Future of Information Seeking on the Internet and Web Advertising: How Can We Guide Web Advertising for Users’ Information Seeking on a Website?

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ABSTRACT
Websites have become an important source of information in our daily lives. As more people spend time on the Internet, websites have become popular media for advertising. There are three major stakeholders in Web advertising: Web ad providers, website owners, and viewers. It is important to understand the effects of Web advertising on information seeking behavior for these stakeholders. This qualitative meta-analysis provides a comprehensive picture of information seeking behavior in a Web advertising situation. Also, it gives a useful guideline for both Web ad providers and website owners on how to design and display Web ads by considering the Web ads’ effectiveness and viewers’ information seeking behaviors. Based on extensive empirical studies, we recommend nine suggestions on how to minimize viewers’ annoyance with Web ads and how to maximize Web ads’ effects on viewers. We believe that we may need to consider both Web ads providers’ and viewers’ perspectives in future research with a balanced view of Web ads and information seeking.

Keywords  
Information Seeking, Internet, Web, Website, Advertising, Advertisement.

1. INTRODUCTION
Websites have become an important source of information for people since the World Wide Web became popular on the Internet. According to the Pew Internet & American Life Project, approximately 58 percent of people turn to the Internet rather than consulting experts or family members for information and resources [16]. An additional study reported that 87 percent of online users have used the Internet at least once to carry out research on a scientific topic or concept, and 40 million adults used the Internet as their primary source of news and information about science [22]. Because people can get useful information from the Internet easily and for free, more people are searching websites as a primary source of information.

As more people search for information or browse websites on the Internet, the Web advertisement (ads) market has grown rapidly during the last decade [28]. Consequently, Web advertising has become a big issue for information seeking behavior on the Internet. Advertisers think that Web ads are the best way to quickly inform users about a product or service [51]. However, from the viewers’ perspective, Web advertising can be considered an obstacle to users’ seeking information on a website. Actually, Web advertising has been characterized as being annoying or intruding, and it is considered to have negative effects, such as affecting peoples’ task performance [13; 21; 50].

Therefore, it is very important to understand Web ads and their effects on information seeking. The objective of this meta-analysis is to provide a comprehensive roadmap of Web ads and their effects on information seeking. To understand this issue, we examined the state of empirical research on various factors that influence viewers’ information seeking, and factors that influence viewers’ reactions to Web ads. We investigated both the environmental elements (website) and internal (Web ads) elements to balance the viewers’ attention to website content and the viewers’ attention to Web ads during information seeking. Based on the analysis of previous studies, we compiled a guideline by considering not only Web ads' effectiveness but viewers’ information seeking performance as well.

2. RESEARCH BACKGROUND
This research focuses on Web ads and their effects on viewers’ information seeking behavior. A Web ad is an advertisement that is presented to the targeted viewers through the World Wide Web [51]. Web ads are usually known as banner ads or display ads on the Internet. The websites are the Web ads’ hosts, normally where Web ads are carried or displayed. Most commercial websites provide Web ads to generate revenue for maintaining their websites and updating their content.

As more people spend time on the Internet, websites become a popular media for advertising. The Internet World Stats reported that 21.9 percent of the world’s population (1,463 million people) uses the Internet, and 220 million people in the United Sates use the Internet currently [24]. With the popularity of the Internet as media, Internet advertising has increased dramatically. According to a recent report from the Interactive Advertising Bureau (IAB) and PricewaterhouseCoopers (PwC), Internet advertising revenues for 2007 are estimated to grow to $21.1 billion, a 25 percent increase over the previous revenue record of nearly $16.9 billion for 2006 [23]. Therefore, understanding the relationship between websites and Web ads – in the situation of information seeking – is very important.
Most websites have a similar revenue generation model to sustain their websites. Since many Internet users expect website content to be free and are generally unwilling to pay for it, the website owners provide Web ads along with the content [19]. Therefore, people usually encounter Web ads on commercial websites despite their preferences. Here is the typical model of the economy of Web content and ads on a website.

**Figure 1. Website Revenue Generation Model by Web Ads.**

Because website owners provide people with the content at no charge, they need to include advertising from Web ad providers. Many website owners rely on advertising as a main source of revenue to reduce or eliminate the direct cost to users of their content [35]. In addition, with the growth of e-commerce, advertising on the World Wide Web has become more popular and has been used by a wide variety of websites to generate advertising revenues [41]. If Web ad providers cannot generate sales from Web ads, they will not want to display their ads online. This will reduce the revenue of the website owners, and then they cannot provide high quality information for their users.

Consequently, it becomes important to understand users’ reactions to both Web ads and websites in their information seeking activities. Actually, Parsons and colleagues observed that user reactions to Web ads in the context of information-seeking activities are of great interest to both advertisers and providers of website content [35]. The providers of Web ads want the website users to be attracted by their advertisements, but the website owners do not want their users to be extremely distracted by the Web ads.

### 3. THEORETICAL BACKGROUND

There are two major theories which support this research: Visual Attention Theory and Information Encountering Theory. According to visual attention theory, since people’s visual attention is limited, the more attention Web ads received from a viewer, the less amount of attention was available for the visual search task and the more damaging it was to the search task [48]. Therefore, Web ads will affect people’s information seeking performance, and consequently it will influence website evaluation and source evaluation of the website.

We can also understand Web advertising in terms of information seeking behavior. There are a good number of theories about information seeking to explain human information behaviors. Based on the current situation of information seeking on a website and Web ads, we think that the Information Encountering suggested by Erdelez in 1997 can be applied to viewers’ information seeking behavior with respect to Web ads. Information Encountering (IE) is one of the information seeking theories, which posits that people accidentally experience some information related to another interest area while they are searching for one specific topic [14].

While information behavior research has traditionally focused on how people actively seek information, Erdelez and several other authors, such as Williamson and Toms [39; 42], brought attention to Opportunistic Acquisition of Information (OAI), which is a common behavior in a modern environment saturated with information and pervasive technologies for its processing and accessing [15]. Erdelez has stated that the placement of OAI in relation to information seeking has been supported in several other theories of information behavior, such as Wilson’s Model of information behavior [43] and Williamson’s Ecological model [42] of information use [15].

Information seeking behavior on a website with Web ads can be explained by the Information Encountering model. The IE model can be broken down into several steps that occur during an IE experience: noticing, stopping, examining, capturing, and returning [15]. The initial information seeking (foreground problem) in the IE model is the users’ original information seeking behavior on a website. The information encountering moment (background interest/problems/tasks) can be the situation of recognizing Web ads. During an episode of information encountering, a switch occurs in users’ attention from the foreground problem to the background problem [15].

The users would experience Web ads as a background problem and websites as a foreground problem in a real world situation. In the IE model, each step involves a combination of cognitive, affective, and behavioral processes that may be applied as a user 1) sees information potentially relevant to the background problem, 2) interrupts the original search process to examine the encountered information, 3) saves the information that is deemed to be worth saving, and 4) returns to the initial information search for the foreground problem [15]. Similarly, we can apply each step of the IE model to Web ads processing: 1) recognizing Web ads potentially relevant to their background problem, 2) deviating from the original search, 3) memorizing the Web ads information, and 4) returning to the original information search on a website.

In terms of the IE model, viewers will experience Web ads as a background problem, and they will perceive websites as a foreground problem. To understand both background and foreground problems in the situation of information seeking with Web ads on a website, we need to investigate more both Web ads and websites as factors influencing information encountering. We reviewed a number of empirical research articles with regard to Web ads and information seeking behaviors. We can provide a comprehensive picture of information seeking behavior involving Web ads on a website.

### 4. RESEARCH METHOD

There are extensive empirical studies on Web ads and their effects on information seeking behavior. Based on the IE model, we can think about a triangle model of information seeking with Web ads on a website which includes viewer, Web ads, and website. The Viewer component represents any person who seeks information on a website. The Web Ads component represents the features or characteristics of Web ads that may be related to information seeking behavior. The Website component relates to any attributes of the hosting entities that may be contributing to the Web ads studies.
variables were classified into more general categories including reaction to Web ads and reaction to websites based on Zhang and Kim’s Web ads research framework [51]. Many studies investigated viewers’ reactions to Web ads, which can be classified into four categories: attention on ads (reaction time, awareness), memory of ads (recall, retention of ads), evaluation of ads (beliefs/perceptions, attitude), and behaviors toward ads (click-through) [51]. Viewers’ reactions to the websites included four categories: memory of website content (recall and retention of website content), evaluation of website content (beliefs/perceptions, attitude), task performance (speed, accuracy, and workload), and behavior toward website content (length of visit, visiting frequency) [51]. Based on this qualitative meta-analysis, we can provide a comprehensive guideline of information seeking behaviors under Web ads on a website. We will go over these findings after we review the future scenario of information seeking and Web ads.

5. FUTURE SCENARIO OF INFORMATION SEEKING AND WEB ADS

Because advertisers and marketers want to provide their advertisements on the Internet, there might be a lot of advertisements online which are interfering with information seeking behaviors on websites. Also, the advertisement methods on the Internet are varied and effective in attracting people’s attention. However, people can improve their information seeking strategies as a learning process. We will review several factors to predict the future situation of Web ads and information seeking behaviors on websites.

The Web will remain as a major source of information for people. There are more than 108 million websites, and more than 29.7 billion Web pages existed on the Internet as of February 2007 [2]. People can find valuable information easily and conveniently on the Internet, and the information on the Internet is free or low cost. Therefore, as the number of Web pages is growing rapidly, more people will be exposed to Web ads in the future. Since approximately 82% of Web pages are commercial Web pages [40], those Web pages are potential carriers of Web advertisements in the future.

The Web advertisement market is the third most popular advertisement media followed by Newspaper and TV, and the size of Web ads’ market share will increase [23]. According to a recent report from the Interactive Advertising Bureau (IAB) and PricewaterhouseCoopers (PwC), Internet advertising revenues for 2007 are estimated to grow to $21.1 billion, a 25 percent increase over the previous revenue record of nearly $16.9 billion for 2006 [23]. Also, the Kelsey Group recently provided a global estimate of $45 billion for Internet advertising in 2007, and it predicted Internet advertisement revenues to reach $147 billion globally by 2012 in its annual forecast [33].

The methods of Web advertisement are becoming more complicated and sophisticated to attract more Internet users. Many studies have reported that Web advertisements do not attract people very well. Also, people can improve their information seeking strategies because they are learning how to improve their search skills on the Internet. Additionally, commercial software is available which blocks any advertisements on the Web. However, if the website owners cannot generate revenue through online advertisements, eventually the customers will have to pay for the information content of a website.

Table 1. Input and Output Variables Influencing Information Seeking Performance.

<table>
<thead>
<tr>
<th>Type of Variable</th>
<th>Input Variable</th>
<th>Output Variable</th>
</tr>
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<tbody>
<tr>
<td>Type of Component</td>
<td>Web Ads</td>
<td>Website</td>
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Variables that could be considered as outputs of a study were selected in terms of reactions to Web ads and viewers’ information seeking behaviors on the website. The output
Therefore, poorly designed Web advertisements can be a serious problem for website owners and viewers as Web ads will hinder website viewers’ information-seeking behaviors. Prior research on the effectiveness of advertising reported that the presence of advertising in online content can negatively affect user evaluations of the content [35]. Also, poorly designed Web advertising can be more disruptive to information seeking than well-designed Web advertising [35], and it will increase the difficulty of task performance [48]. Therefore, we need to consider a guideline to regulate Web ads that help viewers’ information-seeking behaviors and promote information encountering.

6. IDEAL FUTURE OF INFORMATION SEEKING AND WEB ADS

Website owners need to approach Web ads from the perspective of viewers since they are the content consumers of websites. Also, Web ad providers should consider viewers because they are the exact people who respond to Web ads. Based upon our reviews of various studies on Web ads and their effects on viewers, we can provide this guideline for both Web ad providers and website owners. We categorized this guideline into two main entities including Web Ad and Website. Based on the literature on Web ads, this guideline provides a comprehensive picture of Web ads, Viewer, and Website. We believe this guideline can provide valuable advertising strategies to minimize viewers’ annoyance with Web ads and to maximize Web ads’ effects on viewers in terms of information encountering.

6.1 Web Ads Guideline

There are five main elements to consider when designing Web ads. These elements include: movement, onset timing, place location, color scheme, and banner size.

First, Web ad designers should avoid highly animated banners. Even though early studies reported that animation grabbed viewers’ attention and had a significant impact on click-through rates [8; 27; 48], recent studies found that there were no significant relationships between the use of animation and the ability to recall, recognize, and click banner ads [1; 12; 36]. Furthermore, it was reported that recollections of highly animated banner ads were especially bad [5; 46]. Regarding task performance, the highly animated flash banners increased viewers’ workload and decreased visual search speeds [6; 21]. Therefore, website owners should avoid using highly animated Web ads on their websites. Positive attitudes toward Web advertising increase the likelihood that a consumer will make an online purchase [26].

Second, Web ads should be displayed at the top of a Web page, and at the beginning or end of search processes. Research has found that onset timing affects users’ information-seeking performances [18; 49; 50]. Onset timing is related to when a Web ad appears on the screen in relation to a viewer’s task on the website [51]. Animation that appeared in the middle or toward the end of an information seeking task had a more negative effect on attention than animation that appeared at the beginning of the task [18; 49; 50]. This is due to the notion that different levels of depth in a meaningful path and the amount of attention allocated to the content of a Web page are not the same [41]. Therefore, both website owners and Web ad providers need to locate the Web ads in the earlier or later phases of a path in order to increase the effectiveness of Web ads and viewers’ task performances.

Third, Web ads are better when located at the right side of Web page, and website owners prevent pop-up or pop-under methods. The ads’ location can be designated into two categories: one is two-dimensional location on the display screen, and the other is vertical location of ads such as in-line, pop-up, and pop-under. Banners on the left side of the screen were found to be more disturbing than those on the right side [49; 50]. Therefore, if there is a Web ad on the left side of screen, it will distract viewers more severely. In regards to vertical location, users were more positive about ads and brands in in-line ads compared to pop-up ads [11]. Several studies reported that pop-up ads were perceived as irritating, annoying, and intrusive [13; 28; 30]. Therefore, website owners and Web ad designers should use in-line ads rather than pop-up or pop-under ads. The pop-ups and pop-unders are no longer effective, and they increase viewers’ negative feelings.

Fourth, Web ad designers should use a medium level of color scheme rather than low or high levels. The color scheme of Web ads is one of the most important design elements. A couple of studies reported that bright colored animation had a stronger effect than dull colored animation in grabbing viewers’ attention [47; 48]. A medium level of color had better click-through rates than low or high levels of color advertisements [29]. Therefore, Web ad designers should use moderate color schemes rather than colors which are too dull or too bright.

Fifth, website owners need to standardize the size of banners and charge more for larger size banners. The non-standardized size of banners can distract people more than standardized banners [23]. IAB provides a guideline about the various banner sizes for Web ads, and they recommend that Web ad designers follow the guideline to maximize the effects of Web ads and minimize users’ distraction. Also, website owners should charge more for large banner sizes. Large banner ads enhanced reaction time and triggered a higher click-through rate than small banner ads [8; 27]. If a Web page displays a large size banner, the banner will attract more people to the Web page. Therefore, a website owner should have more compensation for attracting more users’ attention to the banner ad.

6.2 Website Guideline

Websites are an important playground for users’ information seeking with regard to Web ads. There are several criteria which website owners and Web ad providers should think about.

First, website owners need to regularly maintain their websites and be sure that they are user-friendly. Website layouts affect the effects of Web ads and information seeking. The simplest background was helpful in terms of attitude toward ads [38]. A Web ad contained in a website with an established reputation induced a more favorable attitude toward the ad [37]. Also, a humanlike navigation interface led to more favorable attitudes toward the ad and better ad information recall [44]. Website owners should strive to make their websites more useful for their users. Then, the website holders can gain more benefits from the positive attitudes toward Web ads which results from the clear and useful layout of websites.

Second, website owners need to consider users’ search strategies when they include Web ads on their websites. Viewers’ search strategies on a host website were found to be a significant factor in terms of viewers’ memory for Web ads [51]. Several studies agreed that users who browsed websites aimlessly tended to recognize and recall more Web ads than goal-directed users [7; 10; 21; 25; 34]. One study found that focused viewers perceived
interruptions as more severe than non-focused viewers [13]. Therefore, the website owners who have more focused users need to be careful so that their Web ads do not affect users' information seeking. Focused users may object to interruptions more than other users who are browsing a website.

Third, Web ad providers need to consider the websites’ credibility. Several researchers found that perceived website credibility is positively and directly related to attitude toward the Web ads [4; 9]. Also, consumers who have a positive response to websites are more likely to recall brands advertised on the Web than those who do not respond positively [17]. Therefore, if a website has better credibility the viewers will have a positive attitude towards the Web ads on the website. So, website owners may need to increase their websites’ credibility in order to increase positive attitudes toward the websites.

Fourth, Web ad providers need to display their ads on the websites which have relevant content to the ads. The congruity between Web ads and website content was found to be important for the effectiveness of Web ads [3; 30]. The relevance between ads and websites is positively and directly related to attitude toward the Web ads and memory of brands [9; 31; 32; 45]. This means that the congruity between a website and Web ads has a favorable effect on customers’ attitudes toward ads. Therefore, Web ad providers may need to display their ads on the websites which have content related to their Web ads.

7. CONCLUSION

7.1 Summary of the Key Findings

This research provides a comprehensive guideline for Web ad providers and website owners by reviewing extensive empirical research on Web ads and information seeking. The Web ads and the websites are the two main components which need to be considered when Web ads are displayed on websites. In terms of Web ads, we recommend that: 1) Web ad designers should avoid highly animated banners; 2) Web ads should be displayed at the top of a Web page and at the beginning or end of search processes; 3) Web ads are better located on the right side of the Web page, and website owners should prevent pop-up or pop-under methods; 4) Web ad designers should use a medium level of colors rather than low or high levels of color ads; 5) website owners need to regularize the size of banners and charge more for bigger size banners. Also, in terms of websites, we recommend that: 1) website owners need to maintain their websites regularly and ensure that they are user-friendly; 2) website owners need to consider users’ search strategies when they include Web ads on their websites; 3) Web ad providers need to consider the websites’ credibility; 4) and finally, Web ad providers need to display their ads on websites which have content relevant to the ads. The Web ad providers and website owners will derive benefits from these findings by attracting more viewers toward their Web ads, and users will gain benefits by minimizing annoyance from Web ads and promoting the information encountering experience.

7.2 Future Research Direction

We believe that current studies on information seeking behaviors under Web ads are not adequate. More research is needed on the interactions of different information seeking contexts and Web ads. To this date, however, our understanding of how viewers react to Web ads and how Web ads affect viewers in information seeking situations is still limited. Also, we may need a balanced view about Web ads and information seeking. Most research is focused on how Web ads negatively affect users’ information seeking behaviors. However, if the Web ad providers cannot generate their sales from Web ads, then they will not want to display their ads online. This will reduce the revenue of the website owners, and subsequently they will not be able to provide high quality information for their users. On the other hand, if users are distracted by online advertisements or, if they feel annoyed by the Web ads, the users will not want to visit the website anymore. Therefore, we need to consider various perspectives of the three stakeholders including the Web ad providers, website owners, and viewers in the future research. There is a great need for future research in this important area.

8. ACKNOWLEDGMENTS

We would like to thank the two anonymous reviewers for their valuable feedback.

9. REFERENCES


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