Improving User Experience by Taking Advance of Semantic Information of Microformats on Municipal Websites

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Abstract. This research regards about the use of microformats as a tool to add semantic information to government web sites. The use of microformats allows the developer to add different resources such as maps, calendars, etc, in an easy way. The paper also shows a survey of the already existing microformats and which of them are useful to be applied to government web sites.

Key words: Microformats, Web sites, Electronic Government.

1. Introduction

Government's web sites provide their citizens with useful information. They become a powerful information channel that allows the government delivering services,

receiving opinions and broadcasting information to the people. However, this information is often, very difficult to find. The existing searchers are text based and literally searches where it is intended to find certain words according to the criteria of person who is performing the search. This way, citizens are not able to perform searches according to the meaning of the published contents. On the other hand, the information that is shown is simply textual. The citizen has the responsibility of making his own interpretation and give sense to this information and also, using it to his own good. These are some of the reasons why it is necessary to incorporate additional information to the web site's text; this information would provide a meaning and would allow that the text will be interpreted not only by people but also by computers in automatic way. This is just the goal of the Semantic Web [16] that allows incorporate metadata, adding information to texts presented in the web.

There are different technologies in order to add semantic information to a web site, for example OWL, RDF, Microformats, etc.

Microformats specially define standards to add semantic information to different domains; for example: persons and entities, addresses, reviews, etc. Their utilization goes beyond the addition of legible meaning by a computer. Through different plugins that are available in the browsers, microformats allow offering users with additional tools, improving their experience of navigation and use. For example, if a web page has an hCalendar microformat that allows the definition of events information, the user, with a plugin in his browser is able to detect that event and just with a simple click he can export the event to his own calendar in Outlook, Google calendar, etc.

Also, some search engines such as Google, take advantage of the information provided by microformats and RDF information, if they are present in the web sites, in order to improve the search results and also to show a more complete web site's information in the result's pages [8].

The pursued goals of this research are:

- Survey the existing microformats.
- Analyze the applicability of each one of the microformat to government's web sites.
- Classify the microformats. For example, one criteria would be the use. It must be able to differentiate those microformats used only in an internal way for example by searchers, from those microformats that allow to enhance the user experience interpreting the information by a browser's plugin.
- Analyze and compare the different browsers' current plugins.
- Propose an implementing methodology for the government's web site's microformats.
- Propose and develop improvements for the current plugins.
- Survey web sites that include this technology nowadays.

2. Microformats

The first step of the research was to analyze the different current plugins in order to determine those microformats that allow to show enriched information to the users and in which way they perform this task.

The following plugins corresponding to different browsers were analyzed:

- Oomph, for Internet Explorer [10]
- Operator, for Firefox [11]
- Microformats, for Chrome [12]

(A) Developed Microformats

According to these plugins possibilities, the mircroformats that bring additional information to the users are the following:

- **hCalendar**: it is used for calendars and events [2]. For example: a government's web site could inform moratoriums' expiration dates corresponding to different taxes using microformats. This way, the citizen would be able to know all these dates as events, and would be able too, to export them and add them directly to his schedule manager such as Outllook, Google Calendar, etc. Picture 1 shows an example of hCalendar with three events and the actions that can be performed with them using the Operator plugin of Firefox.

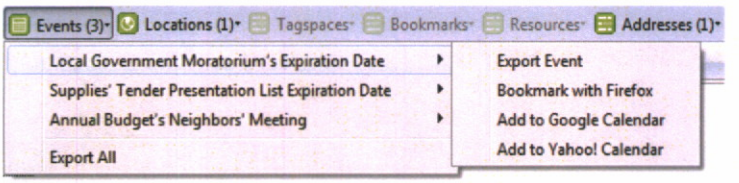

Fig. 1. An example of hCalendar with Operator

The event's information includes:

- *Summary* – the text that the user is able to see as the event's identification.
- *Location* – it can be optionally mentioned the location where the event is going to be performed.
- *Beginning and end's date and time* – including the time zone where it is defined.
- *Description* – text that explains the event's details.
- *Tags* – other information.

- **hCard:** they are introducing cards [3], such as personal cards with an individual or organization's information. In it, all the contact data belonging to a particular person can be described, for example: name, telephone number, address, email address, web site, and also NIC names used in messenger, or the URL where his

contact photograph is published. Picture 2 shows an example of iCard where three contacts are shown, and the possibilities for the user to export those contacts, for example to Yahoo, or to another file that can be read by any scheduler manager.

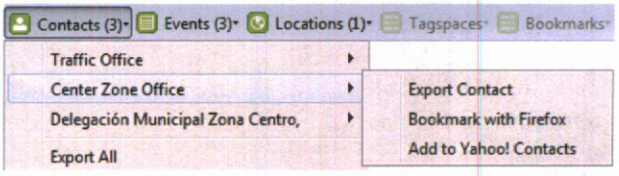

Fig. 2. Examples of hCard with Operator

This microformat could be used to load, for example, the telephone numbers, email addresses, etc. corresponding to different local government's areas. This way, citizens can get with only one click the telephone numbers and other contact data of the government's areas he is interested in, and also he can include them to his contacts.

- **Geo:** This microformat provides geographic information that allows defining the location by the class Geo [1]. The use of this class allows defining the entity latitude and longitude. In an automatic way the user can search an address by using a geographic location program such as Google Maps. Picture 3 shows an example of the microformat Geo use where because of the latitude and longitude's incorporation, the plugin is able to locate this address in a map, for example Google Maps.

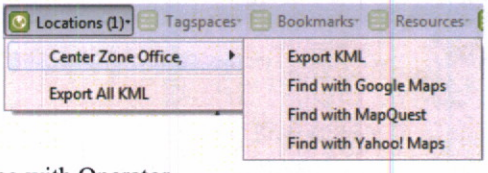

Fig. 3. Example of Geo with Operator

There also are other microformats, that although they don´t have a direct influence over the user interface, they allow adding semantic information to enhance the searches. One of the microformats established as standard that pursues this goal is: **rel-tag**. This microformat allows defining tags inside the web page that denotes key words that identify the page's content or a part of it [15]. The tags are similar to the meta keywords but the difference is that they can be seen as links in order to allow the user noticing the information that is related to the page but this information is not explicitly shown as it is in the meta keywords case.

The tags are specified in the following way:

tagname

The URL must point to a page that contains this word definition. The URLs must have a uniform format where the name that is place behind the last bar represents the

tag's name. The text of the link doesn´t define the tag but its URL. For example, if it is defined:

Places

In this case the semantic information that is included in the tag shows that it concerns a procedure but, the user will see the text "Places". It must take special care when the tag's definition in order to prevent the user's confusion, because the computer would interpret it according to its semantic information. On the other hand, if the user lacks of a plugin that shows him the tag's value, he would understand it according to the text that the tag shows.

The tags can be used for the information search and also to perform contents' categorization inside the web site.

(B) Microformats that are actually in a Development Stage

There are other microformats that are in a maturation stage, and that they haven't been established as standards yet. However they can be useful to add information in order to improve the searches and the contents organization. Some of them are the following:

- **hReview**: its implementation can be interesting in the government web sites because they provide a notation to specify the product, event, service, etc. review [7]. This feature could be used, for example, to show web sites polls' results, enhancing the results value. It can be included to qualify the government's providers or the achievement of the government's goals.
- **rel="home"**: the concept of this microformat, although it is very simple, can be a great help because it allows to define that a determined points to the web site's home page [13]. This microformat added to the plugin use, or much better, integrating them in the browsers in a future, will allow returning to the home page of the site which the user is navigating. If the browser provides a home button inside itself, it won't be necessary to struggle against the different ways of returning to the home page that nowadays provide the different government web sites. For example: some of them uses a banner with a link to go home, other have a button in the main menu, etc. The implementation and standardization of this microformat would simplify the web site's navigation.
- **rel-payment**: this microformat allows specifying the different payments way of a product or service in the web [14]. It could be use, for example, to show the different ways to pay taxes, traffic fines, etc. This way, the user would be able to see the payment's options and to use a plugin that links him directly to a web site where the tax or fine is already selected and he can pay it very easily. This way of paying taxes or fines is more accessible to citizens that don't know how to use electronic payment.

There are other microformats that are in development stage and allow to add useful information to the context and that can be used in government's web sites:

- **hMedia**: for images, videos and audio [4].
- **hNews**: for the news[5].

- **hResume**: for government agents' curriculum vitae[6].

3. Conclusions and Future Works

Gradually the semantic web is being inserted and complements the current web sites adding them standardized information in order to be interpreted, not only by users but also by programs. The possibility for a software agent to be able to understand the information makes possible to create browsers' complements capable of exploiting this information providing the final user with more opportunities to take advantage of it.

Microformats are a quick and easy way of adding that semantic information to the current web sites, with defined standards focused in clear goals. Although nowadays there can be find some plugins for the most popular browsers, a lot of them are not very known and they already have limited functionalities. Therefore is it necessary, in the first place to raise users' consciousness about the microformats use and their benefits; in the second place the necessity of having better and richer plugins in order of using the information that they provide in a better way.

As future work the proposal is the creation of a plugin for Internet Explorer that allows a higher microformats' integration and a better use of them, always focused in the goal of enhancing the user's experience while he is navigating a web site.

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