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COMMUNITY BROADBAND PORTAL INITIATIVE (Paper)

Abstract: This paper examines the creation of the Digital Communities portal and repository that has created a collection of curated content aimed at enabling rural and remote communities to advance their own community broadband networks. The paper explores how the participatory research method was used in the design of the portal.

1. Introduction

Communities across Canada like Olds, AB are building thriving digital communities to overcome the digital divides faced by their constituents (Chung, 2013). Although there is an emerging but disparate body of content on rural and community broadband that could inform these efforts, researchers and other stakeholder communities lack access to such content. This gap leads to scarcity of both knowledge and technical infrastructure (bandwidth and connectivity), which for too long has impeded rural and remote broadband access. Reduced broadband access has a number of implications including limited economic opportunities, diminished access to services and outreach programs (e.g. tele-health and e-government), minimal skill development opportunities (e.g. online, distance education, and trade skills) and inhibits retention of rural youth within communities (Jaeger et al., 2012; Chew et al., 2011; LaRose et al., 2007).

This paper explores a participatory research project that aims to enable rural digital communities by creating a curated web-based portal and online repository of materials related to rural and community broadband known as the Digital Communities Portal. The portal and repository (hereafter just portal) draws together content including provincial and federal policies, academic research (national and international), success stories and business models (such as Olds, AB) for different stakeholders on rural community broadband initiatives. This collaborative research project includes an interdisciplinary team of researchers from the University of Alberta in partnership with the Innovation and Advanced Education Department of the Government of Alberta. The portal is designed to be openly accessible to anyone, and makes use of the University of Alberta's institutional repository for the long-term preservation of content. This portal furthers the community broadband ecosystem by increasing linkages and knowledge transfer among various user groups and is an outcome of a participatory research endeavour stemming from the Van Horne Institute's Digital Future conferences held in 2015.

2. Literature Review

This project is interdisciplinary and draws upon research from several related fields including communication ecosystems, content curation, community informatics, participatory research, and web usability.

While in the U.S. there is a significant ecosystem to support community broadband made up of resources including Broadband Communities Magazine (bbcmag.com), the Institute for Local Self-Reliance (muninetworks.org), Next Century Cities (nextcenturycities.org), and Federal Broadband Strategy State Broadband Strategies FTTH Council Americas (ftthcouncil.org), such a similar ecosystem is lacking in Canada (Wolfe, 2015), and is a key purpose for the Digital Communities Portal project.

Curated content portals offer significant advantages as means for organizing and disseminating knowledge. A curated collection of content can result in enhanced authority for the materials within the collection (Ovadia, 2013), and are an important element in allowing communities of practice to be established (a key goal for the portal) (Fotopoulou and Couldry, 2015). They also encourage collaboration between academic communities and citizens ensuring that content can be of educational purposes both within and outside of academia (Rotman et al. 2012).

The fields of community informatics and participatory research are linked, as noted in a recent special issue of *The Journal of Community Informatics,* which stated, "participatory methods engage participants in conducting research and retaining ownership of data" (Bytheway et al. 2015). Furthermore, community oriented development patterns are being increasingly recognized as important ways to examine broadband deployment (McMahon et al. 2014). One key element from community informatics is the importance of stakeholder involvement, where stakeholder participation in design elements is of particular importance (Halabi et al. 2015). Participatory research is particularly important to this project as the inclusion of stakeholders along with the expertise of researchers can be effective in working towards jointly articulated solutions (Cornwall and Jewkes, 1995). Participatory community informatics research projects should be iterative and flexible whereby data collected in initial phases shapes development in later phases (Craig and Williams, 2011). While participatory research projects are not with their limitations, they can be particularly useful for expanding researchers' perspectives and uncovering new ideas (Whyte et al., 1989). In addition the project draws upon usability literature in order to facilitate navigation and browsing of content available on the portal, and draws upon the work of usability experts such as Nielsen (1992; 1994)) and Shneiderman (2000).

3. Method

The portal development is a multi-phase process and uses a number of methodological approaches in developing the portal and populating the repository with content. The project is focused on improving the community broadband communications ecosystem for rural communities (particularly in Alberta) reflecting Day's (2011) concern that for participatory projects to be successful they must be grounded in making improvements in the communities they involve. Prior to the formal commencement of the research project there were participatory discussions at two conferences. The need for a community broadband portal was first raised at the March Digital Futures conference (McNally and Wolfe, 2015), and at the October Digital Futures conference there was an extended discussion facilitated by members of the research team involving nearly 90 participants about what type of content would be most desirable and needed (McMahon and McNally, 2015).

The first phase of the project involves the use of an environmental scan approach (Shiri et al., 2015) to identify original content different stakeholders are willing to provide, as well as determine third party content to be included in the repository. This phase also involves conducting a survey with community users to assess their information needs. The second phase uses the theoretical framework as outlined in *Information Architecture* (Rosenfeld et. al, 2015) to develop an information organization schema and layout of the front end of the portal. The third phase draws upon usability literature including conducting heuristic evaluations and Cognitive Walkthrough approach to evaluate and assess the portal and repository using usability requirements (Nielsen, 1992; Nielsen, 1994). In line with the participatory research design, an early version of the portal will be discussed at length at the upcoming Digital Futures conference in March 2016.

4. Findings and Discussion

In this section, the paper will focus on the key findings that emerged from the use of environmental scan approach. The other findings related to the second phase and the third phase will be included in the conference presentation (with due consideration to the space limitation). The environmental scan which stems from an analysis of the participatory discussion of various stakeholders during the recent Digital Futures Conferences (March 2015, Edmonton, AB; October 2015, Olds, AB) identified the following issues:

a) The sets of material that needs to be curated for the proposed portal include:
   - Federal policy documents (e.g. Industry Canada and Canadian Radio-television and Telecommunications Commission (CRTC) decisions). Examples include CRTC Telecom Regulatory Policy 2015-326 (Wholesale internet access), Basic Services Review documents (CRTC Notice of Consultation 2015-134), Industry Canada's Spectrum Policy Framework for Canada (2007). Collecting these materials is particularly important given the Government of Canada's directive to eliminate 50% of its web content (McNally et. al, 2015).
   - Provincial policy documents (e.g. upcoming Alberta ICT Strategy, Service Alberta Final Mile Rural Connectivity Initiative).
   - Local bylaws and other legislative frameworks (e.g. municipal Rights of Way regarding fibre deployment).
   - Links for open access scholarly publications and citations for other scholarly sources. This will facilitate access to academic sources that some users may not be aware of.
   - Reports from conferences (e.g. Digital Futures Conference Summary Reports (McNally and Wolfe, 2015), practitioners, think tanks (e.g. Van Horne Institute) and other community broadband sources (e.g. *Broadband Communities*).
   - Documents and links for research initiatives (e.g. First Mile Connectivity Consortium, McNally and Rathi SSHRC grant (Implications of Broadband Policy on the Digital Divide between Communities)) to identify potential linkages between community initiatives and research endeavours.
   - Success stories, case examples and business models from successful rural and remote community broadband projects both national (e.g. materials from O-Net and Olds Institute) and international (e.g. *New York State Broadband Strategy Development Toolkit*).
   - Links to datasets and statistics from national and international sources (e.g. International Telecommunications Union (ITU) statistical database, Organisation

for Economic Cooperation and Development (OECD) broadband statistics portal, CRTC *Communications Monitoring Report*).
- Materials related to emerging trends, technologies and social uses around rural broadband (e.g. Pincher Creek's RCADE project (Doll, 2015)).

b) The environmental scan further helped in the identification of the target audience for the portal including:
   - Rural and remote communities
   - Researchers and students
   - Regional administrators and policymakers (e.g. Alberta Association of Municipal Districts and Counties (AAMDC), Regional Economic Development Alliances (REDAs))
   - Provincial government departments (e.g. Alberta Innovation and Advanced Enterprise, Service Alberta, Alberta Agriculture and Rural Development)
   - Local/regional small internet service providers (ISPs) (e.g. O-Net)
   - Others

c) The other findings from the preliminary investigation include:
   - The architectural framework of the portal: It will have two components i.e., the front-end and the back-end. The front-end is a Web-based interface HTML/CSS pages. The back-end system is the existing University of Alberta's Educational and Research Archive (ERA) repository with links to the front-end portal. The presentation at the conference will cover other key findings including findings from the user survey and metadata framework as well as a demo of the working portal which expected to be complete by April 2016.
   - Licensing and Access Policy: In order to ensure maximum availability and use of content, any original material added to the repository will be licensed under least restrictive Creative Commons licensing terms (CC-BY-4.0), and content from third party websites will be archived in Archive-IT WARC files to ensure long term access to web content. For some limited material (e.g. scholarly publications covered by copyright and not openly licensed) full citations/references will be provided in a specific section on the portal. Such an approach will ensure open access for all, not just contributing stakeholders.

The portal has multiple significances including providing seamless access for community leaders, practitioners, government officials, ISPs and researchers to curated content with the aim of enhancing and extending the resources on community broadband to users across Canada. In addition, the portal upon completion will provide a valuable collection on digital communities and broadband for academic libraries and contribute in pedagogical capacities for courses on policy, communications and community engagement for the Canadian universities.

5. Conclusion

The portal will be the first major Canadian initiative on bringing curated content from disparate sources for the benefit of different types of users (e.g., rural communities and local ISPs, researchers, students, and government officials). The conference presentation will highlight not only the end results which is the portal and related content but also the key learning from the participatory research process of portal development which includes interaction with various stakeholders (e.g., community members, government,

local bodies, etc.). Thus, the proposed project connects to a number of conference sub-themes including community benefit and engagement (e.g., creation portal); community building: opportunities, structures, best practices, learning from the past, visions for the future (e.g., content on portal); community participation, service and leadership (e.g., community feedback, user survey); organizing information for and with communities (e.g., environmental scan of available content, supply of content by communities, and usability studies); community research and methods, and supporting communities, and listening to communities (e.g., participatory research design and methodology).

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