Stay Tuned!
An Automatic RSS Feeds Trans-coder

Patrick Salamin, Alexandre Wetzel, Daniel Thalmann, and Frédéric Vexo

VRLab - EPFL, Switzerland
patrick.salamin@epfl.ch
http://vrlab.epfl.ch

Abstract. News aggregators are widely used to read RSS feeds but they require the user to be in front of a screen. While moving, people usually do not have any display, or very small ones. Moreover, they need to perform actions to get access to the news: download a tool, choose to generate audio files from the news, and send them to e.g. an MP3 player. We propose in this paper a system that automatically detects when the user leaves the computer room and directly sends the trans-coded news onto the user Smartphone. All the aggregated news are then transmitted to the user who can listen to them without any action. We present in this paper such a system and the very promising results we obtained after testing it.

Keywords: User context awareness, RSS reader, Trans-coding, Geo-localization.

1 Introduction

Many people are using news aggregators but sometimes (e.g. while moving) they do not have at their disposal a screen, or a too small one to read the RSS feeds. A solution is to download one of the available-on-the-Internet tools. But in this case, the user must press a button to generate the audio files, connect his/her MP3 player to the computer, and accomplish the file transfer with a "drag and drop" operation onto the player.

We propose in this paper a solution executing an automatic transfer of the trans-coded RSS feeds onto the Smartphone that will directly continue to read the news.

We will first present an overview of the current technologies and researches on the fields of context awareness and trans-coding processes. After this, we will describe more in detail our concept and the needed system architecture. We will finally conclude with a discussion on the results of the previously described tests we made, but also on the further improvements of our application.

2 Related Works

As the user cannot read the news while walking, we need to trans-code the information. Some very promising researches were done within the trans-coding

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domain, especially with the auditory and visual modalities. Jacquemin et al. e.g. developed a system involving audio- and visuo-rendering to mimic gusts of wind blowing a veil [1]. We also developed in 2007 an application allowing blind people to recognize 3D digital content with the help of a PDA [2]. By the way, there already exist several trans-coders to podcast; we could cite for instance Netvibes[1], Feedburner[2], Google reader[3], etc. But the main disadvantage of these tools resides in the manual operations needed to use them.

With the apparition of the "user context awareness" concept, the system must react according to the user context instead of requiring an interaction with the user like pushing a button. An invisible indoor geo-localization system could lead to a fully automated process and a real follow of the user [3]. The system, aware of the user context, must then be able to detect the user displacements, or at least the user location, in order to switch from the screen to another way to transmit the information. There exist several other technologies using specific hardware like infrared, magnetic, ultrasound, etc. But even if they are very precise, they are also very expensive and usually limited to one room. More recent systems tend to use cheaper and already deployed technologies like GSM, Wi-Fi, or Bluetooth. For example, RADAR [4][5] is a tracking system working with the signal strength of radio-based devices. This system inspired several researchers who tried to improve different aspects of the system: accuracy [6][7], localization in high signal fluctuation areas [8], and only using access points [9][10]. But in our experiment we only need to know if the user left his/her computer and the researches of Dhawan [11], [12], and [13] also inform us on range and possible co-existence of Bluetooth and Wi-Fi.

Based on the researches cited above, we decided to trans-code RSS feeds into audio files that will be read on a Smartphone. The user's proximity detection will be performed with the help of the Bluetooth and the data will be transmitted over IP with a previously installed Wi-Fi network. Our solution is described more in detail in the following sections.

3 Concept Description

Nowadays, most of people with a computer use news aggregators like Google News. But, when people are no more in front of their computer, they still should be able to get access to the news they have aggregated. They have then to find a way to trans-code the RSS feeds and to send them to a player they will wear while moving.

Our system performs all these actions automatically (Figure 1). It first stores the news aggregated by the user and automatically trans-codes them into audio files (with the help of the Free TTS[4] library) with a flag to indicate if the news

[1] http://www.netvibes.com/
[2] http://www.feedburner.com/
[3] http://www.google.com/reader/
[4] http://freetts.sourceforge.net/docs/index.php

is already read. Then, it detects when the user leaves the computer room and sends to the Smartphone all the unread aggregated news (already transcoded into audio files) to allow the user to listen to them. Finally, it updates the content depending on the possible newly added RSS feeds in the reader list.

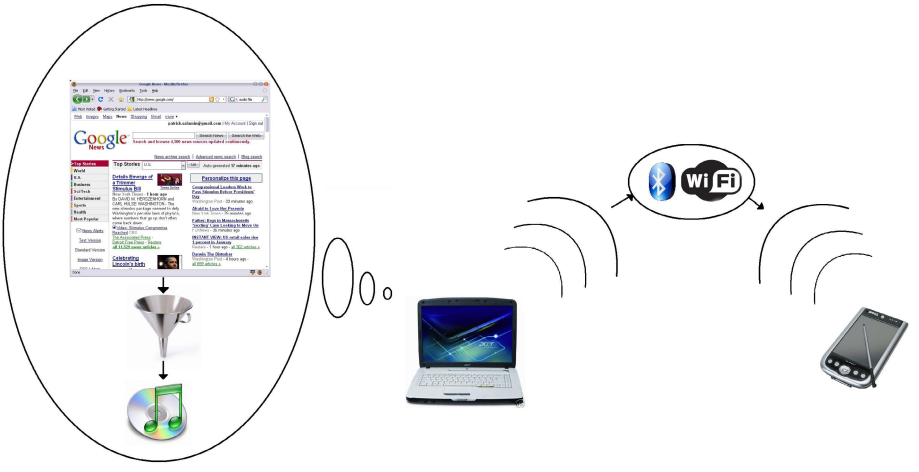

Fig. 1. Schema of our concept: from RSS feeds on the computer (from text into audio files) to an audio player on the smartphone

4 The Experiment

Twelve participants from 19 to 46 (mean: 26 years old) years old voluntarily took part to the experiment. Most of them (10) already read RSS feeds on the Internet and all of them had already used a Smartphone.

Before we start the experiment, we give to the users an overview (or reminder) of RSS feeds, the used material, and the purpose of the system. We then explain to them briefly the scenario of the experiment and which actions they will be asked to perform. Finally, we give them a Smartphone and show them the computer (server) on which they will start the experiment. At this moment, both applications (on the client and on the server) are already started.

Once the user is informed, we invite him/her to seat in front the computer screen (server) to aggregate some news and start to read them. As written above, each news is tagged as read or unread, depending on the user actions. After few minutes, we ask them to stand up and to leave the room with the Smartphone. At this step, our application detects the user is no more in front of the screen and sends the audio files to the smartphone After this, the user can listen the sent news and then to come back to the computer, which lead our system to make an update concerning the status of the pieces of news (to consider them as read or not).

4.1 Questionnaire

Once the experiment performed, we proposed a SUMI-like (Software Usability Measurement Inventory) questionnaire[5] [14] to the users in order to validate the efficiency and intuitiveness of our application. Indeed, several types of validity studies [15][16][17] have already been conducted with SUMI, whose one of them concerns laboratory-based studies (carried out in the Human Factors Research Group). This questionnaire is composed of two parts that we describe here.

The first part is composed of questions about the user profile like the age, gender, but also if the user is used to work with a computer and a Smartphone. This part concludes with questions about the training for using the system (availability and length) and if the time to use the system was also adequate.

The second part of the questionnaire is composed of fifty statements. The user must answer to all of them by marking one of the three proposed boxes labeled: "Disagree", "Undecided", and "Agree". It is also firstly noticed that marking the "Undecided" boxes means that the user cannot make up his/her mind, or that the statement has no relevance to the software or the situation. Secondly, it is added that marking the "Disagree" or "agree" boxes does not necessarily indicate a strong disagreement (respectively agreement) but only a general feeling most of the time.

The questions of this second part concern various topics: responsiveness of the software, quality of proposed instructions, global satisfaction about the software, possible improvements, intuitiveness, and attractiveness of the software. In the next section, we will analyze the users' answers and their behavior during the experiment.

5 Results

Globally, most of the users enjoyed the system. Every step was performed by every user, even if some of them needed more time to adapt to the system. We will now first present the users' behavior during the experimentation and then the answers they give to our questionnaire.

5.1 Questionnaire Trends

Our adapted SUMI questionnaire was filled by every participant. Its first part, concerning the users' profile, reveals us that one experiment loop for training was widely enough for all the participants.

The questions of the second part reveal us that our software is very accurate and fast enough for everyone but two. Indeed, the Bluetooth detection seems not to be fast enough for people rushing out of the room because they are very late. Notice also that the update action (to add new RSS feeds and delete already read ones) was considered as "a bit too long" by eight people. Finally, they seem to be a bit surprised at the beginning with the Smartphone that automatically starts to read news but after the first loop, they really enjoyed our application.

[5] http://sumi.ucc.ie/

Our system was then considered as very attractive, easy to use, and intuitive enough, even if improvements can be done in the future.

6 Conclusion and Further Works

The obtained results confirm our hypotheses. Being able to have access to one's aggregate news all the time (and not only in front of a computer screen) is a very attractive concept.

It seems also that our application reached the planned objectives: attractiveness, intuitiveness, and efficiency. Because of the users' enthusiasm, we may deduce that our application is attractive. As mentioned above, some users even asked us if there already exist a similar version of our application to read emails. In addition, most of the users did neither need any help nor too much time to feel comfortable with our application. Finally, the users really appreciate the concept of the "following trans-coded news".

Nevertheless, some users deplored the "update" and "sending information" steps speed. In order to solve this problem, a first solution would be to send the RSS feeds as text files to the Smartphone and trans-code them after. Another solution would be to send data via 3G [6] instead of Wi-Fi.

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References

1. Jacquemin, C., de Laubier, S.: Transmodal feedback as a new perspective for audio-visual effects. In: NIME 2006: Proceedings of the 2006 conference on New interfaces for musical expression, Paris, France, pp. 156–161. IRCAM — Centre Pompidou (2006)
2. Salamin, P., Thalmann, D., Vexo, F.: Visualization Learning for Visually Impaired People. In: The 2nd International Conference of E-Learning and Games: Edutainment 2007, pp. 171–181 (2007)
3. Abowd, G.D., Dey, A.K., Brown, P.J., Davies, N., Smith, M., Steggles, P.: Towards a better understanding of context and context-awareness. In: Gellersen, H.-W. (ed.) HUC 1999. LNCS, vol. 1707, pp. 304–307. Springer, Heidelberg (1999)
4. Bahl, P., Padmanabhan, V.N.: Radar: an in-building rf-based user location and tracking system. In: INFOCOM 2000. Nineteenth Annual Joint Conference of the IEEE Computer and Communications Societies. Proceedings, vol. 2, pp. 775–784. IEEE, Los Alamitos (2000)
5. Bahl, P., Balachandran, A., Padmanabhan, V.: Enhancements to the radar user location and tracking system. Technical report, Microsoft Research Technical Report (February 2000)

[6] http://en.wikipedia.org/wiki/3G

6. Astrain, J.J., Villadangos, J., Garitagoitia, J.R., González de Mendívil, J.R., Cholvi, V.: Fuzzy location and tracking on wireless networks. In: MobiWac 2006: Proceedings of the 4th ACM international workshop on Mobility management and wireless access, pp. 84–91. ACM, New York (2006)
7. Kumar, R., Apte, K.V., Power, Y.A.: Improving the accuracy of wireless lan based location determination systems using kalman filter and multiple observers. In: Wireless Communications and Networking Conference (WCNC), Las Vegas (April 2006)
8. Ho, W., Smailagic, A., Siewiorek, D.P., Faloutsos, C.: An adaptive two-phase approach to wifi location sensing. In: PERCOMW 2006: Proceedings of the 4th annual IEEE international conference on Pervasive Computing and Communications Workshops, p. 452. IEEE Computer Society, Washington (2006)
9. Zàruba, G.V., Huber, M., Kamangar, F.A., Chlamtac, I.: Indoor location tracking using rssi readings from a single wi-fi access point. Wirel. Netw. 13(2), 221–235 (2007)
10. Hopmann, M., Thalmann, D., Vexo, F.: Thanks to geolocalized remote control: The sound will follow. In: CW 2008: Proceedings of the 2008 International Conference on Cyberworlds, pp. 371–376. IEEE Computer Society, Washington (2008)
11. Dhawan, S.: Analogy of promising wireless technologies on different frequencies: Bluetooth, wifi, and wimax. In: AUSWIRELESS 2007: Proceedings of the The 2nd International Conference on Wireless Broadband and Ultra Wideband Communications, p. 14. IEEE Computer Society, Washington (2007)
12. Patrick, D., Morrow, R.: WiFi and Bluetooth Coexistence. McGraw-Hill Professional, New York (2004)
13. Member-Corvaja, R.: Qos analysis in overlay bluetooth-wifi networks with profile-based vertical handover. IEEE Transactions on Mobile Computing 5(12), 1679–1690 (2006)
14. McSweeney, R.: Sumi – a psychometric approach to software evaluation. Unpublished MA (Qual) thesis in Applied Psychology, University College Cork, Ireland (1992)
15. Ravden, S., Johnson, G.: Evaluating usability of human-computer interfaces: a practical method. Halsted Press, New York (1989)
16. Saunders, C.S., Jones, J.W.: Measuring performance of the information systems function. J. Manage. Inf. Syst. 8(4), 63–82 (1992)
17. Wong, G., Rengger, R.: The validity of questionnaires designed to measure user-satisfaction of computer systems. Technical report, National Physical Laboratory report DITC 169/90, Teddington, Middx, UK (1990)