# INSERTING MICROFORMATS INTO MOODLE

BY

**IASMINA ERMALAI**[*] **and BOGDAN DRĂGULESCU**

"Politehnica" University of Timişoara

**Abstract.** Moodle has been the most used learning management system (LMS) for some years now. In the same time the Internet has been migrating towards intelligent methods of structuring information and microformats are a small step towards this desideratum. The present paper seeks to establish the current use of microformats in the web and also to propose a method of integrating them into Moodle as a way of publishing tutors' contact information, increasing thus the usability of Moodle.

**Key words:** microformats; hCard; moodle; open-source.

## 1. Introduction

Microformats have been designed for humans firstly and for machines secondly and they are considered to be the lower case Semantic Web. According to Sir Timothy John Berners-Lee (2001), the Semantic Web is an extension of the current Web, in which the information receives a well defined meaning, allowing thus a better cooperation between humans and machines. The true force of the Semantic Web consists in the development and use of intelligent software agents which would gather Web content from different resources, process the information and exchange results between them. Some of these technologies and services – Semantic Web publishing tools, context modelling tools, and intelligent search engines – are already in use.

---

[*]Corresponding author: *e-mail*: iasmina.ermalai@cm.upt.ro

In this context, microformats are a small step in the right direction. They are simple standards used as frameworks for intelligently publishing content on the Web. This is the reason why the number of Web pages that use hCard – one of the Microformats – has surpassed 2 billion by the middle of 2010 (Çelik, 2010). A study carried on during 2010 (Ermalai & Vasiu, 2010) revealed the fact that most of the widely known Web applications like Facebook, LinkedIn, Chrome, Blogger, Yahoo, and so on, use microformats for structuring pieces of data. Despite their utility, microformats have barely been used in the educational field. Only a few universities/institutes worldwide have implemented two microformats (hCard and hCalendar) into their Web portals. But these two are not the only microformats with applicability in education; for example hReview is a microformat which could be used by tutors, for writing reviews about the students' activities and hResume could be used for the tutors' and students' resumes. In 2008 we integrated microformats (hCard, hCalendar and hAudio) into the educational portal used at that time with the distance learning students and we concluded that it was a viable solution (Ermalai & Drăgulescu, 2010).

Moodle is one of the most used VLEs (Virtual Learning Environments). It is a free technology, which allows universities to create online courses in a simple manner. The software can be downloaded and used on any computer, having the ability to adapt to different needs, from sites with only one tutor, to universities with thousands of students. Studies carried on at our University revealed the fact that Moodle is by far the most used learning management system, both in Romania, as well as worldwide (Oniţă, 2011).

The attempts to attach semantic reasoning to Moodle are rather scarce and are mostly concentrated on metadata, adding an additional semantic layer and data mining, which usually generate results in the RDF (Resource Description Framework) format (Lukichev *et al*., 2007; Mustapasa *et al*., 2010). According to the definition given by W3C, "RDF is a standard model for data interchange on the Web" (Bevan, 1995).

In comparison with these methods, microformats are a simpler way of adding semantic reasoning to existing structures. Furthermore the results can be observed straightaway even by the less experienced user, as there are plug-ins for most browsers, that allow the processing of data published using microformats' classes. This is a way of facilitating the administrative process of the learning process, increasing thus the usability of Moodle. According to its' most common definition, usability is identified with the ease of use of an application (Ermalai *et al*., 2009).

As stated above, Moodle is the most used educational Web portal nowadays, but so far attempts have not yet been made to integrate microformats into it. The most feasible solution appeared to be the development of a module for all microformats which were to be added to Moodle. The fact that Moodle has been the system of choice for the "Politehnica" University of Timişoara for

almost two years now, made an even more compelling argument to the necessity of developing microformat modules.

## 2. The Current Use of Microformats in WWW and Educational Portals

Due to the fact that they are destined both for humans and machines, but mostly because they allow a relatively easy adaptation and processing of existing Web content, the number of applications, services and programs that implement different types of Microformats is quite significant nowadays and it is continuously growing (Ermalai *et al*., 2009).

The following are some of the most widely known Web portals and applications that use Microformats: Digg, Dreamweaver (Microformats Extension supporting hCard, hCalendar, XFN, rel-tag, relg-licence), Drupal, Eventful, Facebook, Flickr People and Photos, Google (Chrome, Search, Blogger, Creative Commons Search, Maps), Internet Explorer, LinkedIn, Ma.gnolia, phpMicroformats, Technorati (Contact Feed Service, Events Feed Service, Microformats Search, Search, Tags), Upcoming, WordPress, Yahoo (Creative Commons Search, Local, Tech, UK Movies), and Pingerati (Microformats, 2010).   The most commonly used microformat is hCard.

Recent browser versions, like Firefox 3.0, have built-in support for Microformats while older versions can be adapted by adding plug-ins like Operator, BlueOrganizer, Tails or Tails Export. Internet Explorer 7 and 8 use Oomph and Oomph 2 as a plug-ins for Microformats. Chrome uses Michromeformats as an extension and Android uses Mosembro. Other browsers with a consistent effort in this direction are Flock and Safari (Microformats, 2010).

As a part of the new Semantic Web wave, Microformats are also meant to offer better data processing and filtering of information by search engines. Second generation search engines' technologies offer more controlled searches by using the XML (Extensible Markup Language – "simple, very flexible text format derived from SGML") and RDF data from the Semantic networks. This is a method of increasing the relevance of the returned search results (Cho, 2009). In the case of Microformats, search engines perform searches after Microformats' class names. Since 2009, Google has been offering support for Microformats with its Rich Snippets Feature, a new presentation of snippets that applies Google's algorithms to highlight structured data embedded in web pages (Goel *et al*., 2009). Yahoo! SearchMonkey offers similar support, proving hence the utility of Microformats in SEO (Search Engine Optimization) (Lewis, 2009).

Regardless of their currently significant use in web portals, Microformats have not raised the same interest in the educational field. According to a study conducted in the year 2009 (Ermalai *et al*., 2010), only a small number of worldwide universities integrated Microformats into their Web pages, and one could not really speak of a diversity of Microformats - the maximum number of complex Microformats implemented by any university

was two: hCard and hCalendar. A similar study, conducted in 2010, revealed the fact that the number of educational institutions using Microformats has barely increased and no other Microformat has been added to the two mentioned above. Both of the mentioned studies had as starting point the *examples-in-wild* page from the Microformats official web portal, which were tested in order to establish the accuracy of the information.

Results revealed the fact that hCalendar held 37% of the Microformats' *educational market* and universities generally used it for publishing information regarding the timetable. hCard held the rest and it was used for publishing the institution's address and/or staff information.

In 2009, the "Politehnica" University of Timişoara also implemented Microformats in the Distance Learning Centre's portal, but that same year the old platform was abandoned and the University started using Moodle. *Ergo* arose the necessity of finding a way of integrating Microformats into Moodle.

### 3. A Conceptual Model of Integrating Microformats into Moodle

There are basically two ways of integrating the desired Microformats (hCard, hCalendar, hReview, hResume) into Moodle

a) developing a module for each Microformat;

b) developing a module which allows the integration of all Micro-formats.

The second method was chosen, because it offered a better structuring of the code – all Microformats were in the same place and besides this, it was easier to extend a module than to develop a new one.

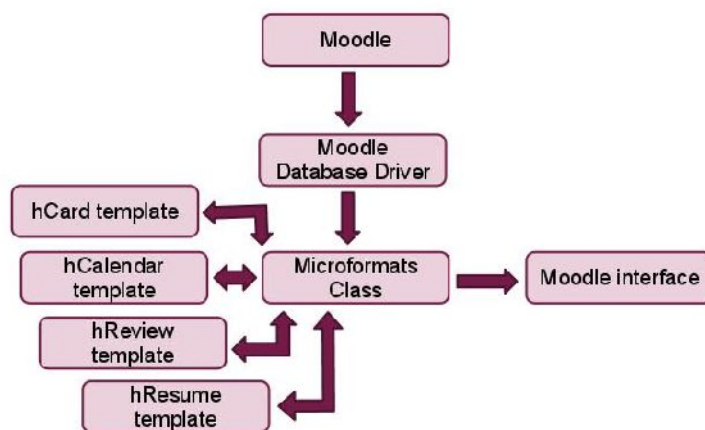The conceptual model of the method is presented in the Fig. 1.



Fig. 1 – The Microformat module's diagram.

The Moodle module for Microformats offers the user the possibility to choose one of the desired Microformats. Independently of this choice, the

Microformat class uses the Moodle database driver to extract the needed information from the database. Depending on the chosen Microformat, the appropriate template is accessed and the information is displayed on the Moodle interface. So far the implementation has been made only for hCard and it is presented in the following section.

## 4. Inserting hCard into Moodle

The default Moodle installation offers a rather slow and difficult contact data extraction, therefore leading sometimes to loss or alteration of information. The common user has to make several clicks in order to manually save the contact details of the tutor into digital agendas like Outlook or Yahoo! Contacts. The present paper offers a faster alternative to this process: the contact information is taken from the Moodle database and published using the hCard classes (Fig. 2).

```
<div class="vcard">
<span class="fn" style="font-weight:bold;">Iasmina Ermalai</span><br />
<span>Email:<a          class="fn          email"          href="mailto:iasmina@cm.upt.ro">
iasmina@cm.upt.ro </a></span><br/>
<span class="org">UPT</span><br/>
<span class="title">Dr. Ing.</span><br/>
<p class="adr">
<span class="locality">Timisoara</span>
<span class="country-name">RO</span>
</p>
<div class="tel">
<span class="type">work</span>:
<span class="value"></span>
</div>
```

Fig. 2 – The use of hCard for publishing tutor information.

The best way of adding new features to Moodle is to develop a module or a block. We opted for a module, which displays tutors' information. The new interface is presented in Fig. 3.

With the help of a browser plug-in like Operator for Mozilla (Fig.3), the user has various ways of using the information published using hCard classes: export it to Outlook-like applications (Fig. 4), bookmark it, localize the address on Google Maps, save the information into Yahoo! Contacts and so on. Operator exports the information for Outlook into a vCard format, which is "the electronic business card", facilitating the exchange of information between different applications (Internet Mail Consortium, 2011). So far the module offers this facility for one contact at a time, due to the fact that we used AJAX

for loading the page. In the future we plan to extend the application so that it could offer the possibility to save all contacts with a single click.
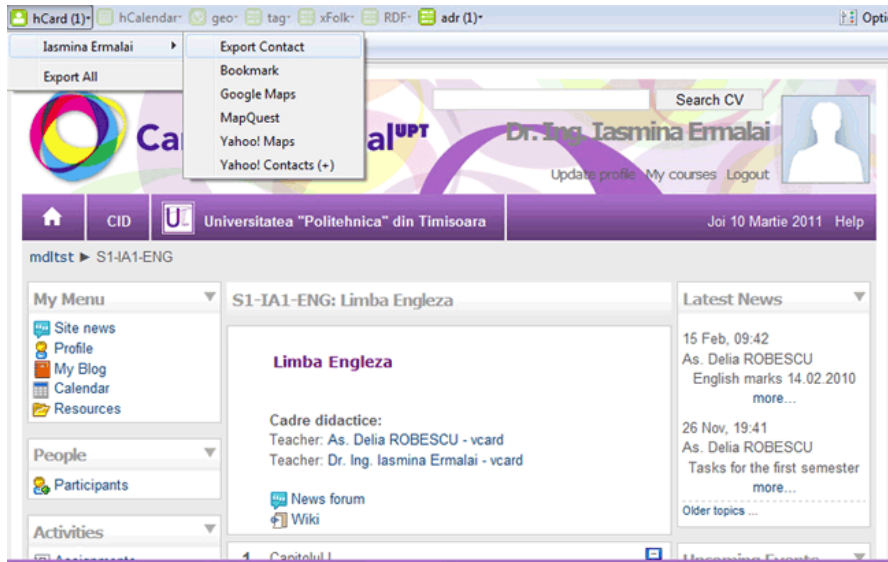


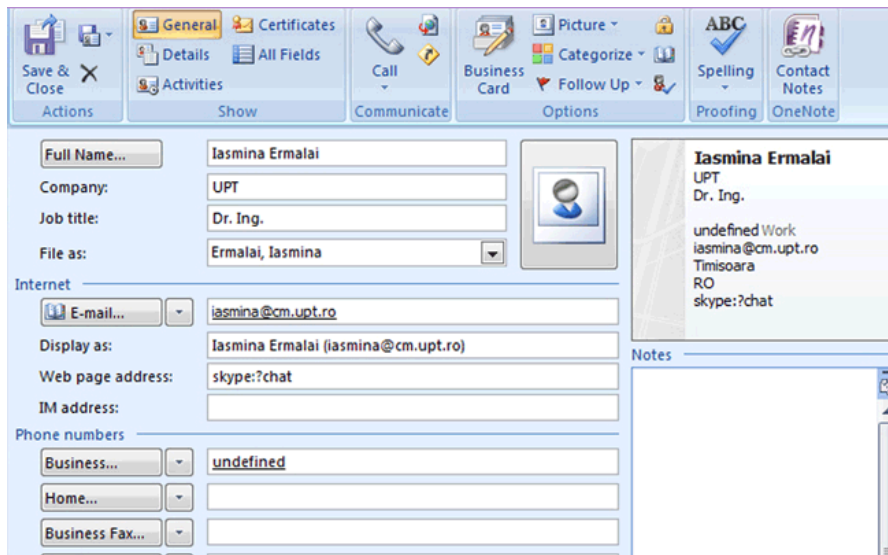Fig. 3 – The hCard module and Operator.



Fig. 4 – Saving the tutor's data in Outlook.

Operator was preferred as it is a very extensible plug-in, allowing the user to develop his own scripts save them into a JavaScript file and afterwards import that file into Operator.

## 5. Conclusions and Further Work

Microformats are simple standards used for publishing structured information on the Web and they are currently used on a large scale by most applications. Despite this fact, the learning environment has been rather reluctant regarding their use into educational portals.

On the other hand, Moodle is currently the most used open-source learning management system (LMS). Its core structure has nevertheless some shortcomings when it comes to usability issues. For example, a simple action which results in saving the tutor's contact information into Outlook implies several clicks. The best method of adding new features to Moodle is through the use of modules or blocks.

This paper presents the conceptual model of a module we plan to develop, which seeks to integrate a few Microformats (hCard, hCalendar, hReview, hResume) into Moodle. So far only the hCard part was developed (used for publishing the tutors' information). This facility not only improves the usability of Moodle, but it also improves Web searches, as detailed in Section **2**.

The next step is to enhance the functionality of the current module so that it would allow the export of personal information for all participants at a course and also to extend the module as to also include other microformats like hCalendar, hReview and hResume.

## REFERENCES

Berners-Lee T.,  Hendler J.,  Lassila O., *The Semantic Web*. Mag. Sci. Amer., New York,  2001.
Bevan N., *Measuring Usability as Quality of Use*. Software Quality J., **4**, 115-130 (1995).
Çelik T., *Microformats.org at 5: Two Billion Pages With hCards, 94% of Rich Snippets*. http://microformats.org/2010/07/08/microformats-org-at-5-hcards-rich-snippets, 2010.
Cho A., *How the Semantic Web is Changing Search Engines – The Search Technology Case Studies of Hakia and Swoogle*. http://browsers.suite101.com/article.cfm/how_the_semantic_web_is_changing_search_engines, 2009.
Ermalai I.,  Drăgulescu B., *The Usefulness and Functionality of Microformats in a Particular eLearning System*.  IEEE Internat. Joint Conf. on Comp. Cyber. a. Techn. Inform. (ICCC-CONTI 2010), Timişora, Romania, 2010, 387-390.

Ermalai I., Mocofan M., Oniţă M., Vasiu R., *Adding Semantics to Online Learning Environments*. 5th Internat. Symp. on Appl. Comp. Intell. a. Inform. (SACI2009), Timişoara, Romania, 2009, 569-573.

Ermalai I., Oniţă M., Mocofan M., Vasiu R., *Inserting Microformats into Online Learning Environments*. Sci. Bull. of "Politehnica" Univ. of Timişoara, Trans. on Autom. Contr. a. Comp. Sci., **55(69)**, 37-42 (2010).

Ermalai I., Vasiu R., *Study Cases on the Current Use of Microformats*. IADIS Internat. Conf. WWW/Internet 2010, Timişora, Romania, 2010, 387-390.

Kavi G., Ramanathan V.G., Hansson O., *Introducing Rich Snippets*. http://googlewebmastercentral.blogspot.com/2009/05/introducing-rich-snippets.html.

Lewis E., *Microformats Made Simple*. Edited by Press NR, Berkeley, 2009.

Lukichev S., Diaconescu I.-M., Giurcă A., *Empowering Moodle with Rules and Semantics*. SFSW, CEUR-WS.org, 2007.

Mustapasa O., Karahoca D., Karahoca A., Yücel A., Uzunboylu H., *Implementation of Semantic Web Mining on e-Learning*. Procedia - Social and Behav. Sci., **2**, 5820-5823 (2010).

Oniţă M., *Contributions to the Use of Video Technologies in the eLearning* (in Romanian). Ph. D. Diss., "Politehnica" Univ. of Timişoara, 2011.

*** *Browsers*. Microformats.org, http://microformats.org/wiki/browsers [Jul. 2010.

*** *Extensible Markup Language (XML)*. W3C, http://www.w3.org/XML/.

*** *Microformats Implementations*. Microformats.org, http://microformats.org/wiki/implementations, Jul. 2010.

*** *Resource Description Framework (RDF)*. RDF Working Group, http://www.w3.org/RDF/2011.

*** *vCard Overview*. Internet Mail Consortium, http://www.imc.org/pdi/vcardoverview.html, 2011.

INTRODUCEREA MICROFORMATELOR ÎN MOODLE

(Rezumat)

De câţva ani Moodle este cel mai utilizat sistem de management a conţinutului educaţional (LMS). În acelaşi timp s-au făcut tot mai multe progrese în direcţia adoptării şi integrării de metode inteligente de structurare a informaţiei pe Web. În lucrare se prezintă o modalitate de a introduce Microformate în Moodle. Pentru a creşte utilizarea platformei Moodle se propune o altă formă de publicare a informaţiilor de contact ale tutorilor.