

The Advertising Effectiveness: Fighting Between Ecommerce and Traditional Retailers-- An Empirical Study

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Abstract

Electronic commerce has experienced tremendous growth over the past twenty years and become a driving force in retail industry. Since Apple introduced its first iPhone in 2007, smartphones have penetrated more than 70% of the American population, further fueling the growth of e-commerce. American adults spend more time on their digital gadgets and do commerce. Marketers have spent more advertising dollars on e-commerce, as they can better target potential buyers through programmatic advertising, particularly when they find that digital users are interested in particular products they browse. This study compares the advertising effectiveness on digital users and traditional retail shoppers. The results of this study reveal some useful insights for marketers in their future marketing endeavors.

Keywords: mobile commerce, m-commerce, electronic commerce, e-commerce.

1. Introduction

US e-commerce sales have reached \$526 billion, about 10% of all retail sales in 2018 and will grow about 15% to reach \$602 billion, about 11% of the total retail sales in 2019. Of all e-commerce, m-commerce growth is at a much faster pace over the past years. The bulk of US retail m-commerce growth is in line with rapid growth of smartphone sales, as smartphones have penetrated more than 72% of the population in the US in 2018, and the average adult daily usage of smartphones has outpaced the use of personal computers for the first time a year earlier (eMarketer, 2018). IP traffic grew in double digits for the past years (Cisco, 2018).

The phenomenon of rapidly growing e-commerce has become an interest for researchers to explore smartphone user behavior, and this empirical study intends to focus on the advertising effectiveness on smartphone users, in order to learn some insights for marketers in their strategic thinking.

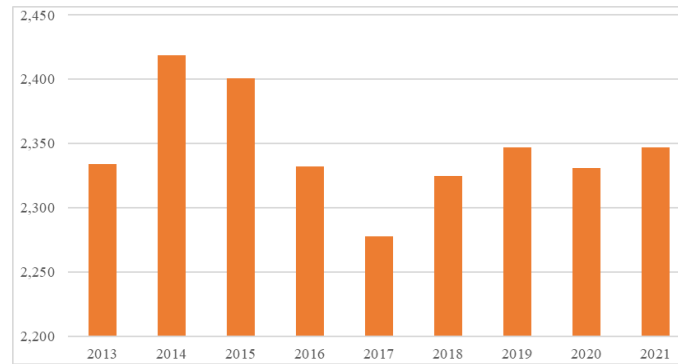
2. Review of Literature

The global market for e-commerce has been fueled by the availability of all digital gadgets: computers, tablets, and smartphones, etc. Figure 1 presents the worldwide digital gadget shipment in the past 6 years and prediction for the next three years.

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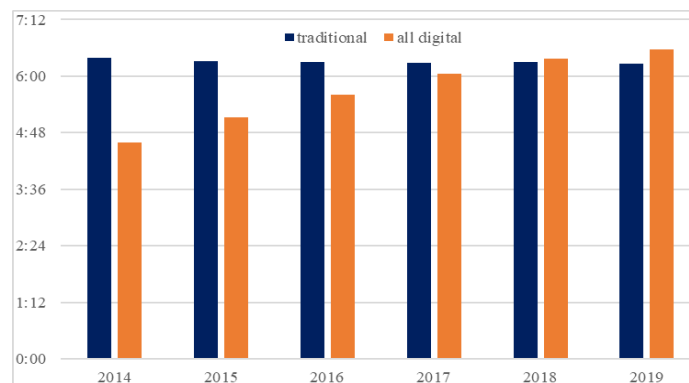
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Figure 1: Global digital gadget shipment, 2013-2021, in mil of units.

Source: Statista, 2019. <https://www.statista.com/statistics/265878/global-shipments-of-pcs-tablets-ultra-mobiles-mobile-phones/>

During the past years, adults have spent more time on their electronic gadget than on the traditional media, and this trend will continue. Figure 2 illustrates this trend.

Figure 2: Time spent per adult user per day on digital gadget vs traditional media, USA

Source: eMarketer, June 2017. The last three years are prediction. <https://www.emarketer.com/Report/US-Time-Spent-with-Media-eMarketers-Updated-Estimates-2017/2002142>

Dinner et al. (2010) studied the effect of digital advertising on offline sales, focusing on measuring this effect by using dynamic linear programming. Their study concludes that advertising cross-effects are large, particularly from digital advertising to offline sales, and that advertising has differential effects on customer counts and spending across channels. This sales decomposition allows the firm to align its advertising spending with its advertising objectives. Karimova's (2011) study discussed the claim that "interactive" advertising is a "two-way communication" while "traditional" advertising is a "one way communication". The author argued the incorrectness of this claim by addressing the etymology of the word "communication". She asserted that the term "two-way communication" is tautological and the term "one-way communication" is contradictory, because the word "communication" implies mutual exchange. She furthered that the main goal of any type of advertising is to sell a product or service. Consumer's feedback is purchasing (or refusal to purchase) the product or service by the target group.

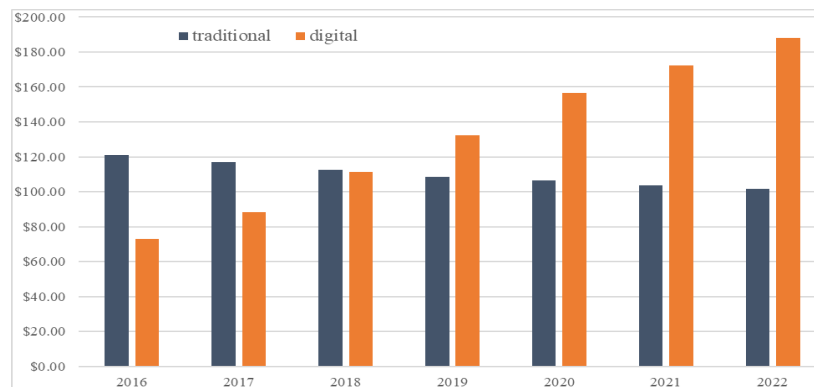
A study conducted by Agarwal, et al (2011) used data generated through a field experiment for several keywords from an online retailer's ad campaign. Using a hierarchical Bayesian model, the authors measure the impact of ad placement on both clicks-through and conversion rates. They find that while click-through rate decreases with position, conversion rate increases with position and is even higher for more specific keywords. The net effect is that, contrary to the conventional wisdom in the industry, the topmost position is not necessarily the revenue- or profit-maximizing position. The authors' results, while aimed at firms participating in sponsored search auctions, provide insight into consumer behavior and advertising strategies in these types of environments. Flosi, S., Fulgoni, G. & Vollman, A. (2013) tried to identify and to better understand the incidence of sub-optimal digital campaign delivery as it pertains to viewability, audience delivery, geographic targeting, and brand safety.

The study highlighted and evaluated the implications for the digital advertising ecosystem of several significant empirical generalizations that have emerged. Cook (2014) investigates online advertising on smartphone and tablets. He challenges researchers to improve survey taking on mobile devices. He believes that over the next five years, the use of touch-screen mobile devices will grow dramatically, and respondents can be expected to use them at a higher rate, as the screens expand (somewhat) and the devices gain more multi-purpose media use.

Each year, digital devices, particularly smartphones entice us to spend more time with them, but the way we're spending that time is changing: more time on smartphones and apps, and less time on tablets and the mobile web. But even as smartphones are ascendant, within a few years the average adult may hit the upper limit of how much time he or she is willing to spend with the device, according to the research report done by eMarketer (eMarketer, Sept. 2018).

Kim et al (2017) focuses on digital shopping, particularly mobile shopping through apps. They believe that smartphones shopping provides promising market opportunities for retailers. They examine two stages in mobile shopping: the possession of shopping applications (hereafter, apps) and the purchase via shopping apps. Their exploratory investigation of mobile data and its empirical analyses provide three substantive findings: 1. online experience and mobile experience both positively relate to the possession of shopping apps; 2. browsing behavior for non-shopping apps helps understand the possession of shopping apps as it reflects user preferences for acquiring more apps; 3. purchasing decisions are explained by digital experience and browsing information from shopping apps, with other factors being of little predictive value. Figure 3 presents the advertising spending on digital gadget and traditional media.

Figure 3: Global Ad spending comparisons between digital and traditional, in bil. of US\$



Source: eMarketer, Sept. 2018. 2019-2022 figures are prediction. <https://www.emarketer.com/Chart/US-Total-Media-Ad-Spending-by-Media-2016-2022-billions/222668>

Stewart and Cunningham (2017), and Ford (2017) studied the mobile form of marketing and revealed that this platform offered consumers unique experiences and a diverse selection of content. They discovered that with so many platforms at consumers' disposal, advertisers struggle to track the usage of each platform and the response to advertising on it. Marketers aim to reach, resonate with, and evoke a reaction from the right audience at the right time, which increases the importance of multiplatform metrics. They offered further theoretical explanations and managerial implications.

Hsu and Yeh (2018) find four critical success factors that influence ecommerce adoption, particularly mcommerce adoption: perceived ease of use, perceived usefulness, value-added and service functionality. In addition, these factors were identified as the cause and effect factors. The results of this study are presented to mcommerce service providers' in facilitating the development of wireless services. Lin, et al (2017) explored the determinants of consumers' use of mobile commerce, and their act of payment. They found that security concerns and privacy concerns are the most important factors.

Raphaeli, et al (2017) analyzed online consumer behavior in mobile and PC devices. They investigated and compared online consumer behavior on an e-retailer website in mobile versus PC devices, through the application of a web usage mining approach on clickstream data recorded in server-side log files. Online consumer behavior is characterized through both engagement measures and the discovery of common sequences of navigation patterns, using an innovative approach that combines footstep graph visualization with sequential association rule mining.

They found that sessions conducted through mobile devices are more likely to consist of task-oriented behavior whereas sessions conducted through PC devices are characterized by a more exploration-oriented browsing behavior. They also found that certain sequence rules were associated with an increased likelihood of purchase in both mobile and PC sessions.

Chao (2018) investigated the relationships between/among mobile commerce, electronic commerce and traditional retail businesses, as the first two emerged as important sectors in retail businesses. The average adult daily usage of smart phone outpaced personal computers for the first time, and the users do more commerce on their smartphones than on their personal computers. As marketers have spent more advertisement on digital media, particularly on smartphones. The marketers realize that they can better target potential customers through programmatic advertising when they find the digital users are interested in particular products they browse.

The review of literature tenders a wide range of aspects for mobile commerce. This study intends to focus only on the fundamental issues through an empirical study: the effectiveness of digital media marketing vs. the traditional media marketing. The authors hope to gain some useful insights for marketers in their future marketing endeavors.

3. Methodology

This study focuses on the effectiveness of digital media marketing vs. the traditional media marketing. A survey questionnaire was designed to investigate these that were important for the advertisers.

3.1 Variable Selection

The variables that were selected are based on our literature review. Twelve research variables were identified from the review of literature and presented below. The respondents were asked to identify how frequently they were aware of the advertising messages, presented either in the mobile form or in the form of the traditional media. The respondents were asked to evaluate the frequency they would notice each of these variable messages advertised in mobile advertising and in traditional media advertising. Five point Likert scale is applied, with 5=always, 4=mostly, 3=frequently, 2=occasionally, 1=never.

The following variables were evaluated:

1. Product quality and features offering
2. Offering free samples
3. Offering free trials
4. Offering attractive prices
5. Offering discounts and promotion
6. Offering coupons
7. Offering rebates
8. Offering incentives to buyers in online store or retail stores
9. Offering free delivery or delivery incentives
10. Offering prizes
11. Offering sweepstakes
12. Offering sport or cultural sponsorship

3.2. Sampling, Hypotheses, and Tests of Hypotheses

The targeted sample respondents were college students in a large university in the northeast of the U.S. One-page survey questionnaires were distributed online over past semesters to target respondents, specifically with the aim of obtaining the opinions of the respondents who are often exposed to both traditional and mobile advertising. The null hypotheses for this study stated:

- H₁ There is no significant difference in product quality and/or features offering between mobile media and traditional media advertising.
- H₂ There is no significant difference in offering free samples between mobile media and traditional media advertising.
- H₃ There is no significant difference in offering free trials between mobile media and traditional media advertising.
- H₄ There is no significant difference in offering attractive prices between mobile media and traditional media advertising.

- H₅ There is no significant difference in offering discounts and promotion between mobile media and traditional media advertising.
- H₆ There is no significant difference in offering coupons between mobile media and traditional media advertising.
- H₇ There is no significant difference in offering rebates between mobile media and traditional media advertising.
- H₈ There is no significant difference in offering incentives to buyers in mobile media store or retail stores between mobile media and traditional media advertising.
- H₉ There is no significant difference in offering free delivery or delivery incentives between mobile media and traditional media advertising.
- H₁₀ There is no significant difference in offering prizes between mobile media and traditional media advertising.
- H₁₁ There is no significant difference in offering sweepstakes between mobile media and traditional media advertising.
- H₁₂ There is no significant difference in offering sport or cultural sponsorship between mobile media and traditional media advertising.

The alternative hypotheses state: there is significant relationship between the respondents' views of mobile media advertising and traditional media advertising over these selected variables.

When two samples are involved and the values for each sample are collected from the same individuals (that is, each individual gives two values, one for each of the two categories), or the samples come from matched pairs of individuals, the Marginal Homogeneity Test can be used. If the significance level is less than the desired level, then the dependent sample means will be different, and if the significance level is greater than the desired level, then the mean of the dependent samples will be the same. It tests whether combinations of values between two paired ordinal variables are equally likely. The marginal homogeneity test is typically used in repeated measures situations. Since the data collected in this study is of ordinal scaling, as the respondents were asked to provide their opinions on the paired variables: mobile advertising and traditional media advertising, the use of marginal homogeneity test is appropriate. The null hypotheses should be rejected if the significance level is less than or equal to 5% in any one criterion (Hamburg, 1977; Conover, 1980; Davis and Cosenza, 1985; IBM SPSS Exact Tests, SPSS Inc. 2010).

4. Results

One thousand two hundred questionnaires were distributed college students and staffs in a large university in the northeast of the U.S., of which three hundred ninety three were returned and usable. This represents roughly 33 percent response rate. The following table presents the background information of these respondents, including gender and income.

Table 1. Background Information of the Respondents

Age	<18	1.5
	19-35	93.6
	36-50	4.6
	>50	0.3
Gender	male	53.2
	female	46.8
Family income in USD	<35k	15.0
	35-50k	21.6
	50-75k	21.4
	>75k	42.0
Education	college	91.1
	graduate	8.9
Marital Status	married	7.6
	single	92.4
Have a smartphone	yes	94.7
	no	5.3
Phone's Operating system	Apple	86.8
	Android	13.0
	Windows	0.3

Source: Original

Overall, the means of traditional media advertising are higher than those of smartphone advertising. Table 2 shows the Marginal Homogeneity Test results. It indicates that only one of paired variables test result shows significance levels less than 5% (highlighted in bold). Therefore, one hypothesis where there is significant differences between the respondents' views of smartphone advertising versus traditional advertising messages is rejected. The other 11 paired variables test results show significance levels more than 5%. Therefore, these hypotheses are accepted: for these promotional elements there are no significant differences in the respondents' awareness based on smartphone advertising messages and the traditional media advertising messages.

Table 2. The Marginal Homogeneity Tests

Variables	MH Statistic	Sig.
Product quality and features offering	717	0.000
Offering free samples	677	0.000
Offering free trials	659	0.000
Offering attractive prices	727	0.000
Offering discounts and promotion	747	0.000
Offering coupons	684	0.000
Offering rebates	652	0.000
Offering incentives to buyers in online store or retail stores	780	0.000
Offering free delivery or delivery incentives	675	0.303
Offering prizes	514	0.402
Offering sweepstakes	486	0.423
Offering sport or cultural sponsorship	556	0.794

5. Managerial Implications and Recommendations

The Marginal Homogeneity Test results reject eight of the twelve null hypotheses; therefore, the study concludes that there are statistically significant differences from the consumers' viewpoints between smartphone and traditional media advertising. The findings suggest that traditional media will continue to hold its position as a result of the rise of smartphone. The two may work more effectively together to yield better advertising.

The rejections of **Product quality and features offering, Offering free samples, Offering free trials, Offering attractive prices, Offering discounts and promotion, Offering coupons, Offering rebates, Offering incentives to buyers in online store or retail stores**, indicate the respondents still favor traditional media advertising, even the respondents spend more time on their smartphones, and explore the offers of various products and/or services on their smartphone, and it seems much easier for the users to access these offers. The rejections offer a glimpse that more promotion can be better targeted to the potential buyer groups via smartphones, rather than on the traditional media.

This study accepts four hypotheses: **Offering free delivery or delivery incentives, Offering prizes, Offering sweepstakes, Offering sport or cultural sponsorship**, as there are no statistically significant differences in effectiveness of the listed marketing activities between smartphone and traditional media advertising. This may suggest, from the consumers' viewpoints, it is less important for advertisers focusing on these issues when they are allocating funds to different advertising media.

The findings of this study may also suggest that traditional media advertising are still an effective way to send the messages to the target customers as compared to the smartphone advertising messages. Credibility of this suggestion should be tested further, as this study has a preliminary nature. Smartphone advertising has emerged as a great challenge to traditional media advertising, not only because of its many advantages, but also because it gives advertisers an additional channel to reach their potential customers and often obtain instant feedback.

While researchers are inquiring the truth, practitioners are experimenting with new ways to reach their target customers; therefore the crowded advertising market is getting more crowded. The results of this research also suggest that smartphone advertising has a strong presence, and it will work hand-in-hand with traditional media advertising. A strategic balancing between the traditional media and smartphone advertising will make advertising industry more effective.

6. Limitations and Future Research

The academic research that focuses on comparisons between traditional media and smartphone advertising is limited, and it may take some years before significant research publications are available. As a preliminary and exploratory research, this study has provided if only limited glimpses of some fundamental aspects of smartphone advertising. Further in-depth research should delve more into the factors and elements that predict the effectiveness of traditional media versus smartphone advertising. Would consumers eventually prefer more smartphone advertising in the future? Does the younger generation differ from the older generation since younger people work more smartphone? As some of the respondents commented, they find using the smartphone enable them to handily obtain products and/or service related information. These issues should also be addressed in future research.

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