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Personal Data Collection and Usage for Mobile Marketing. Customer Awareness and Perception

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Abstract— Marketers have often relied on data to better understand the preferences of the customer base. While the traditional methods were engaged in the retrieval of data, the mobile devices connected to the internet introduced an influx of data on a real time called big data. Based on this advancement, marketers with the technical capacity are able to identify customer needs accurately and identify sway in trends. Although this strategy seems beneficial to the marketers, the naïve nature of the customers to the collection and usage of personal online information for mobile marketing remains a crucial poser. Hence, this study through survey sought to identify the awareness level and perception of 700 undergraduates in three higher institutions in Lagos, Nigeria. Results show that all the respondents had connected mobile devices, received advertising messages on their devices and were active shoppers online. Furthermore, the females were more aware of the collection and usage of personal data, hence, they embraced the collection based on relevance of advertising messages and strict use for mobile marketing. This study therefore recommended marketers' collection and usage of customers' personal data to be based on strict use for mobile marketing and assurance of relevance of advertising messages.

Key-Words: - data, big data, marketing, mobile marketing, awareness, perception

1 Introduction

Creating awareness of a brand has always been the aim of the advertiser [1], and the duty of the advertising agency. In time past, traditional means of communication such as word of mouth, electronic and print media were applied in exposing customers to brand offerings. Though the traditional means are still applied today, the advent of the mobile phone has revolutionized the way advertisers relate with their customers [2]. As part of the change, mobile marketing communication was introduced which is described as a means through which advertisers communicate their brands directly with the customer on their mobile phone [3]. Such direct contact with each customer substituted the conventional idea of advertising and created a paradigm shift from one to more advertising, to one to one advertising [4]. With this strategy, it meant marketing communication agencies were able to reach out to customers with their specific needs as at when required [5],[6].

For advertisers to reach individual customers and identify their exact needs, the place of massive datasets cannot be downplayed [7]. Today's world is flanked by mountains of data, and interestingly, there are posers on the possibility of ever arriving at the summit [8]. People have and are gradually contributing to the rise of these mountains either knowingly or otherwise as a result of daily input to the data space.

[9], aver that observing the digitalized nature of humans, tens of millions of them are connected to billions of sensors that draw data from their activities. The result of these activities has created humongous information, much of which can be used to specifically identify with each individual. Every day, people go about their daily lives and yet adding to the already heightened data community, one which has been metaphorically called a "digital exhaust" [10], where data is the byproduct of numerous activities such as browsing, social media engagement, online purchases, sensor connection, and activations.

It is pivotal to understand that the digital exhaust, as McKinsey metaphorically describes big data, is not the sole creation of humans. [11] states that

conscious data contribution of human is a minute percentile compared to machines that are created specifically for retrieving and analyzing data from human activities, soil, ocean, space, products, etc. The retrieval of data from several sources both human (consciously and unconsciously) and machine is daunting, and there are fears as regards the awareness of collection, communication of usage and storage of these large data sets [12], [13], [14], [15].

2 Problem Statement

Data community continues to grow at an unprecedented rate, and the mobile phone with its personalized nature has been identified as a means to reach online customers. While advertisers and retail online stores, have and are benefiting from an ever-available data community, the possible ignorance of the unsuspecting customer is hardly taken into consideration. Now, customer data are retrieved in real-time depending on the ownership and engagement on certain devices, one of which is the mobile phone. The device, which has been regarded as a large contributor of data [16], [17], [18] makes it possible for customer behavior and preferences to be tracked, analyzed and stored, hence, the advertiser can determine a slight sway in customer interest [19],[20]. Although advertisers can identify customer needs and target them using their mobile devices, the awareness of these customers on personal data collection and concerns need to be addressed.

Based on these positions, therefore, this study emphasizes the awareness and perception of customers about being contributors of data, and also personal data used for mobile marketing communication

3 Hypotheses Formulation

a. Female customers are more likely to know how organizations identify their needs than male customers

b. Female customers are more prone to acceptance of their specific online information used for mobile marketing than male customers

c. Female customers are more likely to allow access to personal information resulting in relevant advertising messages than male customers

d. There is a likelihood that female customers will purchase items based on relevant advertising messages than male customers

4 Conceptual positions

4.1 Mobile Marketing Communication

The difference between conventional media marketing and mobile marketing is that the former pushes products to consumers, while the latter pulls individual consumers with media contents that are specifically tailored to their needs [21]. To pull individual consumers, advertising messages are sent directly to the consumer's mobile. Mobile marketing is regarded as an emerging medium of advertising, one which has a different technique when compared to the conventional media. A study conducted by [22] reveals that the mobile platform has become so attractive to marketers that it can reach over 80 percent of people, wherever they are, and at any time. [23] aver that 74 percent of individuals read their messages almost immediately.

Based on [23] finding, [24] state that 70 percent of individuals are likely to view advertising messages. A result of a research institute in 2011, estimated that in the year 2016, expenses on mobile marketing in the United States would increase three times its figure in 2012 i.e. from 2.8 billion dollars to 8.2 billion dollars [25]. Dissimilar to Forrester's research, which was limited to the United States, [26] in its study mentioned that in 2012, global expenses in mobile marketing would be valued at 16.7 billion dollars. However, in 2013, eMarketer estimated that by 2017, global spending on mobile marketing would be valued at 62.8 billion dollars. Although there are obvious dissimilarities between results from the studies, however, what is similar is the claim on the rapid growth and recognition for the medium as the years unfold. Digital marketing budget, according to eMarketer is projected to enjoy a thirty- six percent increase in subsequent years as a result of mobile marketing.

Grounded on these statistical figures, [27] state that mobile marketing is regarded as a viable means of marketing communication. [27], based on results from [25], claims that a larger percentage of interactive marketers utilize mobile marketing, and other organizations yet to imbibe the strategic plan to do so. For the organizations who have imbibed the personalized platform, [29],[30] posit that long-lasting relationships are being built through marketing communications.

4.2 Big Data

It is of necessity that researchers understand the place of a well-defined data set in tackling an identified research problem. This is because with the right data set, and appropriate analysis, precise extrapolations could be made about a population.

Data sets are an integral part of a research process because without them, understanding an occurrence, predicting future events and providing the right solution might be impossible. This thus explains that solutions to any identified problem are as a result of appropriate data mining, and accurate analysis made. In the time past, once data, no matter how small provided solutions to research problems, [31] believed that these data sets were dropped for sake of little or no value for the future use. The same authors, however, mention that in the era where data are continually growing, such ideology that limited further data usage has eroded.

It is important, therefore to note that data have moved from little chunks where a researcher can pick two thousand respondents from a population to represent the whole. Although this is not to state that selecting a small sample is wrong, today, there is a new class of data called big data. This new class has emerged as one of the most resourceful for researchers (academic or industry) in locating trends, predicting events and providing solutions to problems. To locate trends and predict events correctly, certain strategies and tactics need to be combined to make sense of such huge data [32].

Big data has been found viable in locating trends in areas such as business as seen in [33], politics [34], education, [35], health [36], etc. Big data, in the long run, becomes a worthwhile social driver when data from the above-mentioned sectors are well gathered and analyzed to predict events before occurrence.

Though there are several representations of big data by authors and corporations, what cuts across a good number of them is that big data involves a collection of large chunks of data that are often stored in terabytes and petabytes [37], [38]. Based on the prior assertions, [39] provide a basic definition of big data. The authors define big data as anything but small data. Small data which are usually stored in kilobytes, megabytes or rarely gigabytes range from say 0 to 10, 000 thereabout.

4.3 Big Data and Marketing

As earlier mentioned, big data has been perceived in several key sectors in a nation's economy, where the same has been likened to mineral resources, responsible for economic growth. Several works of literature have also presented the usefulness of large data in health, education, politics, finance, just to mention a few. This study, however, emphasizes the application of big data to the field of marketing, specifically, mobile marketing communication. This is necessitated by [40] who avers that the field of marketing benefits the most from the surge of data in recent times.

The necessity is hinged on the fact that marketing from the time being has always relied on data to serve its customers [41]. In time past, marketing research adopted survey, focus groups among other techniques to determine customer perceptions on brands, and the likelihood of the customer being loyal in the long run. While these techniques proved effective in providing marketers with information about customer preferences, the sourcing and inclusion of more data have made it possible for marketers to observe the tiniest shift in customer preference. Previous research technique in marketing required that if the need arose for another survey, fresh copies of questionnaire were administered to customers to determine if perception toward the brand had swayed, or to test their loyalty, but, the technique in itself drained resources.

The highly digitized customer made marketing research a lot easy for the marketer with the continuous submission of data either consciously or otherwise. Huge streams of data as a result of digital interaction provided marketers with customer information that were previously unknown, unknowable consumption habits and futuristic consumer behavior [42], [43]. Such previously elusive information perhaps is a turning point brought to the fore by big data in marketing. Today, budgets allotted to marketing campaigns are distributed and spent judiciously in achieving set objectives. The foregoing is evident in [44], where the author avers that organizations as a result of big data have become more efficient in their daily operations, where predicted innovations are developed, and most importantly, drastic management and allocation of resources.

5 Methodology

To provide empirical responses, this study adopted a quantitative approach. Grounded on the peculiarities of the study, the respondents were online shoppers of E-commerce platforms in Lagos, Nigeria. The survey method was used in discovering customer awareness and perception on a superficial level on the subject. Thus, a total of seven hundred copies of questionnaire were administered to respondents who actively shop on E-commerce sites. Specifically, undergraduates from three higher institutions in Lagos were selected for this study within the age

range of 18-35. The age selection is based on studies that place young adults as very active online and could be referred to as "online shopperholics" [45],[46],[47],[48], [49], [50].

The multistage sampling technique was first used to delimit the population, while the purposive sampling technique was further used to select each respondent. The qualification of a respondent exposure to the instrument was based on certain parameters, that is, possession of a smart phone connected to the internet, must be an online shopper and importantly, had shopped online through E-commerce platforms in the last one month of the study.

Cross-tabulations were run in order to identify the patterns of relationship between variables. Furthermore, the two-tailed test was used to test the hypotheses.

6 Results

Though 700 copies of questionnaire were distributed, 670 were filled and returned correctly. Below are cross tabulations and independent sample tests that show relationships between variables.

6.1 Crosstabulation Results

Table 1- Internet-enabled deceives

	Gender	
	Male	Female
Is your mobile yes device internet enabled?	297	373
	44.3%	55.7%
	100%	100%
Total	297	373
	44.3%	55.7%
	100%	100%

The respondents for this study were chosen based on some criteria. One of those is the possession of a mobile device that is internet enabled. Also, it must have been connected within the last 2-3 days of exposure to the questionnaire. Results show that 100% of the respondents had internet-enabled smartphones. However, crosstabulation reveals that more females than males had connected devices. Only 11.4% differentiated the pair. This is because there were more females than males upon the operationalization of the instrument. Furthermore, it could be inferred that females are more likely to possess an internet-enabled device than their counterpart.

Table 2- Frequency of internet use

		Gender	
		Male	Female
How frequently in a day do you use the internet?	1-3 hours	84	130
		39.3%	60.7%
	4-6 hours	114	105
		52.1%	47.9%
	7-9 hours	52	67
		43.7%	56.3%
	10 hours and above	47	71
		39.8%	60.2%
Total		297	373
		44.3%	55.7%
		100%	100%

The table indicates the frequency of daily internet use ranging from 1 to 10 hours and above. Statistics show that the internet is indeed a technology that was widely accepted upon introduction. The technology was used between 4-6 hours daily more than any other time range. More so, and quite interesting, the male respondents dominated this range where more than half of them engaged their devices online for about 6 hours. Overall, the table presents the females as more frequently online than the male.

Table 3- Internet use

		Gender	
		Male	Female
What do you use the internet for mostly?	Social media	177	179
		49.7%	50.3%
	News updates	31	29
		51.7%	48.3%
	Window shopping online	49	90
		35.3%	64.7%
	Online purchase	38	70
		35.2%	64.8%
	Online transactions	2	5
		28.6%	71.4%
Total		297	373
		44.3%	55.7%
		100%	100%

The majority of the respondents averred that they used the internet more between 1 to 6 hours daily,

where the ladies appeared to spend more time online than the opposite sex. Table three suggests that perhaps a large chunk of the time spent online by the respondents was to peruse their social media platforms. Online window and actual shopping were second best respectively. Though the difference is not extremely significant (0.6%), the females were more in tune with the social media platforms. Also, the females dominated the males across the options.

Table 4- Receipt of advertising messages

		Gender		
		Male	Female	Total
I receive advertising messages on my mobile device?	SA	119 44.2%	150 55.8%	269 100%
	A	140 45.6%	167 54.4%	307 100%
	U	13 37.1%	22 62.9%	35 100%
	D	17 44.7%	21 55.3%	38 100%
	SD	8 38.1%	13 61.9%	21 100%
Total		297 44.3% 100%	373 55.7% 100%	670 100% 100%

All the respondents possessed at least a mobile device that was internet enabled. They all averred that they connect to the web via their phones for several reasons as presented in (tables 1,2 and 3). To this end, more than half of the respondents received advertising messages. Such high turnout can be attributed to the number of hours spent with the devices online. Similarly, the females pointed out that they receive more advertising messages than the opposite. This is possible because of the time used online, especially the social media platforms which have been known to also serve as an online shopping platform, hence one of the biggest contributors to personal information.

Table 5- Online engagement

		Gender		
		Male	Female	Total
Are you aware that for every time you are engaged online with your mobile device, you contribute information about yourself consciously or unconsciously to the online data community?	Yes	115 40.2%	171 59.8%	286 100%
	No	182 47.4%	202 52.6%	384 100%
Total		297 44.3% 100%	373 55.7% 100%	670 100% 100%

While results in this study have proven the efficacy and wide engagement of the mobile device online, table 5 exposes the possible naïve nature of the respondents to the consequences of their behavior. Almost two-thirds of the respondents did not know that their actions online meant personal information about them were unconsciously contributed to an online data community. Studies have also pointed out that personal information has been used by marketers with the technical skills to identify customer needs and provide adequate solutions.

6.2 Hypotheses Results

H_{01}: Female customers are more likely to know how organizations identify their needs than male customers

Table 5: Group Statistics

	Gender	N	Mean	Std. Dev.	Std. Err Mean
Org. knowledge on needs	Male	297	3.0	1.155	.067
	Female	373	3.19	1.199	.062

Table 6
Independent Samples Test

		Lev's test		
Org. knowledge on needs		t	df	p
	Eq var. asrd.	-2082	668	0.019
	Eq. var not asrd	-2.091	644.37	

There is a significant difference in female customers' knowledge of how organizations identify their needs than male customers (t=-2.082, df=668, P=0.019, one-tailed test). Statistics on table 6 suggest that the females are likely to have more knowledge on the intricacies of organizations' awareness of customer needs (mean=3.19) than the male (3.00).

H_{02}: Female customers are more prone to acceptance of their specific online information used for mobile marketing than male customers

Table 7: Group Statistics

	Gender	N	Mean	Std. Dev.	Std. Err Mean
Accept specific online info.	Male	297	2.65	1.235	.072
	Female	373	2.66	1.206	.062

Table 8
Independent Samples Test

		Lev's test	t	df	p
Accept specific online info.	Eq var. asrd.		-.095	668	0.462
	Eq. var not asrd		-.095	628.20	

There is a significant difference in female customers' acceptance of only specific parts of their online data to be engaged for mobile marketing (t=0.095, df=688, P=0.462, one-tailed test). The females were more likely to accept only specific parts of their personal online information to be collected and used for mobile marketing (mean=2.66) than the male folks (mean=2.65).

H_{03}: Female customers are more likely to allow access to personal information resulting in relevant advertising messages than male customers

Table 9: Group Statistics

	Gender	N	Mean	Std. Dev.	Std. Err Mean
	Male	297	2.26	1.008	.058
	Female	373	2.36	1.100	.057

Table 10
Independent Samples Test

		Lev's test	t	df	p
	Eq var. asrd.		-1.286	668	0.0995
	Eq. var not asrd		-1.299	654.99	

The relevance of the advertising messages was a key driver for customer acceptance of personal data collection for mobile marketing. Table 10 shows a significant difference in the willingness of the female customers to allow access to personal online information provided the advertising messages received were relevant (t=-1.286, df=688, P=0.0995, one-tailed test). The females showed more willingness to allow access to their personal online information provided the advertising messages would be relevant (mean=2.36) than the opposite sex (mean=2.26).

H_{04}: There is a likelihood that female customers will purchase items based on relevant advertising messages than male customers.

Table 11: Group Statistics

	Gender	N	Mean	Std. Dev.	Std. Err Mean
	Male	297	2.44	1.190	.069
	Female	373	2.62	1.200	.062

Table 12
Independent Samples Test

		Lev's test	t	df	p
	Eq var. asrd.		-2.011	668	0.0225
	Eq. var not asrd		-2.013	637.02	

Table 12 indicates a significant difference in the females' purchase of items online as a result of relevant advertising messages received on their mobile devices (t=-2.011, df=688, P=0.0225, one-tailed test). In terms of action, results showed females' likelihood to purchase items online as a result of relevant advertising messages (mean=2.62) than the male counterparts (mean=2.44).

7 Conclusion

The study has pointed out that the mobile phone is here to stay, likewise the internet with individuals constantly embracing both technologies one in every four to six hours of the day. These technologies are

likely to advance in operations beyond what we have witnessed in the past decade or so. The result of these developments is data will forever be on the increase and the usefulness of them across several sectors in a country will be mammoth and of course, specifically to this study, mobile marketing communication. The somewhat naïve nature of the respondents is alarming bearing in mind that their online activities can and are being tracked in real-time. Results indicated that the female counterpart had more knowledge as to the organizational identification of needs. They were more trusting to accept only specific parts of their personal information to be collected and used for mobile marketing. The trust the females had further suggested that they were more willing than the male to grant access to their personal online information if advertising messages would continue to be relevant. Invariably, the females showed more disposition to patronizing items online as a result of relevant advertising messages received on their mobile devices than the male.

8 Recommendations

Though the marketers enjoy the possibly unsolicited collection and usage of personal online data, the unawareness level of the customers is alarming. To this end, this study advocates for permission based mobile marketing service. This involves the marketer requesting prior access to data and ensure safety and strict usage for mobile marketing.

Also, there should be policies in place for the monitoring and sanctions on organizations that engage in collection and usage of personal online data outside the authorization of the data owner.

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