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A model for rural and remote information and communication technologies: a Canadian exploration

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Abstract

While Canada boasts one of the most advanced information and communication technology (ICT) infrastructures, its rural and remote areas are lagging behind. Rural and remote ICTs development is presented as an uncharted domain. A model for rural and remote ICTs is proposed describing the interrelationships among policy, organizational, community, and technological dimensions. The model served as a guide to prepare three case studies that are briefly described. Several principles are described as strategic policy and organizational insights into how rural and remote communities can harness ICTs. The article concludes with a hypothesis highlighting the role of mediating organizations to secure affordable and relevant ICT services and applications for rural and remote communities. © 2001 Published by Elsevier Science Ltd.

Keywords: Model; Rural; Remote; ICTs; Canada; Case studies; Systems thinking

1. The Canadian context

Canada boasts an aggressive information infrastructure policy that seeks to make it the most connected country by the year 2000 (Government of Canada Information Highway Advisory Council, 1997). The policy framework is reflected in a broad range of provincial and federal funding grants to stimulate infrastructure upgrades, inform and train citizens, and enhance new services and applications across most sectors of the economy. Being the 'most connected country' is a political goal open to interpretation through undefined indicators. According to at least one measure, Canada's overall telecompetitiveness is only second to Singapore's, and ahead of the United States (Hubert, 1996). According to other measures, such as Internet hosts per 1000 inhabitants, it comes fourth after the United States and three Scandinavian countries (Paltridge,

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1999). It is clear that on a global scale, Canada boasts a very advanced information and communication technology (ICT) infrastructure. It is certain too, however, that rural and remote communities lag behind urban ones with regard to ICT infrastructure, services and human resources. While some Canadian statistics suggest that the gap in information infrastructure and use between urban and rural sectors may be shrinking (Thompson-James, 1999), the task of servicing rural and remote areas remains relevant. This challenge constitutes a part of a growing global infrastructure gap that is very significant (Hudson, 1998; UNDP, 1999; Mansell & Wehn, 1998). The gap is not only between rural and urban populations; it is also closely associated with education and income levels (Bruce & Gadsden, 1999).

Telecommunication investments are perceived as strategic tools for economic development of rural areas of OECD member states (Ullman, Williams, & Emal, 1996; United States Department of Commerce & United States Department of Agriculture, 2000; Bryden & Sproull, 1998; USDA Economic Research Service, 1998; Richardson & Gillespie, 1996; Reimer, 1997; Parker & Hudson, 1995; Cronin, McGovern, Miller, & Parker, 1995). Their reach into rural and remote areas, however, is limited by weak demand (Bollier, 1988), partly as a direct result of their sparse populations. In other words, the very areas that stand to gain the most from telecommunications are the last ones to be serviced by the market.

A major challenge for Canadian telecommunication regulators is the fact that while on the one hand market liberalization is a goal, on the other hand so is universal access. Managing these two policy driving forces is particularly challenging when it comes to regulating services in remote areas, as was the case with a recent ruling on high-cost serving areas (CRTC, 1999). Canadian telecommunication infrastructure is increasingly owned by large corporate interests that compete on a global scale. ''In place of national policy-making, a global telecom and media policy regime is emerging.'' (Abramson & Raboy, 1999, p. 775) At the same time, a factor of central concern in Canada is unity, national economic viability and cultural identity, all of which are tightly linked to communication policy (Ganley, 1979). Today cultural and communication policies in Canada are confronted with emerging global regimes that place economic and competitive pressures on the sector (Science Council of Canada, 1992; Globerman, Oum, & Stanbury, 1993; Abramson & Raboy, 1999).

2. From a 'business case' to a 'developmental case'

Telecommunication infrastructure expansion and upgrading depend on compelling proposals demonstrating a business case in the eyes of investors. Aggregating demand from different sectors is a mechanism to attract private sector carriers that shun further investments in rural areas (Sawhney, 1992; McMahon & Salant, 1999). In remote settings, the business case will often not be there, and infrastructure upgrades are only possible through regulatory mechanisms, governmental support and partnerships (Schmandt, Williams, Wilson, & Strover, 1991; Dymond, 1998). In such contexts, there are other objectives that create a *developmental case* for the investments. In other words, while economic development remains high on the list, the purpose of harnessing ICTs lies beyond merely a demand and supply rationale. Sustaining and improving opportunities in those communities is a worthy goal (Wilson, 1992; Bryden, 1994). A community development approach to rural and remote ICT development calls for the integration of economic and social

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