A VIRTUAL KNOWLEDGE COMMUNITY FOR HUMAN RIGHTS MONITORING FOR PEOPLE WITH DISABILITIES

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ABSTRACT

Research has shown that there are systematic human rights violations of people with disabilities. Human, rights monitoring is therefore fundamental to implementing human rights policies. In this paper, we describe the design of a Virtual Community (VC) platform to assist the monitoring of human rights of people with disabilities in Canada. This VC platform enables the creation of different Virtual Communities, and encourages collaboration and knowledge mobilization among the community members including researchers, individuals with disabilities, community organizations and the general public. A description of the VC requirements, the platform design and implementation is provided in this paper.

KEYWORDS

Virtual communities, Mobile Virtual Communities, Information Society, Sociability, Health, Human Rights, Disability.

1. INTRODUCTION

Rights monitoring is fundamental to an effective and organized approach to enforcing the equal enjoyment of human rights by people with disabilities. Individual investigations have uncovered systemic human rights violations against people with disabilities such as significant levels of low literacy (Calamai, 1987, Rioux et al., 2003a, Rioux et al., 2003b), refusal of medical care (Frazee et al., 2005), disproportionate unemployment, low income levels and other issues(Statistics Canada, 2001).

This project takes a significant step in developing systems to monitor the human rights of people with disabilities in Canada. Rights monitoring is a research method that involves the tracking, collection, collation, analysis, interpretation and mobilization of data and knowledge about the life situation of people with disabilities using human rights standards as benchmarks.

Research, training, and knowledge mobilization and dissemination is being conducted in four inter-related areas which make up holistic monitoring: *individual case monitoring*, *media monitoring*, *policy monitoring*, and *survey dataset monitoring*. The subject of this paper is the description of the requirements, design and implementation of a Virtual Community platform for knowledge mobilization. The platform is intended to enable participants (researchers, community partners, people with disabilities, students) to organize themselves into virtual communities and to provide them with the tools to cooperate in creating, accessing, using and communicating knowledge.

2. VIRTUAL COMMUNITIES AND RELATED WORK

There are both different perspectives and different classifications of VCs (Stein et al., 2005, El Morr and Kawash, 2007, El Morr, 2007). Independent of those differences, humans meet and form groups for a variety of social purposes. The Internet provided the infrastructure for the formation of other forms, but nonetheless similar, communities: the online or virtual communities (VCs). VCs received a visible level of attention from the research community in Computer Science, Sociology, Psychology and other disciplines (Preece, 2000). A virtual community as a form of social system; inherits some of the social system's characteristics (Weissman, 2000) such as causal reciprocity, purpose, design, roles, circumstances, officers, passion, needs, loyalty, and access. From the perspective of C*ausal reciprocity*; a VC is about a mutual "give and take" that structures the common interest of VC members. On the other hand, the *purpose of a VC* is the main aim of its creation, i.e. share knowledge, exchange experiences, work together, etc. Members of a VC may assume different *roles* in the community, for example, consumer, producer, administrator, lurker, and others. The purpose of a VC is shaped by the *circumstances* that are culturally specific. Furthermore a VC is formed based on the *needs* of its members, whose *loyalty* is essential for its success. Many communities are driven by the *passion*, of its members to share a belief, to generate and communicate knowledge, and so on. Finally, *access* is an important way to provide the tools to enable members to connect to each other.

While several virtual communities platform exist, neither general purpose ones such as dolphin (www.boonex.com, 2008), nor educational oriented once such as WebCT and Blackboard who recently merged (www.blackboard.com), and Moodle (moodle.com, 2008); are adapted to the our research team objectives in terms of creating dynamic relations among team members, enabling particularly each member (and not only administrators) to create folders and upload/download documents, to co-edit documents and to share files across communities in different levels of granularity: share with one person, one group of people and a whole community. Besides, none of these sites is fully accessible to people with visual disabilities an essential objective that we strive for in our project.

3. PLATFORM DESIGN AND IMPLEMENTATION

3.1 Community Requirements

In early stages of the project interviews were made with researchers and administrators of the project to detect the requirements of the platform. The requirements were collected sung the Unified Modeling Language (UML). We've identified that for the VC to be successful it should incorporate the following high level characteristics:

1. Facilitate cross-theme knowledge creation and sharing even among members of different communities. Consequently, enable intra and inter community knowledge creation and sharing members (file editing and sharing)
2. Enable dynamic members' collaboration across communities; thus, any participant should be able to be create folders and upload files, to become member of several communities, and organize folders and files
3. Facilitate external partners participation (e.g. government decision-makers and community organizations) by developing an open system
4. Provide an e-learning (education and training) component to build rights monitoring capacity within the disability community
5. Enable the dissemination of knowledge to the public

In summary, the high level characteristic is to enable the creation of a **collaborative open system platform** that allows the creation of VCs for a **variety of members** (e.g. researchers, community organizations, public), for **different Knowledge-related purposes** such as knowledge creation (document sharing and co-editing) and knowledge dissemination (information communication, education, and training), allowing **dynamic collaboration** among members (control of folder/files, dynamic membership, dynamic sharing of files: share with one person, one group of people and a whole community).

Taking into consideration the above guidelines and characteristics and the importance of incorporating the knowledge of people with disabilities themselves a model of the VC has been designed.

3.2 Community Design

In the field of disability, tools and training resources for evidence-based data collection are scarce as are tools and methods for multiple levels of analysis (i.e. individual, systemic) and particularly those tailored to the Canadian context. Development and dissemination of these tools incorporating an ***e-learning*** component to a virtual knowledge community in order to support continuous training to develop monitoring skills (online manuals, course guides, books, tools…). These dissemination tools (fact sheets, research reports, analysis and recommendations) need to be directed to multiple groups (i.e. researchers, community organizations and individuals, the media, policy makers).

Internally, a VC should support team members' communication to enable researchers to *communicate* and *cross-check* their findings, and to *collaborate* around subjects of interest, *e-communication*. In addition it should provide partners with online communication tools to enable them to collaborate continuously and exchange findings, experiences and strategies regarding disability rights. Therefore, members will need an ***e-collaborating*** component.

The VC platform was therefore designed to comprise functionalities to support the three components: e-*dissemination*, *e-learning*, and *e-collaboration* (Figure 1).

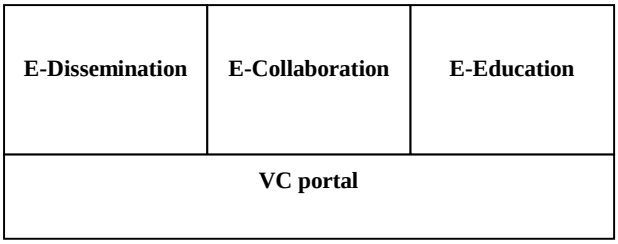

Figure 1. A high level view of the components of the collaborative platform

The platform model is logically composed of two parts presented in figure 2; one part represents the virtual community component in a three tier architecture model, and the other part represents the knowledge management component in a two tier architecture model.

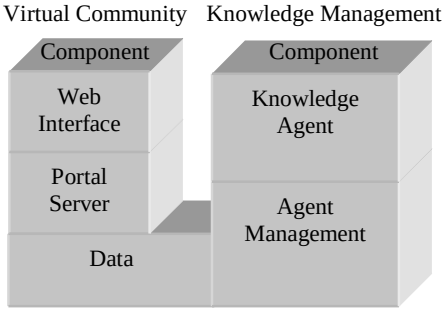

Figure 2. The VC Infrastructure model

3.3 Community Platform Implementation

Open source material has been used throughout the development of this model. In the first phase only the virtual community component has been implemented using Java Servlets and Java Server Pages (jsp) and JavaBeans technologies. Security of information is guaranteed through SSL protocol using an Apache and Tomcat servers; while the database used is Derby. In

this phase, users of the system have been consulted both in the development and implementation as a way of testing the efficacy of the system. Adaptations are being made in the process of development, as the input of people with disabilities in particular is essential to its ethical implementation and use. Essential to disability rights monitoring is the participation of people with disabilities in all aspects of the research and it dissemination.

The VC platform allows two major **roles** to be played: ***Administrator*** and ***Member***; the members can play two possible roles: ***consumers*** and ***producers*** of information. The difference between members and administrators is that the latter are given the power to create/drop communities and to allow members to join a particular community.

Five communities have been created; four of them deal with the four substantive themes of research and one is public. The portal allows a person to connect to the portal and to create his/her own profile. In order; to simplify information dissemination, we decided that the *public community* allows people to join without administrator approval since it is designed to disseminate knowledge (research findings, articles, reports, etc.) to the public in the society at large. To be a member of a specific community (the current 4 or any other future one) the interested person sends a request to the portal administrator who can assign that person to the particular community in question (Fig. 1).

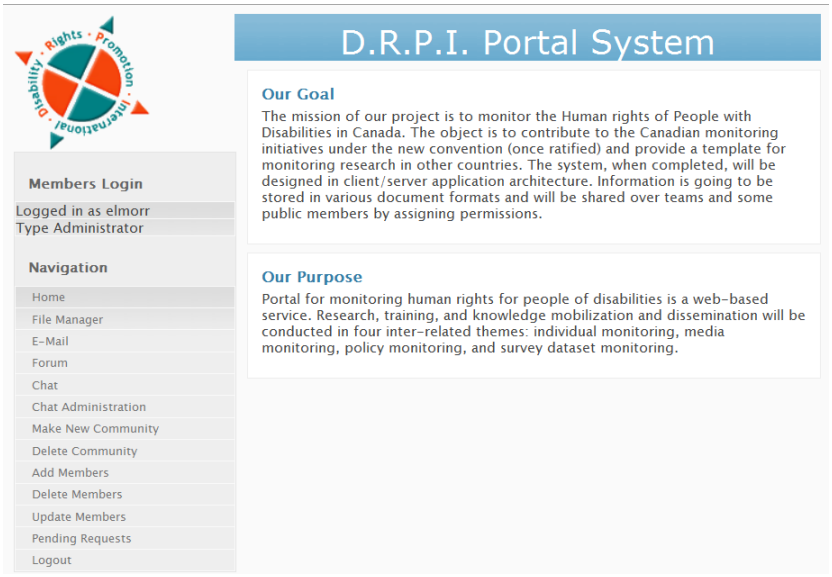

Fig. 3 Portal main page.

Members of the *public community* can play the role of *information consumer* (i.e. they seek and access information); occasionally they can produce information via email or bulletin board. The other role enabled is a participative role of *information producer*. People members to all communities, other than the public, are mainly information producer (e.g. upload documents); nevertheless, they are also information consumers of information exchanged inside their community (e.g. download documents).

The administrator can create new communities or drop/delete them (figure 2). A “pending request” functionality allows the administrator to display the public members’ requests to join a particular community (figure 3) and answer their requests by granting them membership to particular community/communities.

Figure2: creating a new community

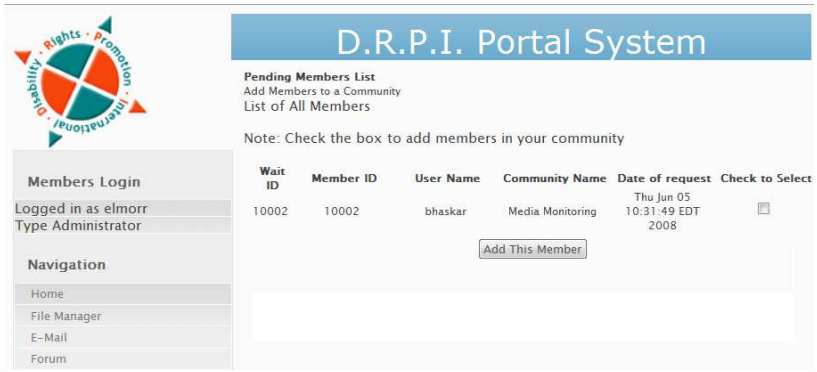

Figure3: the screen that allows the administrator to grant a person membership to a community

Administrators and members of the themes communities can upload and assign each file a "visibility" right (figure 4); that is a member can decide if his/her file is visible by a whole community or a specific person in that community, or any combination of these two possibilities. Members can download files and use an email and bulletin board to communicate with each other. A member can request membership to one of the existing communities.

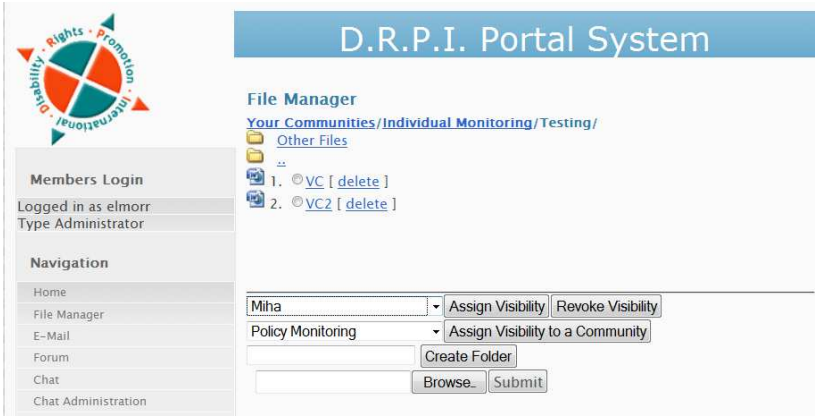

Figure 5: a member assigning "visibility" right (i.e. access rights) to other specific members and/or while communities.

4. KNOWLEDGE MANAGEMENT

Within the platform, numerous users, i.e. ***producers,*** will share large amount of documents within and between the communities for ***consumers***. Large number of users and documents leads to the creation of Knowledge that should be managed. Therefore a Knowledge Management capacity was developed in the VC. During preliminary tests, we identified two major issues and defined features to address them.

First, searching through a *large* number of documents stored in heterogeneous formats (e.g. xls, doc, PDF) will make the information access difficult to the users. Therefore, finding relevant documents in the platform regarding to the users interest is identified as of utmost importance, recognizing that the technology sophistication of users will be very broad.

Second, as the information ***producers*** are mainly researchers, this platform offers a great opportunity to create cross-theme synergies, open new collaborations or enforce the existing ones. Besides, the platform is designed for the public, and other researchers and organizations at a later stage. The large number of potential contributors will make the discovery of potential common interests between members difficult. Consequently, it is important to facilitate this discovery process.

To address these two issues, we designed a matching feature combined with a ***push*** mechanism. This will enable the system to describe users and documents using metadata in order to (1) notify the user when relevant information has been added to the platform and (2) match users having a "similar" profile. We identified four sequential steps in the process: Information gathering, information extraction, matching, and push mechanism.

Information Gathering

The aim of the first step is to gather all the information concerning each member. This includes, research interests, publications, navigation history and geographical information. User will enter keywords describing their interest, choose their topics of interest in a list and upload their publication. Navigation history is stored in the platform.

Information Extraction

Metadata of documents are the key for relevant matching, although document formats like .xls, .PDF or .doc provide some metadata, their relevance is low. The aim of this step is to complete both metada of documents and the users' profile. Degemmis et al. (Degemmis et al., 2006) tackled the problem of the completion of the user profile by machine learning techniques to induce semantic users' profiles. We use text-mining libraries[1], to extract keywords from text documents. These keywords will complete the documents metadata. These extraction will take place for both documents uploaded by users and the publication they entered to complete their profile. Navigation will also be mined to extract relevant topic of interest (Xiaobin et al., 2000, Widyantoro et al., 2001).

Matching Algorithms

We identified two types of matching, user/documents and users/users. Botch matching follow the same principle of computing a distance between the gathered metadata. Yu et al. (Yu et al., 2005) presented an algorithm for matching demands and supplies of profiles using a description logic based approach, a similar approach can be used for the user/documents matching. Degemmis et al. (Degemmis et al., 2006) proposes two matchmakers algorithm, one over free text and a logic based one. A semantic approach was also used for the matching of user profiles and location-based services (Cali et al., 2004).

Push mechanism

Users can create alert using keywords, or automatic alerts where the system will use their whole profile description. Alert using keywords will notice the users about the upload of documents containing these keywords and the automatic alert system will use the profile that was extracted from the user publication, navigation history…

The platform also displays latest relevant documents on users' pages and also provides a RSS Feed for each user.

5. CONCLUSION

[1] GATE : http://gate.ac.uk/

RapidMiner: http://rapidminer.com/

We have created a sustainable Canadian disability rights virtual knowledge network to (1) support its research findings, and (2) continue to mobilize community members, academics, students, as well as the media and policy makers around disability rights and (3) to empower the users in the development and use of the network. The E-education is still in design phase. A public subscription to a public community has been provided. Members are provided tools to publish (upload) and read (download) information (articles, fact sheets, policy briefs, etc.); to communicate to each other in synchronous (chat) as well as in an asynchronous way (email, bulletin board). We designed a system to encourage members' participation to receive continuous desktop notification (push) on issues of interest happening in the community (a new document uploaded, a new meeting is scheduled, etc.) as well as a "What's New" (pull) functionality that a member can use feature when someone is logged in. Moreover, we're planning to use this matchmaking algorithm in order to suggest to members the formation of new communities based on common inter-member affinity detected by the system.

Other advanced features of the system also identified as desirable in the VC include allowing members to co-edit a document, to participate in a managed formal-like virtual meeting (turn taking), set up online questionnaires. Some other features were identified as enjoyable such as using icons instead of text-only for files and folders present in the community. Finally, work is underway to ensure all parts of the system are accessible for people with disabilities (Alison and David, 2006, Boldyreff, 2002).

To evaluate the utility and effectiveness of the project, we designed a monitoring component in order to monitor the knowledge dissemination on the platform. Monitoring includes documents transfer, ease of access to information and users activities. Results of the evaluation will be published in a further paper. Besides, testing the usability of the website especially for people with disability is underway.

We believe that the VC will make a significant impact on the training and development of students and individuals affiliated with disability community organizations, by enhancing critical disability studies curricula and by providing the academic and disability community with evidence-based knowledge and new tools for on-going disability rights monitoring.

6. ACKNOWLEDGMENTS

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