Virtual Repository Development in Canada

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ABSTRACT

The development of large-scale networked resource and virtual repository initiatives in Canada from 1995 to 2005 is interwoven with the availability of new communications technologies, the role of government sponsorship, and the commitment of various Canadian organizations to extend virtual resources development in Canada and internationally. This article provides an overview of key networked resource projects in Canada and addresses major challenges to developing large-scale networked resources in a vast and diverse country.

INTRODUCTION

Canadian Broadband

It is no exaggeration to say that over time, the impact of broadband communications on Canadian life will be at least as great as the impact of railways, highways, airlines traditional telecommunications and broadcasting (Industry Canada, 2003).

The development of e-networks and virtual repository initiatives in Canada is interwoven with the availability of new communications technologies, the role of government sponsorship, and the commitment of various Canadian organizations to extend virtual resource development in Canada and internationally. Canada's main broadband initiative, Canadian Network for the Advancement of Research, Industry and Education (CANARIE), is an e-network rooted in regional-federal cooperative network principles established in the late 1980s, and growing public and private sector interest in high-speed networks during the early 1990s (Luppicini, 2006). CANARIE (founded in 1993) is a not-for-profit federally incorporated organization established to develop a networking infrastructure that would enable Canada to be a leader in the developing knowledge-based economy. Through CANARIE, Canada advanced information technology and telecommunication capacities across the country by implementing high-speed optical computing networking technology connecting universities, research institutes, businesses, government agencies and laboratories, museums, hospitals, and libraries, both nationally and internationally (Industry Canada, 2003).

Once the broadband connections were implemented, there was a need to develop content that required broadband capacities. CANARIE funded a number of organizations carrying out innovative initiatives using broadband technology in a number of areas, including virtual astrophysics communities (Canadian Virtual Observatory), microelectronic online testing (National Microelectronics and Photonics Testing Collaboratory), science information database sharing (Réseau d'informations scientifiques du Québec), and learning object repository development for education (EduSource Canada). The Canadian Virtual Observatory provided advanced observation capabilities to help scientists explore advanced wavelength coverage from radio to X-rays. The National Microelectronics and Photonics Testing Collaboratory provided access to resources for testing high-performance microelectronics and photonics designs. The Réseau d'informations scientifiques du Québec was a scientific information network that links Quebec's institutions of research and higher education. The Canadian Network of Learning Object Repositories (called EduSource Canada) was established in 2002 by CANARIE to create interoperable learning object repositories from coast-to-coast.

Besides CANARIE, a number of federally funded organizations sponsored large-scale initiatives contributing to broadband expansion in key areas, namely e-network and virtual repository development. The Canadian federal government established the Office of Learning Technologies (OLT) within Human Resources Development Canada (HRDC) in 1996 to leverage lifelong learning for a new knowledge-based economy and to help communities find effective uses of learning technologies. In addition, the Canadian Council on Learning (previously called the Canadian Learning Institute) was established in 2003 to promote

evidence-based decision-making at all levels of learning with an emphasis on information sharing through virtual repository development. The following discussion focuses on the Canadian case of broadband expansion, e-networks and virtual repository development.

A selected review of Canadian federal government databases on major e-network and virtual repository development initiatives from 1995 to 2006 reveals a number of problems and challenges revolving around public knowledge, education, and systemic organization. This article provides an overview of innovative projects in Canada and addresses major challenges to developing large-scale virtual repositories with a national scope.

BACKGROUND

E-Networks and Virtual Repository Development in Canada

The population in Canada is approximately 32 million with a high level of cultural and ethnic diversity. The population is geographically dispersed across a large landmass necessitating the use of communication tools and techniques to help "connect" people and communities. To this end, broadband development and e-networks have played an important part in overcoming geographical barriers that separate people, particularly in the area of education. Broadband refers to Internet connection speeds greater than narrowband connection speed of 56kbs, and e-networks are organizations (including virtual organizations) with shared digital resource capacities interconnected through a broadband computer network. Digital resources designed for educational aims for repeated use to advance teaching and learning are known as learning objects.

The Canadian Government began investing heavily in the Internet primarily through the establishment of e-networks, namely CANARIE, the Office of Learning Technologies, and the Canadian Council on Learning. CANARIE was established in 1993 and through CANARIEs' e-learning program several large-scale learning object repositories were funded in the 1990s, including the Athabasca Digital Library (ADLib), Campus Alberta Repository of Educational Objects (CAREO), BCcampus, The Co-operative Learning Object Exchange (CLOE), eduSourceCanada, The Portal for Online Objects in Learning, (POOL), SavoirNet, and The Inclusive Learning Exchange (TILE). In 2003, CANARIE funded nine new projects headed by Acadia University, APR Inc, Delvinia, Immersion Studios, Live Wires Inc, Ryerson University, Sonic Designs Inc and Video Verite Artist Centre. These projects were intended to generate Canadian content and culture in a broadband environment ("CANARIE funds nine new media applications projects," 2003). In 2005, CANARIEs' goal was to upgrade its network to support speeds of up to 50Gbps. This development was intended change how organizations use their networks by allowing users to tailor bandwidth to their needs. It was also intended that the network be used to help research institutions work cooperatively by facilitating large-scale information sharing. A five-year agreement between CANARIE and Rogers Telecom Incorporation was proposed to connect various Canadian research centres to the network. CANARIEs' efforts to build bridges between Canadian telecom providers and the nation's research institutions was expected to benefit a number of research centres and government departments such as Natural Resources Canada, the National Research Council of Canada (NRC) and Environment Canada (Sutton, 2005).

The Canadian Federal Government established the Office of Learning Technologies (OLT) within Human Resources Development Canada (HRDC) in 1996 to leverage lifelong learning for a new knowledge-based economy and to help communities find effective uses of learning technologies. In 2001, OLT had over 300 regional Human Resources Community Centres (HRCC) across Canada and a number of major funding initiatives, namely, new practices in learning technologies, community learning networks initiative, learning technologies in the workplace, and research in learning technologies (Langlois, 2001). The New Practices in Learning Technologies (NPLT) initiative supported projects that advanced understanding of learning technologies and how to use them within the educational sector. The community learning networks (CLN) supported short-term pilot projects to increase access to community learning resources. Learning Technologies in the Workplace (LTW) subsidized projects that increased opportunities for technology-aided learning and skills development in the workplace. Finally, the Research in Learning Technologies (RLT) funded the other initiatives wherever research was required.

The Canadian Council on Learning (previously called the Canadian Learning Institute) was a new