Chapter 19

Content Personalized Recommendation Engine to Support an Informal Learning Environment in the Health Context

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ABSTRACT

People with chronic diseases suffer with limitations imposed by their health condition and learn more about the disease helps in improving the quality of life. This is possible because the use in mass of mobile devices and the advent of Web 2.0 tools, which gave rise to the Health 2.0 concept. This search for the construction of knowledge by stimulating citizens to be active and responsible for their health. However, provide contextualized knowledge at the right time, it is not a trivial task due to the diversity of content and user’s profiles. The solution to this is to provide informal learning through personalized recommendation of content by providing relevant content to users related to their health. This chapter proposes a personalized recommendation system of content, which includes the union of different recommendation techniques and genetic algorithm, seeking efficacy on the recommendation of the contents to people with chronic diseases aiming informal learning in health.

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INTRODUCTION

Chronic diseases represent a high percentage of mortality in worldwide. However, most of them can be prevented and controlled to promote a better quality of life. Therefore, it is necessary for the individual know his disease, and then make the recommended treatment (with medicines, diets, healthy habits, changes in lifestyle and practice exercises) resulting in becoming an active and responsible for care in his own health.

There is a consensus that knowledge about the health condition brings to patients with chronic diseases, the ability to get along better with their diseases, the motivation to carry out the treatment and support for social coexistence. This knowledge can be obtained through health professionals but also through informal learning. According to Cross (2012), informal learning can be understood as the unofficial way, where most people learn to do their job. On this basis, it can be said that informal learning can happen through sharing experiences with other carriers of the disease, or over the internet, social networks, etc.

In this scenario, the concept of Health 2.0 becomes a motivating factor since it combines informal learning to the use of technologies and Web 2.0 tools (social networks, personal health records, blogs, videos, services, etc.) as a way of capture by user experience, information relating to health and, by the combination of these data and information, provide personalized care and content (Hughes, Joshi & Wareham, 2008). However, this learning needs to be directed to each user according to their needs and interests, and content recommendation engines can contribute to this process by analyzing the user profile and extracting information to recommend appropriate content to their situation.

As Barcellos et al. (2007), content recommendation engines are designed to support users in the search process on the Web, showing information and content to the user based on their profile and preferences. Thus, with the objective to develop a learning environment in the context of Health 2.0 which best meets the needs of users and that seeks the improvement of the learning process, it is essential to consider aspects related to real situations of the user’s daily life, transcending the barriers of formalism education.

The ubiquitous learning can support informal education providing a favorable environment for self-learning and user interactions with the real environment through experiences gained by social media. According to Saccol, Schlemmer and Barbosa (2010), the ubiquitous learning is defined as the use of mobile devices, wireless mobile communication technologies, sensors and location mechanism, in order to assist the educational process, taking into account specific characteristics of individual.

Based on the presented approaches, the developed recommendation engine was directed to two types of chronic diseases: (i) diabetes mellitus (DM), considered a matter of global public health since it affects a large number of people (WHO, 2013) and (ii) Amyotrophic Lateral Sclerosis, better known as ALS. According to Yamanaka et al. (2008) and Eisen (2009), ALS is a neurodegenerative disease characterized by a progressive and fatal loss of motor neurons of the cerebral cortex, brain stem and spinal cord, but the cognitive and intellectual activities remain intact.

The motivation for this work came through the study of these chronic diseases. According to researches, there is 10 (ten) years that an increase in the mortality rate of people with chronic diseases had been occurring in the world (World Health Organization, 2005). In Brazil, for example, according to the Brazilian Institute of Geography and Statistics (IBGE), 29.9% of the population reported being a carrier of at least one chronic disease. This percentage reaches 75% when considering only the elderly (IBGE, 2009). Therefore, the choice of the two diseases occurred: (i) the scope in which the disease affects the
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