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Knowledge Sharing for Pediatric Pain Management via a Web 2.0 Framework

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Abstract. The experiential knowledge of pediatric health practitioners encompasses vital insights into the clinical efficacy of diagnostic and therapeutic methods for pediatric pain management. Yet, this knowledge is not readily disseminated to other practitioners and translated into practice guidelines. We argue that a peer-to-peer knowledge sharing mechanism can serve as a key change agent to improve the attitudes, beliefs and methods for pediatric pain management. We are using collaborative technologies, in the realm of Web 2.0, to develop a web-based knowledge sharing medium for fostering a community of pediatric pain practitioners that engages in collaborative learning and problem solving. We present the design and use of a web portal featuring a discussion forum to facilitate experiential knowledge sharing based on our LINKS knowledge sharing model.

Keywords. Web 2.0, knowledge management, pediatric pain, discussion forum

1. Introduction

Traditional health knowledge dissemination mechanisms facilitate the sharing of explicit healthcare knowledge. But, the practice-related healthcare knowledge of health practitioners – termed as *experiential knowledge* – is not systematically disseminated despite the fact that it entails vital and pragmatic insights into *what worked*, *what did not work* and *what are the best practices* in specific clinical situations, especially beyond the realm of accepted norms and established beliefs. We argue that to generate holistic healthcare knowledge it is important to augment explicit knowledge with experiential knowledge. To achieve this objective, we propose the following activities: (a) 'context-specific' *explication* of the experiential knowledge of health practitioners, (b) *sharing* of one's experiential knowledge within a community of practitioners so that it is critiqued and in turn validated, and (c) *incorporation* of the validated experiential knowledge with existing knowledge resources to provide a more pragmatic clinical perspective. From a functional standpoint, the Web 2.0 paradigm allows to achieve the above objectives through collaborative technologies, such as social networking and online discussion forums, to realize a *community* of specialized health practitioners that shares, critiques and validates its collective experiential knowledge to advance the knowledge quotient of the entire community.

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In this paper we present a healthcare knowledge sharing model – LINKS (Leveraging INternet for Knowledge Sharing) – that characterizes the *explication* and *sharing* of specialized experiential healthcare knowledge within an online community of practitioners [1]. We present the application of the LINKS model to a knowledge translation project concerning pediatric pain management in hospitals across Northern Thailand. We demonstrate the use of Web 2.0 technologies to (i) *foster* an online community of pediatric pain practitioners that comprises specialists, physicians, nurses and administrators; (ii) *explicate* and *share* case-specific and practice-related experiential knowledge about pediatric pain management by and for Thai health professionals working across rural and urban hospital settings. Experiential knowledge sharing is facilitated through an online discussion forum to encourage collaborative problem-solving and on-the-job education; and (iii) *understand* the collaboration patterns within the community to design more effective knowledge translation programs for Thailand and other developing countries. We present our pediatric pain portal (http://pediatricpainresearch.ca) and discuss the research methodology and tools pertaining to the design and use of a discussion forum for pediatric pain management.

2. Project Background: The Need for Understanding Pediatric Pain Management

Pediatric pain management is quite unique and complex because children are often unable to describe their pain [2] thus leading to incorrect interventions. The problem is exacerbated due to lack of specialized knowledge and formal training in pediatric pain management [3]. Given the rather intuitive nature of pediatric pain management, our strategy for educating health practitioners about pediatric pain management is to complement traditional training programs with the experiential knowledge of pediatric pain practitioners. We are proposing an experience sharing environment whereby pediatric health practitioners learn from each other's real-life clinical experiences and intrinsic expertise – i.e., pediatric health practitioners voluntarily 'explicate and share' their experiential knowledge about new and pragmatic interventions, tools and beliefs about pediatric pain management [4]. The featured project is a collaboration between Canadian and Thai pediatric health practitioners to establish an online community of pediatric pain practitioners, across hospitals in Northeastern Thailand, for sharing experiential knowledge about pediatric pain management. The goals of the project are: (a) To elevate the awareness of pediatric pain from a clinical, psycho-social, cultural and economic perspectives amongst health practitioners; (b) To standardize the management of pediatric pain across different hospitals, in keeping with variations in hospital resources and practitioner expertise; and (c) To share experiential knowledge of practitioners to reduce the knowledge gaps about pediatric pain management.

3. The LINKS Model for Health Knowledge Sharing

Healthcare knowledge sharing can be characterized as "the explication and dissemination of context-sensitive healthcare knowledge by and for healthcare stakeholders through a collaborative communication medium in order to advance the knowledge quotient of the participating healthcare stakeholders" [1].

The LINKS (Leveraging INternet based Knowledge Sharing) model, illustrated in Figure 1, characterizes healthcare knowledge sharing solutions at three interrelated

levels – i.e., conceptual, operational and compliance. The conceptual level predicates knowledge sharing as a function between three elements: *healthcare knowledge, knowledge sharing context* and a *knowledge sharing medium.* The operational level addresses functional issues in terms of *technical infrastructure* design metrics, and occupational issues in terms of strategies to establish a *culture* of collaboration between stakeholders. The compliance level addresses the underlying issue of perceived *trust* in the validity of the knowledge being shared.

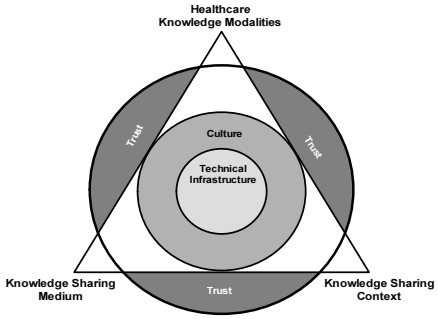

Figure 1. LINKS model for healthcare knowledge sharing [1]

Knowledge Modality: We are keen to explicate and share the experiential (or tacit) knowledge of healthcare practitioners which basically entails their innate skills, experiences and intuitive judgment about *what really works* and *how to make it work*.

Knowledge Sharing Context: The knowledge sharing context is pediatric pain management, and it entails four elements: (a) specific *topic* (or issue) to streamline the discussion and to classify the shared knowledge, (b) the *motivation* for knowledge sharing – i.e., seeking knowledge vs. providing knowledge; (c) the *temporal relevance* of the shared knowledge with respect to the evolving patient conditions; and (d) the *orientation* of the practitioner, engaged in the knowledge sharing exercise.

Knowledge Sharing Medium: The pediatric pain health practitioners share their experiential knowledge through an interactive online discussion forum.

4. Knowledge Sharing for Pediatric Pain Management: Methodology and Tools

We are leveraging Web 2.0 technologies, in terms of a web portal and discussion forum, to develop a collaborative knowledge sharing environment that allows (a) domain experts to disseminate their wealth of knowledge and experience, and (b) novice/junior practitioners to learn from both the domain experts and their peers. Our methodology involves the following five (5) sequential activities:

1. Understanding the Participants: As a first step to designing the knowledge sharing environment, we conducted a survey based study to understand practitioner's (a) attitudes, beliefs and knowledge about pediatric pain management; (b) familiarity with the Internet; (c) usage of online resources to acquire professional knowledge; and (d) approach to practice change. A total of over 500 physicians, nurses and pharmacists from 7 hospitals were surveyed (68% response rate). We found that 94% practitioners had access to a computer and 76% had access to the Internet at the hospital. Yet, using the internet to communicate with colleagues for professional assistance was not the preferred medium (only 23%) in comparison to the use of the phone (68%). In fact, the preferred way to get new knowledge was a face-to-face workshop (32%) whereas a

website was rarely used (only 0.6%). Despite the low use of the Internet for professional education, we found that a large number of practitioners (i) seek guidelines for pediatric pain management; (ii) agree that the experiential knowledge of expert practitioners is both invaluable and desired. We concluded that since the internet is readily available to practitioners and that they are willing to collaborate across different hospitals, it is feasible to explore the potential of using a web-based knowledge sharing solution that is easy to use and relevant to the practitioners.

2. Development of the Knowledge Sharing Medium: We developed a web portal featuring three main components to support pediatric pain practitioners:

Resources to support the clinical practice of practitioners. The resource are classified as: Presentations (including workshop presentations); Tools (Assessment and Therapeutic); Clinical Guidelines and Nursing Care Maps; Evidence based publications; Therapeutic and Medication Information; Information for Patients and Parents; Project Resources (Newsletters, News items, Workshop programs).

Discussion Forum to allow practitioners to engage with one another, around specialized topics of interest, to share their knowledge in response to knowledge seeking questions from the community. To streamline the discussion along identified topics we specified a hierarchy of pediatric pain management topics – starting from general topics to more specialized sub-topics – such as Topics→Sub-Topics→Discussion Threads (see Figure 2). For example, the Pain Assessment topic has sub-topics: (i) *Myths About Pain*, (ii) *Factors Affecting Pain Assessment*, (iii) *Measurement of Pain*, and (iv) *Assessment by Age of Child*. The knowledge facilitator can add new sub-topics whereas the participants can add new discussion threads.

Participant Directory that identifies each member of the community in terms of their professional orientation, healthcare institution and other related information.

3. Training Knowledge Sharing Facilitators: To stimulate and sustain a vibrant knowledge sharing environment we have engaged a team of facilitators who will (a) encourage busy practitioners to engage in knowledge sharing; and (b) promote meaningful discussions. The facilitators are nurses from different hospitals. To ensure their optimal productivity we trained them through hands-on workshops about how to use the web portal and the discussion forum, its features and the policies. The trained facilitators will serve as the 'collaboration agent' within their institutions and will help drive the knowledge sharing activities amongst professionals within their institution.

Figure 2. A snapshot the discussion forum highlighting the main discussion topics

4. Use of the Discussion Forum: The discussion forum allows a participant to pose a question/issue and in turn related practitioners engage in a dialogue. Participants can either respond to the initiating question or to a participant's response. The temporal progression of the discussion – i.e., a discussion thread – provides an opportunity for the experiential knowledge of the community about the question/issue to be explicated, critiqued, validated, disseminated and translated into practice.

5. Analysis: As the final step of our methodology we plan to perform two analysis: (a) *social network analysis* to understand the knowledge sharing pattern across the community and identify the key players, key virtual teams around specific topics and communication patterns between practitioners from different orientations and locations; (b) *content analysis* using qualitative methods to identify salient issues and knowledge nuggets that can be abstracted and documented as guidelines.

5. Results and Concluding Remarks

This ongoing project aims to both change and enhance the existing beliefs, practices and know-how about pediatric pain management through active knowledge sharing. We are currently in the process of slowly developing an online pediatric pain community. In one month, across the four main topics we have 10 discussion topics, with 28 responses from a total of 9 participants out of a community of 51 practitioners. We are noticing that practitioners in different hospitals are now communicating with each other to share their experiences, ideas, suggestions and opinions. In particular, rural and junior practitioners are now connecting with (urban) expert and experienced practitioners for their experiential knowledge. The anticipated net effect is the improvement and standardization of care for pediatric pain throughout the community. Detailed results of the efficacy of the framework will be based on a study that will be conducted in 2010, whereby we will measure the impact of our LINKS knowledge sharing framework on the knowledge levels of pediatric pain management.

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