

NARROWING THE DIGITAL DIVIDE: THE AUSTRALIAN SITUATION

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ABSTRACT

Despite the initial slow progress, governments around the world have finally adopted the Internet as means of interactions with citizens and delivering public services. Despite the strides made by many Western governments, such as Australia, in implementing e-government, significant barriers to the evolution of fully-fledged e-government services still exist, one of which is the phenomenon of digital divide. Digital divide in Australia, a developed country with an advanced technological base, is caused by *demand-pull* factors, and thus, require the application of *social setting* approaches in understanding the phenomenon and subsequently, implementing measures to narrow the digital divide. This paper discusses the digital divided issues in developed countries, strategies to narrow the digital divide in Australia, and issues for further research.

KEYWORDS

Electronic government, Digital divide, Demand-pull/Supply-push, Australia

1. INTRODUCTION

Governments have been relatively slow in adopting web technology to deliver public services, (Marche and McNiven 2003), however, there has been a steady growth in interest with regards to the adoption of the Internet as a medium of public services delivery (Criado and Ramilo 2003). Electronic Government (E-government) is defined as the use of web-based information systems by governments to enhance the delivery of public services to citizens, businesses, and

employees (Silcock 2001). West (West 2000) defines the concept as the “use” by government agencies of information and communications technologies (ICT) to transform “relations” with citizens, businesses, and other arms of government. E-government is also referred to as the use of ICT by government agencies to “simplify” and “improve” interactions with citizens, businesses, and other constituent bodies (Sprecher 2000). Thus, e-government initiatives are aimed at bringing about the optimal delivery of public services and information to citizens, and more transparent and effective interactions with businesses, thereby resulting in reduced corruption, and enhanced effectiveness and efficiency of government transactions with citizens and businesses (Muir and Oppenheim 2002; Ke and Wei 2006).

Some notable initiatives at establishing e-government include the French Information Autoroutes, the Danish Information Society 2000, UK Information Society Initiative, Singapore’s Intelligent Island Strategy, Malaysia’s Vision 2020, China’s NII 2020 policy (Genus and Nor 2005), and the FedLink (Australian Government Fedlink Home Page) and GOVERNMENT (GOVERNMENT) projects of the Australian government. However, e-government initiatives are at various stages of maturity. The four main stages in this process of e-government maturity (Cap Gemini Ernst & Young 2001; Layne and Lee 2001; Muir and Oppenheim 2002) include: Online presence, or *cataloguing*, *Transaction* or interactive websites, *vertical integration* of various information systems at different levels within the same government functionality, and *horizontal integration* with information systems across different government functionality leading to a *one-stop shop* (Ho 2002) for citizens and businesses.

Each stage of e-government evolution is accompanied by advances in technical know-how, transparency, and interactions with citizens, businesses, and other governmental and non-governmental organizations. Australia is one of those developed countries in which the government has devoted attention towards the establishment of an advanced e-government infrastructure, which has manifested in the rise of citizens contacting the government via the Internet from 19% in 2004 to 25% in 2005 ((AGIMO) 2006). Yet, the same report from the Australian government reveals that the number of people who nominated the Internet as a medium for undertaking transactions with the government did not change significantly in 2006 from the 2004-5 period. In fact, a number of potential barriers were identified that impeded the spread of e-government services in the country. The next section looks at the barriers to the evolution of e-government, followed by a discussion of the phenomena on digital divide, and finally, a discussion of the proposed investigation into narrowing the digital divide in Australia.

2. BARRIERS TO THE EVOLUTION OF E- GOVERNMENT

The prime factors identified as potential barriers to the progress of e-government projects include scarce resources, lack of technical expertise, and importantly the digital divide (Ho 2002; Moon 2002). Moon’s (Moon 2002) survey revealed that the development and diffusion of e-government depended on the size and type of municipal government, i.e. larger municipalities were more proactive in adopting and overseeing the further development of e-government than their smaller counterparts. According to (Weare, Myusso et al. 1999), early adopters of new e-government technology tend to be municipalities which govern larger, more affluent, and politically influential populations. Thus, larger municipalities have access to

greater technological, financial, and administrative resources (Moon and deLeon 2001). Indeed, the pervasiveness of computers and Internet within a municipality can be attributed to the socioeconomic backgrounds of its citizens (Reidel, Dresel et al. 1998; Neu, Anderson et al. 1999). Thus, citizens from the higher socioeconomic rungs of society are more likely to use computers and the Internet than their counterparts in poorer municipalities. This fact is supported by (Rogers 1986) who reiterated that some of the major factors affecting the diffusion of the Internet are socio-economic, political, and linguistic in nature. Thus, municipalities inhabited by citizens from the lower socioeconomic strata of society tend to have lower e-government capability (Wilhelm 2000). Moore (Moore 1999) warns government officials against the directing online services aimed exclusively at the higher strata of society as this would invariably impede the development of e-government in the long term. This technological disparity is referred to as the *digital divide*, the subject of discussion in the next section.

3. THE DIGITAL DIVIDE

The digital divide has been defined by Dewan and Riggins (2005) as the difference in the availability of, and access to digital technology across various social groups. This definition supports Hoffman and Novak's (1998) definition according to who digital divide is a disparity between groups and societies in the adoption and diffusion of electronic information and communication technologies (ICTs) and e-business practice. Yu and Wang (2004) are also of the opinion that digital divide is imbalances within a society or between societies that leads to a situation where one community has lesser access to IT than another. It is a difficult phenomenon with political, economical, technological and educational dimensions (Kovacic & Vukmirovic, 2008). It refers to the gap in ability to use ICT, actual use of ICT and the impact of ICT use in terms financial effects. The digital divide results from inequalities in usage of ICT, in autonomy of use, in skill levels, the availability of social support; however, the most important reason is differences in computer skill levels (Dewan & Riggins, 2005). Other reasons for digital divide according to Black and Atkinson (2008) are access to ICT, socio-economic factors, education, age, location, disability, individual's opinion (cost, lack of need and inhospitality) and gender and culture. According to Mossberger et al. (2003) there are four different types of divides related to ICT: an information divide due to some people's inability to gain access to online information due to demographic characteristics; a skills divide related to computer specific capabilities; an economic opportunity divide related to the inability to receive training, education or employment opportunities; and a demographic divide related to certain people's inability to participate in electronic offerings. Some of the common indicators of digital divide identified by the OECD and the US Department of Commerce, are related to ownership and access to ICT (Corrocher and Ordanini 2002). Typically, these measures look at the development of IT infrastructure and the differences between various groups of people and geographical regions in their ability to acquire or access ICT. Digital divide is identified by certain indicators, such as the relative online population, telephone coverage, and newspaper readership between developed and developing countries (Genus and Nor 2005).

Important factors that have been identified to bridge the digital gap are efficacy of community centres to promote ICT adoption and usage (Baker & O'Neil, 2003), Internet use

related to physical access and social networks (Payton, 2003) and feasibility of broadband access using various new technologies (Zhang & Wolff, 2004). Hargittai (2003) is of the opinion that the digital divide is not only affected by connectivity, factors such as quality of technical equipment; location of access and freedom to use; social support networks to assist with technology use; and experience with technology play an important part as well. In Australia rural populations lag behind metropolitan areas (Curtain, 2001) despite the distinct advantages information technology offers residents of geographically remote areas (Hindman, 2000).

Most studies on digital divide are focussed on the technological gap between developed and developing countries. Indeed, (Bagchi 2005) reiterates that the digital divide is considered to be a sociological phenomenon and is a reflection of the prevailing social, economic, cultural, and learning inequalities in developing countries. In accordance with these indicators, one may presume that a country with higher GDP per capita income and telecommunications coverage will have less of a digital divide with a benchmark developed country, such as the USA, than a country where the differentials are higher. However, a study of African countries with similar GDP per capita revealed the different levels of ICT and Internet diffusion were prevalent in these countries (Wilson and Wong 2003). Similarly, a study of the digital divide between Norway and Estonia revealed that the latter, despite being an emerging economy and one of the poorer members of the European Union, did not lag far behind its richer Scandinavian counterpart in terms of its *e-readiness* (Ifinedo and Davidrajuh 2005). One of the prime sectors that enhance the ICT infrastructure of a country is the telecom sector, which in the case of Estonia, was found to have made remarkable progress, thereby leading to the narrow digital divide with Norway. In this regard, (Wilson and Wong 2003) argue that the policies pursued by governments play an important role in creating a congenial environment for the growth of ICT and Internet usage. Digital divide was also found to exist within sections of the population in developing countries. For example, in the case of China, more men were found to be Internet users than women (Lu, Du et al. 2002). Also, most of the Internet users were young and single between the ages 18 to 24. Geographical orientation also played a part as a large proportion of the Internet users were located in the well-developed regions of the country. However, an interesting revelation was the fact that well-established Chinese businesspeople with very high monthly incomes preferred doing business the conventional way than spend time on the web.

Corrocher and Ordani (2002) uncovered the fact that merely having an ICT infrastructure in place was inadequate as people's knowledge and capabilities were important factors in determining the extent of Internet usage, thus refuting the *technological deterministic* (supply-push) approaches often championed by corporations and popular media. Instead, Genus and Nor (2005) propose *social shaping* approaches to identify a number of factors that can promote or inhibit the diffusion of ICT and Internet-related development. These include the skills and confidence of people to use IT effectively, intellectual, human, and social capital, and technological acculturation. They emphasize the importance of taking into account issues, such as the appropriateness of the technology to local needs and requirements, Internet usage fees, and ease of access, by ICT companies and governments.

3.1 The Prevalence of Digital Divide in Developed Countries

Digital divide exists not only between developed and developing nations, but also within different socio-economic groups within a developed country (Bridges 2005). Ho (2002) states that cities and municipalities in the US with poorer communities were less likely to adopt sophisticated forms of e-government. His survey indicated that cities with less-privileged minority populations did not make a high level of progress in the implementation of e-government. This is supported by (Bucy 2000) who points to the digital divide in USA between low-income groups, such as disadvantaged people, minorities (particularly African and Hispanic Americans), people with low formal qualifications, and single mothers on the under-privileged side of the gap, and higher-income earners with higher formal qualifications on the privileged side. Pervasiveness of computers and Internet were undoubtedly influenced by the socioeconomic backgrounds of the citizens in the municipality (Neu, Anderson et al. 1999; Carveth and Kretchmer 2002). Thus, citizens from the lower socioeconomic rungs of society are less likely to use computers and the Internet than their richer counterparts. Moreover, (Weare, Myusso et al. 1999) suggest that early adopters of new technology tend to be municipalities which govern larger, more affluent, and politically influential populations. Likewise, in the UK, consumers over the age of 55 years and those from the lower economic strata of society are less likely to use the Internet (OFTEL 2000).

3.2 Digital Divide in Australia

Despite its rank at number three in its uptake of Internet technology, after Sweden and USA, Australia presents the existence of a digital divide between urban and rural regions, owing to the higher costs of access and poorer quality of connections associated with the Internet in the rural areas (Lloyd and Hellwig 2000; Curtin 2001). A recent study (Singh et al., 2008) indicates that for urban Australian citizens Internet connections at home, knowledge, socio-economic status and public Internet access points are important factors for diffusion of E-government services in Australia. Another Australian study (Singh, 2008) focused on rural Australia, indicates that there are many rural citizens who do not own computers, do not believe they have the ability to access the Internet, and live with the perception that they are too old to use computers. This same report also indicates that although some rural citizens would like to use e-government and e-business services, they do not have the knowledge to search for information on the Internet, or to navigate the web sites. Also, the choice of a suitable ISP, offering un-timed local calls, is limited in rural areas, a significant factor in determining the adoption of e-commerce by small and medium sized businesses in rural areas (Curtin 2001). Added to this digital disadvantage is the trimming down of government personnel providing public services in the rural areas, marked reduction in banking outlets, and cutbacks in rural telecommunications. However, these are the *supply-side* issues contributing to the digital divide. (Lloyd and Hellwig 2000) argue that the *demand-side* issues, such as *socio-economic demographics*, play a greater role in contributing to this digital divide than geographical location. In some parts of rural Australia, less people hold tertiary qualifications and generate less income than their counterparts in the urban areas, factors which account for the lower rate of Internet diffusion amongst the rural population (Curtin, 2001). As low income is undoubtedly an important inhibitor to Internet access, cost of access becomes a major issue, especially in the less-affluent rural districts (Zappala 2001).

Indigenous Australians and Torres Strait Islanders were also found to be deprived of access to the Internet, owing to the same factors of lower income and formal educational qualifications. Comparing the situation in Australia with that in the USA, it can be inferred that similar factors of age, income, formal qualifications, and race, have contributed to the digital divide prevailing in the two western countries. Furthermore, similar demographic issues of age and level of education also apply to Australia and China.

4. NARROWING THE DIGITAL DIVIDE

A number of suggestions and actual undertakings have been put in place to reduce the digital gap affecting developing countries. James (James 2002) suggests that the implementation of "communal technologies", providing ready and low-cost access to rural communities, can be used to effectively address the needs and requirements of the local market. Dai (Dai 2002) describes the proactive undertakings by the Chinese authorities in order to establish a communications infrastructure that is aligned with local requirements. Furthermore, the importance of fostering a sound understanding of local requirements by technology providers calls for senior IT managers to engage in programs of technological acculturation as practiced in middle-eastern and North African countries (Loch, Straub et al. 2003).

With regards to narrowing the digital divide in developed countries, (Ke and Wei 2006) elucidate the efforts of the government of Singapore, directed at reducing the digital divide potentially affecting some of the country's citizens, by setting up learning and demonstration kiosks for elderly people. It also designed training programs to enhance computer literacy and computer ownership programs and public kiosks to improve computer and Internet access. The government also set up call centres, called the e-Service Center, with the aim of providing services to citizens who were unable or not keen on undertaking transactions online. By the end of 2001, Singapore was able to deliver 92% of public services online, in contrast to Hong Kong, which was able to do only 80% of its public services via the Internet at the end of 2002 (Ke and Wei 2004). However, there are a number of factors behind the effectiveness of Singapore's e-government programs. These include the fact that Singapore is a highly affluent city-state with a largely educated population of 4 million, and has been ruled, in the past three decades by the Peoples Action Party, which commands great power and influence in the island nation, thereby enabling it to forge ahead with new technology-related initiatives. Being a small city-state, Singapore does not have multiple layers of state administration, thereby reducing the problems associated with vertical integration.

In Australia, the digital divide is more prominent in rural and regional areas, and to address this issue, as stated in the RIRDC Report (Singh, 2008), governments in Australia at the Federal and State levels have introduced and funded a number of initiatives. These include Rural Transaction Centres, Telecentres, Neighbourhood and Community Houses, to provide availability, accessibility, affordability and use of ICT to reduce disparities in communications access and use between metropolitan and non-metropolitan regions. These centres provide ICT-based training programs which are promoted by local councils to rural people. Training of program managers and coordinators at Community Houses and opening hours of these entities are also supported and funded by governments. The report also recommended strategic alliances with technology providers and local government agencies for discounted computers and Internet connections to further support the adoption of ICTs by rural citizens. Flexible,

formal and informal training programs delivered by TAFE institutes in the region is funded by both the Federal and State governments to get rural citizens to use ICT based education programs as well as hobby courses such as digital photo albums and the use of web 2.0 tools. This report also highlights the need for professional development for TAFE (Technical and Further Education) teachers to keep them informed of new technological developments in ICTs, which they share with rural students. Other strategies for reducing the digital divide included in this report are a 'one stop shop' for e-government services accessible from local e-government site, and to encourage citizen participation on current political and regional issues by allowing them to voice and record their opinions on specially created web sites for these issues. Another recommendation is to leverage on successfully used online applications such as e-banking to encourage the use of other online services.

5. CONCLUSION AND FUTURE RESEARCH

Despite its affluence as an economically progressive western nation with an advanced technological base, the phenomenon of the digital divide is prevalent in Australia. As discussed in the preceding section, demand-side social-setting approaches are required to understand the intricacies of the digital divide in Australia.

This paper discusses the digital divide in developed countries. It includes factors that lead to digital divide in these countries and some strategies and policies put in place to narrow the divide. It clearly indicates that a lot more effort is required to get citizens to use ICT-based applications, however, e-government services seem to be one of the best options. This is because all citizens are entitled to government services, and government initiatives have been introduced to encourage and support citizen access for these services. However, further research is required for addressing issues on narrowing the digital divide from a theoretical perspective, from a global perspective, and to establish the impact of the existing policies and strategies to reduce the digital divide.

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