ABSTRACT

Web metrics help to identify improvement potentials for web sites. In contrast to transaction based sites, the success of web sites geared toward information delivery is harder to quantify without direct feedback out of a transaction. We propose a generic success measure for information driven web sites by observing the users in context of the web site semantics. Thus we identify target pages, analyze the web page content and evaluate effectiveness and efficiency of the user actions with respect to the web site’s objectives. The user’s perspective has to be incorporated for a comprehensive success measure. We propose to integrate search queries from referrer information carrying the user’s intentions. Out of an integrated web site meta model we derive formally a new success measure. This approach uses common data mining techniques and text mining algorithms like PLSA and shows its applicability in two case studies and an independent user enquiry.

Keywords: business models; clustering; consumer-Web site interaction; data mining algorithms; e-commerce models; information and communications technologies; knowledge discovery; Web authoring tools; Web site design

INTRODUCTION

Apart from privately owned and maintained Web presences, professionally organized Web sites have become a natural part of everyday life and work. Companies adopt private initiatives and expand these ideas to a large number of internet users. Hao and Mendes (2006) see it as essential for a company’s success. With ceased euphoria and growing realistic judgment about the possibilities of internet based business, companies focus on the profit generated by their Web sites. After more than ten years after creation of the World Wide Web, Jacoby and Luqi (2007) still ask in their work for measurable success indicators to evaluate and improve Web sites and their business models.
The assessment of success for a Web site can be approached from two sides, by direct enquiry or by observation of the Web site’s users. Both techniques differ in their field of application. Enquiries provide very detailed information of a sample of all users which can be extrapolated to the whole user population. Ongoing, long-term evaluation of large, corporate Web sites cannot be accomplished by user enquiry. Thus, our work concentrates on the continuous observation of user actions. Beside cost advantages, this approach covers all users and can be conducted over long time periods allowing to take dynamically built content into consideration.

The observation of user actions can be performed from server or client side. Like shown in the work of Cheung and Lee (2005), the client side allows to track all actions and even mouse movements of the users within his browser whether there is a data exchange with the Web server or not. Similar to a direct enquiry the scalability of this approach is questionable, since the approval of all users would be mandatory. Therefore, we rely on server side observation of user behaviour, although the observable actions are limited to the facts, shown in section \ref{domain}.

It depends on the business model of a Web site whether actions exist, that allow a direct determination of success.

The business models for a Web presence can follow one or more out of the following categories: e-commerce Web sites sell products and services, content-based Web sites aim to deliver and provide potentially useful information to their users, communication-based Web sites enable their users to contact and exchange each other or communicate with the company. Especially the so called Web 2.0 Web sites are based on this business variant. Finally, context-based Web sites organize and rearrange content within a new context to improve the entropy for their users, like search engines do.

Depending on the business model, it is possible to distinguish between user actions that contribute to the Web site’s objectives and those actions without effect on the success.

Transaction Based Success Measures

Most e-commerce Web sites can evaluate their success by analyzing successfully completed transactions. Within these transactions users provide a direct feedback about the utility and the monetary value the Web site created for them. Thus the success is easily measurable and allows deeper analysis of the whole purchasing process. Cutler and Sterne (2000) show how a chain of linked measures can describe the whole customer life cycle, starting from measures such as reach, acquisition, to conversion and retention of a customer, who can finally reach loyalty status. Other metrics like abandonment, attrition, and churn describe the migration of users. Applications of those measures can be found at Zviran, Glezer, and Avni (2005) and Yeung and Lu (2004), who all have described how to assess the success of transaction-based Web sites.

Web sites without transactions lack this evaluation possibility. In this approach we will concentrate on nontransactional Web sites. We subsume them under the term information-driven Web sites and describe in the following paragraph how other publications approached this challenge.
An SVM-Based Ensemble Approach for Intrusion Detection
www.igi-global.com/article/an-svm-based-ensemble-approach-for-intrusion-detection/217695?camid=4v1a

The Power and Promise of Web 2.0 Tools
www.igi-global.com/chapter/power-promise-web-tools/37632?camid=4v1a