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Availability, access and affordability across 'digital divides':

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Abstract

This paper attempts to synthesise different bodies of literature relating to technology and inequality. The use of technology by minority groups has been studied, but in isolation. That is, it has been examined within particular marginalised communities rather than across them. For example, migrants and the ways that technologies are deployed to sustain connections between family members in different countries have been investigated extensively. Indigenous groups? appropriation of technologies to overcome distance in rural and remote areas has also been explored in depth. The role of technology in providing independence to people with disabilities has been scrutinised too, separately from that of older people. The findings from these studies of various minority groups generally sit in different disciplines, with little to no comparative analysis of them. In understanding commonalities between these minority groups in relation to access and affordability, the paper argues that these can no longer be considered ?minority? issues as they affect a significant proportion of the Australian population. Rather,

affordability needs to be framed as part of a wider discussion about access and accessibility. Furthermore, notions of access and accessibility should be emphasised and clearly distinguished from mere availability.

Introduction: the Australian context

Groups and communities who have largely been considered as being on the 'wrong' side of the digital divide include:

- New migrants and refugees
- People from non-English speaking backgrounds
- Older women
- People of low socio-economic status
- People in rural and remote areas
- Indigenous communities
- People with disabilities.

The Australian Communications Consumer Action Network (ACCAN) has published a number of reports that investigate ICT availability, access and affordability for each of these minority groups.

In 2011, I received funding from ACCAN to conduct a research project to study the technology literacies of newly arrived migrants from refugee backgrounds. Specifically, it looked at how refugees utilise technology products and services upon arrival in Australia, and how they integrate into the diverse technological landscape offered here. As refugees often come from contexts where there is a lack of availability, accessibility and affordability of information and communication technologies (ICTs) in their countries of origin and the intermediate countries to which they are displaced, this informs the levels of technical literacy they bring with them to their country of settlement.

The *Mind the Gap* report (Leung 2011 ^[5]) found that refugees' experiences of technology had been impeded by war and in their countries of origin that had destroyed technical infrastructures. Furthermore, displacement to intermediate countries meant having to learn whole new systems and processes of using ICTs, assuming there was availability. For those who had spent time in refugee camps, availability was often limited, or otherwise financially inaccessible. This impacts on the levels of technical literacies that refugees have when they settle in Australia, such that some have no experience of having a home phone or actually dialling a telephone number directly. Services that they are most familiar with are shared ones, whereby they pay for someone to make a phone call for them, or write and send an email or letter for them.

The case studies in the *Taking Advantage of Disadvantage* report demonstrate how unreasonable it is to expect new migrants and refugees to be vigilant and informed consumers in the Australian telecommunications market. The study illustrates the difficulties in navigating the complex technical and contractual landscape of mobile phone deals, bundles and capped plans, especially in the context of limited English language proficiency and illiteracy in their native language.

According to the *Communicating Difference* report, one in four telecommunications consumers in Australia is from a non-English speaking background (NESB). For NESB consumers, the phone – whether landline or mobile – is a key technology, a more familiar and meaningful technology, than a computer. The Internet is alienating because of the way content is presented and the lack of available multilingual information. Therefore, access to services that are supposed to be universal – such as health and education – is impeded.

Indeed, the majority of participants in the *Telecommunications and health information for multicultural Australia* study confirmed that they do not use the Internet to find health information. CALD communities are more open to using telecommunications for health care than the Internet. This is an important finding considering a key purpose of the NBN is to provide infrastructure to support new technologies in the healthcare sector (AHWI 2012 [6]: 9).

For seniors, offering free training in Internet use in their native language, was not sufficient to entice older people to use computers. Older people use the Internet at a lower rate than the rest of the Australian population, and anxiety surrounding technology use plays a big part in this (NEDA 2010 [7]: 66; COTA 2011: 4). However, the *Where do I start? Female seniors and the Internet* report found that non-users of the Internet seemed to be as well-informed as the Internet users in the study. That is, the non-users sought their information through other means (ibid: 6). Previous research has confirmed that older people are simply not interested in the Internet.

There are also 281,000 people over the age of 65 years who have dual sensory loss, more than three times the number under that age (Able Australia 2011: 7). This affects their ability to communicate and so, support from interpreters, hearing aids or other assistive technology is required. Those who are deafblind have difficulty reading and writing in English (ibid: 8). In addition to language literacies, there are dual technical literacies needed to use both specialised equipment and ICTs, as well as to make those technologies work together. In the *Telecommunications & deafblind Australians* report, 90% of the participants surveyed were on a pension, with the majority stating they did not have funds to buy accessible devices (ibid: 20). However, deafblind Australians were more likely to use landlines and computers with Internet access than mobile phones, largely due to the degree of compatibility with assistive devices (ibid: 24). A constant in the lives of people with deafblindness is isolation, so technology which enables them to communicate with others and access information is particularly critical.

Isolation is also experienced by those living in regional, rural and remote areas. Similar to people with disabilities, access to ICTs is largely brokered through others. Where people with disabilities rely on interpreters and trainers, people living outside of metropolitan areas depend on non-profit organisations.

"Disadvantaged and vulnerable consumers in the Northern Rivers Region also do not value ICT highly as a priority of need. Competing priorities such as secure housing, employment, health concerns and caring for children override the need for access to ICTs. (Also) affordability is a major issue (and) digital literacy must be addressed." (Notara 2011: 8)

Isolation is also compounded by the lack of availability of ICT services in remote areas, where Internet access and mobile networks are patchy and unreliable. Consequently, there is a lack of trust in using such technologies and 'no great interest in these things, they are frightened of them.' (ibid: 28)

In the *Home Internet for Remote Indigenous Communities* report, it was found that less than 6% of the residents in the study had a home computer or laptop and of those who had had used a computer at some point, a third had never been online (ARC Centre for Excellence for Creative Industries & Innovation et al 2011 ^[8]: 11). Sustaining telephone contact between service providers and these communities remains difficult when nobody has home phones, only about half of the population has mobile phone coverage, and there is only one shared public telephone in a town or community. Therefore, issues of availability compound other issues of access such as lack of affordability, lack of English language and technical literacies. This is demonstrated in communities that had satellite broadband: the report found that despite this availability, adoption of home Internet was still low (ibid: 16, 35).

Similarly, Wise's study of low socio-economic status consumers experiencing financial hardship found that irrespective of availability, telecommunications are not universally accessible (2013 ^[9]: 1). But mobile phone ownership was widespread with nearly half using it as their only form of telecommunication. The mobile phone was seen as the most affordable, and as a result preferable to home phone and having a lower threshold to participation than other technologies.

The wider literature and context

It is estimated by Barnard et al (2013 ^[10]: 1715) that nearly 70% of the world's population are 'digitally excluded' in the sense that they do not engage with digital products or services, or access the Internet. Underpinning much of the literature on the digitally excluded is a sense of deficit, that without Internet access, the group in question is deprived of a resource that others have:

"to lag in the use of technology is to remain behind a veil of limited knowledge and opportunities." (Green and McAdams quoted in Selwyn 2004 ^[11]: 370)

Clearly, this is a global majority, but much of the wider literature has focused on particular minority groups as being over-represented on the 'wrong' side of the 'digital divide'. However, many of the studies indicate that they are not uniformly disadvantaged in their ICT access or digital literacies. Indeed, some migrant groups have been shown to be technologically well-connected with friends, family and across diasporas, while refugees were not (Buckingham 2007 ^[12]: 51). It is often where these minority groups intersect that issues of access become more pronounced: for example, the 23% of older Australians aged over 65 years who are from migrant backgrounds will be affected by limited English language ability, limited technical literacy and limited affordability to access ICTs (Migliorino 2011 ^[13]: 107). Kluzer and Rissola (2009 ^[14]: 67) estimate that approximately 16% of the population of the European Union to be social excluded due to income poverty, low socio-economic status and lack of employment: this population is also eight times more likely to be digitally disengaged and have lower digital literacies. In 2007, it was found that 40% of the European population had no Internet skills, with low SES and older people over-represented in this statistic.

Studies of seniors has also shown some to be active ICT users, although attention has concentrated on those that are inactive (Martinez-Pecino and Lera 2012 ^[15]: 876). The vast majority of active seniors owned mobile phones for the purpose of speaking to others, not for any other features such as taking photographs or accessing the Internet. They also felt the mobile was beneficial in cases of emergency but could easily live without one. Research clearly shows that seniors are not using broadband Internet as much as other demographic groups, and are more comfortable using well-known, familiar, and cheaper technologies in order to learn or seek information (Naumanen and Tukainen 2009). Heart and Kalderon (2010 ^[16]: 211) suggest that older people who are experiencing health issues are less likely to use ICTs, as their focus is on other priorities and because their impairments may inhibit their access. That technology is not an immediate priority, too, has been asserted about other minority groups.

Some studies have shown that electricity can be an unaffordable luxury for these communities, in which case Ratliff et al (2012 ^[17]: 221) recommend making use of what is available rather than emphasising access to new and unfamiliar technologies in the context of supporting people with disabilities. Likewise, Radoll (2009 ^[18]: 319) confirms that in remote Australian Indigenous communities, big issues such as unemployment and poor health inhibit ICT adoption, although ICTs can contribute to community wellbeing (Vaughan 2011 ^[19]: 146). Thus, mobile phones have been used as learning resources in preference to computers, as more Indigenous people access the former than any other digital technology (Auld et al 2012 ^[20]; Johnson 2013 ^[21]). Data from the Australian Bureau of Statistics indicates that low income households located in non-metropolitan areas of Australia are the least likely to have computers or be connected to the Internet (Atkinson et al 2008: 481 ^[22]). Goggin (2003 ^[23]: 35) explains that this may be due to country areas receiving services later than metropolitan counterparts and having to pay higher prices for those services.

While much of the wider literature points to the larger issues that inform digital disengagement, few of the studies specifically discuss affordability as a major factor, other than in studies of disability and ICT access. In the latter body of literature, the affordability of assistive technologies and their compatibility with computers and the Internet is discussed prominently (Dobransky and Hargittai 2006 ^[24]; Vicenta and Lopez 2010 ^[25]; Macdonald and Clayton 2013 ^[26]).

It is offline factors which define the disadvantage of the various minority groups, and this appears to be then 'mirrored' in their access and relationships to technology. However, it is also evident in the literature that these groups do not consider technology to address their disadvantage, and so have little use for or faith in new technologies, even if they are available.

What is shared?

Table 1 – summary of issues common to abovementioned minority groups

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For most of the groups discussed, availability is not the main issue (see Table 1). There is ICT availability even in rural and remote areas, albeit limited, but uptake of computers and the Internet is low. Instead, telecommunications technologies have been privileged. The preference for mobiles to computers suggests that telecommunications offers a lower financial and technical threshold to participation.

Levels of literacy, both language and technical, are linked in that those who lack English language skills:

often need assistance brokering access to technologies, inhibiting their technical literacies

are unable to access or understand online content without help
are also hindered in their ICT access because of confusing telecommunications contracts.

Lack of language and technical skills is also connected to financial literacy and affordability, as there is a cost to not understanding contractual agreements with telecommunications and/or Internet service providers. There is also a cost to seeking help with technology access. There is the cost of time for the person seeking assistance as well as for the person assisting. The former is also at the mercy of the latter when making technology choices, as options (which may not be the most affordable) are filtered and interpreted.

The lack of language literacies not only refers to refugees and new migrants, people from NESB or culturally and linguistically diverse (CALD) communities. It also encompasses the 54% of deafblind respondents surveyed in the *Telecommunications and deafblind Australians* report who found websites difficult to read. The Australian Bureau of Statistics cites just over half the Australian population as being 'functionally literate', meaning that 46% of adult Australians cannot confidently read newspapers, follow a recipe, make sense of timetables, or understand the instructions on a medicine bottle? (ABS 2012 [28]).

There is also a strong correlation between low levels of language literacy and low socio-economic status, as those with higher levels of education attainment and literacy have higher rates of employment (APC 2010 [29]). Therefore, it can be said that affordability of ICTs is an issue for nearly half the Australian population. Clearly, these are no longer 'minority' issues when:

One in four Australians is from a NESB background and Australia is becoming increasingly culturally and linguistically diverse (AHWI 2012 [6]: 5)

Over one million Australians are from NESB background also have a disability (NEDA 2010 [7]: 22)

Almost 20% of the Australian population have identified themselves as having a disability, with this percentage increasing as the population ages (Australian Human Rights Commission 2005 [30])

There is overlap in the experiences of minority groups: English as a second language cuts across refugees, new migrants, older people and people with disabilities. Similarly, there are older people in each of the other groups.

In a context where such a large proportion of the Australian population is affected by issues of affordability, and those issues are informed by various types and levels of literacy, it is inappropriate to frame the 'digital divide' debate in terms of a deficit hypothesis: that is, these groups and communities are in danger of missing out on the benefits of technological advances because they do not have the necessary literacies and finances to stay abreast of them. In other words, minority groups are represented as lacking in a digital world of ICTs, unable to keep up with the rest of us. Rather, a rethinking of access and accessibility is required in which affordability is part and parcel of the design of inclusive technology products and services.

Distinguishing between availability and access

Warschauer (2003 [31]: 31) contends that there have been two main models for understanding technology access. The first is in terms of devices, the simple physical access or presence of device. The second is in relation to conduits: things that facilitate use of a device, that is, a network of some kind such as electricity, Internet, or telecommunications infrastructure. Both these models are arguably more about making technologies available than accessible.

Availability is about the supply or provision of a technology, in much the same way that the National Broadband Network (NBN) rollout has been primarily concerned with making high-speed broadband available to at least 90% of Australians (Australian Government Department of Communications 2014 ^[32]). Notions of availability and access become conflated in statements such as:

"The NBN will ensure that all Australians have access to very fast broadband? The government's aim is that all households and businesses should have access to broadband."

However, availability does not equate to access. An NBN service will be present and operational, but the existing literature already indicates that mobile networks will be favoured over the NBN for the above-mentioned groups and communities. Indeed, Prasad (2013 ^[33]: 229) concurs:

"Unlike roads, the provision of digital connectivity is not sufficient to ensure the empowerment or even equitable inclusion of the target population."

"The NBN is unlikely to resolve issues of access and adoption." ARC Centre for Excellence for Creative Industries and Innovation 2011 ^[8]:59)

Accessibility refers to the extent to which available ICTs can be accessed. The ratio of availability to accessibility can be configured differently. For example, there may be widespread availability of a particular technology, but the capacity to access it can be constrained by factors such as:

- the affordability of that technology
- government restrictions on use of a technology
- levels of literacy in that technology.

In addition to the commonplace models of understanding access through devices and conduits, Warschauer (2013 ^[31]: 38) proposes a third model for understanding access: literacy. But while Warschauer defines literacy largely in terms of language (reading and writing) and technology skills (digital literacies), my argument is that financial literacy also plays a significant role in technology access.

In other words, the minority groups discussed have chosen to access technologies that are suited to their levels of language, technical and financial literacy. For the most part, using a mouse and keyboard to access the Internet has not resonated with these communities (with the exception of people with disabilities, who are compelled to use assistive technologies with their computers because of their incompatibility with mobile devices). Firstly, much of the textual content on the Web would not be accessible to those who are 'functionally illiterate'. Secondly, the cost of purchasing a computer and the ongoing costs of Internet access are prohibitive when compared with telecommunications technologies. Thirdly, as a result of not using computers to access the Internet, those technical literacies are not developed.

Yet, central to this thesis of the 'digital divide' is an evangelising of the Internet as the foundation of an information society constituted by informed citizens. This has been the basis for the push for e-government, in which all information and services of government departments can be accessed online (Commonwealth of Australia 2009 ^[34]). However, the responsibility and cost of getting access to the Internet rests with individuals with the underlying assumption that it is unproblematic as long as there is availability.

Is it possible for the government to guarantee access, not just availability? Given the diversity of the technological landscape, and the enduring difficulties that governments have faced in trying to get minority groups on the 'right' side of the 'digital divide', alternative mechanisms are needed that are more user-centred and inclusive of different types of access.

One approach may be to revisit the notion of universal service. Given 2008 [35]: 92) regards the Universal Service Obligation (USO) as one of many instruments that can be used to ensure universal availability. Previously, a USO has primarily applied to making standard fixed line telephone services available and affordable. In 2000, Australia introduced a digital data service obligation to supplement this (ibid [35]: 97) but arguably this emphasised availability over access and affordability. There is no equivalent USO for mobile telephony services in Australia, yet the inclusion of mobile and broadband services in the USO has already taken place in other countries (Prasad 2013 [33]: 227). Ironically, the mobile market has delivered near universal access in the absence of an USO, but does this mean it need not be governed by principles of inclusion?

A key principle underpinning the traditional USO may offer an initial departure point: to ensure 'the ability of everyone to make and receive telephone calls at reasonable prices' (Blackman 1995 [36]: 171). However, this principle is now relevant to more affordable platforms than fixed line telephony, such as mobile networks and the Internet. Application to a wider technological marketplace would enable fulfilment of both rights-based and legal dimensions of universal service (ibid [36]: 172). A rights-based definition suggests access to telecommunications as a basic right of all citizens as it is considered a 'consumption norm', a 'primary good' and a 'bare essential' (Prasad 2013 [33]: 228) such that it is required for those citizens to function in society and those who cannot afford it risk social exclusion. A legal definition of USO implements this by requiring:

Universal geographical availability

Non-discriminatory access in terms of users and platforms

Reasonable costs (Blackman 1995 [36]: 172).

Kent (2007 [37]: 110) argues that a USO must go beyond geographical availability in order for access to be universal. Rather, all three aspects of a USO - the notions of 'universality', 'service' and 'obligation' – each need to be interrogated separately in relation to access, affordability and the current technological landscape. In order for a USO to have broad reach, Kent (ibid [37]: 117) recommends that it should be 'ambiguous', high-level and principles-based, instead of tying it to particular services and funding models.

Conclusions

Looking across the literature at research that has examined various minority groups' relationships to technology is a sobering reminder that availability does not guarantee uptake, nor does it ensure access. The commonalities shared by these communities in relation to their participation in technology demonstrate the extent to which the Australian population is affected by issues of access and affordability, and furthermore, how these are informed by language, technical and financial literacies.

While the market is quick to accommodate the constant flow of new technologies, it is less considerate of users of older, more familiar technologies and the extant literacies exercised to navigate the information landscape and access services. It is clear in the literature that these users extend beyond minority groups to almost half the Australian population when functional literacy, technical skills and affordability are taken into consideration.

If the government is serious about providing technology access, and not just availability, then the implications for e-government policies are profound, in respect to:

Designing information and services using language and content which are inclusive of the communities concerned and accessible to all

Ensuring that access to information and services does not discriminate based on the technology used

Accommodating an increasingly diverse technological landscape that encompasses old and new means of disseminating information

Considering different degrees of affordability that affect access to technology through Universal Service Obligations.

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