is an introduction to the Internet, surfing and browsing the Web, an introduction to email and sending and receiving email (CIRCIT 1998).

MMV has previously evaluated a number of pilot and general projects in terms of their ability to meet membership targets, training contact hours and access hours. This study differs from the MMV evaluation because it focuses on the quality of the training delivered and not the quantity.

6. Research Methods Used

Robson states that "the research strategy or strategies, and the methods or techniques employed, must be appropriate for the question that you want to answer." (Robson 1993)

In order to appropriately answer the main thesis question and its sub-questions, it was necessary to implement the multiple case study research method and two separate data collection techniques. The primary data collection technique used was the survey. The survey was used to collect necessary quantitative data about Skills.net participants in order to answer the thesis sub-questions relating to participants perceived goals and satisfaction with training. The survey also asked participants to rate their pre-training and post-training skill levels. These skills level ratings were then used to allow the researcher to determine if the training empowered them by improving their skill level. This evaluation of empowerment contributed to the findings of the main thesis question, "Does Skills.net training empower participants?"

The survey also asked participants to rate their perceived importance of and satisfaction with various areas of the training. The results obtained from these questions combined with the reasons participants gave for undertaking the training, answered the third thesis sub-question, "Do participants think they are achieving their goals through Skills.net training?" From the 412 surveys successfully mailed to respondents 140 useable surveys were returned. This gave the survey a total response rate of 33.98%.

The second data collection method used was a semi-structured interview. The interview technique was used to assess the perceived needs and goals of the Skills.net trainers. This method enabled the collection of qualitative data relating to the trainer-related sub-question, the main thesis question and whether Skills.net addresses accepted needs for information literacy training. This research method also allowed the researcher to gain insight into the background and culture of the organisation.

7. Results by Cases

7.1 *Case One*

7.1.1 BACKGROUND OF ORGANISATION

Situated in a large rural community within the Central Victorian Skills.net region Case One was a well equipped and resourced learning centre largely focused on training teachers in IT skills before it received Skills.net funding. The Skills.net funding enabled them to bring forward by three years their long-term plan to extend training to the broader community. (CIRCIT 1998)

Case One was one of the pilot leader projects and as such was given funding to provide training for 1000 participants. The Skills.net training provided by this organisation consisted of an initial three-hour training session and nine hours of self guided access to Web and email technologies. The training session was an hour longer than Skills.net requirements to allow adequate coverage of the course requirements.

7.1.2 BACKGROUND OF TRAINER

The primary trainer at this case had been a trainer for five years and had experience in teaching computer applications such as MS Word, MS Office and Internet applications. They did not undertake any teacher training provided by VICNET because it was not available at the time, however they had received some in-house training some time before Skills.net training began.

7.1.3 DEMOGRAPHICS AND SAMPLE SIZE

Of the groups studied this Case had trained the largest number of participants and therefore was sent the largest amount of surveys. Of the 216 surveys successfully sent 79 useable responses were returned, with the response rate being 36.57%. This section explains the demographic composition of the people from this location that returned the survey.

7.1.4 AGE

Fifty-four percent of the trainees surveyed at Case One were aged between 36-55 years. According to the Australian Bureau of Statistics (ABS) 29% of people aged between 40-54 years are likely to have had access to the Internet. (ABS 1998) Therefore it is probable that the participants trained at this location have only had moderate access to the Internet in the past. Also because this training centre is located in a

rural region it is likely that respondents have had less access to the Internet than people from a metropolitan area. (ABS 1998)

7.1.5 GENDER

Over seventy percent of those surveyed at this location were women. As this location had a large proportion of female trainees their Internet accession rate and skill level may be lower than expected. This is due to women being less likely to access the Internet than men. In 1997/98 34% of men accessed the Internet access compared with 28% of women. (ABS 1998)

7.1.6 SUMMARY

Overall this case felt that the Skills.net designed training areas were slightly less important than the other groups studied. This case was also less satisfied with delivery of Skills.net training than the other cases. They were significantly less satisfied than other groups with teaching support, reliability of equipment and course content. This lack of satisfaction with course content may have been a result of the shorter duration of this training course, although this group was the most satisfied with the ten hours of Internet access provided.

7.2 Case Two

7.2.1 BACKGROUND OF ORGANISATION

Like Case One, Case Two is a pilot leader project required to provide training to 1000 participants. However, Case Two differs from the other cases studied because it was not established before Skills.net funding was granted. This case was funded as a 'start up project' to service a small rural community in the South Western Victorian Region and was the result of a joint partnership between local government and the local university.

Case Two's vision was "to facilitate the uptake and use of multimedia technology and the development of multimedia skills in the region by all sectors of the community and develop opportunities for establishing a multimedia industry through providing hands on experience, training and use of multimedia technology in a non-threatening, flexible and professional environment." (Case Two Interviewee 1999)

This case provides ten hours of training to its participants in the form of five two-hour sessions, which allows them to provide more training than other organisations adhering to Skills.net guidelines.

7.2.2 BACKGROUND OF TRAINER

The primary trainer of this organisation had worked as a teacher for 13-14 years and had several formal qualifications in this area. Due to their knowledge of curriculum development and design they were employed as the Project Facilitator and as such played a large role in developing the curriculum taught at this venue.

Although this trainer had no previous specific information technology teaching experience they had experience at teaching music-related technology.

7.2.3 DEMOGRAPHICS AND SAMPLE SIZE

Case Two was sent 132 surveys and returned 44 useable responses, giving a response rate of 33.33%. This section describes the demographic features of those from Case Two who returned the survey.

7.2.4 AGE

Almost seventy percent of those surveyed at Case Two were between the ages of 56-75 years at the time they were surveyed. According to an ABS survey only 7% of people aged over 55 years accessed the Internet in the 12 month period ending in November 1998. (ABS 1998) As this training was located in a rural region their respondents were less likely to have access to the Internet. (ABS 1998) Due to the age, gender and location of Case Two participants they are likely to be the least skilled before undertaking training.

7.2.5 GENDER

Like Case One, the majority of survey respondents were women. However, there was a slightly more even distribution with only 62.79% of respondents being female. Women in general were 4% less likely to have access to the Internet than men. (ABS 1998) This again may reduce the skill level found at this location.

7.2.6 SUMMARY

Case Two respondents consistently reported lower skill levels than the other groups before and after training. The only exceptions were the areas of Internet searching, email, and Internet history, where the groups reported skill levels very similar to those of Case One. Apart from feeling less skilled than the other groups Case Two respondents were still satisfied with the training they received. In general the

satisfaction levels reported by this group fell between those of Case One and Case Three. This case viewed the majority of training areas as moderately important. Although they perceived Internet searching, Internet history and downloading as less important than other groups.

7.3 *Case Three*

Case Three is a general project, which provides training from a community centre in the Melbourne metropolitan Skills.net region. This Case has been providing Skills.net training from early March 1998. However, since the community centre's inception in 1973 they have aimed to provide programs to enhance social justice, access and equity to its community. Case Three also aims to provide lifelong learning opportunities to all individuals regardless of age, gender, race or disability. (Anonymous 1999)

Case Three provides five hours of online training and ten hours of access to it's participants as outlined in the Skills.net guidelines. However, they are flexible and will alter the course content to suit participant needs.

7.3.1 BACKGROUND OF TRAINER

The Skills.net trainer at this location is employed on a sessional basis to deliver Skills.net and Adult Literacy training. Like Case Two the trainer at this location had significant teaching experience in areas other than information technology. Although the trainer has no formal information technology training experience or qualifications they have been incorporating the use of information technology into the literacy teaching for some time.

7.3.2 DEMOGRAPHICS AND SAMPLE SIZE

Case Three had the smallest number of trained participants to survey, as it is a general project and was only required to train 100 Skills.net participants. Therefore only 64 surveys were sent to this location and only 17 useable responses were returned. The response rate from this case was lower than the other cases at 26.56%, and the trainer of this case suggested that this might be a result of the high Non-English Speaking Background (NESB) population at this venue. The section below explains the demographic features of the survey respondents from this case.

7.3.3 AGE

Case Three had the youngest population of all the cases surveyed, with just over forty percent of respondent aged between 26-45 years. As

40% of Australian's aged between 25-39 years were likely to have had access to the Internet this group was the most likely to have access of the groups studied. The respondents at this case were also more likely to have access to the Internet as the course was located in a metropolitan area. (ABS 1998) This increased likelihood of access may result in the skill level of this group being higher than the other cases.

7.3.4 GENDER

This case differed from the other two studied because the majority of survey respondents were male. As men are more likely to have access to the Internet the chances of this group to have access to the Internet are again increased.

7.3.5 SUMMARY

In pre-training and post-training categories Case Three respondents considered themselves slightly more skilled in most areas than the other locations. These results are consistent with the ABS findings that this group should have had more access to Internet and information technology and therefore should be more skilled.

This group also placed higher importance on most of the training areas than the other groups, which may have been because they had more of an idea of what to expect from training because they were more experienced at using computers.

Case Three was also the most satisfied case studied. This high satisfaction was demonstrated with significantly higher perceived satisfaction with their teacher, the course content.

8. Summary of Findings

8.1 *Is Skills.net Addressing Accepted Needs for Training?*

To determine if Skills.net training addresses accepted training needs, information about the programs design, development and delivery was analysed and compared to the guidelines for successful information literacy training by WLMA and Kirk and Todd. To address the WLMA guidelines the training had to enable students to construct strategies for locating, accessing, evaluating and extracting information.

8.2 *Constructing strategies for locating information*

Skills.net addresses this guideline by providing participants with knowledge of information resources including the Web and email. Once participants had knowledge about how these information resources could help them locate information, they could include the use of these resources into their information gathering strategies.

8.3 Locate and access information

The program addresses this area by providing training in skills, which enabled access to information by using the Web and email. The training also provided students with the ability to refine and narrow Web searches to allow them to locate the most relevant information for their needs.

8.4 Evaluate and extract information.

The training enables participants to evaluate and extract information. The ability to evaluate information was beyond the scope of this course, however Skills.net teaches participants how to extract suitable information for future use. Although the amount of training given on information extraction differs between Skills.net groups some methods taught included bookmarking, downloading / saving and printing.

In order to meet the guidelines established by Kirk and Todd Skills.net training had to demonstrate a user orientation to the design, development and delivery of their training.

8.5 Information literacy is relative to the individual, a particular need and the situation of the individual.

Therefore Skills.net training should be sensitive to participants needs. Skills.net training was designed to teach a standard set of skills to training participants and therefore did not allow a great deal of flexibility to enable trainers to meet individuals needs. Skills.net trainers often altered the skills taught in the Skills.net training to be more suitable to the skill level and needs of the group being instructed. For example Case One would provide extra training exercises for those who were unfamiliar with using a mouse, to provide them with the mouse skills necessary to navigate the Web.

8.6 Planning and development of information literacy programs will be based on needs as determined by the users, not defined by the organisation.

Skills.net is not successful in this area because the training program was designed on the basis of user needs determined by MMV and VICNET. The researcher was unable to locate any prior studies by these organisations that

identified a set of user needs to be addressed. Therefore, it is likely that these organisations based the training, on needs of participants from other training courses or their own perceived needs. As a result of the training needs being defined by MMV and VICNET several proposed training areas such as creating Web pages were far too advanced for participants. Also, participants did not view some areas such as the history of the Internet as relevant. Therefore, trainers were forced to redesign the training to suit participants' requirements, creating inconsistency in training between the projects.

8.7 Program evaluation needs to be evaluated in terms of users' needs, and the benefit and satisfaction derived.

Although a prior evaluation of Skills.net recommended investigation into the satisfaction of participants (CIRCIT 1998) until this study, no such evaluation of user needs, benefit or satisfaction has been undertaken. Therefore, Skills.net training has been unsuccessful in this area. Skills.net appears to be achieving mixed success in its ability to meet accepted needs of training. While the program is fairly successful in achieving relevant WLMA guidelines for teaching information literacy, the training does not meet user needs adequately enough to be successful in terms of the Kirk and Todd guidelines.

8.8 Do Skills.net Trainers believe they are achieving Their Goals of Training?

The cases studied had different mission statements and slightly different training goals, however all trainers believe that their organisation is successful at achieving their goals through the provision of Skills.net training. It must be noted that this section measures the perceptions of the trainers in this regard, and these perceptions may differ from reality.

Case One believe they are successful because they seem to be meeting most of VICNET and MMV's training targets while providing training to the broader community. Case Two meet their goals by providing training to those in the broader community who are potentially disenfranchised by not having access to the Web and email. Case Three provide training to individuals regardless of age, gender, race or disability. This organisation has exceeded its aims of Skills.net training and is successful at achieving most of VICNET and MMV's training goals.

8.9 Do participants think they are achieving their goals through Skills.net training? Are they satisfied with the skills they are taught?

The most frequently chosen reasons for undertaking Skills.net training was to develop computer skills or explore a new area of interest. Again it is important to note that the findings in this area were based on the perceptions of users.

It appears that Skills.net training is successful at developing computer skills because most of the participants perceived themselves as more skilled after completing the training. Therefore, it is inferred that participants met their goals in this area.

The ability of Skills.net to enable participants to explore a new area of interest is somewhat more difficult to determine, due to a lack of specific questions relating to this area.

Overall, participants were satisfied with the skills they gained through Skills.net training, even when they did not view the training area as particularly relevant, as in the case of Internet history.

As the satisfaction findings were based on participants' perceptions and not skill level testing, it cannot be adequately determined if the skill levels achieved were of a satisfactory standard.

8.10 Does Skills.net training empower users?

The trainer at Case One saw Skills.net training empower users by providing them with the basic skills necessary to explore their areas of interest. They also believe that Skills.net training empowers users by allowing them to air their views publicly via the use of email.

Although feeling that empowerment is a difficult thing to quantify the primary trainer at Case Two believes that Skills.net training raises the awareness of participants which can be empowering. The trainer also feels that the degree of empowerment achieved by the training depends on "what people are expecting to get out of it".

The trainer at Case Three believes that Skills.net training empowers people by providing them "with a new set of information communication ... and information gathering possibilities."

The findings in relation to increases in skills and satisfaction with training suggest that Skills.net training does to some degree empower participants by providing them with skills to access a broader range of information resources.

However, as the course did not focus closely enough on the needs of its participants it did not provide the degree of empowerment in participants that it could have.

9. Conclusions

The Skills.net program is a well-meaning initiative designed to increase the information literacy of information poor individuals. However, the potential impact of the Skills.net program on increasing information literacy was limited due to the failure of the program to adequately address accepted training guidelines.

Skills.net did appear to meet the WLMA guidelines for constructing strategies to locate, assess, evaluate and extract information. However, the depth to which these areas were taught and the time spent teaching them varied greatly between the training venues. Therefore it may have not been Skills.net's original design that met user needs in this area, but instead the trainers' modifications to the course structure. These discrepancies made evaluation of the program difficult.

The major failing of Skills.net was that during its development there was no consultation with potential Skills.net participants to determine what their needs were from the training. This meant that the course was developed on what MMV and VICNET believed to be the needs of potential participants and not the actual needs of participants.

However this study appears to demonstrate the effectiveness and applicability of the evaluation WLMA and Kirk and Todd guidelines to aid in the development, implementation and evaluation of information literacy training programs. Results from the study appear to indicate that Skills.net participants want strategies for locating, extracting and evaluating information concurring with the WLMA guidelines.

The findings of the study also imply that Skills.net would have been more effective if it had taken into account the Kirk and Todd guidelines and focussed on user needs during its design, development, implementation and evaluation. Although developing an effective information literacy course design was outside the scope of this evaluation it would be worthwhile for Skills.net (MMV and VICNET) to adhere to the accepted guidelines while developing future information literacy training courses. This would ensure that the course design is as effective as possible at meeting user needs while improving information literacy.

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IF YOU BUILD IT, WILL THEY COME?

Challenges for Web Community Builders

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Abstract: *'If you build it, will they come' is a case-study of a non-profit Statewide community in Western Australia, the RRR Network, which constructed a website with a communications focus to attract input via the web from its target community – rural, remote and regional women. Many websites fail to attract visitors and this paper details strategies adopted by the RRR Network to boost user participation and ultimately increase the organisation's outreach. The paper reflects on web development issues, software and design considerations important to constructing a successful website, that is, one where web visitors play a significant role in developing content. Since its launch in November 1999, the RRR Online Network has attracted more than 40,000 hits and quarterly public online forums and cross-fertilisation with the RRR Network's widely circulated print magazine have proved key factors in its success.*

1. Introduction

In the film Field of Dreams, Kevin Costner's character hears a voice in the cornfields whispering, "if you build it they will come". Costner's baseball field was duly built and his invisible players did come, drawn by the concept of his dream.

The same can be said of building an online community. The structure you build is designed to attract invisible players. These players are the 'hits' so valued by those working in the Internet medium. And to a large degree, the success of web communities depends upon the number of players who come and how these players – the invisible 'hits'- interact with the web interface of your community.

In this paper, I will present details of how a non-profit community organisation with a Statewide membership base in Western Australia[1] constructed its online web interface and how the web has impacted on the organisation's membership and activities over a twelve month period.

[1] Western Australia covers one-third the land mass of the Australian continent (2.5 million square kilometres). Most of the State's 1.8 million population live in the capital city Perth. Only 27 percent cent of the population live in rural, remote and regional Western Australia, predominantly in the South West of the State with the remainder spread over vast distances and isolated country.

The organisation to which I refer is the Rural, Remote and Regional Women's Network (RRR Network). I am the coordinator of the RRR Network, which was established in 1996, and is based upon similar rural women's networks in other States of Australia. Most such networks are funded by State and Commonwealth agencies[2] and have the charter of promoting networking amongst rural women to achieve professional and social outcomes. The Western Australian model is different in that it is jointly funded by two State Government agencies – the Department of Commerce and Trade and Agriculture Western Australia.

The launch of RRR Online in November 1999 has impacted significantly on the RRR Network. Worldwide access has led to new members joining the Network online from as far afield as the USA and web postings/interaction from visitors in other States of Australia. When RRR Online was launched, membership of the RRR Network was 2,434. In November 2000, membership has risen to 4,022. This increase should not be solely attributed to the website but with more than 40,000 hits recorded to RRR Online over a twelve-month period, the influence of the web on membership growth cannot be underestimated.

Prior to the launch of the website, the RRR Network produced a quarterly magazine for its members featuring stories of interest to women living in rural, remote and regional areas of Western Australia. The magazine, Network News, is a mix of articles written largely by its readership on issues of interest, and including relevant information from government, corporate and community organisations.

Network News is popular with its readership and there is no question that production of this magazine is the RRR Network's major activity. This is reflected by the fact that the Network allocates $50,000 per annum from its budget to produce four editions of the 24-page Network News magazine, compared to $5,000 allocated to RRR Online in the 2000-2001 financial year. I am pleased to say that our web budget remains unspent, thanks to low maintenance costs and cooperative ventures with common interest organisations such as Women's Policy Office, WA Telecentre Network – and Online WA, which funded development costs for RRR Online, as part of the WA Communities Online project.[3]

The web has played a significant role in increasing RRR Network's outreach, enabling our organisation to expand from communicating with membership by means of a quarterly magazine, to an organisation that additionally provides the opportunity for its target membership to chat with guest speakers and each other

[2] The Queensland Rural Women's Network is an incorporated body.

[3] RRR Online Network (www.rrr.online.wa.gov.au) was developed as part of the Western Australian government's Online WA project. Five organisations were funded by Online WA to develop community portals. All start-up costs were funded by Online WA – www.online.wa.gov.au

online. To date RRR Online's chat forum guest speakers have included WA yabby producer Mary Nenke, WA Deputy Premier Hendy Cowan, noted social commentator Dr Don Edgar and Dr Dale Spender, voted one of Australia's most creative minds by the Bulletin magazine. RRR Online's largest audience for a chat session was 226 on International Women's Day on 3 March 2000.[4]

In addition, the RRR Network now provides an email network regularly distributing information such as relevant government media releases; details of conferences, lectures and events to 50 subscribers.

The WA Online Communities project, of which RRR Online is part, utilised Perth company HarvestRoad's WebPOWER[5] software. The software provides communities with the tools to construct a portal web community, with features such as a document storage and retrieval system, chat rooms, bulletin boards, online databases and the opportunity to offer templated websites for individuals and organisations.

RRR Online was developed by a committee of the RRR Network's regionally based reference group, in coordination with staff and stakeholders and according to the requirements of the WA Communities Online project.

We did not pursue the option of offering templated websites to our target market within the RRR Online structure, a feature often cited as a measure of what constitutes a 'portal' web community. Other WA Community Online communities have taken this option and hope to recoup their hosting costs but due to limited funding and staffing resources, the RRR Network chose not to develop in this direction – although it remains a possibility at a later date. It was felt that our target membership could access free web pages from a variety of sources, including specialist rural organisations such as Farmwide, or via their Internet Service Provider. Our focus, therefore, was not to build a website aimed at generating a commercial profit but one that could develop the Network's outreach and capacity to communicate with members.

RRR Online features public bulletin boards on the subjects of agriculture, health, education, business, hobbies – and a miscellaneous subject we named Homefront. Needless to say, Homefront has become our most popular bulletin board with

[4] The large numbers for this event were due to an initiative of WA's Women's Policy Office, who funded telecentres in regional areas throughout WA to celebrate International Women's Day by offering internet training to women in their communities. Part of the web training activities included women throughout the State meeting in RRR Network's chat rooms. The hit rate to RRR Online chat that day was 226, and 25 new members joined online.

[5] See more information at www.harvestroad.com.au

postings ranging from drug use in schools, to kittens looking for a good home. In addition to bulletin boards, there is a chat room, email group and directory[6] for each subject.

The document management and retrieval system has allowed us to maintain a 'library' of information easily accessible to the public. This has so far proved most useful in allowing online archival of the Network News magazine dating back to 1996 in an accessible format but we also have the capability to store video, audio, and graphic files – up to a million documents – all accessible to the public. When it becomes standard practice for organisations to circulate their reports and other information in an electronic format, this feature is likely to become increasingly useful for us.

Print publications – no matter how interesting, well produced or valued – have their limitations. A great deal of relevant information cannot be included in a quarterly print publication, as it will be out of date when the edition is published. Also, there is only a limited amount of involvement possible by the readership in a print publication. One edition of Network News magazine may feature 20 stories, of these approximately half are written by the readership. This restricts the number of women who can actively participate in the magazine's content.

Another limitation with print publications is that it is difficult to gauge with certainty what are the most popular features. Do people skip the Letters page? Was the story on the ex-model living in a remote farmhouse in Doodlakine selling decorative headbands popular with readers? With a print publication, unless you receive comprehensive feedback from readers, it is not possible to accurately know this information. However, with web technology every page accessed on your website is recorded and statistical packages allow you to monitor over a period of time which pages are the most accessed.

In the title of this paper, I alluded to challenges for web community builders to attract visitors to their websites, and have outlined some of the strategies adopted by the RRR Network that have proved successful in attracting visitors. The most successful features of RRR Online have proved so far to be the bulletin boards, online chat forums with guest speakers, access to the Network News magazine, online membership and the email group. Another benefit for us has been the opportunity to work with other organisations in co-producing events on the web.

[6] The Directory is a searchable online database with the potential for web visitors to enter details of their business, interests and other information. The Directory was not a feature we originally planned for www.rrr.online.wa.gov.au but a feature we chose to include with the opportunity to develop in the future.

Online public chat forums, particularly if developed in association with regional networks such as the WA Telecentre Network, are a low-cost method of attracting hundreds of people to your site at the one time to communicate in real time. Chat is a popular function of Internet technology and organised public chats provide a safe framework for people to experience chat rooms and communication for themselves. RRR Online chat forums are held quarterly, to coincide with publication of the print magazine and usually attract double the visitor hit rate in the months when the chat forums are held.

2. A Guide to OnLine Chat Forums

RRR Online Network has hosted a number of online chat forums, publicly advertised and featuring guest speakers, and also for training and internal communication purposes.

Advertising of online events can be via publications, networks, email groups, web postings. Email groups or lists are an extremely effective medium for promoting online events, as the email can be forwarded to other lists. Print publications are also useful for promotional purposes and for web education, such as printing excerpts of online chats or giving information and instructions on how to access features and services, etc.

If you are promoting chats and want people to participate, make it easy by providing a direct link on the homepage to the chat room. Accessible web chat software is crucial. What if they come, but cannot get in – or get kicked out?

We have learned by experience that a more sophisticated java-based software package can restrict access in chat rooms. Ichat was the software provided to Online WA communities when the original Volano chat software was upgraded in August 2000. Problems with a java based software as experienced at RRR Online included freezing of computer monitor screens, repetition of text, users being involuntarily kicked out of the chat rooms and there were incompatibility issues with office and government agency internal networks. The upgraded software does have several very useful features, such as the ability to download transcripts of all chat, and an administrative function that allows disruptive participants to be ejected from the chat room if required. There is also an internet conference facility where all questions can be forwarded to a single administrator.

For RRR Online's target audience, however, access must be provided for users with slower connection speeds particularly in remote areas of the State. The situation is constantly improving but it can be difficult to access the web or receive assistance when you are physically located hundreds of miles from the nearest regional centre. Telecommunications infrastructure is by no means ideal in WA – digital mobile telephony, for example, at present only covers a geographical area comprising five percent of the State.

The solution for us was to downgrade our online chat forum software!

This decision was prompted by an online event on 10 November where our guest "speaker", author and academic Dr Don Edgar, who was participating from Melbourne in an event entitled 'Emancipation without Emasculation: Finding a New Male Voice', was continually booted out of the chat room when he initially connected via a home PC. We had to improvise by calling Don on a mobile phone at home, reading comments and questions to him, and repeating his responses to a scribe. The session progressed well, although a little slow, in a question/answer format. While it was not an ideal situation, Dr Edgar confessed he did not mind, as our scribe was a quicker typist than he was. The question is though, if Dr Edgar could not gain access, how many others missed out and how many of them will come back next time? It was apparent during both online chat sessions using the upgraded chat software that participants were involuntarily leaving the room and having to re-enter. In the Hendy Online forum on 31 August, featuring WA Deputy Premier Hendy Cowan, one participant in Merredin complained that it took 50 minutes to download the java chat software.

After **access**, the next most crucial feature of online chat events is **content**, followed by **marketing**. We have been fortunate to partner with organisations such as the WA Government's Online WA, Women's Policy Office and the WA Telecentre Network for chat forums. Partnerships such as these have allowed us to link hundreds in with conferences and recruit guest speakers of note such as Deputy Premier Cowan, Dr Don Edgar and Dr Dale Spender.

For examples of chat forum content, see transcripts of chats featuring guest speakers Mary Nenke (yabby farmer and exporter); Hendy Online (online meeting between a government Minister and remote, rural and regional women); Don Edgar and Dale Spender ('Women and Smarts: Gender and the New Technologies') – at www.rrr.online.wa.gov.au.

3. Some key things to consider when organising an online chat event are:

- Time differences. Include an Australian Eastern States commencement time in promotion of the event. The web is a world without borders. It is just as easy for someone in Ballarat to participate in a chat event as it is for someone in Perth where the event is hosted.
- Choose the time of the day when you are most likely to attract your target audience.
- Marketing. Don't just say: "Dr Don Edgar will be participating in an online chat on the topic of...". As an example, Dr Edgar's chat on RRR Online was promoted by email with a subject header quoting the opening line of his conference paper: "Why are so many men boring?". Ask people to forward your email on to other lists/networks. Use print publications and other forms of

advertising. Include instructions how to access the chat room – and don't forget the web address.

- Do you need to pay a speaker's fee? Online chats, once the web infrastructure is in place, are inexpensive to organise in comparison to booking venues, organising catering, travel, equipment for speakers as needs to be done in public lectures.
- Have you sought permission from the speaker to post a transcript of the discussion on the website?
- Try to also have telephone access to your speaker during the chat, in case of technical glitches.
- Do a test with the speaker prior to the chat. Also arrange for outside users to participate to ensure access and that the speaker is familiar with the chat environment and process.
- Consider a scribe. A speaker can only talk as fast as he/she can type.
- Round up a posse – invite people you know with a knowledge and interest in your topic to participate and contribute to discussion.
- It helps to be physically present with a speaker in a room with two or more computers logged into the chat room. This improves communication between speaker and facilitator/s. RRR Online makes use of an IT training room in the WA Department of Commerce and Trade.
- Questions can come thick and fast. Appoint one, or preferably two, facilitators to seek questions and check responses, and to monitor questions. It helps to participate in an organised chat event or visit a chat room prior to your event. Clarify roles and procedures prior to chat but be prepared to go with the flow of chat. Ask questions if there is a break in discussion, welcome participants, promote details of forthcoming web events, obtain feedback, instruct participants to hold questions, explain the speaker is answering a question if there is a pause, etc.
- Familiarise your target audience with 'chat-iquette', emphasising when you commence the chat, the importance for participants to follow facilitator prompts and keep questions/comments brief. Long chunks of text quickly disappear off the screen, which can make conversation difficult to follow. Post instructions and guides on the website.
- Provide transcripts wherever possible. If book titles, web addresses, email addresses, etc. are quoted during the chat, a transcript allows people to access the information later. It also allows visitors, who cannot be present for the scheduled chat, access to the information. Transcripts can also be circulated to many by email.

As a community organisation, RRR Online is not just about hit rates. We now receive valuable input via email and the web. There has been a healthy cross-fertilisation between RRR Online, our email group and the Network News magazine – ranging from promotion of online events in the magazine, to publication of email/bulletin board comments and excerpts of chat forums in the

magazine. The RRR Network and its web community recently participated in the first online public meeting by a WA Government Minister to a Statewide audience, where participants were asked to post topics on the Homefront bulletin board to set the agenda of discussion. Mr Hendy Cowan, MLA, Minister for Commerce and Trade; Regional Development; Small Business, chatted online for an hour to 75 people from across the State, from a farmer in Esperance to the Kununurra telecentre in the North West. A scribe was used to do Mr Cowan's typing. Senior staff observing the session commented that the Minister was able to respond to a far greater number of questions than he could at a public meeting. Questions the Minister missed or took on notice were later followed up by Ministerial staff, in the manner of questions taken on notice during radio programs.

What did our invisible players think of it? The public appreciated the opportunity to have direct contact with the Minister, and many congratulated him on his initiative. Some were cynical that nothing would happen following the meeting and a few experienced technical difficulties but overall feedback received via the online feedback form was overwhelmingly positive, even exuberant in some cases. One participant who had not used a chat room before commented via the online feedback form that it was empowering for women to chat directly to the Deputy Premier without having to leave home: "I could be sitting here in my gardening clothes," she wrote.

An invaluable aspect of operating a website is the information visitors provide by means of direct feedback, or simply as statistics on a page. Members and visitors contribute valuable content to RRR Online. They express opinions, discuss issues, and in the process enrich RRR Online with what is often very engaging reading material. Consequently an increasing amount of material originating on the website or from the email group is now appearing as content in the Network News magazine.

This is not to say that we have constructed the perfect website. After twelve months of operation, we have enough information and experience to identify areas where the website could be improved. For example, some bulletin boards receive fewer visitors and postings than others, indicating they are not as relevant or appealing to web visitors, or perhaps there are too many subjects. A few navigational 'quirks' on our website also require correction. The online calendar may attract visitors, but is time-consuming for staff to maintain[7] and has therefore been neglected. The

[7] The RRR Network employs one full time coordinator and one part-time staff member with responsibility for maintaining the website. The WebPOWER software has so far proved relatively easy to use. A working knowledge of HTML would greatly assist anyone operating the software.

Directory feature remains largely undeveloped, and the evolution of the RRR email group could probably be the subject of a paper in its own right[8].

Web builders strive to create an easily accessible, inviting structure with logical navigation and relevant information: a website that attracts and retains the target market. There are many reasons why websites fail – poor design or maintenance, confusing navigation, or information not presented in an appealing, relevant format. Another failing is placing too much emphasis on all that is technically possible, and allowing this to dominate the design of your website. Technology may provide the structure but people build communities.

Community websites without visitors, no matter how technically advanced or laden with features, are the cyberspace equivalent of ghost towns.

For without the players, there is no ball game.

[8] While it is not necessary to operate a website to establish an email group, it is useful to have a web address where people can subscribe and unsubscribe, and where significant postings to the email group can be cut and paste to bulletin boards or made publicly available. Subscribers often express the desire for an accompanying website to enhance email communications.

COGS IN THE WHEEL

A case study examining regional health care workers access and use of electronic information resources on HIV/AIDS and Hepatitis C.

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Abstract. *To effectively utilise health informatics in the workplace it is necessary to consider the context in which they will be used. These include the influence of organisational capacity, worker education and training needs, and the health information requirements of targeted populations.*

This paper firstly outlines why issues such as these are important considerations in health informatics planning. Secondly, the paper provides a case study on how these considerations can be incorporated into assessing electronic information, education and support requirements. The case study describes the development of a national survey that is assessing health care workers' access and use of electronic resources relating to HIV/AIDS, hepatitis C and other blood borne viruses. Rural health care workers are a defined subset of this survey. The survey methodology was designed to incorporate organisational, worker and service-user perspectives on electronic information and education resources. It is envisaged that in considering the human context of electronic information, education and support strategies, better health outcomes may be achieved.

1. Introduction

Rural and remote health care agencies service approximately two thirds of the Australian population. Health informatics has the potential to alleviate the isolation felt by rural health care workers; provide quality educational opportunities; and be a means of support to specific populations. However, to achieve these outcomes, it is necessary to consider the wider issues within which access and use of electronic resources occurs. These include the influence of organisational capacity, worker education and training needs, and the health information requirements of targeted populations.

This paper firstly outlines why issues such as these are important considerations in health informatics planning. Secondly, the paper provides a case study on how these considerations can be incorporated into assessing electronic information, education and support requirements. The case study describes the development of a national survey that is assessing health care workers' access and use of electronic resources relating to HIV/AIDS, hepatitis C and other blood borne viruses. Rural health care

workers are a defined subset of this survey. The survey methodology was designed to incorporate organisational, worker and service-user perspectives on electronic information and education resources. It is envisaged that in considering the human context of electronic information, education and support strategies, better health outcomes may be achieved.

2. Elements

A valid and reliable assessment of current access and usage patterns of electronic resources is critical for implementing workable health informatic strategies. However, in order to determine what these patterns are, contextual issues surrounding access and use need to be identified.

As illustrated below, in figure 1 the contextual issues that influence access and use of electronic resources include the capacity (including resources, policies and procedures) of organisations involved in the provision of services, health care worker efficacy and target population characteristics.

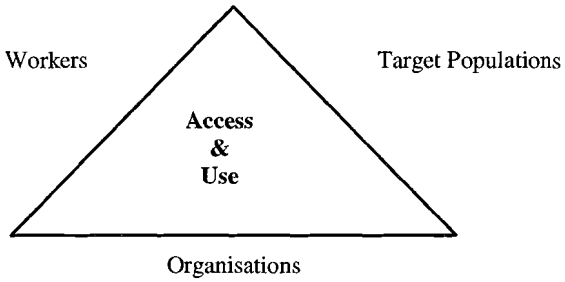

Figure 1. Visual diagram of the positioning of access and use issues within a context of organisation, target population & organisational issues.

This section canvases these contextual issues and outlines some of there features that should be considered in planning for health informatics in any setting.

2.1 Organisation Capacity

An organisations' information technology resources is only one element that influences access and use of electronic resources by staff (Herskovic et al 2000; Crow, Howie and Thrope 1998), or encourages current and potential services users to contact their local health care worker or health-related organisation. Organisational capacity also include consideration of:

2.1.1 ORGANISATIONAL PRIORITIES

For instance, what an organisation considers to be important in its every day activities. In their case study of Internet usage and difficulties among medical practices in Britain, Howcroft and Mitev (2000) show that at a grassroots level, "the adoption and diffusion of information technology within general practice was highly varied with huge contrasts in the levels of commitment to information management. Non-fund holding general practices in socially deprived areas were far less willing to embrace information management and technology. One explanation for this was priorities i.e. when faced with the option of "cruising" the information superhighway, as opposed to treating seriously ill patients living in socially deprived areas, the former may simply be relegated as less important (170)."

2.1.2 WORK PLACE PROCESSES

Christine Bruce (1999) argues that how work places seek and use information is related to workplace processes of information management generally, corporate memory and research and development. To these could also be added financial incentives (or lack thereof) and even administrative practices (Kahn 1993).

2.1.3 ORGANISATION RELATIONSHIPS

The strategies that an organisation uses to market its services, both to other agencies and to its current and potential clientele, influences the way in which electronic resources are accessed and utilised by all concerned.

2.2 Education and Training Requirements of Workers and Service Users

A health care workers' efficacy is facilitated by possessing appropriate skills. Further, the ability of service users to seek out and to understand relevant information influences their health and wellbeing. Consequently both health care workers and service users have education and training requirements. Some features of education and training related to access and use that should be considered are:

2.2.1 RESOURCE AWARENESS

Health care workers need to be aware of what good quality resources exist, how to access them and subsequently, how to use them. Farmer and Richards (1999) examination of access to information for nursing

staff in remote areas showed that the Internet does have considerable potential to do this. However, there was a low awareness amongst nursing staff of important nursing information resources. They concluded creating awareness of resources was equally as important as enabling access to them.

2.2.2 PERCEPTIONS OF ACCESSIBILITY

Individual beliefs about ease of use, need also to be taken account. Mary Culnans' (1985) study of user perceptions of information found that "1) accessibility is a multi-dimensional concept encompassing physical access to the source, the interface to the source, and the ability to physically retrieve relevant information, and 2) perceptions of accessibility [were] moderated by prior experience with the source and contextual factors (302)."

2.2.3 EVALUATION SKILLS

There is a need for information technology users to be able to distinguish between information and knowledge quality (Wootton 1997). Coiera (1998) argues that understanding how to use information technology appropriately can only ever be one small component of the wider discipline of health informatics. Though speaking about clinicians, the comments of Heathfield, Pitty and Hanka (1998), are also relevant to generalist health care workers: "it is important that clinicians have a knowledge of evaluation issues in order that they can assess the strengths and weaknesses of evaluation studies and thus interpret their results meaningfully (1959)."

2.2.4 RECOGNISING THE DIVERSITY IN EDUCATION AND TRAINING REQUIREMENTS

On a very basic need level, inadequate health literacy may be an important barrier to consumers understanding their illness (Williams, Parker, Baker et al 1995), let alone possessing the skills to be proficient in accessing and using electronic information resources. In their study undertaken in two urban public hospitals in the United States of America, Williams and colleagues found that many patients could not perform the basic reading tasks required to function in the health care environment (Williams, Parker, Baker et al 1995).

2.3 Target Populations

Research indicates that access to health information enables patients to be more active participants in the treatment process which can lead to better medical outcomes (Brody 1989; Greenfield, Kaplan and Ware 1985; Mahler and Julik 1990 in Kahn 1993). This has been demonstrated in the interactive computer projects BARN – providing online health information to adolescents (Hawkins, Gustafson, Chewning et al 1987) and CHESS – a computer based education and social support system for people living with HIV/AIDS infection (Boberg, Gustafson, Hawkins et al 1995). However, understanding what influences individuals to seek out information, and how they use it is critical in identifying what strategies need to be developed for encouraging use of electronic resources. Some issues that need to be considered in the planning process are:

2.3.1 SOCIO-ECONOMIC STATUS

Socio-economic status has been demonstrated by the Australian Bureau of Statistics (2000) and by the National Centre for Social and Economic Modelling as an indicator for access and use of electronic resources (Hellwig and Lloyd 2000). As Hill (1998) states "if you are poor or disadvantaged in some way, are you likely to have the same opportunities to access information on health and disease as those better off? There are various concerns here including literacy, language of everyday use, social position and confidence to ask questions and exercise choice" (Hill 1998:9).

2.3.2 INFORMATION SEEKING BEHAVIOURS

O'Callaghan (197) in White and Astbury (1998), found significant differences in information seeking strategies and preferences in information format and content between sexes and various subgroups of women. In their review of women's use of health information, White and Astbury (1998) recommended "a distinct need for an understanding of the information seeking behaviours of women and women's preferred information dissemination systems" (67). They concluded that "by far one of the most popular, currently available sources of health information for women appears to be telephone information lines" (White and Astbury 1998: 8). This was mainly due to telephone information services being more personalised and a sense of mutual trust and respect could be developed (White and Astbury 1998:66). For women in rural and remote regions, this was mainly due to the anonymity afforded by the telephone.

2.3.3 CONTEXT OF INFORMATION

In providing information resources electronically, or otherwise, it is critical to consider not just content and delivery but also the process and context of that health care information (Hill 1998). White and Astbury's literature review indicated that "the lack of sensitivity to women's own opinions and their individual context (culture, language, sexual orientation etc) impacts negatively on how women's health information needs [are] addressed ... once a health issue is identified it must always remain in its context so that health information dissemination will not only be accurate and up to date, but also appropriately targeted" (White and Astbury 1998:43).

2.3.4 LEARNING PROCESSES

An important component of education is the setting in which it is delivered. Kahn (1993) argues that if the setting itself is not conducive to teaching and learning it may lead to poor communication of information. Therefore, providing some types of education and information online may be effective. However, sensitive and political issues, such as the rationale for needle and syringe programs, are probably best provided within a group setting.

Consideration must also be given to the amount of control that the learner has over the learning process. The speed and depth of the learning process has been argued to be critical in achieving the behavioural and affective changes that computer based patient education is intended to produce (Kahn 1993).

3. Case Study: Electronic Resources Survey

The Electronic Resources Survey provides an example of incorporation of different perspectices to provide a holistic picture of current access issues and usage patterns. Such a baseline is important for future planning of online education and information resources.

Though this is a national project, the steps taken in developing and implementing this survey to identify baseline data, are applicable in examining smaller community based informatic systems.

3.1 Project

An assessment of access and use of electronic information resources relating to HIV/AIDS, hepatitis C and other blood borne viruses.

3.2 Project Purpose

To inform the development of future electronic resources by the Commonwealth Department of Health and Aged Care and health service providers for relevant health care workers and target populations.

3.3 Project Rationale

Since the early 1990's many quality resources have been produced on HIV/AIDS, hepatitis C and other blood borne viruses. Specifically, several national training and education programs (e.g. the National Needle and Syringe Worker Training Program and a training package for pharmacists and pharmacy workers). Consideration is now being given to how the products developed from these national initiatives can be produced and disseminated electronically.

However, following the release of two recent reports on HIV/AIDS and hepatitis C, a case was made for assessing access and use of electronic resources, before such developments took place. These two reports were the Consultation on Distribution of Commonwealth Hepatitis C Education and prevention Funding, and The Hepatitis C Prevention Education for Injecting Drug Users.

In particular, the Report on Consultation on Distribution of Commonwealth Hepatitis C Education and Prevention Funding recommended the development of an adult learning web site targeted at people affected by Hepatitis C and health care workers. However, the report noted that "It is clear that whilst access to the Internet is increasing, there are significant numbers of health workers who do not have access to the Internet either at home or at work (13)".

From these two reports, the Commonwealth Department of Health and Aged Care concluded that:

Electronic sources of information such as the Internet and CD-rom can provide the opportunity for flexible and self-paced learning in the place of formal tuition and other learning methods. Research is needed to determine the extent of access to and usage of information currently available, and whether interested parties find using electronic resource material is convenient. The results of this research will then assist the Department to determine the most effective approach with regards to the future publishing of resources electronically.

3.4 Project Problem

The diversity of the blood borne virus field presented several difficulties which needed to be overcome, if a valid and reliable assessment of access and use of electronic resources was to occur. This diversity is demonstrated in a variety of ways. For instance:

- There are numerous services across the country that incorporate blood borne virus related issues into their remit. These organisations range from national peak body groups, user organisations, to pharmacies and to accident and emergency departments. Specifically, needle and syringe programs - a core component of minimising the transmission of blood borne diseases - range from outlets in rural and remote areas (where a pharmacy may act as a secondary outlet for distributing the needles and syringes), to being the core business in some metropolitan areas (a primary outlet). Some organisations have relatively large paid workforces, others rely mainly on volunteers.

  Initially, organisations per se were not a core component of the project. However, it became apparent that to 'capture' these workers and people who have HIV/AIDS, hepatitis C or who inject drugs, it would be necessary to view organisations as more than just gatekeepers. Indeed, organisations were a critical element in individual's access and use of electronic information resources, and in servicing the health and welfare related needs of people living with HIV/AIDS, hepatitis C or who are injecting drugs.

- As can be extrapolated from the below list, workers in the area of blood borne viruses come from many different backgrounds. They also have a diverse range of skills, qualifications and experience. The types of jobs in the field range from peer educators, nurses, information and education officers, pharmacy assistants, and welfare workers. A number of workers are also field based. In rural and remote regions, providing a needle and syringe program may only be part of the health care worker's role, whilst for others it is their only role.

  The populations targeted in the survey are:

  - Needle and Syringe Program Workers in primary outlets
  - Health Care Workers involved in secondary NSP outlets
  - Other Health Care Workers for whom HIV/AIDS and hepatitis C-related services as part of their role
  - Workers in the community sector for whom HIV/AIDS and hepatitis-related services are part of their role. (including those at AIDS Councils, Hepatitis Councils, User Groups)

- People with HIV
- People with hepatitis C
- Injecting drug users.

- Relatively hidden populations as a consequence of stigma. Stigma is often attached to persons who inject drugs, and indeed, often still to people who have HIV/AIDS or hepatitis C. Injecting drug use, an illegal activity, thus leads to relatively 'hidden' populations. Thus dissemination of information, and developing opportunities for interventions via innovative and accessible systems is essential.

- Level of access and subsequent use of electronic resources are commonly perceived to be low due to the relatively low socio-economic status of people living with HIV/AIDS or hepatitis C and of some generalist health care workers. It was therefore considered likely that a cybserspace divide would be evident in the survey results.

3.5 What we did

To ensure that a holistic perspective of access and use of electronic information resources was developed, much effort was placed into developing the survey tools and in developing an implementation strategy for data collection that would result in a representative sample.

3.5.1 Advisory Committee

A committee was formed to advise on survey content and survey implementation. The Advisory Committee consisted of representatives from key organisations in the country, state and territory representatives, as well as individuals who were highly respected in the sector who also had an interest in health informatics. In particular, the committee advised on how questions should be framed and the range of possible responses that should be included in the instruments. The committee also ensured that the sector as a whole was represented in the data collection.

3.5.2 Survey Instruments

The survey instruments were designed to incorporate organisational, worker and service-user perspectives on electronic information and education resources. Consequently they were informed by an extensive literature review and by the variables used in the collation and collection of data by the Australian Bureau of Statistics on households and businesses.

Three survey instruments were developed. One each aimed at:

1. Organisations
2. Workers and volunteers
3. People who have HIV/AIDS, hepatitis C or who inject drugs.

Survey questions were based on the following topics:

- Who has *access* to electronic information resources
- Who *uses* electronic information resources
- What *barriers* exists, and how can these be overcome
- Where are the *gaps* and *inaccuracies?*

Each survey instrument consisted of two parts. The first section was concerned with these topics. Questions were framed so that they would be relevant to their intended target audience. For instance:
For organisations:
Do you believe that using electronic information resources would benefit your organisation in the following ways:

Better communication	**Yes** ☐	**No** ☐	**Unsure** ☐
Accessing information	**Yes** ☐	**No** ☐	**Unsure** ☐
More collaboration	**Yes** ☐	**No** ☐	**Unsure** ☐
Achieving greater visibility	**Yes** ☐	**No** ☐	**Unsure** ☐
Wider distribution of information and resources	**Yes** ☐	**No** ☐	**Unsure** ☐
Sharing knowledge	**Yes** ☐	**No** ☐	**Unsure** ☐

For workers:
Have you had any training in seeking information electronically?

Yes ☐ No ☐

Please indicate on the following four point scale, your skill level in undertaking the following tasks:

	Poor	Moderate	Very Good	Excellent
Locating information electronically	1	2	3	4
Evaluating electronic information	1	2	3	4

For people living with HIV/AIDS, hepatitis C or who inject drugs:
How do you prefer to obtain information? (please rank in order 1 – 4, from most preferable to least preferable).

☐ Face to Face contact ☐ Printed resources ☐ Radio/Television
☐ Via telephone ☐ Online ☐ Other _____

The second section contained demographic questions (e.g. age, gender, salary and locality). The reason for the demographic data was to provide a comparison with Australian Bureau of Statistics data.

3.5.3 Data Collection

Survey implementation was designed to ensure adequate coverage of metropolitan, coastal and rural and remote regions. To this end the surveys were administered in the following ways:

- A cascade technique: Starting with the national stakeholder organisations and moving downwards to each state and territory, and then regional areas
- "Selective random selection": Consciously choosing organisations in metropolitan, regional, coast and rural and remote regions. E.g. including all primary outlets and then specifically choosing secondary NSP programs across each state and territory
- Using various electronic mailing lists such as ADCA update and the NSP Forum
- Publishing the survey in newsletters, magazines and through websites

4. So What?

Ascertaining who has access to electronic resources and who uses them, identifies areas in which utilisation of electronic resources need to be addressed. Providing an holistic assessment of who has access and uses electronic resources, is a means of

determining *how* that implementation should occur. There are many benefits to such an assessment. These include:

4.1 A holistic perspective

- Takes into consideration the current situation as a whole entity
- Places access and use within a context – that it does not occur in a vacuum
- On a practical level, provides an opportunity to match national competency standards with the needs of individuals and groups of workers.

4.2 An audit of resources

- Identifies relevant resources already in use
- Identifies gaps and inaccuracies in resources overall
- Informs what changes should change be made systematically, rather than on a adhoc basis.

4.3 Ownership over the process

- Enables organisations, workers and target populations to be consulted on their needs
- Provide opportunities for participants to publicise solutions they have developed
- Encourages organisations, workers and target populations via self reflection to indirectly consider how they seek information electronically, and how their practices could be improved.

5. Conclusion

This paper argued that in planning for electronic information and education services, the contextual features relating to access and use need to be identified. To demonstrate how this can be achieved, a case study was provided of a national survey of access and use of electronic resources relating to blood borne viruses. Incorporating context into an assessment, provides opportunity for examining the human face of health informatics.

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What are the Infrastructure Requirements to Facilitate Good Use of the World Wide Web?

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Abstract. *The provision of health services in rural and remote areas is presented together with an analysis of our population characteristics and telecommunications infrastructures. Central Queensland covers 141,963 square kilometres and around 184,000 people or 1.3 people per square kilometre on average. Some significant Government initiatives are identified including the CQ A New Millennium project which was launched in February 1999. This is a joint initiative bringing together governments at all levels and the community to create a framework for future planning and development in the region. Health related issues identified in the first draft of a final regional plan are listed. One of the goals of this project is to provide strategies designed to improve the quality of life for communities, particularly in terms of access to facilities and services, provision of infrastructure and sustainable environmental practices. Key regional issues, opportunities and challenges relative to the maintenance of healthy lifestyles facing the region have been identified by means of extensive community consultation. This presentation demonstrates the importance of a suitable telecommunications infrastructure. Without this communities cannot make the best possible use of the World Wide Web to obtain the information and services needed to adopt healthy lifestyles. The future for this region is to ensure that such an infrastructure is provided.*

1. Health Services in Rural and Remote Areas

There continues to exist an inadequate telecommunications infrastructure, in particular a lack of access to integrated services digital networks (ISDN) by rural and remote practitioners[1] many of whom work solo, are always on call and lack ready access to their peers or the most up to date clinical information. Rural and remote communities have long been disadvantaged in terms of access to specialist health services, community care and isolation. This is compounded by the time required for travel to regional and city centres, the high associated costs and family dislocation during the absence of one family member. Women, the elderly and infirm, the poor and indigenous peoples are most disadvantaged in these communities. A 1997 Government report on health information management and telemedicine noted that 'telehealth is valuable in solving many challenges created by under serviced rural communities'[2]

The Royal Flying Doctor Service of Australia (RFDS) has since 1936 provided a vital aeromedical emergency service [3]. However their 1993 report of the National

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The Royal Flying Doctor Service of Australia (RFDS) has since 1936 provided a vital aeromedical emergency service [3]. However their 1993 report of the National

Health Strategy Working Group recommended that it should also greatly extend its preventative health care and clinical services into pro-active programs following their finding that rural health is often poorer than urban health and that the problems with service delivery in rural and remote Australia are long term and getting worse. It also recognised the urgency to develop a more culturally sensitive and appropriate approach to help improve the very poor standards of Aboriginal and Torres Strait Islander health. The RFDS work closely with other health care providers such as rural doctors and remote area nurses (RANs).

Remote area nursing is quite unique in that RANs provide all emergency health services as well as manage on-going health services for clearly defined isolated communities. Primary health care is the model which best suits the type of health service delivery required in remote communities. This is because it encourages community participation in the development of the mix of health services a community might require from health service providers who are either already largely self-reliant as a result of their lifestyles or who have been so in the past. This self-reliance is primarily due to geographical and social isolation. A description of this work environment is perhaps best illustrated in the following summary from an RAN [4] who is located 2 hrs' drive from a major regional centre and who cares for a community of 400 people.

> *" To provide medical services, I consult with the GPs in the centre by telephone, although the line often drops out. I participate in on-going education by teleconference and fax - sometimes that gives me access to more than half of the session. When I visit my patients, the HF radio gives me access to the RFDS, should I need emergency care or evacuate the patient. Most specialist services can give me opinions or test results within a week - or I can refer patients for appointments 1000 km away..."*

The literature reveals that people in remote communities expect more medical than preventative work from an RAN [5] [6]. Humphreys, Mathews-Cowey and Rolley [7] attribute this reality to the continuation of the medical and curative care ethos. This ethos is one of the difficulties of implementing primary health care practice and hence there is a dearth of preventative health care in remote communities which are needed to promote healthy lifestyles. In some communities and within some professional groups a great deal of education is required before many people and communities are comfortable with taking up the challenge of organising and providing for their own health care. Smith [8] noted that "more and more emphasis (is) being placed on outcomes - difficult criteria to meet in a primary health care setting". This difficulty may be overcome to some extent by providing health care consumers with access to public health information and patient guidelines. Such access is expected to provide health professionals with the information and support they need to meet the health needs of the community and for them to be a resource for the community. In some regions, a formally accepted 'Standard treatment

manual' at least provide tools for RANs to make the urgent medical decisions required [9].

2. Population Characteristics and Infrastructure Needs

Australia is in the top five countries with the most Internet users per capita but these are not in rural or remote areas even though such areas cover most of its continent. The Bureau of Transport and Communications Economics [10] identified that approximately 71% of all households are located in inner and outer urban and provincial areas mostly near cities on the coastline. Studies [11 12 13] have shown that remote communities can largely be classed as geographically distant from commercial resource centres. The total number of people in these communities was 920,050 which constituted 5.5% of Australia's population [14]. It is unlikely that this has increased significantly in the last 5 years. These people are amongst the most disadvantaged in terms of health care and other services as evidenced by a demographic profile which according to Clinton and Nelson [15] 'closely resembles the population and epidemiological nature of a developing nation'. The locations of these remote communities vary from the tropical areas of the north of Western Australia, Northern Territory and Queensland, to the cold winters of the Snowy Mountain regions and off-shore islands such as King Island or Cocos Island. Consequently the cost versus revenue ratio of telecommunications varies very significantly between these and larger regional or provincial areas. This is a major impediment to getting the desired telecommunications infrastructure in rural and remote communities in the absence of government intervention. Central Queensland covers 141,963 square kilometres and around 184,000 people or 1.3 people per square kilometre on average.

Both consumers and health service providers need access to up to date health related information, including patient and practice guidelines, that allows them to make decisions in partnership about individual and public health issues as per the primary health care model of health service delivery. Only an intersectoral approach will ensure that the disadvantaged people located in rural and remote areas are adequately provided with access to a sound but costly national telecommunications infrastructure required for the world wide web access needed to support healthy lifestyles. Indeed such an infrastructure should be used not only for health but also for education, other government, social and cultural services, general information, strategic business and specialised industry activities including all forms of electronic commerce by a wide range of individuals, groups and businesses. Sound use of such an infrastructure requires the provision of technical support plus education and training opportunities for all potential users to attain the necessary computing and information literacy. In the first instance it is a matter of ensuring Internet points of presence can be accessed by means of a local call for most to limit the cost of access. Next is the need to provide adequate bandwidth to all.

3. Information and telecommunications technology infrastructure

Existing and enhanced information and telecommunications technology infrastructure needs to bc such that it can accommodate many and varied applications needed to support rural and remote communities. The infrastructure consists of both the media of telecommunications used to actually transmit information such as phone lines, fibre optic cables, satellites, microwave systems, and the media used as input/output devices such as telephones, video cameras, monitors, fax machines, computers etc. which are needed to send and receive data transmissions. One medium cannot be used without the other but various combinations of usage are possible. One needs to consider the possible or required range of transmissions, media available, nature and volume of the information to be transmitted, whether interaction is required, financial limitations, availability of technical support, projected audience/users and their location(s) and expected life of required usage when deciding what is required or possible for use to support health care, distance education and general consumer health information needs. This requires information providers to be conversant with what each technology has to offer, its availability and the target group characteristics. In many instances such providers need to be flexible and possibly use a variety of delivery methods to accommodate these constraints. Only an intersectoral approach will make such a project financially viable.

Consumer access to the available telecommunications infrastructure and its potential use is dependent upon both location and use of technology such as for example compression techniques. The infrastructure consists of a combination of both land-based and air-based communications networks and systems each offering various bandwidths from a single telephone line using copper wire, which is adequate for voice, facsimile and text based data transmission, to broadcast television cable and satellite networks. Convergence of some of these technologies make it possible to combine audio, data and video communications, both synchronous and asynchronous via a personal computer. In any event good use of the world wide web to promote healthy lifestyles does require as much bandwidth as possible to accommodate the increasing use of multimedia technologies.

Consumer access to telecommunication networks is dependent upon their access to these devices which includes access to high speed computers with CD-ROM drives and local call access to an Internet service provider in order to take good advantage of what the Internet, the world wide web and educational CDs have to offer. People in rural and remote areas also encounter special problems such as erratic power supplies, dust storms, and severe electrical storms that effect the reliability of the telecommunications network. Many outback communities share a single phone line using microwave connections to a 'radio concentrator' into the phone system: while any one of the telephones (including public solar powered phone booths) is in use, the others are not available at all. So how will such communities be able to make good use of emerging devices such as broadband digital radios, java teleputers with

Internet access, household Ethernets running on telephone wiring, smart cards, direct broadcast and low earth orbit satellites and media processors? [16]

4. Government awareness and initiatives.

Our federal Government is well aware of these needs yet much remains to be done. A 1991 report of the House of Representatives Standing Committee for Long Term Strategies on Australia as an Information Society: grasping new paradigms noted [17] 'there is a pressing need to increase the community's use of information'. This committee expressed its concern that 'existing education systems are not bridging the gap between the skills provided in secondary education and the expectations of society in the world of work' [18] and noted that 'special provision should be made for those groups in society which are disadvantaged in their access to information' [19]. Amongst this group the rural isolated, aboriginal people and women were identified. The report also noted that 'information retrieval, including data base searching, should be regarded as a fundamental skill at all levels of education' and 'priority must be given to the use and users of information, rather than to putting elaborate structures in place to supply information in the first instance' [20]. It also set out the elements of a National Information Policy for further debate.

In 1996 Hesketh et al [21] noted the implementation of a number of Government policies in relation to Information Technology such as:

- the development of Telecentres to assist rural communities,
- the establishment of Community-based Information Technology Centres as a network of non-profit organisations which provide training and information technology services to their local communities,
- the piloting of the Community Information Network (CIN) in 1995 as part of the Commonwealth Government's Working Nation's initiatives to provide information and communications networks for access by individuals, groups and organisations and
- the establishment of the National Information Services Council in 1995.

However few of these initiatives have to date been undertaken in Central Queensland or had a significant impact on the promotion of healthy lifestyles.

By 1997 the information industries taskforce [22] reported to the Commonwealth Department of Industry, Science and Tourism that "to prosper in the 21st century Australia must be a leading user and producer of information and communication technologies". The need to enable and empower users, enhance information and communication technology education in schools, the tertiary education sector and the re-skilling of the workforce were amongst its recommendations to the Government. As a result a five year $250 million funding program, Networking the Nation - the Regional Telecommunications Infrastructure Fund [23] was established specifically to support activities and projects designed to meet a range of

telecommunications needs in regional, rural and remote Australia in recognition of significant opportunities to improve the delivery of education, training and health services in these areas through the provision of an improved information and telecommunications technology infrastructure. In addition the Queensland Government aims to progressively increase the standard of living and quality of life for Queenslanders by transforming employment, living and business conditions, particularly in rural and regional areas, through innovation and investment in information technology and communication through the implementation of its IT strategy plan. [24]

In February 1999 the Central Queensland - A New Millennium project was launched. Four working action groups were formed to identify regional issues that will impact on the future socio-economic development of Central Queensland. Peak bodies and the wider community were engaged in an ongoing partnership to ensure 'planning for the region, by the people of the region'[25]. The Queensland Government's Department of Communication and Information, Local Government, Planning and Sport play a coordinating role. One of the goals of this project is to provide strategies designed to improve the quality of life for communities, particularly in terms of access to facilities and services, provision of infrastructure and sustainable environmental practices. Key regional issues, opportunities and challenges relative to the maintenance of healthy lifestyles facing the region have been identified by means of extensive community consultation By September 2000 key issues in planning were identified for each of the three themes, leisure and lifestyle, people at work, sustainability, conservation and environment. A first draft of a final regional plan is expected to be available some time in December 2000. Health related issues identified were:

- Limited coordination and collaboration between community service providers
- Increased cost of service delivery, particularly in rural areas.
- Increased demand for aged care services and accommodation
- Limited options for older people to participate in community activities
- Inequitable access to technology
- Trend towards more sedentary lifestyles
- Increased pressure on health agencies to provide additional and improved services
- An imbalance between the social, physical, psychological and spiritual dimensions of indigenous health.
- Prevalence of drug use and alcohol consumption.
- Significant increase in the diagnosis of mental health conditions, including personality and behavioural disorders.
- Impacts of smoke, chemical toxicants emitted by fires, dust, odour and noise.

Can the World Wide Web and an appropriate telecommunications infrastructure address these issues? What type of services go someway towards providing solutions to these issues?

5. Telemedicine and Telehealth

Telehealth is a generic term in use in Australia to denote 'healthcare at a distance'[26],[27]. The term telehealth describes the provision of a range of health services which use information and telecommunication technologies to deliver or enhance services to rural and remote communities including the delivery of education and training, telemedicine and the use of these technologies to improve the organisation and administration of health services. Assessments of patients by telephone with a nurse at the other end with the patient had been done often, this was quite common and is quite effective. Now it is also possible to use the Internet for such a service. As a further example of Internet use, a community nurse caring for an asthmatic child could video the child, convey the images immediately, and confer with an specialist expert on the advisability of transporting the child to an urban centre via air ambulance. Use of the Internet facilitates client participation in the development of an accurate health assessment and an appropriate plan for intervention. Many rural and remote communities in Australia are already receiving a number of telemedicine or telehealth services. This is a rapidly growing field which is slowly becoming a general part of mainstream healthcare.

In 1998 the Commonwealth Department of Industry, Science and Tourism (DIST) published a national scoping study of the telemedicine industry in Australia which details numerous telemedicine projects being undertaken in every State and Territory including this region's Rural Health Training Unit, and the Rockhampton Telepsychiatry project [28]. These technologies can also be used for home monitoring to reduce the number of home visits required by community nurses. There is thus growing local experience which needs to be monitored carefully and evaluated for its ability to effect health outcomes. In May this year the Australian New Zealand Telehealth Committee published a methodology for Telehealth evaluation in Australia.

6. E-health

E-health describes the combined use of electronic communication and information technology in the health sector although it is not simply about business transactions. It encompasses telemedicine and telehealth as well as health informatics. It includes the use of call centres and online health information services driven by business principles.[29] In particular E-health covers a range of initiatives that use the power and reach of the Internet. There are distinct clinical benefits of using combinations of information and telecommunication technologies to provide improved or new services. The convergence of technologies in recent years has increased the ability to perform multiple functions needed for E-health. Australian case studies provided by Mitchell were taken from district and community nursing services, the Antarctic, charities, remote communities and mental health services. Examples include call centres, Internet and CD Roms combined for continuing medical and health

education, use of handheld computers, mobile phones, accessing databases, telemonitoring from home, remote electrocardiograph (ECG) analysis, teleradiology combined with videoconferencing. He also identified a number of international case studies including healthy lifestyle programming kiosks, matching patients with doctors, consumer health site, healthy living magazines, joint ventures, and information for doctors as well examples of e-health companies providing business to business or business to consumer services and of e-health companies providing networks and software.

These efforts have resulted in other Government initiatives such as the establishment of the HealthInsite website, http://www.healthinsite.gov.au providing consumer health information and Health Online, a health information action plan for Australia. The latter is expected to result in major changes in the way that health care will be delivered in Australia. It is about using new technologies to communicate essential information for better decision making across the health system [30]. A related initiative is the concept of a national health information network (HealthConnect) that would allow personal health information to be collected, safely stored and exchanged - but only with the individual health consumer's permission, proposed by the National Electronic Health Records Taskforce [31].

Under HealthConnect, health-related information about an individual would be collected in a standard, electronic format at the point of care (such as at a hospital or a general practitioner's clinic). This information would take the form of event summaries, not all the notes that a health care provider may choose to keep about a consultation. With the consumer's consent, these summaries would then be able to be retrieved at any time they were needed and exchanged via a secure network with those health care providers authorised by consumers to access this information. Having more complete and up-to-date information available would mean that consumers and their health care providers would be in a better position to make decisions in partnership, through shared information.

Current trends such as the adoption of evidence based practice and consumerism together with scientific advances in computing and communications technologies are transforming our lives, how health care is delivered and how health care providers relate with their customers or patients. Skiba [32] noted that without the tremendous increase in computing power and speed, it would be impossible to manipulate and manage the information resources and data sets currently available in health care. Such usage also requires an appropriate infrastructure including the interconnected networks of computers, devices and software. However she saw the third and most important component as being the human connection. It is the development of human centred systems that will greatly facilitate the use of emerging technologies by the masses. Such systems include knowledge repositories, digital libraries, facilitate knowledge sharing, group decision making, virtual reality, 3-D environments, multilingual technologies, multimodal human system interactions including speech recognition tools, audio, optic and haptic

(touch sensitive) and gesture recognition devices to provide people with universal access to information sources from distributed but networked systems.[33] The use of these technologies enhances the effectiveness of consumer communication about health issues using the Internet and World Wide Web. Inter connectivity and operability between systems requires the widespread adoption of a variety of technical, terminological and messaging interchange standards. The latter two aspects are of particular importance in the health industry. A standard is a published document which sets out specifications and procedures designed to ensure that a material, product, method or service is fit for its purpose and consistently performs the way it was intended to [34].

Much is happening both nationally and internationally towards the development of these standards to ensure that we can all participate in a global health information society. A National Health Information Standards Plan for Australia produced by the Commonwealth government's National Health Information Management Advisory Council (NHIMAC) Secretariat, Information and Research Branch, Portfolio Strategies Division, and endorsed by the National Health Information Standards Advisory Committee (NHISAC, is expected to be made available some time in December 2000. This plan provides stakeholders with a national position on standards directions for the health sector and forms the basis for further investment of effort and resources. The lack of standards availability and adoption directly affects the integrated deployment and use of new technologies.

7. Conclusion

The infrastructure requirements for high quality information and health service delivery is far from universally available or reliable. It is extremely costly in sparsely populated or distant areas although its absence may ultimately be more costly. We need to prepare communities now so that they can exercise their rights, be informed and have their preferences considered when in need of health care. Also the administrators of health services must factor in the human (intangible) cost with the financial cost of health care in rural and remote areas, and encourage professional excellence by providing continuing education to nurses and other health workers so that they can adequately work with informed consumers and deliver care in accordance with the best available practice guidelines.

While there are many existing and emerging technologies which may provide effective or alternative options for consumer access to information, distance education, continuing staff development and support, we need to be able to offer a variety of modes of delivery of information and educational services to suit individual learning styles, time, finances, access to technology and other specific needs. Traditional education does provide social interaction, networking and emotional support, which is impossible to replicate in distance modes although these needs are being met in other ways. A shift is occurring as the use of the Internet spreads: we have all heard of people falling in love 'over the Internet', and

other close supporting relationships being established or fostered via this medium. Our experiences with distance education has convinced us that potential users of telecommunications technologies must receive suitable education and have ready access to technical support if they are to have access to guidelines and other health information when required using the proposed infrastructure.

Governments must have the will and the fiscal objectives to resource the necessary telecommunications inftrastructure for its citizens irrespective of location. The disadvantaged in rural and remote areas can benefit significantly from a greater use of these technologies. This is feasible only when these technologies can be fully utilised for a variety of purposes. This requires intersectoral support and cooperation. Furthermore our education system needs to develop people such that they have the necessary computer and information literacy skills to benefit from using these technologies. Professional and regulatory bodies also need to devise and implement competencies and standards to ensure adequate preparation of rural and remote health workers - including nurses - before they embark on 'adventurous' practice in distant communities - at both of their perils. Good use of the world wide web can contribute to the adoption of healthy lifestyles. This in turn requires the provision of an adequate telecommunications infrastructure irrespective of location. There needs to be equity in this regard.

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STUDENT-CENTERED DESIGN

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Abstract. *The key to a successful education for all students is to take each student's background into consideration and create educational technology programs that are student-centered. Despite extreme enthusiasm for student-centered design, education has failed to accommodate for the personal needs of students from diverse academic and cultural backgrounds. The purpose of this chapter is to discuss how the Web can be used to develop student-centered design to serve as a personalized instructional tool that would satisfy both the demands of the academic and cultural diversity of the student population. To achieve this goal, I first present Vygotsky's sociocognitive theory and derive a social inquiry teaching model from it that would allow curriculum personalization. Second, I discuss the process of design for the Web as an appropriate instructional delivery medium to apply Vygotsky's sociocognitive theory to create educational environments that are easy, effective, and responsive to the personal needs of students.*

1. Student-Centered Design

The key to successfully educating all students is to place students' needs at the heart of the design process and to take their backgrounds into consideration. Combs, Avila, & Purkey, explain that the more relevant the education is to the individual, the more meaningful the learning and retention process. The farther the events are from the inner perception of the students the less effect they have on the learning process. The closer the events are to the inner perception of the students, the more likely they will change behavior, learning, and retention. To make education meaningful, Comb and other humanistic psychologists (Maslow 1968, Roger 1983) suggest personalization of curricula or student-centered design. Student-centered design should account for students' social characteristics, communication styles, personality, cognitive ability, linguistic style, and academic background. These personal attributes are gained through developmental periods and they form children's inner perceptions about themselves and the world in which they live.

The challenge of student-centered design is to develop curriculum that is flexible and adaptable to individual students' inner perceptions. Student-centered design is not an easy task. It requires enormous preparation time, appropriate teaching models, diverse tools and an in-depth knowledge about the diverse personal backgrounds of all students. However, as technology advances, especially the Web with its uniquely flexible interactive and adaptive characteristics, curricula personalization is becoming a reality.

One of the main objections to curricula personalization is that it is impossible to personalize education for all students because there are too many unique

characteristics. The issue of the infinite characteristics of all students can be considered from a psychological perspective called modal personality (Bock, 1988), or the most common traits within groups. Therefore, curriculum personalization concepts discussed in this chapter are based on modal personality rather than purely individual personality.

Before considering the design ramifications that the Web offers curriculum personalization, it is important to understand how children acquire and develop their modal personality, which includes social characteristics, communication styles, personality, cognitive ability, linguistic style, and academic background. Such knowledge about development will provide the theoretical foundation for the design of the Web as a tool for curriculum personalization.

2. Social Formation of the Mind

One of the most robust and original social theories, with implications for education and the Web as a social tool, was postulated by Lev Vygotsky (1992, 1978). A salient feature of Vygotsky's notion is that human development and learning (e.g., social characteristics, communication styles, personality, cognitive ability, linguistic style, and academic background) originate and develop out of social and cultural interaction within what he calls the "zone of proximal development." This zone will provide the theoretical framework for the proposed social inquiry teaching model in this paper. A brief overview of four major themes that occur in Vygotsky's work is vital to understanding the zone of proximal development:

1. Internalization of external activities
2. The role of language in cognitive development
3. Knowledge formation within the zone of proximal development
4. Activities within the zone of proximal development

2.1 *Internalization of External Activities*

Internal restructuring of external social patterns is what Vygotsky refers to as Internalization. Vygotsky (1978, 1992) has argued that a child's development cannot be understood by a study of the individual. One must also examine the external, social, and historical world in which the individual's life develops. Development is a collaborative enterprise between the members of the society and the child. Each member of the society assists the child by providing a learning environment that enables the child's cognitive development. This learning assistance is repeated many times during ontogenetic development and enables the child to master the cognitive, linguistic and cultural patterns of his or her environment. This notion of socially-based cognitive development by Vygotsky claims that all higher human functions emerge at two levels: the social plane and the psychological plane:

> *Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (interpsychological), and then inside the child (intrapsychological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relations between human individuals. (1978, p.57)*

The process by which social patterns become psychological, called internalization, is not a passive transfer of external activities. Rather, children actively reorganize and restructure their internal knowledge as more external planes are introduced by an adult, more capable peers, or parents. When the process of social activities is repeated over time, children will internalize the social patterns at the psychological level, which becomes their inner perception of themselves and the world. As later considered in the process of Web design, any curriculum design in school must include these personal inner perceptions, which includes social characteristics, communication styles, personality, cognitive ability, linguistic style, and academic background.

2.2 *The Role of Language in Cognitive Development*

In Vygotsky's view, internalization of inner perceptions does not occur in a vacuum. Rather, the transfer of perceptual patterns from the social to the individual level is mediated by tools of the mind. Language as a tool of the mind plays the most crucial role in transformation of social patterns to individual psychological functions. Just as technical tools play an essential role in shaping the physical environment, language as a symbolic tool plays a corresponding role in the internal construction of knowledge or cognition which is culturally and socially situated.

Human language develops during the early ages. Piaget (1926) refers to the early stages of language as egocentric speech. At first egocentric speech is used by children to solve problems. Children often talk to themselves in trying to solve simple problems. The more complicated the problem the more talking and planning.

Vygotsky argues that as children mature their egocentric speech transforms itself into two separate, yet related tools: external and internal speech. The external speech becomes a communicative tool (language) and the internal speech becomes a vehicle for thinking and planning (thoughts). Vygotsky has stated:

> *On the basis of these experiments my collaborators and I developed the hypothesis that children's egocentric speech should be regarded as the transitional form between external*

> *and internal speech. Functionally, egocentric speech is the basis for inner speech, while in its external form it is embedded in communicative speech (p. 27, 1978).*

The construction of individual psychological functions has its origins in social life, and it is mediated by the combination of internal and external speech, which allows children to plan their activities prior to execution. During development, as children encounter social situations, internal speech becomes a vehicle for thinking and planning to deal with those situations. If they cannot analyze, organize, solve, or understand the situation on their own, then children use external speech as a communicative tool to assist them in understanding socially situated situations. As children master these social patterns through self-discovery (internal speech) or guided interactive discovery (external speech), their cognition develops.

Cognitive development, therefore, is the internalization of these social patterns as they are mediated by tools such as language. In the design of curricula for education we should carefully consider the use of language as a tool to promote cognitive development and academic achievement. Exclusion of language as one of the essential tools in the design of curriculum results in inadequacies for both cognitive development and academic learning.

2.3 *Knowledge Formation in the Zone of Proximal Development*

Internalization of social patterns into psychological learning occurs within the confines of what Vygotsky calls the zone of proximal development (1978). It is within this zone that by the use of internal tools, such as language, that social characteristics, communication styles, personality, cognitive ability, linguistic style, and academic knowledge are transmitted from external social activities into internal psychological knowledge.

Vygotsky believes that the relationship between learning and development is a dynamic process that begins from the moment of birth and continues during the school years and beyond. Such a dynamic process has at least two levels that relate to development: One level is what the child can do on his or her own; the second is what the child is capable of achieving if the appropriate environment and assistance are provided. In other words, the child has the potential of doing more if assisted.

Vygotsky introduced the zone of proximal development to explain the dynamic relationship between learning and development, defining it as "the distance between the actual developmental level as determined by individual problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (1978, p. 86).

Learning and development within the zone of proximal development is a recursive process where actual development is transformed into potential development with assistance from other members of the society. It is within this zone that instruction transforms social functions into psychological functions when they are repeated over time.

2.4 *Activities within the Zone of Proximal Development*

Learning is often much more complex than simple interaction between one teacher and a group of students who passively participate in a classroom. For learning to occur effectively within the zone of proximal development, a theory of learning must also formulate a set of collaborative and interactive social activities in a context that includes the community whose members interact and collaborate with the students to achieve educational goals.

In order to make the progression through the zone of proximal development a social occurrence, Vygotsky (1992) introduced a set of social and contextual activities in which collaboration and interaction for educational purposes occur. Leont'ev (1981), one of Vygotsky's students, elaborated on Vygotsky's social activities and introduced a new theory that has come to be known as the activity theory.

Activity theory has become popular in recent years as the foundation of research in the discipline of Human Computer Interaction (Nardi, 1996). In the field of education, Cole and Engestrom (1991) have posited a number of elements for the activity theory and a set of complex relationships among them. An activity, according to Cole and Engestrom, is goal driven where external and internal artifacts such as language, the Web, or the computer can mediate between the students (subject of the activity) and the student's purpose (the object of the activity). The outcome of such mediation is to allow progression through the zone of proximal development to achieve the educational goal of the activity.

In the model posited by Cole and Engestrom, activities are not limited just between two individuals. Rather, activities involve a community of mentors who would collaborate with the individual learner to achieve an educational goal. Such collaborative interaction is socially situated and the activity is distributed between the members of the community and the individual learner. The relationship between the learner and each member of the community must be well coordinated so that their roles and their responsibilities can assist the learner to effectively progress through the zone of proximal development.

3. Social Inquiry Teaching Model for the Web

The Web, as an educational tool, is a flexible multimedia communication network that can combine content presentation, interactive and collaborative communication, research for further learning, and be a production tool for students' hands-on activities. Vygotsky's notion of the zone of proximal development and its ramification for the concept of the activity theory can provide an appropriate teaching model for the Web.

Children progress through four phases of the zone of proximal development where there is a gradual internalization of social patterns to psychological patterns (Tharp and Gallimore 1992, Gillani 1994, 1997, 1998). These phases are reliance on others, collaboration with others, self-reliance, and internalization. Figure 1 shows the four phases of learning as a scaffolding progression through the zone of proximal development.

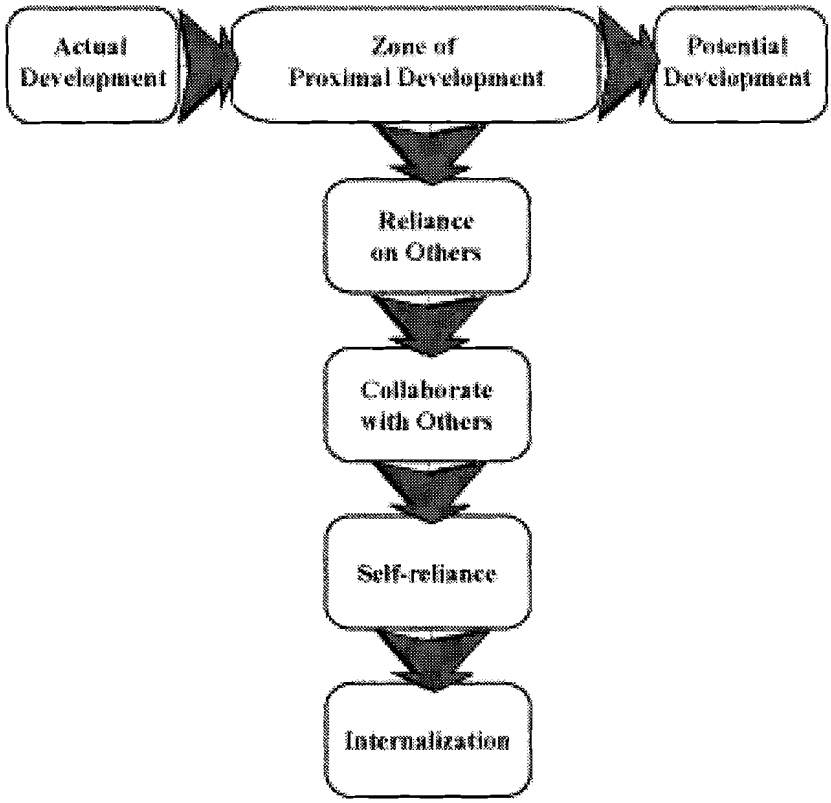

Figure 1. Progression through the Four Phases of the Zone of Proximal Development

The role of students in this dynamic learning environment changes from passive to collaborative to active as they progress through the zone of proximal development (Gillani 1994). During each phase the concept of scaffolding enables the learner to progress through the phases from total reliance on others to collaboration with others, to self-reliance, and finally to internalization of the goal of the educational activities. As I will discuss in the student-centered design process, the interface, the educational content, as well as the architecture of the Web site should be designed to be compatible with these four phases of learning by the students as they progress through the zone of proximal development.

These four phases can also provide the syntax (order of instruction) of a social inquiry learning model. Such a model is socially based and learners subconsciously inquire to learn about social and academic activities. Figure 2 shows how such a teaching model can be applied to design of the Web as a mediating tool that guides and scaffolds the activities of the learner through each phase of instruction. These activities are social and inquiry based. Instruction begins with an intellectual confrontation and learners are then scaffolded through inquiry procedures to find, gather, evaluate, and organize information to hypothesize a possible answer to the intellectual confrontation.

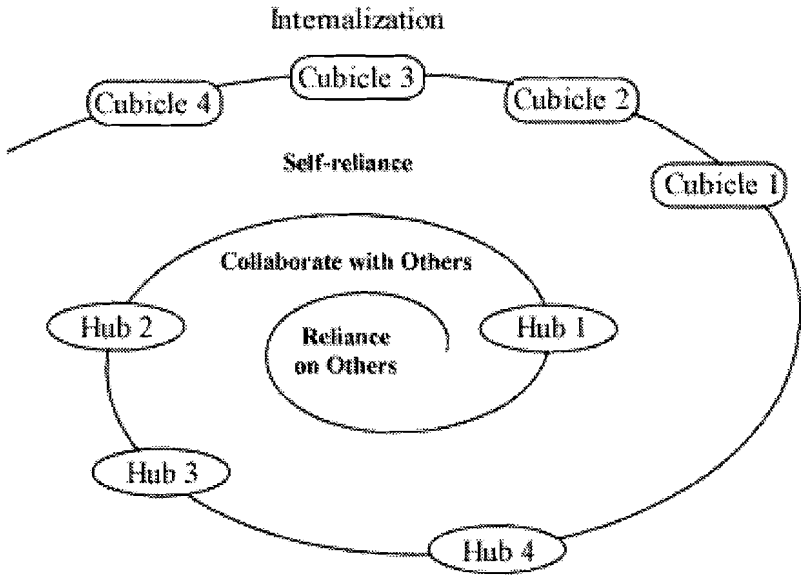

Figure 2. Schematic Social Inquiry Model of Teaching for the Web

In the first phase, Reliance on Others, the learners are passive as they rely on the modeling and presentation of the teacher. Instructional activities in this social inquiry teaching model begin in phase one where all students enter a center on the Web site to receive content presentation. The content is in the form of an intellectual confrontation where students are challenged to find answers to an academic question. Strategies such as webbing and modeling are used to attract the students' attention, invoke their prior knowledge, and generate their interest in the content and the themes to be presented. Web use at this level should include multimedia components such as audio, video, text, and animation to focus students' attention to the theme, content, and the intellectual confrontation of the educational unit.

During the second phase, Collaboration with Others, students become interactive by using both internal and external speech as well as other mediating tools like the Web to interact with mentors to construct their own potential development. In this phase, each student enters a personalized community of learning centers on the Web. I shall call these centers "Hubs" because these centers are where students interact and collaborate with members of the community of mentors to gain more information about the intellectual confrontation. Collaboration, interaction, and communication with others are the key elements during development of this phase of learning. The Web is a wonderful tool to create communities of learning centers where the concept of division of labor in the activity theory can be applied. Hubs in Figure 2 represent centers where the roles of teachers, professors, mentors, parents, administrators and more capable peers are well coordinated to provide assistance for the students to gain more information about the intellectual confrontation.

Depending on the nature of the educational goal, the activity in each Hub should be a collaborative effort and well coordinated between the student and the individuals providing assistance. Such virtual learning communities would follow a specific set of rules. Discussion times, ethics, behavior of students, responsibility of information providers and time for parents to be involved are just a few examples of such rules.

In the third phase, Self-reliance, students become active and rely on their acquired knowledge to reflect on what they have learned and seek ways for further learning. In this phase of instruction learners enter research centers on the Web that I have called "Cubicles" in Figure 2. These virtual cubicles are very similar to the research cubicles found in libraries. The virtual cubicles on the Web allow students to initiate their own search for gathering information for further learning. They gather, evaluate, and organize information and data related to the intellectual confrontation. Learning strategies and activities can be embedded in the design of the Web to encourage students to seek out other related resources (e.g. libraries, learning centers, universities, online courses) to further their learning.

In the final phase, Internalization, students internalize the concept underlying the original intellectual confrontation through repeated active application. It is within

this phase that students become capable of using their newly acquired potential development, without much conscious effort, to be creative in generating solutions to the original intellectual confrontation. The Web can provide the proper environment where students can create their own Web sites to show what they have internalized. Or they can create online communities to generate new ideas about what they have internalized and become mentors to peers who are not as capable as they are.

4. Student-Centered Design Process for the Web

With the explosion of the Web as an instructional delivery medium, educators are in a unique position to deliver student-centered curriculum that fits the personalized needs of the students. Because of the flexibility of the Web, it can be designed to satisfy both the demands of the "information explosion" and the "diversity" of the student population. As described in the previous section, the Web is an ideal tool for applying Vygotsky's theory and its social inquiry teaching model. Application of this model allows both the types of information and the manner in which information is presented to the students. Furthermore, the personal needs of students can be reflected in the interface design so that students with diverse backgrounds can feel at home, therefore, at ease. Moreover, the architecture of a Web site can be developed to serve as a collaborative tool between the learner and the community of mentors. Such design in terms of information presentation, interface design, and site architecture allows a socially situated educational setting that is responsive to the personalized needs of students.

Designing and developing effective educational Web sites should follow a systematic process. For example, IBM's guidelines (IBM, Make It Easy, 1999) for designing easy-to-use Web sites recommends a process approach for developing Web sites that include "Planning," "Design," "Production," and "Maintenance." These categories can be modified for educational purposes as follows:

1. Planning
2. Define educational purpose
3. Students' needs analysis
4. Content organization for a student-centered design
    - Interface design
    - Content presentation
    - Site architecture
5. Development of student-centered Web site
6. Maintenance and Evaluation

4.1 *Planning*

In the planning stage, you gather valuable information about the educational goal and the needs of the students. This stage involves defining the purpose and students' needs analysis.

4.2 *Define Educational Purpose*

Every educational Web site should be designed to address a specific instructional need. The first step is to define the educational problem the Web site should solve. Without a clear idea of the educational problem(s) the site intends to solve, there is a good chance that the project will lose its focus and fail. Defining the educational goal will guide the developer throughout the whole process.

There are four steps that would help to define the educational purpose. First, determine the level of existing knowledge. Second, decide on what is to be learned. Third, identify the educational goal which is the gap between existing knowledge and desired knowledge. Finally, develop an intellectual confrontation scenario that represents the educational goal

4.3 *Students' Needs Analysis*

In the students' needs analysis step the modal personality needs of the targeted students are identified which includes their social characteristics, communication styles, personality, cognitive ability, linguistic style, and academic background. Students' needs analysis is critical to designing an effective Web site. With the students' needs and characteristics established, you can thoughtfully structure the site to reflect their modal personality needs. The analysis also provides essential information for the next level of Web design which is content organization. Learning about the personalized needs of the students involves: 1) becoming involved, 2) seeking appropriate information about your students, and 3) recognizing design implications from your findings.

First, in order to find information about students' background requires becoming involved and assuming the role of a member in the community about which you are seeking information. There are numerous communities such as the church, workplace, art shows, ethnic festivals, social groups, support groups, and social services where you can assume an active role. Once you have become part of that group, read magazines and focus journals about that group to become acquainted with their patterns of thoughts and their preferences. Then, you should assume the role of an anthropologist and create surveys and interviews to gain information about your students' social characteristics, communication styles, personality, cognitive ability, linguistic style, and academic background.

Second, in seeking appropriate information about your students, you should interview the community members about the modal dimensions and plan the design of your Web site accordingly. For example, Shade, et al. (1997) have provided the following guidelines for African American and Mexican American cultural characteristics that contribute to the design of classrooms (Table 1).

Table *1*. Cultural Characteristics

African American Cultural Style	Mexican American Cultural Style
aesthetic appreciation of bright colors, fashionable clothing, and hair styles as the need to express their self-identity	individuals should identify closely with their community, family, and ethnic group:
a deep respect for spirituality and humanness that is often manifested through religion	individuals should be very sensitive to the feelings of others:
a spontaneity and ability for improvisation and rhythmic orientations shown in dance, music, and verbal and non verbal communication	status and role definitions within the community and family are clearly defined and should be respected:
value system that incorporates not only the desire for success, but also group unity, freedom and equality	achievement or success is highly dependent on the cooperative efforts of individuals rather than competitive individualism.
socialization experiences that develop a preference for cooperation and supportiveness, which manifest itself in group affiliation	
a highly developed skill to understand and correctly perceive the affective dimensions of people and situations.	

Similar types of information about students' social characteristics, communication styles, personality, cognitive ability, linguistic style, and academic background can be elicited from the members of a community by interviews and surveys for developing Web sites that are responsive to the personalized needs of the learner. These types of knowledge are vital to the design of the Web for student-centered design purposes.

Third, during the students' needs analysis step you should recognize the design implications from your findings about the students' modal dimensions. This type of information forms the building blocks of student-centered Web sites. Based on the profiles of the students, you should consider the following questions to prepare for the next design phase:

1. What interface design features will represent the students modal dimensions?
2. What instructional model should be implemented?
3. How should the information be structured?
4. How should students communicate?
5. What activities should be included?
6. What level of interactivity is needed?
7. What linguistic style is appropriate?
8. What kinds of graphics are appropriate?
9. What kinds of media best represent the students' backgrounds?

4.4 *Content Organization for Student-Centered Design*

In the content organization level, you translate the results of the students' needs analysis into planning the look and feel, content, and relationship of educational materials and activities. Planning for the diversity of students and personalization of information occurs at this stage. This stage includes planning and organizing for interface design (look and feel to represent diversity), content presentation (teaching model), and site architecture (activities)

4.4.1 INTERFACE DESIGN

Interface design refers to the look and feel of the Web site that includes the screen design, navigational tools, and interactivity. The styles of graphic presentations, color selection, placement of audio, types of video, the menu system, the navigational elements, and other elements of interface design play essential roles in the design of student-centered Web sites.

One of the main objectives of student-centered design is to create a learning environment that fits the actual knowledge, background, and culture students bring to school with them. In other words, the Web site should adapt itself to the "diversity" of students. By choosing the right design for the interface, you can provide the look and feel for Web pages to reflect the diverse needs of students.

Students' needs analysis during the first stage provides essential information that will guide the design of the elements of the interface to appeal to different student groups. Once we gather information about the

students' modal dimensions, the interface can be designed so that students see themselves in their own needs. In Global Interface Design Fernandes (1995) provides three general areas that need particular attention: language, visual communication, and appropriateness of features.

There simply is no global language that students from different backgrounds understand. However, at the initial stage of student-centered curriculum, it is best for the language or the dialect of the Web site to reflect the linguistic background of the student. The same Web site can be designed so that different linguistic backgrounds present the same educational content. For example, the interface design of the first page of a student-centered Web site can provide buttons representing different dialectical backgrounds. These dialects can range from Black English to Hispanic, and in some cases totally different languages like Vietnamese or Spanish. Clicking on the appropriate button will navigate students to the pages where instruction is presented with the appropriate dialects that represent students' linguistic backgrounds.

Visual communication is the second area suggested by Fernandes for interface design to be responsive to the needs of students. Visual communication refers to different elements of interface design. When designing student-centered interfaces, consider using the following visual communication tools:

1. Include video and audio as elements of interface design. These media can be designed to provide cultural specific interfaces that are appealing to students
2. Design cooperative centers: For example, certain indigenous groups enjoy cooperative work with different groups. Create shared areas including chat rooms and forums for cooperative work on the Web pages.
3. Create lockers for long and short term projects. Most students like to have a storage area like lockers, pack backs, or brief cases. It gives them ownership of their work. In a similar manner, lockers can be presented on the interface by icons, graphics, or buttons that are connected to an actual folder on the server. In this manner, the interface acts as a locker for students to save their work. The actual saving and transferring of students' work is done through the FTP capability of the Web.
4. Use specific colors that different cultural groups prefer for the interface, which gives a feeling of being home to students of different cultures. Use of color should be in the background selection, artwork, artifact, and lesson presentation.

5. Provide cultural centers as an element of interface where students of the same cultural background can share information.

Effort should be made to include appropriate features for interface design to make students feel at home. These features include pictures, maps, flags, artifacts, linguistically relevant signs, proverbs, cultural videos, cultural stories, audio, icons, metaphors, people, music, food, mythology, and other related features that are culturally appropriate. The results of your needs analysis during the first level of design should provide the appropriate features for different student backgrounds. Once these appropriate features are identified, then it is simply a matter of embedding them into the interface to make students feel at home.

Recall that it was previously recommended that the interface design of the first page of a student-centered Web site provide buttons representing different modal backgrounds. Clicking on the appropriate button will navigate students to the pages with the appropriate features for interface design to make each group of students feel at home. You should establish visual identity for different groups and consistently use these features. A consistent visual style representing appropriate features gives a site a sense of belonging and reinforces a feeling of ownership for the learner.

4.4.2 CONTENT PRESENTATION

Content presentation is the effective presentation of educational materials on the Web that adheres to the educational needs of the students. These educational needs should be supported by using appropriate learning theories, proper instructional models, and cognitive styles. There is no one specific theory, teaching model, or cognitive style that fits all students. However, we need to consider a general teaching model that would satisfy the demands of the "information explosion" and curriculum personalization using the Web.

Deciding which type of theory, instructional model, and cognitive style to use for a Web site is best done by considering the advantages the Web has to offer. As mentioned, the Web is a multimedia social tool that allows content presentation, interactive communication, research for further learning, and becomes a production tool for hands-on activities. Because of these features, one of the most appropriate theories to use for content organization on the Web is a sociocognitive theory that allows social interaction for cognitive development and learning.

As noted, Vygotsky (1962, 1978) postulated a sociocognitive theory that states human development and learning originates and develops out of social and cultural interaction as mediated by tools. Vygotsky's zones of proximal development can become units of instruction on the Web where

socially situated settings are created that allow students to use the presentation, communicative, research, and production features of the Web to internalize educational materials.

Content presentation also relies on proper teaching models. In the previous section, I discussed in detail that we could derive a social inquiry teaching model from Vygotsky's theory. When the a social inquiry teaching model is used, students follow specific steps:

1. Students are presented with a situation where elements of an intellectual puzzlement are involved. (For example, a movie about lightning is shown and the intellectual confrontation is to find what causes lightning.)
2. Teachers and students in groups rely on each other to interact, communicate, and react to the causes of the situation.
3. Students search different resources to gather data, further their learning and experiment. They isolate relevant information, hypothesize a possible answer to the intellectual confrontation, and test it.
4. Teacher and student groups analyze their findings and apply their learning to new situations.

The proposed social inquiry model has a universal syntax (order of instruction). However, because the Web is a flexible and adaptive tool, both the types of information and the manner in which information is presented to students can be personalized to fit the needs of students. During the first phase of instruction all students receive the same intellectual confrontation scenario. However, as they progress to the next phase, the Web becomes a community of learning centers. The goal of this phase is for individual learners to go beyond the walls of the classroom, using the Web, to interact, collaborate, communicate, and react with others to find the reasons and justification for the intellectual confrontation that was presented in phase I. As such, each student has his or her own personal learning centers connected to specific people to gain more information. As students accumulate more information and develop their own power of evaluation as to the validity of resources, they progress to the third level of instruction where they carry out personal research to gather data, isolate and organize relevant information to further their personal learning experience. Finally, each learner applies his or her own learning in light of his or her cognitive structure to new situations.

The Web's presentation, communication, research, and production features fit appropriately with the four phases of the zone of proximal development as well as the syntax of social inquiry teaching model. In

the Reliance on Others phase, the learners are passive as they rely on the mentor to model and present the intellectual puzzlement. Considerable multimedia units for the Web should be used to invoke students' prior knowledge and to generate student interest in the concept. For example, if the educational goal of instruction is survival of animals, then a variety of graphics, video, animation, audio, and text about animals around the world are presented. Furthermore, stories and animation about endangered species and reproduction can also spark students' interests in the survival theme of the units. Finally, during this phase a clip of endangered species, as an intellectual confrontation, could be shown and students asked what they might do to save animals from extinction.

In the Collaboration with Others phase, each student enters a personalized community of learning centers on the Web, called "Hubs" (see Figure 2). In these "Hubs" students are guided to interact and collaborate with members of the community who serve as of mentors. The function of each mentor is to assist students to gain more information concerning the intellectual confrontation. Each Hub would represent centers for different disciplines where teachers, professors, mentors, parents, administrators and more capable peers provide assistance for the students to gain more information in regards to the original intellectual confrontation. These centers do not necessarily have to be academic. Some of these "Hubs" can be learning centers where students can gain more information about cultural and personal attributes that would assist students to achieve the educational goal as defined in phase I.

Continuing with the same theme of animal survival as an example, five different areas can be designed to represent math, science, language, art, and social studies. Each of these centers could have chat rooms, forums, and video conferencing to create interactive centers where students can communicate with each other and the mentor about the survival of animals. Students are encouraged to move from one center to another to discuss animal survival from different perspectives of different disciplines. Such interdisciplinary interaction allows the mentor and the more capable peers to assist students to gain knowledge about animals and understand how different disciplines deal with the theme survival. Note that these "Hubs" are not limited to academic disciplines. There are "Hubs" for parents, principles, peers, or anyone who can assist the learner to be scaffolded to the next level.

In the Self-reliance phase, students become independent and no longer require extensive assistance from others. They search different resources on the Internet to gather data to further their learning experiences. They depend on their own knowledge to seek ways for further learning. Designers should embed learning strategies and research activities as

elements of interface for the centers I called "Cubicles" in the previous section (See Figure 5). These strategies should encourage students to seek out other related Web sites and resources (e.g. libraries, learning centers, universities, online courses) to further their learning. Furthermore, organizational and management software for the Web should be embedded in this phase of learning to allow students to evaluate, isolate, and organize relevant information and then hypothesize a possible answer to the original intellectual confrontation question.

Continuing with the animal survival example, links can be created to related Web sites around the globe for students to carry out research. Or, students could be assigned to search different libraries or online courses to find books and related articles about animal survival. Or, a mentoring partnership can be created with university professors in different disciplines for students to get firsthand research information. Once students have gathered information, then, they can isolate relevant information and hypothesize a possible answer to the question of animal survival.

Finally, in the Internalization phase students become comfortable implementing their newly acquired knowledge. They are now capable, without much conscious effort, to be creative and to generate solutions to problems that are similar to the concept they have mastered. For example, students can create their own Web sites about what they have internalized. Or, they can create online communities to generate new ideas about what they have internalized and become mentors to peers who have not yet mastered the concept. Or, students can work on projects, write, or deliver interactive reports on the Web about what they have learned.

Continuing with the theme of survival as an example, students might create an interactive Web site where the endangered species is placed in an environment with all the elements that would cause survival or extinction of the species. Then, based on the information they have gathered they could make the Web site interactive with negative elements being reduced and the positive elements being increased to allow survival of the species.

4.4.3 SITE ARCHITECTURE

Site architecture governs how the pages of a Web site are linked to one another. This relationship should be based on the syntax of a teaching model and the elements of the activity theory that supports the site. Depending on the students' needs, or the function of the Web site, the architecture of the site may be structured in a variety of forms. Horton

(1994) has suggested four basic structures: sequential, hierarchical, grids, and web. The site architecture that is most appropriate for the proposed teaching model and the elements of the activity theory is a combination of sequential and hierarchical.

Before beginning any site development, a flow chart should be drawn to represent the syntax of the teaching model and the elements of the activity theory. Such a flow chart defines all pages of the site and the pathways linking each page.

Based on the site architecture, navigational elements can be designed. However, most large scale Web sites have a very complex structure. IBM guidelines for Website development (IBM, Make It Easy, 1999), suggest the following to inform users where they are in a site:

1. Provide easy access to some form of table of contents, from where users can link to any other place (the table of contents may be the home page itself, or another separate page)
2. Always provide an immediate way to return to the home page
3. Make the resident section heading clear
4. Furthermore, testing the navigation design before it is placed on the server is absolutely essential. IBM guidelines also recommend asking the following questions:
5. Do users know how to find the information they need?
6. Does your navigation design connect all related information in a sequence that makes sense to users?
7. Do users know where they are in the site structure?
8. Do users know how to return to points they visited previously?
9. Are there any unnecessary links that clutter the navigation design?

5. 1 *Development of a Student-Centered Web Site*

Development of a student-centered Web site requires that you have some knowledge of new technologies, (Internet tools, server abilities, HTML, scripting, database, and multimedia). Many Web projects miss the fact that Web development is an interdisciplinary effort. The goal of the student-centered design process is to ensure that the final product is educationally effective and satisfies the learners' needs. To achieve this goal, the first step is to follow an interdisciplinary approach to designing educational Web sites. Web development requires the skills of an interface designer, programmer, media specialist, content specialist, writer, actors/actresses, voice-over individuals, secretary, and a marketing specialist. It is most essential that at least one student be an integral part of the design team. Involving students at every step of the design process is a must that is often ignored by developers. Students can provide valuable information about the elements of the site that provide problems. During the maintenance phase and other phases of

development, student input can help to refine the Web site to be truly student-centered.

The development of prototype Web sites should follow these steps:

1. Develop flowcharts based on the educational needs of the students
2. Review the flowchart as a team.
3. Determine the media types to be used.
4. Create a storyboard (a sketch of each page on paper)
5. Determine the programming required (structure and special effects)
6. Produce the first module (a prototype)
7. Review with peers and revise the first module
8. Produce the remaining modules
9. Test on pilot students
10. Revise
11. Test on general students

6.1 Maintenance and Evaluation

Finally, maintenance of the Web site involves evaluation and learners' feedback. The evaluation process determines the extent to which you have achieved the expected educational outcomes. Evaluation is a continuous process. It starts from the first step when the purpose of the site is being defined and continues even after the site has been developed and published. The evaluation of a student-centered Web site and its effectiveness can be done by answering the following questions:

1. Are the elements of interface design representative of students' backgrounds?
2. Are there samples of art, music, and mythology that represent students' backgrounds present on the site?
3. Is the site structured to allow the syntax of a social inquiry teaching model?
4. Are there centers that encourage collaboration and discussion with other mentors?
5. Does the site encourage interaction and communication with peers and teachers?
6. Does the site represent elements of the activity theory?
7. Does the site provide the means for students to help each other?
8. Does the site promote further research?
9. Is instruction interdisciplinary?
10. Does the site provide the means for students to carry out independent research?
11. Does the site provide the means for students to carry out hands on activities?

The most effective way to evaluate and maintain an educational Web site is to provide the learner a way to contact the site developers. This can be done with a form on the Web site or email. In a more elaborate feedback, learners can be surveyed or interviewed. In either case, to achieve student-centered curriculum you should keep learners involved as long as the Web site is functional.

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INFORMATION TECHNOLOGY AND JOURNALISM EDUCATION

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Abstract: *This paper outlines the impact of Information Technology (IT) on journalism education in general and describes specific application of IT in online journalism education at Central Queensland University's eJournalism Centre at the Smart City precinct in Rockhampton.*

The importance of engagement with the community in relation to journalistic practice and its place as one of the fundamental tenets of journalism education is discussed.

The CQU experience shows that IT has enhanced the potential for students to engage with the community and that the city-based Online journalism facility has created opportunities for two-way engagement and joint community based IT projects.

1. Introduction

The Internet has facilitated a rapid multiplication in public voices beyond the media elites – many may interpret this as a new millennium version of "the pre-industrial phase of the press [where] a wide spectrum of individuals or social groups could set up, so to speak their trestle table in the free market place of ideas" (Curran and Gurevitch, p.81 1991).

This has made the task of defining and teaching journalism more challenging as the Internet age dilutes the democratic principle of transparency and journalistic role of making powerful accountable. This is manifested in an increasingly poorly defined border between news and entertainment, and the multiplication of on-line news which can affect the definition of news itself. This can be seen for instance in the irreverent *Drudge Report*, whose owner Matt Drudge 'envision(s) a future where there'll be 300 million reporters, where anyone from anywhere can report for any reason'. (Drudge, 1998).

Confusion about journalistic endeavour and entertainment is reflected in public debate and the coining of the term 'infotainment' and satires such as the British based *Drop the Dead Donkey* (SBSTV) and Australian *Frontline* (ABC TV) using irony and humour to emphasise the contradiction.

Information Technology (IT) in the Internet age serves to emphasise the need for clarity in journalism education about pedagogic principles, particularly in an online learning environment.

2. Journalism Education

The Australian media employs around 4,500 journalists, 66 percent work for newspapers, 17 percent for television and 12 per cent for radio. One-third of broadcast journalists work for the Australian Broadcasting Corporation. (Henningham, 1998).

Journalism is offered as a major or a subject stream by more than 20 universities in Australia, and as an element of a typical Bachelor of Arts (Communications) degree it is estimated to occupy between one third and one half of the total hours a student spends as an undergraduate. (Windshuttle, 1998).

A 1996 survey of 13 universities offering communications courses showed 513 enrolled at the University of Queensland. At the University of Technology Sydney there were 800 first-preference applications for 100 places, and in the ACT, the University of Canberra had 660 people seeking 220 places, Newcastle 500 for 100 places and both Macquarie University and Charles Sturt University had 400 applicants 70 and 160 places respectively. In Victoria at Deakin University journalism was the second most popular unit and at the Royal Melbourne Institute of Technology there were 1200 applicants for 50 places in the Bachelor of Arts course in journalism. (Williams, G 1996).

In 2000 the University of Sydney and Southern Cross University at Lismore offered journalism units for the first time, suggesting continued growth in student demand - a trend which could see students of journalism close to outnumbering the four and a half thousand journalists working in mainstream media.

In 1998 a CQU appointed a Chair of Journalism - the third Professors to be appointed since Journalism schools were established at the University of Queensland and University of Wollongong.

The greater focus on the discipline of Journalism led to a restructure of core Journalism units and the introduction of a double major in journalism.

At the same time CQU's opened a Smart City campus in the old Rockhampton city centre which enabled the creation of an eJounalism Centre and a "learning environment where the basics of journalism are taught in a context of online technology which integrates multi-media formats and web-site production. (Knight, 1999).

Individual units are offered at and generated from, Rockhampton and elements of the majors offered at Gladstone, Bundaberg, Mackay and Emerald, and on-shore international campuses in Brisbane, Melbourne and Sydney. Enrolment is typically 120 students in first year core journalism units, and further 90 across a range of advanced journalism units.

In 1999-2000 the core Level 1 Journalism and two advanced units were externalised in Online format and will be offered for the first time in 2001.

Online access to a journalism stream has diversified unit offerings at international campuses and provided new choices for students at regional campuses who previously had to relocate to Rockhampton.

3. Online Teaching and Delivery Issues

Journalism education should be based on the pedagogic principles of:

- A strong theoretical framework which complements practice;
- Methodologies which provide meaningful simulation of professional practice;
- Teaching strategies to engage students with the off-campus community.

3.1. *Theory*

Lack of clarity about the relationship between theory and journalistic practice will undermine the strength and veracity of function of journalism at the nexus between the media and democracy.

A comprehensive survey of Australian journalists by the Journalism Department of the University of Queensland in 1992 garnered a 90.1% response from 1,068 journalists, about a quarter of all journalists employed in mainstream news media. It revealed a strong nexus between the functional definition of journalism which favoured informing rather than entertaining. (Henningham, 1995). There was between 70 - 89 percent agreement between three types of journalists (non-political journalists; non-Federal political and Canberra press gallery) that it is of "extreme importance" to "investigate claims and statement made by the government" and 70 to 84 percent that journalism should "provide analysis and interpretation of complex problems" which compared with a percentage response of only between 25-30 percent that it should "provide entertainment and relaxation". (Henningham, 1995).

Whilst this may be seen to be a collective 'pat on the back' this is difficult to sustain because of the large number of respondents and the inclusion of non-political journalists.

3.2. *Praxis*

Praxis in Level 1 courses is achieved through weekly assessable theory components about the history and development of the free press and the evolution of genre of new writing, presenting newsgathering skills in this context. The relationship between media and democracy, the different codes of ethics in relation to different systems of governments is examined. The inter-relationship between journalism and the law, journalism and lawmakers and the separation of powers is explained through the rounds system and court and political reporting.

Ready access to on-line material enhances praxis because there is ready access to the most contemporaneous debates about journalism through transcripts of broadcast program such as the ABC's *Media Report*, the *Law Report and Background Briefing*

Web-sites provided material and views on issues of great moment to the Australian media in 1999, such as the National Ethics Review Committee and the Australian Broadcasting Authority's (ABA) inquiry into the ethical and licence implications of talk-back radio sponsorship deals, sparked by the inquiry into Radio 2UE and the "Cash for Comment" affair.

The Media Entertainment and Arts Alliance (MEAA) maintained a web-site with first-hand documents from the Ethics Review Committee throughout the period of that inquiry. This included background discussion documents addressing philosophical, legal and professional issues. On-line newspapers such as Fairfax on-line, and ABC On-Line as well as the MEAA provided transcripts and running commentary throughout the ABA inquiry.

Such readily available "living theory" provides students with individual access to primary resources rather relying on teacher-centered, one-for-all handouts.

3.3. Simulation

Teaching effective professional practice necessarily involves simulation of the workplace. Whilst this is difficult on a weekly rather than a day-to-day basis it is made easier through close industry links and the availability of online journalism technology.

Media employers draw most of their journalism workforce from university graduates, and journalism graduates compete for entry level cadetships with graduates of other disciplines, and sometimes with school leavers (Alysen, 1999). Alysen's study of four Melbourne based major news organisations with formal trainee intake programs (the ABC, News Ltd, The Age and Herald and Weekly Times), showed that journalism education gave a considerable edge over others when it came to the cadet test or demonstration tape.

More than two thirds of the 1997/98 entry-level positions available at the four organisations considered here went to graduates with a first degree or postgraduate journalism qualification. (Alysen, 1998 p.29).

The same study found that employers who had had more interaction with tertiary journalism courses and those teaching them were more positive about journalism graduates. (Alysen, 1998 p.28)

These findings has been borne out with significant increases in the employment of CQU graduates since unit restructure included deliberately forging constructive pedagogic links with industry. Tutors have been drawn from on regional, ABC radio/TV and WIN TV.

The eJournalism centre at CQU's Smart City precinct closely approximates the industry's Online newsrooms. Students are introduced to online journalism writing techniques, web-based news production and industry-wide IT research methods, particularly as they apply to investigative journalism and feature writing.

3.4. Engagement

Engagement with the community is inherent to journalistic practice. Strategies to encourage students to actively apply their newsgathering in the local off-campus community have been assisted at CQU by locating the eJournalism centre in the City campus precinct which provides proximity to local courts, local council, politicians and community centres.

This has made it possible to provide an element in core journalism units which approximates 'civics in action', linking students' practical work to the theoretical concepts of media and democracy.

Engagement requires students to demonstrate an understanding of issues of local importance. Structured into the courses are weekly assessable news quizzes drawn from local print and broadcast media and enhanced to include state and national issues as they occur. With the exception of local print media, all other news quiz material can be researched via the Internet.

News stories assignments from the local court, Council and business community require research of online resources such as web sites with information or media releases, for example the Rockhampton City Council, ABC Online, and the region's elected representatives in the state and federal parliaments.

Engagement with the community can also be a valuable two-way process and information technology in a city-based Online journalism facility has opened up opportunities for community based IT projects.

Professor Alan Knight is coordinating journalism outreach such as a project with local High Schools to create web based 'Kidznet' newspaper, a joint digital photographic project with Queensland's Health's Youth Suicide Prevention Program and negotiating with Queensland Open Learning Network to establish links between the CQU eJournalism Centre and accessible community based IT centres in local libraries.

3.5. Delivery

Online community resources strengthen the pedagogic principles of journalism education – however not all these principles can be upheld in the Online delivery particularly the principle of Simulation.

Theory and engagement with the community at large can be structured into Online journalism – but the key element of face to face access to professional practice, and learning through feedback is not as readily transferable to an Online delivery environment.

Software developed to self- correct news writing provides some of the same learning opportunities and immediacy of face to face feedback and can encompass broad-based fundamentals such as the use of the active voice, present or past perfect tenses short sentences, and clear and brief words.

However materials are yet to be developed to compensate for feedback on the selection of news 'angles' in introductory paragraphs and/or the values applied to select 'news'. This is most absent for distance students are in individual learning environments and only overcome when Online delivery is complemented with tutorials - as is the case at CQU regional and International campuses.

4. Conclusion

Online course content, construction and delivery provide global and regional opportunities for journalism education for community based IT and tertiary institutions.

Nonetheless the learning outcomes of Online platforms need close consideration. IT advances at CQU are fortuitously occurring at a time when longer standing and larger institutions can provide the benefits of hindsight.

One of the largest Online education providers in the USA, the University of Maryland, together with fifteen other tertiary institutions is currently part in a five year, joint government study to determine the appropriateness of content and effectiveness of delivery.

Dr Claudine SchWeber, Associate Vice President and Adjunct Professor from University of Maryland's College's Office of Distance Education and Lifelong Learning oversees 24 fully online bachelor and master degrees to 35,000 students worldwide.

In a media interview in Australia in November Dr SchWeber said experience has favoured diversity and through the three major IT based teaching models. They are "totally online; web enhanced, so you meet once a week instead of three times a week using online study the rest of the time; or face to face, using web resources in the classroom".

Dr SchWeber also anticipated that one result of the study's "reality checks" will be a "new pedagogy, plus a realisation that quality delivery is costly and students will be picky".

The University of Maryland also found that "accrediting agencies want measurable outcomes for online courses" and that one of the key questions Online education needs to address is "how you know someone has learned something, that do you want them to learn?". (SchWeber, 2000)

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SKILLS.NET - COMMUNITY INTERNET ACCESS AND TRAINING IN VICTORIA, AUSTRALIA

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Question: *How to survive once the Government funds run out??*
Answer: The Skills.net Association Cooperative – a model for how government and community can work together to build and grow government funded programs.

HISTORY

Skills.net started life as a three year $5 million dollar program to fund one hundred and nineteen Skills.net projects across Victoria providing free or affordable Internet access and training to local communities. It was especially aimed at those who would normally miss out on such access, e.g. unemployed, women, people with disabilities, people from non-English speaking backgrounds, Aboriginals and communities in remote and rural Victoria. Skills.net had the aim of providing training and access to 40,000 Victorians by 30th June 2001.

So successful has Skills.net become that currently it has provided training and access to 50,000 Victorians well in advance of the original timelines and secured additional government funding to expand the program to reach 80,000 Victorians by June 30th 2003. There are now 218 projects running out of over 600 venues providing over 3,500 Internet connected computers for the community to use. More than a hundred extra projects are still to be funded bringing the total well over 300.

Skills.net is funded through Multimedia Victoria in the Department of State and Regional Development with the day to day management of the program handled by the Skills.net unit within Victoria's Network: VICNET (http://www.vicnet.net.au), itself a division of the State Library of Victoria (http://www.slv.vic.gov.au) based in Melbourne, Australia.

Skills.net has been tremendously successful with a thriving network of projects now up and running, all committed to ensuring the Skills.net philosophy survives on into the future.

The Skills.net funding is only one-off seed funding enabling community based organizations to provide free or affordable basic Internet training and access to their communities. But these organizations, responding to the needs within their community, want to go beyond the narrow confines of the government funded Skills.net program and embrace ecommerce, webpage publishing, advanced training, video conferencing and more. They see that through Skills.net a network of like minded community organizations across Victoria have been able to setup the infrastructure needed to develop these broader ideas and that by working together these groups could deliver these services to their communities.

How would they do this? By the formation of an independent Skills.net Association Cooperative, able to take advantage of the Skills.net name and brand but be independent enough to push beyond the original government funding and endeavor to take Skills.net into the future.

This idea was developed by a committee composed of members from organizations involved in running Skills.net projects and placed before the funding body – Multimedia Victoria, who immediately saw this as a wonderful way in which the groundwork laid down by the government funding could be built upon for the benefit of all Victorians.

They agreed to seed fund the establishment of the Skills.net Association Cooperative for a period of two years. The Association is in the midst of its establishment phase and has to date (end October 2000) been formally incorporated as the Skills.net Association Cooperative, has setup its own website (http://www.skillsnet.asn.au), has signed up over 80 members (including many organizations who have not actually run a Skills.net project but have likeminded ideals), have a very active committee of management who are currently in the process of appointing the Associations first Executive Officer, who will be responsible for taking the ideas below and turning them into something concrete.

This is a model of how a successful government funded project does not have to die and wither once the funds run out but by a partnership between government and the organizations running the projects, can develop a self sustainable way of growing and prospering in the future.

This proposal outlines what the Skills.net Association will do, how it will survive and become self-sustainable after the initial two years seed funding from Multimedia Victoria.

1. What A Skills.Net Association Is All About

1.2 *The Skills.Net Association Vision Is:*

- That all Victorians/Australians seeking to learn about the Internet will use Skills.net as a learning pathway;
- That all organizations working in Adult, Community and Further Education, Training, Telecommunications, Agricultural and Rural, Service, Business and Government, will recognize and accept the benefits of the awareness-raising, training and goodwill that Skills.net promotes in the use of the Internet as a communications medium and the potential benefits it offers in terms of job opportunities, new individual and business partnerships, cost savings to business, marketing potential and so on. And give the Association their full support;
- That Skills.net project groups already funded and supported by the Multimedia Victoria initiative will continue to benefit from the support and networking directed at meeting their needs and aspirations; and,
- That any community groups wishing to form a Skills.net project, or similar representative body, for a designated community group or area, will be able to join the association and enjoy the benefits and opportunities currently offered to existing members.
- That the Skills.net Association is a dynamic organisation keeping tabs on new advances in Internet and on-line services and becomes a dynamic system of informing and training the community in future technical and communication changes, thereby ensuring the community is kept up to date with all future advances and can influence them to make sure they fulfill community needs rather than simply being playthings of the technocrats.

1.2 *The Skills.Net Association Mission Is*:

- To advise and train individuals and communities in the use of, and access to, the Internet and its current best practice;
- To encourage people to use the Internet to its best advantage, to take a leadership role in facilitating Australia, Australians and Australian businesses to become world leaders in the application of this technology to education, learning, community and economic development.
- To establish Skills.net projects for the support of community focused Internet training and access; this also encompasses business especially small business.
- To assist communities to meet the objectives for which they sought equitable access to, and skills in using, new technologies;
- To ensure Skills.net projects are accountable to their communities, with a service charter and client focus;
- To safeguard Skills.net projects from professional misconduct and misrepresentation and
- To enforce the membership of the Skills.net Association with a fair and legal charter (or membership plan).

1.3 *The Skills.Net Association Objectives Are:*

- To actively seek representation of the Skills.net Association member groups in business, government, and community affairs which meet the mission statement of the Skills.net Association;
- To seek new business, provide professional advice and services, and tender on behalf of Skills.net Association member organizations;
- To administer the Skills.net Association in an efficient and effective manner;
- To promote an understanding of, and compliance with, the Skills.net Association charter, the rules and regulations governing the affairs of member organizations who wish to be a member of the Skill.net Association; and
- To assist Skills.net Association member organizations meet community expectations and manage their own affairs as Skills.net project members, under the Rules and Regulations of the Articles of Incorporation.

1.4 *The Skills.Net Association Strategies Are:*

- To constantly keep the vision, mission and objectives of the Skills.net Association under peer review;
- To continually assess the needs and aspirations of those members to whom the Skills.net Association provides membership services to;
- To ensure that all staff and member organizations are aware that the cultural and heritage values of clients may differ from our values, and that these values should be tolerated in our pluralist society, and how these values may affect the administration and delivery of services in Skill.net member projects;
- To encourage all Skills.net Association member organizations to adopt current best practice and promote ongoing learning opportunities for staff and clients in the use of new technology;
- To meet the needs of those Skills.net Association member organizations to whom the Skills.net Association provides services by providing education and training workshops on the operations of the Skills.net Association and expected outcomes for Skills.net Projects;
- To inform and train the community in future technical and communication changes, thereby ensuring the community is kept up to date with all future advances and can influence them to make sure they fulfill community needs rather than simply being playthings of the technocrats.
- To meet the needs and aspirations of those member organizations to whom the Skills.net Association provides services by developing and distributing information explaining the role and functions of the Skills.net Association and its member organizations; and

- To ensure compliance by member organizations with the Rules and Regulation incorporated into the Skills.net Association Articles of Association.

2. Activities

There are a number of activities that could be part of the core functions of the Association. These are services for which members (and non-members at a higher rate) would be willing to pay for. These payments help to ensure the long-term viability of the Association:

- In the first two years of the Skills.net Association it will take over from VICNET the management function of the MMV funded Skills.net Program. This includes auditing projects, updating membership information, and so on. This function will end once the MMV Skills.net funding and program ends.
- Networking among Skills.net projects
- Training - Provision of training services for members. This includes 'train the trainer courses' for members, thereby equipping them to provide the necessary training to their clients.
- Development of materials - Development of training materials that can be licensed/sold to projects. This includes hard copy material, on-line material and possibly Multimedia CD-ROM production.
- Providing advice to improve the standard of content of courses.
- Acting as the central management and administration point for the promotion and operation of the Skills.net Ecommerce solution. This includes developing and delivering training to members on how to sign up SME's in their area.
- Providing a central organisation which can go for larger government grants, sponsorship and tenders than individual centers could submit for.
- Provide advice and help to individual projects going for more localized grants, sponsorship and tenders.
- Technical advice, support and help. This would include providing access to technically qualified staff would could visit member sites and do what is necessary to set them up for Internet access and training.
- Sponsorship broker - Act as agent for projects individually and for Skills.net as a whole.
- Negotiation of special rates for services, software and hardware across Australia.
- Marketing and promotion of Skills.net - Market and promote the Skills.net brand and promote member organizations and their achievements. This includes development of marketing material, brochures, posters and so on.
- Promote local community programs and the benefits of on-line access.

- Quality management and best practice - Operate a quality assurance and certification program for projects. Ensure maintenance of standards and improvement. Set best practice standards.
- Annual conference and regional forums - Conduct an annual conference for members and a rolling schedule of regional forums, where projects can meet and discuss community networking, sponsorship, funding, training and all the other issues of concern.
- Representation to Government - Represent member projects to government - National, State and local
- National linkages - Develop linkages with national organizations and Associations.
- International linkages - Maintain and develop links with like international organizations.
- Networking with other Associations - Network with related industry Associations in multimedia and communications and community organizations.

3. Services

Activities would be grouped into two service portfolios - member services and commercial services:

Member Services Portfolio	**Commercial Services Portfolio**
• Networking	• Technical Support Services
• Member Communication - on-line chat/conference	• Connection Services
• Promotion of Skills.net	• Demand aggregation
• Lobbying	• Quality assurance
• Public relations	• Certification and licensing
• Funding advice	• Funding submissions
• Member database	• Tender Services
• Tender development	• Marketing consulting for groups
• Grant application preparation and co-ordination	• Sourcing new business opportunities for members
	• Sponsorship development
	• Conferences

Member services would be financed through subscriptions and sponsorships and commercial services would be financed through fee-for-service activities.

3.1 Delivering Member Services and Benefits

Services would be delivered to Association members through:

- The Skills.net Association mailing list
- On-line publishing and information

- Manuals and brochures
- Workshops and training programs
- Consulting advice and counseling
- Regional forums
- Annual conference

4. Skills.Net Brand

The Skills.net brand and logo will be licensed to the Association in order to deliver benefit to members and source of income to the Association. This will require the State Library to deregister the name and logo at the end of the 'official' Skills.net funding and for a fully constituted Skills.net Association to then register it for the Association.

Skills.net is a brand that is owned by the State Library of Victoria. MMV and the SLV currently require that Skills.net funded organizations use the brand in promoting their projects and training courses.

The brand has potential value for the commercial activities of an Association.

- The value is in terms of the awareness of the brand as defining program excellence. The brand needs to be promoted by the Association to create this value
- Brand value comes from recognition and what it stands for. Building the brand requires strong promotion.
- Value is in terms of the guarantee of quality that it provides for training consumers.
- The value to members of the Association is enhanced if the quality guarantee enables them to secure grant funding or contracts for training projects.
- If the Association does a good job of brand marketing it can allow members to focus on selling their individual programs.
- The brand could be transferred to the Association. The Association would then be responsible for licensing and controlling the use of the brand. Usage would be by member organizations whose training activities comply with training and operating standards established by the Association.

Licensing of the brand delivers a benefit to members and a source of income to the Association. The brand creates a franchise situation with the Association being able to deliver a complete package to members comprising:

- Model structure
- Organizational systems
- Training packages

- Hardware systems
- Partnership models

This could be a major direction for the Association.

This also provides a vehicle for taking the Skills.net model into a national arena.

5. Organisation Structure

The Skills.net Association would be an incorporated Association formed pursuant to the provisions of the Associations Incorporation Act 1981. As mentioned above the State Library of Victoria would have to deregister the name, Skills.net, so the Association could register it.

6. Membership

Membership would be open to any community groups that supported the objectives of the Association and could demonstrate their pursuit of similar objectives, at a community-based level. Associate membership could be available for other types of community organizations, government agencies and sponsor organizations.

Some variations to the standard rules would be required to ensure that the Association was created for the benefits of the community groups involved and not individuals. The appropriate way to do this would be to provide that its membership was restricted to the community groups which it served. Membership would not be open to individual persons.

Membership would not be restricted to community groups receiving grants. It would be open to any community groups that supported the objectives of the Association and could demonstrate their pursuit of similar objectives, at a community-based level.

7. Skills.Net Association Model

The model would have the Skills.net association operating as a full time professional association. It would take over many of the functions currently provided by VICNET and would offer a range of commercial services.

Features	Model
Objectives	• Networking between projects • Promote Skills.net • Develop the Skills.net movement • Collective representation • Develop new services • Deliver services
Activities	• Networking • Share information • Promote Skills.net • Conferences • Develop sponsorships • Develop and deliver services • National and international links
Membership	• Skills.net projects • Other similar organizations • Training organizations • Sponsors • Suppliers
Funding	• Annual subscription • Sponsorship • Fees for service • Successful Tenders, i.e. Australian Electronic Business Network training deliver tender • Ecommerce • Government grants
Management Structure	• Committee of management • Full-time executive officer • Full-time executive assistant
Location	• Skills.net Assoc. office at VICNET

Table 1: **Summary of Model**

8. Sources Of Funding

There are a wide variety of sources of funding. Some examples are given below:

- **Membership Fees** - Membership fees are likely to generate about 10% of the projected revenue. Skills.net projects are community-based organizations with a

limited ability to pay substantial fees. Skills.net projects consider that the fee structure proposed in this submission would be acceptable.

- **Fee-for-service** - Fee-for-service delivery is an option although the Skills.net Association products need to be established first in order to on-sell it. At this stage it is not included in the projections, but will be pursued as a revenue possibility after the formation of the Association. The development and provision of training modules and software, and software and hardware support are likely fee-for-service candidates.
- **Services** - Skills.net Association could develop and sell training and software (possibly through VICNET) - a nominal amount of every sale could be transferred to the Skills.net Association - again not included in revenue projections
- **Consultation fees** for contracts and tender acquisition are a potential source of revenue for the Association.
- **Franchise fees** for use of the Skills.net brand and services are potential sources of revenue. For example a licence fee could be associated with the use of the Skills.net brand and services
- **Sponsorship from business** is a possible source of funding. This could be cash or in kind. Skills.net Association could tap into in-kind funding VICNET already receives (e.g.. Digital, Datafast etc.). A modest projection for industry sponsorship is included in the projection
- **Brokerage fees** - organizations tendering for grants could include in their package of services, Skills.net accreditation. The Association would provide training, technical advice and support in return for a fee.
- **Grants** - An initial grant by the government/MMV would be required to establish the Association. Government may contract with the Association to deliver specific services or programs in the future.
- **Further Grants** - With over 300 Skills.net projects currently in operation, this gives a great scope to apply for large government grants to deliver training and public access services to a large number of areas across Victoria and soon Australia. The Skills.net Association will go for these grants with some of the funding being used to cover central administration and staff costs. An example of this is the current Skills.net Association submission to the Federal Networking the Nation program to fund a project aimed at small business entitled 'Skills.net for Small Business'.
- **Training Delivery Tenders** - There is a growing demand for Internet training courses to be delivered across Victoria. Skills.net can deliver the required standardised Internet training at over 300 venues across the state. We are in discussion with other groups who also need state-wide delivery of Internet courses for their members, employers and groups. Skills.net is ideally placed to win these training delivery tenders. We have the material and the sites. Eventually Skills.net will be able to deliver this training nationally.
- **Ecommerce** - Skills.net is already working on an Ecommerce solution for SME's to be delivered through Skills.net sites. Ecommerce should bring in significant income for the association and projects. This provides a great

opportunity for the Skills.net Association to form mutually beneficial commercial relationships with industry.

- **Web Page Design** - With the pool of talent available in Skills.net projects, the Skills.net Association can successfully tender for significant web publishing and databasing contracts. These would be subcontracted to the projects with the skills in the relevant area.

9. Sponsors

Existing projects have been successful in attracting support form a range of sponsors.
Commercial and corporate sponsorship of individual Skills.net projects is largely confined to the Leader projects (that is, projects receiving $100,000 in Skills.net funding). In addition general Skills.net projects are likely to receive funding from a variety of government sources in order to support their programs

Project partners may also include:

- Local Universities
- TAFE sector support
- Colleges of Advanced Education
- Public libraries
- Local community groups
- Local businesses

The Association will play two roles in relation to sponsors.

1. Sourcing sponsors for the Association. We believe there is potential to source a combination of cash and in-kind contributions for the Association.
2. Act as a broker for sponsorship to specific projects. The Association would take a sponsorship management fee for this from the projects/members.
3. Act as a clearing house and single point of contact for businesses with an interest in sponsoring information society programs
4. Preparation of specific sponsorship proposals

10. Summary

The Association will provide a vehicle for the Skills.net program and project concepts to survive and prosper in Victoria and to expand Nationally and even Internationally. The Skills.net Association model offers a way in which community Internet access and training venues can look to survive into the future after seed funding from Government, without having to keep going back cap in hand to governments for more funding. The model is universal and can be applied in other countries. For further Information please email Adrian Bates at adrianb@vicnet.net.au

- A Skills.net Association will be a hybrid between a community/industry association and an organisation selling technical services.
- The objectives of the Skills.net Association will include:
- Networking between projects
- Promotion of the Skills.net brand
- Development of the Skills.net movement
- Provision of collective representation
- Development of member services
- Delivery of services to member organizations
- A Skills.net Association will engage in the following activities:
- Networking among Skills.net projects
- Training
- Development of training materials
- Advice on grant applications
- Technical advice
- Sponsorship broker
- Negotiation of special rates for services and hardware
- Marketing and promotion of Skills.net
- Promote local community programs
- Quality management and best practice
- Annual conference
- Representation to Government
- Promote national linkages
- Promote international linkages
- Networking with other associations
- Two portfolios of services will be provided - member services and commercial services.
- Member services will be financed through subscriptions and sponsorships.
- Commercial services will be financed through fee-for-service activities.
- The Skills.net brand will be licensed in order to deliver benefit to members and a source of income to the Association.

- A Skills.net Association will be formed pursuant to the provisions of the Corporations Act
- Membership of an Association will be restricted to organizations. No individual membership would be allowed.
- Association membership will not be restricted to currently funded Skills.net projects.
- Membership will be open to any community group that supports the objectives of the Association.
- Management structure of the Association will develop with the evolution of the Association itself.
- A Committee of Management will be formed in the early stages of the Association.
- Appointed staff will need an entrepreneurial approach.
- The Government will need to provide seeding funding for the Association over a three-year period. If the Association is not self-funding by the end of Year 2 support should be withdrawn.
- Revenue from subscriptions will not be sufficient to fund the operations of an Association.
- Revenue from subscriptions would not be sufficient to fund the operations of the Association and revenue will increasingly be derived from commercial activities, Ecommerce, successful tendering for training delivery contracts, successful grant applications to both federal and state government Internet programs.
- The Association may provide a vehicle for the Skills.net program and project concepts to be replicated at a national level. If this were the case, the activities and revenue based of the Association would be substantially expanded.

ENABLING GROUP LEARNING METHODS IN THE CLASSROOM

Exploring the Conjunction Between Mainstream Pedagogical Practice and Social Informatics

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Abstract. *The social experiences of young learners in the home or in educational settings such as a school classroom are formative in nature. Learner perceptions, attitudes and expectations are fashioned or shaped by the calibre of the learning experience. This paper enquires into the scope that exists for educator's to use information technology to further enhance the formative nature of classroom instruction and assessment.*

The emphasis here is on the primacy of the social and cultural milieu of the classroom as a learning context over the requirements of a set of computer-based activities. Working from a social informatics perspective, what follows reports on preliminary findings concerning the learning partnership between a teacher and 23 Central Queensland primary school students (years 4-7). The class's preparation to interview a local author underpins the focus of the program in language and thinking skills. The use of the Grouputer™ system (Zing and Technologies, 1991-2000) enabled the teacher and the students to participate in an active learning approach using a conversational framework (Laurillard, 1999) to augment an integrated language and literature program.

On one level the students' processing of content was substantially enhanced, allowing for equal participation and rapid compilation and categorisation of entries. On another level the system enabled the teacher to build a profile of the class's response to the task for further diagnosis and assessment.

1. Introduction

Whatever is good to know is difficult to learn

The controversy in education regarding the use of computers in schools has possibly come full circle. There is much about the "succeeding waves of computer applications" (Lai, 2000) over the last 10 to twenty years that have not sufficiently advanced student learning and pedagogical practice in mainstream primary and secondary classrooms. The much-touted groundswell in computer-aided pedagogy, along with the supposed revolution in teaching methodologies has not materialised. If it has, it remains confined to fairly narrow segments of educational practice and research (Pelgrum and Plomp, 1991).

The inference is put forward in this paper that the move to advance mainstream classroom method has unwittingly carried with it a kind of "technological driveness ...served by dynamic obsolescence" (Henry, 1963, p.28). The failure of pundits of the machine technology movement (Cuban, 1986; Kling and Zmuidzinas, 1994; Grint and Woolgar, 1997; Kling, 1999) to effect change in mainstream practice is testimony to the assertion that *new solutions* in schools – specifically those involving changes in teaching and learning (*ie.*, the challenges to teachers and to students) runs almost counter to the central tenets of adoption and diffusion arguments (Cummins and Sayers, 1990; Hodas, 1993; Hodas, 1996; Lemke, 1998).

Indeed, Henry's insistence that mainstream education is "always *against* some things and *for* others [because] it bears the burden of cultural obsessions" (1963, p.235) is poignant, if not pointed in its implications. The widening debate on the social consequences of computerisation (Kling, 1996; Kling, 2000), despite the so-called infusion of computer technology in classrooms, suggests that asymmetrical rather than symmetrical relationships are a direct consequence of stressing the benefits of the technology over and above the requirements of teachers and students as a communities of learners. Clearly educational practice cannot afford the luxury of such indulgence – the gains must be self-evident, if not substantive in nature.

The present initiative stresses the use of an enabling instructional and learning process in the classroom. By 'enabling', it is meant that there is no suggestion of utilising computers to "make kids smarter" (Bromley, 1992; Kirkpatrick and Cuban, 1998; Hunter, 1998). On the contrary, the application of computer power is brought about by a desire to maintain the *status quo*. In other words, working from the premise that the culture of the classroom – the learning context - has precedence, the decision to include computer power is based on a complete understanding on the part of the class as to how the process of group-enabled activities, being appropriated, supports learning as well as diagnostic or assessment objectives. It is imperative that the inclusion of technical processes of any form actually support and reinforce the instructional design of the learning context. By ensuring a high degree of congruence (Whiteley and Callan 1995) between a student's desire to engage the learning process as a member of the class (or group) and the class'

collective expectations of achieving final outcomes (products), it follows that the introduction of any technical process must avoid violating the prevailing norms and expectations of the class. The account which follows provides insight into how a class (*ie.*, the teacher and the students) quickly formed perceptions about the process, and worked collaboratively to address a series of task objectives without compromising expectations, and without compromising their need to identify opportunities to extend their learning. By ensuring a high level of congruence between the need to 'learn' and the need to 'know' with the substantive expectations the class collectively held about achieving a set of 'outcomes', this class was able to deploy the Grouputer™ (Findlay, 1991) system to facilitate:

- individual choice,
- student-centred interactivity,
- group discussion,
- analysis and interpretation,
- collaborative enquiry, and
- teacher-initiated diagnosis and assessment.

Of central importance to this study is the prevailing thought and research related to computer-supported collaborative work, and user-active learning environments (Laurillard, 1999a, Laurillard 199b), and along with the advancement of investigations into the design, uses, and consequences of information technologies in educational settings (Kling, 1999). Given that Social Informatics theory comprises interdisciplinary research involving "systematic analytical and critical research" (Kling, 1999; Kling and Crawford, 2000), the following is exploratory in nature. Essentially this investigation seeks to identify under what learning circumstances a mainstream primary class would engage a group-based process to enhance learning, teaching, and diagnostic or assessment processes.

2. Aims of the Research

This research forms part of a longitudinal study into the effective use of computer technology to support group-based learning and instructional processes in conventional classroom settings. The intention beyond the exploratory research phase is to conduct a series of enquiries to establish under what social or educational conditions in mainstream classroom context it becomes necessary to appropriate a computer-enabled process involving the Grouputer™ system (Zing Technologies, 1991-2000). Of particular interest to this research is the opportunity to examine the congruence of key sequences (dimensions) within a range of learning tasks with the expectations of learners; and the quite distinct or separate expectations of teachers (Whiteley and Callan, 1995).

In a recent review of various agendas governing the application of learning technologies, Laurillard (2000) reiterated that the elements of efficiency and enjoyment are central to a supportive learning environment where the selection media are matched to learning objectives, feedback is offered to support active

learning, and that an appropriate balance is achieved across the range of learning activities. The assessment of balance in this case refers principally logistics management to ensure an optimal fit between methods and media (Laurillard 1999b, and Laurillard, 2000).

Given the broad aims of the research, the present study relays the outcome of consecutive (participant) observations (Erickson, 1986; Atkinson and Hammersley, 1994) of a primary school class engaged in developing a set of interview questions to support a meeting with a local author and novelist. The inclusion of the Grouputer™ system as an information-handling tool was arranged at the request of the teacher. The decision to use the system was influenced by a requirement for total involvement of the class. A series of tasks to enable the students to critique their own input was undertaken. Two teacher-directed lessons - one on questioning technique, and the on interview method (Keats, 1993) were included as part of the instructional content.

3. Methodology

The aim here has been to develop a methodology for observing the use of GSS technology in a mainstream classroom environment. The technology is ordinarily used to conduct strategic planning meetings (Findlay, Hudson *et al.*, 1991; Bostrom and Anson, 1992; Dennis and Valacich, 1993; Beer, 1999), but also includes design components and templates to assist classroom instruction (Zing Technologies, 1991-1999).

The approach taken in this study has been to engage the class (the teacher and the students) as the principal decision makers. At successive stages the Grouputer™ was used to enable the learning process. By adopting a constructivist lens (Erickson, 1986) to the classroom dynamic a number of interpretations were made. Due care was exercised to prevent the use of methods which would allow the researchers to form preconceived ideas of how the class might respond to a technologically enabled set of learning outcomes. Rather, the process was led by discussions informed by the data as it was collected. Primary responsibility for the next stage lay with the teacher in discussion with the students.

Given the primacy of the social milieu of the classroom over technical requirements, the constructivist ontology (Schwandt, 1994) provides an epistemological perspective that ensures that particular or unique ways of knowing within a classroom can be understood relative to the context in which these are formed.

4. Research method

As part of the lead-up to the research focus, the class had been read instalments from a locally published novel the *Orphan Swaggy* (Maizey, and Williams, 1996). The students had used excerpts from the book as stimulus for artwork, and a number of other learning tasks. For sometime the students had been gathering questions as part of their individual efforts as part of preparations for an interview between the author and the students.

As a GSS system the Grouputer™ supports simultaneous input from 12 keyboards into a single computer. A single laptop computer was used, n this case, to collect the data, and a number of desks (sufficient to accommodate twelve keyboards were arranged in a semi-circular fashion in front of a projector screen. A data projector was used to project an image of the team workspace onto the screen, and the class was invited to key in their questions. Figures 1 and 2 illustrate the basic layout in the classroom, and the display format.

Figure 1. The Grouputer™ Classroom Setup

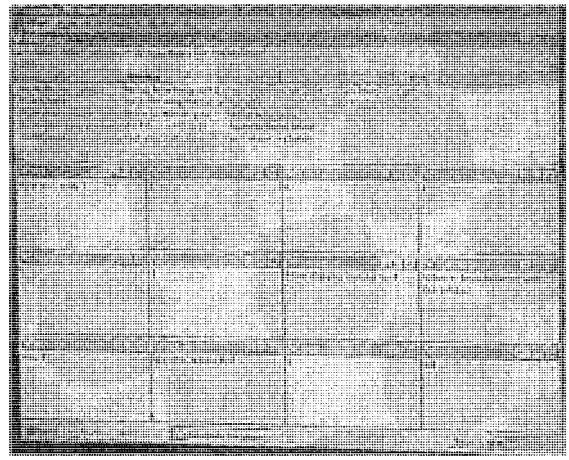

Figure 2. The Grouputer™ Projected Screen Image - Showing 12 Play Spaces Beneath the Team Space

The students were invited to log-on as part of an introduction to the system, and the class engaged in an icebreaker led by the teacher to secure basic orientation to the system. In order to facilitate entry of questions, a buddy system was instituted and students paired-up to key-in their questions.

Figure 2 provides a screen shot of the entries. The list of some 140 questions soon became a taking point, as the students realised that 140 questions would be too great a burden to impose on any interviewee. The teacher's suggestion was that the list would have to be "whittled-down in some way!"

The teacher put the follow-on question to the class. This question required team discussion and it was focused on matters relating to aspects of the story line that each child favoured. A third question concerning issues of some sensitivity was put to the students, so that there was some public acknowledgement that there were aspects of the author's life that could be too painful to raise in the interview.

The problem of how to reduce or refine the 140 questions emerged as an issue. To facilitate an off-line (ie., away from the computer) categorisation task, the students worked in groups to identify the duplicate questions, clear redundancies in the list of questions, and identify key themes from the full list.

For the second session, the students, after a lesson on interview technique with the teacher, completed a brainstorm on the issues that have to be kept in mind when interviewing a guest speaker. Following the brainstorm, the class develop a set of ground rules to set the stage for effective interview. Table 1 provides a description of the ground rules which derived from 56 statements about the do's and don'ts of interviewing.

Table 1. The Ground Rules for the Interview

1.	Ask if you can video him.
2.	Co-operate with Jim to make communication easier.
3.	Watch your manners and be courteous, because he's a visitor.
4.	Always remember what questions have already been answered.
5.	If someone asks one question, do not ask it again if it is on your page tick it.
6.	Speak loudly and clear with simple words throughout the interview.
7.	Ask for clarification e.g. "Could you please give me a definition of that word?" or, "I didn't understand what you meant then."
8.	Listen carefully and show him you're interested by not getting distracted.
9.	Don't distract others and try not to get distracted by others
10.	Don't ignore him.
11.	Be quiet when Jim is talking.
12.	Look him in the eye so he knows you are not ignoring him.
13.	Keep the camera out of his face.
14.	Have a backup.

Finally, the last session, which was preceded with a second off-line group task, involved the class in drafting the final list of questions for the interview in Table 2. One or two caveats emerged from the off-line process. The stipulations related to whether sufficient balance existed between open and closed questions, and whether the questions provided sufficient lead-in details to help keep the interviewer on side.

An issue emerged as to the suitability of one question (based on the values clarification during the framing of responses to question 3).

Table 2. The Final Questions for the Interview
(Only 19/28 questions shown)

		What are the most appropriate questions for the Interview?
1	Team 1	~~In the book you talked about dead swaggies, did you ever look in dead swaggies' swags and get stuff out of them?~~
2		In the book you said you did some droving, did you ever fall of your horse?
3		In the book it said Gladys kissed you, did you like your first kiss and have you ever seen Gladys since she kissed you?
4	Team 2	People say it was better in the old days but would you rather have a horse like Arizona now or a car?
5		In the book you mention jumping on trains and getting caught how many times did you get caught?
6	Team 3	After the police hit you have you always had a bad feeling about them?
7		In the book you mentioned getting bashed by the cops, after that incident have you always had a bad feeling about them?
8	Team 4	At school now if we are bad at school we get a demerit point, when you were at school did you get punished?
9	Team 5	Jelly these days does not melt, why did it melt in the old days and how was it made?
10		We get homework every week, did you get homework when you went to school?
11	Team 6	Do you like police now?
12		Did you ever find a good cop?
13		How long did you stay in jail when you got hit in your head?
14		Were all the police bad?
15	Team 7	We all laughed when you put jelly in your pockets. Was the jelly made the same as it is now?
16		In the book you didn't like Streak. Were you ever friends with Streak again?
17		When we read about Streak and Curly we didn't like either of them. Who did you like least Curly or Streak?
18	Team 8	In the book you said you had some goats, what was the highest number of goats you ever had?
19		In the book you mentioned getting bashed was every cop a mongrel?

A speculative question (see table 2 question 1) generated some concern because of its the moral overtone. The class elected to apply a secret vote to resolve the dilemma and the results appear in Table 3

Table 3. The Secret Vote Tool

Vote

Issue 1: Do you prefer the first question on swaggies to the second?

Vote : 1 Voting Method Yes/No Secret Vote

Member 1 :	N	Member 2 :	N	Member 3 :	N	Member 4 : n
Member 5 :	N	Member 6 :		Member 7 :	N	Member 8 : n
Member 9 :	Y	Member 10:	A	Member 11 :	Y	Member 12 : N

5. Findings

The first question of interest – "What questions do you have for the author?" generated a very positive response from the class. The students were extremely enthusiastic about keying-in all of their questions, and were similarly impressed they had so many to ask. The class used the richness of list to validate content, clarify the form that questions could take, and took sufficient time to consider the substance (or lack there of) with some of the entries at a later stage. The follow-on questions helped to set the stage for other facets of the project.

While the students individually or collectively were suitably satisfied with the extent of the content they had generated for each of the questions put to them, they were also quite at ease engaging in off-line as well as on-line tasks.

The other significant outcome of immediate interest to the teacher was a range of data that could be generated from the class's output. This enabled a range of diagnostic activities that could be compiled to ascertain which teams stayed on task, or at which level participants were contributing to the task. More significantly, however, the data revealed frequencies with respect to topics the students found most appealing from the novel. At another level of diagnosis, Table 4 shows how the data revealed which teams had command of the full repertoire of questions types, or the focus teams had with respect to the themes associated with the storyline.

Table 4. Teacher Compiled Profile

Relativity	Teachers now teachers then	Currency now, currency then	Todays technology	School now School then?	Streak	Police now compared to then	Be a kid now or a kid then
	1	1	1	2	2	3	6
Plot	Struth	Watching cattle all night	Working in the mines	Pinkeyed sheep	Big red	Swaggy incidents	Get back at teacher
	1	1	1	2	2	2	2
Plot	Jo his dad & police	Railway trains hitching	Mail dog	Streak Curly	Police	Jelly	School
	4	4	5	5	10	13	20

6. Conclusion

The results from the findings reported here and in other areas of the research are extremely encouraging. Student evaluation was very positive about the process and the use of the technology to enable the range of outcomes. Similarly, extremely positive comments came from the teacher who saw immediate advantages to diagnosis and assessment profiling.

The continuation of the research is expected to confirm that the range of skills involving peer group support can be expanded quite considerably across the curriculum. The principal gains from this exploratory research comprise the level of understanding the class gained as to the extent to which a learning context can be further enhanced by such an enabling process. Furthermore, this form of GSS has been trialed in Central Queensland for the first time, and the commitment to a series of further studies augurs well for local education as part of increasing interest in the web-based version of the process.

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ONLINE COMMUNITIES FOR COMMUNITY DEVELOPMENT:

Focus on Women's Networks on O'ahu

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Abstract: *A combination of social and technological factors point to a potential for building strong online communities in Hawai'i. Indicators such as the availability of "free" server space for nonprofit community organizations, higher than average volunteerism and philanthropy in Hawai'i (Hawai'i Community Foundation 1999), and a greater percentage of women working outside of the home should make conditions ripe for developing and implementing community informatics for women. Indeed, between 1998 and 2000, web sites for women's organizations on O'ahu have increased from less than 3% to over 48%. This rapid increase, however, is not necessarily an indication of a burgeoning use of the Internet in grass roots activities. This study delves into some of the less obvious reasons that contribute to an evolutionary rather than a seemingly revolutionary adoption of online technologies among women's organizations in Hawai'i.*

1. Introduction

Online communities, regardless of their purpose, user population, or geographic dispersion, share many traits in common, just as they require the same social and technological infrastructure to take root, blossom, and thrive in any environment. These common traits have already been identified and thoroughly analyzed in the diffusion of innovations literature (Rogers 1995) as well as in the more specific context of "Community Informatics" (Romm and Taylor 2000; Romm and W. 2000)

Community Informatics (CI), in the context of this conference, is being used to refer to community development systems that "link economic and social development at the community level with emerging opportunities in such areas as electronic commerce, community and civic networks and tele-centers, electronic democracy, self-help, advocacy, and cultural enhancement." (Romm and W. 2000), 1 Given the general partitioning of these varied topics and their coverage by other papers, this study will take a slightly different approach by using the lens of gender in examining the issues related to online community building. I will also attempt to respond to Romm & Taylor's challenge of analyzing the qualitative aspects of the "depth" of adoption as opposed to a more superficial summary of quantitative data.

2. Background on Technology

In recognition of the importance of communications and information industries to the State of Hawai'i, former Governor John Waihee proclaimed 1988 the Year of Telecommunications. In that year, Hawai'i's Fourteenth State Legislature demonstrated its support for this concept by passing ACT I of its Special Session: the Telecommunications and Information Industries Act. (1988) In turn, this law established the Hawai'i Information Network Corporation (Hawai'i INC). The purposes of Hawai'i INC were to encourage the development of an information industry in the State of Hawai'i, to promote access to public information, and to create the foundation for a statewide information network. The legislature also envisioned the need for education and training of telecommunication personnel, as well as training programs for executives and management of the state government and other end-users.

Although $5 million was originally allocated for this project through Act I, the project was eventually downsized to providing only government information; underwent multiple changes in management and scope; and was ultimately abandoned, without full appropriation of the funds. Despite the failure of Hawai'i INC, this governmental legacy has served as the basis for both positive and negative effects in Hawai'i's efforts to utilize information and communication technologies to build a stronger and more diversified economy. Some experts in the field of telecommunication and economics have identified political appointments of those with little technical knowledge to key positions in the management of government-based community informatics systems as part of the reason for the failure of Act I. Differing expert opinion on the veracity of the most recent community service report on the viability and potential for e-commerce in Hawai'i (Bui 2000) also casts doubts on the political interpretation of statistical data used to foster a positive environment for attracting new e-businesses to Hawai'i. (Jussawalla 2000)

Concurrent with these early legislative efforts, telecommuting was promoted and a telework center built in the "second city" of Kapolei in the western region of the Island of O'ahu. Attempts at telecommuting were also less than successful and spotty at best as, along with many other environments in the U.S., Hawai'i found many obstacles to remote management of a workforce, and other social and personal ramifications in changing a well-established work culture.

On the education front, the University of Hawai'i's independent assessment of new technological trends was reflected in its 1984 report, *A Strategy for Academic Quality, 1985-95*. It was predicted that new communications and information technologies would continue to grow rapidly during that decade, affecting curriculum content, educational delivery systems, and methodologies. Among the strategic goals listed in this document are the University's mission to provide its students with "literacy in the application of computers and other technologies... To improve access for the state's citizens through coordinated programs involving outreach degrees, continuing education, and community service...To incorporate

telecommunications systems selectively into all aspects of the teaching and research mission of the University...and to plan wisely for the impact of technology and related social change." (University of Hawai'i 1984, pp. 9-10).

Despite these early efforts to conceptualize the necessity to move toward an electronically networked education system, especially important in a multiple-island state without the resources to provide equitable higher education services to all islands, the systematic provision of full online degree programs is still in its infancy within the University of Hawai'i system. The only program initiated in the late 1980s and still offered is the Graduate Certificate Program in Telecommunication and Information Resource Management; currently being offered entirely online, but with little means of systematic support from the University of Hawai'i or the State Government.

Although technological progress may have come in slow spurts and with many false starts, the reality today is that with over 30 Internet Service providers, including cable-based and DSL systems, with many ISPs offering free server space for building community-related home pages, there is more than adequate infrastructure to support any modest effort to build any form of service for CI.

3. Traditional news media as backdrop

One of the major incentives for the use and growth of the Internet has been its value as an alternative means for exchanging information of value to the community that was not, in the past, offered by the traditional print and broadcast news media. Hawai'i has been lucky in having very high cable penetration rates and four channels of community service television that cover the spirit of CATV programming in the areas of government, education, and public programming. Although these services are provided to the community through a subsidization scheme that allows free access to modern studios, equipment, and programming time, it is still obvious that the World Wide Web and the Internet have tremendous advantage for ease of use and access when compared to a television studio.

Discounting this citizen-run community television option, we find the daily media sources as less than "friendly" to women and women's perspectives on what needs to be shared as "news" through public media. (Davis 1995) Although since the late 1990s we have seen the addition of more female columnists, anchors, and editors to the media, mass media are still a predominantly male- and Mainland-oriented domain. Women's portrayals in the public eye follow these universal journalistic patterns and are generally limited to:

- A predominant image of women as victims with less focus on the perpetrator of the crime or the circumstances leading up to the crisis. There is often a lack of in-depth information on where victims may receive assistance in times of

crisis. The media have justified this lack of coverage as a conscious means of preventing the criminal elements from tracing the whereabouts of their victims.

- Greater invisibility of women as business and community leaders except when a "special focus" issue or article is presented. In other words, women are less likely to be quoted as expert sources or leaders by the press.

- Greater emphasis on coverage of cosmetic issues in reference to women's health.

- Less coverage of women in sports, while paying greater attention to sex or gender issues in sports rather than actual athletic accomplishments.

- Less coverage of social issues in which women have a greater stake, such as child care, equitable wages, health care, and transitional programs for welfare to work, and the social impact of policymaking that affects the lower socioeconomic segments of the population.

4. Translating traditional images for new technologies

Although women in Hawai'i fundamentally face issues similar to those in other parts of the U.S., this island environment has its unique circumstances based on its demographics and geography:

- Cultural diversity may require sensitivity to "political correctness" across multinational and multicultural barriers. The majority of Hawai'i's population will identify at least two and generally three or more different racial or ethnic identities for each family. These differences are often radical, and not quite comparable to mainland diversity in the context of "Old World" or European cultural differences. Embedded in this diversity are the seeds for potential differences in forms of expression, values, and morals. A socialization process through a common system of education brings uniformity rather than diversity to web site design and construction. The inherent, underlying value embedded in the technology is one of openness to unknown and unseen individuals and circumstances. This is not necessarily a comfortable cultural concept for all cultures.

- Heavy influence from many Eastern and Southeast Asian cultures with a tradition of domestic abuse emphasizes a volatile local topic. Often women must take roles subservient to men or remain in the private or domestic spheres. In such households even if the woman is required to be gainfully employed (given the high cost of living in Hawai'i), household chores are basically not shared, thus increasing tensions and anxieties that lead to further deterioration of stressful domestic relationships. On the one hand, such

patterns can be reversed through education and community support. On the other hand, the pervasiveness of such cultural values is reinforced through representation of such views within institutions, thus making it more difficult for women to receive fair or serious treatment in each instance that such abuse is reported through official channels. The Web can just as easily become a source of reinforcement for the prevailing values as it is likely to serve as a harbinger of change. For matters related to power differentials in family units, it is unlikely that women will find the privacy and access necessary to solving issues of violence or abuse from a home-based computer system. There are, however, women's centers and shelters as well as the public library system that offer web access to the public. Once such walk-in center that has proved very successful for women in transition is YWCA's Women's Center with several computers for networking as well as skills training, resume writing, and general research.

- A fundamental cultural imbalance between the Hawaiian value system that honors humility and encourages privacy in conflict resolution and the public media culture of mainland U.S. (also reflected in the World Wide Web) that is unabashedly self-promotional and litigious. This cultural barrier is often cited by those who find Western media conceptually incompatible with their personal values and beliefs, preferring the "personal touch" of face to face, small group communication.

- A continuing influx of immigrants who bring not only different cultures, but also different languages. Many who have been here for several generations also tend to preserve their original language and culture. As well, there is a rebirth of the Hawaiian population's knowledge of their language and cultural traditions. Twenty-five percent of the islands' population speaks a language other than English at home. This compares with less than 14% of the U.S. population as a whole. (Governor's Office 1992)

- Changing roles of women. The cost of living in Hawai'i is approximately 27-33% above that of mainland U.S. (Davis 1995; Bui 2000) This increase has required many women to join the workforce. However, the trend toward working is a long-standing one as indicated by the fact that of the employed civilian workforce, women made up 35% in 1960, increasing steadily to 47% in 1990. Of women over the age of sixteen, 59.6% were employed by 1990 compared to 65.5% of males in the same age group. Another revealing statistic is that even by the 1990 Labor Statistics, 63.4 % of all mothers with children under the age of six were back in the labor force. (Governor's Office 1992)

5. Women Networking Online

Traditionally, most women have embraced the social role of community building at the grassroots level. Even today, with women's extended roles in the public sector and private enterprise, they are still the primary volunteers for organizing fund-raising events, be it for rewiring schools, garnering multi-million dollar grants for high technology training, or rolling up their sleeves and cooking church suppers or holding bake sales; visiting shut-ins, building support groups, or managing shelters for victims of domestic violence or abuse. At a more personal level, they are typically the ones to organize birthday parties at work, collect funds for a get well bouquet for a sick colleague, or send out the Christmas cards after updating the family mailing list. In every case, the combination of the underlying functions of volunteerism (free labor) and networking (web-building) have now found a new spiritual home-base on the Internet.

There are, in fact, no fundamental differences in the use of technologies by men and women beyond those social preferences that predate the use of technology and are embedded in various cultures or patterns of behavior regardless of the medium for communication. Technology simply enhances an individual's predispositions and highlights such preferences. In other words, for those women who thrive in "connected" environments, then new technologies are used to enhance their networks, whereas those who prefer to control their privacy and solitude will utilize such technologies to "buffer" themselves from additional contact by screening their messages and not responding to external demands. Other behavioral continuaa that are generally seen as a difference in computer use among different individuals are the player/doer, grasper/griper, and volunteer/conscript dimensions. (Davis 1998)

All such differences, however, are more likely to indicate innate human preferences that are not necessarily divisible along gender lines. What does make them more interesting, however, is the same phenomenon that was originally observed several decades ago in the creators of computer systems (high-end, high-skill male computer scientists and engineers) vs. the potential users of such systems (low-end, low-skill female data entry clerks). Now that many women have reached their full potential in their careers of choice, and many men have come to acknowledge their lack of interest, motivation, and skills in tackling new Information and Communication Technologies (ICTs), what we find is that there are both men and women who will remain in the low-interest group. Ramifications will be discussed in the next section.

6. Discussion

Many years of research and experience with diffusion of innovations has solidly identified the factors of observable advantages, compatibility with existing values, and visibility of results as strong motivators in the adoption process (Rogers, 1995). Moreover, recent modifications of the diffusion theory also take into account the

diffusion differences related to "appliances" vs. "services" where it is confirmed that diffusion rates for innovative "objects" can occur over shorter time periods, whereas service-based innovations require a longer adoption phase. This may account for the slower rate of growth in web-building and use as compared to an appliance adoption such as wireless phones or VCRs.

On the negative side, the Internet's total dependence on technical literacy (that is, system complexity), access requirements to computers and networks, and ongoing expenditures for maintenance and connectivity pose as major disincentives to adoption. These issues, along with the broader behavioral, social, and cultural aspects of access have affected the adoption rate of the Internet for those whose livelihood does not already depend on the use of ICTs. In other words, the enthusiasm of those who are building the web sites is not necessarily matched by the skills, motivation, or economic standing of the intended users of such networks - especially in community networking for information dissemination as opposed to building affinity groups. While members of the latter groups are likely to share the same socioeconomic status it is far more likely that the former group will be facing a wider gap in the digital divide.

When we first gathered data for the *Women as Resources in Hawai'i* directory (Media Task Force 1998) in the Spring of 1998, of the 74 organization branches that were selected for inclusion only four provided e-mail addresses and two had web sites. These were predominantly professional or academic organizations whose principals were already using the Internet in their primary work area. By October 2000, of the 73 women's organizations identified for the Island of O'ahu (the overwhelming majority of which are the same as those listed in the 1998 directory but with major changes in staffing, office locations, and communication facilities), 36 had established web sites (see Appendix A) and 40 offered e-mail addresses for the primary contact person.

At first glance, it is quite obvious that there has been a strong groundswell in the use of new communication technologies in this community sector. To gain greater insight into this fast-spreading phenomenon, however, we need to study the factors that have led us to the current state of Internet use from two different perspectives : (1) Motivation for creating these sites, and the level of their use or nonuse; and (2) the absence of web sites for the other half of these organizations and reasons for non-use.

6.1 *Motivation for site creation: Web site existence does not equate web site use*

The first empirically observable phenomenon is that at least half of the women's organizations with web sites are subsumed in a "parent" organization's URL, be it a larger local entity (such as Hawai'i Women Lawyers within the Hawai'i State Bar Association's site) , or a national or international organization (such as the site for Pan Pacific and Southeast Asia Women's Association - Hawai'i Chapter).

Where the motivation for creating the web site has been external, lack of local resources or internal motivation is more clearly visible. In many of these instances there is little more than a local contact person noted on the headquarter's web site - if that (e.g., National League of American Pen Women - Honolulu Branch). In other cases, the organization site has remained "under construction" for several months or a year or more, with no new information added during that time.

One of the more obvious signs of under-utilization or lack of active use of a site is a blank calendar of events, or the final posting of a newsletter or news release that dates back several months or years . Of course, it is also possible that such organizations are truly inactive in "real life" as well, and that the online site is simply a true reflection of that organization's current status. A brief offline look at women in such organizations will, however, serve to dispel such beliefs.

Where sites appear to be more active and very well organized, closer scrutiny shows that much effort has gone into the original design and implementation of the site, but that maintenance and upkeep is missing. An example is the Girl Scouts - Hawai'i site, last revised in March, 1999, with the most recent news release dating back to September, 1999. A more cumbersome but accurate measure of testing Internet use is to send e-mail via the addresses posted on the site. My personal experience, though minimal and not generalizable, tends to show that such e-mail correspondence leads to very slow responses if not total dead-ends. This, of course, is not unique to Hawai'i-based sites or women's organizations; it seems to be the universal norm for many links on the Web.

Not surprisingly, of those with the most up-to-date and active web sites, the .dotcoms and those serving a commercial purpose have taken the lead. In this category the best local example is also the one with the greatest funding support and the most obvious reasons for staying current: Hawaii Women's Business Center, created specifically to assist women entrepreneurs with their business planning process.

6.2 *Absence of web sites and reasons for non-use*

Purely local and small non-profit organizations with no out-of-state or governmental support form the majority of those with no web sites. Ethnic benevolent societies are the most frequently "missing" organizations on the World Wide Web. Apart from the most obvious factor of lack of funds, these organizations are most likely to prefer informal face to face gatherings and their work has a more "physical" rather than intellectual service component - such as distribution of food and clothing to needy families or providing companionship and recreation for the elderly in their communities. Though they may also provide educational scholarships to community members as an

intellectual contribution, they serve a closely-knit and geographically intimate population base that can better utilize its funds on its mission rather than increasing overhead costs by using new ICTS.

Almost every organization has at least a telephone (a few provide only a post office box contact address) and the majority also utilize fax machines. Many responded to our queries this year by stating that they are on the verge of establishing web sites. Yet, even for those with e-mail addresses and reasonably convenient access, most individuals do not check their e-mailbox all that often. Again, the web site seems to be more of a product of social conformity or pressure than one based on an intrinsic need or value.

7. Conclusion

The social networking element inherent in Internet technologies is an obvious attraction to those who have built their lives around this precept. Improvements and simplifications that continually expand the reach of the Internet to less-skilled individuals moves us in the direction of maximum participation by all community members. On the other hand, these same improvements have also made possible the "automation" of the moderator (or sysop) positions that have been the nodal glue for keeping the social interaction of group members under some control.

By definition, social networks are specifically dependent on nodes (those holding information of interest to others) and links - among network members. Just as the automatic switching mechanism for telephone lines eventually relieved the telephone operators of the early to mid 20th century from their tedious work - it also coincidentally removed the central role that such operators played in their communities as repositories of the most current news. So will history repeat itself as further automation of web site building and maintenance removes the personalization stamp from such nodes. The effects of such impersonalization through decentralization or removal of "human nodes" is already evident in automated e-mail response systems, unmoderated listservs, newsgroups, and chat lines. Lack of moderators and "conscious" linkages lead to too few or too many links, resulting in too little or too much information flowing from node to node. Too little interaction and the group dies; too much and a natural breakdown into smaller affinity groups may revitalize the system. Ultimately, however, it is participation at the human level that determines the success or failure of any social network.

Trifonovitch (2000) reports on a recent study by Cheskin Research; The Santa Clara University Center of Innovation & Entrepreneurship; and The Center for New Futures that found substantial differences in challenges faced by men and women in various business-related tasks. Of note was that men spend more time doing business networking. Executive Director of Hawai'i Women's Business Center, Laura Crites, was quoted as saying that "women are indeed effective networkers.

However, they generally don't network with people who have power because: people with power (men) do not act like them; people with power aren't particularly comfortable with women; people with power expect women to give up who they are to join their ranks; and women are uncomfortable with the way powerful people use power." (Trifonovitch 2000)

Of the numerous advantages attributed to the Internet, those that contribute most to its success as a medium of choice for women are its inherent ability to give voice to populations not well-represented by traditional mass media; its relatively inexpensive venue for creating communities of affinity; and allowing "external" time to women who are spending the majority of their waking hours at work or caring for children and tending to household chores. Just as the use of cellular phone (used, albeit, as an electronic leash) at least extended the horizons of women who were otherwise required to stay at home after dark for "safety" reasons; the Internet can expand the distances traveled by women whose circumstances prevent them from physically reaching into their communities or traveling beyond the borders of their neighborhood.

8. Postscript: Is a Day in Our Lives Reflected on the Net?

While interviewing the male assistant director for Community Affairs at a local television broadcast station regarding the coverage of news that was deemed important to the women in our community, I was told: "We don't come to work in the morning thinking 'How can we cover women's issues or ethnic issues or any other issues; rather, we come to work saying what are the important, interesting, and visually appealing news to cover today?" When I asked "But how do you decide what's important and interesting? Does it occur to you that what might be important and interesting to you may not be important and interesting to me?" There was a long and puzzled pause before he replied "No, actually that had not occurred to me...(pause)... But I can see how if we had women making these decisions that they might see things differently." (Davis 1995) This reality check for women should keep us inspired to find our own venues for sharing information and building online communities of affinity and power.

Appendix A: O'ahu, Hawai'i women's organizations with web sites in October, 2000.

In 1998, the Media Task Force of the Honolulu County Committee on the Status of Women undertook a compilation of women's organizations as a part of a larger endeavor to identify women with expertise in a variety of fields as resources for the local media. This was a highly selective list of organizations that generally excluded all auxiliary clubs to men's organizations, single-denominational church groups and partisan political clubs and organizations, sororities and other social Greek clubs, as well as most walk-in non-membership centers, and commercial organizations. The

inclusion criteria, later modified slightly to accommodate greater representation of women from all categories and walks of life were originally as follows:

- A membership roster consisting primarily of women
- The primary goal of focusing on women's issues
- A title indicating women or girls as a major component
- Non-partisan political standing
- Non-denominational in membership or focus

The following is an updated list of these women's organizations, but limited to those for which a web site could be located. As noted earlier, many of these sites are at the national or international level, having been created at the headquarters for each institution. There are, however, a number of notable exceptions; with the most extensive and up-to-date site belonging to the Hawai'i Women's Business Center.

American Association of University Women (multiple local chapters)
www.aauw.org
American Business Women's Association (multiple local chapters)
www.abwahq.org
American Society of Women Accountants - Honolulu Chapter
www.aswa.org
ASK2000 (275-2000) Hawai'i Community Services Council
(a "gateway" organization to social services) www.ask2000.org
Association for Women in Science (AWIS) - Hawai'i Chapter
www.awis.org
Daughters of Hawai'i
www.daughtersofhawaii.org
Delta Kappa GammaSociety International - Beta Beta State Hawai'i
www.deltakappagamm.org
Domestic Violence Clearinghouse and Legal Hotline
www.stoptheviolence.org
Executive Women International - Honolulu Chapter
www.executivewomen.org
Gay & Lesbian Community Center
www.glcc-hawaii.org
Girl Scouts Council of Hawai'i
www.girlscouts-hawaii.org
Hawai'i State Commission on the Status of Women
www.state.hi.us/hscsw
Hawai'i Women Lawyers
www.hsba.organization/sections/hwl/hwl.html
Hawai'i Women's Business Center
www.hawaiiwbc.org
Hawai'i Women's Legal Foundation
www.hwls.org
Hawai'i Women's Political Caucus
www.nwpc.org
Healthy Mothers, Healthy Babies Coalition of Hawai'i

www.hmhb.org
Honolulu Association of Insurance Women
www.naiw.org
International Association of Administrative Professionals - Hawai'i Division
www.iaap-hq.org
Japanese Women's Society of Honolulu
www.jwsonline.org
Junior League of Honolulu
www.expage.communication/page/jlh
www.ajli.org
League of Women Voters of Honolulu
www.hi-lwv.org
www.lwv.org
Mothers Against Drunk Driving (MADD)
www.madd.org
National Association of Women in Construction - Honolulu Chapter
www.nawic.org
National League of American Pen Women - Honolulu Branch
http://members.aol.com/penwomen/pen.htm
The Network - Hawai'i (formerly: Hawai'i State Network for Women Leaders in Higher Education) www.acenet.edu/about/programs/access&equity/owhe/home.html
Pan Pacific and Southeast Asia Women's Association - Hawai'i Chapter
www.ppseawa.org
Professional Women's Network
www.pwnhawaii.org
Sisters Offering Support
www.soshawaii.orgl
SmarTitas Ink! (Tough.Intell igent.Tender.Artistic.Sistas)
www.smartitas.com
Society of Military Widows - Aloha Chapter 25 - Hawai'i
www.militarywidows.org
Try Fitness!
http://tryfitnesshawaii.communication
Women Marines Association
www.womenmarines.org
Women on Wall Street
www.womenonwallstreet.com
www.wow-mom.com
Women's Fund of Hawai'i - Hawai'i Community Foundation
www.hcf-hawaii.org
Young Women's Christian Association of O'ahu (YWCA of O'ahu)
www.ywca.org

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DESIGNING FOR SUCCESS:

New England Women Linking in New Communities — NEWLinC

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Abstract. *A group of people who have something in common is generally called a community. On-line communities develop due to common interests, shared goals, and a desire to assist or provide information or service to others in the group. On-line communities can develop from lists serves as 'welink' has, or portal sites, as with 'Geocities'. Rural women often travel great distances to maintain contact with other women of similar interests and needs. Building on-line communities is one strategy that can breakdown isolation and provides a sharing of diverse knowledge and information. Armidale Incorporated is launching a region-wide initiative to bring women on-line to form virtual communities. This paper provides an overview of the process to be followed during 2001 to involve 250 New England women in on-line community building.*

1. What type of community are we building?

Communities exist to meet the needs of their members. We all belong to several different communities often arranged on social, economic, geographic, spiritual, recreational, historic and many other reasons. Rural women have often experienced very tight knit local communities, though they must travel many kilometers to link up with friends and family. Linking with others with similar interests and hobbies, or even a kindred spirit interested in discussing particular topics does often involve travel and long distance calls.

Armidale Incorporated has received a grant from the NSW Department of Women to involve women of the New England region in linking through on-line communities. This project is designed to increase the number of rural and remote women who have an understanding of, and participate in the development of an information technology society. Through the use of communications software and a dedicated website, these women will extend their networks to women outside their physical boundaries. Education, business and women's groups combine their relative expertise and services to provide information, advice and introductory training creating an understanding of how virtual communities and on-line-networking can build relationships, provide information and raise awareness of the new e-commerce economy.

2. Why are we building a virtual community?

In a 1995 NEEBT report, Lepani (1995) predicts that women will enter the workforce in increasing numbers during the next decade and that the average workers are likely to be older and more educated. She also states that Australian enterprises will need to keep up with technological advances to stay in the global economy. Employment opportunities will shift away from labour intensive production towards greater use of computer technologies. Such changes favour female employment with a decrease in blue-collar jobs and an increase in service jobs, and part-time, casual, or contract employment.

The so-called "tyranny of distance" that has constrained Australia's growth in many industries applies much less to the information industries. Technology is socially shaped and understood differently by men and women. Women have turned from information technology because they prefer direct contact with people. There is an excess of job opportunities (both IT and other fields) in metropolitan areas. As we enter the information technology economy, many of these job opportunities could be undertaken by women in remote and rural areas with the linking of telecommunications. Outsourcing of skills, particularly IT&T skills, is occurring across most industry groups. This project will inform rural women about new economic opportunities, developing links with women's business groups in Brisbane, Newcastle and Sydney. Women who communicate, discuss and network with each other can realise opportunities for enhanced social and economic lifestyles.

3. Who are we building it for?

An extensive report concerning Women and Computers was funded by ANTA in 1998. Marina Salidu-Anderson conducted the project in the New England Region of NSW. The project identified the barriers affecting women in their study of and employment in information technologies. The surveys conducted by the ANTA project highlighted that rural women do not feel confident with information technologies. Rural women expressed concerns that information technology related employment and activities require long hours, lack part-time opportunities, are difficult to balance with family responsibilities, and are inherently stressful.

The Internet has the capacity to change these perceptions and provide rural women with employment opportunities outside their local communities through Tele-commuting, contract work delivered via Internet, and e-business. The *Women and Computers* report recommended the establishment of women's networks and the development of a web page to facilitate remote contact between individuals and groups. The New England Women Linking in New Communities (NEWLinC) project will provide a space on the Internet for networking. The growing concept of e-business provides unlimited potential that is enhanced by collaboration and the grouping and re-grouping of information and services. Rural women, who feel

comfortable with electronic communication and have contact with metropolitan markets, can provide these services and develop niche products.

4. How will the virtual community project relate to other community projects?

Currently there are several community initiatives in the New England region that link well with this project. Armidale Incorporated, the commercial development arm of the local council, is in a strategic planning stage with aim of facilitating the process for meeting the needs of telecommunications infrastructure in rural and remote areas, ensuring greater access to IT services.

NorthNet Internet Services has won a tender to provide points of presence (POP servers) to remote locations of this region. This project ensures that those areas, otherwise not commercially viable, will have IT access. In such locations, it is imperative that training be given to promote the use of the access and to instill confidence in the technologies. The Bushnet Project, funded by Networking the Nation, is a training program for rural people in the Internet and Web design processes.

Telstra has established a Country Wide business centre in Armidale. This has been a strategic decision that will accelerate improvement in Telstra's service levels and business performance outside the big cities. Telstra's Chief Executive Officer has said that the new business unit will mean regional customers will have a faster, local response from Telstra for all communications needs - from fixing a fault to quicker and better access to the Internet.

For each of these individual projects to be effective the population in the rural and remote areas must be aware of the potential of the Internet for economic and social development and feel confident in its use as a tool to facilitate their needs. Thus the purpose of this project is to support other initiatives in the region. Rural women are often strong community leaders. Armed with knowledge and confidence in the Internet as a communication and networking tool, rural women will lead their communities to greater prosperity for all citizens.

5. How will we design the community?

Community is one of the oldest of human concepts. Communities develop from commonality and interest. We live and work in communities. We also experience non-community environments. At one time or another, we have all lived or worked in a 'group' rather than a community environment. Luck may turn a group into a community. But good planning is a better way to go. Communities come to life when they fulfill an ongoing need in people's lives. Regardless of why people come together initially, their ongoing participation and support to a community depends solely on the relationships that they form in that community. 'Virtual' or 'cyber'

communities are an adaptation of the human spirit to the technology of the day. Alder (1999) claims that "Community-of-interest formation is perhaps the single unique attribute of interactive media." Alder advocates the development of a virtual community when an organisation is focused on supporting the needs on one demographic, professional, or interest group.

Kim (2000), a recognised expert in the field of on-line community design, suggests at there are nine essential strategies for creating on-line communities. These strategies are linked to:

- the particular needs of community members;
- the infrastructure for bringing members together;
- the diversity of membership and strategies used for getting to know each other;
- the content provided for members by members;
- the provision of effective leadership and a plan for growth;
- the strategies used to, build trust, develop relationships, and handle conflict;
- the type and frequency of 'events';
- the rituals and celebrations that bind members together; and
- the technology that allows members to build sub-groups for themselves.

The *New England Women Linking in New Communities* project is in its infancy. We have a year to design and begin building the 'NEWLinC-mmunity' by bringing New England Women on-line. I say *begin building* because no community is ever finished. Communities evolve. If they don't, they soon become ghost towns. As explained previously, several partnership organisations have come together to support the needs of women in the New England region with the aim of developing their confidence in, understanding of, and practical use of information technologies. The NEWLinC site will evolve, as the particular needs of the members become known.

5.1 *Stage 1*

A team of five women with complementary and varied skills will implement a staged process of designing and developing the community website and workshops. The first stage incorporates 'behind the scenes' design and development. Between October and February, the team will undertake the design of the website interface and negotiate technological considerations for its implementation. They will develop the contents of introductory workshops to be held at the eleven TAFE campuses of the New England Institute of TAFE and plan the UNE facilitated videoconference.

The development team will organise media coverage in the regional centres and establish a contact database with women from the region. The development of the database is to be facilitated through existing women's networks, such as the Country Women's Association, Zonta International, Quota International, View Club, Women in Business, and Australian Women

in Agriculture and many other less formal women's groupings and existing communities.

5.2 *Stage 2*

By March 2001, the first series of workshops and seminars will begin; their purpose is to provide instruction about the requirements and procedures for becoming connected and to initiate the personal networking of potential virtual community members. The workshops will also provide the development team with feedback about the particular needs and motivations of potential community users. Using this feedback the development team will make adjustments to the cyber community design.

When the training sessions have been completed and the women are on-line, a videoconference connecting eight TAFE centres will be staged so those participating women become familiar with the additional media. Communications strategies will be the focus of this videoconference, with 'guest' presenters from around the region.

5.3 *Stage 3*

A second series of workshops will follow in June and July, introducing participants to the concept of e-business and networking for employment opportunities through the Internet. During these workshops, cyber community members will be introduced to women outside the region who are active in community building and e-business. Community developers will monitor on-going activity and member use of the website with staff facilitating the addition of content. The community site is to be a place for information sharing, brainstorming, problem solving and relationship building. The University of New England will host a second videoconference where community members will be linked to guest presenters from outside the New England region.

5.4 *Stage 4*

NEWLinC aims to provide information, advice, and introductory training about how virtual communities and on-line-networking can build e-business opportunities. The expected outcomes are:

- Improved morale of rural and remote women resulting from connectivity, enabling them to shape their own futures;
- Increased knowledge of potential of Internet and WWW for social and economic development;
- Improved access to information available on demand and how to use it;
- Increased confidence of rural and remote women to investigate opportunities for doing business through the Internet;

- A pool of skilled women in rural communities who can act as models for others, diffusing new skills into the community by discussion and example;

The evaluation process will incorporate independent research to determine the success of the project. We expect to have over 250 women involved in NEWLinC including Indigenous Australians from the region. Stage 4 will also incorporate recommendations and a promotional strategy for the development of further community building opportunities. We aim to begin the process promoted in the recent federal government report—*Time running out: Shaping Regional Australia's Future' which* highlighted the need to:

- Raise community awareness about the opportunities and potential benefits offered by e-commerce;
- Publicise the Australian Electronic Business Network more widely in regional Australia; and
- Provide more opportunities for education and training in IT in regional Australia in order that regional Australians can shape their own future.

The completion of this project will only be the beginning of NEWLinCs, with ever-evolving networks between women of rural and remote communities extended nationally and internationally.

Acknowledgments

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"ISOLATION BREEDS INNOVATION"

Rural/Remote Carers Utilizing Technology

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Abstract. *Dr Andrew Lippman (2000) renowned for researching the social impact of technologies and observing the nuances of their adoption, is founder of a program that explores the boundaries of what it means to live in a digital age. He states that the Internet has democratised society, and the resulting empowerment shifts control to the customer, no matter what their age, culture or level of society.*

1. Introduction

It is now a fact that the greater the Internet database has become, the more opportunity it presents for people to sidestep traditional sources, something that presents a challenge for everyone. There are many rural/remote Carers wanting to bridge geographical separation, and looking to technology, as suggested by Wellman (2000) to develop communities of shared interest, learning, knowledge and practice.

This paper explores the possibilities and benefits of maximising services for Carers in rural/remote areas by increasing intersectorial collaboration and cooperation through technology, such as videoconferencing, email contact, chat rooms, internet access, teleconferencing and electronic newsletters.

2. The Present

The Human Rights and Equal Opportunity Report released in March 1999, confirmed what most rural people already knew - they are losing key services...there is a great sense of hopelessness and alienation - of being abandoned - among rural communities...inadequate, inaccessible and diminishing services in the bush.

Queensland Council of Carers (QCC) has Community Development Officers based throughout Queensland covering vast geographical areas. The author's area, Darling Downs and South West Queensland covers 414,311 sq Km, approximately twice the size of Victoria, has 198 towns with a population of 241,701 people. Australian Bureau of Statistics (1998) figures state that 10% or approximately 24,000 people in this area of Southern Queensland are in a caring role. While personal interaction and face to face contact remains a priority, technology offers another way to reach out to rural/remote Carers to overcome some of the barriers built up by distance and remoteness.

At a forum in Toowoomba in 1999, an opportunity was provided by the Women's Justice Network to discuss utilising the personal computer videoconferencing network, established by them in communities across South West Queensland. The initiative was taken up collaboratively by representatives from Queensland Council of Carers, Rural Allied Health Team , Disability Services Queensland, and Carer Respite Centre. The first trial videoconference, linking the Toowoomba Support Group for Autism Spectrum Disorder (ASD) with a Carer of two ASD children in Quilpie (rural and remote) was held very successfully, in August 1999. The remote Carer was very enthusiastic, "I didn't realise so many Carers were in the same situation as me", "It was so good to talk to other Carers especially when we chatted informally during the tea break and to find they were having the same feelings as myself", "I really enjoyed being able to directly ask the guest speaker questions". "It was hard to believe I was in a room 1000km away, more as if we were all at the meeting together".

In another instance, a baby with a genetic disorder born prematurely in Brisbane to a couple from an isolated rural property required follow-up assessment from a specialised health professional. This meant the Carer (mother) and baby would have to remain in Brisbane while the father returned home alone, or alternatively, all the family would have to drive some 500km to Brisbane each fortnight. Following contact from the health professional, arrangements were made to provide a video link during the family's fortnightly shopping trip to the nearest rural town. The Brisbane hospital professional was able to carry out her visual assessment, talk to the mother and discuss the next fortnight's plan. The Carer told me, "It was so good to be able to go home after weeks in Brisbane and not have the family separated again, which would have happened without the opportunity for the video linkup".

At about the same time, funding was gained for the BridgIT program by the Rural Women's Network from the Regional Telecommunications Infrastructure Fund (Networking the Nation). This was granted to provide personalised, basic Internet training to individuals and small groups in rural and remote areas of Queensland either in the home, office or at public venues. Here was a service that could skill Carers in the use of technology to help build their confidence and capacity to continue their caring role. Carer's ages range from school children to aged pensioners, many who had their own computer or access to one at the local library or community centre but lacked the skills or confidence to use them to their potential.

For the very young Carers, technology is just a part of life and to the Carer of a child or young adult with a disability, their exposure to information systems is often through their child. However for the older person, communities will have to overcome some misconceptions. Although all people are fearful of change to an extent, Nan Bosler in an interview with Gliddon (2000) says it is often the older person who is branded as the most technophobic. The reality is that this senior generation, are as diverse as any other age group, they want to receive information, they want to learn, however it may be not be in the same way as younger people. In one senior's computer club where

ages ranged from early 60s to late 80s, Gliddon (2000) found interest in the internet is on the rise with many discovering that email and the Internet gives them access to distant family, and decreases the isolation for those who are not able to get out and about easily.

Support groups for Carers traditionally have helped in the coping mechanism but they have their limitations according to Bacon, Condon and Fernsler (2000) who found that inability to travel due to physical problems, lack of transportation or prohibitive travel distances limit access. The availability and expense of respite services to allow the Carer to attend a support group may be another factor. In a trial email group moderated by the author, Carers of children and young adults with a disability were linked. These Carers had never met each other and were spread across a wide geographical area. In a very short period of time this groups were not only offering support to each other but exchanging information on funding, new programs, government grants and a variety of other issues that effect their daily lives. When one Carer emailed about a stressful situation there was an almost immediate response from other members of the group. They like the confidential environment and the opportunity to communicate with others in similar circumstances.

It is interesting to note that current research undertaken to find out if the internet increases, ignores, decreases or replaces contact with friend and relatives, found that email adds to in-person, phone, cards/letter interaction, even though it doesn't substitute for in-person contact (Wellman, Witte, Hampton, Quan & Klement 2000).

In a previous study Sharf (1997) reported that the likelihood of connecting to others who share important commonalties, such as age and circumstance, was greater on the Internet than in small local groups. Bacon et al (2000) found that self-help groups on the Internet can allow for interactive or passive participation...email gives people time to organise their thoughts and express themselves more clearly. In addition, seeing one's problems expressed in writing on a computer screen may be therapeutic in itself for the participant (Spinney 1995) and may mitigate one's sense of isolation (Scolamiero 1997).

The most recent achievement in the Darling Downs and South West Queensland areas occurred during National Carers Week in October this year. The original working party now joined by Queensland Telemedicine Network organised a videoconference linking 24 towns from 22 locations, which was aptly called "Isolation Breeds Innovation" highlighting how this form of technology can assist their capacity in the caring role. Guest speakers including the local Federal Member, Hon Bruce Scott, and the State Minister for Families, Youth and Community Care and Disability Services, Hon Anna Bligh were linked from Brisbane, Toowoomba and Hervey Bay. For most Carers participating it was a first, and has stimulated ideas of the possible.

3. The Future

Wellman (2000) writing about his ideas of the future, predicts that the breathless development of computer networks is fostering the societal move from little boxes to social networks and creating possibilities for how people connect with each other. He further states that Internet video may become widely used for real-time chats as well as for leaving videomail messages...only a lack of imagination means stopping with video.

The technology revolution is set to radically change the face of health care sending it into cyberspace with patients consulting their own doctor from anywhere in the world and where a person's entire medical history will be downloaded from a personal smart card or by logging onto a database. Interactive TV (Montgomery 2000), will have the ability to run a documentary on Carer Stress in one corner of the screen, previewed by editorial text below it, while next to that is a text-based chat box where users can talk about what they are watching with others.

Our future technology has significant repercussions for Carers. It is predicted people will live longer with less disease, less genetic abnormality, and greatly improved communications. To cope with the predicted longevity there will be increased use of electronic aids and equipment to assist in the day-to-day caring of a person confined to bed or a wheelchair.

Statistics from Canberra and the authors experience as a community Development Officer, verifies that Carers may sacrifice their own well-being and life opportunities for paid work, education, leisure and even relationships. Technology has the ability to bridge or even fulfil some of these aspects of their life, particularly for the rural/remote Carer. Carers want genuine options as to when and how they provide their care. They want to be valued, better supported and have a better income. What better way to advocate for these changes than to facilitate an online chat session where Carers plan together and then email each other as a follow-up.

4. Conclusion

A future challenge is about how we resource Carers who want to use technology to enhance their own lives and the life of the person they care for but whose only source of income is a government pension or payment. To date it has been through commitment and cooperation from several agencies as described in this paper, and working "with" rather than "for" Carers, that this project has moved forward.

The future of technology is all around us. It will become what Lippman (2000) describes as the dominant infrastructure, one to which all aspects of life gravitate inexorably, like traffic to a highway, because it is simply the most efficient means of executing a process. By empowering all Carers, especially those in rural/remote areas

to embrace and benefit from technology, we are reminded that Community Development happens best when its members have a healthy confidence in themselves as individuals and are confirmed in the talents they possess.

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eLAUNCESTON
A Telstra Research Project

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Abstract. *eLauncestion is a Telstra Research project focused on exploring the factors that influence Internet uptake and usage. A particular focus of the project is the role of localised content and applications in Internet use and to facilitate this aspect of the research, Telstra Research has built a Regional Portal web site (http://www.elaunceston.com/) in collaboration with the Launceston community. Telstra Research is working at a grass roots level with Launceston stakeholders who support the project because of its potential to contribute to the social and economic benefit of the region.*

1. Introduction

Telstra Research announced the *eLauncestion* research project on May 10, 1999 after 11 months of consultation with Telstra and representatives from the Launceston community. The project is focused on exploring the factors that influence Internet uptake and usage. A particular focus of the project is the role of localised content and applications in Internet use and to facilitate this aspect of the research, Telstra Research has built a Regional Portal web site in collaboration with the Launceston community. This Portal is based on a standard Portal model bringing together local information and offering services, such as email and discussion forums, to support and extend existing community activity and interaction. Local personality and interests flavour the Portal. The *eLauncestion* Portal acts as an additional vehicle to promote Launceston nationally and internationally.

Broad-ranging consultation with Launceston residents and organisations over the three-year duration of the *eLauncestion* project is a critical component of the project. As part of this process, a local Project Management Team has been established with key stakeholders such as the Launceston Council, the local newspaper, education institutions and peak local business associations. Representatives of the community are involved in the research, design and ongoing development of the *eLauncestion* Portal.

2. Background

Telstra Research has the task of researching new social and technical trends that may impact Telstra.

Telstra has made a significant investment in the Internet and wants to encourage people to go online. The eLaunceston project gives Telstra the opportunity to explore ways of increasing the perceived value of the Internet. The primary objective of the project is to examine the range of factors that influence Internet uptake and usage.

Telstra's intention is to grow its Internet business. Projects of this nature should ultimately benefit everyone in the Internet industry as they increase understanding of Internet use and people's needs and wants. This information leads to development of better-targeted Internet-based products and services that in turn lead to increased rates of Internet uptake and use.

3. The Project

Launceston, Tasmania, has characteristics that make it an ideal city to use as a base for the Telstra's eLaunceston project. The main factors influencing the decision to select Launceston as the site for the project were:

- The Tasmanian Community Network[1] process has energised the community around information technology and given the project fertile ground to work.
- Launceston City Council is innovative and was very receptive to this project concept.
- Launceston is large enough to provide the project with demographic diversity, but not so large that the project will be overwhelmed by other activities.
- There was strong support from Telstra staff based in Launceston for the project.
- The selection of a regional centre supports Telstra's pro-active commitment to regional Australia.

In-depth research (eg interviews, focus groups, and questionnaires) is being conducted with 120 Launceston households and 23 small businesses based in Launceston over the course of the project. This sample, comprising existing Internet users and non-Internet users, is the project's Research Reference Group. The research aims to better understand use of information and communication technologies over time. Focus areas are perceptions and use of the Internet, particularly by people over the age of 55 years and people under the age of 18 years, and adoption of new technology generally.

A regional 'portal' provides Telstra with an ideal environment to examine the role that localised content and applications plays in Internet uptake and use.

[1] http://www.tcn.net.au/

The regional portal model that Telstra is operating aims to attract a high number of repeat users through:

- aggregating local content that is useful and desirable, and streamlining access to that content;
- supporting community building at macro and micro (community of interest) levels; and
- providing interactive functionality.

Telstra Research staff have developed the *eLaunceston* Regional Portal with the cooperation and involvement of the community of Launceston, Tasmania.

The *eLaunceston* project involves:

- Social and technical research.
- Existing products – the *eLaunceston* Regional Portal includes well-established functionality such as email and chat.
- Trialling of new products and services with the Launceston community – these products and services may be tested via the *eLaunceston* Regional Portal or they may be tested separately.
- Possible generation of new product ideas.

4. A Collaborative Approach

Research conducted within a community should strive to contribute to the local region in ways that are desirable and useful. To ensure that the *eLaunceston* Project contributes to the community and that the Regional Portal is developed to reflect and extend the needs and wants of the Launceston community, Telstra Research invited local representatives to participate in the development and design of the Project and the Portal. Telstra is working to ensure that this kind of collaboration operates for the duration of the project.

Certainly, people are more likely to engage in something they feel they have some stake in.

The process for involving the Launceston community in the *eLaunceston* project is multi-faceted.

4.1 Project Set-up – Establishing a Relationship with Key Community Stakeholders

Community stakeholders were briefed on the project concept and their ongoing participation in the development of the project was invited.

A workshop held with community stakeholders was key to the development of a shared vision for the *eLaunceston* project and a shared understanding of the project scope.

The community supported the project because it was seen to contribute to the social and economic benefit of the region in two key areas:

- The project can contribute to an increased understanding and use of the Internet within the Launceston community.
- The *eLaunceston* Regional Portal provides another vehicle to promote the Launceston region nationally and internationally.

The project is seen in the context of the variety of activities supporting the development of the North-East Tasmanian region. It is important for the project to acknowledge this broad goal and, as much as is possible, to support it.

It was agreed that a useful and important part of the project would be a Local Project Management Team that would meet monthly with Telstra Research to:

- Provide a local perspective on the project, its role and impact on the community;
- Identify related local initiatives and facilitate contact as appropriate;
- Review the progress of the *eLaunceston* Project.

The Local Project Management Team currently consists of representatives of the following organisations:

- The Launceston City Council
- *The Examiner* newspaper
- Tasmanian Electronic Commerce Centre
- TAFE Tasmania
- Australian Maritime College
- University of Tasmania
- The Department of Education
- Tasmanian Community Network (Department of Premier & Cabinet)
- Launceston Chamber of Commerce
- Business North
- Northern Tasmania Division of General Practice
- Telstra Country Wide

4.2 Broad Consultation

Consultation was then expanded to cover a broader cross-section of the community. Telstra Research goals were to:

- Identify and understand related projects (existing and planned);

- Identify and contact people and groups who might be impacted (positively and negatively) by the project;
- Explore community needs, wants, concerns, and priorities.

Consultation with the Launceston community was further extended to address issues raised in these consultative forums, for example, the local IT industry was keen to explore ways in which *eLaunceston* could provide mutual benefit to Telstra Research and local IT businesses.

4.3 Focus Groups

Focus Groups were conducted with randomly selected local Internet users in Launceston to discuss:

- Activities currently undertaken within the Launceston community;
- Interaction within Launceston community;
- Trends in local Internet usage; and
- Launceston community needs and wants.

The goals associated with the focus groups were:

- To increase the project team's understanding of the local context for the *eLaunceston* Regional Portal;
- To identify the range of local information and services that are already online; and
- To get an indication of the services and activities that could be migrated to an online environment or that could be augmented by an electronic service.

4.4 Collaborative Portal Design, Deployment & Ongoing Development

A Design Workshop was held with Launceston representatives invited from key sectors, such as health, education and tourism. The aim of the Design Workshop was to gain information and feedback that has already, and will further, be used to guide the 'look and feel' as well as the operation of the *eLaunceston* Regional Portal.

Our goals for the Design Workshop were to:

- Convert community needs and wants into Portal features and functionality;
- Assess the feasibility of proposed features and functionality against technical and staff resources; and
- Prioritise features and functions within the context of what is feasible.

The process of developing the first version of the *eLaunceston* Regional Portal was undertaken with the involvement of local Launceston web developers.

It was useful to have local people working on the project who could contribute not only their expertise but also a local experience to the Portal development. The *eLaunceston* Regional Portal was launched in October 1999 and underwent a major revamp in July 2000.

4.4.1 PORTAL COMPONENTS

A directory of hyperlinks to local business and community web sites was identified as a fundamental component of the *eLaunceston* Regional Portal. Currently the links[2] are categorised according to the following topics:

- Arts & Entertainment
- Businesses & Services
- Community Information
- Education & Training
- Health
- Recreation & Sport
- Directories (people & places etc)
- Tourism
- Personal Homepages

In addition, the Portal includes the following resources.

- Community Calendar – The calendar is designed to cover not only the high profile events but group meetings, fundraisers, etc. Activities are submitted for inclusion in the calendar via an online form. Calendar administration has been outsourced to the Launceston Online Access Centre.
- News and sport headlines from *The Examiner* Newspaper – To get the full detail on the stories the user clicks through to *The Examiner's* own web site.
- Launceston weather forecast - To get full weather detail the user clicks through to the Bureau of Meteorology web site.

While the information contained within *eLaunceston* is available to anyone who accesses the site, use of the communication services is restricted to the Launceston community (any local person who registers becomes a "member" of the *eLaunceston* Portal). This is to ensure that there is a true local community feel to the interaction that takes place via these services.

[2] Sites are nominated for inclusion in the directory by businesses, community group or individuals themselves.

- Email
- Chat – text and audio chat services are available. In addition to unmoderated chat rooms we run moderated Special Event chat sessions. CouncilCh@t, for example, are moderated chat sessions run at a specified time that have a set topic. People are invited to converse with Council Aldermen on the topic.
- Discussion Board – eLaunceston users act as informal hosts for several of the Discussion Board topics; Gardening, Fishing and Seniors.
- Personal home pages - basic templates are targeted primarily at novices (individuals and community groups) who wish to achieve their first web presence.[3] A simple process enables users to develop and easily maintain a site. Business oriented web sites are not permitted and people wanting such sites are referred instead to commercial operators in the local area.
- Photo Gallery – a showcase for local photography. Whilst anyone can view the Gallery only eLaunceston members can submit images.
- Youth Space - Nameless Generation is an online forum for local youth to showcase their creative work; multimedia streetscapes, poetry and audio. Nameless Generation[4] was developed by students at Launceston College in collaboration with Telstra Research.

eLaunceston also hosts (and is some instances has developed) several sites for Community Groups, for example, a site promoting the Tamar River Festival.[5]

Two new features planned for the *eLaunceston* Portal are mailing lists and Launceston Stories. Launceston Stories will be an online space for people to share their experiences in text and images (and potentially audio and video in the future).

There is no charge for any aspect of the *eLaunceston* Regional Portal (other than normal ISP charges for accessing the Internet).

4.4.2 PORTAL EVALUATION AND EVOLUTION

Development and evaluation of the *eLaunceston* Regional Portal will be an ongoing feature of the project to ensure that content and applications remain useful and desirable to users. We expect that the *eLaunceston* Regional Portal will evolve throughout the course of the project.

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[3] For example: http://www.elaunceston.com/people/bingofun/ and http://www.elaunceston.com/AIR/

[4] http://www.elaunceston.com/namelessgeneration/

[5] http://www.elaunceston.com/tamarfestival/

Indeed, many of the Portal features outlined above were incorporated into *eLaunceston* after launch.[6]

Evaluation of the Portal is based on the following:

User Feedback

- Portal Consultative Group - This group, comprised of six *eLaunceston* Regional Portal users, is an ongoing reference point for feedback and ideas for improvements to the *eLaunceston* site.
- 'Contact Us' electronic feedback forms are available via the Portal site.
- There is an eLaunceston Project Discussion Board topic and 'Chat with the eLaunceston Project Team' sessions are regularly held.
- Orientation Sessions – These 'hands-on' sessions are held to provide information and support to eLaunceston users and these are a valuable indication of people's interests and of the problems that may be encountered using the *eLaunceston* site.

Server statistics – popular pages, number of users, etc.

Usability Testing - Testing the Portal with members of the user community (and on occasion with people outside the community as people outside the geographic area are also potential users) is undertaken on a regular basis.[7] The testing examines the technical performance, usability, and user response to the *eLaunceston* Regional Portal overall and also specific components of the site.

Formal Project Review – Annual reviews of the project are conducted to determine the future directions for *eLaunceston*. Telstra Research and the Local Project Management Team conduct these reviews.

4.5 Collaborative Research

The *eLaunceston* research project provides a springboard for a range of research activities.

Telstra is currently funding (either wholly or in part) the following University of Tasmania projects based on the *eLaunceston* Research Reference Group.

- *Access, Youth and the eLaunceston Project*[8]

[6] The Photo Gallery was implemented in June 2000 and the Youth Space in November 2000.
[7] For example, testing occurred in September 1999, March 2000 and October 2000.
[8] This project is examining the role of electronic communication mechanisms in the establishment and maintenance of young people's social networks.

- *Multidisciplinary research on Internet Usage by consumers, SMEs*[9]*, and community-based organisations - the influence of localised content and broadband access and services.*[10]
- *Small and medium businesses on-line: Learning using the Internet*

Funds have also been contributed to the '*Seniors on-line: Learning outcomes from public provision of Internet access*' project. This project is not utilising the *eLaunceston* Research Reference Group but will be augmented by research conducted by the *eLaunceston* Project Team with the Research Reference Group.

The Central Queensland University research project on the *Diffusion of Internet Technologies in Rockhampton* is also receiving Telstra funds. This project is of particular interest to Telstra as it is expected that results from this project will provide a useful point of comparison for findings from the *eLaunceston* project.

5. INSIGHTS FROM THE PROJECT

This project has generated significant interest both within Telstra and in the wider community. It has not been a normal practice in recent years for Telstra to undertake 'hands-on' longitudinal research projects, although similar projects have been undertaken at 'arms-length' through academia in the past.

5.1 Research

5.1.1 PRELIMINARY FINDINGS - HOME INTERNET ACCESS:

- Cost remains a major factor deterring people from getting home Internet access.
- A lack of understanding and knowledge about the Internet, as well as time constraints, are also factors.
- Interestingly, the decision to not get home Internet access is often a conscious decision made by some households to control the use of the Internet by various members of the household.

5.1.2 PRELIMINARY FINDINGS - SMALL BUSINESS INTERNET ACCESS

- The Internet is now being used as a standard business tool; it is no longer a novelty or something that is being experimented with.

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[9] Small to Medium Enterprises

[10] This project will also leverage off the Launceston Broadband Project (see http://www.elaunceston.com/lbp/)/

- In-house technology enthusiasts are still key to driving technology into business practices but there is general acceptance, even among those in the business who were initially sceptical, that the Internet provides value for money.
- Internet access is now being expanded from the single PC within the business to the majority of computers within the business.

5.2 eLauncestón Regional Portal

Feedback from the Launceston community on the *eLauncestón* Regional Portal project has been positive on the whole. A number of local people have been involved in the design and development of the Portal. The consolidation of local information in one place within a Regional Portal has been noted as providing a valuable service to the community, and research to date has supported the contention that people not only use the Internet to 'leave' home and 'go' elsewhere in the world. Anecdotal feedback and *eLauncestón* Portal usage indicates that they also use the Internet to locate local information and interact with local people.

There are 784 *eLauncestón* Portal members and over 160 sites linked to the eLauncestón Information Directory.[11]

Server based statistics for the month of October show the following level of usage:

International User Sessions	35%
Average Number of Hits Per Day	3,396
Average Number of Page Views Per Day	1,830
Average Number of User Sessions Per Day	96
Average User Session Length	14:30 minutes

5.2.1 PRELIMINARY FINDINGS - COMMUNITY PORTALS

To date, we have identified the following success factors for community or regional portals:

- Set-up
  - Good interface design based on collaboration with end-users.
  - Stakeholder engagement - motivating the opinion leaders and managing community expectations
  - Establishment of a community management team

[11] as at November 9 2000

- A slow start – it takes time for a Regional Portal[12] to develop a profile within a community. A combination of online and offline (eg traditional marketing such as newspaper advertisements, etc) promotion is necessary.

- Post-Launch
  - Community Manager – The community manager will be responsible for sourcing existing content and encouraging the generation of new content for the Portal. Important attributes for this person(s) are enthusiasm for the project and the Portal's role in community development, ability to engage with the community at all levels and to communicate with users across the spectrum of Internet experience, extensive grass roots networks.
  - A 'reference group' of users - keeping in touch with users through formal and informal settings and activities.
  - Dynamic Portal – It should be an evolving service based on ongoing 'testing' and a visible commitment to redevelopment according to user needs.

Information such as these success factors is being fed into Telstra's electronic community strategies with the goal that Telstra's electronic community products and services have an increased chance of success.

6. Conclusion

The *eLaunceston* project is not a trial in the traditional sense of the word; ie the project is not a set of pre-determined, short-term activities. Rather, it is a project with a range of facets that will unfold and evolve over time.

Major outcomes of the project will be a longitudinal study of Internet use and a review of regional portal development and evolution. These areas of research will feed and guide the development of other areas.

The role of Telstra Research within the project represents an innovative departure from tradition. Telstra Research, with other Telstra stakeholders, is working at a grass roots level with the Launceston community over a period of years. Telstra is not trialing a single, specific piece of technology and then withdrawing. Instead the company is building a strong relationship with a community through a project which recognises both Telstra and Launceston goals, and which involves social and technical research and commercial relationships that will be of benefit in the present and in the future.

[12] This term may be used interchangeably with 'electronic community network', 'community of interest network', etc.

The research will not only address lifestyle and technology issues, but also the usefulness and usability of specific technologies.

The key message of this project is one of collaboration and co-operation. Telstra has responded to any concerns expressed from the community about the project and believes it's important for the project to be transparent about its motives, processes and activities. Ongoing community consultation is critical.

While *eLaunceston* is still very much a work-in-progress, Telstra believes the project can be used as a model for Corporate projects that involve aspects of community development. Telstra also expect *eLaunceston* to provide important insights into the value and viability of the regional portal.

COMMUNITY ENGAGEMENT AND EMPOWERMENT USING ICT

Building Sustainable Community Networks

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Abstract. *The role of Information Communications Technologies (ICT) in community development is increasingly being recognised as an essential element of a sustainable and equitable global society. The Harborough Community Commerce and Knowledge Network(ComKNet) Project is a UK scheme designed to explore technologies and methodologies for building sustainable ICT networks which challenge the worst effects of globalisation and help build social and economic wealth.*

This paper draws the conclusion that community led partnerships could provide the solutions to the "digital divide" and empower local citizens to shape their own future by harnessing the skills and talents which exist in every local economy. It draws on experiences of community network development across the globe.

1. Background – The ComKnet Award

The Harborough Community Commerce and Knowledge Network (ComKnet) was born out of a desire to build a sustainable community focused multimedia and web development enterprise. In 1998, the UK Department of Trade and Industry was running an award scheme designed to foster the use of internet and multimedia technologies by Small to Medium Enterprises (SMEs) and to pump-prime the fledgling UK multimedia industry. Mass Mitec was a small digital imaging business with limited resources trying to re-engineer itself into new media. The invitation to apply for an award under this scheme (Multimedia Demonstrator Program) provided that opportunity.

Mass Mitec operated out of a converted barn in the courtyard of the owner's property, in a rural village called Lubenham near the town of Market Harborough in the East Midlands of the UK. The Harborough District Council is based in this

market town and serves a mainly rural area with 90 parishes, including another market town, Lutterworth on its western boundary. It is generally regarded as a prosperous area with low unemployment, but the idyllic countryside disguises some generic problems which could lead to longer term serious issues, including loss of services, structural unemployment and a declining economy.

The main problems associated with the district are found in rural areas where there has been a loss of fundamental services which include banks, shops, post offices, health services and transport. These losses, coupled with agricultural unemployment, combine to degrade local communities and the quality of life and sustainability within them.

The author is owner and founder of Mass Mitec and he saw an opportunity to develop the local economy by pioneering the use of ICT for community network development using innovative leading edge knowledge management and e-commerce technologies.

The fundamental concept behind ComKnet is that within every community there is a wealth of untapped skills and talents which could and should be harnessed to the benefit of both the individuals/enterprises and the community itself. The ComKnet proposal was designed to explore the application of ICT to this challenge. A consortium which comprised Mass Mitec, a regional newspaper, a local university and a local ISP made a successful award application in October 1998. The team was granted £150K of matched funds to develop a two year project.

2. Finding the talent

One of the first tasks in the project was to discover some of the skills which we believed were hidden and under-utilised. This began by searching for web sites with Harborough as a key word. One of the first discoveries was a web site called www.bigfern.demon.co.uk . This site has a great deal of community information and is well designed and easily navigated. The webmaster had already developed some of the facilities planned for ComKnet. Our expectation was that this would reveal a competitive web development company, and it was a major surprise to discover that the webmaster was the local milkman. This discovery proved to be the tip of the iceberg as many more local webmasters from all walks of life were discovered and drawn into a project discussion forum.

The second discovery was that there were a number of talented people living in the community who needed to travel long distances to earn their livelihood, despite the fact that employment opportunities were available locally. These people tend to be self employed or operating small businesses. In these situations, it is difficult and expensive to get established in the local community, especially if your skills are specialised.

The most prominent examples of this came from an appeal for video production expertise. The consortium decided to produce a video of interviews with local people talking about the impact of ICT in the new millennium. Not having the expertise in the local team, we made an appeal via the discussion forum and local papers. It brought forward an ex-BBC cameraman and a Hollywood Special FX technician, both of whom wanted to work within the community but had to travel because of the difficulties of getting known locally. Both men lived within 2 miles of the project HQ.

3. Engaging the Community

Probably the most challenging aspect of any community ICT project is engaging local people to participate in a proactive way. It is an exercise in community development and not a sales pitch on the virtues of technology. People who have bought computers for their home use can be remarkably inventive with their usage. ICT is a very individual experience and its attractiveness is based on personal issues and needs.

The approach adopted within ComKnet was based on 3 strands :-

- A vision for the community
- The involvement of community champions
- "win-win" philosophy

Having a vision which the community can buy into is fundamentally important. It can act as a beacon around which local people can gather to make their individual contributions to collective action. It is like a mission statement for a business. In the case of Harborough ComKnet, the vision was based on Harborough becoming the birthplace of a new communications revolution, following in the footsteps of former resident Thomas Cook. It was easy to explain and understand and got support from all sectors.

Community champions are harder to identify. Those leading initiatives in the community are not always suitable champions, especially if they have their own agendas. Our best community champion was a community development worker, untrained in ICT, but very skilled at getting groups of people in communities to work together on village appraisals (or design statements). As long as community champions recognise the potential of the technology, they do not necessarily need to be ICT fluent.

Building a "win-win" philosophy is also very important. In the early days of ComKnet there was a certain amount of suspicion about the motives, especially from the public sector, who often see community led initiatives as a threat to their

authority. ComKnet engaged the local council at a very early stage by understanding their agenda and integrating their plans into the overall strategy.

4. E-Commerce – Community Trading

One of the objectives of ComKnet was to support the use of e-commerce between community participants. This has not yet been fully successful because the adoption of e-trading has not been as widespread as hype would suggest. ComKnet began by opening a community e-shop and offering free "shelf-space" for local artists to sell their paintings. The strategy is to encourage sales of local crafts via the web and to help community members start in a low cost, low risk way, before developing and maintaining their own e-commerce sites.

5. Spreading the word – sharing experiences

Towards the end of ComKnet's first year, contact was made with the Community Network movement in the UK. It came as a revelation to find that what we considered to be pioneering initiatives were, in one form or another, quite common in communities across the globe. A seminar in November 1999, produced an idea which led to ComKnet hosting the first virtual conference on community ICT networks. Since that time, there has been a second conference on community engagement and empowerment, and these virtual conferences have enabled us to share experiences and successes with groups from all nations.

6. The Future

ComKnet's work has led to a successful bid for funding for an ambitious community network (http://www.harborough.org.uk/webcast/networkdoc.htm) project based on the establishment of a community learning and media centre acting as a hub to a network of ICT access points in 60 rural villages. The 3 year project is worth £500K and is a milestone in the history of the Harborough District.

Through this project we aim to learn significant lessons about the use of ICT for community driven social and economic development. It is clear from the partnership offers coming forward that the network will provide an infrastructure for social inclusion and a collaborative community.

For details of ComKnet see www.comknet.org.uk

ONLINE TECHNOLOGIES EMPOWER GOVERNMENTS & PEOPLE

Hendy Online Demonstrates the First Western Australian Online Government Decision-Making Forum.

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Abstract. *This paper provides a practical guide for Governments using online technologies to enable people, greater involvement in their decision-making processes. Hendy Online, the first Western Australian decision-making forum, demonstrates the whys, whats, and hows of online government forums. This paper includes issues relevant to Ministers, rural women participants, public servants and technology providers.*

Introduction

The premise of this paper is that empowering governments facilitate empowerment of communities and people. This paper will demonstrate how the online application of online decision-making facilitates empowerment.

Jane Stein (1997) defines empowerment as a, "[c]omplex psychological and political concept that represents both a cyclic small group process and an outcome that is intended to help people to gain control of their lives and to improve their social, economic, and political situations" (p. 70).

People's involvement in political decision-making is an essential process for people to gain control of their lives. Greater access to government decision-making using online technologies facilitates empowerment. Of the 70 rural women involved in Hendy Online decision-making forum, Mary and Sue speak of the importance of this access. Mary refers to the importance of connecting with others using online forums. *"[Online forums do] give them [rural women] access to people that they would otherwise find hard to contact. It also gives a form of support, showing that other people have the same or very similar issues that concern them."* Whilst Sue focuses on the limited opportunities to access government meetings; *"Yes, it gives us access to a meeting that many in Perth may take for granted."*

There is great promise that government's use of online technology will facilitate people to take responsibility, and take action to consciously create their own lives and build their communities.

This paper will

1. Guide governments in using online decision-making forums;
2. Provide a case study of Western Australia's first online government decision-making forum; and
3. Present participant's views of their first online Government forum.

Given the practical nature of this paper, there will be few references to academic literature.

This case study is based on the first Western Australian online decision-making forum with a Government Minister, the Deputy Premier Hendy Cowan on the 31 August 2000. This demonstration project, titled 'Hendy Online' brought together the Deputy Premier and Western Australian rural women. This involved the combined efforts of RRR (Rural, Regional, & Remote) Women's Network; WA Telecentre Network; Office of Information and Communications, within the Department of Commerce and Trade; and Deputy Premier's Office. Insights and reflections from people in these organisations provide a platform for future online decision- making forums.

To begin, a description of, and the reasons to use an online meeting are given.

1. What is an Online Meeting and Forum?

An online meeting and forum requires two actions:

- Coming together of people online – for example, government officers, politicians, and people; and
- A discussion of a common interest topic or topics.

Figure 1 demonstrates the concept of an online decision-making forum.

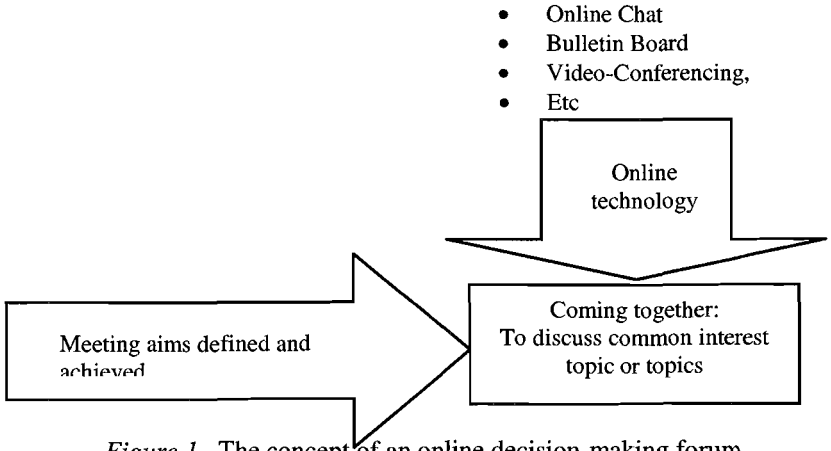

Figure 1. The concept of an online decision-making forum.

Hendy Online demonstrates this concept of online decision-making (see Figure 2). In general, the aims and processes of conducting a meeting online are the same offline. The difference being about how the online environment creates new opportunities and threats that require being managed to ensure the meeting aims are met. These threats and opportunities will be discussed in the later part of this paper.

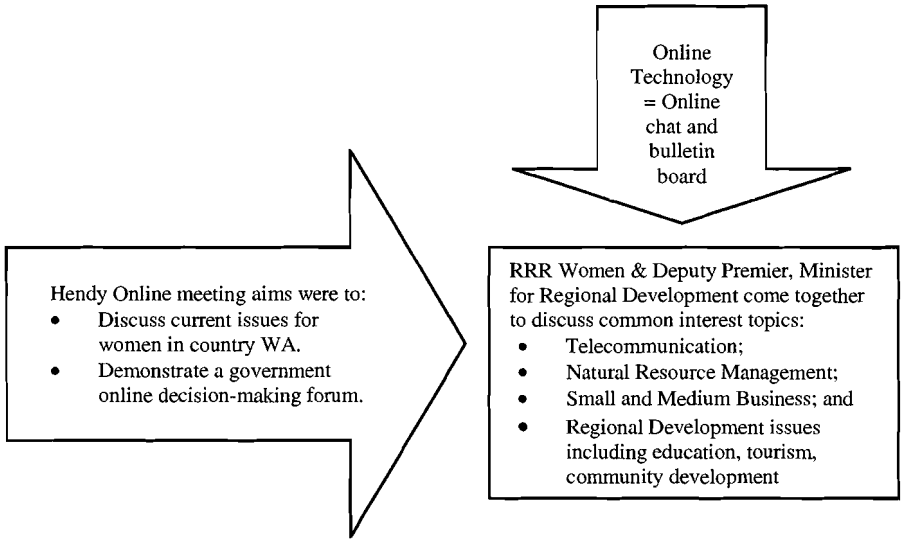

Figure 2. Hendy Online: an online decision-making forum.

2. Why online government forums?

Two-way communication is essential for democratic governments. Dew (1997) claims, true democracy and empowerment go hand-in-hand. In principle, democracy or empowerment requires people and elected representatives to discuss issues, ideas, areas of concern, and to make decisions. This process provides a major step towards people gaining control of their own lives, to improve their situation.

Previously, the lack of direct, inexpensive communication networks to all constituents, leaves lobby groups and closely associated networks as the main source of communication and influence with elected representatives. Online government decision-making forums are the first step towards access to all constituents to their elected representatives. This is a revolutionary time for democracy and the empowerment of people and communities.

The Hendy Online case study demonstrates this revolutionary time for democracy. 250,000 women across 2.5 million square kilometres of country Western Australia had the opportunity to access and be involved in one government meeting

(Department of Commerce and Trade, 2000). This is a paramount feat, given the sparse population of country Western Australia (WA), particularly as it is the largest state of Australia and is bigger than many European countries.

State and Federal governments have for many years aimed to increase rural women's involvement in government decision-making (Maiolo, 2000). Recent research commissioned to investigate why rural women were not involved in government decision-making revealed that the resources required – time, money, and energy – were major deterrents to women's involvement in government decisions (Maiolo, 2000). Rural women's current commitments and responsibilities did not allow for the regular meeting structure, which often was hosted in metropolitan Perth.

Hendy Online enabled country WA women a first opportunity to access government decision-making forums, by speaking to the Deputy Premier from their own home or town. From as far north, Kununurra, far south, Esperance, and far east, Kalgoorlie, 70 countrywomen spoke to the Deputy Premier. The financial and practical barriers dissipated with this new online government environment. A first online government decision-making forum for the Minister and a first for country WA women.

Both the women and the Minister commended this opportunity to meet and talk. There is no equivalent offline forum that can bring together so many people in one space with the minimal use of resources - time, money, and energy. This is a leap forward in democracy, and people's empowerment as people who previously did not have access can now be involved in government decisions.

The participant's voiced loud and clear that online decision-making forums provide innovative opportunities to facilitate their empowerment, as it necessarily brings together personal and political systems. Deanna emphasises the value of this opportunity, *"It allows for the involvement of women whose voices would not usually be heard - it's invaluable! It should be made a regular occurrence!"*

All the women, who completed the feedback forms, and the Minister, stated that the Hendy Online forum was a useful exercise and that these online forums should be regular. These women outlines seven main benefits from online governments forums. These include:

- Grass roots involvement where rural women can be involved from their own residence and hometowns across the entire state of WA. Carmel affirms the importance of politicians keeping in touch with rural women by stating that *"Valuable input can be obtained direct from those at the coal-face."*
- A cost-effective opportunity for women to voice their issues. Louise values *"the cost-savings and the opportunity to involve a wide range of women is most important."*

- Women's involvement and information sharing is significant. June expresses her value of other women, by stating *"I believe that the women participating gained valuable info from other women, the discussions were insightful and I'm sure informative for the minister."*
- A unique opportunity to present a collective voice, that is supportive, diverse, dynamic and evolves. Mary outlines this unique opportunity for all women across country WA to come together by stating, *"Physical isolation means that a body of opinion never really forms. It would be interesting to discover that all country women for example view Telstra issue in a certain way."*
- Unique opportunities to voice issues and experience online government forums. Sarah demonstrates the dual autonomous and group role of online forums, by stating that *"People were able to air their views and get answers to their questions or just sit back and watch the session and see how these chats work and perhaps next time get more involved."* Tina focuses on the value to of individuals to voice their concerns to improve their situation. A fundamental process of empowerment. *"We're always saying - but what can I do, well this gives an opportunity to do something. If powers that be, know what the pressing issues for women in the bush are, then hopefully they will be addressed. This is a good way for them to find out what the feeling out there is."*
- Open access to people & knowledge. Cherie elucidates how the effects of isolation that is often experienced in country WA, are removed with online forums, *"It does give them access to people that they would otherwise find hard to contact. It also gives a form of support, showing that other people have the same or very similar issues that concern them."* Jackie and Joan respectively, outline this isolation is present in the limited opportunities they have to be involved in political forums, as *"It's the only opportunity I have to present ideas."* and *"This is probably the only chance most of us would get to ask a 'polly' a question directly and get an answer or response immediately."*

The Hendy Online case study demonstrates the unequivocal benefits received from online government forums. In particular how people who previously had geographical barriers to their involvement in government decision-making, can now be involved. The ability to involve a broader scope of opinions in government decision-making forums, whilst reducing meeting expenses, is a welcomed development in the pursuit of democracy.

It is important to acknowledge that online government forums are not a substitute to offline forums. Rather online forums are seen as providing additional opportunities for people to become involved in government decisions. Future issues to be consider are the inclusiveness of people who have no information technology experience, illiteracy, and culturally appropriate online forums.

The women and the Minister recommended a number of ways that online forums could be used to empower people and communities. These include:

- Open monthly forum where issues were posted on a bulletin board for the month and women were able to comment.
- To have a general broad discussion of many topics, of which specific discussion on specific topics could follow. Sarah gave an example of this, *"a separate discussion for education in country WA, a separate discussion for conservation and repair of farm land - with the relevant ministers and officers."*
- To identify one topic or issue which participants can discuss thoroughly.
- To have general reflective discussion after the main structured online forum.
- Use online forums for general open communication and networking.
- To have more meetings like Hendy Online so more politicians are in contact with people.

Hendy Online case study demonstrates the benefits of government online forums to people and governments. As with all new initiatives there are threats associated with the implementation of online government forums. These threats centre on technology shortfalls and inappropriate group processes. A guideline follows so to prevent these threats from adversely impacting on the aim(s) of the online government forum.

2.1 *A guide to organising a government online forum.*

Every online forum can be located on five continuums. These online forum continuums include:

- Intent of decision-making;
- Participant's involvement;
- Scope and breadth of topic(s);
- Structure of forums; and
- Duration of forum

When organising online forums, it is critical to decide where best the online forum is located on these five continuums. There is no one right or wrong location along these continuums. Instead it is important to acknowledge the online forum's location on these continuums (see figures 3 to 7) are appropriately suited to best achieve the meeting's objectives, and purpose.

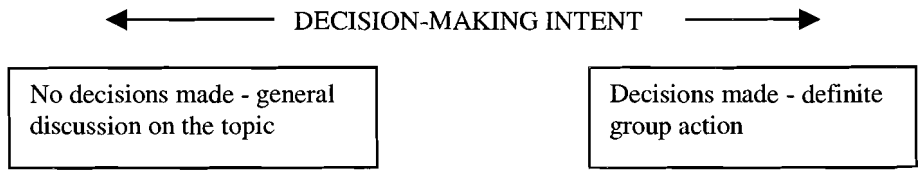

Figure 3. The decision-making intent continuum of online forums.

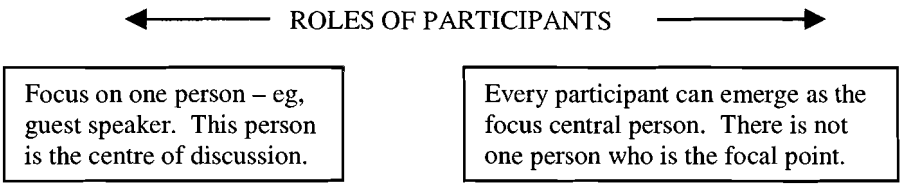

Figure 4. The roles of participant's continuum of online forums.

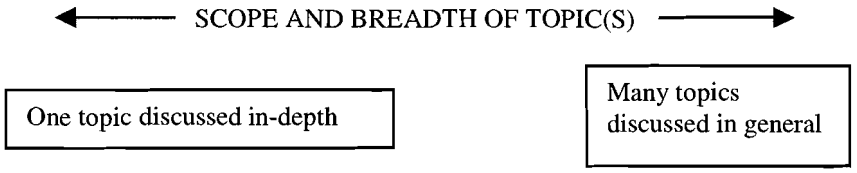

Figure 5. The scope and breadth of topic(s) continuum of online forums.

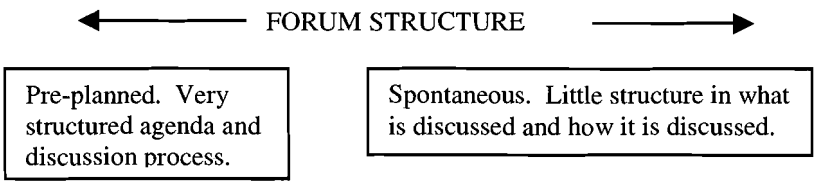

Figure 6. The forum structure continuum of online forums.

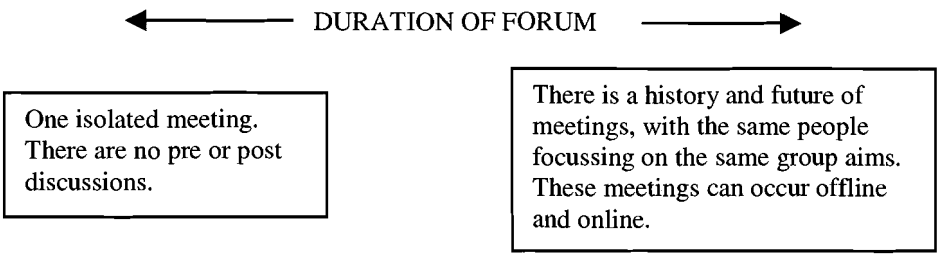

Figure 7. The duration of forum continuum of online forums.

In addition to these five online forum continuums, it is essential that organisers ensure the online meeting software, the participant's and stakeholder's, and the facilitator and administrator's needs are met (see Figure 8). Table 1. provides a list of some of their respective needs.

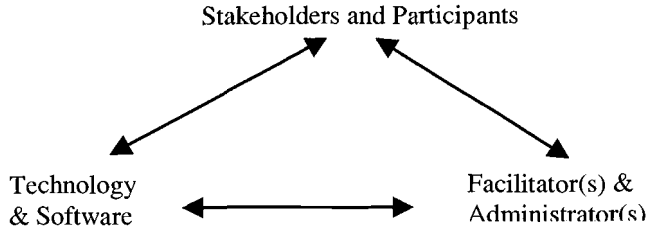

Figure 8. Three areas of needs to be met when organising an online meeting.

In general it can be concluded that the delicate interplay between technology, and group processes meet the stakeholder's and participant's needs. The balance between social and technology needs, ensure that the group's aims are fulfilled. A checklist of these three areas of need, is located in the Appendix, Table 2.

Table 1. Areas of need to be addressed when organising an online forum

Area Of Need When Organising Online Forums	Stakeholders & Participants	Facilitator & Administrator	Technology & Software
Outcome	To ensure participant's issues are identified and met	To ensure the meeting's aims are achieved	To ensure the online meeting infrastructure is working
Specific needs to achieve outcome	• Participant's needs • Guest speaker's needs • Network – information dissemination	• Clarity of roles and responsibilities • Group processes • Type of online meeting • Liaison with guest speaker • Liaison with participants	• Facilitator's needs • Participant's needs – accommodate diversity • Group dynamics • Compatibility • Support • Refinement • Logistics

3. Conclusion

Online government decision-making forums increase opportunities for people to meet and make decisions. To successfully organise an online forum two principles are to be met:

- a best fit with social and technology systems; and
- to appropriately locate the forum on the five online forum continuums.

Online government decision-making forums create opportunities for people to be involved in the democratic governing system. The increase in communication leads to greater opportunities where political systems more likely meet personal needs, and in turn people gain control of their own lives, to improve their situation. These open systems are the key to empowerment.

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Appendix

Table 2. Detailed List of Areas and Actions to Address When Organising an Online Forum.

Areas & Actions to check	**Tick if Completed**
1.0 Stakeholders & Participants. ***Outcome: to ensure participant's issues are identified and met.***	
1.1 *Participant's Needs*	
1.11 Contact main people and organisations to be involved and invite input regarding their needs. This invitation can be offline and online. Information sought may include, best times for attendance, and information technology support.	
1.12 Identify organisations that can provide internet enabled computers so that people who do not have access, can be involved. These organisations might include Telecentres, Libraries, and Resource Centres. Involve these organisations at the beginning of your planning.	
1.13 Identify the technology skill level of participants. Where appropriate include step-by-step instructions online and offline, and provide a contact for technical support.	
1.14 Hold regular meetings with main stakeholders to ensure that needs and issues are identified, and action pursued. This will involve liaison with technical information technology and software people.	
1.15 If the transcript is to be published or archived inform participants before they enter the meeting.	
1.2 *Guest Speaker's Needs*	
1.21 Identify the time constraints of guest speakers such as Ministers. Ensure the aim of the meeting can be achieved within the time allocated.	
1.22 Identify guest speaker's specific needs such as typing or transcribing their responses. Given the momentum of the online meeting it is best if the transcriber is a person that the guest speaker has worked with or has time to develop rapport. Developing rapport could be facilitated via a practise session.	
1.3 *Network - Information Dissemination*	
1.31 Identify ways to inform people of the online meeting. Develop relationships with your stakeholders and networks to facilitate contact with potential participants.	
2.0 Facilitator & Administrator. **Outcome: to ensure the meeting's aims are achieved.**	
2.1 *Clarity of Roles and Responsibilities*	

Areas & Actions to check	**Tick if Completed**
2.11 Determine who facilitates and chairs the meeting. Facilitator is responsible for managing the group process or dynamics of the meeting so to facilitate discussion, questions, and issues.	
2.12 Clarify the role of the facilitator(s) and administrator(s).	
2.13 Clarify who will open, welcome, and manage of the meeting. Particularly if there is a large number of participants and there is a large agenda to address. Decide on the number of facilitators and their synergistic roles.	
2.14 Identify and contact online and offline networks to be involved. Press releases and networking prior to the event will facilitate the involvement of participants.	
2.2 *Group Processes*	
2.21 Identify the meeting aim(s). Ensure the meeting process achieves the aim(s).	
2.22 Determine processes before and during the meeting to inform participants of the aim(s), ground rules, and format of the meeting. It is essential that although facilitators are focused on the aim(s) of the meeting, that they are flexible in how the aim(s) are achieved.	
2.23 Determine if feedback is required after the meeting. This can be achieved through online, offline feedback forms, or a time assigned after the meeting for general reflection.	
2.24 Use processes, to keep the conversation flowing and where necessary to slow down input from participants. Facilitators can invite questions at appropriate times, and issue commands like "hold responses". Private messages can be sent to individuals who are misbehaving or dominating the meeting. These processes maybe necessary to facilitate online meetings with guest speakers and a large number of participants.	
2.25 Determine if communication amongst meeting participants prior to the online meeting will facilitate the meeting aims. If so, use a practise online forum, bulletin board, or a list server.	
2.26 Identify the appropriateness of developing ground rules for the meeting. Ensure participants are informed of, and where possible involved in developing these ground rules.	
2.27 Identify how questions will be put forward to the meeting. Will the questions be visible by all participants or will the facilitator and administrator be processing questions? Ensure that the technology is capable of these requirements.	

Areas & Actions to check	**Tick if Completed**
2.28 Identify the processes - online & offline - that will enable questions to be addressed, and responded to, so to ensure all participants' issues are acknowledged. Processes are to accommodate quick opinion questions to detailed in-depth questions. To ensure smooth group dynamics and confidence, these processes are to be known by all participants.	
2.3 *Type of Online Meeting*	
2.31 Determine the type of online meeting - open, public meeting or closed, private meeting.	
2.32 Determine the style and planning of the online meeting: fully participative - open, evolving, dynamic, to hierarchical - closed, structured, and pre planned.	
2.33 Determine whether the participants form the agenda. If so, this can be achieved via online means such as bulletin boards or offline.	
2.4 *Liaison With Guest Speaker*	
2.41 If appropriate, provide briefing notes (not speech points) to guest speakers. These briefing notes can include format, aim of the meeting, and areas of discussion. Liase extensively with your guest speaker or his or her staff, to ensure that their needs and the meeting aims are met. Recommend for the first online forums that briefing and debriefing sessions are included in the schedule.	
2.42 If possible and appropriate, have the facilitator, guest speaker and transcriber all in the same room. Offline communication amongst these people ensures the smooth flow of the online meeting.	
2.5 *Liaison With Participants*	
2.51 Organise press releases and networking communications prior to event with participants	
2.52 Ensure that participants have sufficient instructions to use the technology for the meeting. These instructions to be available online and offline.	
2.53 Identify the preparatory material participants require before the meeting. This material be accessible online and offline. For example via email, paper form, cd, and bulletin board.	
2.6 *Logistics*	
2.61 If necessary use a word processing program to cut and paste facilitator's prompts. This is useful in a structured online meeting.	
2.62 If necessary, book computers, rooms, catering, and projector for guest speakers.	
3.1 *Facilitator's Needs*	

Areas & Actions to check	**Tick if Completed**
3.11 Ensure the administrator and facilitators have facilities to block or exit people from the meeting.	
3.12 Ensure that the technical or software meets the facilitator's needs to achieve the meeting's aims.	
3.13 Ensure your facilitator has technical administration control of the group process.	
3.2 *Participant's Need – Accommodate Diversity*	
3.21 Have minimal graphics and download time so it is accessible by all. Particularly given the technology infrastructure available to many rural people. Provide people the option to access the web interface as plain text.	
3.22 Identify the participant's information be seen in the chat (forum) room. Usually name (or nickname) and if desired, a brief profile eg. geographical location.	
3.23 Ensure every participant has access to the transcript of the online meeting.	
3.24 Automatic archive of the online meeting so participants can access history of the online meeting.	
3.25 Provide transparent and logical responses, and instructions on all interfaces to meet the needs of new information technology users.	
3.3 *Group Dynamics*	
3.31 Recommend the chat room screen not use an automatic continuous roll whilst people are speaking - typing. This is particularly important if the online forum has many participants, guest speakers and facilitators. An alternative is to have a manually refresh screen that holds messages until you have read them. This will depend on the number of people and time constraints of the online forum.	
3.32 Ensure participants can post the appropriate number of words in the online forum (chat) room. Ensure that not too much or too little text can be included.	
3.33 Provide cut and paste facilities for all participants. This enables participants to respond quickly to items raised in the discussion, and to save the transcript. This function is most important for the facilitators so they can quickly manage the group discussion.	
3.34 Decide if participants are to have private online chat facilities, at the same time of the online meeting.	
3.35 Size of online chat room is large, easy to read, and communication can be viewed.	

Areas & Actions to check	**Tick if Completed**
3.36 Decide whether a public or private online meeting is appropriate. Ensure the software reflects the needs of the meeting.	
3.37 Ensure people are able to see who else is in the meeting.	
3.38 Find out the maximum number of people that can enter the chat area.	
3.4 *Compatibility*	
3.41 Ensure the intranet networks - software and server - are compatible with internet networks. For example: caching and repetition of text; and firewalls affecting access online access.	
3.42 Ensure the online meeting software is compatible to Internet Explorer and Netscape browsers, Windows 94 to 2000 operating systems, and Macintosh and IBM 486 and above, computers.	
3.5 *Support*	
3.51 Ensure that an information technology (IT) support person is available. Particularly if a guest speaker is invited.	
3.52 In case participants have IT problems, if possible provide them with contact to an IT support person. Provide the contact details to the participants, in offline mediums, if possible.	
3.53 Identify the contact person who liaises with the technology and software providers to ensure quality assurance to meet the needs of the online meeting needs. This person does not require IT technical knowledge, more so requires an understanding of the online meeting needs.	
3.6 *Refinement*	
3.61 If developing your own online meeting software ensure that your technical specifications suit your meeting needs. This is best achieved by providing developers with a list of meeting needs, which are to be met by the software. See Facilitators & Stakeholder section of this checklist.	
3.62 Include at least one practise session for the online meeting to ensure the technical issues can be fixed prior, and facilitators and organisers are aware of the group process issues. Invite technical, facilitators and organisers to the practise session.	
3.63 Identify your requirements for site statistics for the meeting. For example, the number of people in the meeting.	
3.7 *Logistics*	
3.71 Ensure the links within and to your online decision-making site are working.	

Areas & Actions to check	**Tick if Completed**
3.72 Identify whether you will host the online meeting using your own software or other public software on the internet. Some public sites include: www.rrr.online.wa.gov http://shaki.the-park.com/newchatChatMenu/	

COLLABORATION – THE KEY TO AN E-COMMERCE FUTURE

GARY STEVENSON, *Chief Executive Officer, Rockhampton City Council, Bolsover Street, Rockhampton*

AND

RICK PALMER, *Critical Projects Officer, Rockhampton City Council, Bolsover Street, Rockhampton*

Abstract. *This paper will look at ways by which a community, which has strong links with traditional industries, can prepare itself to take advantage of the opportunities offered by e-commerce. It will identify the need for communities to act in a collaborative manner and involve all sectors and in particular its Council, University and business.*

1. Introduction

This paper will look at ways by which a community, which, like Rockhampton, has strong links with traditional industries, can prepare itself to take advantage of the opportunities offered by e-commerce.
While taking advantage of the chance to join the New Economy, this community should ensure this social evolution takes place at a speed with which it can cope rather than tear it apart.

This goal of joining the New Economy should be achieved by the community acting cooperatively and bringing together its Council, its University and its businesses so they act in concert to achieve
the accepted objective.

2. North Texas Experience

Gary Stevenson will present the story of Austin, Texas which has a successful track record of community capacity building through extensive Quality programs which have established key partnerships over the past decade or so. Readers should refer to http://www.utexas.edu/courses/kincaid/gaqc/index2.html for details about the Greater Austin Quality Council.

He visited Austin in 1994 and saw first hand successful examples of these community capacity building strategies. He will present some good base data which he will compare with the evidence of strong partnerships which remain today – especially between University of Texas and the City of Austin.

This will provide an interesting study of cultural reform that has flowed from a cooperative strategy involving government, academia and the business community and which resulted in obvious benefit to the community.

Of course, Austin had the fortune of having companies such as Motorola, Texas Instruments and others which carried on business within its community. There is no doubt these international players helped set the pace of involvement for the private sector.

Their involvement was critical. It was this involvement by the private sector which needs to be secured to obtain sustainable outcomes. While the North American experiences are not totally transferable to Australia, the opportunities which developed from the Austin partnership have some important lessons for communities such as Rockhampton which are coming to terms with e-commerce and the operations of the New Economy.

3. RCC-CQU Partnership

The first steps have taken place in Rockhampton to develop a relationship similar to that which has served Austin so well with the establishment of a partnership between Rockhampton Ciity Council and Central Queensland University and particularly the Faculty of Informatics and Communication (Infocom) to pursue a number of initiatives relating to informatics.

In the first project, for which the Council and Infocomm applied for and received a grant, was a $216 000 project under the Networking the Nation Program to expand the Communities on the Internet project, which Infocom had already established under the title of COIN into four neighbouring local authorities. This grant enabled the expansion of COIN, which focused on involving many who lacked the skills or hardware with the operations of the Internet, into the Duaringa, Fitzroy, Livingstone and Mt Morgan Shires for a 12 month period.

The two organisations later applied for $212 000 under the Families and Community Networks initiative to expand the use of community informatics, and especially COIN, in Rockhampton City over a two year period.

The third project was the establishment of a community informatics tele-centre on the ground floor of the Commonwealth Government Building in Rockhampton's CBD which is owned by CQU. Both parties contributed significant funds to this joint initiative which includes a computer room containing a bank of computers, printer and server for use for community informatics purposes by members of the Rockhampton community. There was also space for a coordinator to oversee the project's development.

Infocom also uses the community informatics tele-centre as a focal point for research and scholarship into the emerging technologies concerning informatics including the investigation into factors inhibiting the use of the Internet in provincial and rural communities.

The fourth joint project involved Infocom applying for a grant of $75 000 from Telstra Research Laboratories over three years to investigate factors inhibiting the use of the Internet in provincial and rural communities. Council's Department of Community and Cultural Development helped in the delivery of this project through the organisation of a number of focus groups.

Council's Directorate of Community and Cultural Development became further involved in the joint community informatics initiatives when it shifted into office space on the ground floor of the Commonwealth Government Building. As part of the arrangement, the Directorate assumed responsibility for supervising the coordinator of the Networking the Nation program extending COIN to the adjoining Duaringa, Fitzroy, Livingstone and Mt Morgan Shires.

The Rocky Connect Project is another joint initiative between the Council and CQU. This project has enabled people from both organisations to look at and find solutions to issues concerning electronic service delivery which the Council would like to consider adopting.

4. Change of Vision

The end result of these and subsequent initiatives is to change the vision of the Rockhampton community, which includes Council and the City's business entities, about using the many opportunities arising from informatics.

The need to expand the involvement of the committed private sector is one challenge which the Council and Infocom need to confront. Both are working together to engage Rockhampton's private sector further so this tripartite relationship can yield real benefit for the wider community.

Rick Palmer will describe the motivators which should exist for the private sector to become involved and attempt some analysis of Rockhampton's private sector. He will also look at the past and present influences which have impacted on the City's business community.

Gary Stevenson will also look at some of the roles which CQU could help fill. One of the challenges facing academia and other entities is the need to be responsive and be of direct service to the private sector in "zero time". Readers may be interested in referring to an article on this issue at http://www.ic2.org/9-25-00_Zerotime.htm.

A COMMUNITY RE-BUILDING

The Coolah Story

DON CAMERON

Abstract. *"Coolah has been what I'd call a very smart consumer of outside resources, but I think there's the other side to the picture about Coolah, in that there's been a real degree of investment by local people.*

People have been prepared locally to invest in their future.

And that's what I'm finding, that many of these towns are beginning to discover that you don't build these communities from the top down or from the outside in, you don't wait for the cavalry to arrive from Sydney or Canberra with their grants to do it.

You, as a community, need to start investing in it. I think that was the story of Coolah as much as anything."

Peter Kenyon speaking on the ABC LateLine program, 18th July 2000

1. Introduction

Coolah is a small town in NSW with slightly less than 900 permanent residents. The town provides social, economic and civic services for the smaller towns and farming communities that constitute the Coolah Shire. The Shire itself comprises an area of roughly 43,000 square kilometres, and has a total population of 3,770.

On December 1st 1998, the Coolah community celebrated a significant event. A Community Telecentre opened its doors for business, and for the first time ever, all Shire residents were provided with local-call access to the Internet.

The story of designing, funding, and building this infrastructure would complete a book in itself. From the visionary concept of local farmer Michael White, community leaders and groups spent thousands of hours conducting surveys, analysing needs and requirements, designing and re-designing concepts, raising local funds and completing Government funding applications. This was all conducted in an environment of urgent community need, because only two years earlier, the town of Coolah had lost a vital community asset.

The local Sawmill, the town's largest employer, had closed to make way for a National Park. Community spirit was at an all-time low, and to most local residents, the future of the community looked grim. It was only a matter of time.

For Coolah to survive, the community desperately needed a vision and a reason to fight on.

Noted English Telecentre journalist Andrew Bibby documented part of this story for the UK Telecottage Association in August 1999.

"Coolah is small: only about nine hundred people in the town itself, with a couple of thousand more in the outlying towns and villages which make up the local government area of Coolah Shire. But Coolah, New South Wales can boast a strong sense of community. Since last October, it can also show off its own Telecentre and Internet cafe.

It is early days for the project, which is tucked away at the back of the old Shire Hall, on Coolah's one main central street. However Don Cameron, the Telecentre's manager is optimistic about the prospects. The Centre has begun organising computer-training courses, tailored particularly at non-computer users, and the drop-in Internet Cafe facilities also seem popular. In fact, Coolah Telecentre has rather ambitiously decided to provide PCs with Internet access in three other smaller settlements in the area:

Dunedoo has its own 'Internet cafe' at the back of a bank, whilst in Mendooran and tiny Cassilis the local post offices provide the venue.

Internet access was previously difficult and expensive from the area, so in November last year the Telecentre set up its own ISP, which now has approaching two hundred subscribers. "Developing an ISP is one way to minimise the disadvantage, and to get on an equal par with urban Australia," Don says. "We pre-sold Internet access to a hundred people for a year ahead." It helps that almost all the farms in the area are active users of on-line services, using the Internet among other things to check livestock auction prices and the meteorological outlook.

The money for the Telecentre facilities and for Don's salary has come initially from grants of about $A440,000 (about GB£160,000), the bulk of which has been made under Australia's innovative Networking the Nation initiative (officially called the Regional Telecommunications Infrastructure Fund). This is earmarked money that was raised from the partial privatisation of the country's state-run telephone corporation, Telstra.

Telstra's privatisation remains a controversial issue, but the use of some of the capital generated from the first share issue for telecommunications development seems a masterstroke.

Coolah's Telecentre is one of a number of initiatives that a group of active local people have taken in the past few years to regenerate their community. Earlier in the 90s, with agriculture in some difficulty, Coolah was in danger of slipping into

the downward spiral which has affected other small rural towns in New South Wales where the loss of the local bank branch, post office, stock and station agency (estate agency) and shops has led to a growing economic malaise. But the Coolah District Development Group, set up after a public meeting about five years ago, has worked hard to turn the town around, and claims in all to have attracted $A1.6m in funding support.

Eleanor Cook, the dynamic co-ordinator of the Development Group, points out proudly that all the shop units in the main street are now occupied. Main Street itself is undergoing a facelift to help smarten up the town.

Nevertheless, grant-funded initiatives such as the Telecentre face problems of sustainability, as Don Cameron knows only too well. The track record of Telecentres in Australia (with the specific exception of Western Australia) is unfortunately patchy, with a number of Telecentres folding after relatively short periods of operation. Co-ordination between Telecentres in the eastern Australian states is also relatively poor, with the Australian Rural Telecentre Association currently at a low ebb.

"Too many Telecentres have closed their doors. Our objective from day one was to be commercially viable," Don says. Becoming an Internet Service Provider has provided welcome income, but the Telecentre is also looking hard for (other) suitable opportunities.

(Kind permission to reproduce this extract was granted by Andrew Bibby)

Andrew highlights a significant challenge inherent in a community adopting a new industry, especially when the intent is to integrate the industry as part of the community social fabric.

"We have community support, we have built all this infrastructure, everyone tells us that it's wonderful... but how do we make sure its still here for people to use in five years time?"

To understand the importance of the Telecentre and its range of services to the Coolah community, we must first understand what it is that the community defines as valuable, and what would be impacted by the loss of Telecentre services.

Susie Brown, a former Coolah Land Care Coordinator, undertook an analysis of Coolah's Social Capital using the following measures:

- **Participation in Networks** - interlocking relationships between lots of groups.
- **Reciprocity** - taking care of each other's interests and the interests of all.
- **Altruism** - rather than egotism. This is a very important issue as egotists will decrease social trust and so people will tend not to float ideas within a group dominated by an egotist.

- **Trust** - to take risks within a social sphere. Social Norms - unwritten, inarticulated but with the ability to make you feel bad intrinsically when you have broken one. The Commons - shared ownership of resources.
- **Proactivity** - a community that designs a future for itself rather than is a victim of fate or worse still a victim of a poor self fulfilling prophecy. People are actively participating in a range of community activities.
- **Social Norms** - unwritten, inarticulated but with the ability to make you feel bad intrinsically when you have broken one, therefore it is even more binding and does not require enforcement.
- **The Commons** - shared ownership of resources such as halls, the Telecentre and school. The commons are greatly utilised in this community for a multitude of activities outside their original design.

The analysis finds that Coolah is rich in Social Capital:

- People feel they are part of the community.
- They feel useful and help in a variety of community ventures and experiences
- They actively participate in community networks such as public meetings, group meetings, working bees and social activities raising money for charity
- When there is a crisis, all work together eg when a house burns down, the owners have a new (albeit second hand) set of furniture within two days including linen and crockery. Recently cattle were stolen from a property outside Coonabarabran. Within one week there was a drive where each property donated one beast to replace those stolen.
- Children are minded by the community when in public spaces.
- High feeling of individual safety. Doors are opened for women as they enter a shop by the person exiting.
- People help strangers and sometimes involve them in what is going on. eg. There is often a child's birthday party going on in the local park because it is central and children can spill drinks and have a good time. Tourists are often adopted during these parties when they stop to use the rest rooms there.
- Many people assist with events - no one person gets lumbered.
- Huge range of reciprocal networks where all benefit both in making their job easier and in getting things done. Often barter for altruistic gains. eg a farmer may allow someone to cut firewood from their property provided that they give little old ladies in town free firewood.
- High incidence of barter.
- Cars are not locked despite law changes.
- People feel valued and are told so.
- People know who will help them find out something.
- There is a strong sense of empathy - oh the poor bugger! What can we do to help?
- Cars are not locked despite changes in the law which are known by the community. A survey in town in late May, 2000, showed that 17 out of twenty

cars parked in the main street were not locked and many had the keys still in the ignition.

- People feel valued and are told so - this reinforcement keeps up their self worth and maintains participation. This is very important when things get a tough or there has been heated discussion.
- People know whom to approach to find out information - strong information networks.
- Everyone knows everyone's business - this has advantages such as there exists a natural neighbourhood watch, but it has some disadvantages too when you would like to drop out of the public eye.

Social capital involves asking people to participate and recognising their strengths and almost exploiting them. Asking reticent participants increases participation by highly talented people that may be a little shy (to begin with).

A community that has a strong social capital is a community where people are not afraid of change or embracing technology because someone is always there to hold their hand or to ask.

Transformational leadership manifested in a team approach generates social capital as members of the community develop their own leadership skills through delegation of responsibility and given the trust that is inherent in making responsibility work.

(Kindly reproduced with permission from Susie Brown)

Coolah considers her highest wealth to be in the areas of social interaction and teamwork. "Pulling together as a community" is the strength of the town, but could also be its downfall if something significant is lost, because the loss impacts on every community member. This sense of loss was strongly evidenced following the closure of the Sawmill.

After such a concerted effort to bring the Telecentre project to fruition, the subsequent loss of the Telecentre would be a second, and perhaps irreversible blow to the Coolah community.

2. Measures of Success

The Coolah Telecentre has been highly successful in the delivery of technology-based services.

- Through the Coolah ISP, more than 320 households are now connected to the Internet, providing home Internet access to more than 45% of the total Shire population. Average home Internet usage is 25 hours per month per

subscriber. Both these figures exceed the levels of home Internet use and access in many Sydney suburbs.

- More than 250 people have been trained in basic Internet skills, with an estimated 600 people having undertaken On-Line Internet training through the locally hosted Internet Training Programs. Another 72 people have been trained in higher-level computer applications.
- More than 1,000 people have visited the Telecentre to use the computers and peripheral devices, and the Telecentre has hosted a total of 15 presentations to various community groups.
- All school children throughout the Shire now have access to Internet reference material outside of school hours, and Telecentre visitation by students undertaking project work continues to increase at a steady rate.
- Installed Video-conferencing equipment is providing educators and medical practitioners (the town has two doctors) with access to State and National resources and expertise.
- The Telecentre hosts 7 local community E-Mail Discussion Lists, 18 community web sites, and provides more than 200 web pages offering information and educational material.

Taken individually these successes are significant, however the true value of the Telecentre is the interaction of these services into everyday life and society.

Through the Internet, community members are provided with a mechanism for social interaction, to conduct business, and for educational opportunities that were previously non-existent without a long drive to town.

The Telecentre has become a true "common", a place for people to meet and interact in an environment of learning and support. Teachers and Doctors can schedule events around a one-hour videoconference (instead of a full-day trip to a Regional Centre).

These are the real community assets.

3. Achieving Sustainability

The Coolah Telecentre maintains a charging regime based on cost recovery, however charges are largely structured in accord with community expectations and the desire to provide services to as many people as possible. Coolah is not an affluent community, and many Telecentre customers are in the lower economic bracket even by rural standards.

Dial-up Internet access is provided from as low as 0.35c per hour (for 100 hours per month), and the delivery of training from as low as $5.00 for an evening course.

Cost recovery is being achieved in the areas of Internet Services (ISP dial-up access) and Internet Homepage Hosting. Training has not yet reached a point of cost effectiveness. Whilst community training charges could be raised, this would only be done as a last resort due to the importance of continuing to attract a high level of community participation.

On-site Telecentre services are charged at $5.00 per hour regardless of the services or equipment being used, though additional charges do apply for printing. The number of people using the Telecentre has not reached a point where this results in sufficient payback to achieve full cost recovery.

The most significant challenge facing the Telecentre today is to be able to continue to provide community services. This can only be guaranteed if the Telecentre achieves financially sustainability.

4. External Markets and Opportunities

The Telecentre recognises that in order to sustain current services and technologies, income must be derived from external sources. The town of Coolah is simply too small a market to sustain business overheads and future growth projections.

5. Local Web Hosting

Local Web Hosting is a business venture proving highly successful and attractive to businesses outside of Coolah as well as within. This is primarily because the Telecentre can provide reliable hosting with the culture and ethos to understand rural business requirements and markets.

Companies currently hosting web sites on the Coolah servers include:

- Teletask P/L (Armidale NSW)
- Castlereagh Radiology (Sydney NSW)
- The New England Motor Inn (Armidale NSW)
- Coonamble On-Line (Coonamble NSW)
- The Nyngan Shire Library (Nyngan NSW)
- The Walcha Telecottage (Walcha NSW
- The Australian Merino Breeders Association (Sydney NSW)
- Farm Forest Plantations (Armidale NSW)
- Kingston Web Design Services (Hobart, Tasmania)
- Alfabs Engineering (Kurri Kurri NSW)
- Wildwood National Trust Village (Pearl Beach NSW)

Web Hosting is a growth business offering sustainability potential with the added benefit of increasing community income.

6. The Sale of Intellectual Property

The Sale of Intellectual Property is another growth area of Telecentre business enterprise. Coolah has been successful in providing consultancy services to several other communities embarking on similar programs. Once again this provides outside income to help maintain locals service delivery.

7. Video-Conferencing and Event Web Broadcasting

Video Conferencing and Event Web Broadcasting offers a potential for the community to generate income by providing conferences and lectures to audiences in a variety of diverse geographic locations, and is not limited to the Australian market. This business is as yet fully implemented however initial trials are suggestive of a very successful outcome.

8. Additional Government Funding

This is an option not many people in Coolah wish to consider, even though perhaps this avenue should be investigated further. The community values self-reliance. "It's far better to succeed on our merits than to ask, cap-in-hand, for more Tax-payer funds". This spirit is an underlying component of why the Telecentre project was initiated, so the community could develop their own path and destiny. It is also typical of many rural Australian communities. However Coolah must be careful that she does not let community pride destroy what she has worked so hard to build. If other initiatives fail, then further Government funding may be essential.

Each of these initiatives is designed to increase income, however when taken in concert, they are all designed to increase local employment opportunities, skill development, and to ensure the continuance of essential community services.

9. Tomorrow and Beyond

The Coolah community recognises the enormity of the challenges it faces. The Global Economy coupled with increasing corporate awareness of the value of rural markets stipulates that if the town is to survive, then it must compete on this stage.

Coolah must generate income; she must provide skills in the new fields of technology; she must generate employment; and she must provide what is today viewed as essential community infrastructure - access to the Internet. But most importantly, Coolah must retain the very social capital and values that make the community what it is, and such a great place for people to live.

Traditional industries of agriculture and retailing will continue to be the lifeblood of the community, yet a change in the way these are managed is inevitable. Through the acceptance of technology, Coolah has adopted a pro-active approach to global trends. She is well placed for tomorrow, even though there is still much work to be done.

SUSTAINING COMMUNITIES ON-LINE: ALBANY GATEWAY

GILL SELLAR
Manager Albany GateWAy

Abstract. *"This presentation is designed, not as a conventional academic paper, but as a living, working document of a process which has consumed the author's working life for two years now. It is meant as a supportive suggestion to all current and future regional portal builders; a blueprint or " mud map" cutting to the real core of creating a healthy community on-line; the issue of sustainability." Gill Sellar, Manager Albany GateWAy*

1. Introduction

A plethora of Australian regional communities on-line have developed over the last few years. Phenomenological changes in both social and technological communications demanded new approaches in community development and strategies for handling the explosion. Most regional communities on-line have similar basic aims:

To showcase their regions globally, enable communities of interest to develop, allow delivery of services online and encourage e-commerce to develop.

- To build awareness of the benefits and opportunities of the Internet
- To encourage engagement in the Information Age
- To provide access to the online environment and the region

Peel Direct www.peeldirect.com.au , Avon On-line www.avononline.com.au, My Southwest www.mysouthwest.com.au , COIN www.coinrok.com.au,, and Albany GateWAy www.albanygateway.com.au are just some examples.

Regardless of how these regional portals have developed, how much funding they've attracted to assist that development, what the actual on-line sites actually "look and feel" like, or what the politics has been around their creation and implementation, they all have one major goal in common. Sustainability.

2. Sustainability

Seed funding and even the expectation of continued funding from whatever sources regional communities usually receive support, is a non-renewable resource. (Unless of course you are lucky enough to have a brilliant, savvy grant application writer on your staff, or in your region to assist in this process!) Communities of interest and regional portals need to address this issue of sustainability early on in their development.

3. Planning And Questions To Ask

A sound and achievable business plan needs to be prepared along with a viable strategic plan, with at least a 3-5 year projection. A number of factors need to be considered and a close eye kept on the portal's performance, from day one of launch. These factors are:

- Who are the users?
- What do they want or need to access through the portal?
- What functions are in place to raise awareness, encourage engagement and provide reasonable access?
- Who owns the portal? What formal structure does it have? company, not for profit organisation, cooperative?
- Is there leadership and a range of different people involved in the management and function of the portal?
- What products or services does the portal offer locals and visitors from elsewhere?
- Is the portal interactive, are local businesses, community groups and individuals able to contribute and edit at will. (Is there a DPS system like WebiT or Harvest Road in place?)
- Are there incentives for local people to become involved and at what levels?
- Who maintains the life and soul of the portal? Who moderates, who takes responsibility for keeping information fresh, interesting and non-libelous.
- Are partnerships active between the portal and local media, businesses, government and community groups?
- What marketing and promotional actvities exist to push the portal's existence and pull "eyeballs", clients, contributors and customers?

This list could probably double in size and all questions surrounding community portals and their sustainability would still not have been asked. However it's time to attempt some answers. I will now use examples for Albany GateWAy to provide some suggestions and workable solutions.

4. Who Owns GateWAy? www.albanygateway.com.au

I named GateWAy the " People's Portal" the moment our first editors provided content for the site. The development, use and implementation of a DPS WEBiT system was central and crucial to GateWAy working. **The people ot the Great Southern own the information on GateWAy**, they are able to buy shares in the GateWAy Cooperative and have a say through discussion boards and direct e-mail access to the 'Keeper', whenever they have something to communicate. *(Anecdotes and examples)*

The Cooperative gives the region a chance to :

- grow its own I.T. industry
- encourage I.T. development and incubation
- provide a legal/formal structure on which to grow
- profit and excel through harnessing local skills and enterprise
- own and manage GateWAy locally
- ensure a viable, sustainable platform and process for future generations

The Cooperative structure seemed like a more progressive alternative to the formation of a not for profit organisation or company , which would have put the power into a hands of a few. There is always the probabablity it could end up being bought out by a larger concern, become exceedingly difficult to manage and sustain as a community enterprise and simply not work as the people who contribute would not have necessarily had a voice!

5. E-GateWAy – E-Commerce Strategy

A partnership between GateWAy and Edith Cowan University produced an EIP or E-commerce Incubator Project earlier ths year. Fifteen local businesses were selected to participate in a hands-on, basic e-commerce training course to " kick start" their adoption of e-commerce into their businesses. This was a pilot study and one increasingly evident fact became obvious. Many of these businesses barely knew the worth or necessity of having an e-mail address, let alone a web site.

From this has come a slowly developing model to increase awareness and progress e-commerce and e-business throughout the region. 2001 will see the implementation of E-GateWAy 2001, whereby funding from the Small Business Development Corporation and W.A. Department of Commerce and Trade will see the running of e-business and e-commerce workshops for many Great Southern businesses, from the ground up. It is possible Edith Cowan University might be involved at the training and implementation level.

GateWAy administration will make a decision early next year about which e-commerce backend package GateWAy will adopt to on sell and promote for use on our dedicated SSL server.

6. How will GateWAy become sustainable?

A number of activities make up a suite of profit making possibilities for GateWAy.

6.1 *Membership*

GateWAy offers an $11 per year membership option to all comers.

For this each member gets a listing, something like a Telstra Yellow Pages Listing, only interactive:
www.albanygateway.com.au/Topic/Members_Listings

This $11 per year is a "toe in the water approach" to encourage businesses, individuals, service providers and community groups to start using the Internet as one way to enhance their accessibility.

GateWAy currently has 152 Memberships (*show page on GateWAy site)*

6.2 *Web Page Options – Create Your Own!*

A range of web page design options are offered to people wishing to create a presence on the Internet without it being too scary or expensive.

GateWAy provides a simple to use word processing type editor to edit your web page. A 1 hour training session, cost $55, is required to get you on your way to editing your web page as much as you like, as often as you like. After you submit your application you will be contacted to arrange your training session.

- Plan 2 - $55 per year - 1 web page you maintain to promote your business.
- Plan 3 - $110 per year - Up to 5 web pages you maintain to promote your business.
- Plan 4 - $220 per year - Up to 10 web pages you maintain to promote your business.
- Plan 5 - $550 per year - Full E-commerce enabled web site. (coming soon)

6.3 *Training*

Training is a key element in assuring a portal's sustainability. Knowledge and skills gleaned in the process of portal development need to be shared and spread throughout the community. GateWAy currently has over 100 editors all contributing content daily on-line. They will train others. *(Anecdotes)*

GateWAy will also be actively assisting "The Internet Community Hour" Project, whereby first time users and community groups all over the Great Southern will be able to access a one hour basic Internet course free of charge. This has been a W.A. Department of Commerce and Trade's, Office of Information and Communication initiative, trialled over the past year or two in metropolitan Perth. The Great Southern and GateWAy will be the first Western Australian regional players to benefit from the concept.

WebiT, (GateWAy's DPS, distributed publishing system), training sessions cost a business **$55** once off, with constant on-line support. Community groups and not for profit organisations receive this training free.

6.4 Advertising And Marketing

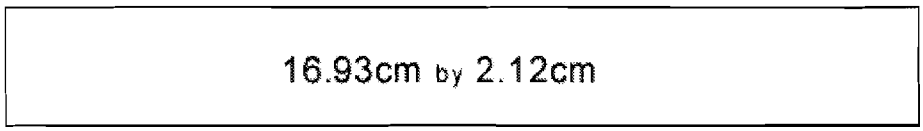
Albany GateWAy is the single entry point for people to access all that the Great Southern has to offer. GateWAy has partnered with GWN and like www.onlinewa.com.au is attracting enormous interest from within the state, nationally and overseas. GateWAy is currently receiving thousands of hits every day and with televised advertisements being regularly broadcast from the second week of August; this rate of interest is expected to only increase.

A comprehensive program of online marketing is being conducted through cross sponsorship arrangements and link exchanging with existing businesses in the region who currently have a web presence to create an entire network of community and business interest. To make your business visible and attract customers to you, website banner ads are available to assist your business to gain maximum exposure on the Internet.

6.4.1 THE NINE ADVERTISING OPTIONS

1. Business listing - name, contact details, email and URL with 25 words or less description - $11 per year.
2. Single Web page - $55/year with all listing functions
3. 5 Web pages - $110/year with all listing functions
4. 6-10 Web pages - $220/year with all listing functions.
5. 11- 20 Web pages - full site plus e-commerce options - $550/year
6. Top Premium Banner Ads – See below
7. Footer Banner Ads – See below
8. Mid Size Ads – See Below
9. Little Ads – See Below

6.4.1.1 *TOP-OF-PAGE ADVERTISEMENT (HEADER)*

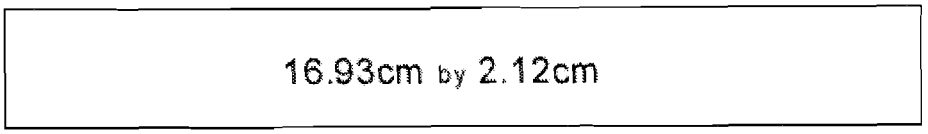


We can create a banner ad to your specifications and have it running on all GateWAy pages, on a hit/rotation process for 24 hours a day, seven days a week. It will appear on all GateWAy pages at different intervals, getting constant, total site coverage. It can even be animated. Places are limited.

Prices are all GST inclusive:

$199/month
$590 per 3 months
$1129 per 6 months
$2000/year

6.4.1.2 *PAGE-FOOTER ADVERTISEMENT*

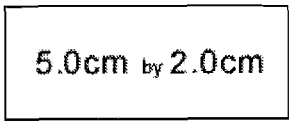


We will create a footer banner ad for you which will run 24 hours a day, seven days a week to the world! These footers will be exclusively displayed on 2 pages of your choice and can also be animated.

The prices are all GST inclusive:

$100/month
$290 per 3 months
$550 per 6 months
$1000/year

6.4.1.3 *MID SIZE ADVERTISEMENTS*

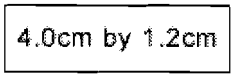


We will create a mid-size ad for you which will run 24 hours a day, seven days a week to the world! These ads will be exclusively displayed on 2 pages of your choice and can also be animated.

The prices are all GST inclusive:

$ 66/month
$198 per 3 months
$ 380 per 6 months
$ 720/year

6.4.1.4 *LITTLE ADVERTISMENTS*



We will create a little ad for you which will run 24 hours a day, seven days a week to the world! These ads will be exclusively displayed on 2 pages of your choice and can also be animated.

The prices are all GST inclusive:
$33/month
$99 per 3 months
$180 per 6 months
$350/year

6.4.2 THE GATEWAY GOPHOR INITIATIVE

GateWAy Gopher is a strategy to take the marketing of GateWAy one step further into the region and will provide locals, already involved in GateWAy, with revenue making ability through their regional portal.

Q: What is a Gopher?

A: A person who wants to earn 60% of all the GateWAy options they sign up whilst promoting GateWAy in their town. We see this person as proactive in wanting to "GO phorward" and "GO phor it" in a big way.

Q: Is 60% the limit?

A: No....when you've achieved a $10,000 or more status you get a 10% incentive rise in earning power. **You start to make 70%! (Gophor Gold status)**

Here's a list of GateWAy options and services...get your calculator out and fill in the amounts.

Current GateWAy Products and Services List:

1. WEBiT training - $55 (60% =
2. One web page - $55/year (60% =
3. 5 web pages - $110/year (60% =
4. 5-10 web pages - $220/year (60%=

5. 10 or more web pages with e-commerce ability (60% =
6. Header banner ads:- $199/month (60% =
7. Footer and Littleads - $ 60/month (60% =

7. GateWAy I.T Group

A GateWAy IT Group was recently formed to bring as many I.T. businesses in the region together as a network. The main aim was to get to know each other, ascertain what skills and experience was in the area and to support each others growth in the Industry.

Already GateWAy has fostered a number of ideas and many of the IT Group busineses have obtained work through GateWAy e.g. Image Quest e.g. Hollywood contract, Adertise-IT e.g. banner ads for GWN, House Sale, Besdshed, GSIS e.g. Aussie Host, Skill Hire. *(Anecdotes)*

People are the key to sustainability of any community or business enterprise. Nurturing a sound group of interested, skilles and active people can set a community portal on the road to success. No people – no portal.

8. Conclusion

GateWAy has been built from the " bottom up". At all stages in its development the community have been consulted and the site built around the feedback from this.

The Great Southern Regions web portal is

- Building awareness of the benefits and opportunities of the Internet
- Encouraging engagement in the Information Age
- Providing access to the online environment and the region
- Becoming sustainable

As we enter our eighth month of cyberlife, we are slowly edging towards becoming a sustainable, creative and fully functioning community portal, not totally reliant on government funding, but a locally, self sustaining entity.

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EC IN THE LOCAL ARENA

The Role Of SME's In Promoting The Diffusion Of Internet Technologies In Communities

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Abstract. *The purpose of this paper is to analyse the emerging literature on electronic commerce (EC) in the local arena as a means for understanding the role that small and medium size enterprises (SME's) can play in the promotion of electronic commerce in their communities. Based on the analysis of the literature, the Action, Reaction, Integration (ARI) model is proposed. We conclude the paper with an outline of the major directions for future research emanating from the ARI model, with particular emphasis on the role that SME's can play in promoting the diffusion of EC in their communities.*

1. Introduction

The primary emphasis of much of the literature on EC is on its global nature. The literature is replete with examples of companies that, over a relatively short period of time, made a successful transition from a local, small business, to a global enterprise, with customers and suppliers based all over the world. The literature in EC, both in the popular media and the learned journals, attributes this phenomenon to the fact that with access to the Internet, many businesses can sell globally without having to make an investment in "bricks and mortar".

The rhetoric that EC is free from constraints of geography is, however, contradicted by a growing evidence that, particularly for SME's business on the Internet is not necessarily as profitable and risk free as it is supposed to be. Establishing an EC "shop-front" may be a relatively painless exercise, but having prospective customers **notice** that shop-front, having them actually transact with the virtual business, and setting the business so that it successfully copes with the demands of a virtual customer base, are all challenges that most SME's find difficult to meet.

Given these comments, the question arises whether SME's should consider national global business as the main reason for getting themselves 'EC enabled'. In a number of recent articles by Steinfield and Whitten 1999), Steinfield et al 1999a, 1999b), the authors mount the **opposite** argument, namely, that SME's should, in the first instance, consider their local communities as their target market, rather than attempt to transact outside their immediate region or globally. To support this proposition, Steinfield et al propose a number of advantages that can accrue to both

SME's and their communities from engaging in EC at the **local** rather than the **global** level.

In the following sections, we present some of the rationale on which the Steinfield et al's 1999a, 1999b) thesis is based and discuss the major arguments in relation to the advantages to SME's from engaging in local EC rather than global EC business. We use this discussion as the basis for our own Action, Reaction, Integration (ARI) model, which considers the role that SME's can play in promoting Internet technologies in their communities. We conclude the paper by outlining the implications from the ARI model to further research on the uptake of EC technologies by SME's.

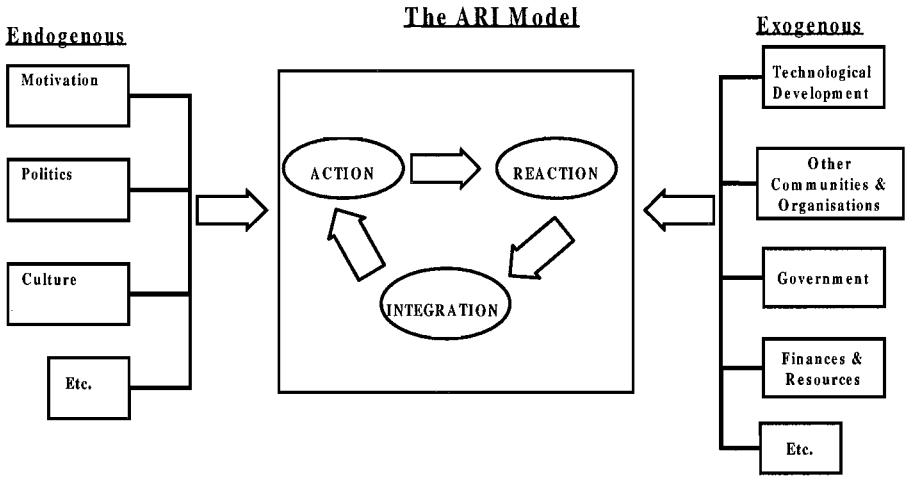

Figure 1. **The ARI Model**

2. Literature Review

1. A review of the literature on the uptake of EC technologies by companies reveals that this practice is seen as associated with the following advantages;
2. Cost reduction through the ability to exchange information and transact rapidly and cheaply with **existing** suppliers and customers (Malone, Yates and Benjamin, 1987);
3. Cost reduction through the ability to engage in relatively rapid and cheap searches for **new** customers and suppliers (Miller, Clemons and Row, 1993; Wigand and Benjamin, 1995);
4. Cost reduction as a result of bypassing the intermediaries in the retail distribution value chain (Wigand, 1997);
5. Lower sunk and operating costs through savings on buildings and salaries given that the virtual business does not "take space" and does not need to be "open" at particular times (Steinfield and Whitten 1999);

6. Access to a larger market with the consequent result of volume discounts on production inputs (Steinfield, 1999a);
7. Potential to offer better service to customers through brokerage facilities that enable customers to locate that meet their requirements for both cost and quality (Malone et al, 1987);
8. Potential to adapt products and services (mass customization) to customers' unique needs (Malone et al, 1987);
9. Potential to make rapid changes to product mix and prices in response to feedback from customers (Steinfield and Whitten, 1999);
10. Potential to offer customers additional, complementary products through hyper-links on the company's web site (Steinfield et al, 1993);
11. No limit to access to the business (7 days a week, 24 hours access) or to amount of information provided by the business to its customers (Steinfield et al 1999b).

Given that most of the advantages that are associated with engaging in EC are advantages that virtual businesses have over brick and mortar ones, the implied conclusion from the discussion in the previous sections is that Internet based retailers have the potential to **undercut** the prices of local retailers, particularly those offering products that are readily available on the Internet (e.g., non-perishable, easily transportable products).

Local businesses can respond to this threat by establishing a presence on the Internet, whereby attempting to re-capture market niche lost to virtual businesses. Interestingly, empirical research into the motivation to establish on-line presence and the specific strategies undertaken by SME's once they have such presence (Gallagher, 1997; Steinfield et al, 1990a) indicates that expanding beyond THE immediate location is the major motive underlying SME's decision to establish a web presence. Indeed, the empirical evidence seems to suggest that a year after SME's establish their Web shop-front, they still have a limited focus on local business and consider national and global business the major justification for this initiative (Steinfield et al, 1990a).

But is this expectation realistic? Given that the success rate of start-ups on the Internet is relatively low (New York Times, July 26, 1999), the expectation that a presence on the Internet by SME's will lead to an expanding profitable business, is dangerous. Indeed, given the heavy investment of time and money required to establish and maintain a Web shop-front, SME'S need to be careful in adopting these new technologies.

Given the high rate of failure for Internet based businesses, the fact that SME's are tempted to invest in Web shop-fronts may be considered as a threat posed by the Internet. In regional, rural, and remote communities, the threat to SME'S from the Internet can result from the following:

1. Large Internet- based companies can compete on price, product range and delivery with local businesses by "siphoning away" their business through economies of scale.
2. By relying on international suppliers, LARGE Based-based companies are likely to transact less with locally based SME's, hence taking even further business away from small regional SME's.
3. By targeting national and international Internet customers and neglecting local customers, SME's are opting for a risky business strategy that is likely to increase the adverse effects of the Based on their business (Steinfield et al, 1997c).

To make matters worse, the majority of regional, remote, and rural businesses are SME's, which means that the adverse effects of the Internet on SME's, are likely to result in a host of social costs in these communities. As indicated by Steinfield et al. (1999b), these social costs may include:

1. Job losses, particularly in relatively unskilled areas (e.g., sales clerks, stockists);
2. Decreased attractiveness of the local community due to the loss of specialized businesses and professional services (e.g., government services, banks);
3. Loss of products and services unique to the region (e.g., services related to the culture, religion of the population);
4. Loss of tax income from businesses, resulting in further deterioration in the quality of the public services available to the community;

Steinfield et al (1999b) propose that the best way that SME's, particularly in regional, remote, and rural communities, can cope with the threat of the Internet is by establishing a "hybrid presence" on the Based. This strategy combines a 'brick and mortar' business with an EC capability. More importantly, the authors insist that locally based SME's should use both the physical and the virtual aspects of their business to target **local** rather than **national** or **international** business. The authors indicate that by adopting this strategy, locally based SME's can gain competitive advantage in several crucial ways, including:

1. **Trust** - One of the most dominant issues mentioned in the EC literature as a major impediment to diffusion of EC is customers' lack of trust in the virtual business (Bollier, 1995; Coates, 1998). This lack of trust can be expressed in a reluctance to provide a credit card details on the Internet and apprehension about the Internet business delivering the promised merchandise and/or service. Obviously, these issues would not apply if the customers transacted with Businesses with a physical presence familiar to them. In other words, if a locally based business establishes a web presence but targets its local customers, it will be building on the existing trust that they have in the business, rather than have to establish this trust from the outset.

2. **Consumer needs and behavior** - Consumers have several preferences that can be advantageous to locally based SME's, which complement their physical business strategy with a virtual one. The physical facet of the business can reduce the perceived risk of customers by giving them an opportunity to return faulty merchandise. A store-based computer can assist customers search the Internet (with guidance and help from the store personnel) for a specific product that they need and which may not be available in the store. The store can then place an order and have it delivered to the customer with guidance on how to use or maintain the merchandise (Klein, 1998). THUS, the Internet can save customer's time and effort by speeding and optimizing the search and decision making processes that ARE major components of purchasing.

3. **Services and applications that capitalize on complementarities between the physical and the virtual** - There are a number of ways in which a physical and virtual business can combine to add value to each other. Many Customers prefer to Browse the Internet but then "feel" the product before purchasing it either on-line or in the physical store. Customers may select the product on-line but then enjoy bargains that are provided by the physical store. The physical store can provide additional advice on related products, the place to obtain information about installation and maintenance and a preferred option for complaints and return of faulty merchandise.

4. **Local Knowledge** - Perhaps the area where the locally based virtual business has the most pronounced relative advantage is in knowledge of the local environment. Local knowledge can enable SME'S to use a dialect or key words that are meaningful to their customers, made use of members of the community to endorse products, and to design A whole marketing strategy (including the design of the web site) to make IT culturally sensitive. All of these strategies would obviously be impossible for a national or international virtual business.

Given that Steinfield et al's (1999b) recommendation is for SME's to embrace EC, but with a local rather than a national or an international focus. This raises the question of whether SME's are in a **position** to do this. In other words, this recommendation is underpinned by an assumption that SME's are based in communities where there is a high level of diffusion of Internet technologies and, hence, enough potential customers to nurture EC enabled businesses. This assumption may be true for some regional, remote or rural communities in some countries, but definitely not for all. In fact, for many SME's, particularly in less developed parts of the world, the solution that Steinfield et al recommend is not feasible simply because the level of diffusion of Internet technologies in their communities is very low.

The issue of low level of diffusion of Internet technologies in communities and how to overcome it is addressed by a new research area called "community informatics".

As indicated by Gurstein (1999), community informatics (CI) links economic and social development at the community level with emerging opportunities in such areas as electronic commerce, community and civic networks and tele-centers, electronic democracy, self-help, advocacy, and cultural enhancement. As such, this term brings together the concepts of IT and information systems with the concept of community development.

As an area of research, CI can be regarded as the body of theory underlying one of the most exciting phenomena of the last decade, namely the diffusion and use of Internet technologies within communities. The Smart Communities movement, as it is often referred to in the popular press (Eger, 1997a; Canadian Government, 1998; and Nordicity, 1997), is a social reality not just in North America and Europe, but also in Asia, Australia, and the Middle East. There are also large-scale CI projects in South America and Africa.

One of the most important themes in the literature on CI is the search for effective means for diffusing IT within communities. In this context several success stories are frequently quoted. The first of these, the Missouri Express Project, was established in Missouri in 1993. This project aimed to connect 80 communities in Community Information Networks (CIN's) over a three-year period (Pigg, 1998). The emergence of the Smart Communities concepts in San Diego in 1994, led to the establishment of the World Foundation of Smart Communities in 1997 (Eger, 1997a). The approach underlying these projects was based on a wide variety of IT applications intended to create vibrant sustainable regional economies through targeting business and formal educational processes.

One of the early attempts to identify issues that can help remote communities benefit from CI was initiated by Gurstein (1999). In his discussion of the CI Project at Cape Britton, Nova Scotia, which he initiated and led, Gurstein mentioned the following as potential advantages of CI for remote communities: (1) overcoming distance insensitivity; (2) achieving local ownership and management of local information (3) making tele-work possible; (4) enabling local nuance in the processing of information; (5) promotion of flexibility for small scale distributed production; and (6) obtaining economies of dis-aggregation.

In the same study, Gurstein identified three strategies for CI as an enabler of community economic development: (1) using it as a 'marketing tool' for small business, (2) using it as an 'enabler' for the mobilization of a wider range of resources for community economic development; and (3) and using it as a 'distributed networker' for the emergence of new networks and economies of 'dis-aggregation'.

In a recent review of the Access Indiana project which funded the establishment of twenty eight community networks, Rosenbaum and Gregson (1998), listed the following as factors that contribute to the success of CI projects:

- integration into the routine life of the community;
- local content for local needs;
- linkage to local government, schools, and social services; and
- processes that ascertain long term sustainability.

Gurstein's work (1996,1999) also heralded the beginning of the search for factors that may hinder the successful diffusion of IT within communities. Based on his findings, Gurstein indicated that less than successful CI projects were associated with the failure to link the projects with local economic activity and to unite community efforts behind strong leadership. In this context, Gurstein (1999) saw the use of CI as a double-edged sword. Whilst it could facilitate community development, it could also be associated with discord within the community resulting from the differential effect on various community stakeholders.

Another study that attempted to identify factors that hinder successful diffusion of IT within communities was undertaken by Scott, Diamond and Smith (1997). This study was based on the first and largest CI project in Australia. It involved the establishment of 450 public access points across three Australian States. The most important shortcoming of this project was that its facilities were under-utilized. The authors saw the fact that the project was based on public rather than private access points as the major reason for its limited success. They recommended that in future, public funded CI projects should strive to encourage private access points (through local ISP's) and invest in raising community awareness of Internet technologies through promotion and training activities.

A recent paper by Kling (1999) alerted researchers to the need to develop theoretical tools that would assist in understanding and eventually overcoming obstacles to diffusion of IT within communities. Perhaps in response to this call, another recent paper (Romm and Taylor, 2000) outlined a model of diffusion of IT within a CI context. The model builds on the literature on diffusion of IT in organizations, highlighting the unique issues that need to be addressed when diffusing IT in communities as opposed to work organizations.

Building on previous work by Markus 1994 and Romm, Pliskin, and Clarke, 1997, the authors mention the following factors as critical to successful diffusion of IT within a CI context:

- **Technology** - Given that CI focuses on the whole community, including its less computer literate members, it is, important that technological constraints, namely, the degree to which technologies are seen as "user friendly" are taken into account when CI projects are undertaken.
- **Motivation** – The degree to which individuals within the community are motivated to participate in CI projects is crucial to the success or failure prospects of these project. Consequently, from a practitioner perspective, a lot of attention should be given to understanding the unique motivation of

subgroups within the community (different age groups, socioeconomic groups etc.).

- **Task** – If members of the community cannot see how the technologies can be of use to them, they are not likely to adopt them. From a practitioner perspective, a lot of attention should be given to understanding the tasks that members of the community wish to undertake and how these can be facilitated by IT.
- **Environment** – This variable would translate as changes to the social and economic environment in which the community as a whole is operating. For example, living in a remote area such as Cape Breton, Nova Scotia (as reported by Gurstein, 1999) would work as an incentive for community members to embrace Internet technologies as a means for marketing their unique products. From a practitioner perspective, a lot of attention should be given to understanding the external environment in which the community is operating and using IT to increase the comparative advantage of the community within its environment.
- **Politics** – This variable refers to the degree to which the community as a whole is characterized by harmonious relationships between its members. It would also translate into the degree to which the members of the community support their leaders in their effort to diffuse the new technologies. From a practitioner's perspective, this variable would suggest that practitioners should be sensitive to conflicts within the community and endeavor to resolve them as a means for facilitating the diffusion of IT.
- **Culture** – This variable would suggest that the culture of the community to which the new IT's are being introduced has to be compatible with the goals of the project in order for the project to succeed. From a practitioner's perspective, this would suggest a "culture analysis" of both the community values and the values embedded in the IT to be diffused.

3. Toward a model of diffusion of EC in communities

The ARI model was developed in the context of the following constraints:

- CI projects may start from a very low base-line, namely, a community whose diffusion of IT is minimal.
- There are exogenous and endogenous factors that motivate the community to embark on a CI project.
- Certain steps have to be undertaken to close the gap between the relatively low base-line at the beginning of the project and the desired high level of IT diffusion at its end.
- Assumptions that are derived from the literature about endogenous and exogenous factors that shape the diffusion process are part of the ARI model.

- The model is prescriptive rather than descriptive. Its emphasis is on recommending a course of action that is **analytically** sound rather than explaining a set of data.

The ARI model is based on the following assumptions:

- The model is based on three major building blocks, Action, Reaction, Integration. In addition, it incorporates a number of endogenous and exogenous factors from the literature on diffusion of Information systems.
- The Action (A) component is defined as activities (or projects) intended to increase **demand** for IT products and services. The Reaction (R) component is defined as activities intended to increase **supply** of IT products and services. The Integration (I) component is defined as activities intended to integrate the demand for and supply of IT products and services through **aggregation** of either demand or supply or both.
- Ultimately, the goal of CI projects should is to aggregate demand and supply for IT goods and services, as their aggregation will result in an upward spiral of increase in both demand and supply, establishing a self sustaining "market" for IT products and services.
- Of the two factors (supply and demand), demand is easier to manipulate by external agents. Therefore, for the purpose of the ARI model, it is defined as the "Action " phase and describes the set of intervention activities that should take place **first**.
- The ARI model refers to the manipulation of supply for IT products and services as the "Reaction" phase based on the assumption that it would be more difficult to manipulate it in a community context unless a demand for IT products and services **already exists**. In other words, it would be difficult to convince industry to provide a community with Internet based products and services (particularly a remote community or one placed in a developing country), unless there is already a body of customers willing to buy the products and services.
- The ARI model refers to the aggregation of demand and/or supply of IT products and services as "Integration" phase because this set of activities represents a level of integration involving the first two. The model also assumes that aggregation will not be possible to achieve unless a minimum level of both demand and supply for IT goods and services have been established.
- The ARI model assumes that the three components, "Action", "Reaction", "Integration" (or demand, supply, aggregation) will drive each other, ultimately producing a mutually dependent upward spiral effect where all three continue to increase over time.
- Finally, the ARI model assumes that to sustain a CI project over time, the leaders of the project will have to maintain a "balanced portfolio" of "Action", "Reaction" and "Integration" activities, intended to reinforce each other.

4. Discussions and Conclusions

The objective of this paper was to consider the impact of the Internet on SME's and the possible contribution that they can make to the diffusion of EC. As indicated in the previous sections of this paper, SME's involvement with EC is a complex matter. The Internet can be a threat to SME's, particularly those in regional, rural remote areas but it can also be a blessing.

The determining factor on whether the Internet will be a curse or a blessing for SME's is the level of Internet diffusion in their communities. If the base level for Based technologies in the community is relatively high, namely, there are enough of a customer-base to support and nurture SME's, then the strategy that is proposed by Steinfield et al (1999c) should be recommended. Namely, SME's should be encouraged to undertake a "hybrid" business strategy combining a brick and mortar business with an Internet shop-front. In this particular situation, SME's should also be advised to focus on the local market, where they have distinct relative advantages, rather that target regional, national, or International markets. These will come for some businesses at a later point in time but should definitely not be seen as the major justification for getting the business EC enabled or the major marketing strategy once the Based presence is established.

As for SME's who are operating within an environment where the diffusion of Internet technologies is very low, namely, SME's which are based in regional, remote, or rural communities in the US or in underdeveloped areas in other countries, their strategy cannot be the one recommended by Steinfield et al.(1993) Instead, as demonstrated in the previous sections of this paper, a strategy intended to increase the diffusion of Internet technologies in the community will have to be initiated first, with major involvement from SME's and from both public and not for profit agencies (such as Local, State, and Federal government) supporting the community.

The ARI model outlines the major strategies to be undertaken in this scenario. The model highlights several issues for decision makers to consider:

First is the issue of the timing of any intervention activities. The ARI model suggests that even though activities that promote demand and supply for IT goods and services should be undertaken **simultaneously**, demand related activities should take precedence and should be initiated **first.** The reason for this recommendation is that if SME's are to play a leading role in getting their communities EC enabled, there has to be a commercial reason for them to proceed. There has to be a big enough market of potential customers willing to transact with them on-line. If such a customer base does not exist, it would be difficult and highly misleading to encourage SME's to establish a Web Presence as it can be a costly and high risk strategy for them.

Second is the issue of priorities. The ARI model suggests that activities that promote aggregation of demand and supply should be seen as the ultimate goal of intervention strategies in communities. The reason for this recommendation is that aggregation strategies have the potential to "drive" further demand and supply in the community. In other words, by introducing major aggregating projects (such as a portal) into a community, will establish "growth dynamics", creating further incentive and justification for SME's to be involved in the 'EC enabling' of their communities. Note, that SME's can play important roles in providing products and services that support both community demand (training of members of the community in Internet related skills) and the supply side of the ARI model (selling Internet related products and services).

Third is the issue of possible overlaps. Does the recommended timing of intervention activities mean that unless a minimum level of demand has been reached, no activities involving the manipulation of supply or aggregation of both supply and demand should take place?

Obviously the answer to this question is "no". The fact that a community is at a low level of diffusion and most efforts are focused on increasing demand for IT products and services, does not mean that activities that are intended to increase supply of these products and services **should not** be undertaken. Similarly, even though a minimum level of both demand and supply is probably necessary for aggregation to occur, it is possible to envisage different levels of aggregation of supply and demand.

Finally, given that the ARI model combines the elements of Demand, Supply, and Aggregation with a range of endogenous and exogenous factors, the most important research questions that emanate from it are associated with the **exact nature** of the relationship between these sets of factors.

The following sets of questions could be the basis for a future research agenda in this area:

- What is the impact of endogenous factors such as motivation, politics, and community culture on SME's likelihood to establish an Internet presence? Do these factors have different impacts in communities that are initially high or low on level of diffusion for Internet technologies? Does the impact that these factors have change over time?
- What is the impact of endogenous factors such as technology, other organizations and communities, government, and financial resources on SME's likelihood to establish an Internet presence? Do these factors have different impacts in communities that are high or low on level of diffusion for Internet technologies? Does the impact that these factors have change over time?
- How do these factors impact on the basic building blocks of the model, namely, the demand, supply and aggregation of IT products and services? Are

the effects the same or different for communities with high levels of diffusion for Internet technologies? Are they the same for communities from different national cultures?

These and other empirical questions that relate to the role of SME's in promoting the use of EC in their communities can be explored by employing a combination of qualitative and quantitative research methodologies. Such investigations can uncover the interplay between issues like who should **initiate** EC diffusion projects, who should **lead** such projects, and who should **contribute the resources** to make them possible and sustainable in the long term. Based on such research, preferably within and across cultures, it would be possible to test the propositions of the ARI model and, consequently, to determine the role that SME's can and should play in diffusion of EC in their communities.

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