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New Metrics for New Media: Toward the Development of Web Measurement Standards

Thomas P. Novak and Donna L. Hoffman

Project 2000

Vanderbilt University

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Project 2000 White Paper
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New Metrics for New Media: Toward the Development of Web Measurement Standards

1) Introduction

The advertiser-supported Web site is one of several business models vying for legitimacy in the emerging medium of the World Wide Web on the Internet ([Hoffman, Novak, and Chatterjee 1995](#)). Currently, there are three major types of advertiser-supported sites: 1) *sponsored content* sites like [Hotwired](#), [ESPNET Sportszone](#), and [ZD Net](#), 2) *sponsored search agents and directories* like [InfoSeek](#), [Excite](#), and [Yahoo](#), and 3) *entry portal* sites like [Netscape](#). At present, these three classes of sites are split at about 55 percent, 36 percent and 19 percent, respectively, in terms of advertising revenue ([Jupiter Communications 1996](#)).

The sponsorship model is attracting increasing management attention because advertising is expected to be an increasingly significant source of revenues in this new medium (Rebello 1996). Sponsored sites are attractive because they are well suited to the Web environment (Hoffman & Novak 1996), yet retain important parallels to existing media in the physical world. In theory, institutional advertising practices and metaphors can be borrowed from traditional media environments to assist initial commercial efforts. Additionally, as it becomes apparent that commercial viability of the online storefront model is years away (MIT Faculty/Industry Workshop 1996), many Web managers are beginning to place more importance on advertising revenue streams as a source of profitability for online ventures (Rebello 1996).

Against this backdrop, firms are trying to understand what makes a sponsored site successful. As advertisers and marketers debate the best ways to measure and track visits and usage on commercial Web sites, most firms remain largely in the dark about how many customers exist online for their offerings. Because the industry currently lacks standards for what to measure and how to measure it, the Web is having difficulty being accepted as an advertising medium and there is no assurance that firms will be successful in generating significant revenues from advertising in

This lack of standardization exists on several fronts. First, there are no established principles for measuring traffic on commercial Web sites that seek to generate revenues from advertising sponsorship. Second, there is no standard way of measuring consumer response to advertisements. Third, there are no standards for optimal media pricing models. Finally, the complexity of the medium in general hinders the standardization process.

From an advertising perspective, the Web medium shares some similarity to radio: there are many different markets and they are clearly (at least in theory) segmented. But standardization in the radio medium eases the process of the media buy. In contrast, the Web presents a "nightmare" buy for agencies and their clients ([CyberAtlas](#) 1996). For example, Focalink's database of over 600 commercial Web sites ([Focalink](#) 1996) shows that there are more than 90 sizes for Web ad banners, that sites use many different metrics to price advertising, that there is no consistency in definitions even among the same or similar metrics, and that consumer demographic information is virtually nonexistent.

Despite the lack of information in this chaotic emerging environment, there is no dearth of activity. AdSpend ([Jupiter Communications](#) 1996) estimates advertising revenues for the first half of 1996 at \$71.7 million, already at the level of a previous estimate of \$74 million by Forrester Research for all of 1996 ([CyberAtlas](#) 1996). However, advertising revenue remains highly concentrated, with two thirds of all revenues going to the top ten of 600 advertiser supported Web sites ([Jupiter Communications](#) 1996). Estimates of Web advertising expenditures in the year 2000 range from \$1.7 billion (Bear Sterns) to \$1.9 billion (SIMBA) to \$5 billion ([Jupiter](#)) ([CyberAtlas](#) 1996).

Despite these heady forecasts, the perception persists that Web-based advertising efforts are not (and may never be) "serious." In part this may be because traditional advertising spending easily dwarfs current Web advertising efforts. For example, the price of a single 30-second television spot on prime-time's top show, Seinfeld, is currently \$550,000 ([Advertising Age](#), 1996). As Table 1, compiled from the Direct Marketing Association (1996) and the Outdoor Advertising Association of America, Inc. (1996) shows, Web advertising expenditures represent a medium in its infancy:

Table 1: 1995 Advertising Expenditures in Various Media

Advertising Medium	Total U.S. Expenditures (billions of dollars U.S.)	Comments
Direct Response - Mail	31.2	.
Direct Response - Phone	82.7	Telemarketing
Outdoor - Traditional	1.83	Billboards
Outdoor - Out of home	3.00	Transit, Bus, Airport, etc.
Print - Magazine	12.5	.
Print - Newspaper	37.7	.
Radio	11.1	.
Television	38.1	.
Web	.312	Estimate for 1996 (Jupiter Communications 1996)
Other	21.3	.

Yet the skepticism can more importantly be traced to the fact that few have specified conclusively just how advertising on the Web can and should further a firm's strategic marketing objectives. Clearly, *standardizing the Web measurement process is a critical first step on the path toward the successful commercial development of the Web.*

Therefore, the objectives of this White Paper are to:

- Review practices for advertising measurement in traditional media.

used in traditional media research.

- Propose standardized terminology and methodology for Web advertising measurement.
- Offer preliminary recommendations for Web advertising research.
- Address the policy and strategic considerations that affect the development of Web advertising standards.

We believe that metrics based solely on impressions are necessary in the Web measurement process, but cannot and should not form the basis of a Web measurement system. Therefore, in addition to proposing a set of "basic constructs" and "exposure metrics" that define the consideration set of possible measures, we also introduce a set of "interactivity metrics" that we believe must be included in any complete program for Web measurement. We take care to identify what data are required in order to calculate a particular metric and remain cognizant of the link between Web metrics and media pricing models.

We hope our preliminary measurement proposal stimulates rigorous discussion and debate. Our intention is to encourage the competitive marketplace to adopt specific metrics from each set. Research is necessary to identify which metrics are most useful for judging the effectiveness of advertising, for determining where and how ads should be placed, and for determining optimal pricing schemes for efficient media buys.

2) Advertising Measurement Terminology in Traditional Media

There is considerable confusion regarding the terminology currently in use for Web advertising; the first step is to ensure that all are working with the same vocabulary. We propose that if there is terminology from traditional media that is appropriate to use in the context of Web-based advertising, then it should be used avoid confusion and ease the adoption process of standards formation. Thus, we begin by providing a glossary of the standard definitions for key measures in print and broadcast vehicles. Such measures are used in most media audience evaluations and for intermedia comparisons in media planning in traditional mass media.

<i>Gross impressions /impressions</i>	The gross sum of all media exposures (numbers of people or homes) without regard to duplication. (Surmanek 1993).
<i>Reach</i>	The number of [unduplicated] people or households that will be exposed to an advertising schedule at least once over a specified period of time. (Batra, Myers and Aaker 1996)
<i>Effective Reach</i>	The number or people who are exposed to an ad at the "effective frequency."
<i>Frequency</i>	The number of times that an individual is exposed to a particular advertising message in a given period of time.
<i>Effective Frequency</i>	The number of exposures needed for an ad to become "effective". In mass media models, effective frequency stipulates that a certain amount of exposure is necessary before it is effective, and is used interchangeable with effective exposures. Research indicates that less than three exposures will not allow adequate recall. However, too many exposures are inefficient in that incremental recall after 7, 8, or 10 exposures during a purchase cycle is very small.
<i>CPM</i>	Cost-per-thousand impressions (exposures). The cost per 1,000 people (or homes) delivered by a medium or media schedule.-(Surmanek 1993).
<i>Duplication</i>	The number or percentage of people who see an advertisement or campaign in two or more vehicles
<i>Gross Rating Points</i>	GRPs are a measure of scheduling impact calculated on a weekly or monthly basis. GRP for mass media can be calculated as multiplying the reach (expressed as a percentage of prospects in the target market exposed to television and/or magazine vehicles carrying the ad) by frequency. The GRP level for a particular schedule can also be calculated by summing the ratings of the individual show carrying the commercial (assuming one commercial per show).
<i>Share</i>	"Share of audience" is the percentage of HUT (or PUT, PUR, PVT) tuned to a particular program or station. "Share of market" is the per-centage of advertising impressions generated by all brands in a cate-gory accounted for by a particular brand, but often also refers to share of media spending.

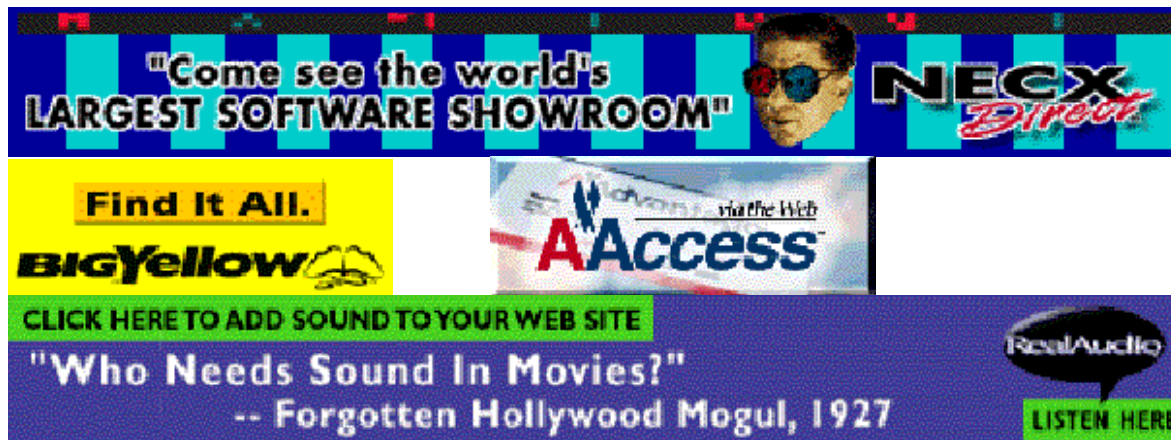
Ratings	The percentage of a given population group consuming a medium at a particular moment. Generally used for broadcast media, but can be used for any medium. One rating point equals one percent. (Surmanek 1993).
HUT, PUT, HUR, PUR	The percentage of {homes/people} tuned in to {TV/radio} at a particular time.(Surmanek 1993).
Composition	The mixture of audience characteristics found in the audience for a medium or vehicle. It also refers to the percentage of some medium's total audience made up of the target segment.
Cost per Inquiry	The cost to generate an inquiry in direct-response advertising. Calculated by the total cost of the direct-response advertising divided by the number of inquiries it generates. [www.infi.net/powerhouse/glossary.html]

3) Current Practice for Advertising Measurement on the Web

3.1) Types of Ads

We focus upon the form of advertising referred to as "banner ads" and "target ads." This primitive form of Web-based advertising may ultimately not be the most effective, but as the current dominant form, we feel it is appropriate to propose a set of standards for its measurement. At a minimum, using banner and target ads, whatever the limitations might turn out to be, provides a concrete example to work with. Although we expect Web-based advertising efforts to evolve, the problem with making recommendations more general so that they could encompass other types of yet to be developed Web-based advertising is that they would be too broad and diffuse to be practically useful.

A *banner ad* is a small, typically rectangular, graphic image which is linked to a target ad . Banner ads come in a variety of sizes, with 90 percent of banner ads ranging from 120 to 500 pixels wide (with a median of 460 pixels) and from 45 to 120 pixels high (with a median of 60 pixels) (Focalink 1996). Banner ads typically provide little information other than the identification of the sponsor, and serve as an invitation for the visitor to click on the banner to learn more. Following are a few examples of banner ads:



Target ads, on the other hand, can be fairly involved, ranging from a single web page with basic HTML, to a Web page enhanced by Java applets, audio, or forms, to a series of linked pages, or to a complete corporate "Internet Presence," "Content," or "Online Storefront" site (Hoffman, Novak & Chatterjee 1995).

Chatterjee (1996) considers banner ads to be a form of *passive advertising exposure*, in that the consumer does not consciously decide to view the banner ad. Rather, the banner ad is presented as an outcome of accessing a particular Web content page, or as the outcome of entering a series of key words into a search engine. Conventional market segmentation theory would lead us to predict that the more targeted the banner ad, the higher the click rate. Thus, ads placed on home pages of general-interest sites, or on the entry page of a search engine would have lower click rates than ads that are consistent with the content of a narrowly targeted web site, or banner ads presented by a search engine in response to specific keywords (e.g. ads for Lionel trains presented every time a visitor searches for "model railroad" or for "Neil Young").

Paid links are often incorporated in directories, which may contain large numbers of such paid links.

Chatterjee considers target ads, on the other hand, to be a form of *active advertising exposure*, since the consumer actively decides to access the target ad (i.e. by clicking on the banner ad), only after being passively exposed to the banner. *Active ad exposure is under the consumer's control; passive ad exposure is under the marketer's control.* Thus, the distinction between passive and active advertisements implies a crucial difference between banner and target ads. Further, the concept of an active advertisement is a feature that differentiates Web advertising from advertising in traditional media.

To date, most of the focus in Web advertising measurement has been upon banner advertisements. This is most likely because their passive nature means banner ads have many more parallels with traditional media planning than do active ads. The factors that affect perceptual selection (i.e., that the consumer will pay attention to an advertisement he or she comes across) in print media should also impact perceptual selection of banner ads. These factors are closely tied to the "creative" function in advertising and include size, position, directionality, motion, color, intensity, contrast, and novelty (e.g. Wilkie 1990), all of which we would expect to be useful for predicting the likelihood that a visitor will click on a banner ad.

3.2) Pricing Models

Currently, exposure models, based upon CPM or Flat Fees applied to site exposure or banner ad exposure, are the dominant approach to Web media pricing. Fees based upon actual click-throughs are also in use, where the advertiser pays for actual clicks on a banner ad that lead to the advertiser's target ad. In the following section, we consider these and other possible pricing models. While we believe it is premature to recommend any one media pricing model, it is important to understand the relative strengths and limitations of methods currently in use or that have been proposed.

3.2.1) Exposure models (CPM and Flat Fee). Flat fee pricing consists of a fixed price for a given period of time. Flat fees were the earliest Web advertising pricing model to appear. Flat fee pricing can be implemented either with or without traffic guarantees. Naturally, it would be advantageous to the advertiser to request guarantees of traffic level. The earliest ad pricing approaches on the Web simply used flat fees (e.g. ad cost per month) without clear specification of the traffic delivered in that period of time. At a minimum, accurate information on site traffic must be made available to the advertiser so that the advertiser can evaluate alternative Web media vehicles.

Assuming accurate traffic information, flat fee prices can be readily converted into a CPM (cost per thousand exposures) model. CPMs can also be enhanced by providing "guarantees" of the number of impressions in a given period of time. Thus, we consider the flat fee and CPM models to be interchangeable if traffic information, specifying the number of (possibly unique) visitors to a Web site, is available. If traffic information is not available, then flat fee pricing can still be used, although its value is then impossible to evaluate.

Ninety percent of CPMs for Web advertising sites ([Focalink](#) 1996) range from \$10 to \$150, with a median of \$60. This compares with CPMs of \$6-\$14 for national television, \$8-\$20 for magazine, and \$18-\$20 for newspaper advertising ([Pro](#) 1996).

The ultimate challenge is to determine the business models that will be effective in this new environment. At present, the advertiser-supported business model is being largely driven by a broadcast paradigm that has initially gravitated toward CPMs as the appropriate unit of measure. In this model, the belief is that exposure-based pricing takes into account different advertisers' response functions and represents a rational way to price advertising on the Web.

But in fact, impression/exposure models go only part of the way because the Web is different from traditional broadcast media. The Web is based on a many-to-many communication model and traditional media are based on a one-to-many communication model. Thus, in addition to exposure metrics, we also need interactivity metrics. The CPM approach places too much emphasis upon the banner ad, and essentially no emphasis upon the target ad which is the "real" marketing communication that the advertiser wishes the visitor to see and interact with.

In the CPM model, larger numbers are bigger winners because the one-to-many model seeks a mass audience for its message. The dangers of relying solely on exposure models means that interactive managers will be driven to scale their sites to larger, mass audiences with more homogeneous tastes in order to attract more advertising revenue. This is in contrast with solving the more difficult problem of how to measure interactivity and price advertising according to

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