

## **Analyzing the Impact of Traffic Source on Visit Duration**

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### **ABSTRACT**

Web site performance related to visitor's purchasing decision can be indicated from their visit duration. Traffic sources have different impact on visit duration. The site owner can focus on determining which source of visitor's traffic that has to be increased to improve web site performance, especially visit duration. There are three sources of traffic, namely: direct, referrals, and search. By using the One-Way Analysis of Variance (ANOVA) this study will try to find out whether there are differences in visit duration visitors based on three different traffic sources. The results indicated that visit duration of visitors who come from the search traffic source has the shortest time visit, significantly different from the other two sources of traffic. Based on that result, the site owners can focus to increase visitor traffic from direct and referral sources in order to increase web site's visit duration.

*JEL Classification: M3*

*Keywords: traffic source; visit duration; stickiness; direct; referral; search*

## I. INTRODUCTION

Omidvar et al. (2011) mentioned that direct visitors have higher influence on page views compared to referral visitors. Their study investigated the effect of traffic sources consist of direct visitors, referrals visitors and search visitors to the page views. Laudon and Traver (2009) stated that a page view is the number of pages viewed by visitors at the site. However, despite the importance of page view metric mentioned by Burby and Brown (2006), Laudon and Traver (2009) also mentioned that the metric is not a very useful due to the increased use of web frames that causes a page can have multiple page views.

Furthermore, Laudon and Traver (2009) suggested other metric to measure the performance of a web site related to customer's purchase decision called visit duration. Duration (stickiness) is the average length of time a visitor spent on a web site. Duration is very important because the longer time visitors are in a web site, the more likely visitors to take action on the site. The action can be either in the form of purchases of products or services, become a subscriber, or any other action that would benefit the owner of the web site. This study aimed to answer the following research questions:

1. How are visit duration characteristics based on traffic source?
2. Are there differences in visit duration based on traffic source?

With the results of this study, site owners can focus on increasing specific visitor's traffic source, especially to improve visitor's visit duration performance of the web site.

## II. LITERATURE REVIEW

### A. Google Analytics

Omidvar et al. (2011) mentions about a method to measure success rate of a web site by using time series data as follows "This survey had introduced a methodology to measure the success of the sites with its time series data. It also focused on one of the most primary and important variables which are page views and showed how to use the most suitable data for that. This method can be used on all sites and time series variables."

Models offered in that research will be used in this study. One of the steps that need to be done to improve the success of a website is to measure the degree of success of a website. Prasetio (2011) in the study of the use of Google Analytics e-commerce research states that "the data provided by Google Analytics metrics have adequate types and can be used as a source of research data related to e-commerce." Furthermore, he mentions that

"The use of the site as a media sales have different characteristics compared to other media. The use of a web site enables a more detailed analysis of the success of a web site to achieve its goal to reach visitors and see its behavior than other sales media. This can occur because the Internet allows detailed tracking of visitor data with the help of the software."

Tracking data to measure the level of success and performance of a website is generally done with a software tool known as site management tools or web analytics. One web analytics service providers is Google Analytics. Google Analytics is a tool that is most widely used to measure the performance of a website. Statistical data of BuiltWith (2011) shows that in October 2011, Google Analytics is used by 58.04% of the 100,000 primary site analytics web users in the world with the development trend of increasing market share. This is consistent with studies of Omidvar et al. (2011) which uses Google Analytics data as a source of research data.

### **B. E-Commerce**

Laudon and Traver (2009) define E-commerce as the use of the internet especially one of its most popular service, the web, for business transactions. To support that, commercial transactions are mostly done digitally between organizations and individuals. Furthermore, Laudon and Traver (2009) state that revenue Ecommerce for B2C (Business to Consumer) growing 10-15% per year. Furthermore, Laudon and Traver (2009) also mention that according to a survey in America, in 2008, B2C revenues reached more than \$ 250 billion, while the B2B (Business to Business) already exceeds USD 3 trillion.

### **C. Site Management Tools**

Laudon and Traver (2009) state that the site management tools are very important to make the site work, and to determine how well a site works. Laudon and Traver (2009) also mention further that the site management tools can help to understand customer behavior on a web site, observing the customer purchases more effectively, observe marketing campaigns, information hits and visits. Site management tools can also be implemented using web analytics technology to obtain more complete information.

### **D. Online Marketing Metrics**

The level of success of a website can be measured by using some metric data. Laudon and Traver (2009) state that there are two groups of metrics used in measuring the performance of a web site: group metrics that focus on measuring success in achieving market share website visitors and group metrics that focus on the conversion rate of visitors into customers.

Furthermore, they mention that some examples of metrics that focus on measuring market share of visitors to the site include: Impressions (how many visitors who saw the advertisement), Click-through rate (the ratio between the number of visitors who click on the number to see an advertisement), View-through rate (the ratio between the number of visitors that perform a specific action after some time since seeing an advertisement), Hits (number of http requests are made on a web site or a web page), Page views (how many page views in a web site), Stickiness or duration (how much time does a visitor spent on a web site), Unique visitors (number of unique visitors on a web site), and Loyalty (the number of visitors who return to a web site, usually expressed in ratio to the number of visitors).

Some examples of metrics that focus on converting visitors into customers include: conversion rate (the ratio of the number of visitors who take certain actions in a web site compared to the total number of visitors), browse-to-buy-ratio (the ratio between the number of purchases compared to product browsed), view- to-cart ratio (the ratio between the number of shopping cart to how many views of the product), and cart conversion rate (the ratio between the number of purchases compared to the amount of the shopping cart).

### III. METHODOLOGY

This research is a comparative quantitative research. Comparative quantitative research is research that seeks the cause for the difference in behavior or status within the group (Sekaran, 2011). The subject of this study is the visit duration of prothelon.com web site's visitors between July 2009 and June 2012. The data collection techniques used was experimental methods. Data then analyzed using statistical tools called one-way ANOVA.

This study compared prothelon.com web site's visitors duration based on three sources of traffic: direct traffic, referrals, and search. Levine et.al (2006) state that One-way ANOVA (Analysis of Variance) test two variances under the null hypothesis ( $H_0$ ) whether the two variances are equal. The first variance is the variance between groups (among groups) and the second variance is the variance in each group (within groups). According to Zikmund et al. (2009), it is called one-way ANOVA for only one independent variable involved (traffic source). Data must be at least in interval scale, therefore the data in this study meet the requirement since it used scale ratio data, which level is higher than the interval.

Initial hypothesis for ANOVA is expressed as follows:

$H_0$ :  $\mu_1 = \mu_2 = \mu_3$ , there is no difference in the average visit duration of the traffic source that come from direct, referral, or search.

$H_1$ : not all  $\mu_j$  are the same, there is a difference in the average visit duration of the traffic source that come from direct traffic, referral, or search, where  $\mu_1$  is the average visit duration of the source of direct traffic,  $\mu_2$  is the average visit duration of the source of referral traffic,  $\mu_3$  is the average visit duration of search traffic source, and  $j = 1, 2, 3$ .

Although the hypothesis initially see the difference average between groups, but the one that tested is the difference of variance between groups (Among groups) and the variance within each group (Among groups) as stated by Levine et al. (2006). Variance between groups called Sum of Square among Groups (SSA) and the variance in each group is called Sum of Square within Groups (SSW). When SSA value greater than SSW value, the initial hypothesis is not accepted, the alternative hypothesis is proven. The conclusion is that there are differences in the average visit duration based on direct traffic sources, referrals, or search.

#### IV. RESULT AND DISCUSSION

##### A. Result

During July 2009 and June 2012, as shown in Table 1, most visitors came from search traffic sources with an amount of 868.855 visitors, while visitors from the source of referral traffic is at least with just 42.505 visitors. Although the number of visitors from search source is the biggest one, but their average visit duration is the shortest (273.08 seconds), while the longest average visit duration is made by visitors who come from referral traffic sources (352.72 seconds).

**Table 1**  
Visitors amount

Traffic Source	Total Visitors Amount (June 2009- July 2012)
Direct	101.764
Referral	42.505
Search	868.855

The results of ANOVA test using SPSS 17, obtained sig. = 0.000 < 0.05 then  $H_1$  is proven that there are significant differences in the average visit duration based on traffic source (see Table 2). Based on result comparison from Tukey-Kramer Multiple Comparison Table shown in Table 3, visit duration of search traffic sources (traffic source number 3) proved to be significantly different in visit duration compared the other two traffic sources (direct and referrals). On the other hand, the duration of the visit direct traffic and referral traffic sources are not proven to have a significant difference.

**Table 2**  
Visit duration Anova test result

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	143259.796	2	71629.898	36.376	.000
Within Groups	206763.194	105	1969.173		
Total	350022.991	107			

**Table 3**  
Visit duration Tukey-Kramer multiple comparison table

(I) Traffic Source	(J) Traffic Source	Mean Difference (I-J)	Sig.
1	2	-5.00	.882
	3	74.64*	.000
2	1	5.00	.882
	3	79.64*	.000
3	1	-74.64*	.000
	2	-79.64*	.000

\* The mean difference is significant at the 0.05 level

## **B. Discussion**

Chaffey (2009) mentioned that Stickiness is “an indication of how long a visitor stays on-site” and can be measured using duration and page views. This study showed that there are differences in visitor stickiness especially average visit duration among various traffic source. This result consistent with Omidvar et al. (2011) and Prasetio et al. (2013) findings that used Page views to measure stickiness.

The results also showed that the average visit duration from search engine traffic source is significantly lower than the referral and direct. Referral visitors are visitors from other sites where the sites usually have some content relevancy with the destination site. This relevancy means that visitors will find relevant information according to their needs. The level of relevance of the information obtained will make visitors stay longer in a web site.

Direct traffic is traffic that does not originate from search-engine results or a referring link in a domain for example visitors who use a bookmark or type a web site’s URL into his or her browser due to off line interactions (Park, 2009). For that reason, direct visitors are visitors who are already familiar with a web site. They are visitors who have found information that are relevant to their needs at the sites visited. That relevancy will lead to long visit duration of a web site. Google’s explanation also implies that some direct visitors are returning visitors who already visited the web site before. Wang et al. (2010) showed that returning visitors has significantly more interactions toward a web site which is consistent with this study’s result.

On the other hand, search visitors are visitors coming from search engines. Search engine visitors visit a website based on the keywords they type in a search engine. In general, search visitors decided to visit a website solely based on short information provided in the search engine results. This, sometimes, can lead to irrelevant information. If the keywords and content of the linked web site are relevant, the visit duration will be long, but if it is not relevant, then visitors will quickly return to the search engine to continue the search to other sites.

Irrelevant keywords will bring down the average duration of visitors coming from search engines. The low average visit duration of search visitors is an indication that the keywords used by visitors are mostly have not been relevant to the information on a website. So investigate this further, we need to do future research to study the relationship between duration and the relevance of the keyword. Omidvar et al. (2011) in their study mentions that "In order to understand search behavior visitors, their quarries should be understood meaning which is available through semantic web technologies." The study also shows that the meaning of a keyword needs to be understood in order to understand the behavior of search visitors.

## **V. CONCLUSION AND IMPLICATION**

### **A. Conclusion**

The average duration of referral visitors was the highest compared to other traffic source at 352.72 seconds followed by direct visitors (347.72 seconds) and search visitors (273.08 seconds). There were no significant difference between the duration

of the referral visitors and direct visitors, but the duration of search visitors have a significant difference compared to the duration of the other traffic sources.

## B. Implication

The results showed that referral visitors had a high average duration. The owner of the web site can focus to multiply referral links from other relevant sites. Henceforth, it is necessary to conduct further research to determine whether there is any difference between search visitors from relevant and not relevant keywords.

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