

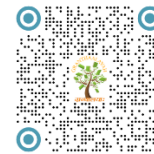
Original Article

IMPACT OF DIGITAL MARKETING ON CONSUMER BEHAVIOUR IN THE TECH AGE: A STUDY WITH SPECIAL REFERENCE TO KANDHAMAL DISTRICT OF ODISHA

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ABSTRACT

Emerging technologies have made digital marketing the most important form of commercial communication in today's world. It has changed the ways in which consumers gather information, compare choices, and make purchases. This study focuses on the effects of digital marketing on consumers in the Kandhamal district of Odisha. The district is mainly rural and tribal, and has experienced a recent rise in the availability of the internet. The study employed a descriptive research design, and a structured survey was used to collect primary data from 150 participants. The survey included, among others, social media marketing and online advertising, consumer trust in digital channels, and self-reported behavioral changes. The survey used a 5-point Likert scale. Several statistical analyses were conducted on the data, including, but not limited to, Pearson correlation, multiple regression, and ANOVA. The results of the study demonstrated a high level of awareness of digital marketing and a strong self-reported behavioral impact. From the respondents surveyed, 68.7% claimed that their buying behavior was influenced by digital marketing. Although significant behavioral impacts were reported by female respondents as compared to male respondents ($p = .042$), and significant effects were found on the Digital Marketing Awareness between rural, semi-urban and urban respondents ($p = .041$), favorable opinions of digital marketing were not expressed in a measurable way. The study attempts to provide evidence of digital consumer behavior of a region with limited research in the area, and provides marketing, policy, and research recommendations.

Keywords: Digital Marketing, Consumer Behaviour, Purchase Decision, Social Media Marketing, Tech Age, Kandhamal District, Odisha

INTRODUCTION

Innovations in technologies are rippling across the market. Opportunities for in-person exchanges using shop owners, printed announcement, and word of mouth have shifted to screens, applications, and algorithms. Digital marketing uses tools and channels of technology. Search engine marketing, social media marketing, automated advertisements, e-mails, influencers, and mobile commerce are all examples of marketing technologies Chaffey et al. (2019). Kotler et al. (2017) describe the customer journey as being redefined by technology. The stages of awareness, appeal, ask, act, and advocacy occur online.

The developing country of India is the fastest growing technology market. The inexpensive and rapid distribution of technology have led to rural areas having access to the internet. Transportation networks and communication technologies have fuelled the inclusion of previously isolated users. Many online offerings and services are available to consumers in rural areas. While there are

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many differences in urban and rural areas of India, consumers in small town rural areas have access to the same marketing offerings and services as urban metropolitan consumers.

Consumer behavior is the study of how individuals choose to acquire and dispose of products and services to meet their needs and/or wants [Hoyer et al. \(2013\)](#). Digital marketing addresses each phase of consumer behavior. Problem identification and the search for information are impacted by search engines. Evaluation of choice options is impacted by social media and online reviews. Purchase decisions are impacted by digital advertisements and remarketing. Post-purchase interactions foster loyalty and advocacy [Stephen \(2016\)](#). Recognition of how regional context impacts each of digital touchpoints is imperative. Due to local cultures, levels of digital and physical access, and trust, consumer response to digital stimuli is highly variable.

Kandhamal district of Odisha is an excellent case study for this type of research. Kandhamal, with its district headquarters in Phulbani, is a highly rural and an agricultural district with a significant indigenous population and Geographical Indication recognized turmeric. Traditionally, districts in Odisha have poorer development indicators for the state's literacy and infrastructure. However, in recent years, there have been marked improvements in mobile connectivity, usage of social media, and adoption of digital payments. This has attracted district consumers to the national digital marketplace. In a transitional, rural, and largely underserved digital ecosystem, how behavioral economics and how digital marketing impacts consumer behavior is a research question that is yet to be answered.

This study addresses a two-part problem. Most research regarding the interaction between digital marketing and consumer behavior occurs within urban and international contexts. Very few studies focus on aspirational and tribal-majority districts like Kandhamal. Furthermore, marketers and policymakers need more district-specific information to develop digital campaigns, e-commerce, and digital literacy solutions tailored to the district. This study addresses this need and explores the influence of digital marketing on consumer behavior among 150 respondents in the Kandhamal district. The study uses a published survey and a suite of statistical tools to analyze the survey results. The study's evidence base is region-specific, and combined with its demographic analyses differentiated by gender, age, and urban/rural residence, and its clear focus on research methods, the study is likely to stimulate managerial initiatives and additional academic research.

The term tech age used in this study does not refer simply to the existence of technology. Rather, it refers to a situation where technology permeates the everyday economic activities of most peoples' lives. Examples include paying recharges and utility bills via mobile wallets, discovering products via short videos, comparing prices using e-commerce apps, and validating purchases in messaging groups. Within a tech age environment, the traditional difference in marketing exposure and market participation erodes because every consumer that is connected is at the same time an audience, reviewer, and potential supporter. The tech age is, however, lacking in balance. The digital divide, in terms of access and affordability as well as skills and the meaningful use of technology, are issues of concern in Kandhamal district, and different gender, age, and rural-urban divides may experience the behavioral impact of digital marketing in different ways. This research study is therefore focused on the demographic differences listed above.

REVIEW OF LITERATURE

CONCEPTUAL AND THEORETICAL BACKGROUND

Several existing models have been adapted to create the theoretical basis for digital consumer behaviour. The Theory of Planned Behaviour [Ajzen \(1991\)](#) is used to understand purchase intentions, which are influenced by attitudes, subjective norms, and perceived behavioural control, all of which can be actively influenced through digital content, social media peer endorsement and ease of online transactions. The unified extension of the Technology Acceptance Model [Davis \(1989\)](#), namely the Technology Acceptance Model [Yasmin et al. \(2015\)](#) is used to account for the adoption of digital shopping channels via perceived usefulness, ease of use, social influence and facilitating conditions. [Kannan and Li \(2017\)](#) provide a broad framework for digital technologies to interact with the classic marketing process, creating value through touchpoints within the environment, in the company, and in the customer-outcome chain. [Lamberton and Stephen \(2016\)](#) analyse 15 years of studies to demonstrate the transformation of digital, social media and mobile marketing from a tool for individual expression to a pivotal data source for marketing.

INTERNATIONAL STUDIES

There is empirical evidence at the international level that show the behavioural relevance of the digital channel over and over again. [Tiago and Veríssimo \(2014\)](#) noted that firms believe that strong incentives exist to undertake digital and social media marketing due to consumers' increased expectations for digital presence and interaction. [Stephen \(2016\)](#) compiled research data that demonstrated how digital environments affect the consumer psychology across all phases of the decision journey, ranging from motivation, information processing and choice to post purchase behavior. [Duffett \(2017\)](#) showed that the attitudes of young consumers in South Africa are significantly affected by social media marketing communications with the effects being at the early, cognitive level of the hierarchy of effects. In 2018, Alalwan found that the performance expectancy, hedonic motivation and interactivity of social media advertising significantly boosted purchase intention among users. According to [Yasmin et al. \(2015\)](#) the digital marketing tools like e-mail, social media, and online advertising have measurable positive effect on sales and consumer

engagement, and [Dastane \(2020\)](#) revealed that digital marketing has significant effect on online purchase intention, mediated by customer relationship management only partially.

When viewed in detail, there are common themes emerging from the single studies as well as informative limitations. The results of the survey of marketing practitioners and consumers by [Yasmin et al. \(2015\)](#) provide a strong finding that digital tools are effective on cost and reach, but they were conducted in an urbanised commercial environment, which restricts transferability to rural areas. Using a large sample of young consumers and a hierarchy-of-effects model, [Duffett \(2017\)](#) used a stage-wise decomposition to examine the impact of attitudes; the strength of the study is the decomposition of the attitudinal impact into the different stages of the hierarchy, and its limitation is that it did not investigate older consumers, who represent a large proportion of the present sample. Although the study of [Alalwan \(2018\)](#) used a modified UTAUT model combined with structural equation modelling, which proved useful in examining social media advertising, its focus was on an advanced consumer base technologically, and its findings were based on the assumption of continued social media platform use, which may not be applicable to newly connected markets. [Dastane \(2020\)](#) provided mediation evidence for the influence of digital marketing on purchase intention with the use of customer relationship management but his respondents were recruited online, thereby omitting the consumers at the fringes of digital participation. Together, these restrictions inspire the study of an entire district population of internet users, with all age groups and occupations, and explicitly testing demographic contrasts.

INDIAN STUDIES

In the Indian context, [Bala and Verma \(2018\)](#) analyzed the development of digital marketing and highlighted its advantage of being cost-effective, measurable and interactive, which are essential for companies targeting Indian consumers, apart from the issues of trust, privacy and digital divide. The emphasis on the mobile-first experience, the influence of local language social media, and the convenience of cash on delivery and hassle-free returns have all been revealed by numerous studies on Indian consumers. In light of the fact that the principles for engaging consumers don't change with their channel, [Ryan \(2016\)](#) argues that marketers in emerging rural markets need to tailor digital strategy to local consumer psychology, rather than copy-and-paste metro strategies into a new channel. Overall, the Indian literature indicates that awareness of digital marketing has spread widely, but that behavioural conversion relies on trust, infrastructure, and demographic factors—these are potentially key concerns in areas like Kandhamal.

Show an understanding of the characteristics of the rural consumer and the challenges digital marketing poses to the sector.

A smaller though growing body of literature focuses on digital consumption outside metropolitan India. This literature brings together some propositions that are relevant to Kandhamal. The first is mobile-first interfaces that are voice- and video-based, which reduced the literacy requirement to participate digitally, enabling consumers with limited formal education to search, compare and transact. Second, the process of trust formation in rural and semi-urban markets is relational: the recommendations that are spread through family and community networks on messaging apps tend to have a greater impact on behaviour than the formal advertising that is sent by the brand, indicating that the impact of formal marketing communication could be underestimated. Third, fulfillment constraints, such as delivery reach, return logistics, cash on delivery availability, introduce a blockage between digitally formed intention and completed purchase, and in turn allow for synchronicity of high perceptual engagement and low behavioral conversion. Fourth, as women's access to smartphones increases, they form one of the fastest growing digital consumer segments, especially in social commerce areas, in smaller markets. Both the hypotheses of the present research and the interpretation of the results are based on these propositions, particularly the demographic differences between genders and dwelling type.

SYNTHESIS

Theoretically and empirically the literature leads to three expectations that are summarized here. Awareness of digital marketing should be high in transitional districts, as mobile penetration is very deep; dimensions of digital marketing should, in principle, relate positively to behavioural outcomes, according to the reports of [Duffett \(2017\)](#), [Alalwan \(2018\)](#) and [Dastane \(2020\)](#); and the effect of digital marketing on behavioural outcomes should be moderated by the demographic characteristics. The literature also warns, however, that the design of the instruments (as detailed above), ceiling effects in Likert responding, and unmeasured contextual constraints can weaken observed relationships, a warning that is relevant to the findings reported below.

RESEARCH GAP

The literature reviewed reveals three gaps. First, there are geographical differences: The vast majority of empirical research on digital marketing and consumer behaviour focuses on metropolitan, national, or international sample populations; very little published research exists for tribal majority and predominantly rural districts of Odisha like Kandhamal where connectivity is recent, and consumption is in a state of flux. Second, there is a demographic gap because although gender, age, and urban-rural differences are often discussed, there are few studies at the district level that formally test these differences using inferential statistics on primary data. Third, a measurement gap exists; much of the applied literature yields consistently positive perceptual results, but fails to explicitly investigate whether perceptual agreement equates with statistically significant perceptual-behavioural

correlations. The current study aims to solve these issues by gathering primary data from 150 consumers of Kandhamal district, testing of hypothesis using various statistical tools, reporting the significant and non-significant results clearly and honestly and provided an honest regional benchmark for future research.

OBJECTIVES OF THE STUDY

The study is guided by the following objectives:

- 1) To assess the level of awareness and perception of digital marketing among consumers in Kandhamal district of Odisha.
- 2) To examine the relationship between the dimensions of digital marketing (awareness, social media marketing, online advertising, and consumer trust) and consumer behaviour.
- 3) To measure the combined impact of digital marketing dimensions on consumer behaviour using multiple regression analysis.
- 4) To examine the association between demographic characteristics and the behavioural impact of digital marketing.
- 5) To analyse differences in digital marketing awareness and consumer behaviour across gender, age groups, and area of residence.

RESEARCH HYPOTHESES

Consistent with the objectives and the reviewed literature, the following alternative hypotheses were formulated:

H1: There is a significant relationship between the dimensions of digital marketing and consumer behaviour.

H2: The dimensions of digital marketing significantly predict consumer behaviour.

H3: There is a significant association between area of residence and the level of behavioural change attributed to digital marketing.

H4: There is a significant difference between male and female respondents in the behavioural impact of digital marketing.

H5: Consumer behaviour scores differ significantly across age groups.

H6: Digital marketing awareness differs significantly across rural, semi-urban, and urban areas of residence.

CONCEPTUAL FRAMEWORK

The conceptual model of the study is presented in Figure 1. The four dimensions of digital marketing are independent variables: the awareness of digital marketing (DMA) which is the familiarity of digital marketing and perception of digital channels by consumer; consumer trust in digital channels (CT) which is consumer confidence in digital products and services; consumer social media marketing (SMM) which is consumer's trust in social media platforms such as Facebook, Instagram, WhatsApp, and YouTube; and consumer online advertising (OAD) which is consumer's trust in online ads such as display ads and video ads. The dependent variable is the changes in overall buying behaviour which are attributed to digital marketing by the consumers (CB). Differences and associations are tested based on the demographic characteristics (gender, age, education, occupation, income, area of residence).

Figure 1

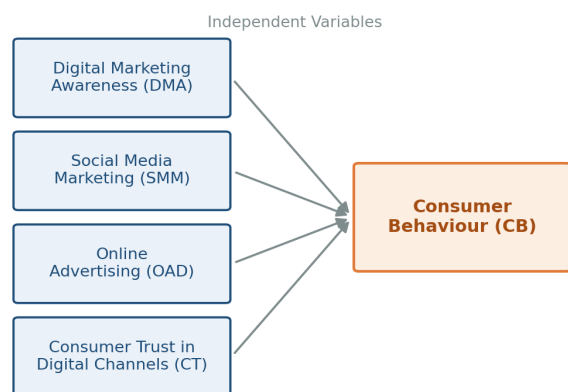


Figure 1 Conceptual Framework of the Study

RESEARCH METHODOLOGY

RESEARCH DESIGN AND STUDY AREA

The study was descriptive and analytical in nature using Cross Sectional survey design. Kandhamal district has been taken up for study, which includes rural villages, semi-urban block headquarters, and the urban centres of the district, like Phulbani and G. Udayagiri. The district was intentionally chosen, as it is a digital marketing district, largely rural and tribal, but becoming connected via mobile internet and digital payment systems.

SAMPLING AND DATA COLLECTION

Primary data were gathered using a structured questionnaire to consumers who indicated that they use the internet. A convenience sampling method with the consideration of quotas based on gender and place of residence was used. The first 150 responses from the larger survey exercise were used for the present analysis, which proved to be a sufficient sample size for the procedures of the survey (correlation, regression, chi-square, t-test, and ANOVA). The existing literature, books and official reports were used to frame the study and identified secondary data.

INSTRUMENT AND MEASUREMENT

There were two parts to the questionnaire. Demographic data, including gender, age, education, occupation, monthly income and area of residence, were captured in Part A. Part B was composed of 7 perceptual statements with 5-point Likert scale from (1) strongly disagree to (5) strongly agree. 3 items captured digital marketing awareness and perception (ADM1 to ADM3) while single items captured online advertising (OAD1), social media marketing (SMM1), consumer trust (CT1), and consumer behaviour (CB1). The operationalisation of the variables is presented in Table 1. The mean of the three ADM scores (ADM1 to ADM3) was used to create an aggregate awareness index (DMA).

Table 1

Table 1 Operationalisation of study variables	
Code	Statement / Description
ADM1	I am aware of digital marketing channels such as websites, mobile applications, e-mail, and social media.
ADM2	Digital marketing provides useful information about products and services.
ADM3	Digital marketing influences my preference for brands and products.
SMM1	Social media marketing influences my purchase decisions.
OAD1	Online advertisements attract my attention towards new products.
CT1	I trust products and services promoted through digital channels.
CB1	Digital marketing has changed my overall buying behaviour.

Source: Structured questionnaire developed for the study.

STATISTICAL TOOLS

The coding and analysis of data was done with SPSS and Microsoft Excel. The data analysis was conducted in five steps: descriptive statistics (frequency, percentage, mean, and standard deviation); reliability analysis (Cronbach's alpha); Pearson product-moment correlation; multiple linear regression (CB1 dependent variable); and tests of group differences and association (chi-square test of independence, independent samples t-test, and one-way ANOVA). A 5 per cent level of significance was used for all hypotheses.

SCOPE OF THE STUDY

The study is delimited in three ways. The geographical coverage includes consumers from rural, semi-urban and urban areas within Kandhamal district. It is a conceptual framework in which the four pillars of digital marketing, as well as awareness and perception, social media marketing, online advertising, and consumer trust, are discussed in relation to consumer self-reported behaviour, and not specific to any particular brand or platform or campaign. Analytically, it is limited to the techniques outlined above, univariate, bivariate and multivariate, applied to the primary data, with 150 respondents, but does not include structural equation modelling or longitudinal analysis as future directions for research.

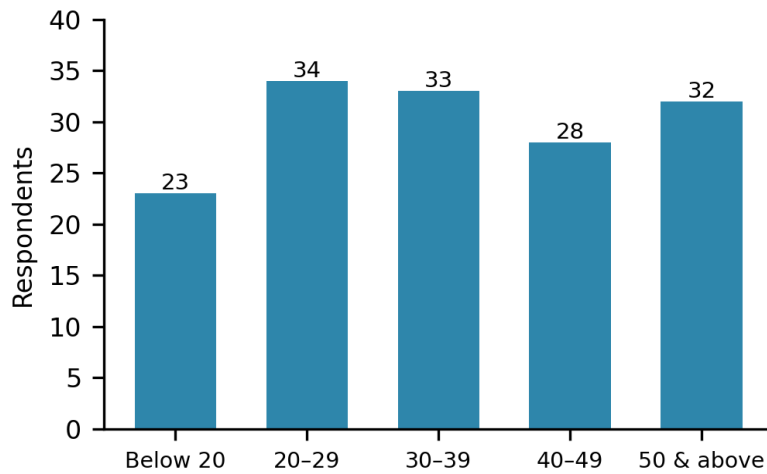
DATA ANALYSIS AND RESULTS**DEMOGRAPHIC PROFILE OF RESPONDENTS**

Demographic profile of the 150 respondents is presented in Table 2. The sample represents equal numbers of male and female respondents, 33.3 per cent and 34.0 per cent respectively, and 32.7 per cent of the respondents did not disclose gender. The age distribution is fairly even: 15.3 per cent are younger than 20; 22.7 per cent aged between 20 and 29; 22.0 per cent aged between 30 and 39; 18.7 per cent aged between 40 and 49; and 21.3 per cent aged over 50, suggesting that digital exposure is not limited to the young in the district. Educational wise, 24.0 per cent are graduates, 21.3 per cent postgraduates and 34.0 per cent have matriculation or higher secondary education. The district has a heterogeneous occupational population with 17.3 per cent of the students, 14 per cent of farmers, 14 per cent of government workers and 13.3 per cent of self-employed respondents. Monthly income is distributed across all five brackets and area of residence has 32.7 per cent rural respondents, 28.7 per cent semi-urban and 38.7 per cent urban respondents. The following figure shows the age distribution (Figure 2).

Table 2

Table 2 Demographic profile of respondents (n = 150)			
Variable	Category	Freq.	%
Gender	Male	50	33.3
	Female	51	34
	Prefer not to say	49	32.7
Age	Below 20 years	23	15.3
	20–29 years	34	22.7
	30–39 years	33	22
	40–49 years	28	18.7
	50 years & above	32	21.3
Education	Up to matriculation	27	18
	Higher secondary	24	16
	Graduate	36	24
	Postgraduate	32	21.3
	Professional/other	31	20.7
Occupation	Student	26	17.3
	Government employee	21	14
	Private employee	14	9.3
	Business/self-employed	20	13.3
	Farmer	21	14
	Homemaker	18	12
	Others	30	20
Monthly income	Below Rs. 10,000	27	18
	Rs. 10,000–25,000	32	21.3
	Rs. 25,001–50,000	29	19.3
	Rs. 50,001–75,000	28	18.7
	Above Rs. 75,000	34	22.7
Residence	Rural	49	32.7
	Semi-urban	43	28.7
	Urban	58	38.7

Source: Primary data computed from the first 150 responses.

Figure 2**Figure 2 Age Distribution of Respondents**

DESCRIPTIVE STATISTICS

The means for the seven perceptual items are summarized in Table 3 and represented in Figure 3. The values of all range from 3.70 to 3.99 on a five-point scale, far from the neutral point of 3.00, and lie within the range 1.03 to 1.20 for the standard deviations. The highest mean score is for ADM2, where the mean score is 3.99 with a standard deviation of 1.05, representing the most positive agreement with the statement that digital marketing offers useful information on the products (72.7 per cent agree or strongly agree). The levels of brand influence (for ADM3 the mean was 3.93) and general awareness (for ADM1 the mean was 3.77) are also high. For the behavioural stimuli, the highest degree of majority consensus, at 66 per cent, is for online advertising (OAD1), consumer trust (CT1), and social media marketing (SMM1). In particular, the dependent variable CB1 reports an average of 3.84 with the majority of respondents (68.7%) stating that they agree that digital marketing has affected their total buying behaviour. The figures confirm that digital marketing has penetrated the minds of most consumers in Kandhamal district at perceptual level and consumers themselves attribute significant behavioural change to digital marketing. This meets the first aim of the study.

Table 3**Table 3 Descriptive statistics of study variables (n = 150)**

Item	Mean	SD	% Agreement
ADM1	3.77	1.031	62.7
ADM2	3.99	1.046	72.7
ADM3	3.93	1.03	72.7
SMM1	3.7	1.197	64
OAD1	3.78	1.11	64.7
CT1	3.79	1.076	65.3
CB1	3.84	1.13	68.7

Note: % Agreement = share of respondents selecting 4 or 5.

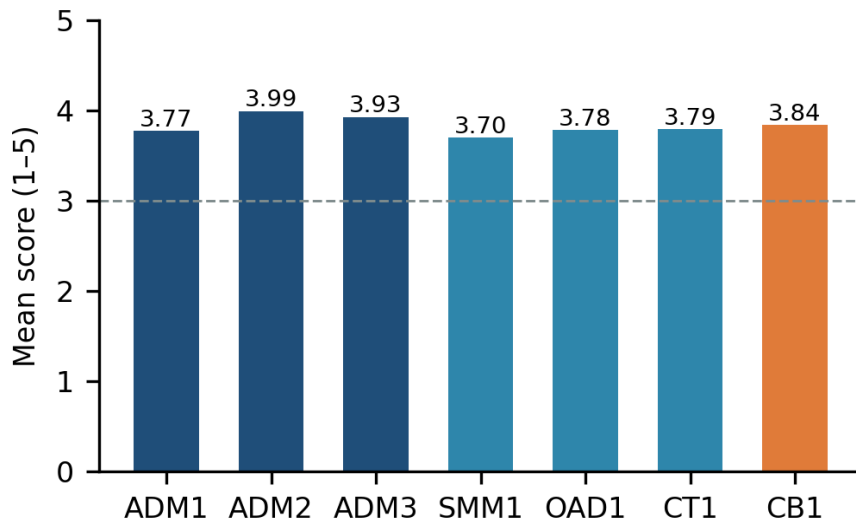
Figure 3**Figure 3 Mean Scores of Study Variables****RELIABILITY ANALYSIS**

Table 4 shows the results of Cronbach's alpha to determine internal consistency. The results for the seven perceivable items indicated an alpha of -0.083 and the three items of awareness indicated an alpha of -0.135 . Both results fell below the threshold of $\alpha = 0.70$, the generally accepted threshold of internal consistency [Nunnally and Bernstein \(1994\)](#). This suggests that these items do not reflect a single dimension of scale. Rather, they appear to behave as distinct, single indicators of separate items of the digital marketing experience. There is a high probability of this happening in research when, as in this case, two, or several, specific constructs are captured in one research item. [Bergkvist and Rossiter \(2007\)](#), along with [Diamantopoulos et al. \(2012\)](#), argue that single-item measures are acceptable in this case, although they violate normal scale reliability. This justifies that all the measures of the singular items of this research, along with the aggregate index of awareness, are presented. Inter-item covariance is considered to be an indicator of the extent of the limitation of measurement in this research. This was done to be as transparent as possible, rather than using composite scores.

Table 4

Table 4 Reliability statistics		
Item set	Items	Cronbach's α
All perceptual items	7	-0.083
Digital marketing items	6	-0.094
Awareness items (ADM1-3)	3	-0.135

Source: Computed from primary data.

CORRELATION ANALYSIS (H1)

Pearson correlation coefficients estimating the relationship between dimensions of digital marketing and consumer behavior are also shown in Table 5. The rest of the coefficients referring to CB1 signal small and statistically insignificant values. DMA ($r = .040$, $p = .625$), SMM1 ($r = .029$, $p = .727$), OAD1 ($r = -.028$, $p = .732$), CT1 ($r = -.083$, $p = .315$). Independent dimensions of digital marketing are also characterized by low values and insignificant correlation (all $|r| < .08$). Therefore, the absence of multicollinearity is confirmed and among the dimensions of digital marketing administered in the present research is evident. H1 is not confirmed at the five per cent level. However, the parameter has an important meaning. Namely, although the participants had only positive impressions and perceptions about digital marketing, and there is no correlation between positive impressions and changes in consumers behavior and their purchases. This parameter suggests the presence of the so-called ceiling effect, where high consistency

of impressions of the participants is combined with a low correlation of results. This also indicates that the additional unquantified factors such as pricing, availability, and others impact consumer behavior.

Table 5

Table 5 Pearson correlations among study variables (n = 150)					
	DMA	SMM1	OAD1	CT1	CB1
DMA	1				
SMM1	-.025	1			
OAD1	0.045	-.065	1		
CT1	0.056	-.064	-.078	1	
CB1	0.04	0.029	-.028	-.083	1

Note: No Coefficient is Significant at the .05 level (two-tailed).

MULTIPLE REGRESSION ANALYSIS (H2)

To assess the predictive factors of digital marketing models, consumer behavior was regressed on DMA, SMM1, OAD1, and CT1 (refer to Table 6). The model captures only 1.1 percent of the variance of consumer behavior ($R^2 = .011$, adjusted $R^2 = -.017$). The model was not statistically significant, $F(4, 145) = 0.392$, $p = .814$. All predictors were statistically non-significant. DMA ($B = .093$, $p = .569$), SMM1 ($B = .021$, $p = .790$), OAD1 ($B = -.036$, $p = .669$), and CT1 ($B = -.091$, $p = .300$). The high average level of reported behavioral change was attributed to the significant predictor, the intercept ($B = 3.881$, $p < .001$), and therefore, H2 was not supported. Considering the regression summarizes the reported behavioral change of consumers in the Kandhamal District, the impact of digital marketing is mostly uniform and broad, and not greatly changed by the differing levels of perception of individual consumers. This result aligns with a market environment where various consumers are constantly exposed to digital marketing across all market segments.

Table 6

Table 6 Regression of Consumer Behaviour on Digital Marketing Dimensions				
Predictor	B	SE	t	p
(Constant)	3.881	0.847	4.585	< .001
DMA	0.093	0.163	0.571	0.569
SMM1	0.021	0.078	0.267	0.79
OAD1	-.036	0.085	-0.429	0.669
CT1	-.091	0.087	-1.041	0.3

Note: $R^2 = .011$; Adj. $R^2 = -.017$; $F(4, 145) = 0.392$; $p = .814$.

CHI-SQUARE TEST OF ASSOCIATION (H3)

For the chi-square analysis, we grouped CB1 responses into categories based on the behavioural impact score with levels 1 and 2 grouped as low impact; 3 as neutral; levels 4 and 5 grouped as high impact; and cross-tabulated with area of residence (Table 7). The high impact group is reported by 83.7 percent of rural respondents (41 of 49), by 62.8 percent of semi-urban respondents (27 of 43), and by 60.3 percent of urban respondents (35 of 58). The chi-square test gives $\chi^2(4) = 8.771$, $p = .067$, which is not significant at the 5 percent level, but is at the 10 percent level. A similar test of gender vs behavioural impact gives $\chi^2(4) = 8.381$, $p = .079$, which is also considered marginal. Therefore, hypothesis H3 is not supported at the standard level, and the correlation of area of residence with behavioural impact is considered suggestive. The pattern of rural respondents indicating the highest level of reported behavioural change is significant and should be studied with larger samples, particularly given the greater novelty and potential impact of digital services on rural Kandhamal.

Table 7

Table 7 Chi-square tests of association with behavioural impact					
Cross-tabulation	Low	Neutral	High	χ^2	p
Rural (n = 49)	5	3	41		
Semi-urban (n = 43)	6	10	27	8.771	0.067

Urban (n = 58)	11	12	35	(df = 4)
Gender × impact	—	—	—	8.381 0.079

Note: Impact Categories: Low = 1–2, Neutral = 3, High = 4–5 on CB1.

INDEPENDENT SAMPLES T-TEST (H4)

Table 8 and Figure 4 demonstrate the influence of behavior as reported by male and female respondents. Female respondents demonstrated a statistically significant higher mean CB1 score ($M = 4.10$, $SD = 1.06$) than male respondents ($M = 3.64$, $SD = 1.17$), $t(99) = -2.056$, $p = .042$. This supports hypothesis H4. The findings will suggest that the female respondents from Kandhamal District have a higher perception of how much their buying behavior has been transformed than the male respondents by about a half of a scale point. The findings of the respondents from Kandhamal District support the findings in the existing literature, which demonstrate that female respondents are more responsive to social commerce and to visual peer recommendations. This research deems that the respondents from Kandhamal District have a preference for social shopping, a preference that might be leveraged in the development of advertising campaigns that target female respondents in the District. The advertising campaigns that target female respondents in this District have the potential to be successful for advertising personal care products and clothing.

Table 8

Table 8 Independent samples t-test: behavioural impact by gender					
Group	n	Mean	SD	t	p
Male	50	3.64	1.174		
Female	51	4.1	1.063	-2.056	.042*

Note: Significant at the .05 level; df = 99.

Figure 4

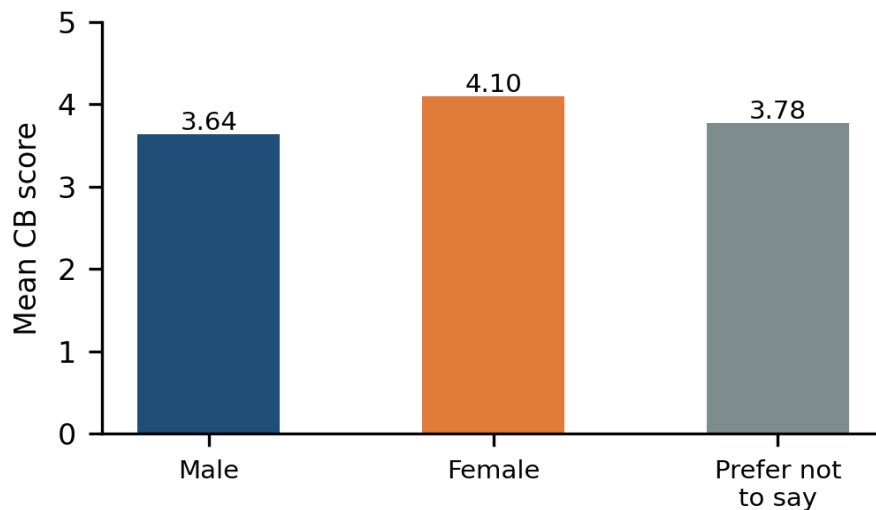


Figure 4 Gender-Wise Mean Consumer Behaviour Score

ONE-WAY ANOVA (H5 AND H6)

Table 9 shows the results of two one-way ANOVAs. The first analysis compares mean CB1 scores given by the five surveyed age groups. The scores showed a mean of 3.53 for the 20–29 age group and a higher mean of 4.09 for the 30–39 age group. However, these differences were not statistically significant, $F(4, 145) = 1.264$, $p = .287$. Levene's test shows equal variance with $p = .697$. Therefore, H5 is not supported. The results show no clustering of young people in the district, but instead show a cross-cutting self-described behavioural impact of digital marketing for all age groups. The second analysis compares the aggregate awareness index (DMA) given the respondent's area of residence. The highest mean awareness score ($M = 4.02$, $SD = 0.54$) is given by Semi-Urban respondents, followed by Rural respondents ($M = 3.96$, $SD = 0.54$) and Urban respondents ($M = 3.75$, $SD = 0.60$). This difference is statistically significant, $F(2, 147) = 3.266$, $p = .041$, and showed equal variance (Levene $p = .833$).

Semi-Urban and Urban respondents showed a significant difference in awareness with H6 being supported. The results, illustrated in Figure 5, suggest that Urban respondents' lower awareness of digital promotions is due to Urban consumers being critical of an over-saturation of digital promotions. In contrast, Semi-Urban and Rural consumers rely on digital marketing to provide the few marketing and retail options available.

Table 9

Table 9 One-way ANOVA results			
Comparison	F	df	p
CB1 across age groups	1.264	4, 145	0.287
DMA across residence	3.266	2, 147	.041*

Note: * significant at the .05 level.

Figure 5

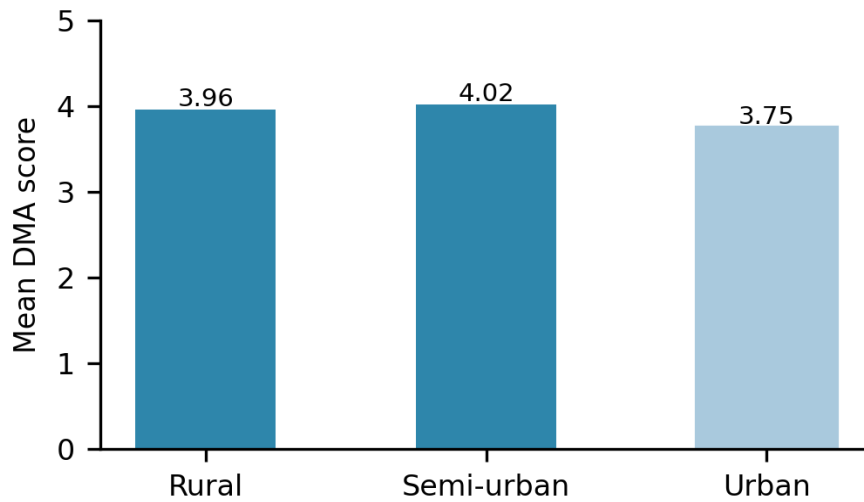


Figure 5 Residence-Wise Mean Digital Marketing Awareness

SUMMARY OF HYPOTHESIS TESTING

Table 10

Table 10 Summary of hypothesis testing			
Hyp.	Test applied	Statistic (p)	Result
H1	Pearson correlation	max r = .083 ($\geq .315$)	Not supported
H2	Multiple regression	F = 0.392 (.814)	Not supported
H3	Chi-square	$\chi^2 = 8.771$ (.067)	Not supported
H4	Independent t-test	t = -2.056 (.042)	Supported
H5	One-way ANOVA	F = 1.264 (.287)	Not supported
H6	One-way ANOVA	F = 3.266 (.041)	Supported

Source: Computed from primary data (n = 150).

DISCUSSION OF FINDINGS

Here, careful thought is warranted. Digitally pervasive marketing in Kandhamal claims up to three-quarters of respondents for some statements, with 68.7 percent reporting a change in behavior. Though, perceptually, the dimensions of marketing in this study showed no correlation or predictive relationship with change in behavior. These findings can be explained four ways. First, agreement to the survey statements was so high that response variance, and thus correlation, was affected; a change in perception

does occur when members in a group individually perceive a meaningful difference. Second, of the other marketing constructs, only one item was devoted to each, and while one item measures can be defended in situations where the construct is easily defined Bergkvist and Rossiter (2007), reliability and, thus, correlation is undermined, which is shown in the confirmed negative alpha; this was made even worse by the absence of several marketing constructs. Third, structural factors such as availability of certain goods, varying prices, delivery and digital payment systems, which did not feature in the model employed, could explain behavior change of this market, in which case digital marketing would be a contextual factor. Lastly, the strongest demographic influences may actually show variation between groups, as opposed to along the perceptual dimensions; respondents of differing gender reported differing behavior with men reporting less; of differing residences, semi-urban dwellers most increased their awareness of digital promotions.

The pattern as a whole suggests a digitally saturated market, aware of its constraints, where the next incremental behavioural conversion, will emerge from fulfilment and trust-building through segment-specific targeting, not through more generic exposure.

CONCLUSION

MAJOR FINDINGS

Below are the key points of the study:

- 1) Knowledge and understanding of digital marketing are particularly high in the district as evidenced by item means on the five-point scale from 3.70 to 3.99 with agreement falling in the range of 62.7 to 72.7 percent.
- 2) Digital marketing has altered overall buying behavior for almost all respondents, as represented by $M = 3.84$.
- 3) The digital marketing dimensions and consumer behavior exhibited small and statistically negligible correlations ($p > .05$). The regression analysis was also not significant ($R^2 = .011$, $p = .814$). Therefore, H1 and H2 are not substantiated.
- 4) The relationship between where a person resides and the degree of behavioral impact is insignificant ($\chi^2 = 8.771$, $p = .067$) and among the responding groups, rural respondents exhibited the most high-impact responses (83.7 percent); therefore, H3 was not substantiated at the 5 percent level.
- 5) It was found that female respondents have a greater behavioral impact than male respondents ($t = -2.056$, $p = .042$); therefore, H4 has been substantiated.
- 6) It was found that behavioral impact was not significantly different across the age groups ($p = .287$). However, it was found that digital marketing awareness was significantly different across the residential groups ($F = 3.266$, $p = .041$), with the highest level of awareness being in the semi-urban respondents. Therefore, H5 has not been substantiated and H6 has been substantiated.

CONCLUDING REMARKS

This research intended to analyze the influence of Digital Marketing on the Behavior of Consumers in the Kandhamal District of Odisha. This was done with the help of Primary data collected from 150 Respondents. We draw three major conclusions from this data. Point one, it was found that, in this District, which is primarily Rural and Tribal, the penetration of Digital Marketing has flourished with remarkable success. The mean Agreement with regard to each and every aspect is far above the midpoint, and over two-thirds of the Respondents contend that Digital Marketing has altered their purchasing behavior. The significance of this finding is that the Digital Marketing Platform has, in fact, arrived in Kandhamal. Point two, the picture painted in the voluntary responses is broadened and, in many ways, tempered by the Inferential Analysis. In this case, neither the Correlation, nor the Regression Analysis, of the perceptions of Digital Marketing, and the resultant Behavioral Change, yielded any significant results. In the district, the Behavioral Change triggered by Digital Marketing appears to be widespread and uniform. It does not prescribe the intensity of the individual perceptions of the various aspects of Digital Marketing, and it may be, to a large extent, influenced by intersectional factors such as Pricing, Accessibility, Logistics, and social factors. Point three, the demographic structure has been shown to have a significant effect in that the observed change in behavior is significantly greater for females than for males. Furthermore, the extent to which consumers are aware of Digital Marketing differs significantly depending on the area in which they reside. Semi-Urban consumers are the most aware of Digital Marketing, while Urban consumers are the least aware.

The following implications are based directly on the research findings. For marketers, the district constitutes a receptive but homogeneous market. In this scenario, the key constraints are the availability and fulfillment of products rather than persuasion, unlike other markets. The introduction of gender-sensitive campaigns and the establishment of semi-urban distribution centers provide viable pathways. For policymakers, the results justify further rural investments in transportation and digital literacy projects, where rural Kandhamal access already exceeds urban levels, while infrastructure and services are lagging behind. For researchers, the results demonstrate the importance of integrity in research. Candor shows that positive indirect findings with behavioral gaps and rural digital segments suffocated by urban segmentation, are and can be only revealed through honest and comprehensive reporting.

Based on the findings, the following recommendations are formulated:

- 1) For marketers, Kandhamal represents a unique market in that fulfillment infrastructure, reliable distribution, cash-on-delivery, and customer returns are of greater importance than transport costs and efforts spent on creating awareness campaigns, which are of little value.
- 2) Marketers should use gender-sensitive campaigns, which tap into the positive response of women, to design social-commerce, community reselling, and vernacular-based videos focused on women.
- 3) Marketers should consider semi-urban block towns as the natural distribution and promotion centers of the district due to their mediation of urban supply and rural demand.
- 4) Marketers should focus on implementing transparent pricing and honest feedback along with a significant trust building campaign. While trust and confidence in digital systems is relatively high, it does not lead to an automatic behavioral response.
- 5) Behavioral changes are more common amongst rural populations, which means they are more likely to benefit from new digital systems that are more inclusive. Because of the rural populations greater needs, policymakers should strengthen connectivity and digital literacy programs.
- 6) Greater use of multi-dimensional, validated scales will allow the perceptual mechanisms behind behavioral changes to be measured with much greater precision in future institutional surveys in the district.

LIMITATIONS OF THE STUDY

Multiple limitations must be considered when interpreting the findings. First, the focus of this study is the Kandhamal district. Findings may not be relevant for other districts of Odisha or in the greater context of India. Second, the data were drawn from 150 participants using non-probability sampling, which though demographically balanced, limits the overall sample representativeness. Third, with the exception of digital marketing awareness, each of the other dimensions of digital marketing was assessed with a single Likert item. Reliability analysis showed that each of these was a single, stand alone, and non-redundant, and therefore non-reliable, item. Thus, single items of costs were measured, which may have led to sparse relationships and contributed to the other non-significant structural findings. Fourth, the measurement of consumer behavior was conceptualized as self-reported change in behavior rather than observed purchasing, which introduced recall and social-responding biases. Fifth, participant responses were measured at one point in time, which is inconsistent with the rapid changes in the digital marketing environment. Lastly, the effects of digital marketing, network quality, service delivery, and digital payment systems were unmeasured, which may have substantial effects on consumer behavior in Kandhamal district.

FUTURE RESEARCH DIRECTIONS

This study opens several new lines of inquiry. Future studies should include psychometrically validated, multi-item scales for each digital marketing component. These scales should undergo confirmatory factor analysis, followed by the measurement model for SEM, which enables direct, indirect, and mediated analyses of digital exposure on purchasing behaviors through trust and engagement. Future studies should collect large probability samples from multiple districts of Odisha. These samples should have study designs that compare districts with high tribal populations with Odisha's coastal districts. These studies would strengthen the findings' external validity. Behavioral changes impact with the increase in connectivity and the use of long-term studies. The effect of theories such as vernacular video ads, influenced advertising, and price advertising can be discovered with field studies. The use of AI-based consumer analytics, clickstream data, machine-learning segmentation in rural digital markets, and other data collection methodologies combined with traditional research methods to capture digital traces of consumer behavior with a focus on women consumers would be beneficial. The research would build on the current findings and explore the motivations and reasons behind the differing consumption patterns of digital consumers.

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