Impact of Advertising Appeal Type and Interactivity Level of Digital Signage on Attitude toward Advertising and sharing intention

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Abstract

This study empirically analyzed the effect of advertising appeal types (information appeal vs. image appeal) and interactivity level (low vs. medium vs. high) of digital signage on consumers’ advertising attitude and sharing intention.

As a result of the study, first First, it was found that medium interactivity digital signage had a more positive impact on advertisement attitude and sharing intention than high- or low-interactivity signage. Additionally, rational/informative advertising was found to have a more positive impact on advertisement attitude and sharing intention than emotional/image advertising when the interactivity level was medium. Second, when the interactivity level of digital signage was high, it was found that emotional advertising had a positive impact on attitude, but both rational and emotional advertising had a negative impact on sharing intention. Third, rational advertising was found to have a positive impact on attitude and sharing intention when the interactivity level of digital signage was low.

Given the increasing convergence of digital media, particularly with respect to advertising signage, the results of this study provide important strategic direction for the construction of effective advertising with regard to appeal type and interactivity level.

Keywords: Digital Signage, Advertising Appeal, Interactivity, Attitude toward Advertising, Sharing Intention

1. Introduction

In today’s changing media market, the phenomenon of digital convergence is occurring with increasing rapidity. Digital convergence describes the blurring of boundaries between shared digital services and media (such as broadcasting and telecommunications) due to technological development. New forms of advertising are emerging in response to this convergence, as consumers increasingly embrace active, rather than passive media consumption behaviors, such as active information gathering, participating, and sharing. In response to this convergence and change, digital signage is developing equally rapidly.

The definition of digital signage varies among scholars and related institutional organizations; however, most generally define it as signage that uses a digital information display (DID) to provide textual or audiovisual information, such as entertainment or advertising, in public or commercial spaces. In recent years, digital signage has evolved to allow two-way communication through the incorporation of a variety of complementary technologies, such as smart media, enabling the signage to transcend a simple informational display. Digital signage has expanded consumer-advertisement interaction beyond simple, traditional exposure, and is changing faster than any other medium. The effect is even more direct and dramatic when considering that consumers are naturally exposed to advertising messages by outdoor advertising and when purchasing products [11].

While more and more marketers incorporate smart signage (i.e., media convergence of smart phone, SNS, and digital signage) as an integral part of integrated marketing communications, far fewer studies examine the effectiveness of this emerging media platform.

There is significant interest in developing digital signage to provide a wide range of interactive experiences between users and media devices. However, while consumers interact with digital signage in a number of important dimensions, a higher level of interactivity has not been observed to increase the effectiveness of advertising messages contained therein. In fact, consumers’ escape capacity has
been found to increase proportionally when blindly increasing the interactivity level of digital signage, thereby negatively impacting consumer attitudes toward, and memory of, the signage [12][13]. However, previous studies have not proposed a concrete interactivity level that would positively impact the communicative effectiveness of digital signage. Thus, this study aims to empirically investigate differences in advertisement attitude and sharing intention depending on the advertising appeal type (rational appeal vs. emotional appeal) and interactivity level (low, medium, or high) of digital signage.

2. Research Background and Hypothesis

Billboard advertising, like other traditional media, has so far relied on simple exposure to convey messages to consumers. However, the recent emergence of new media in online and mobile environments has shifted the marketing communications paradigm to an interactive, media-oriented structure. Correspondingly, the latest digital signage is evolving faster than other media, especially with regard to user interaction. Thus, while digital signage was previously considered an unfamiliar medium, its role in advertising is gradually increasing as it serves as a daily point of contact for consumers. Many companies have increased their use of digital signage as part of a communication strategy to promote a direct, interactive user experience (UX), rather than the simple, passive experience previously offered by traditional media. Indeed, research has found that higher interactivity levels were associated with a proportional increase in information acceptance, thereby positively affecting memory of and attitude toward the information conveyed. However, interactivity requiring additional information or behavior above a certain level could negatively impact communication [12][13]. Interactivity is one of the major factors affecting new media advertising, and an important feature that distinguishes digital media from traditional media [3][10]. Various studies have been conducted to analyze the effects of interactivity; for example, interactivity was found to positively impact the effectiveness of Internet advertising [10][8]. In contrast, a study of outdoor advertising found that advertising invasiveness and immersiveness negatively impacted consumer attitudes. From these studies, one can be conclude that a higher level of interactivity in advertising may be associated with a perception of increased invasiveness, thereby provoking negative consumer attitudes [11].

Additionally, in their study on the effect of interactivity on memory, judgment, and engagement with smart signage, Han et al. (2013) reported that lower interactivity levels were associated with a higher rate of recollection, but also with a lower level of judgment-related diagnostic characteristics. Thus, it would be desirable to maintain a digital signage interactivity level high enough to simultaneously increase memory and judgment [12][13]. As such, the fact that a higher interactivity level has a positive communication effect is consistent with studies on the effects of interactivity on Internet advertising. Internet media present a simple experience relying mainly on visual and auditory stimuli, leading to a largely proportional relationship between the level of interactivity and the effectiveness of communication. Digital signage, however, communicates with consumers through multiple approaches, including the senses, emotions, behavior, cognition, relationships, etc.; thus, taking this multiplicity into account, a higher interactivity level in this context would not always lead to a positive communication effect.

Thus, to maximize the effectiveness of interactive digital signage, it is imperative to find the points of contact between various communication factors and effects, both quantitative (e.g. number of levels of interactivity) and qualitative (e.g. types of advertising appeal). Advertising appeal, also known as appeal type or plead type, refers to the linguistic or visual content of advertising. The existing appeal classification framework, as first defined by Hartman (1963), can be broadly divided between rational appeal, an informative approach which appeals to the user’s cognitive faculties, and emotional appeal, which appeals to the user’s moods and emotions (although the use of this term varies widely in relevant literature)[5][7].

Rational advertising, also known as attribute-based or information conveyance advertising, emphasizes the objective, concrete, and functional benefits of a product. Information contained in such advertising, when processed by consumers using logic or reason, may change consumers’ beliefs, attitudes, or behavior. Rational advertising also improves consumers’ knowledge of a particular product or brand [1]. Thus, rational advertising aims to influence consumers’ knowledge of and attitude toward products by providing information that can produce a positive cognitive reaction. On the other hand, emotional advertising, also known as image advertising or end-oriented advertising, uses moods and images to associate products with emotional benefits. Such advertising aims to make the consumer
feel emotions like passion, vitality, enjoyment, or belonging, and connects these reactions to corresponding brands or products. Thus, the most appropriate appeal method can be chosen by determining whether the product can be positioned as a way to satisfy a consumer desire (emotional), or to solve a consumer problem (rational).

This study summarized many previous studies of digital signage, classifying them by whether they focused on rational advertising or emotional advertising [2][9]. Overall, while most studies argued that the persuasive power of advertising varied depending on product type and consumer factors, they found that rational advertising is most effective in cases where competing brands are differentiated, when a product is first introduced or used by most consumers, and when the product’s usage situation is not special. Emotional advertising, on the other hand, was found to be most effective in cases where the degree of product involvement is high, consumers are highly knowledgeable about the products, and where the product is perceived negatively compared with competing brands.

When summarizing these studies, it was also found that, overall, an extremely high or low level of interactivity in digital signage was likely to reduce the communication effect, suggesting a medium level of interactivity would be most effective. Moreover, if the interactivity level was extremely high or low, users would spend more time searching for peripheral information than for core information, such as basic product attributes, suggesting that emotional/image advertising would be more effective in such situations than rational/informational advertising. On the other hand, consumers would be more motivated to search for information when the interactivity level is medium, thereby increasing consumer interest in core product information. In such a situation, consumers could be expected to be more positively disposed to rational/informative advertising than by emotional/image advertising, and, correspondingly, more likely to spread positive information about the product via word-of-mouth. Based on this review, the following hypotheses were proposed.

H1: Digital signage with a medium level of interactivity might positively affect consumers’ intent to share the advertisement.

H2: Digital signage with a high level of interactivity that incorporates emotional advertising might more positively affect consumer advertisement attitude and sharing intention than would signage incorporating rational/informative advertising.

H3: Digital signage with a medium level of interactivity that incorporates rational/informational advertising might more positively affect consumer advertisement attitude and sharing intention than signage incorporating emotional/image advertising.

H4: Digital signage with a low level of interactivity that incorporates emotional/image advertising might more positively affect consumer advertisement attitude and sharing intention than signage incorporating rational/informative advertising.

3. Research Method

This study installed two digital signs in a specific space in order to test the effects of the two basic types of advertising (rational vs. emotional appeal) on advertisement attitude and sharing intention depending on the interactivity level (low, medium, or high). In order to measure these effects, this experiment utilized a 2x3 factorial design to account for two types of advertising appeal (rational vs. emotional) and three levels of interactivity (low, medium, and high). The results were analyzed using two-way MANOVA.

First, two types of advertisements were constructed for presentation on digital signage: a rational/informative advertisement, and an emotional/image advertisement. The experimental material was formulated to advertise a type of tablet PC, as this product was significantly preferred by our sample subjects (university students). A fictional brand of tablet PC called "Smart P" was devised in order to rule out brand familiarity as a factor that could affect the results. The rational/informative advertisement concretely stated the five most important tablet PC product attributes (mobility, design, touch functionality, camera functionality, and screen resolution and size), as suggested by preliminary survey results. The emotional/image advertisement, in contrast, only showed a model using the product, with no other product information. Manipulation verification performed on this advertising appeal
model showed a statistically significant difference between the rational advertisement and the emotional advertisement ($M_{\text{information appeal}} = 5.57$ vs. $M_{\text{image appeal}} = 3.20$, $t(184) = 14.84$, $p < .01$).

Next, the interactivity level of the digital signage was manipulated. The low-interactivity sign allowed a single type of interaction: (1) searching for information via touch screen. The medium-interactivity sign allowed three types of interaction: (1) searching for information via touch screen, (2) taking a photo, and (3) transferring the photo to a smartphone. The high-interactivity sign allowed five types of interaction: (1) searching for information via touch screen, (2) taking a photo, (3) transferring the photo to a smartphone, (4) uploading the photo to Facebook, and (5) conducting a QR search via smartphone. Manipulation verification performed on this interactivity model showed a statistically significant difference between levels ($M_{\text{low interactivity}} = 2.58$ vs. $M_{\text{medium interactivity}} = 4.30$ vs. $M_{\text{high interactivity}} = 6.11$, $df(2) = 37.42$, $p < .01$).

**4. Results**

First, the study conducted a Two-Way MANOVA analysis with the advertising appeal types (information appeal vs. image appeal) of digital signage and the interactivity level (low vs. medium vs. high) as the independent variables and the advertisement attitude and sharing intention as the dependent variables for verification of the hypotheses.

As a result of MANOVA analysis of <Table 2>, the main effect on the advertising appeal types (information appeal vs. image appeal) was found to have a statistically significant difference with Wilks' Lambda value of .58 ($F=63.56$, $df=2$, $p<.01$). In addition, the main effect on the interactivity level (low vs. medium vs. high) was found to have a statistically significant difference with Wilks' Lambda value of .04 ($F=350.73$, $df=4$, $p<.01$). Lastly, the interaction effect on the two independent variables was found to have a statistically significant difference with Wilks' Lambda value of .13 ($F=150.63$, $df=4$, $p<.01$).

Next, a statistical significance difference was verified through a post-ANOVA analysis. First of all, the advertisement attitude ($F=39.27$, $p<.01$), which was the dependent variable, was found to have a statistically significant difference in the post-ANOVA analysis on the advertising appeal types (information appeal vs. image appeal). Moreover, the sharing intention ($F=87.39$, $p<.01$) was found to have a significant difference. Also from the post-ANOVA analysis on the interactivity level (low vs. medium vs. high), the advertisement attitude ($F=348.63$, $p<.01$), which was the dependent variable, was found to have a statistically significant difference, and the sharing intention ($F=1477.04$, $p<.01$) was also found to have a significant difference. Lastly, also from the post-ANOVA analysis on the interaction effect for the advertising appeal type and interactivity, both of the advertisement attitude ($F=384.39$, $p<.01$) and the sharing intention ($F=4921$, $p<.01$) were found to have a significant difference.

**Table 1. Mean and Std. Deviation**

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Appeal Types</th>
<th>Interactivity</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude toward Advertising</td>
<td>Information Appeal</td>
<td>Low</td>
<td>4.73</td>
<td>0.41</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medium</td>
<td>6.27</td>
<td>0.41</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>2.50</td>
<td>0.53</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>4.54</td>
<td>1.62</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>Image Appeal</td>
<td>Medium</td>
<td>3.32</td>
<td>0.39</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>4.55</td>
<td>0.30</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>4.48</td>
<td>0.6</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>4.09</td>
<td>0.67</td>
<td>91</td>
</tr>
<tr>
<td>Sharing Intention</td>
<td>Information Appeal</td>
<td>Low</td>
<td>4.67</td>
<td>0.45</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medium</td>
<td>6.31</td>
<td>0.39</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>2.15</td>
<td>0.32</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>4.42</td>
<td>1.77</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>Image</td>
<td>Low</td>
<td>3.31</td>
<td>0.25</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medium</td>
<td>5.99</td>
<td>0.61</td>
<td>27</td>
</tr>
</tbody>
</table>
Table 2. Result of MANOVA and ANOVA

<table>
<thead>
<tr>
<th>Main Effect</th>
<th>MANOVA</th>
<th>ANOVA (F)</th>
<th>Sharing Intention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wilks’Lambda</td>
<td>F</td>
<td>d.f</td>
</tr>
<tr>
<td>A: Appeal</td>
<td>.58</td>
<td>63.56**</td>
<td>1</td>
</tr>
<tr>
<td>B: Interactivity</td>
<td>.04</td>
<td>305.73**</td>
<td>2</td>
</tr>
<tr>
<td>A X B</td>
<td>.13</td>
<td>150.63**</td>
<td>21</td>
</tr>
</tbody>
</table>

Note: *p<.05, **p<.01

Based on these results, the following hypotheses were analyzed comprehensively.

<Hypothesis 1> expected that the advertisement attitude and sharing intention might be positive in the case where the interactivity level of digital signage was medium. As a result of the study, The advertisement attitude (M=5.55, SD=0.93) of the case where the interactivity level was medium was higher than the case where the interactivity level was low (M=4.01, SD=0.81) and the case where the interactivity level was high (M=3.51, SD=1.09) (p<.01). Moreover, as for the sharing intention as well, the sharing intention of the case where the interactivity level was medium (M=6.16, SD=0.52) was higher than the case where the interactivity level was low (M=3.98, SD=0.77) and the interactivity level was high (M=2.15, SD=0.32) (p<.01). Thus, <Hypothesis 1> was accepted.

<Hypothesis 2> expected that image appeal might be more positive for advertisement attitude and sharing intention than information appeal in the case where the interactivity level of digital signage was high. As a result of the study, the advertisement attitude of image appeal (M=4.48, SD=0.36) was found to be higher than the advertisement attitude of information appeal (M=2.50, SD=0.53) in the case where the interactivity level was high (p<.01). However, as for the sharing intention, it was found to be low without any difference between the information appeal (M=2.15, SD=0.32) in the case of high interactivity level and the image appeal (M=2.16, SD=0.32) (p>.05). Thus, <Hypothesis 2> was partially accepted.

<Hypothesis 3> expected that information appeal might be more positive for advertisement attitude and sharing intention than image appeal in the case where the interactivity level of digital signage was medium. As a result of the study, the advertisement attitude of information appeal (M=6.27, SD=0.41) was found to be higher than the advertisement attitude of image appeal (M=4.55, SD=0.30) in the case where the interactivity level was medium (p<.01). Moreover, as for the sharing intention, the sharing intention of information appeal (M=6.31, SD=0.39) was found to be higher than the image appeal (M=5.98, SD=0.61) in the case where the interactivity level was medium (p<.05). Thus, all of <Hypothesis 3> were accepted.

<Hypothesis 4> expected that image appeal might be more positive for advertisement attitude and sharing intention than information appeal in the case where the interactivity level of digital signage was low. As a result of the study, the advertisement attitude of image appeal (M=4.73, SD=0.41) was found to be higher than the advertisement attitude of image appeal (M=3.32, SD=0.39) (p<.01), which was contrary to the hypothesis. As for the sharing intention, as contrary to the hypothesis, the sharing intention of image appeal (M=4.67, SD=0.45) was found to be higher than the sharing intention of image appeal (M=3.31, SD=0.25) in the case where the interactivity level was low (p<.01). Thus, all of <Hypothesis 4> were rejected.

5. Conclusions

This study empirically analyzed the effect of advertising appeal types (information appeal vs. image appeal) and interactivity level (low vs. medium vs. high) of digital signage on consumers’ advertising attitude and sharing intention.

First, it was found that medium interactivity digital signage had a more positive impact on advertisement attitude and sharing intention than high- or low-interactivity signage. Additionally, rational/informative advertising was found to have a more positive impact on advertisement attitude and sharing intention than emotional/image advertising when the interactivity level was medium. This
supports the findings of previous studies that have observed advertising attitude and memory to be inversely proportional to interactivity level. Thus, it is important to strategically design convergent advertising technology with the interactivity level most appropriate for the type of advertising used (rational or emotional).

Second, when the interactivity level of digital signage was high, it was found that emotional advertising had a positive impact on attitude, but both rational and emotional advertising had a negative impact on sharing intention. This suggests that digital signage taking an emotional advertising approach could temporarily raise consumers’ advertisement attitude by adopting a higher interaction level. However, a more measured and careful approach to interactivity is suggested in order to increase the word-of-mouth effect in the long term.

Third, rational advertising was found to have a positive impact on attitude and sharing intention when the interactivity level of digital signage was low. This contradicts previous studies that found a medium interactivity level to be best suited to the presentation of core information, as high and low levels of interactivity increased the likelihood that consumers would use the interface to search for peripheral information.

Given the increasing convergence of digital media, particularly with respect to advertising signage, the results of this study provide important strategic direction for the construction of effective advertising with regard to appeal type and interactivity level. Recently some technologies to increase interactivity by converging smart phone and SNS appear as digital signage grows rapidly. But the important finding of this study is that if interactivity level of digital signage is increased unconditionally, avoidance level also increases, which gives negative effects to attitude or memory. Therefore, it is rather necessary to figure out a way to increase engagement through optimum interactivity level. That is, it is certainly necessary to have a strategic view to enable the convergence of technology and contents by securing some contents which may increase Smart signage technology and engagement, to minimize interactivity level of digital signage.

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7. References


