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Abstract

This research-in-progress analyzes the impacts of geospatial website attributes on eImage, or the online image of an organization. Specifically, geospatial attributes on websites of service-oriented businesses that must convince consumers to visit their physical locations are addressed. Limited existing research regarding geospatial website attributes provided the motivation to conduct this study. Additionally, the moderating impact of geospatial reasoning ability on eImage is explored. The results of this study will further electronic commerce and human-computer interaction research, expand the understanding of website attributes and their effects on eImage, as well as provide practical guidance for web designers.

Keywords

eImage, eCommerce, Human-Computer Interaction, Geospatial Website Attributes, Web Design, Web Usability, Online Mapping, Geospatial Reasoning Ability.

1. Introduction

Geospatial website attributes, or website content consisting of address information, embedded maps or driving directions, are often considered essential elements of service-oriented business. Unlike businesses that can conduct transactions without face-to-face interaction, many service-oriented businesses, such as automotive repair centers, hotels and restaurants must convince a prospective customer to visit their physical locations.

While there are several geospatial attributes that can be added to a business website, from a simple physical address to an embedded online mapping service, there is little understanding about how these attributes are implemented or which of these attributes have the greatest impact on an organization's eImage.

The questions addressed by this research include; How are service-oriented businesses implementing geospatial website attributes? Which geospatial website attributes positively influence the eImage of an organization?

As service-oriented businesses strive to stay competitive by building and maintaining their online presence to drive customer visits, some do not consider the importance of including geospatial website attributes, such as embedded maps, which provide crucial cartographic information that

can ultimately increase business and lead to additional revenue. Without an understanding of which geospatial website attributes should be included, and what their specific benefits are, many businesses simply mimic competitor websites. This research project aims to identify the geospatial website attributes allowing service-oriented business websites to increase their eImage most effectively.

This paper is organized as follows. The next sections provide a review of geospatial website attributes as well as eImage. Then, the conceptual research model and hypotheses are presented. Next, the research methodology of both the Phase I Study, the identification of geospatial website attributes and their uses by service-oriented industries, as well as the Phase II Study, the identification of which geospatial website attributes most influence an organization's eImage are presented. Finally, a discussion of the limitations, implications and direction of future research is presented.

2. Geospatial Website Attributes

Five geospatial website attributes that are commonly found on service-oriented business websites will be analyzed in this research. These include physical addresses, written directions, custom maps, embedded online mapping services and direct links to online mapping services. The analysis examines how these website attributes are currently implemented by service-oriented businesses, as well as their influence on the service-oriented businesses' eImage. Each of these geospatial website attributes provides various levels of information richness and relevance as well as requiring various levels of prior knowledge to be effective. See Table 1 for definitions of each of the attributes in the context of this research.

Geospatial Website Component	Definition
Physical Address	Provides the street number and name, city name and state at a minimum.
Written Directions	Turn-by-turn directions to direct someone to a business location.
Custom Maps	Maps that are integrated into a website to provide aesthetic compatibility while providing the minimum level of relevant information necessary to locate the business.
Embedded Online Mapping Service	Provides an interactive third-party map embedded in a business website.
Direct Link to an Online Mapping Service	A link that forwards the prospective customer to a third-party online mapping service, usually with the target location highlighted on the map.

Table 1: Definitions of Geospatial Website Attributes

Service-oriented businesses frequently employ the use of geospatial website attributes by either linking directly to an online mapping service or by embedding an online mapping tool, provided by an online-mapping service, directly into their website content. Businesses also include static maps, which may be simple screenshots taken from online mapping services, or custom static maps created by professional graphic designers or cartographers. Such custom maps are treated as a unique mode of geospatial website attributes in this study, as they may provide schematization of geospatial information, which has been shown to provide utility. Often, custom maps found on websites focusing on only the most relevant information necessary to locate a business. The utility of such simplified maps has been demonstrated in research

(Agrawala and Stolte, 2001). Additionally, Klippel et al. (2005) suggest that modern cartographers can successfully develop schematic maps that are simplified, yet provide "cognitively adequate representations of environmental knowledge."

3. eImage

The term eImage is defined as the online image of a business or an individual, composed of various factors including, website appearance, website content and an online reputation acquired from online ranking systems and user feedback (Gregg and Walczak, 2008). In 2009, Walczak and Gregg further defined eImage as "all of the characteristics and impressions of a business that are assessable through electronic signals."

Within the marketing scholarship, an organization's brand image is approximately equivalent to reputation, or the perception of a business by others (Reynolds, 1965). Similarly, eImage is how consumers, investors, suppliers, partners and the general public perceive an organization though electronic mediums. The perception of such groups is essential to the success of an organization, thus identifying all factors that contribute to eImage provides scholarly and practical value. While it has been shown that website attributes contribute to eImage, no studies have specifically addressed the inclusion of geospatial website attributes and determined if such attributes contribute to an organization's eImage.

4. Research Model

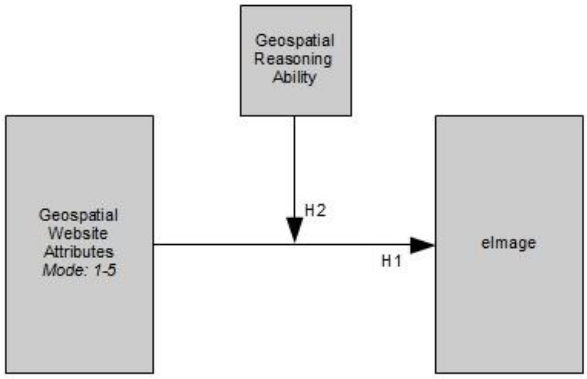

Figure 1: Research Model

Gregg and Walczak (2008) found that including website attributes, such as return policies, email addresses and thorough product descriptions positively impact an organization's eImage. The focus of this prior research was on eCommerce businesses and did not include the impact of geospatial website attributes on eImage. However, including maps and other geospatial data on a website is one way a service business can enhance the professionalism of their website (similar to return policies for eCommerce businesses). Thus, we posit:

H_1: Inclusion of geospatial website attributes positively impact eImage.

4.1 Geospatial Reasoning Ability

The lack of pre-existing geospatial reasoning ability of a prospective customer may reduce the ability to effectively utilize geospatial website attributes. Spatial reasoning ability, such as that which is relied upon by military cartographers performing terrain analysis or developers of geographic information systems, is stated to be a widespread human reasoning ability (Frank, 1992); however, as geospatial attributes and web-mapping reach beyond the realm of cartographers and spatial analysts, spatial reasoning may become a key success factor for technology acceptance. To manage these assumptions, geospatial reasoning ability will be treated as a moderating variable and measured using an instrument developed by Erskine and Gregg (2011). Thus, we posit:

> *H_2: Geospatial reasoning ability moderates the positive impacts of geospatial website attributes on eImage.*

5. Research Methodology

To test the proposed research model, a two phased study is being conducted to first understand how geospatial website attributes are implemented, then to determine their effect on eImage. The Phase I Study was completed in October of 2009. It is estimated that the Phase II Study will be completed by late 2012.

5.1 Phase I Study

To test the above theoretical model it was crucial to gain an understanding of how service-oriented businesses incorporate online mapping services into their marketing strategies. To accomplish this, a sample (n=90) of service-oriented businesses was selected. The sampling included equal numbers of businesses from major cities in three regions of the United States: Seattle, Denver and Boston. Additionally, to ensure a wide spectrum of service businesses, the research analyzed equal numbers of businesses from three service-oriented sectors: automotive repair, restaurants and hotels. As some businesses did not have a website and others simply shared a website with a larger organization (such as franchises) the total number of reviewable websites was reduced to 75. Of these 75 sites, each was analyzed to determine whether their websites included an address, written directions, a static map, an embedded online mapping application, or a link to an online mapping service.

This initial research determined that 98.6% (74 out of 75) of service-oriented business websites included on address. Fifty-two percent (39 out of 75) of the sites included written directions. Thirty-three percent (25 out of 75) included a static map. Forty-five percent (34 out of 75) of the websites reviewed included an embedded online mapping service, while only 32% (24 out of 75) provided a link to an online mapping service. Additionally, of the sites visited, only about 9% (8 out of 75) had no static map, embedded map or link to an online mapping service whatsoever. Results of this initial research revealed that service-oriented business use various types of geospatial website attributes. The goal of the Phase II Study will be to determine which geospatial website attribute modes have the greatest positive effect on eImage.

5.2 Phase II Study

The second phase of this research will examine the effects of geospatial website attributes on eImage. This phase will utilize a survey of potential service-oriented business customers to

determine their perceptions of a service-oriented businesses' eImage, where the only difference between the websites is the mode of geospatial website attribute presented. Geospatial reasoning ability will be included as a potential moderating variable.

Spatial Element	Usage by Sector			*Total Usage*
	Automotive Repair	Restaurant	Hotel	
Address	21/21	26/27	27/27	*74/75*
Written Directions	4/21	9/27	26/27	*39/75*
Static Map	7/21	9/27	9/27	*25/75*
Embedded Online Mapping Application	14/21	13/27	7/27	*34/75*
Link to an Online Mapping Service	6/21	5/27	13/27	*24/75*

Table 2: Geospatial Website Attributes on Service-Oriented Business Websites by Sector

This research will utilize surveys developed in prior research to measure both eImage (Walczak and Gregg, 2009) and geospatial reasoning ability (Erskine and Gregg, 2011). The survey experiment is currently in progress. Upon completion of the administration of the survey instrument, a PLS analysis will be conducted to determine the validity of the hypothesized model.

6. Conclusion

This research-in-progress seeks to reveal the impacts of geospatial website attributes on eImage. Additionally, the impact of geospatial reasoning ability as a moderating variable between the presentation mode of geospatial website attributes and eImage is taken into account. The results of this study will expand the understanding of website attributes and their effects on eImage, which will further electronic commerce and human-computer interaction research, as well as provide practical guidance for web designers.

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