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INDUSTRIAL ECONOMICS

ADVERTISING AND FIRM PRODUCTIVITY

GROUP 3

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EXAMINING THE EFFECTS OF ADVERTISMENT ON FIRM PRODUCTIVITY: THE CASE OF TELECOMMUNICATION INDUSTRY IN GHANA.

ABSTRACT

This research paper seeks to investigate key effects of advertising on firms in the telecommunication industry. Per the case study, Phillip Nelson's theory of quality signaling was applied with the experience and search goods assumptions, keeping in mind that no firm within any industry can keep a constant productivity level to retain proportionate profits without meeting the needs of its customers. Data utilized were in the form of both primary and secondary data. From the analysis, effects of advertising on productivity levels identified were in two forms: direct effects being advertising scale economies, brand loyalty, market-share stability and indirect effects being price and quality. The results support previous studies' findings of the quality signaling model to some extent and highlight the effects of advertising on productivity levels of intangible goods' industries, using preferences of the consumers examined with theoretical knowledge and interpretive approach.

SIGNIFICANCE OF STUDY

Significance of this study is to increase the awareness of advertisements and its effects on firm productivity with a second focus on further increasing the existing body of knowledge that supports Nelson's quality signaling model.

RESEARCH OBJECTIVES

1. To utilize quality signaling model and assumptions to also give some extent of evidence to back previous studies that support Nelson's model.
2. To further examine the effects of advertising on telecommunications providers' productivity.
3. To examine customers level of response to high and low advertising and its corresponding effect on firm productivity.
4. To understand how repurchasing is influenced by brand loyalty.

INTRODUCTION

Advertising originates from the Latin verb "clamare" which means screaming or "reclamare" which means echo. It is persuasive medium designed to ultimately influence purchase behavior. Advertising has economic, social, cultural, political and international effects on societies and firms.

Around the world, advertising expenditures having a positive influence on firm market demand as proven by the Dorfman Steiner condition (Dorfman & Steiner, 1954), seems to consume quite some amount of a country's GDP and Ghana's case is no different. Over the years the country has been experiencing progressive growth in advertising expenditures and this expected to grow further (A. Guttmann, 2019), especially in terms of the services sector which the telecommunication service providers are a part of.

Some of the modes and mediums of advertising employed by these telecommunication providers include: Television, Radio, SMS, Social media, automated voice calls. These mediums are used as a means to showcase products and services to the public to either entice, inform or persuade them to make purchases for these products.

To understand the effects of advertising on firm productivity, we first consider the types of advertising as:

1. Persuasive Advertising
2. Informative Advertising

Persuasive advertising deals with claims about the product which are not objectively verifiable, to change consumer perception to stimulate sales.

Informative advertising involves giving consumers information to make informed choices and to acknowledge existence of the product. The direct effects of advertising have been noted as Advertising scale economies, brand loyalty, sales market share stability whereas its indirect effects are price and quality. Also taking a key interest in the type of goods offered within the telecommunication industry as intangible goods in form of services which has a direct relation to experience goods propounded by (Nelson, 1970),(Nelson, 1974) as goods that consumers first experienced in order to ascertain quality.

With the background information given, we seek to investigate the effect of advertising on productivity of telecommunication providers, providers of intangible goods, using Nelson's model of quality signaling to illustrate the effects arrived at. We chose this approach on the basis that firms producing higher-quality services will recover their advertising expenditures when their numerous satisfied customers repurchase, while firms producing lower-quality goods will not be able to do so. Realizing this, consumers rationally infer that advertised goods are of better quality and are willing to pay more for them from the outset. Therefore consumers exposed to high quality products accompanied with high advertisements may patronize experience goods of this nature if the satisfaction is met and cease to if the advertisement does not meet the described quality of the product.

Two types of quantitative data were collected; Primary data and Secondary data. Means of delivery was through Google survey sheets. Analysis and visualizations were conducted with open source data science tools. A stratified random sampling method was used. This ensured that every member of the population with a unique set of network mix had equal chance of being part of the sample.

LITERATURE REVIEW

Advertising is a powerful tool of competition. It provides valuable information about products and services in an efficient and cost effective manner (Nerlove & Arrow, 1962). It helps the economy function smoothly, keeps prices low and facilitates entry of new products and firms into the market. It is believed that companies spend money on advertising because it increases the sales of already existing products, helps grow the adoption of new products, builds brand loyalty, and takes sales away from competitors. Therefore every company aimed at making profits, must incur advertising expenditures. For this reason all telecommunication providers in Ghana take advertising seriously. They engage in repetitive advertising to increase consumers' awareness for their available products and offers, by so doing reduce, consumer's search costs (time spent looking for products) and reduce dis-utility (unhappiness or loss of value) from picking wrong products. By improving market awareness, advertising also improves the firm's competitive position, increasing consumer preferences, and strengthens the brand image (Koslow, Sasser, & Riordan, 2006). Pollay and Mittal (1993) observed that advertising often stimulates demand, thus stimulating sales and increasing the firm's productivity. Yet there are those who oppose this view. Hanssens, Parsons, and Schultz (2003) suggest that the sales performance does not necessarily increase with greater advertising spending. Other business literature research also indicates that advertising does not necessarily generate an expected sales return, rather it has a moderate influence on short and long term sales (Berndt, Bui, Reiley, & Urban, 1995).

Schmalensee (1978) argued that a firm producing a low-quality product at a very low cost might find it profitable to advertise extensively, if it could sell the low-quality product at a high enough price to first-time buyers, even if they never repurchase. His argument surrounds the size of the price-cost mark-up for the low-quality product. When mark-up is high, the producer of the low- quality product might spend more on advertising than the producer of a high-quality product.

Caves and Greene (1996) with empirical evidence surrounding consumer reports, suggest that there was no statistically significant positive correlation between product quality and advertising of consumer reports quality ratings for 196 products and their respective advertising expenditures. We would like note that these empirical evidences by Caves and Schmalensee, though holding some support were analyzed with tangible goods without noting that with intangibility, customers move towards quality and price more than they move towards quantity preferences.

McPherson and Winston (1993) recognize that many scholars have heard different views on the effect of advertising on sales performance, however most of them agree that effective advertising will eventually increase sales revenue thereby increasing productivity.

METHODOLOGY

A case study research design was applied to test the quality signaling theory in ascertaining the effects of advertising on the firm productivity using telecommunication firms within the industry as a case study. Sources of data were primary and secondary approaches. For the primary sources, online surveys were conducted. These were in the form of both qualitative and quantitative data as they involved both open-ended and close-ended questions. From secondary sources, data from National Communication Authority's website (Authority, 2020) on telecommunication providers' voice and data subscriptions for the first quarter of 2020 was used. This was not to imply a cause and effect relationship, but to be used as a measure to validate our approach and findings.

Since telecommunication firms in Ghana are reluctant to share revenue generated from advertising, which would have been used to ascertain its effect on their productivity, qualitative and quantitative descriptive approaches were used to collect data. Participants of this research were customers who patronize one or more of these firms' services. The online surveys employed as the method of data collection, consisted of 14 multiple choice questions, 2 checkbox questions and 2 open-ended questions. The aim was to conduct the survey with a total of 90 customers including MTN, Vodafone, AirtelTigo and Glo users from 23- 27 July. Participants filled the online survey anonymously.

There were 115 total respondents. A few of the survey forms were incomplete but were filled with majority class categories. 100 survey results were included in the analysis. Samples of respondents were selected based on the stratified sampling method. The stratified sampling method was used in order to give all participants using their respective networks mix the chance of being included in their respective stratum to gain insights on how advertising affects their purchases.

In analyzing the quantitative data, all open ended questions were coded into numerical values. The programming language used was Python because of its many uses for statistical inferences. The pandas library was used to load the data into Python and to perform manipulations on the data. This helped to get the data in the right form, as well as to restructure it to answer the outlined research questions. The matplotlib and seaborn libraries in Python were used to create and visualize results. All these tools are data science tools used for analysis and visualizing insights and can be downloaded online for free.

FINDINGS

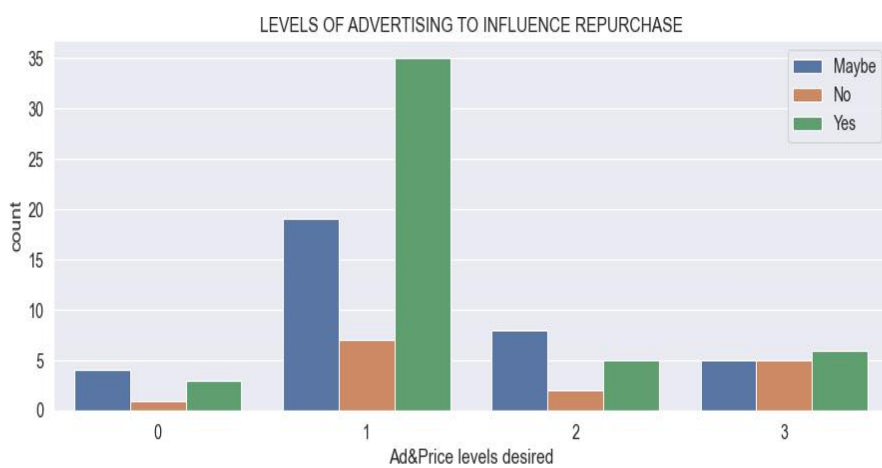

Figure 1. Frequency of advertising levels desired to influence repurchasing were listed to participants (those certain to repurchase(Yes), those uncertain of repurchasing (Maybe) and those certain of not repurchasing(No)) in response to the question *Which type network would you prefer?* 0 = highly advertised network with high prices, 1 = highly advertised network with low prices, 2 = lowly advertised network with low prices, 3 = neither of the above.

A total of 8 customers who opted for a highly advertised network with high prices, had 4 customers unsure of repurchasing products, 3 customers sure that they would repurchase, and 1 customer certain that he/she would not repurchase.

A sum of 62 customers who opted for a highly advertised network with low prices, had 19 customers unsure of whether they would repurchase, 35 customers sure that they would repurchase, and 7 customers certain that they would not repurchase.

A sum of 15 customers who opted for a lowly advertised network with low prices, had 8 customers unsure of whether they would repurchase, 5 customers sure that they would repurchase, and 2 customers certain that they would not repurchase.

A sum of 11 customers who opted for neither of the above, had 5 customers unsure of whether they would repurchase, 6 customers sure that they would repurchase, and 5 customers certain that they would not repurchase.

Figure 2. Based on the condition that customers purchase advertised product if their expectations were met, from the question *"Do you think these various forms of advertisements employed by these networks affects your decision making in voice and data purchases? *if yes or maybe*, Do you think, it may lead you to purchase these services/products again?"* 0 = highly advertised

network with high prices, 1 = highly advertised network with low prices, 2 = lowly advertised network with low prices, 3 = neither of the above

It is discovered that all range of customers who make choices on repurchasing, desire some level of Advertising accompanied with some level of price. Of all the advertising levels, those worth noting were a highly advertised network with low prices with over 61 respondents, followed by a lowly advertised network with low prices with 15 respondents and A highly advertised network with high prices with 8 respondents.

Figure 3. Frequency service benefits customers choose to derive were listed by participants in response to the question, *In terms of services and promotional content advertised by your preferred network, which of these benefit(s) would you prefer?* 0 = High Quality of services offered only, 1= High Quantity of services only, 2= Low Prices and High Quality of services offered, 3 = Low Prices and High Quantity of services offered, 4= Low Prices of services offered only.

45 out of 100 respondents preferred networks with Low Prices and High Quality of services offered, 25 out of 100 respondents preferred Low Prices and High Quantity of services offered, 19 preferred High Quality of services offered only 10 preferred High Quality of services only and 1 out of 100 preferred Low Prices of services offered only.

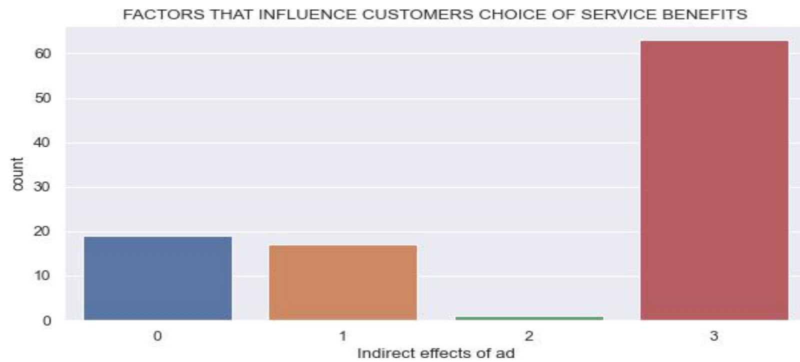

Figure 4. In response to the question, "*Are Price and Quality the only effects of advertising that you think influence your quality, tastes and preferences in services advertised?"* inquiring whether price and quality are the only factors that influence tastes and preferences for telecommunication services, 0 = Maybe, 1=No, 2 = Quantity Also Matters, 3 = Yes

63 out of 100 respondents, assert that price and quality are the only factors that influence tastes, 19 out 100 respondents are unsure, 17 out of 100 respondents are certain that those are not the only factors that influence their preferences and 1 customer made the notion that Quantity also matters.

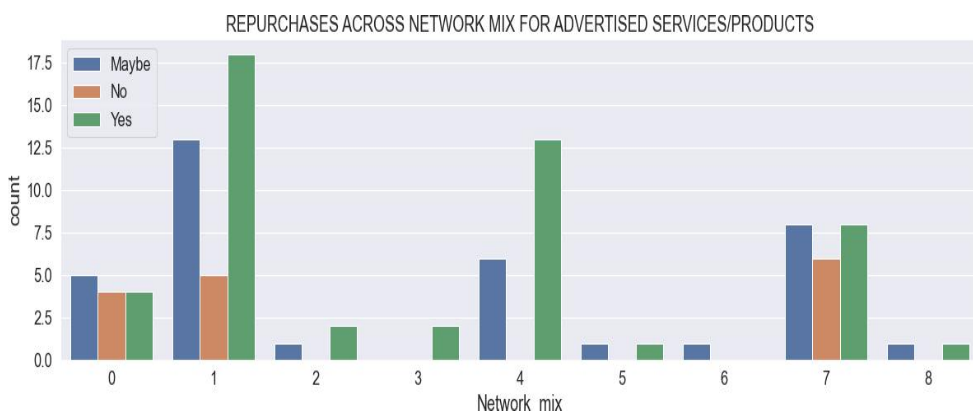

Figure 5. Frequency of 9 distinct types of customers and their various network(s) mix, we see levels of repurchases for each unique network mix listed by participants in response to the question, "*Among these, Which telecommunication networks are you actively using?"* and. *"Do*

*you think these various forms of advertisements employed by these networks affects your decision making in voice and data purchases? *if yes or maybe*, Do you think, it may lead you to purchase these services/products again?"*

0 = AIRTELTIGO, 1 = MTN, 2 =MTN;AIRTELTIGO, 3 =MTN;GLO, 4 = MTN;VODAFONE, 5 = MTN;VODAFONE;AIRTELTIGO, 6 = MTN;VODAFONE;AIRTELTIGO;GLO , 7 = VODAFONE, and 8 = 'VODAFONE;AIRTELTIGO.

Out of all 9 network mix listed MTN, VODAFONE, MTN; VODAFONE and AIRTELTIGO had the highest amount of user respondents being 36, 22, 19 and 13 respectively with the remaining 5 network mix each having less than 4 respondents. Out of the four worth noting network mix, 18 MTN users, 8 VODAFONE users, 13 MTN; VODAFONE users and 4 AIRTELTIGO users said yes to repurchase while those who said maybe were 13, 8, 6 and 5 respectively. And for customers who opted not to repurchase were recorded as 8 MTN users, 6 VODAFONE users and 4 AIRTELTIGO users. Also from the graph it can be noticed that customer who opted for multiple networks are only either certain of repurchasing or not repurchasing.

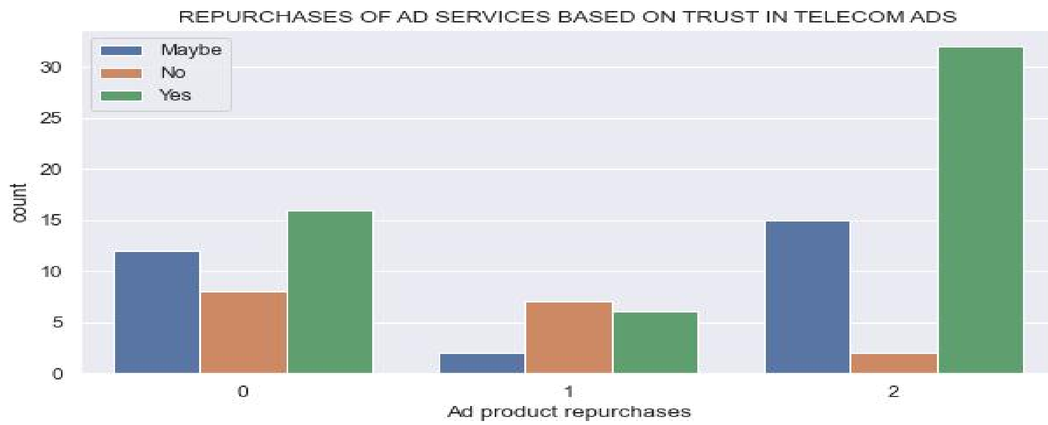

Figure 6. Frequency of customers repurchasing based on trust in advertisements (uncertain of trust = Maybe, Don't Trust = No and certain of Trust = Yes) in response to the question "*Do you think these various forms of advertisements employed by these networks affects your decision making in voice and data purchases? *if yes or maybe*, Do you think, it may lead you to purchase these services/products again?"* 0 = Maybe, 1=No, 2=Yes

A sum 50 out of 100 respondents assert that they would repurchase on the basis that services and products met expectations, 36 were unsure of whether or not they would, and 15 were certain that they wouldn't. Of those 50 respondents, 32 happened to assert they trust advertisements by telecommunication firms, while 15 are unsure and 2 are certain they don't.

Also of 36 uncertain of repurchasing, 16 respondents do have some level of trust in advertised services, while 12 are unsure and 3 are certain they don't.

Lastly of 15 respondents who were certain they wouldn't repurchase, 6 out of 15 have some level of trust in advertised services, while 2 are uncertain and 7 are definitely certain they don't.

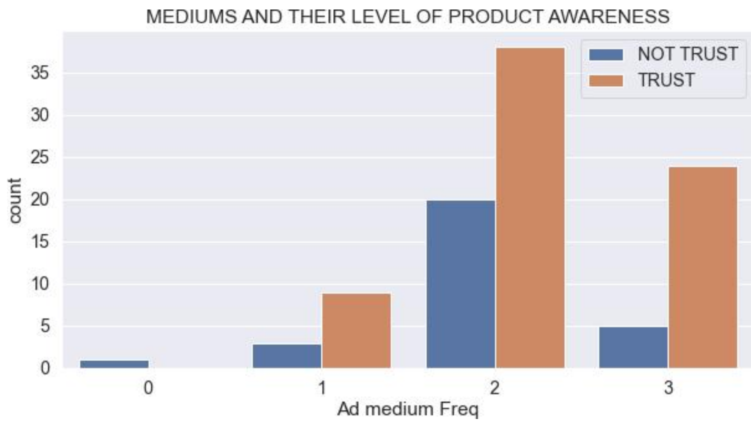

Figure 7. Mediums employed for advertisements corresponding influence on level of product awareness (both those who Trust and those who don't trust) in response to the question "*Which medium of advertisement does your network provider use frequently?"*

0 = Automated Voice calls, 1= Internet Ads (which includes website ads and social media ads), 2= SMS, 3 = TV

Automated call Ads had one respondent who was certain he would neither trust nor purchase products advertised through this medium.

Internet ads had 9 out of 13 respondents who asserted that they would trust and purchase products advertised through this medium. Whereas 3 were of a differing opinions.

SMS had the highest number of respondents. Out of 58 respondents who were made aware of products through this medium, 38 of 58 asserted they would trust and make purchases of products while 20 out of 58 agreed on the opposite.

Lastly TV ads had a total of 29 respondents, out of which 24 asserted they would trust and make purchases of products, while 5 agreed on the opposite.

Figure 8. Frequency of product purchases made and corresponding influence by advertisements (both Influenced by ad and not influenced by ad) in response to the question *"Have you ever purchased a product or service advertised by your preferred network?"*

0 =Maybe, 1 =No, 2 =Yes

Customers who are unsure of purchases summed up to 16 respondents, 6 of them made purchases based on ads influence and 10 made purchases without advertisements influence.

Customers certain that purchases weren't made based on ads also summed up to 16 respondents, 10 of them make purchases based on ads influence and 6 make purchases without ads influence.

Lastly Customers who are certain of purchases made based on ads summed up to 69 respondents, of which 55 out of 69 made purchases based on ads influence and the remaining 13 make purchases without ads influence.

DISCUSSION

Our analysis shows effects of advertising on firms as advertising scale economies, brand loyalty and market-share stability being direct effects and, price and quality being indirect effects.

Brand loyalty is a direct effect of advertising from the persuasive view, depicting that demand for advertised products become less elastic (customers become less responsive to changes in price of advertised products). As depicted in **Figure 6** from the overall number of respondents, having 54 consumers who trust in their chosen brands and 32 of them opting to repurchase if product meets expectations, consumer inertia is as important as brand intensity and brand rates in measuring brand loyalty. Lambin (1976), also suggests that these three forms of inertia effects in markets are important to evaluate how advertising reduces demand elasticity. These findings when compared to the Mobile Voice and Data Subscription for Quarter One 2020 (Authority, 2020), yield similarities as market shares for MTN data subscriptions rose from 66.85% to 67.78% from January 2020 - March 2020 in which number of subscribers increased by 614,594 while its voice subscriptions rose from 55.95% to 57.07% with number of subscribers increasing by 269,413. These statistics are also supported from our findings with 31 out of 36 users constantly or more frequently being exposed to MTN advertisements. Though brand loyalty may be the main effect, it is worth noting that the mediums employed also play a key role in increasing said effect.

To understand the advertising scale economies effect, Bagwell (2005) suggests that previous empirical studies broadly stress that an advertising scale economy may arise for two reasons;

1. The marginal effectiveness of advertising messages in generating sales may be greater, when the number of messages is already large.
2. The advertising expenditure per message may fall as more messages are sent.

These can be realized as elasticity of advertising defined within the Dorfman Steiner condition as high levels of advertising to sales ratio increases profit margin and reduces demand elasticity. In measuring levels of advertising that influence sales, as depicted in **Figure 1**, customers have a high tendency to desire high levels of advertising to increase repurchasing since it not only increases their awareness of the product and its prices but also reaffirms them that, quality is unchanged. Customers respond poorly to low levels of advertising thus such firms experience low levels of productivity in the form of advertising scale dis-economies. Also with remarks from respondents, a number of them are of the view that high advertising alone won't make them repurchase but if accompanied by reasonable prices and high quality, they would. Others also raised the issue that high advertising isn't the sole reason for trusting and repurchasing but if value derived from service is equivalent to said advertisement, they would have no reason not to repurchase. A few who also went in for lowly advertised products with low prices, also noted that though trust is not enough financial limitations lead them to opt for such services.

In the case of price and quality in theory, a manufacturer who has large advertising expenditures would also account for said expenditures when pricing a product. But in reality, for intangible products such as telecommunication services, the said practice doesn't apply simply due to the fact that customers are neither interested in products that have only high levels of advertising nor are they interested in high priced products that don't meet their expectation. Thus high advertising to sales ratio can only reap greater profits when firms compromise between levels of advertising, low prices accompanied with high quality. This is supported by F**igure 3**, inquiring levels of prices and quality desired and **Figure 4**, as inquiring benefits customers derive from procuring. Majority of the respondents deemed low levels of price and high quality important incentives by firms to stimulate product repurchases. This also provides evidence against critique that even low quality producing firms can make constant profits with high advertising due to the price-cost mark-up leading to high sales (Schmalensee, 1978), since we have established telecommunication firms need customers to constantly repurchase products and services to reap gains.

It was noted that not accessing firm advertising expenditures and revenues data causes limitations in assessing other direct and indirect effects such as sales, profits and concentration.

CONCLUSION

We utilized the quality signaling model and its assumptions to also give some extent of evidence to back previous studies that support Nelson's model. We examined the effects of advertising on telecommunications providers' productivity to arrive at four effects being advertising scale economies, brand loyalty and market share stability, quality and price. We further delved into customers' level of response to high and low advertising and its corresponding effect on firm productivity.

RECOMMENDATION

We also note that due to limitations of the data, though more effects could have been elaborated on, we lack the required data to make valid claims on them. For this reason, we recommend that further studies be done in such manner to provide further elaboration.

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