



Behavioral Advertising with Big Data: A Consumer's Perspective

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(Received 20 March 2020, Revised 12 May 2020, Accepted 14 May 2020)

(Published by Research Trend, Website: www.researchtrend.net)

ABSTRACT: With the increasing pace of internet usage, digital advertising is the fastest growing and promising field in the era. From the traditional advertising techniques to behaviorally targeted advertisements (BTA) over the web – promotional techniques have also undergone a complete change-making the market more challenging. “Big data” is an essential component increasing organizational competitive advantage. Moreover, recording privacy information of the consumers by online companies is the biggest challenge faced by the users. Drawing on the BTA literature, we investigated the awareness level among the Indian consumers regarding behavioral advertisements and big data. First, exploratory factor analysis is employed and factors related to consumer awareness are extracted by using a sample size of 408 college students. Secondly, awareness factors of behaviorally targeted advertisements are validated using confirmatory factor analysis (CFA). The research concludes four important factors about which the consumers are aware: “General awareness”, “Information use awareness”, “Technical awareness” and “motive awareness”. This research will be useful to plan better strategies for this sector as awareness is the first step to study the consumer's psychology behind any new marketing trend. The study findings will contribute in adding to the literature of advertising and enhancing further avenues for research.

Keywords: Awareness, Behaviorally targeted advertisements, big data, Invasive Marketing.

Abbreviations: BTA, behaviorally targeted advertisements; OBA, Online behavioral advertisements.

I. INTRODUCTION

In the financial year 2019, the total revenue set up by the digital advertising was valued at 160 billion Indian rupees across India. Digital advertising in 2019 witnessed a growth of 26% over 2018, even as overall advertising in India witnessed a growth of 9.4%, as per the latest report by the [1]. It has also been reported that digital advertising will continue to grow and will grow at the pace of 27% by the end of 2020 and cross the mark of Rs 50,000 crore by the end of 2025, with the growth of CAGR of 27.4%. With such growing prospects in digital media advertising, online advertisers are more focused on data-driven personalized advertising strategies [2]. “Big data” refers to the large volume of data used by the business to enhance insight and decision making processes [3]. Likewise, features of big data are very closely connected to privacy of personal information, security-related factors, and their impact on the consumer's welfare. This feature of big data has attracted immense attention of research scholars, businesses, and policymakers. Initiatives of the business to gather personal data of consumer have faced a lot of resistance from the consumers end [4]. Consumers have shown that the data collection methods by the organizations, especially using tracking technologies via cookies and GPS trackers are their major and growing concern. For example, big companies like iPhones and Android phones are secretly selling personal information about the users locations to Apple and Google [5].

In the context of e-commerce, businesses or big companies are effectively able to convert single time users into repeat customers by tracking their behavior and using big data [6]. Such strategies are heavily used

by the online marketers to advertise their products to their potential consumers by recording their online browsing behavior, website visits, search history, purchase behavior, social media activities, etc. to acquire vast data and to serve them with same products which they have earlier searched [7]. This recent and controversial form of digital media advertising is Behavioral Advertising [8].

Various practitioners and scholars view behavioral advertising as the future of digital media advertising [7, 9, 10]. Scholars argued in favour of BTA that personalized, précised and targeted advertisements will help to communicate with individuals based on their behavior making the advertisements more effective [11-13]. Despite having a promising impact of BTA on the consumers and gaining the attention of both the academicians & industry [2]; it has also raised various privacy concerns among the consumers.

Furthermore, various studies argued that the BTA collection of big personal data happens without the knowledge or permissions of consumers [14, 15]. The covertness of these advertisements is harmful or unethical and there should be transparency in the BTA mechanism [2]. The studies have reported that people did not recognize the icon which represents BTA and lacked awareness regarding such advertising [16].

Grounded on these issues, it becomes important to shed some light on the understanding and awareness of Indian consumers regarding BTA and big data mechanisms in online advertising as lack of awareness leads to inefficiency in BTA disclosure which is harmful for the success of industry and consumers privacy too. During last decade, various studies and articles on these online practices have been published. Despite

that, there are very few studies analyzing the understanding and awareness of BTA practices among the Indian population. Overall, the paper intended to reveal the understanding of behavioral advertising and big data practices. Therefore, the study investigated the following question to fill this research gap:

To study the understanding and awareness level of behaviorally targeted advertisements among the Indian population.

II. BACKGROUND

Knowing and considering the bright side of the BTA in the future, it is obvious that the advertisers will invest in this digital media advertising strategy [17]. However, it becomes important to have a better understanding of the concept and some needs to be addressed making it more transparent for the online companies and customers. It has been seen that a lack of understanding about BTA will lead to harm to the growth of the industry. Few pieces of researches conclude that consumers are aware of such practices but they remain at a certain distance from such targeting practices [18, 19]. Moreover, few studies claimed that users are aware of the meaning of BTA icons and this awareness further leads to brand recall [20]. Besides, certain studies concentrated on the psychological impact of awareness on brand [21]. It studied the impact of awareness of users on the consumer's opinions [22].

Apart from this, online behavioral advertising (OBA) acceptance among users based on the high and low involvement groups [23]. Also, ad acceptance is mediated by perceived intrusiveness of privacy from the OBA. It also claimed a direct relationship between consumer attitude and purchase intention of the product advertised in online behavioral advertisements [24]. OBA is a kind of psychological targeting which ultimately leads to higher clicks on the advertisement [25]. It concluded that majorly people have negative purchase intentions attached to the products displayed by OBA because of the privacy concerns of users [26]. It reported it as a discriminatory practice by advertisers which has reduced the user acceptance [29].

It attempted to explore that targeted advertisements increases the click-through rates by 670% as compared to the non-targeted advertisements [28]. It is examined from the consumer's perspective and named such advertisements as creepy and annoying [29]. Few researches [9] have claimed that OBA increases the revenue of the advertisers leaving an economic impact. Consumers feel less irritated and ad avoidance reduces if the individuals find some value from the advertisement [30]. It also reported the same findings that the entertainment value of the advertisement reduces the irritation caused by these advertisements [31, 32]. Therefore, it can be viewed that the entertainment value of advertisements can reduce the drawbacks associated with that particular advertisement to an individual. Fastest growing transactions over the internet is a challenge and opportunity for businesses [33].

Few studies have studied Psychological Reactance Theory [2, 34] in context with highly personalized advertisements. "Reactance" refers to the state where consumers behave oppositely as they are intended ultimately reducing the effectiveness. It was suggested that consumer's psychological reactance from

personalized advertisements can be reduced if the users are provided with more freedom and control over their privacy [35]. Moreover, consumers can feel less reactance if they are able to assess balance between perceived benefit and perceived cost of the advertisements.

Nevertheless, it has been seen that consumers' knowledge of OBA is very limited. It is founded that majorly participants did not know about OBA. In the study, an experiment was conducted in which they were shown with a video that shows how OBA works and it was reported that after knowing the working of OBA, the participants were upset, some even had concerns related to their financial information and even some call it as creepy or scary [16].

Based on the background of the literature presented, it is confirmed that existing literature does not have enough studies which can provide awareness level of behaviorally targeted advertisements in India. The literature offers various studies to view consumer awareness but none of them is based on the awareness of the Indian population towards online behavioral advertisements. Besides, all the studies are concentrated only on the awareness related to their privacy and personal information. Therefore, a wide gap exists in the literature which can be bridged by studying the awareness level BTA in Indian consumers.

III. MATERIALS AND METHODS

Survey Instrument: To study the awareness level of consumers, a seven-point level of awareness Likert scale from 1: strongly unaware to 7: strongly aware is adopted by the researcher (see Appendix 1 for the survey questionnaire). The 7-point scale is considered more reliable and valid as compared to the 5-point Likert scale. Various studies [36, 37] has highlighted that the 7-point scale produces better and detailed results. It has been concluded that 7 point scale produces more accurate results in comparison to a 5-point scale [38].

Sampling and Data Collection: A sample size of 408 respondents was taken through a convenience sampling method and data was gathered through the structured questionnaire. Respondents were the college students above the age of 18 years because college students are the highest web users [39]. The data was collected from Chandigarh and Delhi in Northern India because they have the highest number of internet users [40].

The data collected were analyzed through SPSS. Firstly, exploratory factor analysis was conducted followed by reliability tests and then, confirmatory factor analysis in AMOS was applied to confirm as well as validate the factors [41].

Before conducting data collection from the respondents, the survey instrument was pretested from the two stages to ensure validity. First of all, expert opinions were taken to ensure the content validity and they were requested to critique the questionnaire instrument for ambiguity, relevance, and clarity so that the items and constructs taken can easily address the study subject. Based on the opinions given by the experts, the validity of the questionnaire improved. Secondly, the improved instrument was sent to 50 respondents and they were requested to give their review on the readability and completeness of questionnaire. The feedbacks of the

respondents are taken to improve the validity of the instrument.

Afterward, a full-fledge survey was conducted for collecting data on the subject. At this stage, total 500 questionnaires were distributed among several college students in NCT of Delhi and Chandigarh. 408 total questionnaires were completely filled and returned which showed an 81.6% of survey response rate. Finally, all the valid responses were digitalized into SPSS software. Based on the results of survey, a summary of the sample profiles of the respondents is presented in Table 1.

Table 1: Profile of respondents.

Characteristics of Respondents	Profile	Results
Gender	Male	54.65%
	Female	45.34%
Age Group	18-21	16.17%
	22-25	46.56%
	26-29	25%
	30 or above	12.25%
Region	Chandigarh	50.73%
	Delhi	49.26%
Type of Education	Bachelor's degree	21.07%
	Master's degree	58.82%
	MPhil or Ph.D. degree	20.09%
Favorite Shopping Website	Myntra	35.20%
	Amazon	30.39%
	Flipkart	23.28%
	eBay	17.15%
Shopping Frequency	Others	7.35%
	Rarely	19.85%
	Once	25.24%
	2-3 times	31.12%
	4-5 times	16.42%
More than 5 times	7.3%	

Non-Response Bias: To investigate non-response bias- early responses and late responses were compared to see significant differences between both the groups [42]. To conduct this study, respondents were classified into two groups- early respondents and late respondents in equal numbers. An independent sample t-test was applied in which there was no significant difference was found between both groups.

Goodness of Measure: During reliability tests conducted through Cronbach alpha, all the

measurement items were found highly reliable which ensures that there is internal consistency. The reliability came to be more than 0.7 [43-45]. The reliability tests outputs produced, $\alpha=0.823$ for general awareness, $\alpha = 0.831$ for information use awareness, $\alpha = 0.791$ for technical awareness and $\alpha = 0.744$ for motive awareness.

IV. RESULTS AND DISCUSSION

Here, the data which is surveyed are transformed into meaning form by using the appropriate statistical tools. The results of the statistical tools are given in Tables 2, 3, 4 and 5. The detailed results of the statistical tools are given below. Table 2 discusses the descriptive statistics of each measurement item.

Table 2: Descriptive analysis.

S.No.	Mean	Standard deviation
AW 1	5.8	1.01
AW 2	4.9	1.01
AW 3	4.3	1.24
AW 4	5.3	1.28
AW 5	4.4	1.14
AW 6	5.4	1.13
AW 7	4.9	1.2
AW 8	4.9	1.05
AW 9	4.9	1
AW 10	4.93	1.09
AW 11	4.43	1.24
AW 12	5.3	1.2
AW 13	4.95	0.97

Items: 13, Mean=4.61, Minimum =4.41, Maximum = 5.74

Factor analysis for consumer awareness: In the exploratory factor analysis, the findings indicate that the constructs are appropriately loaded with the measurement items and the loadings of the items are above 0.50 (Table 3), which is as per the recommendations given by Hair *et al.*, (2010). The KMO revealed 0.746 inter-correlation with Bartlett test of Sphericity (χ^2) = 1887.062 and degree of freedom = 78. The exploratory factor analysis extracted four factors and it was seen that all the items are relevant to the construct. Extracted factors displayed a cumulative variance of 69.928% (Table 3).

Table 3: Factor Analysis.

S.No.	General awareness	Information use awareness	Technical awareness	Motive awareness
AW1	0.86			
AW6	0.84			
AW12	0.79			
AW4	0.73			
AW5		0.88		
AW3		0.86		
AW11		0.85		
AW13			0.86	
AW2			0.84	
AW10			0.77	
AW9				0.88
AW8				0.80
AW7				0.77
Eigenvalue	3.35	2.2	1.81	1.72
Alpha value	0.82	0.83	0.79	0.74
Variance (69.28%)	25.78	16.89	13.97	13.3

KMO=0.746, Bartlett's test of Sphericity (χ^2) =1887.062, DF = 78, Sig. = 0.

Results of Confirmatory Factor analysis: CFA helps in investigating whether the measurement model achieves the acceptable fit to the data [46]. Fig. 1 show four factors: "General awareness", "Information use awareness", "Technical awareness", "Motive awareness" and the significant loadings of each item. The "General awareness" factor included four items and these items were loaded as AW12 = 0.71, AW6 = 0.80, AW4 = 0.63, AW1 = 0.84. Similarly, "Information use awareness" factor consisted three items and items were loaded as AW11 = 0.78, AW5 = 0.81 and AW3 = 0.77. "Technical awareness" factor comprised three items with a significant loading range such as AW13 = 0.85, AW10 = 0.65 and AW 2 = 0.77. Lastly, the "Motive awareness" factor included three items with significant loadings such as AW9 = 0.86, AW8 = 0.68, and AW7 = 0.61.

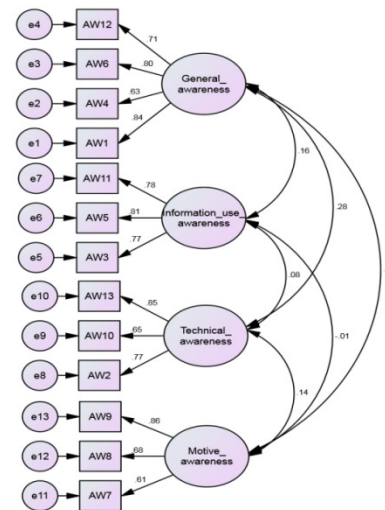


Fig. 1. Confirmatory Model for Factors Affecting BTA.

Table 4: Reliability and validity analysis of the CFA model.

S. No.	CR	AVE	MSV	Technical awareness	General awareness	Motive awareness	Information use awareness
Technical awareness	0.8	0.58	0.08	0.76			
General awareness	0.83	0.57	0.08	0.28	0.75		
Motive awareness	0.76	0.52	0.02	0.14	0.15	0.72	
Information use awareness	0.83	0.62	0.03	0.08	0.16	-0.006	0.79

The Table 4 highlights that "General awareness" factor has CR = 0.84, AVE = 0.57, and MSV = 0.08. Similarly, "Information use awareness" factor has CR = 0.83, AVE = 0.62, and MSV = 0.03. Furthermore, "Technical awareness" factor has CR = 0.80, AVE = 0.58, and MSV = 0.08. In last, "Motive awareness" factor has CR = 0.77, AVE = 0.52, and MSV = 0.02. All these values ensure reliability, convergent validity and discriminant validity of the tested confirmatory model.

Five fit indices are recommended by the researchers [45, 43] to test the goodness of fit. Results depicted in Table 5 indicate a good alignment for the measurement model with a Chi-square/degree of freedom (CMIN/DF) = 1.364, GFI = 0.971, NFI = 0.914, TLI = 0.958, CFI = 0.988, RMSEA = 0.30 and PCLOSE = 0.987. All these values satisfy to the recommended model fit [47, 45].

Table 5: Model fit the results of the CFA model.

Title	Value	Title	Value
Chi-square (X ²)	80.49	TLI	0.99
Degree of freedom (DF)	59	CFI	0.99
CMIN/DF	1.37	RMSEA	0.30
GFI	0.98	PCLOSE	0.98
NFI	0.95		

V. IMPLICATIONS AND DISCUSSION

Marketers and academicians have continuously paid attention to the behaviorally targeted advertisements. However, there is a scarcity of literature based on this type of online advertising. Thus, the current study tried to fill some gaps on the OBA. Moreover, the outcomes of the investigation prove that the Indian consumers are aware of OBA. The results supported that people notice that their behavior is being recorded while surfing over the web.

The empirical results of the study demonstrate that consumers are aware but not completely understand the practice of OBA. In the same vein, studying awareness about a subject is important to take strategic decisions and to maximize the sales, profit, and market share of the online advertisers.

These results have important implications for marketers and online advertisers in terms of understanding the consumer perspective more effectively to achieve better targets and improve performance. The managers need to understand the psychology of consumers behind the targeted advertisements and the first foremost thing is to know that whether they are aware of such targeted practices.

The study concludes that consumers are aware of OBA practices and they notice when they are targeted with the same advertisement again and again. Likewise, if the marketers themselves disclose all the practices they

are adapting to record personal data of consumers, then the consumer's opinions regarding OBA will be more positive. The study suggests that consumers are aware of OBA that means there is no use of hiding the practices from them. Therefore, researchers and marketers should be very careful about disclosing targeting practices to the public. A successful disclosure statement by the companies adopting OBA can help in gaining the trust of consumers and reducing their concern for privacy as well as personal information.

VI. CONCLUSION

This study helps in extracting factors of consumer awareness regarding online behaviorally targeted advertisements. The study confirms that the Indian population is aware of OBA. The "General awareness" is concluded as the most promising factor. Answering these questions is important to further understand the consumer perspective and effectiveness of such the newest forms of advertising. Moreover, this study adds to the literature of OBA in terms of the Indian population. Therefore, studying this perspective can be used as a strategical weapon to frame policies related to the subject.

VII. FUTURE SCOPE

The study highlights various opportunities for further future research. Survey involved respondents that are college students which means the study results is not a good representation of all Indian populations. Moreover, it is concentrated on two regions which keep the scope of the study limited. Consumer awareness in the present study is limited to the general perspective and no other perspectives like back end operations, cookies software, etc. are taken into consideration, which can also be dug out in future researches.

Conflict of Interest. The authors of the present research declare that there is no conflict of interest and the procedures followed are according to the ethical standards.

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How to cite this article: Puri, D. and Mohan, T. (2020). Behavioral Advertising with Big Data: A Consumer's Perspective. *International Journal on Emerging Technologies*, 11(3): 771-776.