



Community Access to Digital Technologies

a literature review

Foreword

The Research and Evaluation Services Teams of the Department of Internal Affairs conducted this literature review to inform and support its work with communities. The project looked at ways to better understand the factors (including precursors) that relate to the readiness of a community to adopt digital technologies and the key success factors or intervention strategies that build readiness and support the application of new technologies in communities, especially those considered 'hard to reach' communities – Māori, Pacific, rural and regional.

This review has not been peer reviewed and it is not an exhaustive traverse of the literature. The Department believes it is a fair but modest coverage of the literature. Within its modest intentions and constraints, this review is published with the intent of contributing to a wider understanding of how to support community connectedness to digital technologies.

The views within this document belong to the cited authors and are not necessarily the policies or views of the Department of Internal Affairs.

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Introduction

The purpose of this literature review was to find the evidence needed to better answer the following questions:

- What are the factors (including precursors) that relate to the readiness of a community to adopt digital technologies?
- What are the key success factors or intervention strategies that build this readiness and support the application of new technologies in communities, especially those considered 'hard to reach' communities – Māori, Pacific, rural and regional?
- What are the barriers and risks to the effective uptake of new technologies?

A wide range of sources were consulted in this review, both national and international.

For this report 'digital technology' and 'ICT' (Information and Communication Technologies) are used interchangeably as they essentially define the same thing.

Key findings

Digital literacy and connectedness is seen as an essential 'life skill' in the 21st century. In general community discussions, links are drawn between connectedness and broader societal socio-economic and cultural goals. Indeed it is often said that digital connectedness is essential for a strong and resilient community.

From the literature two key reasons for providing ICT and increasing connectedness were identified. Firstly, to achieve broader socio-economic goals and secondly to address the lack of access as a violation of a necessity of life in an information based modern world.

Statistics indicate there are many sections of the population that do not have access to digital technologies. This gap between people who have access and those that do not has become more formally referred to as the 'digital divide'. There is evidence that in New Zealand the digital divide, in terms of access, is closing and that use is becoming a more important consideration.¹ People need access to the additional resources that enable them to use the available ICT hardware effectively in their lives.

It is also reported that people who are already marginalised will have fewer opportunities to access and use ICT. 'Access to ICT' should be thought of as embedded in a complex array of factors that span the physical, digital, human, and social resources and relationships of a community of people. For example, literacy, education, community and institutional structures, and language must all be taken into consideration if meaningful access to new technologies is to be manifested.

Defining the success of ICT interventions is problematic. The literature provided no evidence of ICT having a positive effect on social mobility – the idea that 'have nots' were now moving in the same socio-economic realms of the previously identified 'haves'. In this sense, people who are marginalised in society will continue to be so, but with some ICT skills in their repertoire.

¹ Ministry of Social Development, 2010 Social Report, Bell et al 2010. Telephone and Internet Access in the home 2007-09; Auckland Institute of Technology, the Internet in New Zealand. World Internet Project New Zealand Institute of Culture, Discourse & Communication AUT University Auckland New Zealand; Head, Marilyn (undated) Addressing the 'Digital Divide' in Aotearoa New Zealand, retrieved from <http://www.community.net.nz/hottopics/Hot+Topic+Archives/Digital+Strategy/addressing-digital-divide.htm>, 25/3/11.

Like any other policy or programme intervention, a digital connectedness project needs to have a clear definition of 'success' and how it may apply to that particular project or community. There may not be universal success factors that can be applied to all interventions.

The literature review has found that a comprehensive ICT intervention that incorporates the unique characteristics of a community has a greater chance of resulting in meaningful sustainable community development than projects that have a singular focus on digital connectedness and access.

Since 2006 data about differences in access and use in New Zealand has come from two major sources: the Statistics New Zealand Household Use of Information and Communication Technology, undertaken every three years, and the World Internet Project New Zealand, undertaken every two years. There is no annual data or research on Māori and Pacific Peoples' digital connectedness and usage.

Apart from non-research based articles and opinion pieces, we found no substantial discussion about what an intervention within the sphere of community development that reflected, or was characterised by, 'Māori' or 'Pacific' values and culture, would look like. An attempt has been made to apply what is known about other types of interventions (such as health) to draw a bridge between Māori and Pacific initiatives within those spheres to the ICT sphere. For example, there are some examples of research about the relationship between language/te reo programmes and ICT in relation to mainstream approaches to language revitalisation.² Due to the gap in literature, readers of this review need to accept that the links are tenuous and not based on research of likely outcomes, but rather assumptions based on out-dated data or learnings from other projects unrelated to ICT.

There are factors that define a 'good' project and there are precursors that can be identified that make a community more able to take up ICT technologies. Like other interventions, ICT based programmes need to make ICT relevant to the environment of the community; recognise the characteristics of the people; and tailor the solution.

² Organisations may be using ICT in interventions that have a Māori basis but research about these is not prevalent.

Community Development and Digital ‘Connectedness’

For this review the ‘digital connectedness’ or ‘digital divide’ is discussed as part of a broader discussion on ‘community development’. To focus the research through this lens we looked at literature and principles of community development that are relevant to understanding digital connectedness disparity.

One of the major issues for community development is the tension between economic and social returns and the timeframe required to obtain the former.³ In surveying the literature it is clear that each commentator attributes great importance to satisfying ‘human needs’ as a fundamental part of community identity, whatever their specific centre of attention is.

A brief overview of community development as it may relate to the ‘digital divide’

The Aspen Institute⁴ suggests eight measures of community capacity building –



³ Denison, Hardy, Johanson, Stillman, Schauder – Community Networks: Identities, Taxonomies and Evaluations, Centre for Community Network Research, School of Information Management Systems, Monash University, 2002.

⁴ Measuring Community Capacity Building, v 3-96. Aspen Institute, 1996, Introduction, p11. Retrieved from http://www.aspeninstitute.org/sites/default/files/content/docs/community%20strategies%20group/MEASURING_COMMUNITY_CAPACITY_BUILDING.PDF 25/3/11.

The Aspen model exemplifies how the broader goal of community capacity building is linked to the creation of wealth and employment for the economic and social benefit of the community, and its citizens. Whilst employment and economic development are seen as central to the goal of community capacity building, local development also looks at issues relating to social cohesion and takes a holistic approach to local problems.

A holistic approach presents a unique problem for digital connectedness interventions. Most interventions identified in the review were not holistic and did not exhibit a socially cohesive approach. Rather they appear to lack cohesion between providers, requesters, recipients and motivators. Community Informatics advocate Michael Gurnstein has raised his concern about this sort of outcome and says ICT experts, social scientists, community and political actors all have an inherent bias in skill set and motivations for undertaking such initiatives.⁵

Community development is a concern of the OECD and their rationale for supporting community/local development policy intervention can be summarised as follows:⁶

1. Stimulation of employment and economic development (e.g. increasing employment, raising incomes, encouraging labour market participation, and assisting with enterprise development).
2. Improving quality of life (e.g. improving community facilities and services).
3. Encouraging social participation (e.g. enhancing of democratic participation).
4. Conserving and enhancing the environment.
5. Increasing community capacity to develop solutions to local problems and to act on local opportunities and mobilising community participation.

The community development/community partnership approach is seen as important for the following reasons:

- Desire by communities for greater self-determination including input into problem definition and solution (this has been particularly true for Māori, but exists in many communities)
- Perception that “top down” approaches have not worked, especially in disadvantaged areas
- Perception that the local solutions to local problems are effective because of local knowledge of problems and opportunities
- Perception that delivery of services may be improved in terms of local responsiveness if delivered by the client’s own community
- Holistic approach needed to community issues, especially in areas of multiple disadvantage
- Ability to mobilise community resources to supplement government resources, and
- Desire for longer-term sustainability of initiatives to combat disadvantage.

An example of a community partnership approach in New Zealand is the Mahi a Iwi Strategy developed by the Community Employment Group. This was a holistic approach to community development with a partnership that focused on the involvement of the whānau, hapū and iwi to

⁵ Gurstein, Michael. "Effective use: A community informatics strategy beyond the Digital Divide" *First Monday* [Online], Volume 8 Number 12 (1 December 2003)

⁶ OECD. (1999). *Local Development Policy Experiences in OECD Countries: Good practices and transferability in less developed regions*. Paris: OECD.

encourage solutions to Māori unemployment.⁷ The literature that underpins community development contains the message that successful digital divide interventions need to have similar characteristics.

A community development process allows for community to identify their preferred intervention and build partnerships through strategic planning processes. Both steps are needed to be successful at mobilising community support.

Tailored local solutions require the identification of how best to work with each community. Differing communities will need different approaches to relationships, local capacity and sustainability. For example, the needs and resources in a poor inner city area will differ from those in an isolated rural area. There needs to be specific strategies for working with Māori and Pacific peoples.

The key themes that come through a discussion of ICT through the community development lens suggest that defining factors for the local development approach are:

1. Involving a multiplicity of stakeholders and networks of local people and agencies that may have conflicting interests, e.g. central, regional and local government, community and voluntary organisations, universities, employers and trade unions, private companies.
2. Establishing partnerships and involving local communities in decision-making about the design and planning of their projects and identifying locally-held resources.
3. Tailoring development to address the different needs, wants and processes, and the diversity of economic and historic conditions. It is not possible to simply transplant an approach from another region without paying attention to differences in local context.
4. Emphasising the notion of development and its capacity to generate new activities and the need for flexibility to accommodate change.
5. Working across multiple sectors (social, economic, physical and political) with the aim of improving cohesion.
6. Developing processes that gain momentum over time, emphasising economic and social dynamics and making the initiative responsive to changes in the local context.
7. Starting with a clear focus on a broad range of outcomes and impacts, ranging from economic social, physical and infrastructure that the initiative will contribute to. For example, local development initiatives often focus on employment and enterprise development as a starting point.

ICT community development with disadvantaged communities

The OECD notes the following as critical considerations to any development framework that seeks to improve the outcomes for disadvantaged communities:⁸

- Long-term planning, including addressing sustainability issues
- Simultaneous use of social, cultural, economic, and natural factors to address the multiple problems
- Good training for local players and commitment to ongoing capacity building
- Co-operation with universities, research and training institutions of a region
- Concern for cultural awareness and implications for delivery
- Mechanisms for economic support for direct investment and risk taking by project initiators

⁷ Community Employment Group, Department of Labour, *Connecting Communities: A Strategy for Government Support of Community Access to Information and Communications Technology*. 2002

⁸ OECD, 1999; Community Employment Group, 2002

- Bringing communities along with the development process and moving at a pace appropriate to them.

Development frameworks often refer to economic development as a main component of the investment and return that is forged between community and government in these interventions. However, Blakely cautions against this practice in his critical theory of local economic development. He says pitfalls occur when communities select economic development strategies as their primary focus. Some of these pitfalls include over-dependence on governmental programmes, letting the tools determine the strategy and following fads that may not suit their locality. Alongside these considerations Blakely points out that funding for community ICT should be flexible - without flexibility communities will tend to try to adapt their work to fit funding criteria.⁹ This type of goal displacement can be detrimental.

Further, Blakely says results are more likely to be sustainable if remedies are tailored towards individual needs, rather than through a “one-size fits all” programme. Issues of dependency are real and need to be addressed in an accompanying programme of strategic planning, where longer-term outcomes are considered and a robust evaluation of outcomes can feed back into policy development.

Community informatics, ICT and development

A lot of literature that explores digital connectedness refers to the concept of ‘community informatics’. There are a range of perspectives about what this term means:

- It represents a way of thinking or talking about a particular set of ICT technologies that are available for use in and by local communities
- It is a way of formulating and integrating the use of ICT as an instrument for economic and social development into more mainstream Information Systems thinking and research
- It is a form or methodology of community development that happens to use ICT rather than paper or blackboards as a primary means for facilitating community communications
- It is the beginning of a ‘movement’ by means of which ICTs are taken up by marginalised communities to realise a new role for themselves in the information society.

Gurstein, an advocate of Community Informatics, suggests that a huge industry has been created to respond to the perceived social malady of the “digital divide”. He feels that it is little more than a marketing campaign for Internet Service Providers.

Gurstein proposes an alternative approach — that of ‘effective use’ — drawn from community informatics theory which recognises that the internet is not simply a source of information, but also a fundamental tool in the new digital economy. Gurstein¹⁰ suggests that CI is “an evolutionary advance on traditional systems by integrating them with the dynamism and adaptability for life as lived in organic communities.”

Brian Loader and Leigh Keeble¹¹ argue that community informatics is distinctive as it “emphasises a grassroots perspective whereby community members are centrally involved in the application of ICTs

⁹ Blakeley, R. (1998). Social Capital and Public Policy. In Davis, R. (ed.) *Social Capital and Strong Communities*. Wellington: Capital City Forum. Cited in OECD 1999:32; Community Development Group, 1999:16

¹⁰ What Is Community Informatics (And Why Does It Matter?). Michael Gurstein

¹¹ Loader, Brian D. and Leigh Keeble (2004). *Challenging the digital divide? A literature review of community informatics initiatives* Joseph Rowntree Foundation. Page 2.

for community development.” Both Gurstein and Loader & Keeble discuss community informatics within existing frameworks of research from the field of sustainable community development. They suggest human ‘agency’ (e.g., motivation, desire, capacity) is what leads to the adoption and use of new technology – not the technology *per se*.

There is evidence of a relationship between the use of ICT and human/community development, although the precise nature of this relationship has not been well articulated in the literature to date.

For example, Birdsall¹² studied the potential impact of internet access on voting patterns and suggested that: “while the rhetoric of the internet is one of both decentralisation and connectedness, the behaviour of internet activity is similar to other social phenomena. It tends to cluster around centres of cultural and economic power and instead of creating new connections; it reinforces other indicators of connectedness, including, potentially, voting.”¹³

Birdsall also refers to the work of Dori and Suk Jan as relevant to the discussion of ICT impact and supports their finding that non-economic factors account for changes in IT connectivity over time. In particular, education and science play a central role in a country’s move to greater IT connectivity. It is arguable that education and science are driven by human, rather than digital capital.

Using the HDI (Human Development Index)¹⁴ and DAI (Digital Access Index)¹⁵, Birdsall & Birdsall examined the statistical and spatial relationship between human development and digital access. They found a strong correlation between HDI and DAI and suggest that digital access may not play as strong a role in promoting human development as is usually asserted. Perhaps public policies might need to shift their focus to human rather than digital capital. They recommend further research to examine the proposition that human development leads to ICT development rather than the converse. Again, there appears to be a dearth of research in this field – this seems to indicate that this link is hard to formulate.

Birdsall & Birdsall also found regional clusters of ICT development which led them to the conclusion that geography and location matter. The clustering suggests that cultural (including economic and political) factors within a region may be more significant with regard to advancing human development than technological factors.

Technological advances might more accurately be seen as resulting from, rather than driving, advances in human development. Birdsall proposes that public policy development strategies that give a high priority to human development in a regional cultural context could be more productive than either broad international or national strategies that give high priorities to ICT development.

¹² Geography matters: Mapping human development and digital access - Stephanie and William Birdsall.

¹³ Birdsall, Stephanie, 2005. “The Democratic Divide,” First Monday, Volume 10, number 4 (April), at http://www.firstmonday.org/issues/issue10_4/birdsall/

¹⁴ The Human Development Index (HDI) is a composite statistic used by the UN and other development agencies to rank countries by level of “human development” and separate developed (high development), developing (middle development), and underdeveloped (low development) countries.

¹⁵ In 2003, the Market Information and Statistics Unit of the UN’s International Telecommunication Union launched the Digital Access Index (DAI). This index measures the overall ability of individuals in a country to access and use new ICTs. It covers four factors that impact a country’s ability to access ICTs: infrastructure, affordability, knowledge and quality and actual usage of ICTs. The DAI has been calculated for 181 economies and enables cross-country comparison of relative strengths and weaknesses

The currency of New Zealand research

In New Zealand the government has identified those who are most likely to be left behind in the 'information revolution'. These groups include Māori and Pacific peoples, people on low incomes, sole parents, older people, people with no or low qualifications or poor literacy, the unemployed, people with a disability, and people living in rural areas that lack sound telecommunications infrastructure.¹⁶

Much of the research about these groups is now dated, and its relevance to the dynamically changing field of ICT, needs to be taken into account when considering policy.

Statistical data

From 1966-1981 the Census contained a question about access to telephone. From the 2001 Census onward a question has been asked about access to telephone, fax and internet. The 2001 Census and October 2001 Household Economic Survey undertaken by Statistics New Zealand were the main source of statistical data for New Zealand researchers around the early 2000s. In 2006 a supplementary survey was added to the Household Labour Force Survey (HLFS) to measure household access and use of ICT. This survey is repeated every three years as part of the December administration of the HLFS.

From the 2001 Census more information about ICT and ethnicity in New Zealand has been available. Ethnicity counts were based on the presence of at least one occupant of that ethnicity in the household. Households containing at least one person of Asian ethnicity at the 2001 Census had the highest level of internet access, with 58 percent of households connected. In contrast, households with Pacific people were less than half as likely (23 percent) to be connected to the internet.

When differences in household income between ethnic groups were standardised, the percentages with access remained relatively unchanged. This suggests that the ethnicities of household members had an influence over the presence of an internet connection, independent of income. Standardisation by highest qualifications showed that some of the variation between the ethnic groups could be attributed to differences in educational attainment. Households with at least one person of Asian ethnicity were still the most likely to have internet access (49 percent), followed by Europeans (38 percent), Māori (30 percent) and Pacific peoples (26 percent). Figures for the European population remained unchanged when standardised by household income and highest qualification. This is due to the European group being the largest single ethnic group in New Zealand, the distribution therefore resembling that of the whole population.

The ISP survey in 2010¹⁷ highlighted the following and gave a little more data about the type of access:

- The number of broadband subscribers increased 15 percent, to 1.3 million, between June 2009 and June 2010
- Cellular, cable, and satellite, combined, grew at a faster rate than other broadband connection types

¹⁶ *Connecting communities: A strategy for government support of community access to information and communications technology, 2002.* Wellington: Community Employment Group, Department of Labour.

¹⁷ In 2003, the Market Information and Statistics Unit of the UN's International Telecommunication Union launched the Digital Access Index (DAI), a new index, which measures the overall ability of individuals in a country to access and use new ICTs. The DAI is built around four fundamental vectors that impact a country's ability to access ICTs: infrastructure, affordability, knowledge and quality and actual usage of ICTs. The DAI has been calculated for 181 economies where European countries were among the highest ranked. The DAI allows countries to see how they compare to peers and their relative strengths and weaknesses. *Connecting communities: A strategy for government support of community access to information and communications technology, 2002.* Wellington: Community Employment Group, Department of Labour.

- Sixty percent of broadband subscribers in June 2010 had a data cap of 5GB or more, up from 50 percent in June 2009
- Subscribers with upload speeds of 256kbps or more have increased significantly since 2007, and now account for nearly 80 percent of broadband subscribers.

FIGURE 1: Household Access to Broadband, by Region (December 2006 and 2009 quarters)



Source: Statistics New Zealand

By 2009, 75 percent of New Zealand households had access to broadband internet, compared with 65 percent in 2006. The 2001 Census showed that 37 percent of households had any sort of internet connection. Though not directly comparable, the growth over eight years in the number of NZ households with access to the internet was clearly substantial. The Nielsen research company estimated more people started accessing the internet through broadband connection, more than any other connection type, in 2007.¹⁸

The Household Use of Information and Communication Technology survey also shows only 12 percent of households had a dial-up connection in 2009 compared with 31 percent in 2006. An analysis of the 2009 data by region shows that rural households were less likely (55 percent) than households in urban areas (64 percent) to have broadband. The 2006 data demonstrates this pattern as well, but the gap was wider, 35 percent compared with 22 percent.

The same 2009 survey data provides an analysis by region and shows broadband access was represented at a rate of 50 percent or over. Auckland led the table at 72 percent, followed by Wellington (69 percent) and Canterbury (64 percent). The data shows rural communities are less connected than metropolitan centres.

¹⁸ The Broadband Report 2008, The Nielsen Company. Retrieved from <http://www.internetbureau.co.nz/attachments/docs/the-broadband-report-july-2008.pdf> 28/3/11

TABLE 1: Location of Internet Use over Last 12 months for individuals aged 15 years and over (December 2006 and 2009 quarters)

Location	Individuals aged 15 years and over					
	Number (000)		Those who used the Internet in last 12 months ⁽¹⁾ (%)		Of total population ⁽²⁾ (%)	
	2006	2009	2006	2009	2006	2009
Home	1,933	2,450	88	92	60	73
Work	802	1,067	36	40	25	32
Place of education	343	477	16	18	11	14
Another person's home	540	900	24	34	17	27
Community Internet facility	193	313	9	12	6	9
Commercial Internet facility	254	364	11	14	8	11
Somewhere else	11	59	0	2	0	2

(1) Number of individuals who accessed the Internet in the last 12 months in 2006 was 2,208,000 and in 2009 was 2,677,000.

(2) Total number of individuals 15 years and over in 2006 was 3,202,000 and in 2009 was 3,359,000.

Note: Individuals may have selected more than one location. All numbers in this table have been rounded to the nearest thousand. Due to rounding, figures may not add to the stated totals.

The table above is particularly relevant to this discussion as it indicates that for most New Zealanders, the overwhelming majority of internet usage takes place at home. This would seem to indicate that interventions that increase access to ICT at home could be effective in bringing access to people and addressing the inequity of ICT 'haves' and ICT 'have nots'.

Auckland University of Technology (AUT) produced a report¹⁹ in 2010 as part of their 'World Internet Project' initiative that appears to be the most up-to-date data on internet usage including usage by ethnic groups and rural communities. The report, comparing data collected in 2007 and the most recent data from late 2009, investigates New Zealanders' usage of, and attitudes towards, the internet. It found that the portion of New Zealanders using the internet has increased slightly, but the percentage of persons of Māori and Pacific Island descent using the internet increased sharply over those two years. They also found that the difference between urban and rural use has eased as well, however there is still a large divide between the three main centres and smaller rural towns – certainly when it comes to having broadband access in the home.

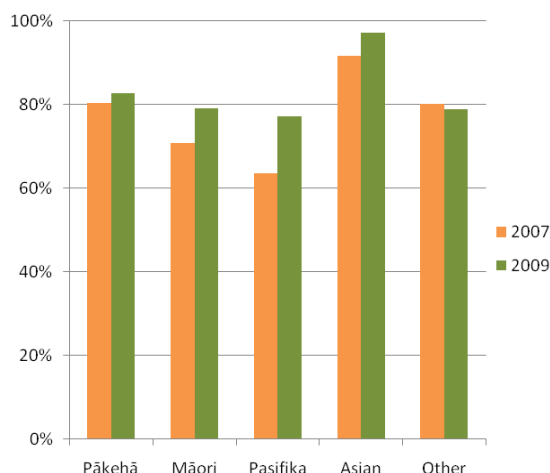
Ethnicity and access

The table below shows that, with the exception of the composite 'Other' ethnic category, internet use has increased for all major ethnic groups in New Zealand, though to differing degrees. The greatest increase was for Māori and Pacific Island peoples, although they still use the internet less overall. The proportion of Māori respondents using the internet rose by 8 percent, and the proportion of internet users of Pacific Islands descent increased by 13 percent. The differences across ethnic groups have diminished. The difference between the Asian community (the highest) and the Pacific community (the lowest) proportions of use was 28 percent in 2007 reducing to 20 percent in 2009. The difference between Pacific populations and Pākehā also decreased over the same period from 16 percent to 6percent.²⁰

¹⁹ *The Internet in New Zealand 2007-2009*, Bell et al., World Internet Project NZ, Institute of Culture, Discourse & Communication, AUT University 2010. [available online - <http://www.aut.ac.nz/research/research-institutes/icdc/projects/world-internet-project>]

²⁰ While the authors of the report do warn of coding and small sample size issues around some ethnic group differences but they are confident about the reported differences.

FIGURE 2: Use of Internet by Ethnic Group

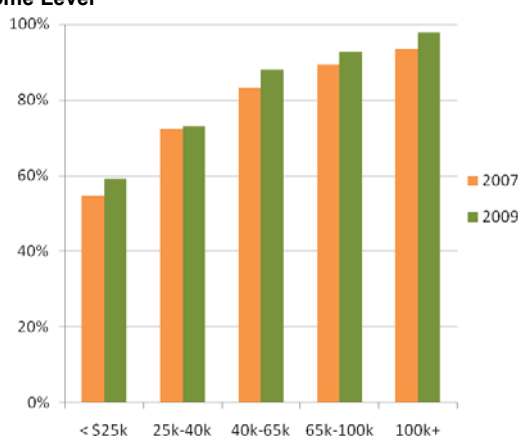


Source: Auckland University of Technology (2010) 'World Internet Project'

Income and access

Whilst the survey conducted by AUT seems to indicate a reduction in disparities along ethnic lines, the trend with regard to income level seems markedly different. The AUT analysis identifies a pattern of higher use amongst people with a higher income. Maori and Pacific populations are largely low income according to official measures of income from Statistics New Zealand²¹. What the AUT data appears to provide is further evidence that shows a link between socio-economic factors and the level of peoples' use of ICT. In short ICT access can not be understood narrowly as the availability of computers and connectedness.

FIGURE 3: Use of Internet by Income Level



Source: *The Internet in New Zealand 2007-2009*, Bell et al., World Internet Project NZ

²¹ See for example

http://www.stats.govt.nz/browse_for_stats/work_income_and_spending/Income/NZIncomeSurvey_HOTPJun10qr.aspx retrieved 8/4/11

Access rich and access poor

The table below provides a guide for the nature of internet use. Because so little research has unpacked what respondents mean when they report going online 'at least occasionally', it is easy to misinterpret findings to mean that almost all people have quality access to digital resources.

Robinson found that such measures efface the difference between youth with favourable and unfavourable conditions of access.²² In her review of a high school digital connectedness project in California she found those with high-quality home access have different experiences, attitudes and skills than their counterparts with no or low-quality home access.

TABLE 2: Internet Activities over Last 12 Months, by individuals aged 15 years and over, December 2006 and 2009

Activity ⁽¹⁾	Individuals aged 15 years and over			
	Those who used Internet in last 12 months ⁽²⁾ (%)		Of total population ⁽³⁾ (%)	
	2006	2009	2006	2009
Internet communication				
Send or receive emails	90	90	62	72
Other communication eg chat rooms, message boards, instant messaging or blogging	25	24	17	19
Telephone over the Internet	12	26	8	20
Social networking ⁽⁴⁾	...	46	...	37
Video calling ⁽⁴⁾	...	17	...	13
Obtaining information on the following				
General web browsing or other information	84	86	58	69
Goods and services	65	74	45	59
Government organisations	44	46	30	37
Health or health services	28	35	20	28
Job opportunities	28	36	20	29
Leisure activities				
Download or listen to online music	32	39	22	31
Read or download electronic books, newspapers or magazines	26	34	18	27
Download or watch movies, short films or images	19	34	13	27
Play or download computer or video games	17	19	12	15
Listen to web radio or watch web television	16	26	11	21
Share files via peer to peer exchange	13	9	9	7
Personal purposes				
Internet banking	54	65	37	52
Download software, patches or upgrades	39	41	27	33
Sell goods and services	30	35	21	28
Formal education or training activities	19	20	13	16
Apply for jobs	15	21	10	16
Interaction with government organisations				
Download or complete a form online	27	35	19	28
Make online payments	14	20	10	16

(1) Personal use of the Internet only; does not include use of the Internet for work purposes.

(2) Number of individuals who accessed the Internet in the last 12 months in 2006 was 2,208,000 and in 2009 was 2,677,000.

(3) Total number of individuals 15 years and over in 2006 was 3,202,000 and in 2009 was 3,359,000.

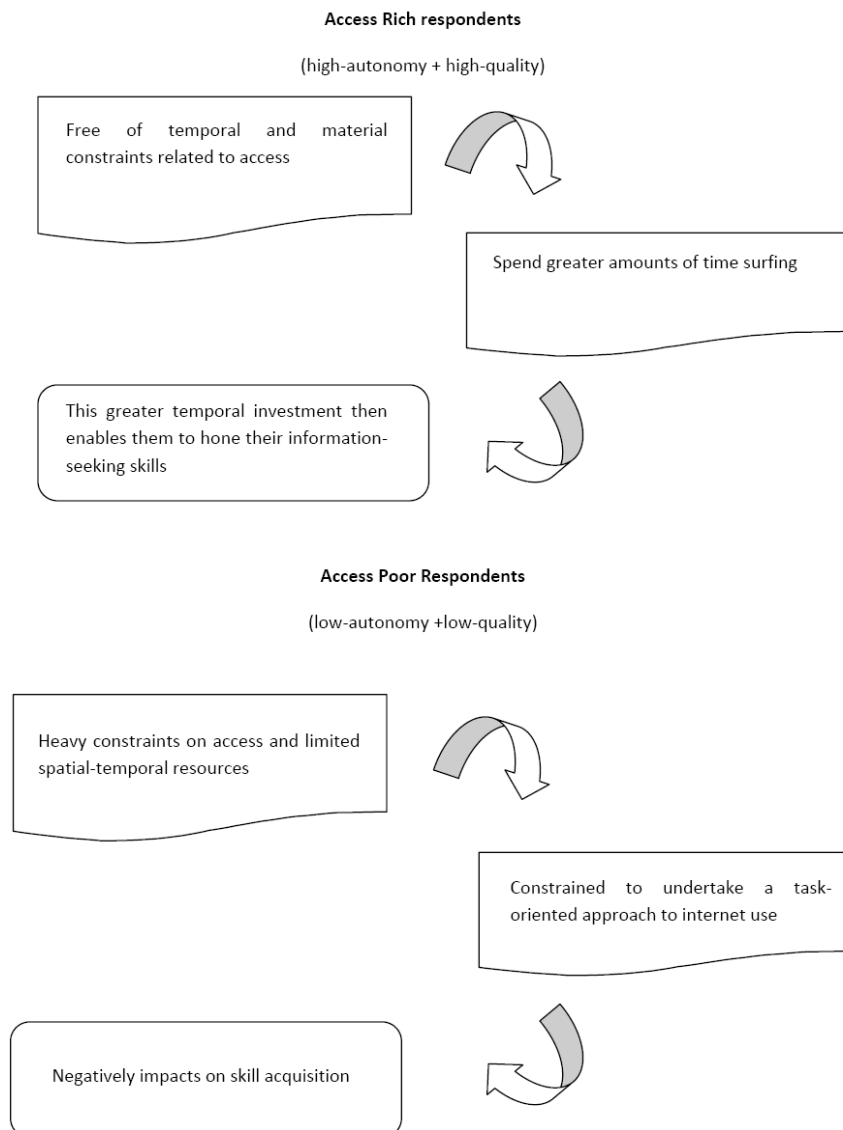
(4) The data was collected for the first time in 2009.

Note: Individuals may have selected more than one activity. Due to rounding, figures may not add to the stated totals.

²² Robinson, Laura (2009), "A Taste for the Necessary", Information, Communication, and Society Volume 12, Issue 4 June 2009, pages 488 - 507, Routledge.

In addition, Robinson also found that constraints, opportunity costs, and social pressures, in turn, shape respondents' attitudes towards appropriate use of IT. The outcomes for those students who had rich or poor access opportunities are illustrated in the diagram below.

FIGURE 4: Dynamics of ITC Access



The diagram above from Robinson's research shows that the 'divide' needs to be conceptualised as more than just access to ICT. Rather, it is the wider environmental factors within a community that lead to usage of ICT being 'access poor' versus 'access rich' – and it is this dichotomy that is more of a problematic 'divide' than access. Robinson's point is that access to ICT alone does not define nor solve the divide.

Ultimately, for 'access poor' students, access to the net did not provide the same benefits per unit of time as it did for their more 'access rich' counterparts. A majority of the 'access poor' students in Robinson's study indicated a keen awareness of the importance of the internet for their schoolwork, despite a host of spatial-temporal constraints.

Access poor students reported that the time, emotional energy and economic resources needed to obtain basic internet access caused them stress. Their experience led them to the conclusion that despite their efforts, sometimes their strategies would fail and leave them unable to do their work.

Other problems identified by Robinson included: old and slow computers; breakdowns associated with low quality second hand equipment; competing with others for time on shared equipment; and a budget that *at best* could afford only slow internet speeds (dialup). This finding has some resonance with Van Dijk's observation of a likely link between those that report their use of the net as occasional and the quality of access these people have to digital technologies. She suggests "many people assumed to be included are in fact non-users".²³

Respondents to Robinson's research who enjoyed high-quality home internet access see a positive relationship between web surfing and learning. While high-quality access respondents frame surfing as being globally beneficial to the learning process, no and low-quality respondents do not see this connection as relevant to their immediate needs. Rather, they describe being goal-oriented agents who must focus on task-specific internet activities and give consideration as to how they will appropriately allocate their limited resources. For example, in a 'search skills' test, the high-access respondents displayed much more sophisticated skills than the low-access counterparts. The low access ones worked just as hard, but did not enjoy the same outcomes because they lacked the skills to perform targeted searches. Not only did these respondents have less time to go online but they were less likely to use that time effectively.

These differences lead to web access being seen as 'investment' by the 'access rich' population versus web access seen as a 'luxury' by the 'access poor'. This is an important point as in a developed country where access to ICT is available there may be other sources of digital division that are not attributable to 'lack of ICT resources' alone. Qualitative differences are important – disparities in access between more privileged and less privileged users are every bit as consequential in the gap between users and non-users in terms of the benefits accruing to internet usage. There is a relationship between different levels and forms of constrained physical access, attitudes towards the appropriate use of information resources, and information-seeking skills. There is a complicated interplay between digital inequality and other forms of disadvantage.

The World Internet Survey results published by AUT echo these ideas as the data show a strong relationship between income and internet behaviours and attitudes. The following examples are given in New Zealand dollars:

- Only 30 per cent of households earning less than \$25,000 rate their ability as very good/excellent, but for households earning more than \$100,000 well over twice that proportion (70 per cent) rate themselves that way
- 42 per cent of households with an income under \$25,000 rate the internet as important, with the comparable figure for households earning \$100,000 or more being 76 percent and
- The highest wage earners are among the most likely to rate the loss of the internet as a problem, with 75 per cent of households earning over NZ\$100,000 holding this view. Whereas people of different ages have similar opinions about this issue.

Internet and everyday life of the community

There is a need to situate internet practices in the context of a community's everyday lives. In recent years in Malaysia government policies and programmes gave determined support in promoting the usage of ICT across the general population. In a 2008 review of one such programme for rural

²³ Van Dijk, J. (2005) *The Deepening Divide: Inequality in the Information Society*, Sage, Thousand Oaks, (p.32)

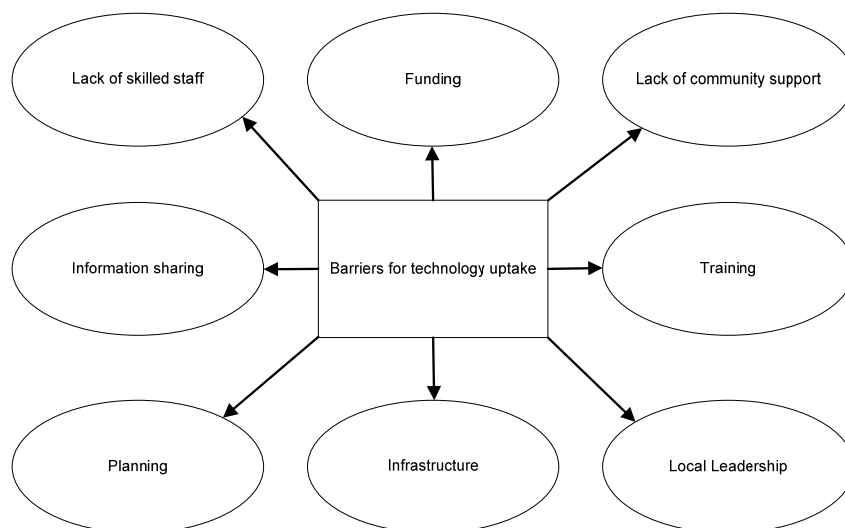
communities,²⁴ the findings indicate that people were likely to believe that the ICT centre could be more than a place for using computers and connecting to the internet – these facilities could serve as a public space for community interactions. This finding suggests that ICT ‘hubs’ can be established to create public spaces that shape the ideas and actions of the community members by providing technical assistance and resources essential to meet the community needs. In addition these spaces can offer a common ground for community members to socialise comfortably. Further, this finding suggests that an ‘under privileged’ community might consider using an ICT hub in other ways that foster the building of a local community and sustain positive development outcomes. Overall the research suggests the ICT programme facilitated more positive outcomes than were initially expected for the rural ‘telecentres’ and it is fair to conclude this finding might also be presented if similar programmes were implemented in New Zealand.

The second hypothesis underpinning the Malaysian project: *“The ICT awareness among community members will influence their ability to adopt ICT in their everyday life”* was supported in the analysis of results. This supports the idea that a high level of ICT awareness and technology integration among community members will influence their ability to adopt ICT in their everyday life. An under-served community can be ready and able to adopt ICT if:

- Most of the members of the community are adequately supportive and they are willing to participate in ICT initiatives
- The local community places an appropriate emphasis on the integration of ICT and
- The local leadership is willing to lead local ICT initiatives.

Further, community members were aware that the successful expansion of ICT, and bridging of the digital divide in the local community, critically required social support to overcome the barriers of integrating technology for the purpose of local development. Components of influence are modelled in the diagram below.

FIGURE 5: Influences on Access and Use of ICT



²⁴ Zulkefli bin Ibrahim, Ainin Sulaiman, and Tengku M. Faziharudean, *The Roles of Community Based Telecenters in Bridging the Digital Divide in Rural Malaysia*, World Academy of Science, Engineering and Technology 46 2008, <http://www.waset.ac.nz/journals/waset/v46/v46-62.pdf>

The findings from the Malaysian research support the conclusion that the prospect of success in projects is likely to be affected by a combination of internal and external elements. These include central and local government and local support for fostering exposure and promotion of ICT to the local community; support of ICT projects from the local community; and local leadership. These requirements are key ingredients of any sustainable community development programme.²⁵

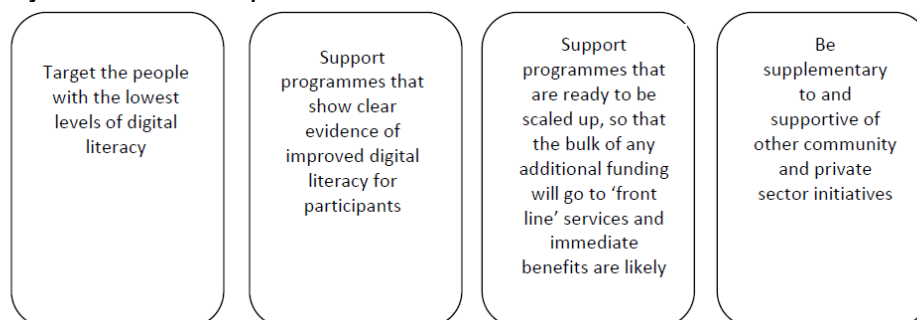
The internet in the everyday life of New Zealand communities

The NZ data presented earlier seem to point to trends in the user population. Despite some data being out of date or relying on small sample sizes, there is enough data to indicate differences in the New Zealand population based on income, access and use. This raises important questions for example:

- Is the population is moving *uniformly* in the direction of increased access and use?
- Are some population groups, such as ethnic minorities and people with a disability, being 'left behind' as more the divide sophisticated users move on?

The Ministry of Economic Development presented a report to the Minister for Communications and Information Technology in 2009 that aimed to summarise the case for improving digital literacy in NZ.²⁶ The report concluded that “market incentives for private sector investment to increase digital literacy in the most under-served populations are weak”. Ministry of Economic Development (MED) felt this was a gap that government interventions should be required to address. In an attempt to fill that gap they described a four point criteria for intervention (see diagram below).

FIGURE 6: Ministry of Economic Development’s Criteria for ICT Interventions



Success criteria for New Zealand community based ICT interventions

In presenting this advice, MED assessed four programmes that were ‘active’ in the community: the Computers in Homes project, the Computer Clubhouse programme, the Aotearoa Peoples Network (APN) and the Ngatiwai communications project. In MED’s view, all four were examples of successful digital connectedness intervention initiatives. This assessment was based on “high levels of participant engagement” and “good value for money”.²⁷ This definition of success excludes socio-economic outcomes by focusing on access and usage metrics. If we are to promote ICT initiatives as leading to socio-economic outcomes then evidence should be available that supports this mainstream assumption within the voluminous ICT literature.

²⁵ Research and Evaluation (2011) Sustainability in Community Organisations: A literature review, Department of Internal Affairs, DMS 2611786 DA

²⁶ “Mechanisms for Improving Digital Literacy” report to Minister of Communications and Information Technology, Ministry of Economic Development, 23 May 2009

²⁷ Ibid.

The review did not find examples of self-sustaining, self-funded projects that had begun as a local or central government initiative. However, criteria that address indicators of sustainability would also be useful. Whilst most 'successful' projects aimed to be self-sustaining, the community often struggled to achieve this objective. Crump²⁸ points out that without a 'project champion' to give their time to help and motivate the community, a project will struggle to survive. Day²⁹ proposes a useful framework for planning and assessing ICT projects. He asserts that communities need to be empowered before they can campaign for their own interests, and influence community policy. His framework aims to create a 'democratic community planning agenda' by defining the critical criteria for successful and sustainable community ICT projects. A table describing the framework in more detail is as follows:

TABLE 3: Framework for the democratic design of ICT initiatives³⁰

Toward Democratic Community	<ul style="list-style-type: none"> Seek initiatives that embrace community values, solidarity, participation and coherence Promote community development through the empowerment of citizens to define their own needs Relate goals and outcomes to the needs of communities and citizens Identify community need through sustained and meaningful dialogue between citizens and service providers, and develop activities and services that meet it Give priority to the needs and interests of a community's socially excluded citizens
Toward Democratic Politics	<ul style="list-style-type: none"> Avoid policies that establish authoritarian or elitist social relations Ensure initiative and independence to encourage participatory community action to achieve goals Contribute to public space for shared communications that facilitate inter/intra-community conviviality Recognise and celebrate diversity of opinions and beliefs, values and cultures and avoid policies that promote intolerance and disrespect
Toward Democratic Work	<ul style="list-style-type: none"> Promote self-actualization through activities and services that stimulate lifelong learning and active citizenship Invest in social capital by promoting common community interests and concerns Seek to stimulate both social and formal economies of local communities
Securing Democratic Sustainability	<ul style="list-style-type: none"> Enable meaningful engagement with groups and organisations active within local communities through the development of tripartite partnerships Promote social innovation by harnessing the indigenous knowledge and creativity of communities with the resources and expertise of public, private and third sectors Develop a sense of community identify and ownership (essential to sustainability)
Embracing Community Participation	<ul style="list-style-type: none"> Promote universal participation Seek 'local' technological flexibility and 'global' technological pluralism

In comparison to Day's framework for success, measurement and monitoring based solely on a two point criteria as presented by MED seems inadequate. Indeed, O'Neil pointed out that whilst it is generally agreed that measurement of community ICT projects is important, the reality is somewhat

²⁸ Crump, B., & McIlroy, A. (2003). The digital divide: Why the "don't-want-tos" won't compute: Lessons from a New Zealand ICT project. *First Monday*, [online] Volume 8 Number 12 , 1-20. Retrieved December, 24, 2006

²⁹ Day, P. (2004). Community (information and communication) technology: Policy, partnership and practice. In S. Marshall, W. Taylor & Y. Xinghuo (Eds.), *Using Community Informatics to Transform Regions*. Melbourne, VIC: Idea Group.

³⁰ Day, P. (2004). Community (information and communication) technology: Policy, partnership and practice. In S. Marshall, W. Taylor & Y. Xinghuo (Eds.), *Using Community Informatics to Transform Regions*. Melbourne, VIC: Idea Group.

more ad-hoc.³¹ While undertaking a meta-analysis of community ICT projects, she identified five key outcomes they generated:

- Strong democracy
- Social capital
- Individual empowerment
- Sense of community
- Economic development opportunities.

In comparison to approaches with fewer categories for success, these alternative models offer a comprehensive regime of measurement criteria. The inclusion of multiple criteria suggests a greater recognition of the complex and interconnected dynamics that underpin community development.

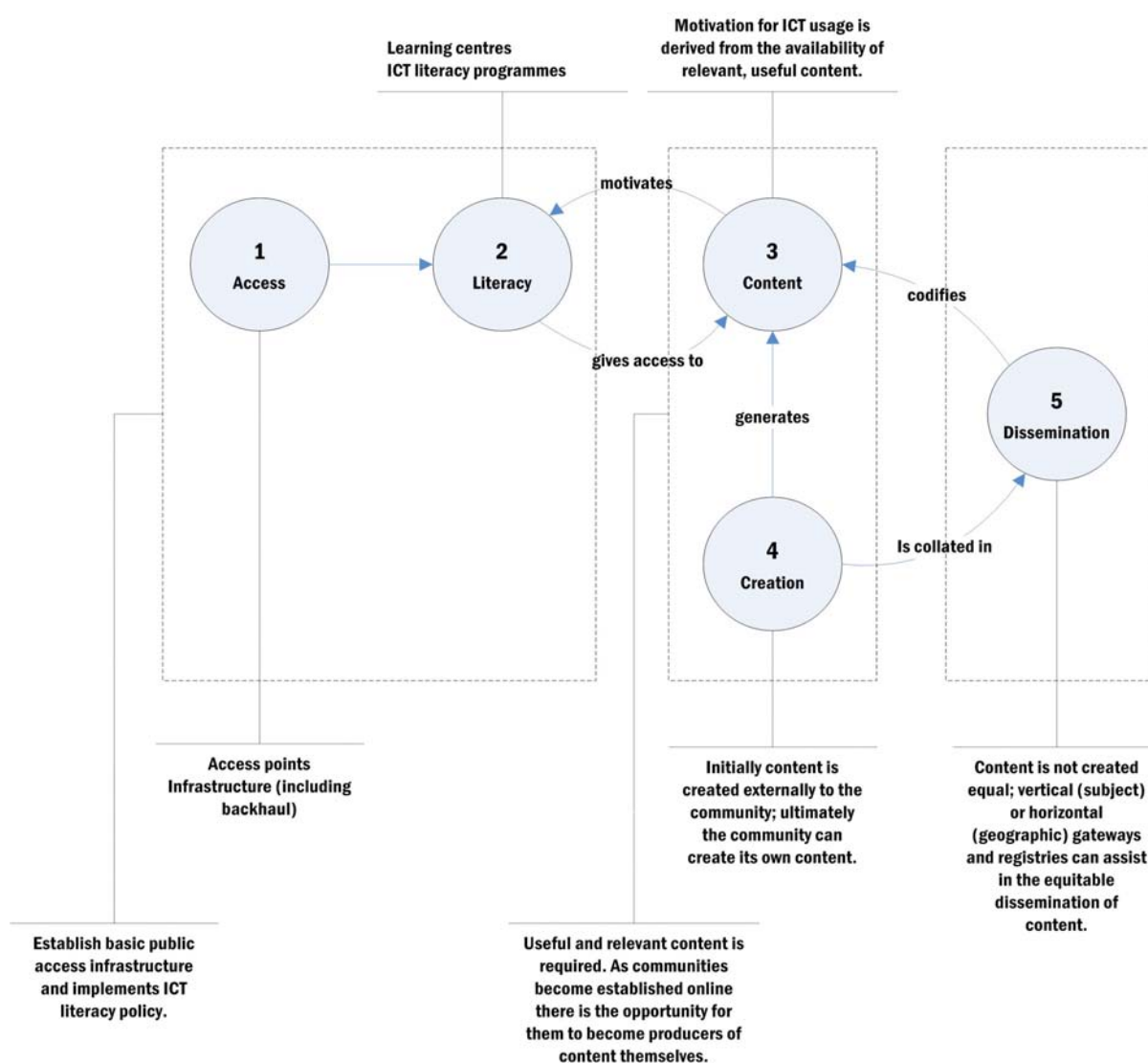
³¹ O'Neil, D. (2002). Assessing community informatics: A review of methodological approaches for evaluating community networks and community technology centres. *Internet Research: Electronic Networking Applications and Policy*, 12(1), 76-102.

Readiness factors for Digital Connection

The literature does not directly identify the factors required for a community to be 'ready' for ICT initiatives. There is general agreement that a certain standard of education is required for any ICT intervention to succeed – indeed, literacy, and basic communication skills are assumed in many projects.

Williamson has attempted to develop a five-stage model for community ICT engagement that takes into account the dynamism and differences within and between communities.³² This model seeks to assess the current 'maturity' of a community to uptake ICT, as well as provide a multi-stage framework for establishing a community ICT maturity. This model can be useful for assessing and developing community informatics issues and processes within individual groups (such as Māori and Pacific Islanders) and communities and as a way of mapping progress within a wider community, city or regional setting.

FIGURE 7: Five-stage model for community informatics (Williamson, 2004)



³² Day, P. (2004). Community (information and communication) technology: Policy, partnership and practice. In S. Marshall, W. Taylor & Y. Xinghuo (Eds.), *Using Community Informatics to Transform Regions*. Melbourne, VIC: Idea Group.

Williamson's model shows that Stage One to Stage Four occurs within communities; they are not necessarily a formal process and are not entirely dependent on each other. The requirements and relative importance (or even existence) of a stage is related to the maturity of ICT usage. In other words each of the four stages, whilst to some degree reliant on its predecessor, does not require that prior stages are, or were, formalised or even articulated (there is likely to be a continuum between a *laissez-faire* approach and formal strategy or policy initiatives). Stage Five exists as a meta-stage, occurring beyond community boundaries. This and other models draw on Gurstein's concept of the 'effective use' of ICT. This is as the capacity and opportunity to successfully integrate ICT into the accomplishment of self or collaboratively identified goals.³³

The capacity and opportunity to successfully integrate ICT into everyday life is attractive but we need to understand the political economy of the digital divide as much as the socio-economic sphere. Kearns has pointed that we need to consider that ICT does not exist in a vacuum and that technology is not politically neutral. He says the value of any technological intervention critically depends on the broad social and cultural values that are embedded within it.³⁴ Ultimately the use of technology in a community setting will be driven by that community. A cautious approach needs to be adopted according to Kearns if the proposal is to source ICT based community development models and plans developed in one context and implement them in another location.

Some critiques

The literature surrounding digital connectedness is not all supportive of such initiatives. Indeed a growing body of work offers much scepticism of such interventions and asks 'what makes the digital divide so worthy of attention?' This is an important question as it gives an insight into why certain types of interventions have been tried over others and why despite many instances of failure they continue to be implemented. Though these critiques make reference to the international divide, it is equally applicable and worthy of consideration in the New Zealand context.

Luyt³⁵ suggests that the even though the 'gap between ICT access in the developed and developing countries' is on the agenda at international conferences this may not reflect the intrinsic importance of that gap to world affairs. What it does reflect is a convergence of interests that are able to collectively set the political agenda in such a way that the digital divide is now seen as a serious and important social problem. As in the past, elites in the 'global South'³⁶ are actively involved in seeking lucrative roles as intermediaries in a global economic structure dominated by the developed world.

The discussion about new forms of information technology and digital divides helps to secure state legitimacy and revitalises the notion that development is achievable within the parameters of the current global economic system. ICT appeals to the people of the South, or at least to the middle classes of the South, as an avenue of upward mobility and as a means by which they or their descendants can achieve economic prosperity and social advancement.

'Information-theoretic' economics concepts were popularised by the World Bank during the 1990s. For Luyt, these concepts provided the 'missing link' for development in the neo-liberal age. The basic premise is that although markets are the most efficient means of organising the material operations of

³³ Gurstein, Michael. "Effective use: A community informatics strategy beyond the Digital Divide" *First Monday* [Online], Volume 8 Number 12 (1 December 2003), page 9.

³⁴ Kearns, I. (2002). *Code red: Progressive politics in the digital age*. London, UK: IPPR.

³⁵ Brendan Luyt, *Who benefits from the digital divide?* *First Monday*, Volume 9, Number 8 – 2 August 2004.

³⁶ The North-South Divide is a socio-economic and political division that exists between the wealthy developed countries, known collectively as "the North", and the poorer developing countries (least developed countries), or "the South". Eg: <http://www.talktalk.co.uk/reference/encyclopaedia/hutchinson/m0030871.html>

a society, they are difficult mechanisms to perfect. In many cases they fail due to a lack of appropriate information on the part of market participants. In such cases planned intervention by non-market agents such as governments becomes an essential means to attain the ultimate goal of an efficient market.

This legitimised international and regional 'development' activity without contradicting fundamental neo-liberal tenets (superiority of the market, minimalist government intervention, primacy of the private sector, etc) and without introducing uncomfortable notions such as power and class that would constitute a truly radical critique of the current global economy.

On the back of this shift came an emphasis on ICT. If provision of information was now the core of 'development' then the tools by which this information could be disseminated and manipulated became of vital importance. From the mid-90s onwards increasing numbers of reports and case studies on 'IT for development' began to circulate and the concept of an international digital divide came of age.

Frequently, policy discussions surrounding the digital divide focus attention on target populations defined as lacking access to, or perhaps the skills needed to use, ICT. Projects and programmes are designed to benefit these groups. However, the range of policies required to tackle the digital divide is likely to be broad and various. What is required is a focus on constructing the digital divide as a policy issue. In this sense the policy framework would address more than access, skills or even content, it would offer solutions that tilt the balance of benefits away from those already privileged (information capital, the state, and the development/social entrepreneur industry) towards those currently excluded from not only new information and communication technology but the basic requirements of a dignified human existence.

A common theme in the literature relates to the identification of the nature and the extent of the divide and the risks inherent in exclusion of population groups if they do not have access. To a lesser extent the literature contains discussion on content (what is being accessed), and the extent and type of application of usage. The research on 'non-users' is scarce.

New Zealand case study – Smart Newtown Project

Crump and McIlroy reviewed the Smart Newtown Pilot Project to address the question of 'what if a community has access, but doesn't use it?'³⁷ That particular residential based project seemed to tick all the right boxes in regard to being a 'successful' intervention. The residential intervention followed what is thought of as the 'classic' model with 'Third Place' characteristics³⁸ including:

- Neutral place – away from home and work, where people feel comfortable and can come and go at will
- Little interference from host
- Social inclusion in terms of membership/participation
- Stimulating connection with others
- Accessibility in terms of hours and locations
- Frequency of regulars.

The evaluation of the Newtown project indicated it failed despite attempts to create easy access to ICT in a neutral socially inclusive environment. The findings suggested a key factor in its failure was a lack of motivation to use the ICT. Under-use of the available resource could be a result of the

³⁷ The digital divide: Why the "don't want tos" won't compute: Lessons from a New Zealand ICT project, Barbara Crump and Andrea McIlroy

³⁸ Crump, B., & McIlroy, A. (2003). The digital divide: Why the "don't-want-tos" won't compute: Lessons from a New Zealand ICT project. *First Monday*, [online] Volume 8 Number 12 , 1-20. Retrieved December, 24, 2006

initiative not being 'sold' persuasively enough when the project first started, a high turnover of residents in the apartments and other more important demands on their time.

Not all people want to be users of ICT or believe it beneficial to their lives. In other words, not all the 'have-nots' want to be 'haves'. The Department of Labour have made use of the investigation by Wyatt, et al. (2002) and the research finding that identified four types of non-users:³⁹

- 'Resisters' – people who have never used the internet because they do not want to
- 'Rejecters' – those who have stopped using the net
- People who cannot gain access to the net and are considered as socially and technically excluded
- Those who have stopped using the net involuntarily because of cost or loss of institutional access.

Social exclusion

Loader and Keeble⁴⁰ examined current evidence on the effectiveness of public access centres and related community informatics (CI) initiatives. Their focus was on initiatives which aimed to provide better access to information and communication technology for people who experience social exclusion. Through a comprehensive examination of worldwide research, they attempted to identify the potential strengths and weaknesses of a range of initiatives. Their report is divided into five areas that typically represent the components of such projects:

- Physical access and connectivity
- Computer skills and literacy
- Economic regeneration
- Civic participation and
- Diversity, difference and social exclusion.

Their findings support the general consensus amongst CI practitioners that any 'intervention' needs to take into account various community complexities which include cultural, economic, infrastructural, educational, and political dimensions. Failing to acknowledge and address one or all of these complexities can lead to a widening of the digital divide between those in society who are already 'under privileged' and those who are considered not to be. They acknowledge a lack of robust data and the impact its absence could have on informing the future planning of initiatives. This literature review suggests there has not been much progress in building this body of research.

'Hard to Reach' communities

This literature review found a lack of research into New Zealand's 'hard to reach' communities and the strategies that could help address the digital divide. What follows below is a summary of the available credible information.

Māori and ICT

The literature review found few contributions in recent years on Māori and digital development. Early last decade discussions about ICT and Māori tended to focus on access to technology and its benefits; concern about the digital divide; and concern about Māori control over their intellectual property. It was at this time that Te Puni Kokiri defined the growth and development of ICT as a matter of great interest to Māori and commissioned a 2001 report *Māori Access to Information*

³⁹ Community Employment Group, Department of Labour, *Connecting Communities: A Strategy for Government Support of Community Access to Information and Communications Technology*. 2002

⁴⁰ Loader, Brian D. and Leigh Keeble (2004). *Challenging the digital divide? A literature review of community informatics initiatives* Joseph Rowntree Foundation.

Technology. This research was intended to identify the extent of people's access to the technology. In addition to this report there were other activities that show a heightened interest in ICT and Māori, for example, the establishment of the New Zealand Māori Internet Society and the Aotearoa Māori Internet Society (AMIS).

Another report commissioned by Te Puni Kōkiri in 2001: *The Digital Divide and Māori* highlighted the fact that Māori "own fewer computers than non-Māori, use the internet less, are less likely to be employed in occupations that use computers, and are not likely to train to be IT specialists".⁴¹ The report goes on to say that these facts amount to a 'digital divide' that will only grow as the requirement for digital knowledge and IT skills increase within the modern economy. Despite its age, the report, prepared by Infometrics, raises some important points that are relevant to current discussions. The report finds that there is an argument for a need to close the digital divide, but "it isn't clear that spending on computers and computer skills is the best way to do this". They asked three key questions:

- What is the gap that we actually want closed?
- Do people actually want this gap closed?
- If we identify the gap, and we know those targeted want it closed, is spending justified?

The report argues that the digitally based divide is better understood as a gap of income and education. Those on higher incomes and better education seem also to have higher and better access to digital technology. Access to computers will help bridge this gap but not by itself. The report suggests that closing this 'gap' might be best achieved by a focus on general education. Secondly, the report suggests that we need to be aware of the needs of those we are trying to help. It suggests that there may be Māori who we identify as lacking access to digital resources but who may choose not to access ICT and may well reject it. The observation that there are different types of users correlates with the category of non-users in Wyatt's model of 'Resisters'.⁴²

Understanding the differences amongst users and non users assists in the development of ICT initiatives that suit a community's particular needs. Not all people use ICT in the same way or for the same reasons so a 'one size fits all' solution will not work for every community. The Infometrics report also argues that even if a gap is identified and a community is singled out for targeted intervention, the public spending on an ICT digital divide project may still not necessarily be justified. They recommend that "a case must be made that [the community] cannot 'bridge the divide' themselves, or with the assistance from the business community, and if they cannot, that the benefits of the spending exceed the costs".⁴³ The report concludes by suggesting that any spending on closing the digital divide must be balanced by the fact that the money could be better spent on education or health and that these interventions may have as strong or stronger impact on closing the digital gap in the longer term. It is well evidenced that health and education status has a correlation to an individual's income and life outcomes. In summary, the authors suggest that educators should be the principle targets for funding ICT.

With the exception of AUT's World Internet Project, since the early 2000s there has been limited new research on the topic of Māori and the utilisation of internet/digital technologies. The AMIS, for example, no longer exists. According to a previous chairman the group lost relevance as Māori became suitably digitally connected and represented. In addition, he commented that "much of the

⁴¹ *The Digital Divide and Māori*, Report for Te Puni Kōkiri prepared by Infometrics Ltd, 2001.

⁴² Crump, B., & McIlroy, A. (2003). The digital divide: Why the "don't-want-tos" won't compute: Lessons from a New Zealand ICT project. *First Monday*, [online] Volume 8 Number 12 , 1-20. Retrieved December, 24, 2006

⁴³ *The Digital Divide and Māori*, Report for Te Puni Kōkiri prepared by Infometrics Ltd, 2001, page 2

grassroots knowledge of Māori digital achievements was only recorded in personal emails and blog postings”.

There is published research on the use of ICT and language and Māori educational participation (⁴⁴Te Rito and Nuku 2010; ⁴⁵Lomax and Lemon Demographic Impacts: ICT Education in Rūmaki Reo 2007; ⁴⁶Laws, Mark (undated); ⁴⁷Benton 1992).

Our exploration of the literature seems to suggest that Māori have not seen the need to pursue a line of inquiry about their preparedness for digital initiatives, perhaps because there is ample evidence to indicate iwi Māori in particular have embraced these developments and were indeed early adopters of ICT.

In the absence of published knowledge about the operations and activity of Māori and ICT we can return to the community development literature and the generic models of how that development occurs. The following three examples of Māori development models are well known, particularly to practitioners in the health sector.

Te Whare Tapa Whā: Mason Durie

The four cornerstones (or sides) of Māori health are whānau (family health), tinana (physical health), hinengaro (mental health), and wairua (spiritual health).

Te Wheke: Rose Pere

Another model of Māori health is based on Te Wheke, the octopus and the eight tentacles that collectively contribute to waiora or total wellbeing.

Te Pae Mahutonga: Mason Durie

Te Pae Mahutonga (Southern Cross Star Constellation) brings together elements of modern health promotion. In the model the four central stars of the Southern Cross represent four key tasks of health promotion:

- Mauriora (cultural identity)
- Waiora (physical environment)
- Toiora (healthy lifestyles)
- Te Oranga (participation in society).

Many principles within the models of Māori community development closely resemble ‘successful’ methodologies identified in projects set up to tackle the issue of the digital divide. It is likely that projects aimed at closing the digital divide would align well with Māori community development models. Indeed, the Te Whakamotuhakitanga Hapu Strategy for community development, which is designed and implemented as an integral part of the Department of Internal Affairs’ engagement with

⁴⁴ Te Rito, Joseph Selwyn, & Nuku, Pareputiputi, *Using ICT To Enhance Maori Language Teaching*, ICT for Language Learning Conference, 3rd edition

⁴⁵ Lomax, Terri C, *Demographic Impacts: ICT Education in Rūmaki Reo*, Ruth Lemon 20th Annual Conference of the National Advisory Committee on Computing Qualifications (NACCQ 2007), retrieved from <http://www.naccq.ac.nz/conferences/2007/141.pdf>, (28/3/11)

⁴⁶ Laws, Mark R, *Development of a Māori Database for Speech Perception and Generation*, Retrieved from http://www.aut.ac.nz/resources/maori_synthesiser.pdf

⁴⁷ Benton, Richard A, *Combining Medium and Message: An Electronic Communications Network for Maori Language and Education*, NZCER / AARE Joint Conference 1992 Symposium On Maori Education. Te Wahanga Kaupapa Maori New Zealand Council for Educational Research.

Maori communities, is an excellent framework to consider in any future discussion about the integration of ICT and community development with Maori communities.

Pacific peoples and ICT

As is the case with Māori, there is also little published research knowledge about the operations and activity of Pacific people and ICT. In this absence we need to turn to the community development literature and the generic models of how successful intervention has previously taken place. The AUT survey⁴⁸ referenced earlier in this report indicated that increasing amounts of Pacific people are using the internet. However it does not show how/what they use it for, nor does it show if there is any socio-economic mobility in the population(s) as a result of the overall increase.

Pacific peoples' identities and perceptions of life are often formed through the perspective of the collective, not the individual. The interconnectedness between the individual, family and community and the holistic links between the mind, body, environment (social and physical) and spirituality are typically key cultural values, beliefs and practices among Pacific peoples.⁴⁹

To be effective, it is important to consider the cultural context within which Pacific peoples generally view the world and to be mindful of the significant role that the family and community play in peoples' lives. What this means in terms of ICT interventions is unclear. It suggests that any intervention needs to be a consultative process with the larger Pacific community that is being targeted, to understand the specific and unique considerations for each group of Pacific peoples. It is also important to understand in this context that 'Pacific peoples' is a catch-all phrase that does not show that different groups, for example Tongans, Samoans, and Fijians, have different cultural and social norms. Any intervention with Pacific people needs to recognise these cultural and social differences.

Rural communities and ICT

The literature notes that there are four main factors affecting ICT provision in rural New Zealand: political; economic; social; and technological.⁵⁰ Each factor has a variety of issues which need some consideration when planning and implementing an ICT initiative. In general, rural communities have experienced poor digital technology and this affects broadband uptake in rural areas. The monopoly of telecommunications infrastructure by one company; high costs; and residents' lack of knowledge of satellite broadband availability in rural areas have contributed to the rural digital divide.

According to the AUT survey,⁵¹ the percentage of internet users with a broadband connection at home has increased for those living in rural areas of New Zealand. The largest increases were for those living in minor towns and rural areas. The proportion of those in minor towns with broadband access showed a great increase from 51 percent in 2007 to 79 percent in 2009. Broadband also rose steeply in rural areas, from 45 percent to 67 percent in those years. Comparing statistics for rural

⁴⁸ Bell et al., *The Internet in New Zealand 2007-2009*, World Internet Project NZ, Institute of Culture, Discourse & Communication, AUT University 2010. [available online - <http://www.aut.ac.nz/research/research-institutes/icdc/projects/world-internet-project>]

⁴⁹ Robinson, G., Warren, H., Samu, K., Wheeler, A., Matangi-Karsten, H., & Agnew, F. *Pacific healthcare workers and their treatment interventions for Pacific clients with alcohol and drug issues in New Zealand* [electronic version], (2006). *New Zealand Medical Journal*, 119. Retrieved 30/7/2009 from <http://www.nzma.org.nz/journal/119-1228/1809/>.

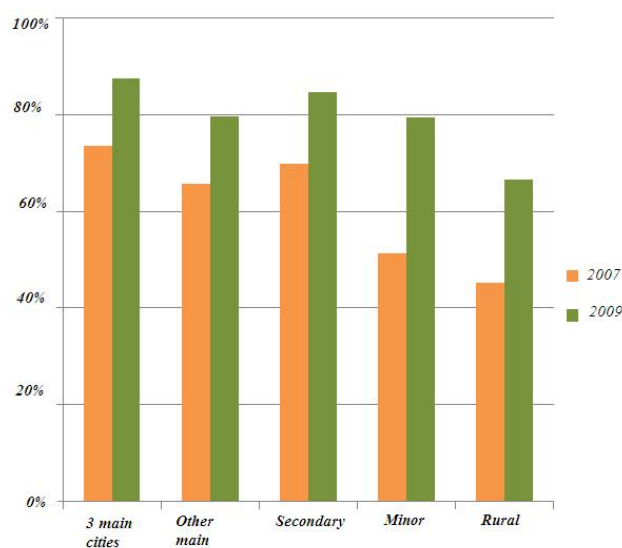
⁵⁰ Shibliq, F. K., (2008/2009, Dec/Jan), *ICT in Rural New Zealand: A Review of the Literature*. *Bulletin of Applied Computing and Information Technology* Vol. 6, Issue 1. ISSN 1176-4120.

⁵¹ *The Internet in New Zealand 2007-2009*, Bell et al., World Internet Project NZ, Institute of Culture, Discourse & Communication, AUT University 2010. [available online - <http://www.aut.ac.nz/research/research-institutes/icdc/projects/world-internet-project>]

areas and the three main cities (Auckland, Wellington and Christchurch), the figures show a slight closing of the gap where rural community broadband access grew from 2007 to 2009 but the three metropolitan areas still lead the table (See Figure 8).

The existence of a divide between urban communities and their rural counterparts is captured in a large body of literature. However, it is difficult when reading these texts to ascertain the level of divide that actually exists. Much of the rhetoric about the digital divide between city and rural is just that, according to Bronwyn Howell of the New Zealand Institute for the Study of Competition and Regulation.⁵² She writes that there appears to be a large difference between people’s perceptions of a gap, and the empirical evidence of an actual divide. Her report concludes that the data fails to support the theory that individual rural users are any slower in taking up new technologies than their urban counterparts.

FIGURE 8: Broadband Connection by Rural-Urban



Source: Auckland University of Technology (2010) ‘World Internet Project’

An important issue for a discussion about a rural urban digital divide is how to define ‘rural’ and ‘urban’. Many studies choose their own definition; therefore it is difficult to compare data and drawing conclusions from an analysis of the information is problematic. Indeed this issue is relevant to discussion in NZ where over 80 percent of the population resides in urban areas, and those that do reside in areas classified as ‘rural’ may still have strong urban ties. Communities in the main are not separated by vast distance as is the case in many large countries, for example Australia, and some New Zealanders perceptions of ‘rural’ might be quite different to others’.

OECD analysts Caspary & O’Connor⁵³ explained the challenges that exist in rural areas as:

- Remoteness: resulting in high maintenance cost and lack of electricity which impacts on the quality of ICT in these areas

⁵² Howell, Bronwyn, *The Rural-Urban “Digital Divide” in New Zealand: Fact or Fable?*, NZ Institute for the study of competition and regulation Inc. October 2000.

⁵³ Caspary, G., & O’Connor, D. (2003). *Providing low-cost information technology access to rural communities in developing countries: What works? What pays?* (Report No. DEV/DOC(2003)27): OECD. [available online -sourced February 18, 2011], <http://www.oecd.org/dataoecd/13/52/7112502.pdf>

- Low population density affecting cost. This may not be an issue in NZ, where national carriers are able to offset their increased rural service costs by sharing the costs burden with the greater urban population
- Lack of human capital, particularly technicians and ICT specialists. This is an important issue in rural communities where help for IT issues may not be close-by, unlike in the urban environment
- Low earning capacity of rural population. This is an important consideration, as data shows that higher income earners spend greater time on the internet and utilise ICT far more than lower earners.

Although rural citizens may have widespread access to the internet now, they are less likely to have broadband internet access than their urban counterparts. Nonetheless, broadband access for both rural and urban populations has increased rapidly between 2000 and 2011 since Howell's review in 2000. The main limitation of slower, dial-up internet access is that many content-dense applications and documents available from the internet cannot be quickly transferred or downloaded.

As such, it is hard to pinpoint 'factors' that need to exist within a rural community for effective uptake and success of ICT initiatives. However, there is a body of literature which says there is much work to be done on the provision of infrastructure to these communities. The same is not said for metropolitan communities, where there is evidence of access to superior digital technology and infrastructure, including fast broadband speeds.

Debates about rural ICT development include discussion of the cost of providing these services to a rural community. It is argued that because the cost is less efficient than it is for a metropolitan area the development of infrastructure is choked. These points have frequently been used in rationales for promoting the involvement and investment of governments in the development of ICT infrastructure to service rural communities.

However, the AUT World Internet Project has recently provided data that suggests that, without much local or central government intervention, the rates of broadband uptake are increasing in the rural community.⁵⁴ Based on this finding, the researchers recommend that any ICT initiative within a rural community should not be focused on provision of infrastructure alone. They concur with other researchers highlighted in this review who suggest interventions should also include political, social, cultural, cognitive and economic considerations, because these underpin community development and will allow for the effective use of the internet.

Rural community uptake of digital technologies has been the focus of various Australian based research projects because the country is vast and rural communities can be separated by distances as great as 1000km. These geographic distances create obstacles for community development because people are socially distanced and therefore have fewer opportunities to engage with other regional citizens and build identification as a community.⁵⁵

The interest in ICT community development in Australia is also driven by a premise that the digital age promotes economic opportunities. The restoration of economic prosperity to rural regions of Australia is a paramount concern for both federal and state governments due to the increasing frequency of drought and flood events that come at great cost to these communities.

⁵⁴ *The Internet in New Zealand 2007-2009*, Bell et al., World Internet Project NZ, Institute of Culture, Discourse & Communication, AUT University 2010. [available online - sourced February 18, 2011] <http://www.aut.ac.nz/research/research-institutes/icdc/projects/world-internet-project>

⁵⁵ Simpson, Lyn. Daws, Leonie. Wood, Leanne. Previte, Josephine. 'New pioneers: Rural women and communication technology' (1999) University of Ballarat [available online -sourced March 3, 2011] <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.117.3289&rep=rep1&type=pdf>.

Queensland University of Technology researchers explored the Australian based ICT rural development project literature and then asked why most rural based ICT interventions failed to revive and sustain regional communities.⁵⁶ They suggest the following must be integral to any programme of local development for it to be successful:

- Clearly specified sustainability goals
- Leveraging micro-business enterprise development off government-funded technical and human infrastructure provision, and using local industry strengths
- Learning from global experiences, whilst building on local assets
- Finding innovative business models to capitalise on new opportunities for content and applications
- Ensuring community involvement in deciding, planning and evaluating projects
- Adopting a learning approach.

People with a disability and ICT

The brief for this literature review did not mention users with disabilities as a population of interest. However, it has become clear from the literature that when attempting to understand the digital divide, it is necessary to consider the experiences of users with disabilities. The data in this area conveys the message that disabled people lag well behind other population groups regarding their access to ICT. The disparity is well evidenced in international studies and the gap between the disabled 'have nots' and able bodied 'haves' show a deep divide with little change over many years.⁵⁷

The disabled 'have nots' have recently been described by ethics researchers Wright and Wadhwa as the e-excluded.⁵⁸ Their approach has been to suggest various strategies for e-including them such as a European Union and Member States policy to make technology affordable, which includes social and cognitive resources to support the uptake of technology by people on low incomes. Wright and Wadhwa present the facts, as do several other researchers that the low income population includes the majority of disabled people.

The body of literature seems largely driven by interventions of non government actors who take a direct advocacy role to improve the access of disabled people to digital technologies. Many authors are quick to point out the ICT industry has not given adequate attention to disabled peoples' needs. In their texts there are many examples of new and useful technology, which demonstrate that, at the design phase, there was no consideration of how a person with a disability might operate the technology. Few websites, according to diversity best practice expert Michael Collins, have the operability that permit assistance technology to interface with the site, thus excluding groups such as the visually impaired from participating with the internet.⁵⁹

⁵⁶ Hearn, Greg, Kimber, Megan, Lennie, June, Simpson, Lyn, (2005) *A Way Forward: Sustainable ICTs And Regional Sustainability*, The Journal of Community Informatics, Vol. 1 No. 2 Special Issue: Sustainability and Community ICTs. [available online available online -sourced March 3, 2011] <http://ci-journal.net/index.php/ciej/article/viewArticle/201/159>

⁵⁷ *Disability and the Digital Divide: Comparing Surveys with Disability Data*, (2006) RTC Rural Institute [available online available online -sourced March 3, 2011] <http://rtc.ruralinstitute.umn.edu/TelCom/Divide.htm>

⁵⁸ Wright, D. and Wadhwa, K. 2009. Mainstreaming the e-excluded in Europe: Strategies, good practice and some ethical issues. *Ethics Information Technology*. 12. pp 139-156.

⁵⁹ Collins, Michael. 2011, *People with Disabilities Face Digital Divide* [available online available online -sourced March 3, 2011] <http://www.diversitybestpractices.com/news-articles/people-with-disabilities-face-digital-divide>

Access to technology is generally regarded as mainstream and an integral part of daily life. However, this is not the case for all groups in the community. The reality for most people with disabilities is there are a host of obstacles that prevent the inclusion of technology in their lives including the cost of purchasing assistance technology.⁶⁰ Motivation, attitudes and skills are also drivers that affect the uptake of digital technologies amongst the disabled population according to Applied Economic academics Maria Vicente and Ana Lopez. They suggest that people with disabilities lag behind the rest of the population in internet use largely because the technical barriers create a state of technical intimidation amongst users, to the extent that disabled people stop pursuing digital options.⁶¹

There is consensus amongst the authors included in this review that technology offers a powerful tool to overcome the societal barriers disabled people face, including participation in education and employment. However, they all indicate there is a long way to go before these ICT driven opportunities are readily available to a disabled population. Part of the solution for ameliorating the digital divide, according to some, is the fostering of partnerships between societal institutions and representatives of the disabled community.⁶²

⁶⁰ Rothman, Wilson. 2011, *For The Disabled Just Getting Online is a Struggle*.
http://technolog.msnbc.msn.com/_news/2011/01/21/5892186-for-the-disabled-just-getting-online-is-a-struggle (sourced March 3, 2011).

⁶¹ Vicente, Maria Roselia & Lopez, Ana Jesus. (2010) *A Multidimensional Analysis of the Disability Digital Divide: Some Evidence for Internet Use*, The Information Society, Vol 26: 1, pages 48 -64

⁶² Kearns, Taylor. 2008 *Using Partnerships to Bridge the Digital Divide within the Disabled Community*, The International Centre for Disability Resources on the Internet (ICDRI)
http://www.icdri.org/DD/using_partnerships_to_bridge_the.htm (sourced March 3, 2011).

Conclusion

Digital literacy and connectedness is seen as an essential 'life skill' in the 21st century. Links are drawn between this connectedness and broader societal socio-economic and cultural goals. Indeed it is often said that this connectedness and literacy is essential for a strong and resilient community. Flowing on from this claim, statistics indicate there are many sections of the population that do not have access to these technologies. This 'divide' between those that have access and those that do not has become more formally referred to as the 'digital divide'.

Digitally connected citizens can more easily and readily participate in the economy, access digital educational opportunities and have superior access to online government and other services. The logical implication of interventions within this sphere is that social and economic problems within a community of people can be addressed through providing means and access to ICT.

Each community project, both national and international, was motivated by a sincere attempt to improve the lives of people in the community through ICT. Many programmes ran into problems – some of which were a surprise, many of which, in hindsight, could have been anticipated. Whilst the programmes all differed in scope and application, many of the problems were similar in nature and stem from the fact that they were all too often 'cheerleading' for ICT and providing hardware (and software) without paying sufficient attention to the unique human and social systems within each community that must change for technology to make a difference.

'Access to ICT' should be thought of as embedded in a complex array of factors that span the physical, digital, human, and social resources and relationships of a community of people. Literacy, education, community and institutional structures, and language (just as examples) must all be taken into consideration if meaningful access to new technologies is to be manifested.

The digital divide that exists between those that 'have and use' ICT, and those that 'have not and do not' is marked not by physical access to ICT alone, but rather by access to the additional resources that allow people to use technology effectively for measurable improvements in their lives. Even if access were the primary concern, there is evidence that the divide in New Zealand is closing and that use is becoming a more important consideration.⁶³

The lack of access to ICT, (however we define this), does have negative impacts on life chances. We can also say the opposite is true – that those who are already marginalised will have fewer opportunities to access and use ICT. There is a danger that community interventions, though well meaning, ignore the complex and co-constitutive interrelationship between society and technology, making assumptions of causality problematic.

Our reading of the literature points to a need to distinguish between providing ICT and increasing connectedness for communities in order to achieve broader socio-economic goals, versus providing ICT and increasing ratios of connectedness due to the strong belief that lack of access constitutes in and of itself a violation of a necessity of life in an information based modern world.

Definitions of what constitutes 'success' are as numerous as the varieties of interventions reviewed. What can be ascertained is that in none of the cases examined in the literature reviewed, was there any evidence of social mobility – the idea that 'have nots' were now moving in the same socio-

⁶³ Ministry of Social Development, 2010 Social Report, Bell et al 2010. Telephone and Internet Access in the home 2007-09; Auckland Institute of Technology, the Internet in New Zealand. World Internet Project New Zealand Institute of Culture, Discourse & Communication AUT University Auckland New Zealand; Head, Marilyn (undated) Addressing the 'Digital Divide' in Aotearoa New Zealand, retrieved from <http://www.community.net.nz/hottopics/Hot+Topic+Archives/Digital+Strategy/addressing-digital-divide.htm>, 25/3/11.

economic realms of the previously identified 'haves'. In this sense, save a few individual cases, those who are marginalised in society will continue to be so - albeit now with some ICT skills in their repertoire.

Like any other intervention policy or programme, a digital connectedness project needs the key ingredient of being clear about what will constitute 'success'. It also needs to accept the limitations of this definition of success and that it may only apply to that particular project or community. There may not be universal factors of defining success.

It might be more useful to conceptualise digital connectedness within the context of 'social inclusion vs. exclusion'. That, in order to be included in the modern society, digital literacy is seen as a must. In this context, interventions are characterised by more than just a narrow ICT focus, but rather ICT becomes part of a broader package of initiatives delivered simultaneously that target this problem. This review concludes that a comprehensive intervention that is not solely focused on ICT, but that takes into account the unique characteristics of a community, has a greater chance of resulting in meaningful, sustainable community development than projects that simply seek to address such development through rectifying digital connectedness and access.

It must be pointed out that the literature is vast and it is likely that more research and reportage on digital divides could be unearthed. We are confident this review has spanned the breadth of thinking, but is limited in terms of the depth of discussion. In particular, as it relates to NZ, there is no annual data or research on Māori and Pacific Peoples' digital connectedness and usage. Since 2006 the statistical data about differences in access and use in New Zealand has come from two major sources: the Statistics New Zealand Household Use of Information and Communication Technology undertaken once every three years; and the World Internet Project New Zealand undertaken every two years.

Apart from non-research based articles and opinion pieces, we found no substantial discussion about what an intervention within the sphere of community development that reflected, or was characterised by, 'Māori' or 'Pacific' values and culture, would look like. There are some examples of research about the relationship between language/te reo programmes and ICT in relation to mainstream approaches to language revitalisation.⁶⁴

What does a digital connectedness project look like when characterised and informed by Māori cultural values and norms? What are the implications of this? There is no research in this sphere at all. To be helpful we have tried to make inferences about interventions in other sectors (such as health) and draw a bridge between Māori and Pacific initiatives within those spheres to the ICT sphere. However, due to the gap in literature, readers of this review need to accept that the links are tenuous, and not based on research of likely outcomes, but assumptions based on out-dated data or learnings from other projects unrelated to ICT. However, we felt there was merit in presenting this, as it can provide a basis for conceptualising frameworks for intervening within these communities.

Nevertheless, we can say that the scan of literature available globally in this area seems to indicate that this lack of depth is unlikely to be of sufficient importance to sway the key findings presented here for policy purposes.

⁶⁴ This is not to say organisations are not using ICT in interventions that have a Māori basis but that the research about these is not prevalent. For example the Māori language institution Te Kohanga Reo completed a project to electronically link their centres through the Internet (see. Ministry of Economic Development, Information and Communication Technologies and Social and Economic Inclusion, 2005, appendix 1. Retrieved from http://www.med.govt.nz/templates/MultipageDocumentTOC____9662.aspx..

There are factors that define a 'good' project and there are precursors that can be identified that make a community more able to take up ICT technologies. However, there is no identifiable, causal link between ICT project based interventions and increases in socio-economic outcomes within a community. Like other interventions, ICT based programmes need to make ICT relevant to the environment of the community, recognise the characteristics of the people and tailor the solution. Above all, do not focus narrowly on ICT.