Chapter 47

OUPIP:
Ontology Based User Profile for Impairment Person in Dynamic Situation Aware Social Networks

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ABSTRACT

This article aims to propose an ontological user model called OUPIP (Ontology-Based User Profile for Impairment Person), that extends existing ontologies to help designers and developers to adapt applications and devices according to the user's profile, disability and dynamic context. Besides, the approach has been applied in a typical real-life scenario in which personalized services are provided to impairment person through a mobile phone.

INTRODUCTION

Nowadays, the new technologies propose a different method of access information that is shared in a real-social network of the user. Moreover, there is an increasing level of disability over billion of people, which is about 15% of the world's population.

The World Health Organization (WHO) states that:

Disability is part of the human condition. Almost everyone will be temporarily or permanently impaired at some point in life, and those who survive to old age will experience increasing difficulties in functioning.

A person with a certain disease can face several difficulties in interactions with the interface or applications. The people with disabilities have limited access to useful applications which requires personalized applications corresponding to real situation context by considering the disability of the person (Said & Schleppenbach, 2004).

Besides that, a person with some functional or censorial difficulty has some problems to adapt or access to this information. Applications provided by play-store or Google play give incomplete adaptive information for the user with a disability. Therefore, it is necessary to consider the profile of the users, the physical context and user's disability.

A large number of social adaptations programs do not take in consideration a dynamic context. Situations often change, varying from professional to the private situation and for each situation, some measures could be taken according to the people in real social network.

For example, a friend might call during a project meeting, or a commercial advert can arrive during a family dinner. Such situations can cause major discomfort. When one has a big social network, this may take even longer than an interruption during the task itself. We consider the following scenario to illustrate this problem:

Michael is a manager. He is now preparing a presentation for an important conference. Because this is a professional situation for him, he only wants his office colleagues and a few important family members to be able to interrupt him directly. However, Michael has a sensory hearing difficulty. Therefore, to solve Michael's interruption problem, his mobile phone must be adapted according to the current situation (a phone call with high-pitched sound). His mobile phone must reject all the calls of friends or other persons that want to communicate with him. Now, assuming that Michael has changed situation (he is at home or no longer busy working). Therefore, close friends can contact him, and his mobile phone must be adapted according to the new situation taking into account his disability.

For such situations, some projects address semantic modeling in accessibility and e-inclusion domain (Romero-Mariño et al., 2017; Said & Schleppenbach, 2004; Soui, Diab, Ouni, Essayeh, & Abed, 2017; Tzovaras & C.; Votis, 2011).

In this paper, we introduce OUPIP (Ontology-Based User Profile for Impairment Person) a user profile ontology that adapts applications and devices according to the user's profile, disability and dynamic context. The proposed ontology can be helpful for software developers and tools designers to create a useful user interfaces for people with special needs.

The remainder of the paper is organized as follows. Section 1 background and context Section 2 discusses existing work within the area of ontological user profiling. Our approach is detailed in section 3. Section 4 summarizes the conclusions and ongoing research.

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