The Digital Divide in Albury City

This report was commissioned by Albury City to investigate an issue known as 'the Digital Divide' in the Albury community. Both Charles Sturt University and Albury City worked collaboratively to design and implement the requirements for this investigation.

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Executive Summary

The 'digital divide' has been investigated in the Albury community through joint research with Charles Sturt University and Albury City. For this report the 'digital divide' was defined as the gap between people who have access to the internet and communications technologies (ICT) and those who do not. However, when considering the digital divide it is also necessary to take into account the ability to access technology; and the level of training and support available for its use.

The research questions for this research were:
1. How do we identify a digital divide?
2. What are the ICT services currently available in Albury?
3. Is there a digital divide in Albury?
4. What are the social, cultural and economic impacts of the digital divide?
5. What needs to be done to address a digital divide in Albury?

The data for this research was gathered from three sources: semi-structured interviews; focus groups; and telephone surveys. Six semi-structured interviews were conducted with ICT service providers; seven focus groups were conducted with groups in the community that could be affected by the digital divide; and a telephone survey was conducted with over 250 Albury residents to investigate the community's access to ICT resources and issues such as training.

The findings of this research demonstrate that elements of the Albury community experience the effects of a digital divide. For example the Glenroy and Rural East planning areas were two areas that show a different level of access to computers compared to the other planning areas for Albury City. In additional it was identified that those people older than 65 years of age are less likely to have access to a computer and the internet. Similarly those people in the community on lower income levels (less than an annual income of $44,000) are less likely to be able to access computer and internet resources. Finally those members of the community who have attained an education level of Year 9 or less are less likely to be able to access a computer or the internet.

Recommendations from this research to minimise the impact of the digital divide in the Albury community are:

1. To continue to provide community ICT resources
The hardware and software support provided to the community through Community Centres, public libraries and youth café must be continued but extended to include training and support. The Glenroy and Rural East planning areas need to be targeted in the provision of these services.

2. To provide ICT technical support and training services

People in the Albury community who have access to a computer and the internet require ongoing technical support. To facilitate this a Information Technology Support Officer should be employed to provide ad hoc support as well as scheduled IT training sessions to the community.

3. To improve access to ICT services

The physical access to current and future ICT services must be improved. In particular location of car parking and public transport must be addressed for people with mobility problems. In addition service providers must provider appropriate hardware and software to meet the specific needs of disadvantaged groups in the community. This would include voice activated software, larger screens, headsets etc.

4. To recycle redundant hardware in to the community

A program needs to be set up to facilitate the redistribution of redundant computer hardware into the community. This service could be coordinated by the information Technology Support Officer and by the use of a standard 'ghost image' to allow for easy of reinstallation in the event of any unexpected problems.

5. To improve awareness of ICT services

The providers of ICT services need to promote these to the community.

6. To facilitate access to ICT services

There needs to be greater advice and assistance in the selection of the most appropriate ICT services for the Albury community. This could be coordinated by the Information Technology Support Officer by not only providing advice but also by providing forums at community events to disseminate information.
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7. To expand the 'learning cities' concept

Greater cooperation needs to occur between the respective educational institutions to provide the highest level of teaching and training in ICT in the Albury and Wodonga communities. The Information Technology Support Officer could facilitate this cooperation between the respective educational institutions.

Contents

1.   Introduction

This research was commissioned by Albury City and undertaken as an honours project by a student at Charles Sturt University. The aim of the project was to investigate the 'digital divide' in Albury City by considering five research questions. These questions were: how do we identify a digital divide?; what are the ICT services currently available in Albury?; is there a digital divide in Albury?; what are the social, cultural and economic impacts of the digital divide? and what needs to be done to address a digital divide in Albury? This is the first project to study the implications of the digital divide for the Albury community and the outcomes provide direction for future investment in information and communication technologies in this region. The project can also serve as a model for other rural and regional areas as they investigate the digital divide.

2. Background

The term 'digital divide' has been defined by many people (Stone, 2001; Leigh and Atkinson, 2001; Lloyd and Hellwig, 2000; and Rooksby et al, 2002). Most of the definitions are similar. It is described by Arrison (2002) as "… the gap between those who have access to the internet and those who do not". The term is similarly defined by Wikipedia.org (2005): "… a social/political issue referring to the socio-economic gap between communities that have access to computers and the internet and those who do not". In addition, Wikipedia.org (2005) points out that the digital divide differentiates between groups regarding their ability to use ICTs effectively. Such groups are identified by different degrees of literacy and technical skills, as well as access to useful and quality digital content. The Digital Divide Council (2002) defined the term to encompass training, as it is generally used to "describe an individual or community's lack of access to computers, training and on-line resources".

Davison and Cotten (2003) argue that a gap in the digital divide is not only determined by access to the internet, but also by access – or lack thereof - to ICTs and media. They state that the access to the internet is only one aspect, and the quality of connection and auxiliary services, processing speed, other capabilities of the computer used, and other factors can also contribute to the issue.

It is acknowledged that the digital divide is a complex combination of variables. However, for the purposes of this report, the term 'digital divide' will be used to differentiate between those people who have access to computer and internet resources at home, and those who do not.

2.1 Barriers to accessing information and communication technologies.

The digital divide occurs when one section of society is denied the benefits of employing ICTs to access information contents, services and resources due to various inherent or outside barriers (Greco and Floridi, 2004). This section will investigate the main barriers, as detailed in the literature, that contribute to a digital divide. They include income, age, disability, gender, ethnicity and education.

2.1.1 Income

According to Servon (2002), income level affects a person's access to the internet and the use of a computer, with considerable gaps existing

between higher and lower income groups. According to data from the US Department of Commerce (2000) the percentage of households that have access to the internet is directly related to their income. For example, in the USA in August 2000, only around 19 per cent of households with annual incomes less than USD$15,000 had a computer, while 86.3 per cent of households with an annual income over USD$75,000 had a computer. Levy (1999) claims that US households earning incomes over USD$75,000 are more than twenty times more likely to have internet access than households at the lowest income levels (under USD$15,000). Similar findings (Pew Internet & American Life Project, 2001) show that 85 per cent of individuals with incomes above USD$75,000 have access to a computer and the internet, compared with only 34 per cent of individuals with incomes less than USD$20,000.

The situation in Australia is similar to that of the USA. Data from the Australian Bureau of Statistics (ABS, 2003) shows that 73 per cent of Australians with incomes above AUD$80,000 use the internet compared to just 34 per cent of those with income under AUD$40,000 (Figure 2.1)

Figure 2.1 Percentage of Australians with internet access by income
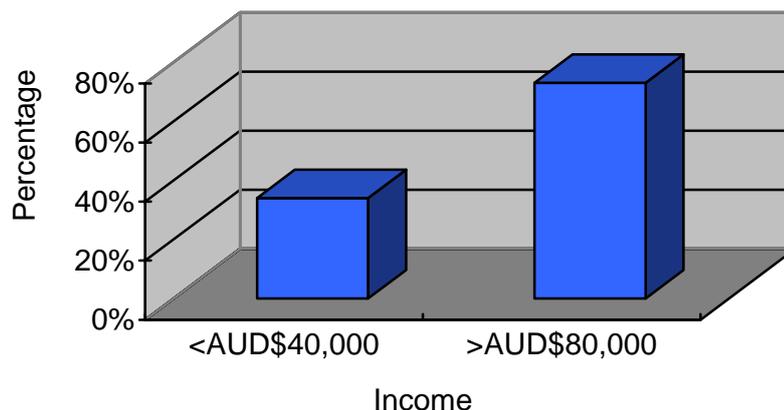
Source: ABS (2003)

Similarly, Figure 2.2 shows that more that 50 per cent of Australian households with an income of AUD$100,000 were connected to the internet compared with 6 per cent of households with income below AUD$25,000 (ABS 2003). These data clearly illustrates that the level of income is a significant factor in determining access to a computer and to the internet.

Figure 2.2 Percentage of Australian household connected to the internet by income
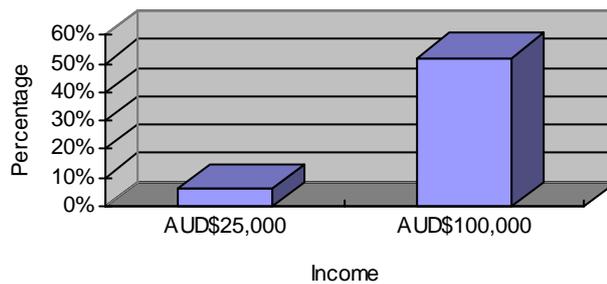
Source: ABS 2003)

Based on less recent data, but still applicable to this report, the growth in access to information and communications technologies is slower in lower income households compared to those with higher incomes (Figure 2.3). To be more specific, internet access for those with an income of less than AUD$25,000 increased from 5 per cent to 6 per cent, while those who earn incomes of more than AUD$50,000 increased from 21 per cent to 31 per cent (ABS 2003). This indicates that the digital divide is growing based on income, with those on higher incomes more likely to gain access to a computer and the internet compared to those on lower incomes.

**Figure 2.3 Digital divide due to income in Australia, between 1998 to 1999**
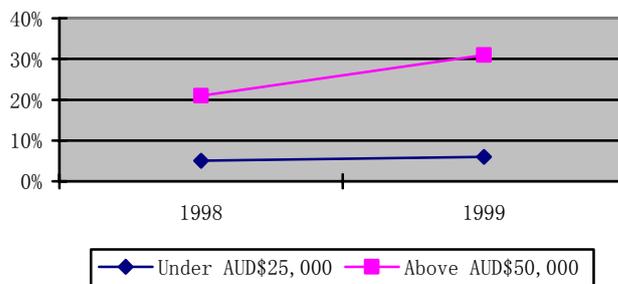
Source: Chinatownsydney.com (2000-2001)

2.1.2 Age

Gartland (2004) argues that age is also one of the 'visible' divisions related to the 'digital divide'. He believes that age differences have a profound influence on the diffusion of information and communication technologies into mainstream society. Typically, the younger generation is more willing to adopt new innovations and change compared to older generations.

Data from the US Department of Commerce (2000) clearly shows that access to the internet is inversely proportional to age (Figure 2.4).

Figure 2.4 Percentage of US individuals access on internet by age
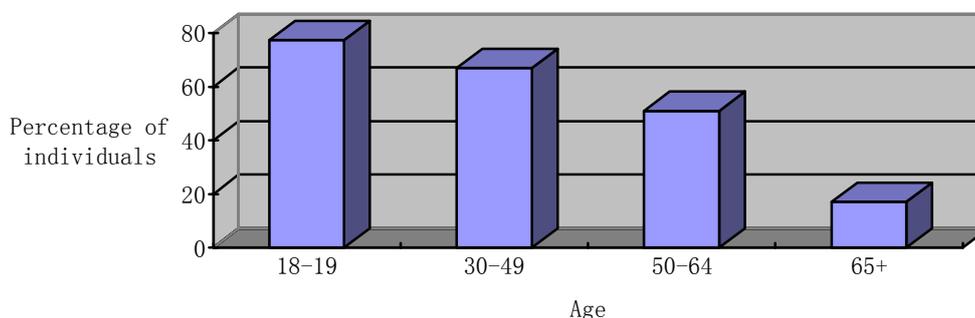
Source: US Department of Commerce 2000

According to the Pew Internet and American Life Project (2000) in the USA, 17 per cent of individuals aged 65 or older, 51 per cent of individuals aged 50-64, 67 per cent of individuals 30-49, and 77.4 per cent of individuals aged 18-29 had access to the internet. Similarly, in Australia, the gap between the elderly and the young also exists. According to the ABS, internet users in Australia are normally between 18 and 24 years of age (ABS 2002) with only 6 per cent of Australians aged more than 65 years accessing the internet (HREOC 2000).

However Morry (2002) shows that the difference between age and access to the internet is minimal except for those 65 years of age and older. Lenihan (2000) believes the issue is more complex than age alone, identifying both income and comfort in using personal computers (PCs) as indications of likely internet access.

2.1.3 Disability

Kearns (2001) believes that computers, the internet and technologies can be powerful tools in assisting people with disabilities to overcome many societal barriers because they offer the chance to "achieve personal, educational, vocational, and lifestyle goals". However, people with disabilities were 50 per cent less likely to have access to the internet than those without disabilities (NTIA 2000). The NTIA report also illustrated that 60 per cent of people with disabilities had never used PCs compared to an average of 25 per cent for those without a disability (NTIA 2000). This demonstrates that disability has a significant effect on whether people would or would not use the ICT (Stone 2001). Unfortunately, the use of computers, internet and technology often bring additional barriers to people with disabilities including their ability to use

basic equipment, their income, previous training, and language skills (Kearns 2001).

2.1.4 Gender

The effect of gender on the digital divide seems to be gradually decreasing (Lloyd & Hellwig 2000). Riley (2004) argues that females use the internet less often than males worldwide. Nonetheless, in the USA, statistics are changing as women equal or exceed the internet access of males (Figure 2.5). This change has occurred quite dramatically. In 1998, 84.5 per cent of males and 15.5 per cent of females had access to the internet, while by 2001, a small majority of women (43%) had access to the internet compared to men (41%) (Servon 2002).

Figure 2.5 Percentage of US people accessing to internet by gender
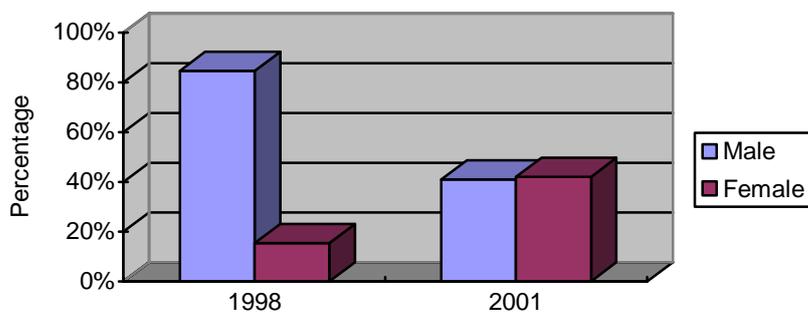
Source: US Department of Commerce

Similar trends are occurring in Australia where the gender gap of internet access is narrowing (Chinatownsydney.com 2000-2001). However, Stone (2001) argues that inequalities continue to exist as a result of gender because men and women use IT tools differently (Servon 2002). In particular, men participate more in work-related or financial online services, while women access health-related sites and local content more than their male counterparts. (Lenihan 2000).

2.1.5 Culture

2.1.5.i Language

Feldman (2004) found that lack of proficiency in the English language can be a significant issue when it comes to accessing the internet. According to Kearns (2001) much of the Web is in the English language which can present a barrier for those of a non-English-speaking background. Taik (2001) also argues that the internet has been "overwhelmingly dominated by the English language and North American culture", since the early 1990s.

However, the gap associated with language and the American dominance of the internet is shrinking. In the early days of the internet, American residents represented around 86 per cent of the 1.1 million internet users (Oudet, 1997; Nua Internet Surveys, 2000), while by 2001, English was used by only 47.6 per cent of internet users (Global Reach 2001).

2.1.5.ii Ethnicity

According to Curtin (2001), race and ethnicity also have an impact on internet access in the USA, however no similar research has been carried out in Australia. The fact that the English language continues to dominate the general and commerce websites means that a digital divide based on ethnic-race continues to exist (OECD, 2000). Bucy (2000) shows in 'Social Access to the internet' that minority groups in the USA, especially the African-American population, are much less likely to be online than the white population. It appears that this digital divide related to race has not declined. Also, according to the US Department of Commerce (2000), internet access rates rose far more slowly in groups of African-Americans and Hispanics, although the ownership of computers in all racial groups increased. from 1994-1999 (Figure 2.6).

**Figure 2.6 Percentage of US households with computers by race**
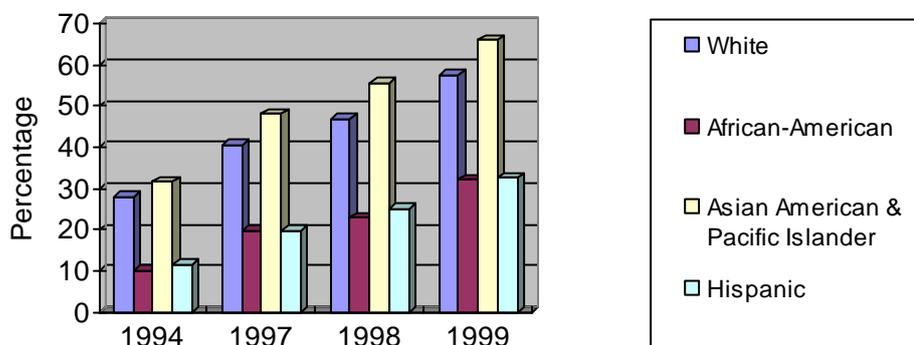
Source: US Department of Commerce 2000

2.1.5.iii Education and training

According to Curtin (2001), educational qualification is another key factor that predicts internet access, although Novak et al (2000) asserts that both income and education are the key "demographic variables" of access to the internet. Keller (1996) states that income and education are "the most likely to differentially impact the consequences of interactive electronic media for different segments in our society". In the USA it has been shown that the higher the level of education the greater the computer and internet penetration (Servon 2002). For example, only 3.1 per cent of individuals with an elementary school qualification accessed the internet compared to 48.9 per cent of those with a four-year college degree or higher degree (NTIA 2000). Australia has a similar situation as the USA where the higher the academic qualification an

individual possesses the more likely he or she is to have internet access at home (Curtin 2001) (Figure 2.7)

Figure 2.7 Australian adults with internet access at home by education level, 2000
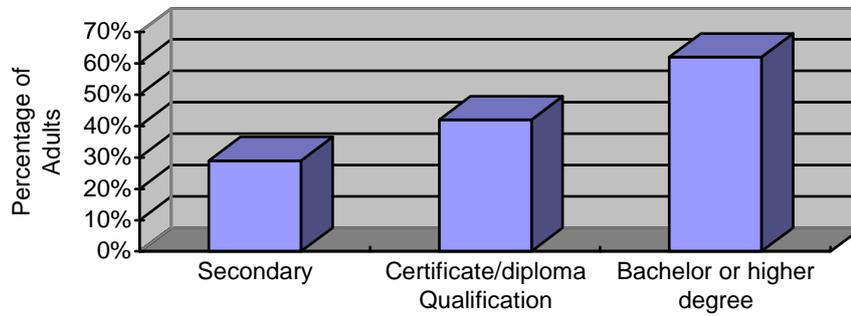
Source: KPMG Household Survey 2000 & NATSEM calculations

3.   Methodology

This section will detail the research questions and the data collection techniques used.

3.1   Research questions

This research aimed to investigate the digital divide in Albury City by addressing five research questions:

1.   How do we identify a digital divide?
2.   What are the ICT services currently available in Albury?
3.   Is there a digital divide in Albury?
4.   What are the social, cultural and economic impacts of the digital divide?
5.   What needs to be done to address a digital divide in Albury?

To address these questions a wide range of data was collected. The techniques used included an academic literature search, semi-structured interviews, focus groups and a telephone survey. The details of each of these collection techniques are outlined in the following section.

3.2   Data collection techniques

The reason for using three separate data collection techniques was to build on the information collected from the structured interviews and focus groups in order to develop and implement the telephone survey. The semi-structured interviews and the focus groups were able to provide underlying information from the key ICT service providers and community groups which could then be explored further through the telephone survey.

3.2.1 Semi-structured interviews

In conjunction with Albury City the main providers of ICT services in the Albury community were identified. These organisations were then further investigated in this project using semi-structured interviews:

• Albury TAFE (Poole Street, Albury)
• Community Education Centre (High Street, Wodonga)
• Retro Café (Dean Street, Albury)
• Internet café (Lanmine in David Street, Albury)
• Aged Concern (Townsend Street, Albury)
• Community Centre (Lavington)

The aims of the semi-structured interviews were to elicit information from the key personnel from each of the above organisations to determine the ICT services that they provide, the reasons for providing these services and also to identify their respective customers. These semi-structured interviews were used to determine the ICT services available to the Albury community.

Each interview was approximately 60 minutes in length and was conducted on the premises of each of the respective institutions. These data were then transcribed and analysed using the software package *Nvivo*.

3.2.2 Focus groups

The literature identified a number of cohorts, or groups of people in the community, that could be affected in terms of the digital divide. These cohorts have been identified as being disadvantaged in terms of their overall access to computer and internet resources. In consultation with Albury City a number of focus groups were set up to identify the particular issues that face these disadvantaged groups. Focus groups were conducted with people from the following cohorts:

•   Disabled community members – people entitled to a disability pension
•   Indigenous groups
•   Primary school children – up to grade six
•   Youth – 14-19 years of age
•   Women
•   Seniors – two groups, one from Aged Concern and the other from Mirambeena)

Focus groups provide more detailed data from a wider group of people with similar interests, or from similar backgrounds, than can otherwise be obtained using interviews. Each focus group interview was conducted in an environment in which each cohort felt comfortable. For example, the indigenous focus group was conducted at an Albury City meeting room during one of the indigenous groups' regular meetings; the primary school children focus group was conducted at the 'Out of School' premises; and the youth focus group was conducted at the Retro Café.

3.2.3 Telephone survey

Data from the semi-structured interviews and the focus groups provided an understanding of the ICT available in the Albury community as well as

a snapshot of how these services are used by specific groups. The telephone survey data were used to determine the access that a random sample of Albury City residents have to computer and internet resources. The telephone survey investigated access to ICT resources and issues such as training and knowledge. The survey was conducted by the Centre for Rural Social Research at Wagga who randomly telephoned 256 people in the Albury City area, spreading contact across each of the ten designated planning areas. Data from the surveys were analysed using simple descriptive statistics as well as modelling more complex comparisons using the 'Splus v6.2' software.

It is acknowledged that the telephone survey could return biased data as people who do not have a telephone service could not participate in this research. Typically, people do not have telephone access because of the associated costs, and as household income has been identified as a factor that can contribute to a digital divide, it is important to consider this issue when drawing conclusions from this survey. Therefore is the survey representative of the Albury population?

3.2.3.1. Planning Areas
The distribution of responses obtained from the telephone survey is as follows:

Table 3.1 Location of respondents who participated in the telephone survey

LGA planning area	% of respondents
Rural NW	10.2
Springdale	12.2
Lavington	6.7
Norris Park	10.6
Thurgoona	12.2
North Albury	4.7
Glenroy	11.0
East Albury	8.6
Central Albury	7.5
West Albury	4.3
South Albury	6.3
Rural East	5.9

It is not possible to determine how representative the data collected through the telephone survey was compared to the actual number numbers in these planning areas due to the names of the respective local government planning areas having changed from ABS census conducted in 2001

3.2.3.2. Age

The median age for Albury City is 35 years (ABS 2003) compared to the cohort who participated in the telephone survey where the median age was about 40 years. The age distribution for the survey is therefore fairly similar to that of the median age of the population of Albury City.

3.2.3.3. Income

Disregarding the 33% of people who did not indicate their incomes in the telephone survey, the median income level for the respondents was in the $27,000 - $44,000 per annum bracket (see figure 3.1). The survey respondent median income is similar to the age median for Albury City.

Figure 3.1 Income Distribution
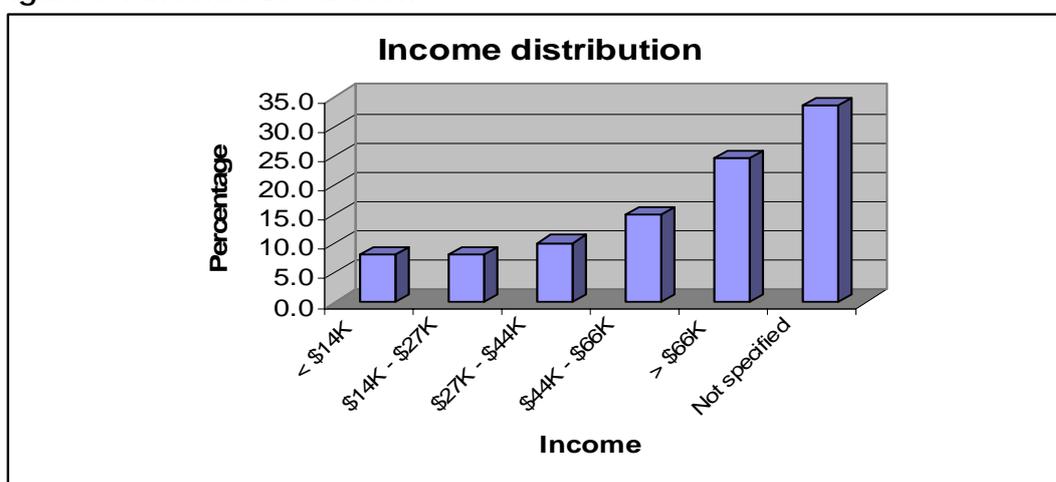
3.2.3.4. Education level

According to Curtin (2001) the educational qualifications is a determinant of whether a person will have internet access although others contend it is a combination of both income and education (Novak et al 2000). ABS data shows that those with a bachelor or higher degree qualification are 30 per cent more likely to have internet access compared to those who have attained a secondary education qualification. The respondents to the telephone survey demonstrated a bimodal distribution in terms of the level of education that they had achieved.

Of the people who participated in the telephone survey 33.7% indicated that they had attained an educational level of Year 11 or less. This compares to the overall Albury population where according to the ABS (2003) 56.7% of the population has an education level of Year 11 or less. This represents a significant difference however it can be explained because only those people who have access to a telephone

participated in the survey (which would typically exclude younger people who would not have yet attained higher levels of education).

3.3   Conclusion

This report used three data collection techniques to gather data: interviews with ISP; focus groups with potentially disadvantaged groups in the community; and a telephone survey. The breadth of the data collection was comprehensive and the results obtained can be measured to verify the findings. In the next chapter the findings of these data collection techniques will be discussed.

4.   Research questions to be addressed

The focus of this report was the research questions that were developed in conjunction with Albury City. In this chapter each research question will be considered and addressed in terms of the data collected in this report.

The five research questions to be addressed are:

1.   How do we identify a digital divide?
2.   What are the ICT services currently available in Albury?
3.   Is there a digital divide in Albury?
4.   What are the social, cultural and economic impacts of the digital divide?
5.   What needs to be done to address a digital divide in Albury?

4.1   How do we identify a digital divide?

As mentioned in Section 2 there is no universally agreed definition for the term 'Digital Divide'. However, it is important to appreciate that the digital divide is a complex term and to be effectively addressed it requires the consideration of many factors. For this report a simple, more informal definition is more suitable, such as that stated by Rooksby et al (2002): "…the digital divide marks a gap, more or less clearly delineated, between those who have a high level of access … and those people who have little or no access." Taking a similar approach to that of Rooksby et al (2002), this report begins with acknowledging the 'digital divide' is 'the division between individuals and areas with levels of access to information and communication technologies (ICTs) to those individuals or areas with less access'. However, this represents a very broad definition and should only be used as a way of rapidly assessing whether or not a digital divide exists in a given area. It is important to recognise that the digital divide is a complex issue and other factors need to be addressed in determining its existence. In particular the ability to access suitable hardware and software, to access appropriate training, to access service support and to access the internet were identified by participants in this project as factors that affected their access to ICT services. Therefore, even though a person may have access to a computer, this is only one factor that determines whether or not a digital divide exists.

4.2.   What are the ICT services currently available in Albury?

4.2.1   General access to ICT services in Albury

If a person requires access to computing and internet resources outside their own home in Albury City area there are limited choices available to them. The main public access is available through the public libraries, community centres and internet cafes. One of the informants, Carina, describes the services provided by the two public libraries:

CARINA: Ok, what we've got at both Albury and Lavington libraries; we have public access Internet PC, so we have three at both libraries. We also have standalone PCs that provide information using CD-ROMs…we also have two PCs that provide word processing services to the public free of charge.

The services offered in the libraries are provided free of charge to the public. Other than public libraries, the Retro Café is another place where Albury residents can access free computing and internet resources. It has three PCs that are connected to the internet via broadband and allows anyone using the café to access these resources during normal business hours.

The community centres offer basic computing and internet resources. For example, Thurgoona Community Centre has two PCs connected to the internet but only via the slower dial-up service.

CAROL: Well, the service to the community (is)…an Internet link up and two computers that you can type on, so people can come in here and get on the internet and research and find things, and also if they wanted to do they could put an address here and pick up and send out email for themselves.

However internet cafés are where Albury residents can gain access to the most comprehensive range of computing and internet resources. In addition to being able to use a computer for word processing and to access the internet, it is possible to burn CDs and DVDs, scan, fax, photocopy and play computer games. The drawback is that such services are not free and can result in expensive usage costs. The Lan Mine is a popular ICT service for younger people in Albury City although there are other internet cafés including one provided by a Service Club.

DAVID: I guess we started up Lan Mine because we saw a need for a gaming café. We have seen the services in Melbourne and wondered why there wasn't any in Albury. I guess our customer's age bracket is sort of about 15-25 year old male for the games and there's really not a lot to do in Albury especially for the under 18s. So it's something for the kids to do.. It's $5.50 per hour now.

4.2.2 ICT training services available in Albury City

In Albury City there is a wide range of services where residents can access and learn about ICT. The main service providers of ICT are TAFE, Continuing Education Centre (CEC), public libraries, Age Concern and private service providers. In the majority of cases the users of these services are required to pay to access and use them. This section will investigate these services.

Albury TAFE is the only service provider (besides Charles Sturt University) to provide a comprehensive choice of certified courses. TAFE is able to offer a wide range of courses ranging from the very basic to certificate level 1 or 2 diplomas and diplomas that linked to university degrees.

GAIL: We run two year diploma here as well, we run Networking in Digital Media, and in Web Development, so there's three main areas. The diploma is actually linked to the Charles Sturt University degree. So it's an integrated diploma degree, with the students concurrently studying a subject at Charles Sturt University, while studying our diploma...

For more basic computing skills, Albury residents can enrol into courses offered by CEC in Wodonga. In terms of the services that CEC provides there is no equivalent organisation for residents in the Albury community.

HELEN: We run short courses in basic computing skills and sometimes not totally basic...

Alternatively, the two public libraries in Albury City offer a number of ICT training sessions.

CARINA: ...so for members of the public ... we provide basic internet awareness, we provide family history on the net services, training services or training sessions, how to use email, training sessions.

Age Concern (or Open Age Learning) provides members of the community with access to many facilities including computer and internet access and training.

DAVID: Open Age Learning and activities club provides a whole rangeof leisure, recreational and educational opportunities for mostly older adults so they are really sort of leisure activities I guess .... therefore $10 dollars you can be a member. That enables you access to all our educational, recreational and leisure activities but there is an additional fee of $30 a semester where you can do almost anything you can think of including computer classes, and accessing the internet and doing word documents.

There are also a number of private ICT training providers in Albury City who are focused on local business requirements. These providers were not specifically targeted in this report, however they do provide important services to the local community.

4.3   Is there a digital divide in Albury?

In Section 4.1 it was stated that the digital divide is more than just access to a computer; rather, it is about access to hardware and software, access to training, access to service support and access to the internet. This definition should allow us to compare one area to another based on the level of access to these (ITC) resources, however unless there is a benchmark it is not possible to globally compare one area to another. For example, if a third-world country is compared to Australia, even though parts of Australia may not have a high level of access to ICT services, it could be said that a digital divide exists between Australia and that country. Similarly, when determining whether a digital divide exists between metropolitan and regional areas, or regional and rural areas, or even within the same immediate location, there is a strong possibility that a digital divide will exist. In reality the digital divide can exist right down to the micro-level of the individual family unit where one member of a family has access to ICT resources while another family member does not. It follows that any strategies that are implemented to address a digital divide need to clearly identify what divide they are referring to and what issues they are attempting to tackle.

### 4.3.1. Factors affecting the digital divide

This research has shown that a digital divide does exist within the Albury City community. Through the semi-structured interviews, the focus groups and the telephone survey it is clearly evident that elements of the Albury community experience the effects of a digital divide. This section will consider the factors that are creating a digital divide in Albury City.

4.3.1.1. Computer access and the digital divide

According to the Australian Bureau of Statistics (ABS 2003), in 2002 61 per cent of Australian households had access to a computer at home, up from 44 per cent in 1998. It would be expected that with further reduction in costs of ICT that this will result in a continued increase in the level of access to computer resources in the home environment.

For the respondents in the telephone survey (Fig 4.1) the level of computer ownership was very high (84.3 per cent) even if it is considered that 'no reply' actually indicated there was no computer ownership in that home (see Fig 4.1. This level of computer ownership is much higher than the reported national average (ABS 2003) however it must be acknowledged that the cohort for these results were those people who owned a telephone, implying a certain level of household disposal income, although this is a much more recent survey.

Figure 4.1 Computer ownership at home
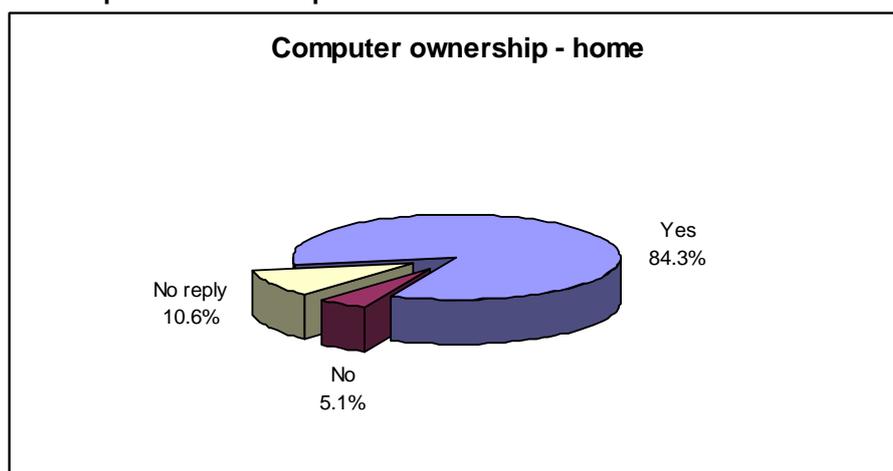
The majority of people who use a computer will do so from their own home (86.4%) although many will also access computer facilities from the respondent's workplace (see Table 4.1).

Table 4.1 Location of access to a computer

Home	School	Workplace	Public Library	Internet Cafe	Friend/ Relative / Neighbour
86.4	5.7	39.0	2.6	2.2	3.1

Implications

Even though there is a high level of computer ownership in homes in Albury City, some of the residents do not have access to their own ICT resources. The areas where access to computer equipment showed a significant statistical difference from other planning areas in Albury City are in Glenroy and Rural East planning areas (see 4.3.1.3. Planning Areas). To improve access for residents in these locations Albury City could provide increased public ICT resources in these planning areas.

4.3.1.2. Internet Access and the digital divide.

The level of internet access continues to grow in Australia. The Australian Bureau of Statistics (ABS 2003) shows that 46 per cent of Australians had home internet access compared to only 16 per cent in 1988. It would be expected that these figures will continue to climb with the advent of cheaper telecommunication resources.

The level of home internet access by respondents to the telephone survey (see figure 4.2) is also very high (73 per cent) compared to the rest of the Australian population (46 per cent – ABS 2003). Care should be taken with interpreting this data as the people who participated in the telephone survey are at least able to afford a telephone and therefore

may not be representative of the Albury population. However this survey is more recent than the ABS data and may have captured the current trends in the level of internet access.

Figure 4.2 Do you access the Internet from home?
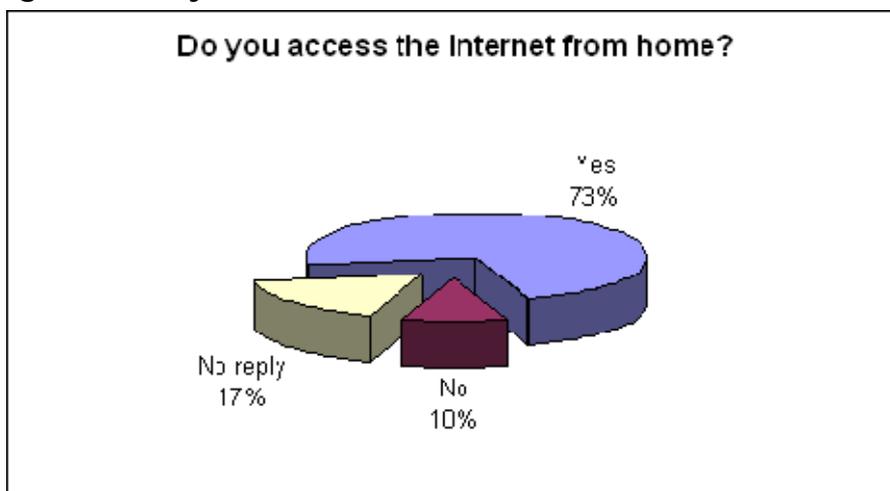
The most common location from which to access the internet for respondents participating in the survey was from their home with the respondent's workplace being the next most popular location (see Table 4.2).

Table 4.2 Location to access the internet

| Home	School	Workplace	Public Library	Internet Cafe	Friend/ Relative / Neighbour
66.3	5.1	29.0	2.4	1.6	3.5

Implications

Respondents indicated that the main means to access the internet is primarily from their homes, followed by their workplace. Interestingly, public libraries and internet cafes are used for internet access by a small number of respondents. Again it can be postulated that Albury City should consider providing greater internet access resources to residents in the Glenroy and Rural East areas due to their significant difference to other planning areas.

4.3.1.3. Planning Areas and the digital divide.

The telephone survey attempted to elicit a similar number of respondents from each of the planning areas in Albury City. Figure 4.3 illustrates that the distribution of respondents varied across the respective planning areas. For example, for West Albury and North Albury 11 and 12 people

respectively responded compared to 31 respondents from both the Thurgoona and Springdale Heights areas.

Figure 4.3 Proportion of participants by Albury City Planning Areas
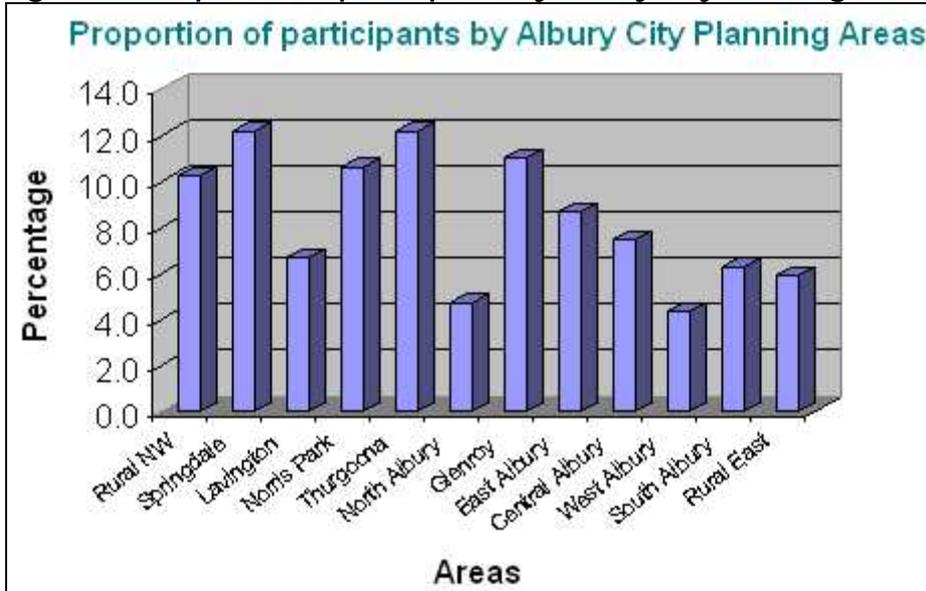
The respondents in the Glenroy and Rural East planning areas demonstrate statistical differences in their responses to those obtained from the other planning areas. This research was not able to identify the nature of these differences only that the respondents in these planning areas, from a statistical perspective, responded differently from respondents in the other planning areas.

The following illustrates the percentage of access to computer and internet access in each of the respective planning areas (Table 4.3)

Table 4.3 Planning Area versus access to a computer and the internet

Planning Area	% of access to a computer	% of access to the internet
Rural NW	96	88.5
Springdale	84	74.2
Lavington	88	88.2
Norris Park	96	92.6
Thurgoona	100	96.8
North Albury	100	100
Glenroy	82	64.2
East Albury	86	81.8
Central Albury	84	78.9
West Albury	90	90.9
South Albury	94	87.5
Rural East	67	53.3

A statistical difference was observed between the two variables: planning area and access to a computer. It was shown that there is a

statistical difference in the access to a computer for people in the Glenroy and Rural East planning areas compared to access for people in the other planning areas for Albury City.

Implications

The analysis of the planning areas suggests that there is a significant difference between Glenroy and Rural East compared to the other planning areas in Albury City. This difference may suggest that these two areas could be disadvantaged in terms of the residents' use of and access to ICT resources. Future planning should address this and any potential disadvantage that may exist in these planning areas.

4.3.1.4. Age and the digital divide.

Age is identified as one of the most significant factors to affect the digital divide (Gartland 2004).

Figure 4.4 - Age Distribution
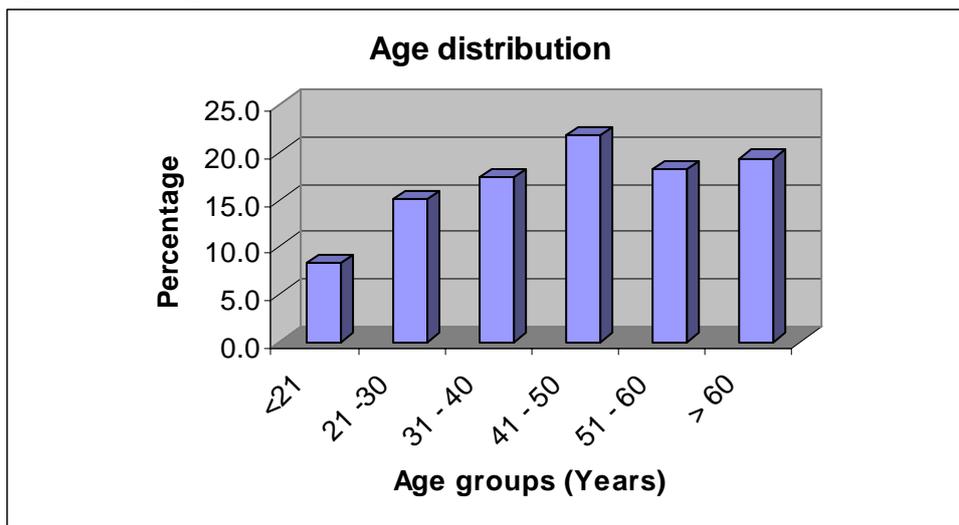
The findings of this report confirm that there is an inverse relationship between age and access to a computer. Two statistical tests were carried out on the data: backwards stepwise logistic Generalised Linear Modelling (GLM) and the Tukey multiple comparison method. The GLM method found that when considering the significance of computer and internet access to the independent variable 'age' then there was a significant relationship. That is, the age ($p < 0.001$) is a significant factor affecting whether a person will have computer and/or internet access. The Tukey method was able to identify that people born soon after the Second World War are less likely to have computer and internet access compared to younger members of the community. These findings support the literature which shows that age is a significant factor affecting a person's access to a computer and the internet.

Implications

It has been identified that age is a determining factor as to whether or not a person will access a computer and/or the internet. In particular, people older than 65 years of age are less likely to have access to a computer and the internet. This cohort of the population will continue to be disadvantaged unless ICT service providers target and support them. Future planning must ensure that sufficient ICT resources are directed to community centres and other areas where older people meet. Unless such resources and appropriate training are provided to this section of the Albury community, they will continue to be disadvantaged in terms of the digital divide.

4.3.1.5. Gender and the digital divide

A relatively high percentage of females (62%) participated in the telephone survey (Fig 4.5).

Figure 4.5 Gender distribution
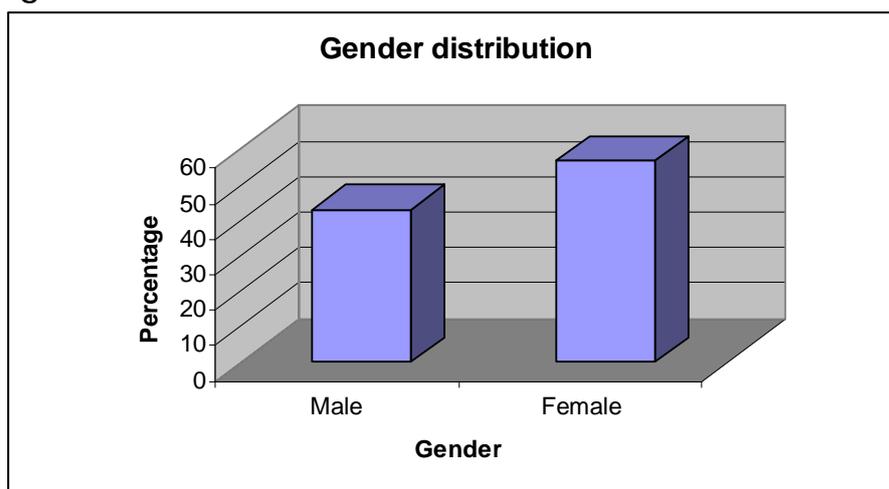
Using backwards stepwise logistic GLM (generalised linear modelling) it was found that there is no significant relationship between 'gender' and whether people access a computer and/or the internet. That is, in the Albury City area, the gender of a person is not a determining factor in influencing whether a person has computer and/or internet access.

Implication

Gender is not a factor that affects the digital divide in the Albury community.

4.3.1.6 Income and the digital divide.

The majority of people (83.6%) who participated in the telephone survey indicated they had a household income (see section 3.2.3.3) of greater

than AUD$44,000 (although nearly 34 per cent of respondents did not disclose their level of income). A sizable number of respondents (about 16%) in the telephone survey had an income below AUD$40,000, the figure suggested by the ABS (2003) as being significant in terms of access to a computer and the internet. However, it was unexpected that the respondents to the telephone survey indicated that household income was not a determining factor in whether they would access the internet. While higher income was linked with higher levels of computer ownership, there was not a significant relationship between income and internet access.

However when applying the GLM model it was determined that there is a significant relationship when considering the effect of the independent variable 'income' on whether people have access to a computer. That is, in Albury City the household income is a determining factor influencing whether or not a person has computer access. In particular, those with lower income will be less likely to own a computer which confirms data provided by the Australian Bureau of Statistics.

The majority of participants in the focus groups identified income as being a major factor in their decision about computer and internet access. Typically, those people in the lower household income bracket are those who participated in the focus groups, namely older members of the community, women and indigenous people (although it does not include youth or children). Therefore, basic technology such as a telephone is often outside the reach of some indigenous people. It was expected that the respondents to the telephone survey would indicate that household income was not a determining factor in whether they would access the internet. While high income was linked with higher levels of computer ownership, there was not significant relationship between income and internet access.

Implications

There is relationship between 'income' and 'computer and internet access', additional support needs to be provided to assist those people with low household incomes to access ICT services. As detailed in Section 6 support can be provided in a number ways for people who experience lower per capita household income. ICT resources should be provided in areas occupied by people of lower income or at least in areas where they congregate.

4.3.1.7. Education and the digital divide

According to Curtin (2001) the educational qualifications is a determinant of whether a person will have internet access although others contend it is a combination of both income and education (Novak et al 2000).

Figure 4.6 Education level
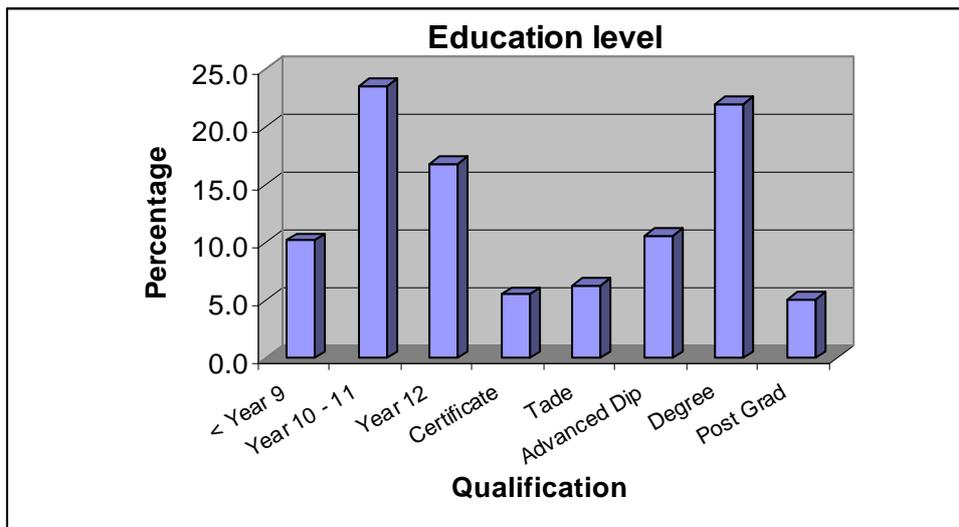
Using backwards stepwise logistic GLM (generalised linear modelling) it was found that there was a significant relationship for Albury people when considering computer and internet access to the independent variable 'the level of education a person has acquired'. This correlation is particularly pronounced in people who have attained an education level of Year 9 or less (representing 9.8% of the people who participated in the telephone survey) (see Fig 4.6). To a lesser extent 50.6% of those people, with an education level less than Year 12, are also less likely to have access to internet resources compared to those with a higher level of education. Further analysis also identified a correlation between people over 65 years with low levels of education (Year 9 or less) and limited access to a computer and the internet. Therefore the level of education ($p<0.001$) is a significant factor determining whether a person will have computer and/or internet access. This means that people with lower educational qualifications in Albury City are less likely to have computer and internet access compared to those more academically qualified members of the community.

Implications

The variables of 'education' and 'age' are determining factors in whether a person will have access to a computer and/or the internet. However a person with a lower education level may also be on a lower income level and similarly an older member of the community may be on a fixed retirement income. This intertwining of education, age and income factors will all affect whether a person has access to a computer or the internet and therefore must be taken into consideration when attempting to bridge the digital divide. Each factor needs to be addressed individually and training and education providers in Albury City must acknowledge that people in these categories may require special support. In particular, training and education providers should

target people with lower education levels and older people to provide them with the skills necessary to access a computer and the internet.

4.3.2. Focus groups

The following is a summary of the data collected primarily from the focus groups that is also supported by information gathered in the semi-structured interviews.

4.3.2.1. Seniors

The focus groups highlighted that older members of the community identified their age and income levels as major factors influencing their access to ICT services. In particular they felt that their age made it difficult to understand ICT and, because of their limited incomes, the cost associated with these technologies was also a barrier. They also identified their personal 'comfort zone' as a reason for not adopting technology because they often felt uncomfortable with using ICT and believed they were 'stupid' for not understanding how to use it. Training was also identified as an issue for older members of the community because they believe they require special training. Trainers need to be aware that older people may require one-on-one training and additional support in order to grasp some of the tasks required.

4.3.2.2. People with disabilities

People with disabilities identified income as one of the main barriers to their access to ICT services in Albury. They felt that ICT technologies are generally expensive, but that, in addition, due to their special hardware and software needs, the overall costs for their access can be very high compared to other people. The lack of appropriate training and support for people with disabilities are also barriers. It appears that many ICT trainers in Albury are not aware of the special needs of people with disabilities resulting in the delivery of ineffective or inappropriate training.

4.3.2.3. Culturally and linguistically diverse people

The needs of culturally and linguistically diverse (CALD) members of the community were not formally investigated in this report. However, some service providers indicated that CALD community members had special software requirements in terms of the installation of special language packs on machines used by this group.

4.3.2.4. Indigenous people

Indigenous people identified income as the primary influence that affected their access to ICT services. In particular, due to low incomes, they were not able to afford ICT services in their homes and also found it difficult to travel to access ICT services provided within the community. They also identified that current training and support services provided in Albury did not meet their needs.

4.3.2.5. Youth issues

The youth who were surveyed through the focus groups were aged between 13 and 19 years. Interestingly, these young people suggested that they were not comfortable with the having to purchase hardware and software from local vendors in the community. They felt they lacked the knowledge and the experience to clearly understand what ICT would be adequate for their requirements and that local ICT vendors confused them with technological jargon. This view was also expressed with every other focus group in this report (except young children of less than 10 years of age). Cost of hardware and software was another issue that youth expressed concern about and they saw this as a barrier to their access to ICT services.

4.3.2.6. Single female sole parents

Interviews conducted with the ICT service providers indicated that single female sole parents are a cohort who may be disadvantaged in their access to ICT services in the Albury community. Although this was not verified in any other areas of the research conducted it should be investigated further.

4.4   What are the social, cultural and economic impacts of the digital divide?

The effect of the digital divide on Albury City is difficult to quantify although data collated through this research suggest the lack of access to ICT services can impact on certain groups within the community. In particular, the digital divide will impact on where a person lives in Albury City, older members of the community (who are over 65 years of age), and those people on lower incomes levels (less than $44,000 per annum).

The digital divide has the potential to create a community of "haves" and "have nots" and, as information and communication are valuable resources, a digital divide can have a huge impact on the community.

Access to a computer and the internet can facilitate more sophisticated levels of communication than would otherwise be possible. Basic access to ICT services will allow for the use of electronic mail communications and the availability of more advanced ICT services will increase that level of access. This could be beneficial for elderly folks or disable people to keep in touch with relatives and friends. Further, the availability of broadband technology can mean that communication can move from email to voice and video communication and more.

Becoming a richer society in terms of access to information will increase other opportunities in terms of education for people in the community and ways in which information can be dispersed, such as access to electronic banking and the way public announcements are communicated to members of the community.

4.5 What needs to be done to address the digital divide in Albury?

This research has shown that many factors can contribute to a digital divide including age, locality, income, and education level. Any steps that can be taken to bridge a digital divide will assist the overall community. In this section recommendations to reduce the impact of the digital divide on Albury City are made.

4.5.1 Continue to provide ICT services to the community

Continuing to provide access to hardware and software resources to the community is best achieved through existing facilities including Community Centres, public libraries and the youth café. A review of these facilities is required to better coordinate the benefits that ICT technologies provide to the community. The review should also consider the training and support these facilities provide as well as the possibility of extending access to these facilities in the Glenroy and Rural East planning areas where it has been shown that residents' access to ICT resources is less than in other planning areas.

4.5.2 Provide technical support and training

People who have access to a computer and the internet require ongoing technical support. This support could be achieved by employing an Information Technology Support Officer to provide ad hoc technical support as well as scheduled IT training sessions to the community. This position could also become a focal point for supporting the community in locating the support services required. It is recommended that the position be more an education, rather than a

technical, role to ensure that the Support Officer is able to communicate effectively with the wider community. The position could be located in one of the disadvantaged planning areas in Albury.

ICT technical support should be provided as part of community celebration events such as Seniors Week, indigenous events, etc. This support could be through the provision of technical advice and assistance on ICT issues specific to that community group, such as the specific hardware and software required for people with disabilities or resources available for older members of the community.

The support services provided by the Information Technology Support Officer could be supplemented by coordinating additional assistance from student groups from Charles Sturt University and Albury TAFE. This would not only provide students with hands-on experience but also benefit the members of the local community.

4.5.3 Improve access to ICT services

There are two aspects to the access to ICT services. The first is the physical access. Many disadvantaged groups in the community indicated that they found it difficult to physically go to where these ICT resources are located. In particular the distance of the resources from car parking or public transport is an issue that needs to be considered by service providers.

The second issue that needs to be considered by ICT service providers is that appropriate hardware and software needs to be provided for disadvantaged groups in the community. Examples include voice-activated devices, larger screens, special mouse devices, headsets, etc. Similarly, software requirements include the ability to display larger print on display devices and the ability to implement voice-activated commands.

4.5.4 Recycle redundant hardware in to the community

Currently many businesses and organisations in Albury City have redundant computer hardware that is surplus to their requirements. Such equipment could be redistributed into the community, directed by a central person such as the Information Technology Support Officer, who could facilitate the collection, re-imaging and redistribution of this equipment into the community. Basic software would need to be provided on the machines, with no expectation that the computers would be used for playing games or other multimedia activities. A 'ghost image' could be placed on each machine which would allow for easy reinstallation in the event of any unexpected problems. This project

could also be supported through the support of local service clubs and Cambers of Commerce.

4.5.5 Improve awareness of ICT services

One of the issues raised by focus groups was the lack of awareness of the ICT services provided in the community. This is an issue that needs to be addressed by service providers through their communications with the community.

4.5.6 Facilitate access to ICT services

Access to ICT services is hindered by a number of issues. Primarily it is the cost of hardware and software, but it also includes the community's understanding of which services best meet a particular person's requirements.

With regards to cost, a suggested approach has been to reduce the cost of hardware by recycling redundant equipment (see Section 4.5.4). Software is another issue that would need to be addressed, however this should be coordinated through the Information Technology Support Officer. Recommendations with regards to support in the selection of hardware and software for a particular individual in the community are more problematic and such advice needs careful consideration. However, community groups are requesting such advice and support and one approach could be to use community forums to disseminate such information. Such advice and services should also be facilitated through the Information Technology Support Officer.

4.5.7 Expand the 'learning cities' concept

The ICT services in the Albury-Wodonga community need to complement one another, not compete against each other. The synergism that could be achieved through greater cooperation not only with ICT service providers but also through education in general needs to be a driving force in coordinating all education services. Such services include CSU, TAFE, primary and secondary schools, CEC, Albury City Aged Concern, and ISPs to maximise the education benefits. The Information Technology Support Officer could be one of the facilitators to develop pathways for people to move from one service provider to another.

4.6   Conclusion

This report has made seven recommendations that, if implemented, can significantly reduce the impact of the digital divide in the Albury community. These seven recommendations are:

1. Continuing to provide ICT services to the community particularly to those disadvantages planning areas.

2. Improving access to ICT services. This includes physical access to ICT services in the community as well as the provision of appropriate hardware and software to meet the requirements of the disadvantaged members of the Albury community.

3. Providing technical ICT support and training through the employment of an Information Technology Support Officer.

4. Recycling redundant hardware in to the community.

5. Improving awareness of the ICT services available to the Albury community

6. Facilitating access to ICT services.

7. Expanding the concept of the 'learning cities' concept by including a coordinated approach to ICT education and services in the local Albury-Wodonga community.

5.   Conclusion

This report investigated the digital divide in the Albury community. It identified that there is a digital divide, although the affects on the community can be minimised by implementing a number of recommendations.

These recommendations are to:

- continue to provide community ICT resources particularly in to the disadvantaged planning areas in Albury City of Glenroy and Rural East;
- provide technical support and training; through the employment of an Information Technology Support Officer;
- improve the access to ICT services including the access to the physical location where ICT services are provided in the community; and also with the availability of special hardware and software required by certain disadvantaged groups in accessing ICT resources;
- recycle redundant hardware in to the community by providing basic applications on refurbished machines;
- improve the awareness of the ICT services available in Albury City;
- expand the 'learning cities' concept by coordinating the ICT services available in the Albury-Wodonga community.

The new Cultural Precinct also provides an unique opportunity to extend the provision of ICT services in Albury City. This will require careful planning and consideration as to the types of ICT services that best address the needs and requirements of the Albury community. Such consideration needs to include the provision of hardware and software, the physical layout of the services and the training support to be provided.

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