FROM THE HORSE AND CART TO THE INTERNET: A CENTURY OF RURAL CONNECTIVITY CHANGE IN RURAL WESTERN AUSTRALIA

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Abstract

The challenges of remoteness and lack of accessibility/connectivity in regional Western Australia have been compounded by rapid changes in transport and communication technologies which can render pre-existing and expensive infrastructure obsolete. The railway network and system of town sites/service centres developed for the state's wheat belt up to the 1930s became partially redundant following the development of mechanised road transport. Similarly, 'outback' mining towns have now been largely replaced by fly in fly out (FIFO) operations. Against this background, we present the findings of a review of the state's Community Resource Centre (CRC) network. These Centres were first established in the 1990s to assist rural dwellers who, for various reasons, lacked adequate or appropriate internet access. Notwithstanding the revolutionary changes in internet use and coverage in recent decades, this survey of 93 CRCs found that they continue to provide a valuable community service, especially for those who, for reasons of age, finance or inadequate broadband coverage, remain on the wrong side of the digital divide.

Keywords

Regional Western Australia, accessibility, technological change, Community Resource Centres

Résumé

Les défis de l'éloignement et du manque d'accessibilité/de connectivité dans la région d'Australie occidentale ont été aggravés par les changements rapides dans les transports et dans les technologies de communications qui peuvent rendre l'infrastructure préexistante obsolète. Le réseau ferroviaire et le système des sites urbains et des centres de services développés pour la ceinture alimentaire de l'état jusqu'aux années 1930 sont devenus partiellement superflus tout en suivant le développement du transport routier mécanisé. De même, des villes minières isolées ont, maintenant, été en grande partie remplacées par des activités exploitant l'aller-retour (FIFO operations). Dans cette perspective, nous présentons les résultats d'un examen du réseau étatique du Community Resource Centre (CRC). Ces centres ont été établis la première fois dans les années 1990 pour aider les habitants ruraux qui, pour différentes raisons, ont manqué d'un accès adéquat et approprié à Internet. Malgré les changements révolutionnaires dans la couverture Internet et son usage au cours des dernières décennies, cette enquête dans 93 centres de détection et de contrôle permet de constater qu'ils continuent à fournir un précieux service à la communauté, particulièrement pour ceux qui, pour des raisons d'âge, de finances ou d'une insuffisante qualité du réseau, restent du mauvais côté du fossé numérique.

Mots clés

Australie occidentale, accessibilité, changements technologiques, centres de ressources communautaires

I. INTRODUCTION

Although non-metropolitan (locally termed 'regional') Western Australia has been inhabited by Aboriginal groups for tens of millennia, the sustainability of settlement in this area has presented a considerable challenge to its more recent inhabitants ever since its incorporation into the British Empire in 1829 and, subsequently, into the Commonwealth of Australia in 1901 (Bolton, 1992). This challenge relates, on the one hand, to the harshness of its large-ly arid environment and, on the other, to the sheer size of the area in relation to its relatively small population. Even today, ca. 600,000 inhabitants occupy an area of approximately 2.5 million square kilometres (see WA map including CRCs at Figure 1). Regional Western Australia therefore presents an extreme example of what Blainey (2001) terms "the tyranny of distance". Providing this small and extremely scattered population with the goods and services that they require is both difficult and expensive.

Figure 1. Community Resource Centres in Western Australian
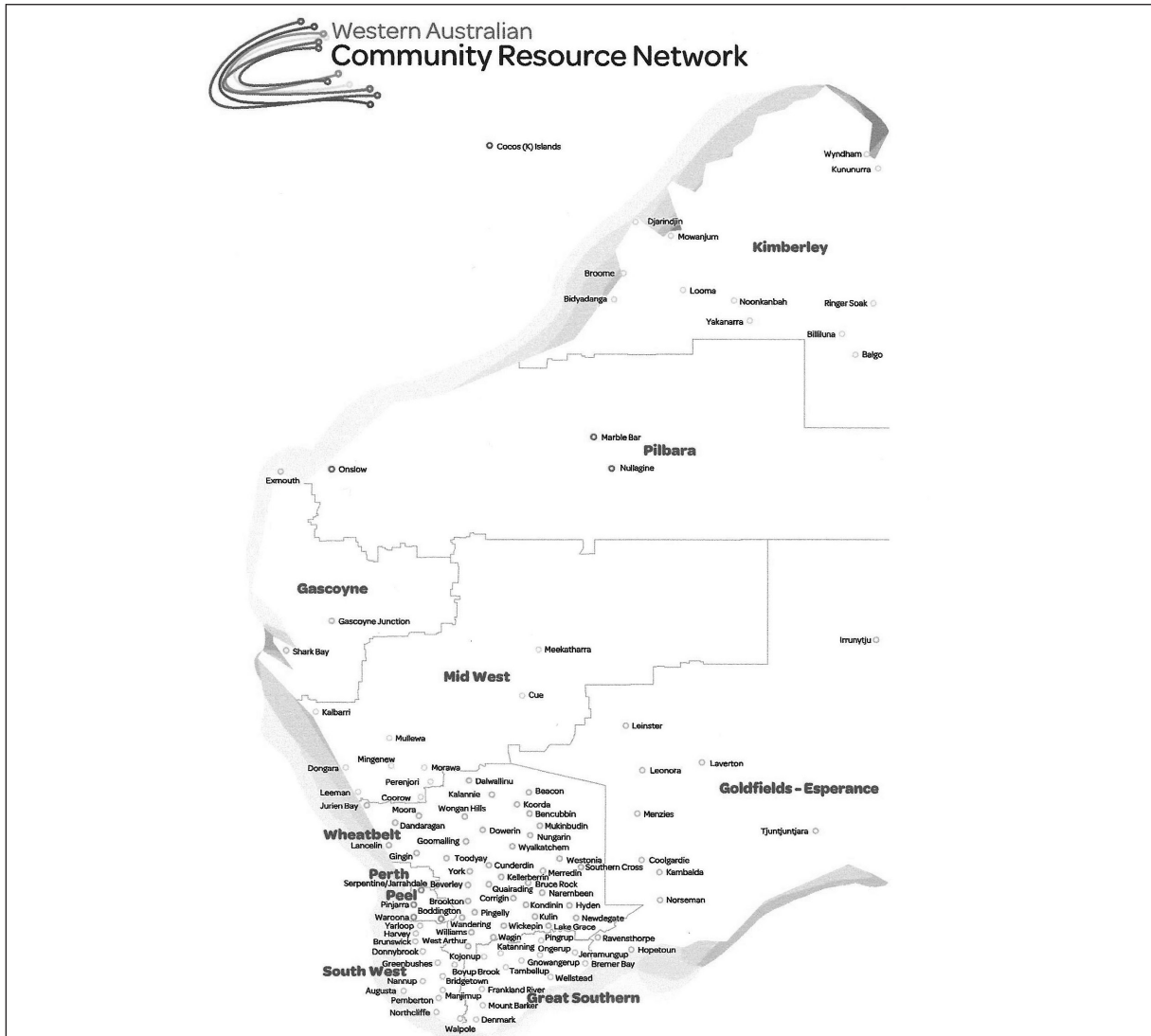
Source: Government of Western Australia, Department of Regional Development.

Over time, some of these difficulties have been ameliorated by innovations in transport and communications technologies. The camel trains that supplied the first gold mining towns in the late nineteenth century were gradually supplanted by a railway network. By the mid twentieth century, the School of the Air was providing children on remote pastoral stations with an education by radio and the Flying Doctor Service was transporting patients hundreds and even thousands of kilometres to medical facilities. However, these technological innovations can, in themselves, present challenges of change which can complicate the process of finding sustainable solutions to the problems of extreme remoteness.

Conceptually, Janelle (1969) has described how the ever growing demand for greater accessibility has led to successive technological advances in transport and communications technology. The time-space compression generated by these advances then brings about what he terms 'spatial reorganisation', an ever growing centralisation and specialisation of economic activity. The mining industry in regional Western Australia provides a classic illustration of this process. When a remote, but major, mineral deposit was discovered more than a century ago, during the state's gold rush, a significant town would characteristically emerge around the fortunate prospector's find, with a range of shops, schools, pubs, hospitals and other services

being developed by government and small business to supply the needs of both the mining population and those who moved in to serve it. By the mid twentieth century, large mining corporations were establishing generally smaller 'company towns' with a more limited service base at their remote mine sites and, more recently, even these have been largely supplanted by fly in fly out (FIFO) operations whereby the labour force live permanently in large cities and are only accommodated temporarily at the mine sites (Jones and Birdsall-Jones, 2014). Over time, therefore, more and more of the activities related to the mines have been centralised to larger cities, notably the state capital of Perth, and the mining settlements in the remote parts of the state have become ever smaller, more temporary and more specialised on the immediate task of resource extraction.

In this paper, we present longitudinal studies of two phases of rural infrastructure provision in regional Western Australia. Firstly, the development of a system of railways, wheat bins (grain collection points on the railway lines) and town sites in the early twentieth century (Glynn, 1975) and secondly the establishment of Telecentres (subsequently renamed Community Resource Centres) since the 1990s. In both cases, the development of newer technologies, the internal combustion engine and internet accessible personal computers respectively, have had the potential to render the earlier infrastructural provision obsolete. We therefore conclude with a consideration of the extent to which the infrastructures initially related to these transport and communication innovations remain sustainable.

II. THE DEVELOPMENT OF THE WESTERN AUSTRALIAN WHEATBELT

At the beginning of the twentieth century, the explosive economic and population growth brought about by the Western Australian gold rush was coming to an end. The newly established state government was therefore looking for alternative and, ideally, more sustainable ways to support the state's economy, notably through the expansion of agriculture. A Royal Commission on Agriculture and Land Settlement was established and, in its report (Western Australia, 1905), it set out the means by which this agricultural expansion was to be achieved. Over an area ca. 200-300 kilometres across and extending almost 1,000 kilometres from the port of Geraldton on the west coast to that of Albany on the south coast, land was opened up for agricultural settlement (Jarvis (ed.), 1979, 56).

The established forms of transport at this time were the railway and the horse and cart and the Royal Commission Report therefore recommended that "all considerable areas of agricultural land must have a fifteen mile rail (24 kilometres) rail service" (Western Australia, 1905, xxii). In accordance with this recommendation, the state government oversaw the development of a railway network across the expanding Wheatbelt whereby the railway lines were 30-40 miles (48-64 kilometres) apart and town sites were designated at regular intervals along them so that no farmer was obliged to haul wheat more than 15 miles to the nearest railhead (Glynn, 1975; Jarvis (ed.), 1979, 46).

Agricultural, railway and town site development continued on this basis up to 1933 by which time most of the land experiencing sufficient rainfall for grain cultivation had been taken up and the onset of the Great Depression discouraged any new initiatives. Also by this time, however, the use of mechanised road transport was becoming increasingly common. In the UK, Wibberley (1965) claimed that the changeover, on farms, from the horse and cart to motor transport doubled the average radius of the service area of a country town. In Australia, Bolton (1963) contended that this technological shift trebled the distance that could be travelled in a given period of time. Given that the area of a circle is the square of its radius, simple geometry would indicate that this technological innovation could enable a single rural service centre to supply an area nine times its former size. In itself, such a shift could therefore render eight out of nine service centres obsolete. Furthermore, in most agricultural areas, including the Western Australian wheat belt, it is not only what Christaller (1966) terms the range of a good or service (the distance that people can travel to obtain it) but also the threshold population (the number of people required to make the outlet/service viable) that has been transformed through technological innovation. The mechanisation of agriculture has made it possible for ever increasing areas of land to be managed by ever decreasing numbers of workers leading to both farm amalgamation and rural depopulation and therefore the consequent removal of services from the region's country towns.

The wheat belt has therefore experienced a decline in farm and country town population, in levels of service provision and in the railway network, particularly as transport and agricultural mechanisation has intensified since the Second World War. However, the rate of this decline has been slowed and modified by a number of political and social factors. Perhaps most importantly, representation in the state's parliament has been and, to some extent, still is characterised by a malapportionment in favour of the rural and regional areas (Jones, 1993). This has provided rural dwellers with disproportionate influence in lobbying for the maintenance of government services locally, even for small and declining populations. The fragmented local government system, whereby most wheat belt local authorities have populations of a thousand or less, also assists in this regard.

Nevertheless, and particularly since the state government adopted a neoliberal ideological stance in the 1980s (McCarrey, 1993; Tonts & Jones, 1996; 1997), centralisation and specialisation of rural service provision has been the order of the day. The State Planning Strategy (West Australian Planning Commission (WAPC), 1996) envisages a two thirds reduction in the number of "Local Service Centres" in the central part of the wheat belt by 2029 with the bulk of the rural population becoming dependant for most of their needs on "a range of consolidated service centres" (WAPC, 1996:114) which could well be up to 100 kilometres away from their homes/farms (Jones, 2001). Many of the smaller towns are now becoming (except for their seasonally operated grain handling facilities) social, rather than socioeconomic, central places. Their remaining facilities are largely limited to meeting halls, sports grounds and (generally unstaffed) places of worship.

In these circumstances, the state government acknowledges that "service delivery to small and isolated settlements" is the "paramount" land use planning concern in this region (WAPC, 1996:24) and, in the 1990s, it proposed the development of a network of telecentres as one means of addressing this problem. In the next section we therefore consider the evolution, characteristics and ongoing relevance of these centres over two decades of ever accelerating technological change.

III. WESTERN AUSTRALIA'S TELECENTRE/COMMUNITY RESOURCE CENTRE NETWORK

Community Resource Centres (CRCs) have been established across Western Australia supporting the State government's identified agenda of maintaining thriving regional towns and communities (Government of Western Australia, 2014). The WA Community Resource Network (WACRN) comprises 105 centres, including 12 smaller CRCs mostly located in remote Aboriginal communities. A review in 2015/16 of the WACRN (excluding smaller remote centres) sought among other requirements to determine the ongoing use and relevance of CRCs as a mechanism for regional service delivery. CRCs fundamentally provide a range of services to small regional locations and include: computer and internet access and support, printing and photocopying, access to government services and computer training. In many centres, this service range has expanded to include library, newsletters, health, banking, and postal services. In general, CRCs act as a community hub, providing news and information, support for sporting and social clubs, social and wellbeing benefits and places of learning, at reasonable cost utilising local staff and volunteers. Before detailing relevant findings from the review, the next section outlines the establishment and changes in the network over time commencing with its telecentre origins.

IV. SHARED ACCESS ICTS

The concept of shared access to information and communication technologies (ICTs) first took shape in Scandinavia with the establishment of 'telecottages' in the1980s (Harrison and Qvortrup, 1989). This developed into the more global community technology centre (CTC) movement of the 1990s (Fillip & Foote, 2007). During that decade, the Australian government partnered with state/territory authorities to implement *Networking the Nation,* a national initiative designed to address the digital divide. While all state/territory programs had an integrated state-wide focus, the majority opted for CTCs or telecentres as the main means of providing access to internet-enabled computers

and basic ICT skills in regional, rural and remote communities (Tibben, 2010).

In Western Australia, these initial or 'first generation' telecentres were established in small rural and remote communities on an *ad hoc* basis rather than forming part of any centralised and planned statewide network. They remain widespread across WA, albeit in disproportionate numbers and proximity in some locations such as the Wheatbelt (25% of the total) reflecting previous discussions (see Figure 1). Telecentres provided a range of services including access to computers, high-speed internet services, two-way video-conferencing, and education and training facilities, as well as government, business and community information and referral services. Aside from the initial establishment costs, ongoing funding was by means of an annual grant sufficient only to cover operational costs, making individual telecentres reliant on volunteers and responsible for absorbing their own supplementary costs (Western Australian Regional Development Trust (WARDT), 2013). Funding for this iteration remained static for 18 years. Suffice to say, most telecentres were struggling to generate sufficient income to cover their operating costs, as well as experiencing increasing difficulty in delivering services to their communities. By 2008, there were 103 telecentres, typically not-for-profit[1], community-based, locally governed and staffed which had forged strong relationships with other entities within their communities including local government, business and community groups (WARDT, 2013).

A significant boost to telecentre funding from 2009 onwards was associated with the Royalties for Regions (RfR) scheme. This scheme guarantees that 25 per cent of all mining and petroleum royalties earned in the state will be spent in regional areas, over and above normal State government expenditure (McLure, 2008). The decision by DRD to fund Telecentres through RfR accompanied a rebranding from Telecentres to Community Resource Centres (CRCs) and the establishment of the WACRN, or second generation CTCs providing a united brand and shared internet interface, moving towards what Fillip and Foote describe as a "telecentre ecosystem" (2007, p.12).

A six-fold increase in annual funding to CRCs was accompanied by the establishment of state-of-the-art IP based video conferencing suites and technology upgrades in each centre. Additional funding led to concomitant expansion of CRCs' remit:

> *"The role and functions for Telecentres were expanded to include: a greater emphasis on improved technology; an increased role in event coordination; delivery of training; coordination of local activities and a stronger focus on providing government information. Significantly, CRCs will be freed up to promote social development through providing access to services not otherwise available to the community[2]"*

In 2013, the WACRN program was reviewed by the WARDT, an independent tribunal established

Table 1. Description of data collection methods, units and totals for the 2016 WACRC review

Method No	Description of data collection method	Units	Total persons surveyed
1	Randomised community telephone survey process using computer-assisted telephone interviewing (CATI)	2400 households	2400
2	CRC stakeholder individual and group interviews	92 interviews	235
3	CRC online surveys	33 online surveys	33
4	Broader stakeholders engagement	55 (interviews, web-based survey, email correspondence)	55

to provide oversight of RfR funding. This review made a range of recommendations to improve the relevance and sustainability of the WACRN, as well as to strengthen the program's alignment with the *Royalties for Regions Act 2009* specifically that the objective of funding is 'to promote and facilitate economic, business and social development in regional Western Australia'[3]. This inclusion of economic and business dimensions further broadened the functions of the WACRN or 'third generation' CTC.

An independent review of 2013 changes commenced in late 2015 and involved approximately 2,600 individuals in data collection that included: individual and group stakeholder interviews in over 30 visited CRCs; a randomised community telephone survey of 2,400 regional households; online survey of CRCs not visited; and interviews with broader or external stakeholders. A summary of data collection aspects are provided in Table 1.

V. RELEVANT FINDINGS

Results emerging from the random household survey included that around 90 per cent of households were aware of CRCs with almost three-quarters (74%) having accessed their local CRC at some stage in the past two years. One third accessed a CRC at least monthly. Feedback from interviews with community members and local businesses reinforced the findings of the randomised survey, with strongly positive views being expressed. In addition to access to services, CRCs acted as a community and social hub where local services were acknowledged to be provided at reasonable cost and supported by friendly and capable staff.

VI. DEMOGRAPHIC CHARACTERISTICS OF CRC USERS

Profiling information from the study indicates that CRCs had the broadest appeal for the dominant demographic group in regional WA namely those over 50 years old. However, the study identified a distinct sub-group of local residents (versus visitors or travellers) who remained unfamiliar with computing and online services. Albeit that the broader the range of general services within a particular CRCs, e.g. banking, post office etc. the

greater the demographic diversity. Despite both the rapid increase in mobile technologies and internet access in Australia generally, connectivity in many regional areas of WA still remains patchy despite National Broadband Network (NBN) roll-out in most areas included in the study. However, according to the Australian Bureau of Statistics (2014) connectivity and location are not the only barriers to digital access: being over 60 years and having a household incomes of below $40,000 (only 57% of households in this bracket had internet access) are also key considerations. The Australian Communications Consumer Action Network confirms that this combination of issues, namely location, age and income impacts on around seven per cent of the Australian population (ACCAN, 2014). Not only does this indicate ongoing barriers in opportunities to participate in the 'knowledge economy' but review data reveals the increasing usage of CRCs as access and support points for government services provided through online portals. Government services such as the Australian government social security system (Centrelink) are scheduled by 2020 to have the majority of its non-metropolitan areas serviced through online access. This is incongruous given that connectivity is impacted by inequalities related to income, education, age and locational divide that greatly disadvantage precisely the segment of the population most reliant on social security assistance.

VII. CONCLUSION

Technological changes, and perhaps especially those related to transport and communication, have often engendered extreme reactions, be these Cassandran or Messianic (Jones, 1993). The fears of the poet Wordsworth that the English Lake District would be ruined by the coming of the railways or of those legislators who required mechanised road vehicles to be preceded by a walker carrying a red flag were largely, but perhaps not completely, groundless. Equally, not even the internet has been able to bring about "the annihilation of space by time" (Marx, 1971) since both physical and digital divides remain.

Our consideration of the implications, over time, of the two very different technological innovations discussed here leads us to broad agreement with Gold (1991:339):

"If we are to make better sense of the patterns that are arising, however, it is essential to move beyond simply looking for the impacts of technology and start showing the role of human agency in the process: why people choose technology and how they choose to use it. Only by doing so will it be possible to move beyond seductive utopian images of social redemption through technology towards an understanding that reflects the true complexity of the relationship between technology and society."

The governmental responses, both in the Royal Commission report in 1905 and in the Telecentre programme of the 1990s, could be seen as proactive in terms of the technological conditions prevailing at those times. However, these technological conditions are changing at an ever-increasing rate. In this context, our first case study indicates that people may use the political system to mitigate the impacts of the introduction of one new technology while the second underscores the importance of striving for more equitable access to another. The subsequent governmental response, in both cases, has been to achieve, or at least to approach, a level of rural sustainability in which as few as possible are left behind through successful social adaptations to technological changes. But, in ideal circumstances, governmental sustainability strategies for rural areas should not merely be reacting to the impacts of technological change on small and remote communities, they should also be anticipating these impacts and working with the communities to identify the opportunities presented by technological change as well as the threats.

Notes
[1] On a lesser scale, there are two other administration models, including management by: 1) local government; and 2) Aboriginal corporations
[2] Department of Regional Development and Lands (RDL) submission to WARDT 2013 review.
[3] *Royalties for Regions Act* (2009), Part 1, Section 4.

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