



## Development and performance evaluation of a new RSS tool for a Web-based system: RSS\_PROYECT

Isabel de la Torre-Díez <sup>a,\*</sup>, Saúl Álvaro-Muñoz <sup>a,1</sup>, Miguel López-Coronado <sup>a,1</sup>, Joel Rodrigues <sup>b,2</sup>

<sup>a</sup> Department of Signal Theory and Communications, University of Valladolid, Paseo de Belén, 15, 47011-Valladolid, Spain

<sup>b</sup> Instituto de Telecomunicações, University of Beira Interior, Rua Marquês d'Ávila e Bolama, 6201-001 Covilhã, Portugal

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### ABSTRACT

The aim of this paper is the development, implementation and subsequent performance evaluation of an innovative tool called RSS\_PROYECT, based on the RSS technology for content syndication. At the present, there are several Web content syndicators; although there is no one so far specifically designed for the search of news related to women in risk of social exclusion. They do not even have the characteristics and configuration level of the program syndicator RSS\_PROYECT, presented in this paper.

To obtain these contents, we used 2 filters (generic and selective), set up by the administrator from the module RSS\_PROYECT installed in Joomla!. The generic filter allowed us to do a search of the words included in a series of sources indexed by the user. This filter showed all the sources that contained this word, without exception. In the selective filter, the condition on which the sources would appear would be that all the words of the selective filter were contained in the source.

We used different languages such as PHP, MySQL, HTML, XML and Joomla!'s Application Program Interface (API). Furthermore, we used the program, Firebug to measure the response speed of the module, both with the selective and generic filters. The results were favorable for the selective filter, and very favorable for the generic filter, concluding that the processing time was short and executed efficiently. Better average times were obtained for RSS\_PROYECT with respect to other modules analysed in Joomla!. Nowadays, this tool is used by the Comprehensive Center for Women's Help (*Centro Integral de Ayuda a la Mujer*, CIAM) of Valladolid, Spain.

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### 1. Introduction

At the present, the new configuration of the labor market (which mostly affects women and young people), the existence of political and/ or socio-cultural factors, joined to the absence or decrease of family support and ties, may end up in processes of social exclusion. Estivill, (2003) defined social exclusion as an accumulation of conclusive processes with successive breaks that, starting from the heart of economy, politics and society, gradually increases the distance between persons, groups, communities and territories with regard to the centers of power, the resources and the dominant values (Estivill, 2003).

One of the most important factors of exclusion still arises from the fact of having or not having a job. In this regard, the possibility of

having access to a job is going to be increasingly determined by the ability to make efficient use of the Information and Communication Technologies (ICT) (Hull, 2003; Warren, 2007). The Declaration of Principles of the United Nations argued that if an "Information Society" for all the people was really desired, it was necessary to promote an Information Society that relied on the individual as well as to harness the potential of these technologies to promote the development goals established in the Millennium Declaration (United Nations Development Programme, 2001).

Nowadays we are living in the information age. Every day we are bombarded with hundreds of news and have access to a variety of media (Internet, written press, television, radio, etc.) that makes it impossible for us to be able to process so much information. In the past, we had no choice but to wait for the news previously filtered by a few people or entities who decided what, when and how the information was presented. With the advent of the Internet all this changed, or at least "when" the news is given. People who surfed the net could now access the Web contents anywhere and anytime. All that meant a great achievement, but at the same time it demanded a few requirements that had not been thought of until then. The updating of

\* Corresponding author. Tel.: +34 983423000x3703; fax: +34 983423667.

E-mail addresses: isator@tel.uva.es (I. de la Torre-Díez), salvmun@ribera.tel.uva.es (S. Álvaro-Muñoz), miglop@tel.uva.es (M. López-Coronado), joelj@ieee.org (J. Rodrigues).

<sup>1</sup> Tel.: +34 983423000x3703; fax: +34 983423667.

<sup>2</sup> Tel.: +351 275 319 891; fax: +351 275 319 899.

the information made the users consult the Web constantly. This meant a loss of time and an increase of Internet traffic, which was unnecessary.

From this came the idea of organizing the Web to keep updated with no need to be connected all the time. Most of the programs used for this were external to the browser and an agreement and a series of protocols were established to guarantee their universality. RSS is an XML format to syndicate and share content on the Web. It is employed for spreading frequently updated and personalized information among users subscribed to the source of content (Ning et al., 2008; Samper et al., 2008; Bouras et al., 2010). The format allows for the distribution of content without the need of a browser, using software designed to read these RSS contents. Likewise, Joomla! is a file management system and its main strength is to let you edit the contents of a Web site in an easy way. It is an open source application, programmed mostly in PHP under a GPL license. The content administrator can be used at Internet or Intranets and requires a MySQL database and, preferably, an Apache HTTP server.

It is important to emphasize the significance of this novel tool (RSS\_PROYECT), as according to the Spanish Government, namely the Ministry of Equality and Social Affairs (Ministry of Health, Social Policy and Equality, 2007), 3.6% of Spanish women were battered and in risk of suffering social exclusion in 2011.

This opens up a new area within ICT giving way to some tools that can encourage the integration of these people into society, keeping them away from social exclusion. The tool presented in this paper is a search engine that can select very specific news from a high and indefinite number of sources and display them through its Web platform. It is a stand-alone tool that provides a continuous update of its content to reflect the current news.

In this way, RSS\_PROYECT is a Web-based tool in Joomla! It has an easy interface to administrate in a simple way. It does not require professional programming knowledge. This will encourage self-management by the user in order to achieve greater success and satisfaction.

The rest of this paper is organized as follows: first, we will talk about similar applications that we can find in and out of Joomla!. Next, we will explain the technique that we have used and the results (performance evaluation and development module). Finally, the conclusions and future related works will be shown.

## 2. Related work

When looking for content, it is important to know the relevance it may have for us, although we cannot know it without knowing the prior impact of this and we do not have tools to calculate it.

In spite of that, we cannot establish a relevancy of our RSS source items; we have to provide a mechanism that allows our user to publish things when they want to. In the following paragraph, we will study some of the tools in and out of Joomla! with the highest impact, observing the number of users, allowing us to control our RSS items.

### 2.1. Syndicators outside of Joomla!

#### 2.1.1. Google Reader

Google Reader is an Atom and RSS reader. It allows us to organise and to quickly access, from a Web interface, to all the news of the pages that are supported. Google launched it on October 7, 2005 by means of Google Labs, Google Reader incorporated to Google Labs on September 17, 2007. The interface is very similar to a normal email inbox reader. On the left side you can see the subscriptions, which the user has applied for

membership, and to the right, the list of new pieces of news, which can be seen in several ways (Google Reader RSS, 2011).

#### 2.1.2. Omea reader

Omea Reader is a tool for reading. It is versatile and simple to set up for Feeds. Omea Reader is a perfect mixture of the RSS channels, favorites of the Internet (that can be read online) and newsgroups. The e-mail and instant messenger are not in Omea Reader. The interface gives a very personal and efficient impression. It allows you to search and to save the Web sites. You can save these searches in unlimited categories. The disadvantage is that it does not offer synchronization.

#### 2.1.3. Netvibes

Netvibes is a Web service that acts like a virtual desktop, similar to a personalized Google main page. Visually, it is organized in tabs, where each tab is typically an aggregate of different modules and the user previously defines a scrollable widget. These modules, in turn, act as small windows which content is generated by another Web service or mini application. As other readers of generic RSS, they allow us to sign up for an undetermined number of Feeds. With it, we can be up to date on the news that publish diverse sources of information, which offers its contents on the Web, which we have selected, but without controlling the content (Netvibes. RSS, 2011).

#### 2.1.4. FeedDemon

FeedDemon is a program where we can enter and see all of the news of our favorite sites at once. It provides various utilities to manage data sources RSS (feeds) like: ranking in several categories, notices when there are new sites entered, different views of reading RSS feeds, options specific to each subscribed feed, display posts in the program itself, connection with sites of sending or posts voting (Feeddemon RSS, 2011).

#### 2.1.5. NewsGator

NewsGator is an RSS reader, but it has another very original and useful functionality. It is a synchronization system with the RSS reader, NewsGator Online. It is a Web application to administer your RSS, but that does not need any software, only your Web browser. With NewsGator Online you can administer and support your list of favorite RSS from any computer connected to the Internet. This way, if you go away on a trip and have to use other computers, you will be able to have your RSS list of interest with you. Both the desktop and Web applications share your configurations and RSS Feed's conditions.

### 2.2. Syndicators inside of Joomla!

We will give an overview of the most valued and downloaded Joomla! Modules 1.5 (free ones) by users (Joomla! 1.5 Extensions, 2011; Joomla! 1.5, 2011; Joomla! API, 2011).

#### 2.2.1. RX RSS ticker module

In this module, you can only subscribe to a Feed source. It has options such as the transition speed controls in the Front-End, and when you place the mouse on the news is when it stops.

Seemingly, it is a simple module whose strengths can stand out in a striking display of the news in our Web, with some control in its configuration. Nevertheless, in contrast, we can state that it only allows for one source, and neither we can see the images, nor the description, nor control the number of words we see, etc. It is a more visual module and it is really functional.

### 2.2.2. Feed

The next module, which is installed by default in the Joomla! version 1.5. Its principal characteristics from the Back-End are: to allow seeing a description of the news, including its image. In contrast, you cannot select to see only the image of the article, but also those of the feed, producing in many cases a bad visualization, less attractive and professional.

Other cons of this module is that it only offers one feed source, instead of several, and also that it cannot control the content with the number of words on display, which might result in very long titles and overflows in the screen.

### 2.2.3. RSS Browser 2.7

This module is the first that we have seen that allows syndication of several news. With this, you can subscribe to several news sources. Between its advantages and strengths we find this characteristic, in addition to being able to control the number of visualized articles, as normally happens in the previous ones. But above all, this module adds an important characteristic, and that is possible to visualize the information of the feed (not that of the article), with the supposed problems. It adds another characteristic: if you put the mouse over the news description, the information of the news increase, showing the items description.

### 2.2.4. Slick RSS

It is one of the most complete modules of all that we have found. Among its principal advantages and characteristics there is the control of images and visualization content, including on the feed, or the control of the number of words visualized in the article. It opens in a new page or in the same one, time configuration of the cache life, no—follow attributes and enables Tooltip. In spite of this, one of the principal disadvantages of this module is that only allows a source to syndicate every time. If you have several sources, it is necessary for them to syndicate one by one, building a module every time.

Regarding the syndicators within Joomla!, RX RSS Ticker uses the Joomla! J Factory methods, which provide higher processing speed with respect to the default FEED module, as the program module (RX RSS Ticker) to run implements a series of additional features that require a higher resource consumption than in the FEED module.

In its favour we find its display options and far more comprehensive and complex settings than in the default FEED module. FEED is found in the Joomla!'s default 1.5 Package. This module uses the libraries from the Joomla! API (JFactory::XML), which enables a similarly fast operation to the use of SimplePie libraries, although it also leads to more malfunctions when syndicating news compared to the use of the SimplePie library, as it features a more basic level of development and is not able to recognise many of the ATOM versions that are currently used to syndicate content. RSS Browser 2.7 is based on the SimplePie library to retrieve the RSS feeds of the news. The main advantages that this library provides to the module are: a similar processing speed to the Joomla! API (due to its optimisation), enhance retrieval of the RSS and ATOM (it supports up to 8 protocols, outperforming Joomla!'s default package) and greater compatibility as it can be integrated into more platforms (apart from Joomla! RSS Browser 2.7), and it allows the user to syndicate several feeds. Conversely, the code of this module is based on nested loops that are always run (in spite of not being required by the Back-End setting), resulting in a slower processing speed compared to the other analysed tools, no matter how it is set up.

Slick RSS uses the SimplePie library, with the advantages mentioned above. It needs to be noted that this library is already

incorporated in the Joomla!'s default platform from the 1.5 version to prove useful and efficient in the news search process. A further benefit is that it is based on PHP, resulting in more user-friendly code programming and reading for programmers in PHP. It uses the functions for the extraction of images, headlines, etc. However, in the structuring of the code, the system executes several functions and algorithms that remain unused, which causes the system to run slowly. A better implementation of the software could make it more efficient by increasing the processing speed.

The difference of the RSS\_PROYECT with the rest, is that we have developed 2 blocks of search:

- Generic filter, in which the user typed a single word and that only showed the news that contained this word (several programs exist with this characteristic).
- Specific filter, in which they typed several words and it only showed the news that had the specific set of words (We did not find any program that solved this problem).

## 3. Methods

The technologies used for the development of the RSS\_PROYECT are the following:

**PHP.** The version used at the moment of programming is PHP 6, in spite that in Joomla! we only need a version of the PHP 5.3, in this way, it would support future improvements without having to rewrite the code.

**Database MySQL** is a code used by Joomla! It is for making queries in the databases. It has been necessary to use this module, for adding and searching data in the information table of the “black list”, used to store the URLs eliminated by the user administrator.

**HTML.** It is used in the file 'index.php', which is responsible for displaying the processed results. The structures are defined in JOOMLA! and partly programmed in HTML so it's not very big.

**XML.** Package installer is written in XML, any error of code does not only cause an error, but also it does not allow for the installation of the module. It is a critical part of the code, since besides all the file and roots of the program, it contains the part of the variables that are going to interfere from the Back-End. A bad programming will cause the loss of data or configurations from our Back-End.

Joomla's API! 1.5.23 (Joomla! API, 2011) is the source from which we obtained all the methods and Joomla! sentences for executing the code correctly and to avoid instabilities and safety gaps in the program (CIAM Website, 2012). The software used for the evaluation is Firebug. It is an extension of Mozilla searcher.

## 4. Results

Later we will show the results obtained from the front-end part of the user and the performance evaluation.

### 4.1. RSS\_PROYECT module

The RSS\_PROYECT module can be define principally as a module capable of subscribing to an unlimited number of feed sources. It can extract all the articles and compare them with a series of filters and a black list stored in our database. This allows us to visualize them or not, as well as to fulfill the criteria marked by the administrator. In addition, we can form a type of users in our module, giving permissions to eliminate content. It goes without saying that a registered user will find tags with which

he will be able to delete a series of articles that are not interesting for him. By this way, the user has total control.

We will talk about the characteristics of the configuration of the module in two parts: one, the zone of the filters, cache, etc. The first part consists of a series of configurable parameters. This one is a general sight for creating a perspective on the program. The zone we are interested in is on the right, which is specific to the RSS\_PROJECT. The column on the left side is generic for all the modules and we do not have permissions in this. Then, we will explain the fields in a descending order: two types of filters exist inside the module: generic and selective. Generic filter: it is possible to put an unlimited number of words. This one selects individually each of the words and searches for a correlation within the news title (it is sensitive to capital letters and lower-case letters). When this happens, the news is shown on the screen. Selective Filter: They can put in an unlimited amount of words. The condition for executing it is that they all coincide with the words of the title and with the words of the selective filter.

These filters are connected between the appearance of one, two, or none; and they have different effects on the module. The specific filter has priority; it is enough if one of the 10 fields has something written and they do not execute the information of the rest. For executing the generic, it is necessary that the specific is empty. In case that two are empty, the number of news will be chosen in order of appearance, as if a normal syndicator was searching itself. Later we will explain briefly the configurable fields of the RSS\_PROJECT module.

In the field “template style for the module,” we can select a suffix of cascading style sheet. Thus, the module will be able to take a different style to factory default. To grant elimination permissions to the users for deleting news, we will give some of them a name defined by Joomla! in the Access Control Level (ACL). Moreover, the user that we grant these permissions at the moment of registering will be able to delete news that will go on to the database.

In Fig. 1, we will find a part of our configuration feed, where we will obtain a wide range control at the moment to configure our module. In the URLs feed, we will be able to put all of our feeds that we want to subscribe to; the only requirement is that we must make a separation space, because the program can add different URLs. To visualize the source feed we will mark the field that permits seeing the newspaper name, the Web site where we extract the information. It appears only once, and all of its articles below. With the description of the feed we can visualize the information in the newspaper, Web, etc.

In the description that it has stored. By activating the field *Feed Image* we see the image of the source feed. To control the *Number of articles seen*, we select a numeric value, which will be the number of articles that will appear. In the case that it is near the limit, the program will stop and will show this number of articles on the screen. And if it does not come near to the established limit, the program will execute until the end and will show the obtained results. With the field *X words of the article to see* we can decrease the limit of the number of words that will appear in the title. In *Paper Description* we can enable or disable the item description, in case that there is one.

In *X words of the article description*, you delimit the number of words that you want and they will appear after the link of the article. It is necessary that this is activated in the previous field in order for this one to be executed. With the field *See images for each article* you can enable individually the article that has images, they are later seen on the link (the majority of the RSS do not incorporate images, because it is slightly probable that they could be visualized).

Finally, we will speak about the Tooltip. It is a tool that activates after placing the mouse over the news icon, and with

it we can activate different functions. The field *Entitled Tooltip* allows us to activate or to deactivate this function. The following fields will not be affected if this option is not activated. With *X Words of Tooltip* it allows you to form the number of words to visualizing of the news title in the Tooltip. The field *X Words of Tooltip description* forms the number of the description words that is going to be seen.

#### 4.2. Performance evaluation

We have conducted a real test in the CIAM Webpage (CIAM Website, 2012) where the program FIREBUG has been used for doing the response times measurements. The usual connection is 6 Mbps downstream and 512 kbps upstream. Moreover, we will conduct a study to see the average times that are recorded in the server process on having modified different variables as: Number of feed, number of filter words and number of articles for visualizing.

With all that, we will see which are the strong points and will deduce the critical processes in those where we need more resources. All this information will be used in future lines of work, as they look for solutions to improve the performance. We have conducted a measurement before implanting the module because we want a reference of the delay that the RSS\_PROJECT may introduce. The speed in loading the page without the module has been 1.07 s. We will study the first case, which is done in the generic filter and responds in seconds, connecting with the changes in URLs's parameters and words in the filter.

We must keep in mind that the Back-End configuration has been formed in order for the first 100 articles to go out, using for it the Web in which we are going to use this module.

According to the data, when we increase the number of feed sources of which we obtain news, the delay grows, as the calculation time is longer. Nevertheless, we can see that the worst response time in the program is 4.28 s (see Fig. 2), which means that in the worst cases, the loading time would be 3.21 s. This time is not excessively long, if we consider that this is the worst-case scenario.

We obtained the best responses with three URLs in 1.79 s, 0.6 s slower. The conclusion in this case is that the results have been given quickly, partly for the limitation of the sample. The average time of the whole study is near 2.8 s, which means that 1.8 s of delay would be the average in our module in the generic case. We must bear in mind these factors: the traffic of the network, to reach the limit of articles, the number of feeds, etc. It is necessary to mention that if you increase the number of words, the loading time increases, in the same way as if we increase the number of feed sources.

For specific filters, the loading time obtained without the module is 2.46. It is a longer time than the other case, but we must bear in mind that we are not only measuring how quick the module is, but also it depends on the condition of the network and on the server, variables that determine these parameters and that we cannot control. As you can see in Fig. 3, in this case the delay times introduced by the module are critical. The worst case is with 24 URLs and 4 words. The results may be strange if they are obtained with four words, instead of with 10; but if we look carefully at the graph, we see that this was happening in the case where we reduced the feed. This means that when we were deleting certain words from filter four (in our case) the program was executing to the end, since it did not find the maximum number of articles. That's why there was a greater delay, since all the articles of the feed had to be scanned. In the best cases, the delay created has been 3.74 s; over the average of the generic filter. This is due to the algorithm nature, since in this selective filter the number of operations grows exponentially with regard

URLS feed	<pre> http://www.rtve.es/rss/temas_noticias.xml http://www.noticias.com/rss/portada http://www.20minutos.es/rss/ http://www.nortecastilla.es/portada.xml http://www.abc.es/rss/feeds/abcPortada.xml http://www.elpais.com/rss/feed.html?feedId=1022 http://elmundo.feedsportal.com/elmundo/rss/portada.xml http://www.larazon.es/rss             </pre>
Visualizar la fuente feed	<input type="radio"/> Si <input checked="" type="radio"/> No
Descripcion del feed	<input type="radio"/> Si <input checked="" type="radio"/> No
Imagen Feed	<input type="radio"/> Si <input checked="" type="radio"/> No
Numero de articulos a visualizar	<input type="text" value="5"/>
X palabras del titulo del articulo	<input type="text" value="15"/>
Descripcion del articulo	<input type="radio"/> Si <input checked="" type="radio"/> No
X palabras de la descripcion del articulo	<input type="text" value="25"/>
Ver las imagenes de cada articulo	<input type="radio"/> Si <input checked="" type="radio"/> No
Abrir la noticia	<input checked="" type="radio"/> En una ventana nueva <input type="radio"/> En la misma ventana
Anade el atributo 'no follow' a los enlaces	<input checked="" type="radio"/> No <input type="radio"/> Si

Fig. 1. Back-End.

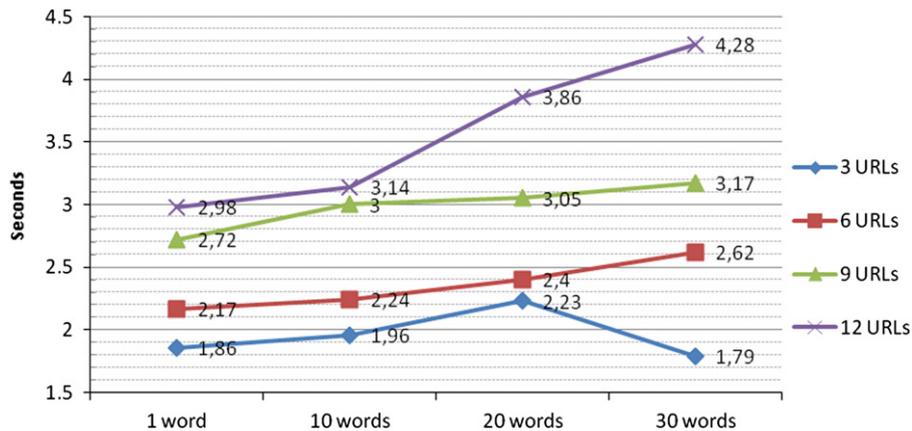


Fig. 2. Response times for generic filter.

to the generic one. The final average of this selective filter is 8.4 s, which represents almost 6 s slower loading that without the module. This is why we should consider carefully the number of selective filters and selected sources, since their implementation becomes critical when navigating.

The relevance of the search engine RSS\_PROYECT lies in its ability to provide faster searching compared to the tools analysed within Joomla! 1.5, thereby optimising processing speed and adding news management and setup functions. This tool gives

the administrator full control over the publication of articles, which allows him/her to delete articles found by the search engine (they are stored in the database known as black\_list) but that he/she considers that they should not be published on the Web. It also enables attribute assignment (display, hide, remove) depending on the user hierarchy (administrator, superadministrator, manager, publisher...), differentiating it from the rest of tools in its field. Fig. 4 shows better average times for RSS\_PROYECT with respect to other modules analysed in Joomla!.

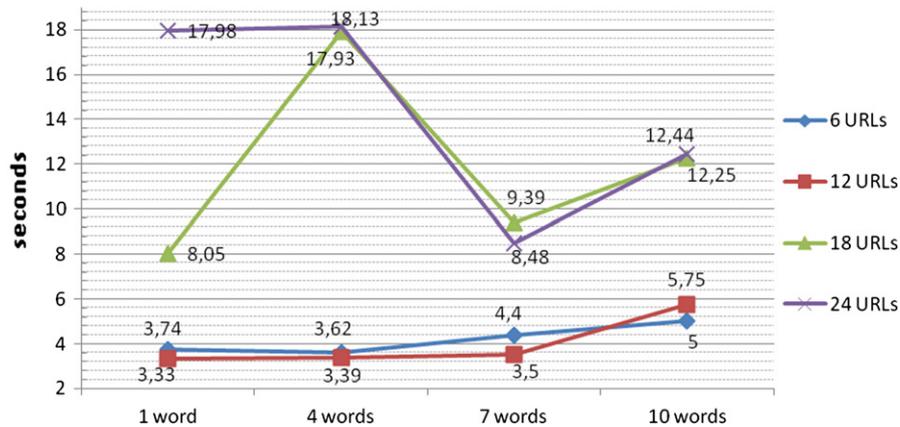


Fig. 3. Response times for specific filter.

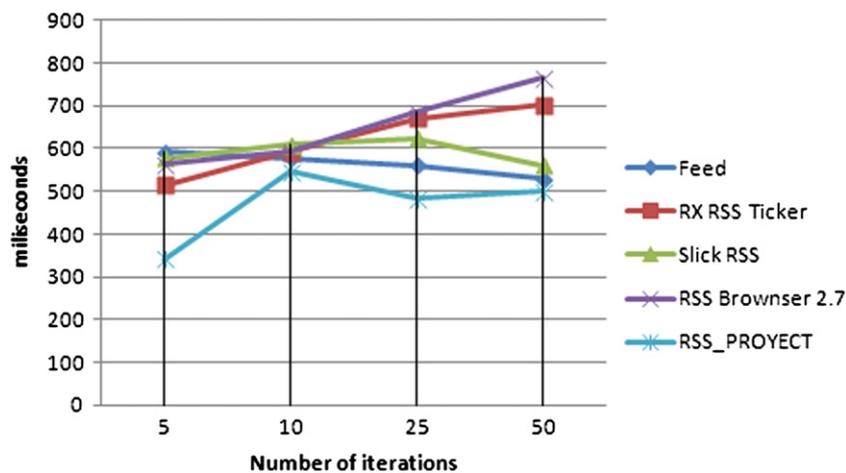


Fig. 4. Average times for different Joomla! modules.

## 5. Conclusions and future work

One of the conclusions achieved is that this module is successful in the Web, as there is nothing similar in Joomla! (at least free). For this, it would be interesting to be able to publish in the official page of Joomla!, so that users could download and adapt it to their needs. It has two types of filters, selective and generic, which constitutes a powerful tool and clearly a distinct characteristic, because this module is different from the other Joomla! modules. RSS\_PROYECT provides solutions to problems that other RSS tools are not able to solve. This makes the RSS\_PROYECT different from other tools.

In relation with the efficiency of the filters, the conclusions are: when we increase the number of words in the filters we also increase the processing time, as in the case of the URLs.

In conclusion, the study conducted about the speed execution has confirmed what we felt at the moment of programming the algorithms of the module. When the number of feed sources increases, the computational efficiency increases too. It is necessary to emphasize the singularity of the selective filter. We must bear in mind the random factor, as the flow chart of RSS\_PROYECT is optimized. Therefore, in the moment that it achieves the goals it stops processing (it is the singularity observed in the selective filter, where by increasing the number of URLs the goals are reached and it does not explore all the possible iterations).

The security levels implemented are the maximum that can be implemented today within a module, so we ensure that our tool will not be a security gap within our site and we will be well

protected. This is because the commands have been used through the API of Joomla!, so the module is not vulnerable.

In the technical aspect, we have observed that the computational efficiency posed by the algorithms of the module is low, and very small (400 kb), ideal for a mobile device. (It is important to point out that for the case of selective filters, with more than 20 feeds, the computational efficiency is significant. It would be necessary to conduct a study on the convenience for both fixed devices and mobiles). In spite of being a complete tool within Joomla! modules, there is always room for an improvement in the future. Next, we propose some possible future lines of study and their explanation:

*Added news:* It would be interesting to include an option in which the administrator could add news, since the program performs a few searches on the Web that you have indicated, but you might want to add something else.

*Scale of values of the news:* Another improvement that could be done is that if, for example, news are updated slowly, the user would be able to rate them and, for example, the news that were out of date could be deleted.

*Algorithm to eliminate news on the database:* Despite the eliminated articles do not pose a significant size in bits, neither in memory, nor in execution, a timing device could be installed for the news that are stored in the database (Black\_List), because throughout the years they would increase the calculation of the program and it might go slower (remember that the news are being updated, so they are also being removed and it does not make sense to continue storing them).

Search algorithms based on the number of times that a word is repeated in an article, but we must bear in mind the environment where our tool is being used, as the Web scraping is carried out on a series of sites in RSS format indexed by the user.

Infinite selective filters: In our case we have made 10 selective filters, with this we are meeting the needs of our client, but circumstances may arise where a user needs even more. This could be a possible line of study and work. Improvements to the searcher: We might improve the algorithms of search so that they are capable of looking for words of other alphabets, or interpreting words with question marks, exclamation marks, etc. providing them with an artificial intelligence to distinguish this type of symbols.

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