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## Google Analytics: Tips for Cultural Economists.

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#### **ABSTRACT:**

**Purpose** – Web analytics is time consuming and costly. The aim of this paper is to go deeper into Google Analytics and to construct some user-friendly strategic metrics which could be accessible to Cultural Economists.

**Methodology** – This paper addresses the above mentioned aim by carrying out a time series analysis of Google Analytics data (from ARIMA models). Then, the resulting key metrics are tested for simple cross-sectional data, in order to set up the essential strategic questions and answers specifically required for web analytics, and to supply the Basic Key Metrics.

**Findings** – A brief strategic and unsophisticated user guide is set up with key metrics for information non-professionals.

**Research implications** – Web Analytics seem to become websites' data warehouses, providing broad and nonstrategic analytics which are, in fact, probably too broad. The search for and collection of relevant website information can be very time-consuming and costly for website managers. The adoption of Key Metrics developed in this article can contribute to reducing time and costs for searching for relevant information on a website's performance.

**Value of the paper** – The value of this paper is the presenting of structured easy-to-use strategic metrics, accessible for Cultural Economists. The importance of this paper is not the particular academic website, but the new methodologies tested to arrive at these results. The case study must be presented only as a way to explain the new methodologies - methodologies that could be of interest for small players.

Keywords: Digital Economy, Google Analytics, eMetrics

Work in Progress. Please do not quote !!

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#### **1** Introduction

Does the website meet the needs of the organization it represents, by meeting the needs of the target audience? There is a lot of work being done at industry/academic level to develop metrics for media planning and online marketing. Web analytics is a key part of online marketing, since its primary concern is with measuring how well a website pursues its aim. Website analytics has been accepted as an integral part of online business. Web Analytics shows what type of people are on the site, where and how they came to the site, how much it cost them, what they did on the visit and whether the organization's (company's) objectives have been met. Marketers are concerned with web analytics which measure the cost-effectiveness and payback from online campaigns.

The launch of free web analysis tools by search engines (for instance, Google Analytics and Yahoo Web Analytics) can become a key marketing tool for small and medium enterprises (SMEs). Free web analytics tools generate high volumes of data. Website owners are interested in the number of clicks and pathways. This is useful, but it does not provide an understanding of the driving-force behind the visitor when navigating through the website. Interpretation is a critical dimension of the elevation of web analytics into business intelligence. Skills shortages in the analytics area are all too common, with web analytics requiring a particularly difficult skill. Web Analytics is not just about the numbers of people visiting a site, but is also about the quality of the traffic and what the visitors do. The purpose of this article is to help Cultural Economists` website owners to make better, more strategic use of Google Analytics.

Web Analytics is the measurement, collection, analysis and reporting of Internet data for the purposes of understanding and optimizing Web usage (Web Analytics Association 2009). With accountability comes measurement, which in turn creates the need for metrics. Google Analytic's target audience ranges from the most highly trafficked websites, which receive more than 1 billion visits per day, to the small players that receive just a few page views. But, can Google Analytics supply the strategic and sufficiently sound analytics necessary for even the small players? A business adage says: 'You cannot manage what you don't measure'. This principle is true for all websites, but can Google Analytics validate this business adage for any Cultural Economist webmaster?

Google Analytics is a web analyzer program available to web owners. The output from web analytics needs to be simple, concise, readable and usable. Google Analytics uses tools like dashboards, reports and visualization systems that release the information in understandable formats. Google Analytics provides plain and simple statistics concerning the website: for example, the number of visitors, the average number of pages viewed per visitor, average page viewing duration, most requested pages, domain classes and referrals, the geographic location of visitors, and which pages they started and ended their visits with. Google Analytics allows users to export data in MS Excel format, which can be analyzed later on. However, Web Analytics seems to have become website data warehouses, too broad and undifferentiated for site owners. The aim of this article is to further develop the methodology initiated by Plaza (2009; 2010) on the use of time series with Google Analytics' data, and to supply some user-friendly Key Metrics for information non-professionals. It is interesting to see how uncomplicated indicators can help site owners and small firms, making websites more visible to search engines, reserving web analyzer professionals (consultants) for a later optimization stage.

The paper is structured as follows. Firstly, a literature review on Google Analytics is supplied. Secondly, the author presents the methodology and hypothesises to be tested with time series analysis. Thirdly, this methodology is tested for cross-sectional data from <u>http://www.scholars-on-bilbao.info</u>. This is then followed by final remarks and conclusions.

# **2** Literature Review

Several scientific articles have analysed the use of Google Analytics and evaluated its usefulness as a web analytics tool. Fang (2007) and Rodriguez-Burrel (2009) used Google Analytics to evaluate and develop a library website, utilizing the ordinary reports from Google Analytics, although without developing specific metrics. Hasan, Morris and Probets (2009) suggest specific web metrics that are useful for quickly indentifying potential usability problems of e-commerce websites. Betty (2009) explores the use of Google Analytics to track usage statistics for interactive Shockwave Flash (.swf) files, the common file output for screen cast and Flash projects. Plaza (2009) explores some statistical matters with regard to the use of Google Analytics data in combination with time series methodology. Plaza (2011) analyzes the effectiveness of entries (visit behaviour and length of sessions) depending on their traffic source for a website, using time series analysis. Website owners seek to take action based on measurable results. Finally, Moral et al (2015) test the effectiveness of online marketing using the data provided by Google Analytics.

# **3 Methodology**

Web analytics present statistical data in a visual way for website owners, to better comprehend the interaction between their visitors and their sites. Google Analytics explains statistical data in an easy-to-understand, simple and uncomplicated manner. There are many features of Google Analytics, and the website manager should spend some time in exploring them to see whether the site is getting qualified visitors.

The focus of this article is experimental and concerns the analysis of the following case study: <u>http://www.scholars-on-bilbao.info</u>. The findings might provide insights for other small webmasters on using Google Analytics for analysing web performance.

# Google Analytics' Dashboard

When the website manager clicks into the reports, webmasters will see the overall website usage numbers (Figure 1). Here are the basic metrics to see what is happening on the site:

- 'Visits' is the number of times someone interacted with the particular website
- 'Bounce rate' is the percentage of visitors that instantly left the site
- 'Page views' is how many pages were viewed during those visits
- 'Average time on (the) site' tells how long people stayed on the site
- 'Percent (of) new visits' tells how many people visited the site for the first time

# [Place Figure 1 about here]

With just these basic metrics the site manager has an idea of what is happening on the site. Google Analytics reports allow webmasters to compare data from different date ranges. They also allow access to detailed information on visitors, and where these visitors were viewing from, that is geographical segmentation. For the particular website <u>http://www.scholars-on-bilbao.info</u>, geographical segmentation shows that 23% of the visitors come from Great Britain, 11% of visitors were accessing from the United States, 10% from Spain, 4% from Germany, 3.9% from the Netherlands, and 3% from Canada.

`Content by Titles`, presents a list of the most popular items on the website. By analyzing data from this feature, the site manager can figure out what content is attracting visitors (see for instance Figure 5).

## Traffic Sources Overview

The Traffic Sources Overview shows how people arrived at the site (Figures 2 and 3):

- 'Direct Traffic' includes people who typed the particular site's URL, or who clicked on a bookmark.
- 'Referring Sites' are other websites sending traffic to our website, in-links and referrals from e-mails.
- 'Search Engines' stands for Google, Yahoo, MSN, and others. This section would include organic traffic. That is, traffic the website owner did not pay for, as well as 'pay per click' that the website owner did pay for.

## [Place Figures 2 and 3 about here]

#### **Referring Sites**

Website managers look for sites that refer traffic to his/her website. Firstly, the website manager can identify in-links the website manager does not know about, but that are sending the owners` traffic. The web owner can make use of this information: For instance, visit the website, see how they are referring traffic to them, analyze the type of visits that they are referring to the owner, and study how the web manager can cater to the referring traffic. Secondly, if the web manager has made an effort to publicize the website through particular channels, the extent to which these efforts pay off in terms of increasing traffic can be seen through Google Analytics.

## Search Engines and Keywords

Making a website findable is critical to its success. Brands want to maximum exposure on the Internet and on mobile phone handsets through the use of search engine marketing. Search Engine Optimization (SEO) is about having your website, brand, product, service or diffusion ranked highly in search engines, under the right keywords and phrases, in order to achieve and maintain visibility, as well as brand recognition and reputation. It is important to understand which search engine is working for the owner of the site, and why.

Which search terms are the best performers? Search terms are a critical way to understand the website's audience (Figure 4). Are the visits arriving at the website correctly based on the visitors' searches? The website manager could check the keywords and meta-data on the web pages to make sure that misleading keywords are not causing miss-indexing by the search engines. The website manager should also repeatedly check the meta-data for the web pages to make sure that they provide adequate words to increase traffic through search engines.

## [Place Figure 5 about here]

Which keywords qualify as low bounce rate traffic? Each keyword tells you what the visitor expects to find in the site. In fact, keywords with a high bounce rate show that the website manager failed to meet those expectations.

As said before, Google Analytics has the capacity of tracking both paid searches and unpaid searches for different search engines. It is useful to separate the organic traffic from the paid traffic, so that the webmaster can identify paid keywords with high bounce rates. The site manager should figure out whether the website owner is driving traffic to the wrong keywords,

or driving traffic to the wrong landing pages, as well as identify keywords with a high bounce rate and stop spending on paid keywords that have high bounce rates. Furthermore the webmaster should identify landing pages that need to be made more relevant.

In the following sections, Google Analytics is tested by utilizing time series analysis and cross-sectional data for <u>http://www.scholars-on-bilbao.info</u>.

## 4 Defining Key Metrics with Time Series Analysis

## Website profile

In July 2006 a non-profit organization (based in Gernika, Basque Country-Spain) launched <u>http://www.scholars-on-bilbao.info</u> (Art4pax Foundation 2008) in order to improve the dissemination of R&D results in the field of 'Cultural Tourism' scientific production, through the exchange of research work on the Guggenheim Museum Bilbao case. This locally based website encompasses academic papers that analyse the 'Guggenheim Effect' (cultural tourism, the Guggenheim Museum Bilbao and dilemmas, gentrification, uneven development, creative industries and artists). Each paper includes the abstract and a web-link to its pdf/word file. Due to the fact that each one is displayed on a single page, the number of pages per visit tells one whether the visitors are attracted by the content or not (that is, it reveals the visit length).

## Methodology and hypothesis testing

Google Analytics allows users to export report data in MS Excel format, which when transformed can be analyzed with time series statistical programs. In this case, the software *EViews* is utilized. A data set with 27,015 entries for 111 months drawn from Google Analytics was employed to analyse the performance of the website from 4 February 2007 to 14 June 2016; enough for obtaining valid results. Of those visits 5,662 came directly to this site, referring sites sent 9,167 visits via 121 sources, and search engines sent a total of 12,186 visits (Figure 2), mainly through Google (Figure 3). Search Engine traffic is, by far, the main source of entries for <u>www.scholars-on-bilbao.info</u>. But how deep into the website do in-links visits navigate in comparison with other traffic sources? Are Wikipedia references more effective than other in-links? How deep do Google entries navigate?

Several time series regressions are undertaken (see the sequence of regressions in Figure 6). Google Analytics supplies daily, weekly and monthly data. Here weekly data is made use of (for statistical issues see Plaza 2009). Dickey-Fuller stationarity tests are calculated for each variable and all are shown to be stationary (Tables 1, 2 and 3). The Breusch-Godfrey Serial Correlation LM Test is used to check serial autocorrelation. The White Test is used to test heteroskedasticity, and the Jarque-Bera statistic to test normality. The presence of outliers is corrected through the use of dummies. The roots of the AR and MA processes are outside the unit circle. The regressions are well-adjusted. The fitted estimations are as follows (Tables 1, 2 and 3):

[Take in Figure 5 about here]

[Take in Tables 1, 2 and 3]

#### Results

Results from Table 1 show that the number of pages per entry grows by 0.06 out of every return visit, whereas the marginal effect of new visits is nil. That is to say that return visits are the main engine for nurturing session length for <u>www.scholars-on-bilbao.info</u> (see Figure 6), and bounce less (Figure 7). But, which type of traffic source nurtures these return visits?

# [Take in Figures 6 and 7]

According to the reading of the results in Table 2, 0.43 out of every direct entry visit returns, 0.36 out of every search engine entry visits the site again, and only 0.24 out of every referee site visit returns. In other words, for our particular website, direct visits are the most effective ones, followed by search engine visits and only thirdly link-entries (Plaza 2009).

With regards to reference sites (see Table 3), the effectiveness of the in-links from <u>www.ehu.es</u> and <u>www.uv.es</u> is null, whereas 0.21 out of every <u>http://en.wikipedia.org</u> driven entry visits the site again, and 0.29 out of every 'Other In-links' visit returns. In other words, for our particular website, <u>http://en.wikipedia.org</u> driven entries are effective, showing an adequate return visit behaviour and length of sessions; although 'Other In-links' are shown to be even more effective with 0.33 return visits per entry (Plaza 2011).

With reference to search engines (Table 3), visits through Google are shown to be effective, with 0.39 return visits per Google entry. The effectiveness of other search engines shows null for this particular website (Table 3). In summary, for our particular website direct visits are the most effective ones, followed by Google entries and only thirdly en.wikipedia.org visits.

# 5 Key Metrics for Information Non-professionals with Cross-sectional Data

The performed time series analysis with Google Analytics show that:

- Rule 1: Return visits navigate deeper into the website and stay longer (that is, more time spent at the site and/or a greater number of pages viewed per visit)
- Rule 2: The less the bounce rate (error visits), the longer the visit length (regarding the time spent at the site and/or the number of pages viewed per visit)
- Rule 3: The less the bounce rate (error visits), the greater the return visit rate.

In the following sections, these rules are tested for simple cross-sectional data for one website. The aim of this work is to provide some user-friendly strategic tips for small players.

## Testing with http://www.scholars-on-bilbao.info

Our testing website is <u>http://www.scholars-on-bilbao.info</u>. From 4 February 2007 to 14 June 2016, Google Analytics registers 27,015 entries for 111 months. Of those visits 5,662 came directly to this site, referring sites sent 9,167 visits via 121 sources, and search engines sent a total of 12,186 visits (Figure 2), mainly through Google (Figure 3). Search Engine traffic is, by far, the main source of entries for <u>www.scholars-on-bilbao.info</u>. But how deep into the website do Google visits navigate in comparison with other traffic sources? Are Wikipedia references more effective than other in-links? Which is the most effective traffic source? How deep do in-link entries navigate? Which are the most effective keywords?

In order to give a preliminary answer to these questions, the already stated 3 rules (and key metrics) are measured for simple cross-sectional data as follows:

- 1. The first step is to collect all the data (see Table 4): the number of visits for each traffic source, session length (time spent on the site and/or the number of pages viewed per visit), the bounce rate and the return visits rate. These indicators correspond to average values for the period 4 February 2007 to 14 June 2016.
- 2. Then, the traffic sources have to be sorted according to traffic volume; a ranking from the highest to the lowest traffic volume source is established. Next, the top ten are selected.
- 3. Then, the traffic sources have to be sorted according to the return rate; a ranking from the highest to the lowest return rate is established.
- 4. Next, a scatter plot is created for the return rate against the number of pages viewed per visit for all the main traffic sources (Figure 8). From Figure 8 it can be seen that there is a positive relationship between return rates and the number of pages viewed per visit for the traffic sources. For this particular website, it can be seen that the most effective traffic source is <u>www.elearningeuropa.info</u> (referral), the keyword 'Scholar' in search engines, the in-link <u>www.ehu.es</u> and the keyword 'Plaza' in search engines.
- 5. The next stage is to scatter plot bounce rates against the number of pages viewed per visit (Figure 9). The aim here is to identify the qualified low bounce traffic sources. The keyword 'scholar' in search engines is by far the traffic source that qualifies with the lowest bounce rate (Figure 9). Then, well behind, the referral <u>en.wikipedia.org</u>, direct traffic and the keyword 'Bilbao' in search engines perform also relatively well in terms of qualified low bounce traffic.
- 6. The next stage is to scatter plot bounce rate against return rate for all the traffic sources (see Figure 10). From Figure 10 it can be seen here that there is a negative relationship between bounce rate and return rate.

## [Place Table 4 and Figures 8, 9 and 10 about here]

The webmaster can quantify the relationships that underlie these graphs through very simple regression analysis, as can be seen in Tables 2, 3 and 4. Several regressions are undertaken. The Breusch-Godfrey Serial Correlation LM Test is used to check serial autocorrelation. The White Test is used to test heteroskedasticity, and the Jarque-Bera statistic to test normality. The presence of outliers is corrected through the use of dummies. The regressions are well-adjusted. The fitted estimations are as follows (Tables 5, 6 and 7):

## [Place Tables 5, 6 and 7 about here]

According to the reading of the results in Table 2, a 1% increase in the Return Rate leads to a 7.27 increase in the number of pages viewed per visit. Furthermore, according to the Intercept Dummy Variables, the keyword 'scholar' performs above average, whereas the referrals <u>http://www.elearningeuropa.info</u>, <u>no.wikipedia.org</u> and <u>www.ehu.es</u> perform below average. In other words, it is clear for this particular website that return behaviour increases visit duration.

A 1% increase in the Bounce Rate leads to an 11.08 decrease in the number of pages viewed per visit (Table 6). The negative relationship between Visit Duration and Bounce Rate (error visits) makes sense. Finally a 1% increase in the Bounce Rate leads to a 0.77% decrease in the return rate (Table 7). Furthermore, according to the Intercept Dummy Variables, the referrals <u>http://www.elearningeuropa.info, www.ehu.es</u> and <u>no.wikipedia.org</u>, the keyword 'Plaza' and the search engine 'Yahoo' perform above average.

Summarising, the less the bounce rate the better the website's performance. On average, traffic sources with a high bounce rate show that the webmaster failed to meet his/her expectations.

## **6** Conclusions

Web Analytics is not just about the number of visitors visiting a website, but is also about the quality of the traffic and what the visitors do. The launch of free web analytics tools by search engines (for instance Google Analytics and Yahoo Web Analytics) can turn into key marketing tools for Cultural Economists.

A way of analysing Google Analytics has been tested that can be uncomplicated, quite reliable and repeatable for small players with limited resources. After analysis, small and regular updates can then be made - which might be the best option for web owners when trying to maintain visitor interest in their site content. (That is, in the following order: web analysis, improvement and re-testing could be carried out).

The agenda for future research calls for the repetition of the experiment with different websites, to delimit more accurately the effectiveness of different traffic sources and to compare these results with other case studies. Firms have to revolutionize their web analytics strategy with effective methods that can assist practitioners in evaluating their website performance and subsequent online marketing effectiveness.

The agenda for future research calls for integrating online and offline data, in order to optimize the website and to place a budget on paid search terms (keywords) as accurately as possible, realigning the website but not redesigning it. Small players could analyze the Google Analytics data reliably, which hopefully results in increased visibility and a positive outcome.

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Figure 1: Google Analytics dashboard overview for <u>www.scholars-on-bilbao.info</u> (monthly data, 4 Feb 2007 to 14 Jun 2016)



Source: Google Analytics for <u>www.scholars-on-bilbao.info</u>

# Figure 2: Google Analytics traffic sources overview for <u>www.scholars-on-bilbao.info</u> (monthly data, 4 Feb 2007 to 14 Jun 2016)



Source: Google Analytics for <u>www.scholars-on-bilbao.info</u>



Figure 3: Top Traffic Sources for <u>www.scholars-on-bilbao.info</u> (4 Feb 2007 to 14 Jun 2016)

Source: Google Analytics for www.scholars-on-bilbao.info

Keyword 🕜		Acquisition						
		Sessions 🥐 🖣	% New Sessions ?	New Users				
		<b>27,015</b> % of Total: 100.00% (27,015)	76.51% Avg for View: 76.40% (0.14%)	<b>20,669</b> % of Total: 100.14% (20,640)				
1.	(not set)	<b>18,264</b> (67.61%)	76.81%	14,028 (67.87%)				
2.	scholars on bilbao	<b>404</b> (1.50%)	46.53%	188 (0.91%)				
3.	bilbao regeneration	<b>91</b> (0.34%)	72.53%	66 (0.32%)				
4.	basques will not recoup guggenheim the art newspaper	<b>74</b> (0.27%)	0.00%	0 (0.00%)				
5.	hard branding	<b>62</b> (0.23%)	93.55%	58 (0.28%)				
6.	reflective images: the case of urban regeneration in glasgow and bilbao	<b>62</b> (0.23%)	74.19%	46 (0.22%)				
7.	bilbao urban regeneration	<b>58</b> (0.21%)	86.21%	50 (0.24%)				
8.	museums as flagships of urban development	<b>47</b> (0.17%)	80.85%	38 (0.18%)				
9.	scholars bilbao	44 (0.16%)	59.09%	26 (0.13%)				
10.	bilbao scholar	<b>42</b> (0.16%)	30.95%	13 (0.06%)				

Figure 4: Main keywords (phrases) for <u>www.scholars-on-bilbao.info</u> (4 Feb 2007 to 14 Jun 2016)

Source: Google Analytics for <u>www.scholars-on-bilbao.info</u>



**Figure 5: Sequence of the performed regressions** 

Source: Plaza, B. (2011). Google Analytics for measuring website performance. *Tourism Management*. 32(3), 477-481.

Variable	Coefficient	Standard error	t-Statist	tic	Probability		
Constant	4.95	0.44	11.04		0.000		
New Visits	0.001	0.013	0.09		0.935		
Return Visits	0.069	0.022	3.068		0.002		
N = 111							
$R^2 = 0.44$ F-statistic = 11.66					Prob(F-statistic) = 0.00		
Breusch-Godfrey Serial Correlation LM Test: F-statistic 0.72					ility 0.48		
White Heteroskedastici	ty Test: F-statist	tic 1.22		Probab	ility 0.27		
Jaque-Bera 4.28				Probability 0.11			
Augmented Dickey-Fuller Unit Root Tests for Variables:							
ADF Test Statistic for 'Pages per Visit': -5.8 5% Critical Value -2.88							
ADF Test Statistic for 'New Visits': -3.2 5% Critical Value					tical Value -2.88		
ADF Test Statistic for 'Return Visits': -3.20 5% Critical Value -2.88					tical Value -2.88		

 Table 1: Regression for Pages per Visit (monthly data, 4 Feb 2007 to 14 Jun 2016)

Variable	Coefficient	Standard error	t-Statistic	Probability			
Constant	-5.49	1.26	-4.33	0.000			
Direct Visits	0.43	0.06	6.80	0.000			
Referring Sites Visits	0.27	0.03	6.82	0.000			
Search Engine Visits	0.37	0.04	7.66	0.000			
AR(1)	0.32	0.07	4.12	0.000			
N = 111							
$R^2 = 0.69$ F-statis	stic = 68		Prob(F-stat	tistic) = $0.00$			
Breusch-Godfrev Seria	l Correlation LN	1 Test: F-statisti	c 0.92 Pro	bability 0.39			
White Heteroskedastic	ity Test: F-statis	tic 1.11	Pro	obability 0.35			
Jaque-Bera 0.50			Pro	obability 0.77			
Augmented Dickey-Fuller Unit Root Tests for Variables:							
ADF Test Statistic for 'Return Visits': -3.20 5% Critical Value -2.88							
ADF Test Statistic for 'Direct Visits': -3.84				Critical Value -2.88			
ADF Test Statistic for 'Referring Sites Visits': -2.99				Critical Value -2.88			
ADF Test Statistic for	'Search Engine '	Visits': -3.52	5%	Critical Value -2.88			

 Table 2: Regression for Return Visits (monthly data, 4 Feb 2007 to 14 Jun 2016)

Variable	Coefficient	Standard error	t-Statistic	Probability		
Constant	-5.50	1.28	-4.27	0.000		
Direct Visits	0.42	0.06	6.46	0.000		
en.wikipedia.org	0.23	0.06	3.38	0.000		
ehu.es	0.38	0.27	1.41	0.160		
uv.es	0.12	0.26	0.48	0.630		
Other in-links	0.33	0.08	3.99	0.000		
Google	0.39	0.05	7.48	0.000		
Other Search Engines	0.21	0.24	0.86	0.387		
AR(1)	0.32	0.08	4.04	0.000		
N = 111 $R^2 = 0.69$ F-statis	tic = 37.43		Prob(F	F-statistic) = 0.00		
Breusch-Godirey Seria	Correlation LN	i Test: F-statistic	C 0.94 Probat	0.19 11:1 0.18		
white Heteroskedastici	ty Test: F-statist	10 1.33	Probat	0.18		
Jaque-Bera 0.65			Probat	onity 0.72		
Augmented Dickey-Ful	ller Unit Root Te	ests for Variable	s:			
ADF Test Statistic for 'Return Visits': -3.20 5% Critical Value -2.88						
ADF Test Statistic for 'Direct Visits: -3.84 5% Critical Value -2.88						
ADF Test Statistic for 'en.wikipedia.org': -3.15 5% Critical Value -2.88						
ADF Test Statistic for 'ehu.es': -4.10 5% Critical Value -2.88						
ADF Test Statistic for 'uv.es: -8.64 5% Critical Value -2.88						
ADF Test Statistic for 'Other inlinks': -2.46 5% Critical Value -2.88						
ADF Test Statistic for 'Google': -3.38 5% Critical Value -2.88						
ADF Test Statistic for 'Other Search Engine Visits': -4.33 5% Critical Value -2.88						

 Table 3: Regression for Return Visits (monthly data, 4 Feb 2007 to 14 Jun 2016)

# Figure 6: Return visits navigate deeper into the website and stay longer (weekly data, 4 Feb 2007 to 30 Jan 2010)



Source: Plaza, B. (2011). Google Analytics for measuring website performance. *Tourism Management*. 32(3), 477-481.

Figure 7: The less bounce rate, the more return visit rate (weekly data, 4 Feb 2007 to 30



Jan 2010)

Source: Plaza, B. (2011). Google Analytics for measuring website performance. *Tourism Management*. 32(3), 477-481.

		Visits	Pages per Visit	Bounce Rate	Return Visits Rate
	Total	7.561	6,13	0,41	0,23
T 66°	Direct Traffic	1.368	7,48	0,35	0,29
I raine Sources	Referring Sites	3.298	5,84	0,41	0,18
Sources	Search Engines	2.892	5,81	0,45	0,26
	en.wikipedia.org / referral	1.820	6,62	0,32	0,19
	nl.wikipedia.org / referral	392	3,37	0,58	0,05
	es.wikipedia.org / referral	275	5,04	0,52	0,13
Top 10	ehu.es / referral	133	4,27	0,50	0,46
Refering	de.wikipedia.org / referral	109	3,33	0,65	0,04
Sites by	uv.es / referral	93	6,35	0,45	0,16
Traffic	answers.com / referral	35	6,14	0,40	0,14
	plataformaurbana.cl / referral	32	3,78	0,44	0,16
	no.wikipedia.org / referral	21	1,43	0,90	0,05
	elearningeuropa.info / referral	19	3,47	0,47	0,63
Search	Google	2.741	5,79	0,45	0,25
Engines	Yahoo	80	7,21	0,41	0,44
	All keywords	2.892	5,81	0,45	0,26
	Bilbao	1.485	7,36	0,36	0,34
	Urban	816	5,51	0,48	0,20
	Regeneration	583	5,86	0,42	0,22
	Guggenheim	457	6,32	0,42	0,32
	Scholar	324	10,61	0,16	0,50
	Museum	309	5,81	0,43	0,33
	Cultural	296	4,98	0,57	0,17
fic	City	179	4,55	0,59	0,12
raf	Culture	160	6,38	0,44	0,21
y T	Brand	146	4,93	0,62	0,11
d sl	Effect	123	5,26	0,41	0,37
ord	Plaza	111	5,59	0,46	0,45
wyć	Image	94	4,31	0,60	0,16
K	European	94	4,87	0,62	0,14
15	Tourism	92	4,34	0,52	0,09
Top	Design	91	3,57	0,57	0,10

Table 4: Traffic sources for www.scholars-on-bilbao.info(average values from 4 Feb 2007 to 30 Jan2010)

Source: Google Analytics for <u>www.scholars-on-bilbao.info</u>



Figure 8: Traffic sources for <u>www.scholars-on-bilbao.info</u>: Return visits navigate deeper into the website and stay longer (average values from 4 Feb 2007 to 30 Jan 2010)



Figure 9: Traffic sources for <u>www.scholars-on-bilbao.info</u>: The less the bounce rate, the greater the visit duration (average values from 4 Feb 2007 to 30 Jan 2010)



Figure 10: Traffic sources for <u>www.scholars-on-bilbao.info</u>: The less the bounce rate, the greater the return visit rate (average values from 4 Feb 2007 to 30 Jan 2010)

Variable	Coefficient	Standard error	t-Statistic	Probability
Constant	3.92	0.35	11.20	0.000
Return Rate	7.27	1.49	4.88	0.000
Dummy elearningeuropa.info (in-link)	-5.05	0.96	3.14	0.000
Dummy 'scholar' (keyword)	3.01	0.96	3.14	0.004
Dummy no.wikipedia.org (in-link)	-2.84	0.88	-3.19	0.003
Dummy ehu.es (in-link)	-2.99	0.93	-3.21	0.003
N = 33 $R^2 = 0.77$ F-statistic = 18.33		Prob(F	-statistic) = 0.00	
Breusch-Godfrey Serial Correlation LM White Heteroskedasticity Test: F-statist Jaque-Bera 2.61	4 Test: F-statistic tic 0.94	c 0.88 Probab Probab Probab	ility 0.42 ility 0.48 ility 0.87	

Table 5: Regression for Pages per Visit (average values from 4 Feb 2007 to 30 Jan2010)

Source: Plaza, B. (2012). Google Analytics: Tips for micro-firms. *Scientific Research and Essays*, 7(33), 2913-2926.

Variable		Coefficient	Standar	rd error t-Statistic	Probability
Constant		10.72	0.57	18.59	0.000
Bounce Rate		-11.08	1.16	-9.53	0.000
N = 33					
$R^2 = 0.74$	F-statistic = 91			Prob(F-statistic) = 0.00	1
Breusch-Godfr	ey Serial Correlation LM	A Test: F-statisti	c 2.36	Probability 0.11	
White Heteroskedasticity Test: F-statis		stic 1.03 Probability 0.36		Probability 0.36	
Jaque-Bera 3.6	5			Probability 0.27	

Table 6: Regression for Pages per Visit (average values from 4 Feb 2007 to 30 Jan2010)

Source: Plaza, B. (2012). Google Analytics: Tips for micro-firms. *Scientific Research and Essays*, 7(33), 2913-2926.

Variable	Coefficient	Standard error	t-Statistic	Probability
Constant	0.56	0.05	10.62	0.000
Bounce Rate	-0.77	0.11	-6.96	0.000
Dummy elearningeuropa.info (in-link)	0.43	0.06	6.76	0.000
Dummy ehu (in-link)	0.28	0.06	4.41	0.000
Dummy 'plaza' (keyword)	0.24	0.06	3.75	0.000
Dummy Yahoo	0.19	0.06	2.97	0.006
Dummy no.wikipedia.org (in-link)	0.18	0.08	2.26	0.031
N = 33				
$R^2 = 0.84$ F-statistic = 23.17		Prob(F	-statistic $) = 0.00$	)
Breusch-Godfrey Serial Correlation LM White Heteroskedasticity Test: F-statis Jaque-Bera 2.75	A Test: F-statisti tic 1.08	ic 1.58 Probab Probab Probab	ility 0.21 ility 0.40 ility 0.85	

Table 7: Regression for Return Rate (average values from 4 Feb 2007 to 30 Jan 2010)

Source: Plaza, B. (2012). Google Analytics: Tips for micro-firms. *Scientific Research and Essays*, 7(33), 2913-2926.