



Usage statistics analysis of specialized libraries websites

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Abstract

The usage statistics and the perception of users about library websites are commonly used as an evaluation tool. This case study explores the website usage of the Natural Science Library (NSL) and Agricultural & Experimental Station and Library (AESL) of the University of Puerto Rico. This study reveals the importance and usefulness of these websites in the academic environment. The methodology used in the investigation serves as an indicator of use, contact with the users and their perception of services. The data were obtained from Google Analytics reports, interviews and focus groups about visits to website pages. The results show how much current use of resources and services are used to make improvements in the design and content.

Keywords: usage statistics, design of Web portals, academic libraries, development of Web portals, Google Analytics, user-centered design, evaluation of Websites, users' opinions about Websites, academic libraries in Puerto Rico, University of Puerto Rico.

Introduction

The use of Web portals have a significant impact on the way libraries are organized, offer and facilitate the access to information resources and services. The ways and methods that resources and information services are presented to users have changed because of the use of Web pages (Brake, 2004; Turner, 2010). Web portals are one of the working tools of librarians and a key mechanism for the users. Investigating the use of Web portals through qualitative research is important because of its main role for dissemination of the information resources and services. This case study explores two websites specializing in agriculture and natural sciences as part of the Agricultural and

Experiment Station Library (AESL) <http://biblioteca.eea.uprm.edu>, and Natural Sciences Library (NSL) <http://NSL.uprrp.edu/>, both at the University of Puerto Rico (UPR).

The Agricultural and Experiment Station Library (AESL) is a unit of the College of Agricultural Sciences, University of Puerto Rico, Mayagüez Campus. In 1915 a pathologist, Dr. John A. Stevenson, began planning and creation the library. Since the library was conceived, it is managed as a special library to support scientific research. It is a useful resource for researchers in agricultural sciences, biological sciences, chemistry, veterinary sciences and other disciplines. Its valuable collection consists of journals, books, pamphlets, indexes, and documents in print and online. The library's vision is being on the cutting edge of technological advances to provide the most innovative agricultural resources to users. In this way, it aspires to be the leader in providing library agricultural resources and agro-business, and recognition as the best agricultural Virtual Information Center in Puerto Rico. The library's mission is to promote research through the availability of resources that support research projects. It seeks to provide access to information through the digital library, provide an excellent service to users, and manage to satisfy the information needs of university students and the scientific community. The library portal uses an open access program call Joomla, the content is updated by the library director and assistant librarian (Pagán, Suarez, and Almeyda, 2010).

The Natural Sciences Library (NSL), part of the Center for Information and Technology, of the Natural Sciences College at the Rio Piedras Campus, is a specialized library in pure and applied sciences. Its valuable collection consists of journals, books and indexes in print and online and it is considered one of the most comprehensive in Puerto Rico and the Caribbean on. A comprehensive collection of the theses presented at the Natural Sciences College is another of its strengths. The library's development is focused on the college's curriculum and research faculty needs. Since 2008, the NSL is part of the services offered by the Center for Information and Technology. It was developed to provide services and support for students, faculty and researchers, integrating the areas that are related to information resources and technological services. The NSL portal is designed to be the primary access to the library's collection, whether remotely or physically.

Background

This research project provides an overview of the use of web pages based on data collected from interviews, focus groups and statistical reports from Google Analytics. It was developed with the purpose of improving access to the information resources and library services. One of the objectives was to learn about the usage of the library's webpage and identify the advantages and disadvantages provided by the users who access the resources and information services. Another objective was to seek a possible alternative to improve access to resources and information services through the web portal of the library. In addition, we explored the changes that have occurred in the role of the librarian as the websites now provide mechanisms to access the information resources and services. The research was based on the following questions:

1. What is the use of the library's website according to its organization, design and content?
2. How easy is it to use the library website?

3. Is it necessary to reorganize and redesign the library website to enhance services available to users and the needs of users?
4. What have been the changes in the role of librarians driven by the development and improvement of websites?

The emergence of the Internet has had a significant impact on libraries in the manner and methods that resources and services are offered to users (Brake, 2004). The web portals serve as gateways to a variety of resources and services in an easy and integrated way. These make it possible to expand the boundaries of ways to access to browse and search information and get the resources and library services without physically visiting (Lehman, & Nikkel, 2008). In academic libraries, it is one of the perfect tools to organize, disseminate and facilitate access to electronic and print resources. Its properties, composition and structure allow deepening and updating the content. Also it offers various forms of communication of information, such as links, search engines, forums, documents, applications, audio, video, text, photographs and other tools and new formats contributing to reducing limitations of time and space.

One of the consequences of the proliferation and use of the web portal is the generation of a changing process that have an effect on the concept and the way libraries work, therefore affecting the tasks and roles of librarians. An example of this tendency is reflected in budget allocations, where a larger amount is allocated for the acquisition of electronic information sources such as magazines and books (Turner, 2010). Another aspect that has risen is the way to include the library's web portal in social media platforms like blogs where updates can be performed fast and frequently. According to Pagan, Suarez, & Almeyda (2010), social communication platforms are used to promote communication and collaboration between the user and the librarian. The functions or roles of the library staff have gone to be active and highly technological.

The websites of academic libraries are the main entrance to the information resources and services and provide a variety of possibilities to communicate with users. According to Turner (2010), they are key points of access to the information online, but must be attractive to the user with a dynamic presentation and distribution of the contents effectively. Although the benefits and amount of information that the library homepage has, it is not necessarily the first access point for information. The studies by OCLC (2006), show that 89% of college students begin their research through the Internet, while only 2% began searching library catalogs. This proves how important it is to know if website are being used and if their structure or content attracts the users. Other considerations of the web pages are their difficulty to use and the promotion of frequently used contents.

Therefore, it is important for libraries to incorporate a program for collecting and applying the statistical data on the use of web pages (Cohen, 2003). According to Ortega & Aguillo (2009), there are three ways of measuring the use of website: the analysis of web log files, controlling access, and analysis of local or program counter statistics. This research used the option of a statistics program used in the website. The advantage of this method is that the program can capture demographic data and technical information not normally found in other methods (Turner, 2010). The statistics about use may provide data on how many visits, page views, bounce rate, average time on site, location, traffic sources, content sources, and percentage of new visits, among others. According to Arendt & Wagner (2010), the statistical tools provide objective data about

the use of the portal. These assist with decision making and help avoid speculation or personal opinions. There are different tools to measure, collect, analyze and communicate data using the library's website. Examples of these tools are: VisiStat, StatCounter, ClickTracks and Google Analytics (see Table I).

Motigo Webstats http://webstats.motigo.com/	123 count http://www.123count.com/	3d Stats http://www.3dstats.com/
AceStats http://www.acestats.com/	Adfree Stats http://www.addfreestats.com/	Clustr Maps http://www.clustrmaps.com/
CounterCentral http://www.countercentral.com/	Count My Page http://www.countmypage.com/	Cq Counter http://www.cqcounter.com/
Dataplain Web Stats http://www.dataplain.com/	Digits Web Counter http://www.digits.com/	Easy Counter http://www.easycounter.com/
FreeStats http://www.freestats.com/	GoldStats http://www.goldstats.com/	GcStats http://www.gcstats.com/
HiStats http://www.histats.com/	Hitmatic http://www.hitmatic.com/	Histlink http://hitslink.com/
iWeb Track http://www.iwebtrack.com/	Mega Stats http://www.megastats.com/	NedStat http://www.nedstat.com/
NextStat http://www.nextstat.com/	One Stat http://www.onestat.com/	Opentracker http://www.opentracker.net/
Realtracker http://www.realtracker.com/	Servustats http://www.servustats.com/	Shinystat http://www.shinystat.com/
Site Meter http://www.sitemeter.com/	Sitetracker http://www.sitracker.com/	SiteTrafficStats http://sitetrafficstats.com/
Statcounter http://www.statcounter.com/	Stats For Your Site http://www.statsforyoursite.com/	SuperStats http://www.superstats.com/
Traffic Examiner http://www.trafficexaminer.com/	Traffic File http://www.trafficfile.com/	Viaclicks http://www.viaclicks.com/
W3Counter http://www.w3counter.com/	WebStat http://www.webstat.com/	Web-Stat http://www.web-stat.com/
Webtistic http://www.webtistic.com/	WunderCounter http://www.wundercounter.com/	Estadisticas Gratis http://www.estadisticasgratis.com/
Weboscope http://www.weboscope.com/	Controlia http://www.controlia.com/	Contador de visitas http://www.contadordevisitas.org/
Webcontroler http://www.webcontroler.es/		

Table I. Free or reasonably priced programs to measure usage statistics on the Web (Ortega & Aguillo, 2009).

The statistical data used in this study was obtained from the Google Analytics reports. According to Jasra (2006), it is considered a very valuable tool in order to determine the website performance quickly and reliably. Its purpose is to help understand how websites are used and offer alternatives for optimizing their content (Google, 2006). This is a free statistical analysis of websites that Google acquired from Urchin Software in March 2005 and was available to the public free of charge in mid-August 2006 (Fang, 2007). It generates reports on the use of websites, tracking unique users, the performance segment of users, the results of marketing campaigns, search engine

marketing, ads testing version, the content performance, navigation analysis, objectives and redirection process or design parameters. The statistical data available is objective and multifaceted to facilitate interaction between users and website (Fang, 2007).

This service only requires opening an account with Google and installation is quick and easy (Google, 2011). The Google application allows you to compare user behavior, to access various search engines to enter the library portal, email, direct visitors and others (See Figure 1 and 2). This provides some performance indicators of the library portal (Turner, 2010) that is used to measure the performance of tracking website usage. This is a metric that tabulates the user's behavior, its location and provides technical information using JavaScript code to insert into the page under study.

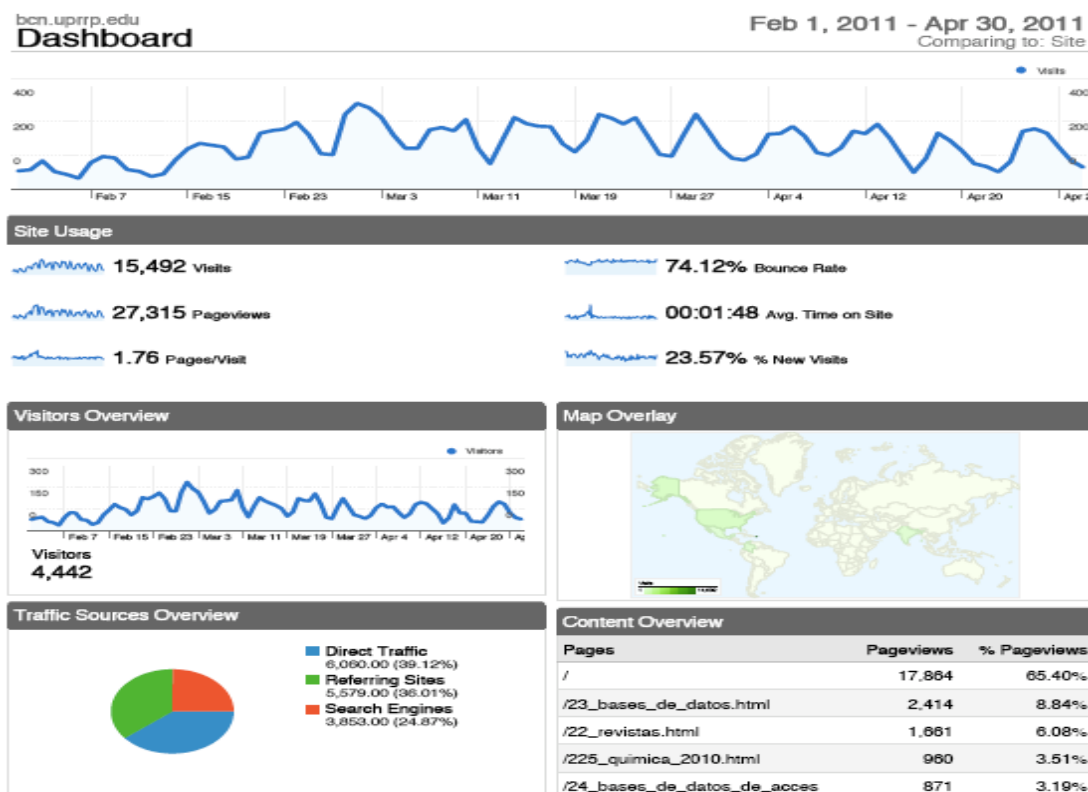


Figure 1: Google Analytics NSL

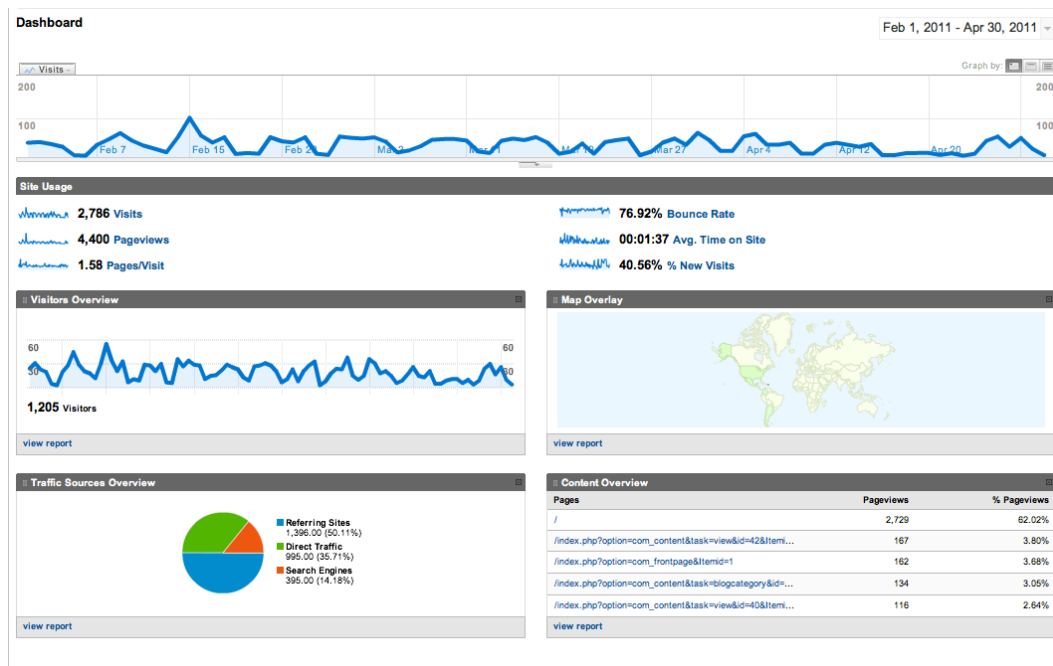


Figure 2: Google Analytics AESL

Methodology

This qualitative research is a case study about the use of two libraries' websites specializing in agriculture and natural sciences at the UPR. The usage of the libraries' website was explored through the analysis of statistical data and user is perceptions of the AESL and NS). Data were collected using research methodologies, semi-structured interviews, focus groups and document review of statistical reports of Google Analytics. This justifies the point made by Fang (2007), that there are many studies on the use of library website based on statistical data but these do not include the user behavior in order to provide guidance to redesign it. In addition, there is little information about how libraries in Puerto Rico use the data obtained through the tools that measure the usage statistics of a website, much less interrelating it with the perception of users about its content.

The sample selected for the research was intentionally composed of forty-five users from the NSL and sixteen users from the AESL. The design of the sample was stratified into three types of participants because of the characteristics of users and library staff members. Two techniques were used to collect data: focus groups and interviews. In both libraries, the first group had the same characteristics but the amount of participants varied; ten participated from NSL and five from AESL. A second group was made up of thirty students in NSL (twenty undergraduate and ten graduate students) and ten members of the AESL community. A third group was made up to employees' interviews in both libraries, but the number of participants varied, in NLS five and two in AESL. The numbers of participants were not similar because the population of students, community and employees in each library is different. For example, the NSL has a total of 20 employees and AESL has seven employees.

The triangulation of data was performed with information obtained from the analysis of statistical data from Google Analytics reports, focus groups and interviews. The statistical reports of Google Analytics is a tool that probes it easier to build user-centric

websites and provides a user friendly interface that facilitates the identification of situations or problems (Fang, 2007). This tool was chosen because both libraries use them, supplies some essential data, and is a free service that generates statistics about visits to the website of the libraries under study. Statistics from the Google Analytics report presents information about pages that users visit and do not have explanations for why users made certain things or how that information can be used to improve the website as suggested by Wiggins (2007).

In order to answer the questions raised in the research, other sources of data were used for users perceptions, conceptions, experiences and points of view. They were semistructured interviews and focus groups that help expand or corroborate the perception of the participants of the websites of both libraries. Following the guidelines of Lehman and Nikkel (2008), instruments were generated for data collection, especially the question guide that was based on models of the studies on the use of websites of Sheeja (2010) and Kaushik (2008). The guide questions served as a starting point but through the conversation we had the flexibility to broaden the questions which generated a deepen conversation about the subject.

The analysis was performed after the collected data was organized, transcribed and read using an inductive and deductive approach. This process needs at least three deep readings to achieve reductions and seek meaning and interpretation of data. Data were grouped into the main categories, which are the following: the use, reasons for use, satisfaction with the content, use of content and innovation, overall satisfaction, the role of the librarian to manage website and recommendations.

Results and Discussion

The methodology of the research used semi-structured interviews, focus groups and statistical analysis of the Google Analytics reports to answer research questions. The statistical data obtained from Google Analytics reports show the number of visits in the period from February, March and April 2011. The AESL has a total of 2,786 visits and NSL has 15,492 visitors. In every item of data used, the NSL has a greater ratio of users visiting the homepage than the AESL. This is because the NSL has a larger and clearly defined population of 3,400 graduate and undergraduate students, 250 teachers and researchers, versus AESL where the users are not clearly defined because the services are not going directly to students but to the community in general, and to 58 teachers and investigators assigned to the Research Program of the Agricultural Experiment Station.

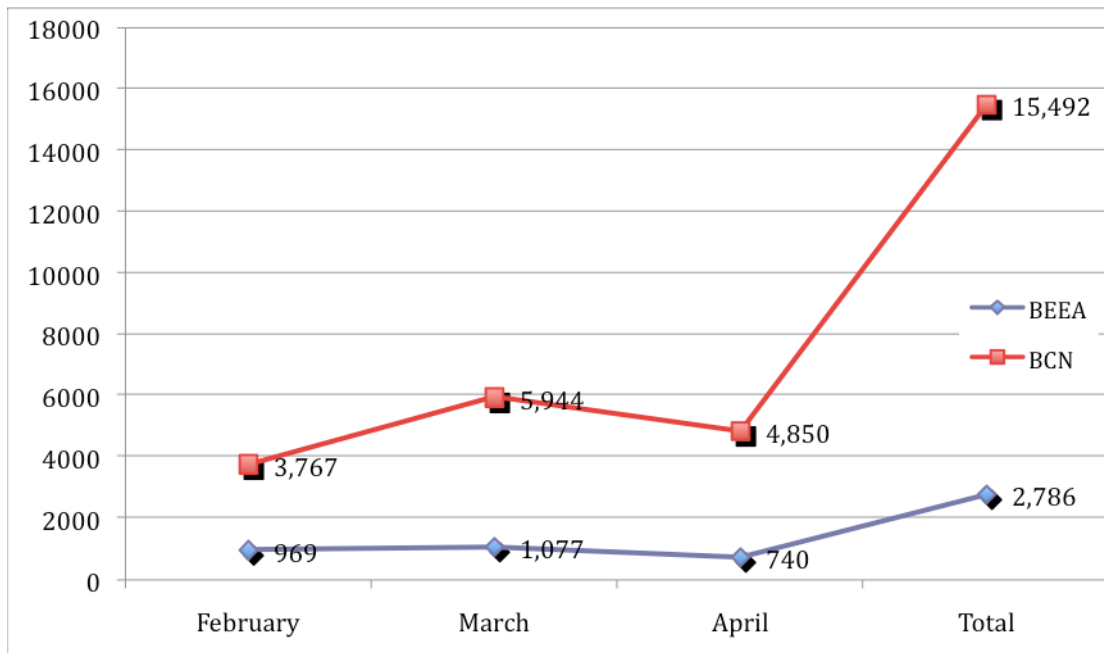


Figure 3. Monthly visits from users

During the month of March the distribution of the data shows a greater amount of visits in both libraries. The month that received fewer visits for NSL was February and April for AESL. Figure 3 shows how the distribution of data at both libraries agrees; they incrementally increase during the months of February to March, and start to decline in April. This demonstrates that the peak month of use is March compared with the months investigated.

The use of the portal is complemented with data obtained from the focus groups and the interviews where the users expressed how often they used the library homepage (see table 2 and 3).

Frequency	Undergraduate Students (SG1-SG 20)	Graduate Student (G1-G10)	Professors & Researchers (P1-P5)	Staff (B1-B5)
Daily	2	1	2	5
Weekly	1	3	1	0
Monthly	3	2	1	0
Bimonthly	4	2	1	0
Never	3	0	0	0
Total	13	8	5	5

Table 2. Frequency of Visits to the NSL Portal (Focal Groups and Interviews)

The users of the NSL expressed that everyone knew about the existence of the library portal. The use show that visits to the website are sporadic: monthly among

undergraduate students, monthly among graduate students, and daily between teachers and researchers. Table 2 shows the frequency with which each group uses the portal.

The results of focus groups and interviews at the AESL show that all the participants are aware of the website. However, the frequency of use varies by the type of user and the information needed. The greater frequency of the community is divided between monthly and bimonthly; for professors and researchers the higher frequency is monthly (see table 3).

Frequency	Community (C1-C5)	Professors & Researchers (P1-P5)	Staff (B1 - B2)
Diary	0	0	1
Weekly	0	0	0
Monthly	2	3	0
Bimonthly	2	2	0
Never	1	0	1
Total	5	5	2

Table 3. Frequency of Visits to AESL Portal (focus groups and interviews)

In both libraries, the content of the homepage is abundant because it consists of 39 web links that turn into 39 sub-pages. The use of the web subpages cannot be measured because they are not disclosed separately; globally the usage is 4,400 times in AESL and 27, 315 times in NSL. If the total is divided between 39 links, the amount of visits is distributed and the result is that each sub page of NSL received 700 visits and those of AESL received 113. The result of the subpages is very low compared to the amount of portal content and sub-pages generated.

Another statistic that shows that unique visitors use little of the overall content . These are users who only visit the portal home page without going through to the subpages. Unique visits made at the website of the AESL are 1,205 and 4,442 for NSL. This result is high versus the amount of sub pages that both homepages have. There is a need to consider an indicator to review the content and seek a mechanism that invites the user to other pages.

The percentage of new visits indicates how many people use the site for the first time and it is a good indicator for promotion and marketing he site. The total percentage of visits is of 40.56% for AESL and 23.57% for NSL. This result shows that the portal AESL has a marked increase in new users while the website of the NSL is very low. The NSL's website needs more exposure; this was brought up by the focus group. They expressed that they knew about the website but not its contents, and their use was mostly to content. Another aspect is the high percentage of rebounds; when it is high, it shows that site visits are for something specific, and is not used in spite of having other content. The total percentage of rebounds is substantially high, 76.92% for AESL and 74.12% for NSL.

The traffic sources data provides a significant fact that helps decide the best places to register and market the webpage. It lets you know who accesses directly by typing the web address, or by searching reference websites or search engines. Figure 4 shows that

AESL has a higher number of users who access the site from web reference with a 50.11%. NSL has a greater percent of access by direct traffic with 39.12%, and follows with a minimum from different websites.

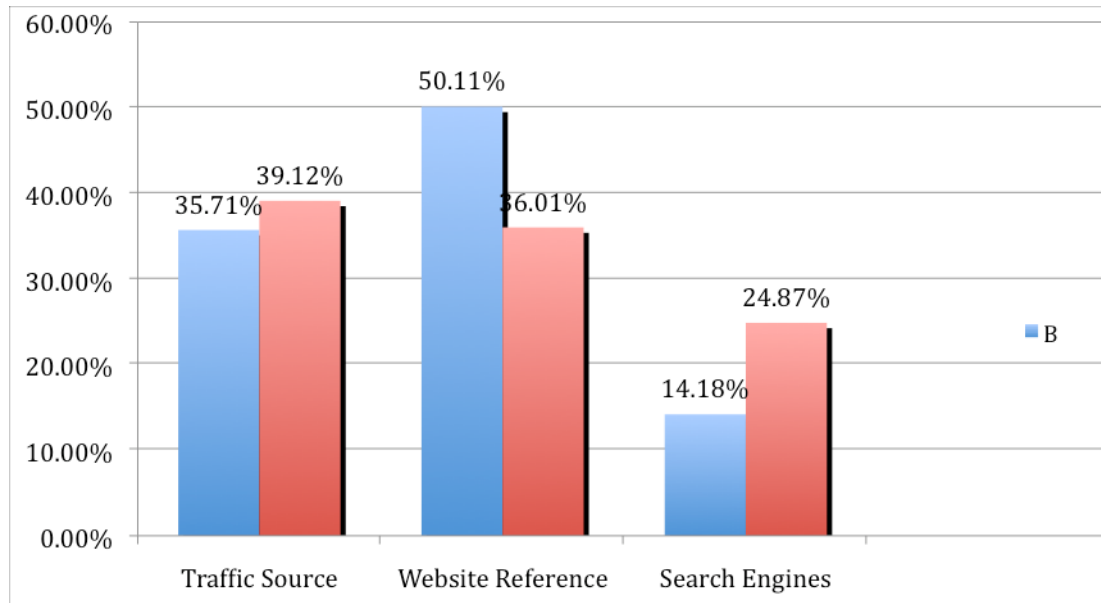


Figure 4. Percentage of Traffic Sources

The result shows that AESL markets its website better compared NSL. The NSL has some minor results especially in reference websites and links to other pages. The visitor traffic shows who uses the website pages. The AESL website is used by fifty-one countries, versus the NSL that is used by thirty-one countries. Table 4 presents the distribution of the countries between both libraries with high amounts of visitors. The number and variety of countries range in both libraries. This may be because the approach of content both libraries provide and the differences between the enrollment of students, teachers and researchers.

COUNTRY	AESL	NSL
Puerto Rico	2,309	14,632
United State	90	604
India	0	83
México	81	27
Colombia	28	55
Spain	25	20
Argentina	26	8

COUNTRY	AESL	NSL
Venezuela	26	0
Peru	23	6
Brazil	16	0
Chile	13	0

Table 4. Distribution of Visits by Country

The result of the distribution of the contents based on formats and categories are different. A comparison of the contents cannot be done but can be organized into categories of common or unique results. The common content was divided into journals, virtual reference, services, and staff. Table 5 presents the distribution of the use of the subpages.

Common Categories	AESL	NSL
Journals	46	1,661
Virtual Reference	35	339
Service	28	1,001
Staff	40	181

Table 5. Percentage of Visits Subpages

The most important common category in both libraries is the use of journals, the AESL with 46 visits and in NSL with 1, 661. This demonstrates how important is the use of journals for users who access the pages of both libraries. The virtual reference category had a very low percentage of visits in both libraries; this service began a year ago. The AESL participants said they mostly use the website to learn about the activities carried out in the library, to access the forms for interlibrary loan and access electronic resources. The NSL participants emphasize that their use is to access electronic reserve tests, find references to books, journals, databases and information.

When the NSL participants were questioned about the least used resources, the link on research was identified. Twelve undergraduate, four graduate students, and two teachers and researchers had not noticed of its existence before. The participants of both libraries expressed that they do not use social networking tools such as the Facebook application, blog and twitter account. This is despite the fact that all participants found it interesting to use virtual reference and social networks to help encourage communication and collaboration between the user and the librarian.

Another aspect to consider is if the organization and ease of access to information contents meets user expectations. The opinions in both libraries are different. The AESL participants expressed that in general terms the portal is nice, but recommended renewal or changes to specific sections and content updates. One participant considered that the website should be renewed to avoid falling into the monotony and prevent the user losing interest in visiting the website. Other participants recommended the need to change the relationship of electronic resources, making them more visible and increase the amount of available digital resources.

The NSL website was severely criticized by the participants because they believed that the content is important but its organization is inaccessible, confusing and does not attract attention. What stands out from the comments is that the search link for electronic journals is considered easy to locate and access, but the remote access link is not. The participants recommended that remote access and the organization of the list of the journal by issue be improved. The 85% of participants in the focus groups emphasized that the database page is not easy to use; there is too much content which confuses and does not show which database should be used.

Another aspect considered in the investigation was whether the role of librarians changed due to the development of website pages. The participants of both libraries expressed that the role of the librarian has changed by the way users look for and access information. It has changed their type of work and space, offering continued services through the website of the library, the librarian has become virtual. In addition, all participants recognized that it is a good mechanism to facilitate contact with users, although not used. According to one participant of the AESL, "Thanks to the website our work is more agile achieving more access to information resources and services." These expressions summarize the comments from all participants.

All participants expressed general recommendations about upgrading and redesign a website. The most significant recommendation on the AESL website are: feature an English version choice; provide increase digitized resources; relocate links, providing an overview of available services; describe the access policy for the community so that private users can have access to all online resources.

The recommendations from the NSL participants are the following: give instructions on how to use databases; change the confusing color; give the content a more attractive view to draw attention and make it easier to use. In both libraries, participants recommended placing the tools of social networking prominently. Also, it was suggested that a subscription to a different Meta search page be included for expanded use.

Conclusions

The data obtained from the Google Analytics statistical reports and expressions of participants in focus groups and interviews were used to document and answer the questions established in the investigation. One of the results founded that the use was not significant according to the organization, design and content. Data from the Google Analytics reports show usage of both websites, but is not substantially higher compared to the amount of content. Another element that shows that the content is not well used

is the higher percentage of rebounds. This is because users visit the website for a specific place and do not use it as a web portal to various services and information resources.

All participants would use the portal. However, 90% of participants agreed that it is necessary to reorganize, redesign and relocate the contents of the portal to make it more appealing and accessible to the user. They stated that it is easy to access but sometimes they faced difficulties in locating the databases or other information needed. An analysis of both pages suggests the need to reorganize and redesign to improve the services and meet the users needs. Also, there is a need to perform a marketing campaigns to increase website use.

Another aspect to consider is to provide ongoing maintenance of the website because the content constantly changes and may become obsolete. This leads to a commitment to update the library's website to provide users with the accurate information and be a reliable mechanism for users. Therefore, you must perform ongoing assessments of the website to detect changes.

The data obtained suggested that the roles of librarians have changed significantly. The participants in the study validate the issues raised about the role of librarians; they should reinvent their roles and responsibilities to meet the demands of users. According to Troll (2001), changes brought about by new technologies in the library make traditional performance measures less effective in demonstrating the contribution of the library in higher education.

Future Work

It is considered important to integrate the recommendations obtained through the study of these two websites, especially those that help capture the user's attention and retention. An outstanding feature of this experience was that both libraries are considering developing websites in a coordinated way to have patterns in common and unify resources and services.

Another recommendation is to perform similar research beyond the limitations raised in this study of aspects. One limitation was the difficulty of recruiting AESL participants because they do not have fixed and constant users. An additional limitation was the short period of time of three months to collect data. This was because the UPR faced a strike period that affected usage of library resources and ability to perform research over a longer time. Future work will address these limitations while helping to develop a better, more cohesive web portal for our libraries.

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