

The Level of Interactivity of Smart Signage and the Effects Depening on the Type of Creative Appeal

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Abstract

The objective of this study was to empirically analyze the effect of advertising appeal types (rational vs. emotional) and interactivity level (low vs. medium vs. high) of smart signage on the consumers' attitude toward advertising and word-of-mouth. As a result of the study, first, it was found that medium interactivity level of smart signage had a more positive impact on attitude toward advertising and word-of-mouth than extremely high- or low-interactivity signage. Additionally, when the interactivity level was medium, informative advertising was found to have a more positive impact on advertisement attitude and word-of-mouth than emotional advertising. Second, when the interactivity level of smart signage was high, it was found that emotional advertising appeal had a positive impact on attitude, but both emotional and informative advertising appeals had a negative impact on word-of-mouth. Third, when the interactivity level of smart signage was low, rational appeal in advertising was found to have a positive impact on attitude and word-of-mouth.

Keywords: Advertising Appeal, Component, Interactivity, Smart Signage, Word-of-Mouth

1. Introduction

As a form of smart signage, smart signage uses a Digital Rational Display (DID) to enable users to directly touch rational on advertising screen or to connect with mobile devices, such as smart phone, thereby increasing the interactivity level¹. Smart signage has an advantage at increasing interactivity as it enables users to selectively accept rational and advertisements among a variety of them available simultaneously and it also allows the users to connect with their smart media.

The recent emergence of new media based on the Internet and mobile environments is shifting the marketing communications paradigm to interactive media-oriented structure. Higher interactivity level is found to be associated with an increase in rational

acceptance, thereby positively affecting the retention of the rational conveyed as well as the attitude toward it². Various studies have been conducted to analyze the effects of interactivity of Internet advertising and they have consistently found that interactivity positively impacts the effectiveness of Internet advertising³. However, as the smart signage media is conveyed in various direct forms, including sensual, emotional, behavioral, cognitive and relational, a higher interactivity level would not always lead to a positive communication effect. Accordingly, it is imperative to rediscover the point of contact at which the effectiveness of the most appropriate communication is maximized when quantitative and qualitative levels of interactivity are considered simultaneously. However, studies regarding the interactivity of smart advertising are not being conducted as only the online effect of inter-

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activity is accepted. In addition, the strategic perspective of smart advertising is neglected in the smart advertising media industry because of the expectation that effectiveness will increase when the interactivity level is raised unconditionally.

While interaction with smart signage is conducted variously across a number of important dimensions, a higher level of interactivity is not observed to increase the effectiveness of communication with users. Hence, this study aims to empirically investigate the differences in advertisement attitude and word-of-mouth based on the advertising appeal type (rational appeal vs. emotional appeal) and interactivity level (low vs. medium vs. high) of smart signage.

2. Theoretical Background and Hypothesis

2.1 Smart Signage

Smart signage can be referred to as “the integration rational system that uses a digital imaging device in a particular place, provides a variety of rational over network and interacts with users”⁴. It is more appropriate to interpret smart signage as an innovative form of traditional outdoor advertising media in the context of the advancement of rational technology (IT) rather than as a new concept. In this perspective, smart signage emerges as an alternative advertising media, which has an easy access to consumers. Particularly, smart signage, such as point of in-store purchase video advertising, is considered a more valuable advertising media since it is close to the point of purchase, hence, serving the purpose of advertising. Thus, signage should evolve from a general advertising and rational display to a smart signage platform that stimulates interest and excitement through interactive touch or approach and on which payment service is available to enable purchasing.

2.2 Interactivity and Advertising Appeal

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Recently, many companies have started focusing on a communication strategy to promote a direct and interactive user experience (UX) rather than the simple and passive experience previously offered by the traditional media. The emergence of new media based on Internet and mobile environments is shifting the marketing communications paradigm to interactive media-oriented structure. Higher interactivity level is found to be associated with an increase in rational acceptance, thereby positively affecting the retention of the rational conveyed as well as the attitude toward it. Various studies have been conducted to analyze the effects of interactivity of Internet advertising and found that interactivity positively impacts the effectiveness of Internet advertising⁵. Regarding outdoor media, including smart signage or smart signage, consumers often touch smart signage installed at certain places (theaters, public offices, and shopping malls) out of curiosity or interest. In addition, consumers are not seated comfortably, like at home or office, when they access through the Internet. Instead, they are in a public space when they use smart signage even for a moment and, thus, a higher level of interactivity in advertising may actually reduce the effectiveness of communication. The invasive and immersive characteristics of advertising are found to have a negative impact on attitude toward it⁶⁻⁸. This implies that a higher level of interactivity in advertising may be associated with a perception of increased invasiveness, thereby provoking negative attitude.

Considering the technological advances, it is time to develop a communication strategy by applying the effect of interactivity, which is studied for Internet media, on media, such as smart signage, in a situation where various attempts are made to increase the interactivity of smart advertising. Although there are slightly different perceptions with regard to the meaning of the existing appeal framework that classifies advertising messages, the framework can be broadly divided between rational appeal, which appeals to cognitive rational processing and emotional appeal, which appeals to various moods and emotions⁹. Rational conveyance advertising emphasizes the objective, concrete and functional value of a product when describing its benefits. On the other hand, emotional advertising communicates the emotional benefits associated with the use of a product and is oriented toward factors that stimulate the consumers' emotions regarding a product, that is, moods and emotional.

Eventually, the communication effect is likely to decrease when the interactivity level of smart signage is extremely high or low. Thus, a medium level of interactivity will be most effective. Moreover, if the interactivity level is extremely high or low, users spend more time searching for peripheral rational than for core rational, such as basic product attributes. Thus, emotional advertising will be more effective than informative advertising. On the contrary, when the interactivity level is medium, consumers are more motivated to search for relevant rational, thereby increasing their interest in the core product. In this situation, consumers have a more positive attitude toward rational appeal than emotional appeal and correspondingly, they are more likely to spread positive rational about a product via word-of-mouth. Based on this theoretical discussion, the following hypotheses are proposed

Hypothesis 1: Smart signage, with a medium level of interactivity, will have a positive effect on the consumers' attitude toward advertising and word-of-mouth.

Hypothesis 2: Smart signage, with a high level of interactivity that incorporates emotional appeal, will have a more positive effect on the consumers' attitude toward advertising and intent to word-of-mouth the advertisement than smart signage incorporating rational appeal.

Hypothesis 3: Smart signage, with a medium level of interactivity that incorporates rational appeal, will have a more positive effect on consumer advertisement attitude and word-of-mouth than smart signage incorporating emotional appeal.

Hypothesis 4: Smart signage, with a low level of interactivity that incorporates emotional appeal, will have a more positive effect on consumer advertisement attitude and word-of-mouth than smart signage incorporating rational appeal.

3. Research Method

3.1 Manipulation of Experimental Advertisement

This study experimentally tested the effects of the two basic types of advertising (rational appeal and emotional appeal) on advertisement attitude and word-of-mouth depending on the interactivity level (low vs. medium vs. high). To measure the effects, two digital signs were installed in a particular area.

To manipulate experimental advertisement, “informative” advertisement and “emotional” advertisement were each presented on smart signage. The smart signage used in the experiment is 1.92 meters high and has a 46-inch vertical touch screen display. “Tablet PC,” which is preferred by subjects, that is, university students, was selected as the target product of the experiment. Additionally, a fictional brand of tablet PC called “Smart P” was devised in order to prevent a confounding effect due to brand familiarity.

Two types of advertisements were prepared for presentation on smart signage: “informative” advertisement and “emotional” advertisement. The informative advertisement clearly stated the five main attributes of the tablet PC (“mobility,” “design,” “touch functionality,” “camera functionality” and “screen resolution and size”) that were suggested by the preliminary survey results. The emotional advertisement, in contrast, only presented background music and a model using the product, with no other product rational.

Manipulation verification of the advertising appeal showed a statistically significant difference between rational appeal and emotional appeal ($M_{\text{rational appeal}} = 5.57$ vs. $M_{\text{emotional appeal}} = 3.20$, $t(184) = 14.84$, $p < 0.01$).

Finally, the interactivity level of the smart signage was manipulated. The low-interactivity signage allowed a single type of interaction (advertising exposure via touch screen). The medium interactivity signage allowed three

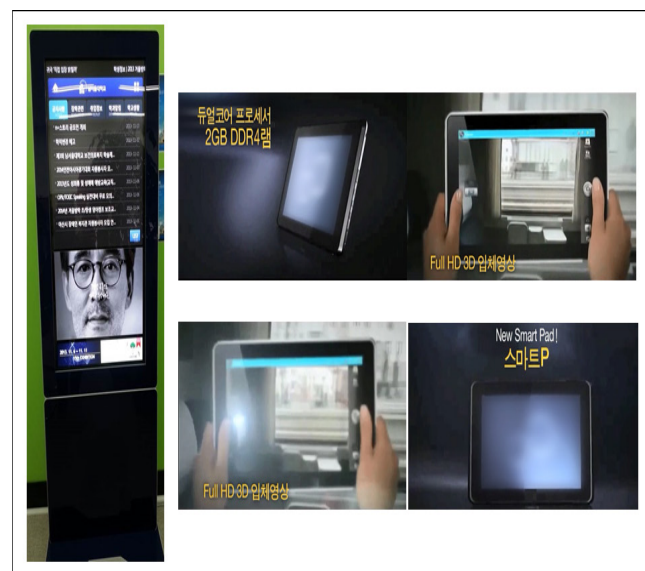


Figure 1. Smart signage for experiment.

types of interaction 1) advertising exposure via touch screen, 2) taking a photo and 3) transferring the photo to a smartphone). The high-interactivity signage allowed five types of interaction 1) searching for rational via touch screen, 2) taking a photo, 3) transferring the photo to a smartphone, 4) uploading the photo to Facebook and 5) posting the review on Facebook).

Manipulation verification of the interactivity level showed a statistically significant difference [between levels] ($M_{\text{low interactivity}} = 2.58$ vs. $M_{\text{medium interactivity}} = 4.30$ vs. $M_{\text{high interactivity}} = 6.11$, $df(2) = 337.42$, $p < 0.01$).

3.2 Experimental Procedure and Analysis

This experiment utilized a 2×3 factorial design to account for advertising appeal types (rational appeal vs. emotional appeal) and interactivity levels (low vs. medium vs. high) and a Two-Way MANOVA analysis was conducted.

In this experiment, randomly selected sample subjects – university students – came to the campus at an appointed time to directly operate the smart signage installed at a particular area in the university campus. The subjects were informed in advance that the purpose of the virtual product advertising on smart signage was to examine the reaction of consumers for the final advertisement production, and they were instructed to always

respond to the survey questions after operating the smart signage advertising.

Although 213 subjects (university students) participated in this experiment, only 186 responses were considered for the final analysis to account for error in the experimental process and exclusion of unreliable responses.

3.3 Results

To verify the hypotheses, the study included the Two-Way MANOVA analysis with the advertising appeal types (rational appeal vs. emotional appeal) of smart signage. The interactivity levels (low vs. medium vs. high) were considered the independent variables and the advertisement attitude and word-of-mouth were assigned as the dependent variables.

As a result of the study on <Hypothesis 1>, the advertisement attitude ($M = 5.81$, $SD = 0.73$) of the case where the interactivity level was medium was higher than the case where the interactivity level was low ($M = 3.98$, $SD = 0.75$) and the case where the interactivity level was high ($M = 3.24$, $SD = 0.98$) ($p < 0.01$). Furthermore, the word-of-mouth of the case where the interactivity level was medium ($M = 5.99$, $SD = 0.62$) was higher than the case where the interactivity level was low ($M = 4.12$, $SD = 0.81$)

Table 1. Mean and Std. Deviation

Dependent	Appeal	Interactivity	Mean	Std. Deviation	N
Aad	Rational	Low	4.84	0.38	31
		Medium	6.05	0.38	33
		High	2.47	0.62	31
		Total	4.43	1.54	95
	Emotional	Low	3.32	0.39	32
		Medium	4.38	0.54	27
		High	4.51	0.62	32
		Total	4.12	0.76	91
WOM	Rational	Low	4.24	0.56	31
		Medium	6.23	0.31	33
		High	2.65	0.42	31
		Total	4.24	1.42	95
	Emotional	Low	3.47	0.37	32
		Medium	4.98	0.61	27
		High	2.16	0.41	32
		Total	4.21	1.32	91

Table 2. Results of ANOVA

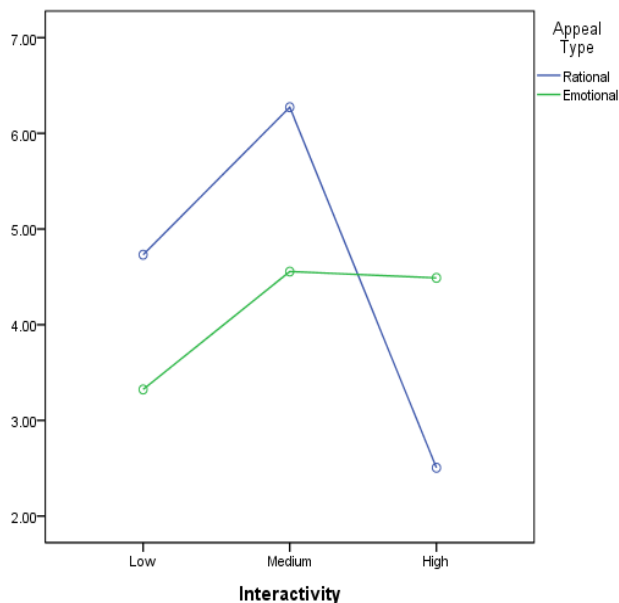
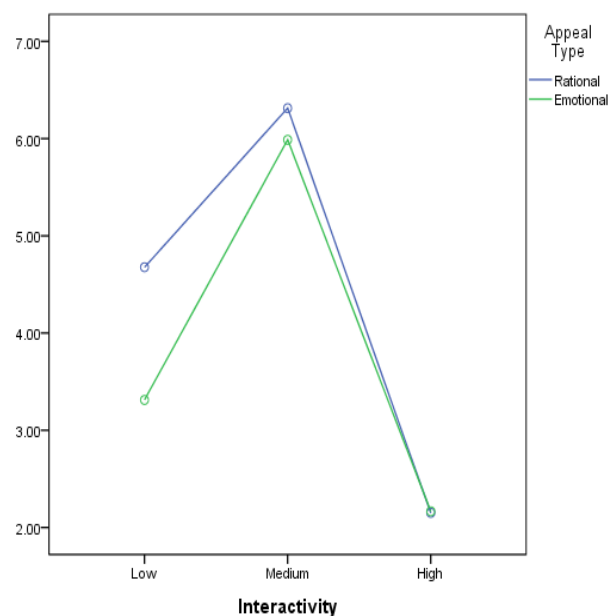
Main Effect	MANOVA		ANOVA(F)		
	Wilks' Lambda	F	df	Aad	WOM
A:appeal	.62	54.47**	1	41.32**	73.24**
B:interactivity	.12	346.42**	2	213.97**	389.91**
AxB	.23	126.41**	2	371.01**	38.51**

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

and the interactivity level was high ($M = 2.54$, $SD = 0.53$) ($p < 0.01$). Thus, <Hypothesis 1> was accepted.

As a result of the study on <Hypothesis 2>, the advertisement attitude of emotional appeal ($M = 4.51$, $SD = 0.24$) was higher than the advertisement attitude of rational appeal ($M = 2.47$, $SD = 0.62$) in the case where the interactivity level was high ($p < 0.01$). However, the word-of-mouth was low without any difference between the rational appeal ($M = 2.65$, $SD = 0.42$) in the case of high interactivity level and the emotional appeal ($M = 2.68$, $SD = 0.23$) ($p > 0.05$). Thus, <Hypothesis 2> was partially accepted.

As a result of the study on <Hypothesis 3>, the advertisement attitude of rational appeal ($M = 6.05$, $SD = 0.38$) was found to be higher than the advertisement attitude

**Figure 2.** Appeal Type x Interactivity in Aad.**Figure 3.** Appeal Type x Interactivity in WOM.

of emotional appeal ($M = 4.38$, $SD = 0.54$) in the case where the interactivity level was medium ($p < 0.01$). Furthermore, the word-of-mouth of rational appeal ($M = 6.23$, $SD = 0.31$) was found to be higher than the emotional appeal ($M = 4.89$, $SD = 0.41$) in the case where the interactivity level was medium ($p < 0.05$). Thus, <Hypothesis 3> was accepted in entirety.

As a result of the study on <Hypothesis 4>, the advertisement attitude of rational appeal ($M = 4.95$, $SD = 0.44$) was found to be higher than the advertisement attitude of emotional appeal ($M = 3.65$, $SD = 0.37$) ($p < 0.01$), which is contrary to the hypothesis. Again, as contrary to the hypothesis, the word-of-mouth of rational appeal ($M = 4.84$, $SD = 0.38$) was found to be higher than the word-of-

mouth of emotional appeal ($M = 3.47$, $SD = 0.37$) in the case where the interactivity level was low ($p < 0.01$). Thus, <Hypothesis 4> was rejected in entirety.

4. Conclusion

The smart signage advertising market is expected to facilitate the emergence of a new type of media as it competes with or complements traditional outdoor advertising. The spread of smart media devices, Social Network Service (SNS) and advances in IT are all contributing to changing social trends, which has led to a rapid transformation in the environment of the advertising market. The advertising market is fast approaching an era where the role and spread of smart signage will be very important.

This study empirically analyzed the effect of advertising appeal types (rational appeal vs. emotional appeal) and interactivity level (low vs. medium vs. high) of smart signage on attitude toward advertising and word-of-mouth.

The study found that, first, smart signage with medium interactivity level had a more positive impact on advertisement attitude and word-of-mouth than smart signage with extremely high- or low-interactivity level. Moreover, informative advertising was found to have a more positive impact on attitude toward advertising and word-of-mouth than emotional advertising, when the interactivity level was medium. As smart signage grows rapidly, recent technological advancements have led to enhanced interactivity by converging the features of smart phone and SNS. However, the important finding of this study is that if the interactivity level of smart signage is increased unconditionally, avoidance level also increases, which has a negative effect on attitude or memory. Hence, it is necessary to have a strategic view of the optimum interactivity level to enable the convergence of technology and contents through product attributes rather than via rational in emotional form.

Second, when the interactivity level of smart signage was high, it was found that emotional advertising had a positive effect on attitude, but both emotional and informative advertising had a negative effect on word-of-mouth.

Third, when the interactivity level of smart signage was low, informative advertising was found to have a positive effect on attitude and word-of-mouth. This implies that in the case of digital media, such as smart signage, consumers are more motivated to search for rational when the

interactivity level is low. This increases their motivation to process core product rational and positively affects informative advertising rather than emotional advertising.

Given the recent emergence of smart media, setting of optimum interactivity level and developing the rational content in a strategic dimension are growing practical concerns. Thus, the results of this study are expected to provide an important strategic direction. They will be an indicator that can help in determining the point of contacts where the effectiveness of the most appropriate communication is maximized when quantitative and qualitative levels of interactivity are considered simultaneously.

5. Acknowledgement

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