The Suitability of Web Analytics Key Performance Indicators in the Academic Library Environment

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A B S T R A C T

As the demand for library assessment grows, academic libraries are becoming more interested in Web analytics. Data are automatically gathered and provide information about a wide variety of online interactions. Libraries have long used simple counts such as visits and page views, but have more recently begun to choose strategic benchmarks, also known as key performance indicators (KPIs). Many common KPIs were created for commercial websites and are challenging to adapt for libraries. However, the underlying concepts are sufficiently valuable that libraries should explore their use. By evaluating the validity of web metrics, libraries can further the development of standards and benchmarks to support future investigations. This article discusses how commercial web metrics might be adapted for use in academic libraries. First, the limitations of web analytics are presented. Major key performance indicators used in the commercial sector are reviewed in the academic library context. Finally, the article discusses how the various indicators might support specific library website goals and decisions and uses local data to illustrate one example case. As libraries choose web analytic methods, they should deliberately evaluate their validity. Over time, this will slowly build the profession's ability to use web analytics more effectively for library assessment.

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INTRODUCTION

Web analytics have long been used by the commercial sector for studying online user behavior and determining quickly how effective their virtual spaces are at achieving business goals. Libraries should learn which of these well-researched counts and ratios might be adapted to the library environment for use as key performance indicators (KPIs). Looking at commercial KPIs is a good starting place for beginning to think of the library's virtual space as a place that has business objectives and target customers.

Analyzing web metrics is somewhat similar to using financial ratios for corporate valuation. It is not difficult to identify a company's stock price, price-to-earnings ratio, or other performance indicators. But no matter how clearly the data is presented, it is the interpretation of those indicators that is the challenge. Additionally, even with an expert interpretation, KPIs do not provide a total picture of value.

There are definite limitations when using web analytics. As with most quantitative information, inferences made about human behavior based on web analytics should be considered working hypotheses until a more experimental approach can be taken. In addition, while web analytics may show *what* users are doing, they don't generally reveal *why* the user is doing it. Also, Web analytics treats people in a transactional, inhuman way, aggregating individuality and providing no information

about the need(s) the visitor brought to the site. Academic libraries are often seeking deeper meaning than web analytics can provide. Are resources promoting user productivity? Have users discovered information of value to them—information that promotes learning? These are the complex questions librarians want to answer. Therefore, Web analytics are most useful when combined with other methods to confirm findings and develop interpretations. Additionally, setting up web analytics software has many potential technical pitfalls which can lead to invalid data.

A challenge when trying to adapt commercial web analytics is their use of cost information at the transaction level. Library systems have not typically integrated cost information at the transaction level; cost and use information for individual interactions is almost always aggregated. While it is theoretically easy to imagine how a patron's visit to the library could correspond to a financial value in terms of items checked out and downloaded, systems are not usually set up to provide such a figure. Library cost data is also quite complicated, involving both annual and ongoing costs. Because online patron–library interactions usually span multiple systems, it is also difficult to know where to assign credit for cost. For example, the value of full-text article downloads is inherent in the information objects themselves, but value is also added by whatever search tool(s) the user employs for discovery.

Another factor in adapting commercial KPIs is libraries' understandable resistance to tracking individual users' information use. Therefore, some techniques are off-limits unless specific permission is granted and the scope of study is limited. For example, in an academic library that

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requires login to use public workstations, one could find out how the information use habits of freshmen vary from seniors on the website by connecting the login with the browser history. Such a study would face several IRB hurdles in protecting individuals' privacy. Because individual tracking is usually not possible, and the domain encompassed by a library's web presence includes not only the library website, but also the library catalog, third-party databases and journal publisher sites, and third-party software such as link resolvers and federated search software, it is difficult to gather and connect relevant information.

Despite these limitations, libraries need to grapple with the challenges inherent in tying web analytics data to patron behaviors. By reviewing commercial KPIs, libraries can identify underlying concepts that will be useful for developing valid web metrics. By choosing analytics carefully, studying their relationship to patron behaviors, and reporting their findings, libraries will begin to build a professional knowledge base to support the use of web analytics as part of library assessment.

This article will first review the existing literature surrounding library use of web analytics. Then, common commercial web metrics will be reviewed to explore their potential use as key performance indicators in academic libraries. A process will be recommended for libraries to choose meaningful web analytics for local situations. Finally, a case study will provide an example of how selected KPIs could be selected to match website objectives and support accountability, and how those KPIs could then be evaluated to determine their validity.

LITERATURE REVIEW

The commercial sector quickly recognized the need to study online user behavior (Constantinides, 2004), and developed web metrics to help them quickly learn how effective their virtual spaces were at achieving business goals (see bibliography in Calero, Ruiz, & Piattini, 2005). The Digital Analytics Association has defined three broad classes of web metrics. Counts are defined by the Digital Analytics Association (DAA) as "the most basic unit of measure; a single number, not a ratio," (e.g., "Visits") (Digital Analytics Association, 2007, p. 3). Ratios are counts divided by another count or ratio, for example, "Page Views per Visit" (Digital Analytics Association, 2007). Key Performance Indicators, or KPIs, are ratios or counts selected because they relate directly to business strategy (Digital Analytics Association, 2008). Brian Clifton noted that KPIs are important because they help specific parts of the organization focus on the online strategies particular to their area(s) (chapter 10, para. 3).

In 2009, Jansen offered a process for using web analytics: identifying key stakeholders for the site, defining the website's primary goals, identifying the site's most important visitors, and identifying key performance indicators. Numerous case studies of library website redesigns have followed the first two steps in this process by identifying key stakeholders and goals (e.g., Felker & Su Kim, 2005; Ward, 2006).

Libraries do not seem to have taken the next steps in Jansen's process. Specifically, national standards for reporting library web metrics remain vague and define only the most basic web metrics as key performance indicators. Both the ARL's E-Metrics (Association for Research Libraries, 2007) and the NISO (2004), for example, define only one web metric, "Virtual Visits." Extensive work has been done with national standards for reporting use of electronic information resources (i.e., subscription journals and databases) (ICOLC, 2006; COUNTER, 2008), but not with the library websites through which many users access them.

The literature contains case study publications and basic tutorials showing how Web analytics can support decision-making in specific situations (Betty, 2009; Black, 2009; Fang, 2007; Fang & Crawford, 2008; Ghaphery, 2005; Memmott & deVries, 2010; Tidal, 2011; Turner, 2010; Welch, 2005). Some have focused on using out-of-the-box reports (Marek, 2011a, 2011b), rather than starting with a research question or

targeted KPI. Case studies are beginning to report analytics and suggest ways they can be used, but this activity is just beginning (Loftus, 2012; Marek, 2011c; Prom, 2011; Whang, 2007), and cross-site studies are needed such as Pakkala, Presser, and Christensen (2012).

More recently, libraries have been working to develop frameworks and strategies. Manuel, Dearnley, and Walton (2010) urged libraries to adopt a more strategic approach to evaluating and improving websites, monitored through metrics and KPIs. A recent preconference workshop at the American Library Association's 2013 Midwinter Meeting, "Developing a Web Analytics Strategy for Your Library," focused specifically on goal creation and selecting KPIs that fit (McHale & Farney, 2013).

The past reliance on analytic software's defined reports and metrics rather than the creation of more sophisticated custom reports is understandable. However, there is a larger potential for web analytics based on a more strategic approach. This article aims to further this trend by reviewing commercial web metrics and exploring their potential as KPIs for academic libraries.

WEB METRICS AND THEIR POTENTIAL FOR USE AS KEY PERFORMANCE INDICATORS IN LIBRARIES

This section will review web metrics commonly used in the corporate sector as key performance indicators and explore how they might be adapted to the library environment. There are several terms used repeatedly in this discussion which require some preliminary discussion: visitors, unique visitors, and page views.

VISITS

In web analytics, a visit is technically any web-accessible device that interacted with the website during a particular time frame. For example, imagine a college senior searching the library website simultaneously with both her tablet and her desktop PC: in web analytics terms, this counts as two visits. If she accesses the library website three times and closes her browser each time, this will count as three visits. The time frame is also important: if she accesses the library site but then performs no action for half an hour, her visit would end, and further action would be charged to a second visit, according to some analytics software (Kaushik, 2007; Google, 2013c). This term is often used interchangeably with "sessions" or, confusingly, "visitors" (Digital Analytics Association, 2007, p. 11).

UNIQUE VISITORS

Any metrics involving visitors or visits will include multiple visits from the same computer or device. The metric unique visitors attempts to count "the number of inferred individual people (filtered for spiders and robots), within a designated reporting timeframe, with activity consisting of one or more visits to a site" (Digital Analytics Association, 2007, p. 12). Unique visitors are best tracked through authentication, thus isolating an actual person, but are most often tracked using cookies set in a web browser. In academic libraries, this means a computer in a public area could potentially be counted as one unique visitor even though many people use the same computer.

PAGE VIEWS

The metric page views provide a critical dimension to the web metrics suite: "the number of times a given page was used" (Digital Analytics Association, 2007, p. 10). This simple definition has grown more complex as websites have become more interactive. Many library websites and systems are database-driven, meaning that technically, a site may only have a few actual pages (i.e., files). A library catalog's main "results" page, for example, usually uses the same file every time, and just displays different data in response to query