Social Networks – Challenges of Ubiquitous Web Access

Introduction

At these days, we can observe some exciting processes happening around us. First, the world goes mobile. Faster or slower, sooner or later but a drift is taking place with individuals and in all branches of nation's economy. The nature of this drift is so diverse that it is even difficult to classify the devices as for their belongingness to the mobile domain. A great number of devices from tiny wrist-watches with embedded browsers till powerful desktop-replacing notebooks may be considered as mobile. Second, a phenomenon of Social Networks has grown out of its infancy and become a well-known notion. Those technologies that Social Networks base on are not emerging anymore but are the technologies of everyday life; now we can speak of emerging tools utilising those technologies. Third, a phenomenon of Semantic Web has been finally positively appreciated by the industry. This appreciation yields to an occurrence of such a notion as Web 3.0 and enormous number of discussions about it.

Pehr Brahe Software Laboratory (PBOL) has done research and development in the field of Information and Communication Technology since the beginning of this century. We work on software solutions, applications and services. In most of our projects we deal with mobile domain and concentrate on machine intelligence and interoperability issues. Two the most recent projects of ours have concerned ubiquitous home environments.

We would like to introduce to you some of the possible use-cases that may relevantly occur within ubiquitous web access environment but are not limited to Social Networks and encourage the community to discuss the possible solutions or directions for their effort.

Case 1. Browser experiences

Background. Within this case, we limit browser experiences to the case where browsers act as GUIs. Some of the sites of social networks provide their users with a web interface in a form of colourful mix of needed and not very needed components. In many cases those interfaces may be customised and the amount of features available at the home page reduced. Still, by accepting a new feature and/or giving it a permission to be presented on the home page, a user may not expect how large and sometimes annoying those new features can be. Some of the social sites exist in versions for mobile devices. Especially designed for limited capabilities of mobile devices, pages provide users with more ascetic interfaces. Those interfaces due to their simplicity and good directly-to-a-target orientation may sometimes be considered as preferable over the traditional ones.

Description. With the purpose to use a simplified interface, a user may consciously access a mobile version of a site with a desktop browser. In the same way, the user may like to access some other site and have a dedicated-to-his/her-needs version of an interface. Still he or she

may like to use the same browser without any special settings (like turning into a mobile mode) or limitations (like setting up certain preferences).

A particular case within the described one can be as following: an interface to home automation system(s) may be browser-based. This interface can be delivered to the user via TV, touch-panel or mobile device. In this particular case it may be beneficial to use the browser in full-screen mode. When the interface is used for a limited number of dedicated tasks, it may be possible to design an interface that would be absolutely the same and offer the same user experiences regardless of the way it is delivered: on a TV, touch-screen or mobile.

Problems. Due to certain lack of experience, the user may not be able to customise the UI of the site. Sites do not always offer extensive customisation abilities. User authentication is still required to access the personalised content. The authentication process is far as not a seamless. Information on customisation and user preferences is not usually shared. Storing information in cookies may not always be advisable. This list can be continued for long. Known and unknown security issues may occur. The required functionality may not be achievable exclusively by server-side technologies but by some advanced browser functionality and XML-based linked data technologies (like RDF, etc.) may be needed.

Case 2. Device recognition, self-configuration

Background. On one hand, the whole set of web-enabled devices is very heterogeneous in by technical features and capabilities and the roles those devices play on the web are very diverse. On the other hand, the total number of technologies used in web development is so huge that even the most advances advanced devices may not work with all of those technologies without certain software or even hardware updates. Since the amount of devices available on the market is continuously growing, the situation is becoming to be considerable.

Description. When any device is powered on, it may check the connectivity available and, by using a certain policy file or profile, make a decision on the best connection channel. That channel in some cases (when extra payment is involved) may be approved by user. The device has a profile of its technical features and capabilities ready to be send sent on request. An existing engine (or many of them) may exist (or many of them) that will be aware on a new device occurrence within the network. This engine may be acquainted with technical features and capabilities of for the device, based on specifications received from that device profile or by some other means. An interaction of the device with web servers and/or network nodes may be organised in the best possible manner once when a device description is known.

Problems. It may not be enough to implement some device recognition techniques on a server-side. Device description profiles may not be precise and detection algorithms may not be sophisticated enough. Extended device-side functionality may require involvement of device manufactures and adoption of generic algorithms for such functionality, which is not an easy process. Probably the solution would be in some kind of reasoning engines that would be able to make decisions based on an information mix, obtained from different sources: device

description profiles, resulting of device activities, and even from information obtained from past activities of the device and/or the user preferences profile associated with a given device, or not.

Case 3. Context/presence awareness

Background. For the best user experiences, it is not enough that a device would decide on the best communication channel and start to use it immediately. The best could be described as: the use of the most appropriate communication channel at the most appropriate time by being at on the most appropriate location using the most appropriate data and representing content in the most appropriate way for every given case or a group of cases. Thus, besides the behaviour of the device relevant to its recognition and self-configuration, the overall behavioural model has to be considered – the model that exhibits the context/presence awareness. Such awareness may use a large variety of different metrics and polices, like user's mood with respect to certain presence at a very precise location, etc.

Description. The user is having on his/her device some client software for some of the social networks sites. While he or she is at work, this software is not active. It is not active as well on the way to home. When the user reaches the home and a location is roughly recognised as the home, the software becomes alive. First of all, it detects a precise location. Once the precise location is one of those few places where the user usually "drops" the device when he or she is at home, the software may define the best communication channel and start to transfer some early-morning images to the home server or to one of the online image hosting services. After thirty minutes (during which the user is usually having coffee) the software may download some of the messages from predefined sites and inform the user of new messages with a sound signal. If the precise location is not one of those few known, the software will just upload the images but won't check for the messages. It could be so that the user has arrived home for a very short period of time, thus he is about to leave and doesn't like to be disturbed by the messages from social networks' sites. Still, the message of a very high priority may be delivered to the user in such the way as 'PUSH'.

Problems. A further developed version of this scenario requires the availability of metadata layer(s) and the ability of the application involved into the scenario to process it. Details of the scenario are not yet developed up to the greatest details. To make this scenario real, it requires an effort from the whole community. Client and server-side software serving such a case have to be developed as loose-coupled, modular, highly extensible and scalable – in other words it has to be easy to change anything on them and adopt any newly-occurred technology. Systems serving the case don't have to be of the same architecture but they all should be able to work with metadata. The rest is to generate the appropriate metadata, design policies, metrics and algorithms. This all is not a trivial task.

General Remarks

The use-cases described above are not any new to the industry. The same or similar observations were made by many research and business entities and similar cases are

implemented to some extent. The technologies allowing those use-cases to be implemented exist: variety of mark-up languages and technologies based on those, including the Semantic Web technologies. Particularly, the Delivery Context: Client Interfaces (DCCI), the Composite Capability/Preference Profiles (CC/PP) and the Delivery Context Ontology are worth to be considered.

Still, the application of those technologies is not always clear. W3C's Mobile Web Best Practices WG has published a document called Mobile Web Best Practices. This document specifies those practises for delivering Web content to mobile devices. The MWI WG also offers the relevant education. Something similar could be done for the same and other technologies as well. For example, the best practices for delivering Web content to home electronic devices (e.g. TV). There is not enough of public guidance on the use of the Delivery Context Ontology, the CC/PP and reports on practical experiments with those. The Delivery Context Ontology is too heavy for tiny devices and it may also be good to consider some multi-ontology scenarios where the other available ontologies could be used as well.

This is not of the influence of W3C, but the community could consider sharing certain achievements as Open Source Software (OSS) projects for example, that everyone who are interested could contribute or at least get involved. Quite a few work results are available as OSS, but not that many from the topics we discuss at this workshop.

It is clear that in order to make all the possible scenarios available beside the laboratory's or company's premises but all around where Web exists (everywhere in the world, right?), it requires a significant effort from all industry players: W3C (as a coordinating and standardising body), researchers, practitioners, developers, network operators, content providers, governments (especially in the digital divide case), industry (not only device manufacturers but also the users) and business representatives.

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