A Study of the WordPress SEO Plugins for Microformats

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Abstract: The evolution of technologies puts pressure on organisations upon its digital transformation. The content these organisations make available on the Web and their strategies of Search Engine Optimization (SEO) have a real impact in the achievement of the organisations' communication objectives. Marketing departments are increasingly dominated by SEO strategies to achieve the best positions in Search Engine Results Pages (SERP's). To achieve the first positions increases the probability of new business opportunities. This paper is focused on semantic SEO, and on the quality of the WordPress SEO plugins that incorporate microformats (free-of-charge versions). We have studied 85 different plugins and concluded that only 20 incorporate truly microformats. We concluded that 95% of the 20 use JSON-LD as mark-up language and the vocabulary schema.org. All of the 20 plugins fall far short of expectations as they exploit very few schema.org types and terms compared to the possibilities of descriptions defined by the theoretical analysis made. To date, if an organisation needs to incorporate microformats in its Website Wordpress based contents, it will have to pay to a programmer to do this, or use the paid versions pulgins, as the free plugins do not provide quality tools.

1 INTRODUCTION

The expression "Content is King" (Gates, 1986) appears in an article by the Microsoft's founding entrepreneur, where he already assumed that, in a context of a large amount of online information, the content would have great prominence and value due to its quality, originality and exclusivity. Several decades later, its expression still influences marketing strategies based on content (Patrutiu-Baltes, 2016). The internet specialists recognise the value of content as a fundamental tool of digital marketing (Baltes, 2015). Currently, organisations outline their communication strategies supported by content to add value to their brands (Lemos, 2017).

In a context of new challenges for organisations, with the attention of their consumers divided, where digital media offers enormous communication potential, with greater versatility and accuracy, they are also more dependent on new marketing tools in a more complex communication environment (Batra & Keller, 2016). Several open source Content Management Systems (CMS) provide a large number of free plugins for easy implementation, WordPress[1] is the most relevant, where every day new updates and new Search Engine Optimisation (SEO) plugins are announced. SEO becomes a significant necessity for all online businesses, without which businesses will not succeed (Sohail, 2012). These plugins present themselves to the end-users as an indispensable tool for any digital marketing strategy. SEO strategies and SEO plugins have been imposed on online businesses, promising the best results in organic searches and achieving the desired notoriety, converting the traffic generated into some kind of benefit for organisations (Veglis & Giomelakis, 2019).

According to Google[2] there are only two options for organisations to ensure good results in the ranking of Search Engine Results Pages (SERPs):

- Advertising investment: this can be done purchasing keywords in Google Ads (words that are related to the websites, products and services provided by the companies, description of content), and;
- Organic results, which have to do with how sites are optimised so that search engines

[1] See https://wordpress.org - Accessed in May 10, 2020
[2] See https://support.google.com/google-ads/answer/6335981 - Accessed in May 10, 2020

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interpret them as having relevant content for the search in question, so the search engine puts them in the top positions of the resulting search listing. To achieve this there are several techniques. The most important one is the Google's Rich Snippets[3] that explore websites' contents that have embedded structured data called microformats.

According to Statcounter.com, the four main search engines are Google, Bing, Yahoo! and Baidu. All of them have evolved, focused on the needs of their users, allowing websites to disseminate content with new mark-up elements, inserting additional semantic information, so that search results in the SERPs appear according to relevance, displaying meta-information of the landing pages (Marcos et al., 2015). The technology that underlies the SERPs uses algorithms developed by Google that insert additional semantic information defining how search terms are interpreted by their search engines. According to Statcounter data[4], Google represented 91.61% of the global search market share (Desktop, Mobile and Tablet) between May 2017 and May 2018.

Currently, search engines use structured data for SERPs, select Rich Snippets, ratings, prices and reviews, among others. This evolution reflects the application of structured data technologies, the way metadata usage is processed and the text embedded in HTML[5] of web pages, defining what is relevant for each specific search. Interoperability between machines enhances the whole process of interpretation of information embedded in HTML, a reality that has encouraged marketing experts and the business sector to have the ambition to have organisations listed in the top positions of SERPs.

The flow of information technology is growing and tends to increase the complexity and dependence of companies on technology. This raises questions about how well prepared they are to meet the challenges of digital innovation. It also forces managers and marketing departments to rediscover themselves, to speed up decision making for the digitisation of their processes. Organisations have to reconsider their traditional business models and processes to implement new opportunities in the digital world, where resources for new marketing technologies, with content experts, multi-channel campaigns, data analysts, among others, are key elements to survive in a digital transformation process (Świeczak & Eng, 2017).

This paper focus on the second option. Metadata embedded in Web Pages positively influences search engines, ultimately offering a better experience for Web users. If this metadata, also called "data about data" (Riley, 2017) , is structured i.e. is modelled and coded with mark-up languages using standard vocabularies (e.g. Dublincore.org or Schema.org[6]) that give meaning to the metadata, this will enhance data interoperability.

This paper presents an on-going research that focuses on WordPress and on its SEO plugins which add microformats to the webpages being built. The aim is to identify the vocabularies and mark-up languages used in the SEO plugins, and to characterise the terms used.

We focus on WordPress since it was identified as the most popular open source CMS on the market (Cabot, 2018). The W3techs[7] platform states that WordPress is used by 35.7% of the sites, worldwide, having a 62.4% share of the CMS market, which explains the huge attraction of developers; currently WordPress has over 54000[8] plugins.

This article is organised as follows: next section presents the methodological approach of the study, section 3 presents the theoretical context of the study, section 4 presents the results & the analysis: first of the theoretical study, second of the plugins studied. Finally we conclude the paper in section 5.

2 METHODOLOGICAL APPROACH

The main objective of this study is to identify the types of mark-up languages used by the SEO plugins which insert microformats on the webpages being built, and to analyse what vocabularies are use and how. To achieve this goal, we followed the steps:

1. To create the theoretical framework - Perform a literature review (LR);
2. To create the ecosystem – Define & Create the contents;

[3] See https://webmasters.googleblog.com/2009/10/help-us-make-web-better-update-on-rich.html -Accessed in May 13, 2019

[4] See https://gs.statcounter.com/search-engine-market-share#monthly-201705-201805-bar - Accessed in December 20, 2019

[5] See https://www.w3.org/TR/xhtml2/ - Accessed in May 14, 2019

[6] See http://schema.org - Accessed in December 20, 2019

[7] See https://w3techs.com/technologies/overview/content_management - Accessed in December 20, 2019

[8] See https://wordpress.org/plugins/ - Accessed in December 20, 2019

3. To find the SEO plugins for the study –Search on the WordPress Website for SEO plugins.
4. Sites preparation - Develop the sites;
5. To create our microformat description – we analysed the content and decided the vocabularies & the terms to be used in the microformat descriptions;
6. Analyse the sites – Analyse the structured data.

The following paragraphs give the details of each step:

Step 1: search on: EbscoHost.com; Link.Springer.com; Semanticscholar.org; Sciencedirect.com and Scholar.google.pt: We searched papers in English, Portuguese and Spanish; The search was done on the title with the keywords: Metadata; Search Engine Optimization; SEO; Digital Marketing; Wordpress; Semantic Web; Microformats; Interoperability; Resource Description Framework (RDF); Vocabularies. The search was performed between May 2019 and December 2019. A total of 221 articles were collected, 80 of which were considered relevant and a total of 31 were selected. We rejected articles dealing with outdated technologies.

Step 2: To study each plugin we needed to work in a common setting so that we then could compare the results of each analysis. We created a fake company "Marketing Digital Tools" (MDT) (http://marketingdigitaltools.com), and a content template for its website presenting the company and an e-tailor type of shop that sells online services (e-commerce) of site building. MDT seeks to take an innovative approach by converting its services through the creation of integrated and discriminated service packages, for online sale.

We created different types of content so to have diversity of information:

- Definition of the organisation: (i) Description, Name, Image, URL, Brand, Mission, Vision, Values, Social networks, Contacts, Opening days & hours; Maps & Geo-coordinates; (ii) Founder & CEO: Name, Image, URL, Social Networks, Contacts;
- Description of the Services: Description, Images, Brand, Price, Rating, Contact Point;
- HowTo: Name, Description, Images, URL, Steps, Total time, Estimated Cost;
- Videos: Description, Thumbnail image, Duration, Date of Publication, URL, Author, Upload Date;
- Blog: Content, Article Section, Headline, Image, Alternative Headline, Publishing Date, Modified Date, Language, Type of Content, Copyright holder, Copyright Year, Place of Publication, Comments Count, Accountable Person, Author, Creator, Publisher, Sponsor, Keywords, Genre;
- FAQs: Title, Content, Author, URL.

Step 3: The search was done in the WordPress Website. We used the keyword "SEO" and only chose the plugins that were: (i) compatible with WordPress V 5.3.2; (ii) Free or Freemium, and (iii) in English. The search resulted in a total of 3582 plugins. We analysed each plugin reading its descriptions to understand if the plugins were within the scope of the study. We ended with 85 plugins (see the spreadsheet "ListOfPlugins.xls" in http://doi.org/10.5281/zenodo.3830889). This file presents the plugins: the first column has the ID number of the plugin, the second denotes if the plugin works with microformats, the third the name, the forth a description & notes, the fifth the version analysed, the sixth the last update of the version, the seventh the active installations, the eighth the average rating and the last column the number of voters).

Step 4: We replicated a WordPress site with the contents described in Step 2 as many times as the plugins to be studied (85). We installed one different plugin on each site. And created the microformats of the information described in Step 2 with the plugin user-interface.

Step 5: We created our view/description of the contents using JSON-LD (see Section 4) as mark-up language.

Step 6: We studied the microformats created by the plugins. The goal of the analyses was to study, for each plugin:

- The vocabularies used (e.g. http://schema.org, dcterms [9]), the terms (e.g. http://schema.org/organization) used and for what;
- The mark-up languages used (JSON-LD [10], Microdata[11] or RDFa[12]).

The analyses was developed in a Descriptive Research approach, according to the Case Study method through which presentation tables are developed, for the organisation of the collected data, for later appreciation, comparison and publication (Zainal, 2007).

[9] See https://www.dublincore.org/specifications/dublin-core/dcmi-terms/ - Accessed in May 13, 2020

[10] See https://www.w3.org/TR/json-ld/ -Accessed in May 13, 2019

[11] See https://www.w3.org/2012/pyMicrodata/ -Accessed in December 20, 2019

[12] See https://www.w3.org/TR/rdfa-primer/ -Accessed in December 20, 2019

We studied the pages with microformats and for each plugin identified the mark-up language and the terms used for each piece of information generated by each plugin. The organisation of the data of the analysis was done on tables (created in a spreadsheet), one table per plugin. The levels of description were noted through a numbering from one to four levels.

We used the testing tool of Google[13] to analyse the structured data of the plugins.

3 METADATA & SEMANTICS

Metadata has always been part of the archive management universe and is used to classify, organize and search information related to specific elements, such as location, dates, authors, subject, among others. Metadata as structured information allows us to make use or manage an information resource (Riley, 2017). In the past, metadata used to be embedded in the HTML header tag of the HTML pages. Metadata is "data about data" (Riley, 2017, p. 11). Online metadata has grown exponentially in recent years, generating a huge amount of digital information, which consequently makes access to relevant information difficult and significantly reduces search engine efficiency (Palanisamy & Liu, 2018).

In 2012 Google created the Knowledge Chart[14] , compiling more than 3.5 billion facts, as important as the relationships created between 500 million entities. The Knowledge Graph facilitates the search process, decreases the time spent on the searches and develops more intelligent searches. Google search incorporates three main elements:

- Find the right thing, Google can restrict search results because it interprets the entities and nuances of their meaning.
- Get the best summary, Google can better understand the search, to summarize relevant content and the relationships between things.
- Go deeper and wider, the Knowledge Graph allows for new discoveries and facts by answering in advance.

3.1 Digital Marketing & SEO

The search process in search engines, from the user's point of view, is quite convenient because it allows quick access to information. From the point of view of organisations, SEO tools have become relevant because they optimize the contents of websites and improve the experience of their users. There are three aspects that are relevant for users who benefit from their browsing experience (Palanisamy & Liu, 2018):

- Originality and authority of the content;
- Ease of user interaction;
- Design, visual simplicity and easy navigation.

SEO tools are integrated into companies of online marketing strategies in order to increase business opportunities and better positioning in SERPs. In economic terms it makes sense to opt for SEO solutions to increase the visibility of a site compared to advertisers who invest in advertising (Khraim, 2015). One of the focuses of SEO tools is to generate opportunities to create relationships of trust and loyalty that boost sales (Patrutiu-Baltes, 2016). SEO is part of the strategies adopted by digital marketing to give greater visibility to brands and their products in search engine rankings, giving priority to content quality and relevance (Khraim, 2015).

Google's goal is to generate relevant results for its users, so the content of web pages is the main element to be optimized. The content includes text, images, videos, audios, documents that make up a web page including the data embedded in HTML (Oliveira, 2016).

According to Sohail (2012) most people click on the first five search results, generating more traffic and more profit for these top positions, which arise organically from search engine optimization.

Gifford (2010) states that the basic ingredients of SEO are Quality content; Relevant keywords; Strong metalanguage properties; Internal links throughout the site; External links (backlinks) to the site.

In 2015, SEOmoz [15] elected nine factors with impact on the ranking of searches to better understand the complexity of the resources Google uses. It also states that Google's search engines constantly work to improve their calculations that define the rankings.

Google also makes recommendations on SEO for beginners[16], 2019 .

[13] See https://search.google.com/structured-data/testing-tool - Accessed in May 13, 2020

[14] See https://googleblog.blogspot.com/2012/05/introducing-knowledge-graph-things-not.html - Accessed in December 20, 2019

[15] https://moz.com/search-ranking-factors - Accessed in November 14, 2019

[16] See https://support.google.com/webmasters/answer/7451184?hl=en -Accessed in November 14, 2019

3.2 Semantic SEO

The technology used in search engines and SEO tools has evolved to provide answers to web users' expectations. Microformats, also called semantic SEO, allow metadata in HTML pages to be machine-readable, providing the possibility to search engines to extract more detailed information, so that final users have better search results and a better browsing experience (Nevile & Brickley, 2018).

Microformats are a hybrid solution between the embedded metadata in a HTML header tag and the Semantic Web which has the RDF data model[17]. The Semantic Web, also called Web of Data, is a paradigm of Linked Open Data (LOD). The Semantic Web has a construct called metadata application profile (Coyle, 2017) – MAP. A MAP is a data model for LOD that "mixes and matches" vocabularies[18] to enhance interoperability among a community of practice (Heery & Patel, 2000). The Linked Open Vocabularies [19] (LOV) is a vocabulary directory organised by application contexts, these vocabularies can be used by any agent that publishes LOD. Any person or community can create a vocabulary, however it is important before doing so, to try to find a vocabulary that has the term that can describe the identified need. Sometimes the semantics of an existing term may not be exactly what we need, but we must find a compromise between semantic accuracy and a high degree of interoperability.

Microformats are not the Web of Data. Microformats are coded blocks of data descriptions embedded in HTML. The mark-up language to add this data, or metadata to the Webpages are: JSON-LD[20], RDFa[21], or Microdata[22]. RDFa and JSON-LD have a better expressiveness than microdata since microdata has limitations regarding interoperability (Nevile & Brickley, 2018). RDFa provides a set of mark-up attributes to enhance visual information on the Web (Herman et al., 2015).

As in the Web of Data, Microformats use vocabularies to add the semantic meaning to the thing to be described.

Schema.org is a vocabulary created by Google, Bing, Yahoo! And Yandex that gave to microformats a big boost and came to fully dominate the context of microformats. Schema.org has been increasing the number of descriptive contexts, having increased over the years the number of Types and Terms. For example, a few years ago Schema.org integrated a vocabulary called Good Relations[23] - now the part of Schema.org that describes the context of ecommerce is a copy of this vocabulary. As far as we see it, Schema.org is still far from being able to describe all the possible contexts, and a solution for the lack of expressiveness is the use of other vocabularies of the Web of Data to be able to fully describe our contexts.

According to Lopezosa et al. (2018) semantic SEO helps sites to appear well positioned in the SERP's. Lopezosa et al. (2018 also say that it is predictable that SERPs will be oriented to be direct response systems rather than information retrieval systems.

4 RESULTS AND ANALYSIS

All documentation of the study is available at http://doi.org/10.5281/zenodo.3830889.

4.1 Theoretical Study - Results & Analysis

According to step 5 of the methodology a description for the contents of the MDT Company was developed. We used JSON-LD as mark-up language and, 1) the ESSGLOBAL[24] vocabulary for a single description (mission), and; 2) all other descriptions developed using the http://schema.org vocabulary.

The JSON-LD coded document can be found at the URL referred (see "TechnologicalAnalysis.json").

The analysis of the Terms and Types used can be found in the spreadsheet file "TheoreticalAnalysis.xls". On this analyses we did not include the ESSGLOBAL term since no other plugin used it. Regarding the use of Schema.org Types and Terms, we have used 29 different Types and 71 different Terms, and in total we have used 122 Terms. As far as we can understand, this was the way we found to make the most of the descriptive

[17] See https://www.w3.org/wiki/Choosing_an_HTML_Data_Format#RDF_data_model - Accessed in May, 10, 2020

[18] Originally called "Metadata schemes"

[19] See http://lov.okfn.org/ - Accessed in May 16, 2020

[20] See https://www.w3.org/TR/json-ld/ - Accessed in May 10, 2020

[21] See: https://www.w3.org/TR/rdfa-primer/ - Accessed in December 12, 2019

[22] See: https://www.w3.org/2012/pyMicrodata/ - Accessed in December 2019

[23] See http://www.heppnetz.de/projects/goodrelations/ - Accessed in May 16, 2020

[24] See http://purl.org/essglobal/vocab/v1.0/ - Accessed in May 15, 2020

possibilities of Schema.org in relation to the contents we wanted to describe.

Next section shows how each plugin used the Terms and Types of schema.org to describe the same contents.

4.2 Plugins Study - Results & Analysis

The results of the study of the plugins are available in the spreadsheet file "Results.xls".

The study of the 85 plugins shows that only 20 of them integrate the functionality of microformats (Column 2 of the spreadsheet file "ListOfPlugins.xls" marks these plugins). Plugin "Slim SEO" is the only one that is 100% automated in the extraction of microformats. In all others, the user is asked to describe the content through the interface provided by the software.

Another fact that comes immediately to the eye is that all plugins used one single vocabulary to describe the content, there is no "mix and match" of vocabularies as in the MAP construct of the Web of Data.

The analysis of the results is presented in the spreadsheet "Analysis.xls". This file has a sheet per plugin: the first column of each sheet presents the Types of schema.org used by the plugin in question, and the contents described, with the corresponding Term marked in the following columns. Still in the first column, we can see in the last row the total number of Terms used. In the last cell of each of the following columns we can see the number of times the corresponding Term was been used. Finally, in the last cell of the next-to-last column, we can see the total number of different Terms used, and in the last cell of the last column the total number of Terms used.

The spreadsheet "FinalAnalysis.xls"For compares all plugins. The sheet "Analysis Types" presents the analysis of the used Types in the different plugins. Each line represents a different plugin, the 1st column has the ID number of the plugin, the 2nd the name of the plugin, the 3rd the mark-up language used by the plugin, and the 4th the vocabulary used. The following columns show the Types used by the plugin in question. The last column presents the total of Types used by the plugin in question in the descriptions. The loose line, with the name "Theoretical Analysis" presents the summary of our proposed description, so that a comparison with the plugins in analysis is possible.

The plugin that uses fewer Types is the "Premmerce SEO for WooCommerce" (ID=28) and the one that uses more different types is the "Markup (JSON-LD) Structured in schema.org" (ID=53).

Schema.org is the most used vocabulary, since in 20 plugins, 19 use it. One plugin ("The SEO rich snippets") uses uses an obsolete vocabulary called data-vocabulary.org. JSON-LD is the most used mark-up language since it is used in 19 plugins. One plugin uses microdata ("The SEO rich snippets"). RDFa is not used by any plugin which is an interesting conclusion since this language is a W3C standard and JSON-LD not. The wide use of the latter should be related to its ease of use and ease of reading by humans, and because it follows a logic similar to JSON. JSON[25] is a widely used data interchange format, easy to use for those that come from the context of C, C++; C#, Javascript, Perl or Python, which encompasses a very large group of programmers.

The spreadsheet "Analysis Terms" presents the analysis of the used terms in the different plugins. Each line represents a different plugin, the 1st column has the ID number of the plugin (see file "ListOfPlugins.xls"), the 2nd the name, and the following columns show the Terms used by the plugin in question. The next-to-last column shows the number of different Terms used by the plugin in question, and the last column the total number of Terms used. The plugin less descriptive, because it uses the smallest number of different Terms (3) and the smaller total number of Terms (4) is "Premmerce SEO for Woocommerce" (ID=28). The plugin plus descriptive because it uses the biggest number of different Terms (31) and the biggest total number of Terms (51) is "markup (JSON-LD) structured in schema.org" (ID=53). Compared to our theoretical analysis, we find that there are many Types and many other Terms that could have been used to describe the information. In the case of the Types, we used a total of 29 Types, and in the case of the Terms, we used a total of 71 different Terms, and a total of 113 Terms, far exceeding the numbers used by the plugins.

We conclude that the free plugins do not fully exploit schema.org. One of the reasons for this to happen is the fact that schema.org evolves over time, and plugins do not have updates that follow that evolution of schema.org.

Regarding the expressiveness of Schema.org, some content remained unexplored in the theoretical analysis since Schema.org resources do not absorb all the specific needs of the contents. As an example, for

[25] See http://json.org – Acessed in May 14, 2020

the description of the "mission" of MDT, we used the term “mission” of the ESSGLOBAL vocabulary (see Curado Malta (2014)). When testing the code on Google[26] testing tool, it gave an error since the error control tool only controls the terms and types of schema.org, as far as we see it, it should allow a “mix and match” strategy.

5 CONCLUSIONS

The digital transformation process is a challenge for organisations. E-commerce provides many opportunities for organisations to take the leap. Semantic SEO, also called microformats is an opportunity for organisations that seek to explore the digital business and make the most of it. With Semantic SEO, website contents can incorporate microformats and become more accessible to intelligent-machines, allowing search engines to understand their contents in an intelligent way. Thus, the pages will have a greater chance to position themselves in the first places of SERPs'.

This paper presents a study of the WordPress plugins which provide an interface that allows the definition and creation of microformats according to the contents of the Website. WordPress is an open source Content Management System (CMS), with a large community that develops plugins, i.e., software that adds functionality to the core of WordPress. We focus on WordPress since it was identified as the most popular open source CMS on the market (Cabot, 2018), widely used by organisations to build Websites. The plugins studied were the free plugins that implemented SEO strategies and also add microformat to the pages.

We performed a systematic search on the WordPress Website plugins page, looking for SEO plugins. The total number of plugins found were 85, from those, only 20 incorporate microformats. We only analysed these 20 plugins.

To compare the plugins, we created a template site in WordPress, and replicated it, as many times as the plugins. On each site we installed one plugin and created the microformats with the plugin interface. From there we created a common sheet, where we collected the data related to the microformats created by the plugins. We also developed a theoretical study, where we explored the contents and described them using vocabularies, so that we could understand the breadth of the plugins' descriptions.

We conclude that 95% (19 out of 20) of the plugins use the vocabulary schema.org and the mark-up language JSON-LD. One plugin used the data-vocabulary.org vocabulary, a vocabulary preceding schema.org that is already out of use, and microdata as mark-up language. The trend is clearly JSON-LD and schema.org

Schema.org has conquered the market because, from the very beginning, it has positioned itself as a strong brand: the great search engines have joined in designing the vocabulary. This was a great sign that it would have a large market share, if not a monopoly. However, there are still descriptive contexts that remain to be explored and that create voids for information architects when it comes to describing the business of organisations in the virtual world.

We also conclude that the free of charge WordPress SEO plugins studied do not explore the totality of schema.org, many content remains without semantic mark-up.

This study does not explore paid versions of plugins. We don't know if they would bring a better exploitation of schema.org. But we do know that for now, for an organisation, which has its website based on WordPress, to aspire to be positioned in the top positions of the SERPs will have to:

i) invest in advertising, an investment that will always have to be fed over time, very volatile because it depends on the competition and the prices attributed to keywords, or;

ii) explore organic search solutions, which include the optimization of contents through the use of microformats. By choosing this route, it can: a) choose to buy paid versions of SEO Plugins, since according to our study the free versions do not fully exploit all the possibilities that Schema.org provides[27], or; b) hire programmers to develop from scratch the microformats in the contents.

One way or another organisations will have to make an investment since the study concluded that there are no microformat plugins for WordPress that are free and of quality. We consider that the option of investing in order to enhance the results of organic searches on websites is the most advantageous because it is a long-term investment.

[26] See https://search.google.com/structured-data/testing-tool - Accessed in May 13, 2020

[27] Note that we do not have information about the quality of the paid versions, since as already said our study did not include them

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