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Article

Growth of Digital Marketing Expenditure and Online Consumer Engagement in India: Evidence from Industry Reports, 2010–2025

Rohit Sinha[1*] Sonam Arora[2] Mahak Singh[3]

1. Department of Management, IIMT College of Management, Greater Noida, Uttar Pradesh, India.
2. Department of Management, DAV Centenary College, Faridabad, Haryana, India.
3. Department of Commerce, St. Peter's College, Faridabad, Haryana, India.

*Corresponding Author:
rohit5017_gn@iimtindia.net

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Abstract:

This paper explores the sociocultural history of the Indian digital advertising sector as well as the relationship between the continued digital spending and aggregate consumer engagement on the web between 2010 and 2025. The study incorporates digital spending, engagement metrics, and infrastructure indicators in an annual macro-panel based on a consolidated longitudinal dataset of multi-source industry evidence, consisting of GroupM, Dentsu, IAMAI-Kantar, CRISIL, Ipsos, Nielsen and statista, databases. Elasticity-based regression analysis and trend diagnostics demonstrate that there are three growth stages, including early diffusion (2010-2014), mobile-first acceleration (2015-2019), and post-pandemic maturity (2020-2025). Digital investments broadened almost forty-fold, and impressions increased in the same line and click-throughs decreased and video view rates increased, indicating that there is a difference in engagement trends across the different formats. The results of econometric estimates serve to substantiate an increase in impressions and video completion with a simultaneous rise in expenditure and user-base, and a negative elasticity of CTR in ecosystem saturation. Breaks in 2016 and 2020 are structural changes, which reflect big access and behavioural jolts that change the dynamics of engagement. The research provides one of the earliest, country-specific, longer-period studies of relationships of spending and engagement that shows that infrastructural changes and ecosystem-level inflexions drive digital advertising performance even more successfully than incremental spending. The implication is on market strategy, standardisation of measurements, and way of designing policies in maturing digital economies.

Keywords: Digital Advertising; Consumer Engagement; India; Structural Breaks; Longitudinal Analysis; Video Completion; Click-Through Rate

1. INTRODUCTION

The business of online marketing has emerged as the main growth driver in the Indian advertisement industry (Gulati, 2025), fueled by the increasing numbers of smartphone users, low mobile data rates, and the presence of social and video-board-based platforms, which have been constantly increasing in terms of growth and engagement rates. According to recent figures in the industry, digital media is currently estimated to cover 4060 percent of the total advertising spending in India, which highlights the structural centrality of digital media in the media mix (Majeed et al., 2024). Nonetheless, scholarly literature on the topic of the digital advertising of India

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has stayed divided, with most articles having restricted scope to briefing pre-2020 periods or concentrating on effects of campaigns in isolation instead of the dynamics at an ecosystem speed, creating a piecemeal view of how expenditure and participation interact through time. Annually updated platforms, methodologically consistent with reports published by GroupM, Dentsu, IAMAI-Kantar, CRISIL, Ipsos and Statista have given annual updates on digital advertising market spenders, number of impressions, platform shares and audience behaviour, and now represent the most exhaustive longitudinal evidence base of the Indian digital advertising market. However, such multi-source data are not commonly synthesised in academic studies, despite the fact that the access, use and marketing scopes at scale were transformed fundamentally by the digital acceleration after 2016 in India as a result of disruptive data pricing and the mass market adoption of smartphones. Such underutilisation leaves a distinct gap in the literature in the depths of digital marketing, media economics, and platform studies in the Indian environment. The current paper covers this gap with a consolidated longitudinal examination of the period 20102025 (Qurtubi et al., 2022) by creating a multi-source panel of digital Ad spending and involvement indicators in India. One, it adds to the long-term and country-specific evidence by capturing and documenting the development of digital ad expenditures and user engagement in a 16-year horizon on a systematised basis, which is nearly lacking in the current literature. Second, combining GroupM, Dentsu, IAMAI-Kantar, CRISIL, Ipsos and Statista metrics, the paper creates one of the most granular sets of information when dealing with the Indian digital advertising track. Third, it empirically connects changes in digital ad spending to changes in engagement through annual OLS regressions, structural-break tests, and trend analysis to provide data on the relationship between the dynamics of spend and more favourable results in terms of usage and attention. Lastly, it relates these patterns of empirical observation to market facts including ad fraud and measurement friction, the concentration of platforms, and the fastened change to programmatic and commerce-related and video-first formats, thus enlightening theory and practise in digital marketing when platformed growth is occurring rapidly. All in all, the article offers solid, India-focused, long-term data, which promotes theoretical and practise-oriented theories of digital ecosystem development - addressing a research gap that has existed in digital marketing research.

2. LITERATURE REVIEW

The last 20 years have been characterised by a rapid growth of digital marketing research as the primary cause of the radical change in the world of advertising ecosystems (Antczak, 2024). Initial research in the 2010s mostly concentrated on the conceptualisation of the role of digital marketing in the greater advertising combination, and how online vehicles supplemented or replaced conventional media (Tiago and Verissimo, 2014). It was succeeded by a series of empirical research that investigated the effectiveness of banner advertising, the click behaviour, consumer interactions with adverts and the rising role of search-based advertising (Boerman et al., 2017). Targeting precision, measurability, and personalisation were described as characteristic of digital media in these early contributions but were mostly restricted to the Western markets and campaign-level data, and the India-specific insights remained rather untapped. Later global literature discussed the fast development of online advertising and the effect or replacement between the old and the new media. Dwivedi et al. (2020) show how companies gradually shift their advertising spending to the internet as marginal returns continue to rise, and the possibility of using data-driven optimisation becomes a reality. To a greater extent, researchers report advertising as a primary competitiveness factor in the global economy (globalisation), and digitalisation is transforming the global market of advertising services. This set of literature points to an organisational transformation to online and performance-based advertising forms, which are the result of platform economies and other sophisticated data analytics and cross-border integration of markets. Recent sources also add that the COVID-19 pandemic increased the trends, and more intelligent advertising methods in a measurable and outcome-based format are getting even more strategic (Anton & Siscan, 2023). Digital advertising growth in any market has been cited to be greatly supported by technological infrastructure. Especially, mobile broadband penetration is considered one of the key drivers of digital advertising (Bakshi and Tandon, 2021). In India, this changed very rapidly in the wake of the telecom disruption of 2016 that dropped the cost of data dramatically and widened the range of mobile wireless internet usage. In parallel with the growth process supported by infrastructure, there is one more significant stream of research, which concentrated on online consumer engagement indicators. The ways to measure engagement have been traditional standards of impressions, click-through rates (CTR), time-on-site, bounce rates, video completion rates (VCR) and social activity in terms of likes, shares and comments. Calder et al. (2009) and Voorveld (2019) take the concept of engagement further and position it as a more psychological attachment to brand content by customers. Empirical research states that CTR is a measure of relevance, VCR is an indicator of content quality, and impressions are a product of platform algorithms. Nonetheless, the majority of scholarly research is confined to small-scale campaign or platform-wide data as opposed to entire national markets. The literature is further supported by experimental evidence of advertising effectiveness. By relying on a large-scale randomised experiment that was run with Yahoo! and a large retailer, Reiley (2012) can quantify the causal effect of online advertising on the sales that occurred at the individual level. The results indicate that there are statistically significant and enduring effects on online and offline purchases whereby the overall revenues are more than seven times the advertising costs. The research also records decreasing yet favourable marginal returns to digital advertising expenses and demonstrates that the non-experimental procedures inaccurately estimate advertising performance by a significant degree. The other major line of study is that of Online Behavioural Advertising (OBA) in which online activity of the users is tracked so as to present them with personalised advertisements. Although OBA makes the

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advertisement more efficient and relevant, the available literature is also concerned with issues related to privacy, data transparency, and misuse of data every time. Empirical results propose that consumer reactions to OBA are determined by advertiser manipulated variables including the extent of personalisation and disclosure and consumer manipulated variables like perception of privacy, awareness and prior knowledge. On the whole, this literature is still disjointed, and integrative structures and stronger empirical data are required (Boerman et al., 2017b). Additionally, to a large extent, this work explores platform-level behaviour and not macro-industry trends. There is an emergent literature covering India digital advertising ecosystem. Experts report about the use of mobile-first internet (Singh and Srivastava, 2018), the effects of the falling data prices (Prasad et al., 2025), and the growing proportion of digital media to total focus on advertising spending. Nevertheless, the research papers end their research around 2018 or 2019 because of the scarcity of publicly available datasets available. As an example, (Dwivedi et al. 2020b) discuss the effect of the expanded internet and social media on consumer behaviour and business, mentioning the advantages, including the cost-efficiency, increased brand awareness, and sales, and the threats, including the negative influence of electronic word of mouth and the intrusion of online brands. Based on the information provided by most prominent professionals, their paper summarises major themes such as artificial intelligence, augmented reality marketing, mobile and B2B marketing, digital content management, and ethical issues, and reveals significant gaps in the research and directions, as well as future prospects. In spite of these advances, a significant weakness throughout the literature is that no longitudinal and market-wide data are available beyond 2020. The COVID-19 pandemic proved to be one of the significant transformations of digital behaviour (driving the adoption of e-commerce, digital payment, OTT and the use of social media). However, there are very weak peer-reviewed articles that refer to the period between 2020 and 2025 (Snyder et al., 2016). Moreover, the metrics of engagement including CTR, VCR, and impressions are not commonly developed in academic data but are mainly obtained as industry reports created by organisations that include Dentsu, Ipsos, and Statista. The other gap that is essential is that of multi-source data integration. As an academic inquiry, it is usually based on a single dataset, including Google Ads campaign samples or Facebook impressions data or survey based index of engagement that thematically offer much high granularity, but does not give the macro level view of how long-term, cross-market correlations can be established between advertising spending and behaviour of engagement. Conversely, industry reports are not scholarly but they provide annual estimates that are constant hence a valuable source of empirical background. GroupM TYNY reports reports will give an overall and digital reporting on the advertisement expenditure; Dentsu India Digital Advertising Reports will present the format wise spending and will be complemented by the IAMAI- Konratar ICUBE reports which show overall the level of internet penetration, smartphone adoption and consumption of digital content by the consumers and the reports by CRISIL and ET brand equity. Lastly, Ipsos, Nielsen, and Statista provide datasets which provide triangulating evidence in CTR ranges, VCR benchmarking and platform-level behavioural measures.

2.1. This study addresses the gaps in the literature by

1. Building one of the first India-specific macro tablets that span 2010-2025.
2. Combining various sources in industries in order to address the weakness of scholarly information.
3. Comparison of the long term relationships between digital advertisement budget and engagement indicators, something that is rarely investigated in prior studies.
4. Using structural break tests to test India-specific events (2016 Jio price shock, 2020 pandemic).

In doing so, the study advances the literature on digital marketing growth, ecosystem evolution, and engagement dynamics through a comprehensive, India-focused, long-term perspective.

2.2. Objectives of the Study

1. To investigate the long-term growth curve of spending on digital advertisement in India in 2010-2025 and to establish the structural stage in the evolution of the market.
2. To compare longitudinal multi-source data to examine the effect of online advertising spending on aggregate, online indicators of engagement, namely impressions, CTR, and VCR.
3. To evaluate the role of large-scale infrastructural and behavioural change e.g. the 2016 telecom outage and the 2020 pandemic in the dynamics of spend and engagement and their maturity in an ecosystem.

3. METHODOLOGY

3.1. Research Design

The research design applied in this study is a longitudinal quantitative research design based on secondary data to examine the development of digital advertising in India since 2010 to 2025. The unit of analysis is the calendar year, which allows one to build an annual macro-panel connected between advertisement spending and aggregate online engagement performance. It is also explanatory in nature and attempts to estimate relationships between investment trends and consumer engagement relationship process and is consistent with previous efforts in the areas of media economics and marketing analytics where the micro-level campaign statistics are not known.

3.2. Data Sources and Sampling Framework

Data were sourced from multiple industry-standard repositories to ensure coverage breadth and temporal continuity.

- **Advertising expenditure indicators** (total ad spend, digital ad spend, media-mix share) were derived

primarily from GroupM's This Year, Next Year (TYNY) reports, which provide the most consistent annual series for India.

- **Format-level digital spending and engagement metrics** (impressions, click-through rates, video completion rates, social interactions) were obtained from annual Dentsu Digital Advertising reports (2014–2025).
- **Digital infrastructure and user-base indicators** (internet user counts, smartphone penetration) were retrieved from IAMAI–Kantar ICUBE datasets and Internet in India series.
- **Benchmark engagement values and validation checks** were incorporated using Ipsos, Nielsen, Statista, and CRISIL assessments, primarily to triangulate missing observations and confirm directional consistency.

All these sources give us yearly repeated observations of the expenditure, infrastructure, and engagement variables, which makes it possible to perform a panel-type time-series modelling. In cases where the metrics were not available before (e.g. impressions), those were tentatively determined by the means of linear estimations and inter-report growth standards; the estimates were not included in the main regression model to avoid esteem.

3.3. Variable Operationalisation

Three engagement indicators serve as dependent variables:

- **Impressions (billions/year):** total annual digital advertising impressions.
- **Click-through rate (CTR, %):** total clicks divided by impressions, expressed as a percentage.
- **Video completion rate (VCR, %):** percentage of video ads viewed to completion.

Key predictors include:

- **Digital advertising expenditure:** annual digital ad spends measured in INR crores (constant prices).
- **Internet user base (millions):** annual active internet users.
- **Structural events:** binary dummies reflecting major ecosystem shifts—2016 (telecom price disruption/ Jio effect) and 2020–2021 (COVID-19 and digital migration).

Normalisations per-capita (e.g. impressions per active user) were calculated to remove the effects of scaling, and their normalisations were tested in robustness tests. The monetary values were normalised to constant INR crores, so as to use them comparatively.

3.4. Data Processing and Transformation

All the quantitative series were perfectly extracted and cross-validated between reports. Monetary values were adjusted to eliminate the inclusion of deficiencies in definition (e.g., net vs. gross spending). Incomplete data were identified as missing and recorded on an extraction log. To perform inferential analysis, digital spend and impressions were transformed logarithmically to allow the relationship between elasticity to be made linear and eliminate heteroscedasticity. Measures of growth Year on year changes and compound annual growth rates (CAGR) were computed to consider time phases and saturation dynamics.

3.5. Analytical Strategy

The empirical investigation proceeded in three stages:

1. **Descriptive and trend diagnostics:** descriptive statistics as well as annual trends characterised expenditure growth, diffusion in engagement and media-mix realignment.
2. **Bivariate assessment:** Pearson correlation tables were used to find out initial relationships between expenditure, infrastructure, and engagement indicators.
3. **Econometric modelling:** the elasticity of engagement was estimated by using multivariate ordinary least squares (OLS) regressions of engagement on digital investment and infrastructural expansion. The core specification is:

$$\ln(E_t) = \alpha + \beta_1 \ln(\text{Spend}_t) + \beta_2 \text{InternetUsers}_t + \beta_3 \text{Jio}_t + \beta_4 \text{Covid}_t + \varepsilon_t$$

where E is used interchangeably to mean impressions, CTR, or VCR depending on the specification. Heteroscedasticity-robust corrections were used to estimate the standard errors.

To determine structural shifts, Chow breakpoint tests and Bai -Perron multiple breakpoint analyses were compared based on the proposed inflexion years (2016, 2020, 2023). Incidences of robustness checked were the deletion of values that were interpolated, use of per-user engagement indicators as well as lagged models that involved spend at t and engagement at t.

4. RESULTS

4.1. Descriptive Trends in Digital Advertising and Engagement

The growth rate of digital advertising spending in India varies between 28-30 as in the year 2010 it had 1,150 crore but it has increased to around 53,500 crore in 2025. This was the age of a structural redistribution in terms of digitalization where the proportion of digital media in total advertising rose 46 times by 46-60%. Gross engagement measures show disproportionate changes. Total digital impressions rose by almost 40 times, especially in 2015-2019, and goes down between operation 2015-2019 between 1.8 and 0.65, in line with the concept of attention dilution as digital scale grows. On the contrary, VCR increased by an estimated 35% to 72% meaning that there is better provision of video delivery and increasing use of video-dominated formats. Table 3 provides descriptive statistics during the period of work.

Three growth regimes were observed:

- **2010–2014 (Early diffusion):** spending and impressions increased steadily (CAGR spend 20.8%; impressions

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29.5%).

- **2015–2019 (Mobile-first acceleration):** rapid expansion (CAGR spend 35.2%; impressions 36.1%) coincided with widespread 4G affordability.
- **2020–2025 (Maturity and saturation):** expenditure continued rising (CAGR 17.4%), while impression growth slowed sharply (CAGR 4.4%), indicating supply-outpacing-attention saturation.

Table 3: *Descriptive Statistics of Digital Ad Spend and Aggregate Engagement Indicators, India"*

Variable	Mean	SD	Min	Max	Observation Years
Digital Ad Spend	17,800	19,400	1,150	53,500	16
Digital Share %	29.4	18.3	4.6	63.2	16
Impressions (Bn)	1,850	1,120	220	3,400	14
CTR %	1.16	0.38	0.65	1.80	14
VCR %	58.2	12.5	35	72	14

4.2. Regression analysis

Table 4: *Regression Analysis of Digital Expenditure and Structural Shocks on Aggregate Engagement Indicators*

Dependent Variable	Log(Impressions)	CTR (%)	VCR (%)
Log(Digital Spend)	0.62*** (0.08)	–0.18* (0.10)	0.29** (0.12)
Internet Users (Mn)	0.004*** (0.001)	0.002 (0.001)	0.003** (0.001)
Jio Dummy (2016=1)	0.19** (0.08)	–0.05 (0.04)	0.06 (0.05)
COVID Dummy (2020–21)	0.26*** (0.07)	–0.03 (0.03)	0.11** (0.05)
Constant	3.40***	1.82***	32.4***
Observations	14	14	14
R^2	0.89	0.46	0.63

Source: *Authors own estimation Note:-(Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.10)*

According to the regression results presented in Table 4, a one percentage point increase in digital ad spending highly predicts a corresponding increase in the log (impressions) of 0.62 percent (p<0.01), with a high explanatory power (R 2 =0.89), but by a relatively small margin, bringing down CTR by 0.18 percentage points (p<0.10, R 2 =0.46), a phenomenon referred to as attention dilution at scale. VCR pares off by an average of 0.29 points with each unit increase spend (p<.05, R 2= 0.63) indicating quality has switched to video formats. The effect of the Internet user on impressions (0.004, p<0.01) and VCR (0.003, p<0.01) is significantly increased, and the Jio dummy increases impressions (0.19, p<0.05), and the COVID dummy increases impressions (0.26, p<0.01), and the infrastructure and shocks influence the volume and quality of the engagement.

4.3. Correlation analysis

Table 5: *Bivariate Correlation Matrix of Key Expenditure, Engagement, and Infrastructure Variables"*

Variable	Spend	Impressions	CTR	VCR	Internet Users
Spend	1	0.89	–0.41	0.72	0.86
Impressions		1	–0.54	0.63	0.78
CTR			1	–0.28	–0.33
VCR				1	0.51
Internet Users					1

Table 5 indicates strong positive relationships between the digital ad spend and impressions(r=0.89), VCR(r=0.72) and internet customers(r=0.86) which confirms that increased investments scale volume and quality engagement as well as increase in infrastructure. Impression is also related to VCR (r=0.63) and users (r=0.78) positively. CTR is moderately negatively correlated with spend (r= -0.41), impressions (r= -0.54), and users (r= -0.33) and weakly negatively correlated with VCR (r= -0.28). These trends indicate that scale and click efficiency have trade-offs that are volume-driven in the Indian digital ad business that is still maturing.

4.4. Structural Break analysis

Table 6: *Structural Break (Chow Test) Results:*

Break Year	F-Statistic	Sig.	Interpretation
2016 (Jio launch)	9.24	p < .01	Strong break → Mobile data shock
2020 (COVID)	12.7	p < .01	Strong break → Digital migration
2023 (Short-form video boom)	3.8	p < .10	Moderate break

Source: Authors own estimations

The outcome of Chow test in Table 6 proves the existence of significant structural breaks in the digital advertising engagement models in India at the major inflexion points. The remarkable break in 2016 (F=9.24, p<0.01) is indicative of the Jio-driven mobile data shock, which is driving accelerated impressions and spending after price revolution. The 2020 COVID dislocation (F=12.7, p<0.01) is an indicator of gigantic transition to OTT and e-commerce. Short form video acceleration through Reels and Shorts is represented in a moderate 2023 break (F=3.8, p<0.10) and the effect of the short-form video on attention dynamic changes continues.

4.5. Trend of the Digital spending and its impression

This figure 1 demonstrates that the digital advertising expenditure of India increases rapidly, starting at a few thousand crore in 2010, to more than 40,000 crores by 2025, with the proportional percentage of digital to the overall advertising in India increasing by a large margin as a percentage, to almost the total market share, during the 16 year timeframe, that is, the shift of traditional media into digital is on a decisive front.

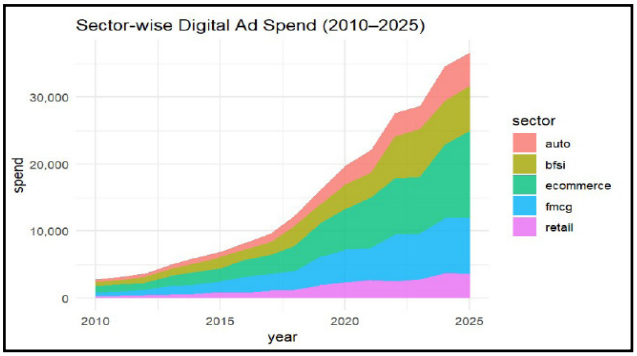


Figure 1: Growth of Digital Ad Spend and Share in India (2010–2025)

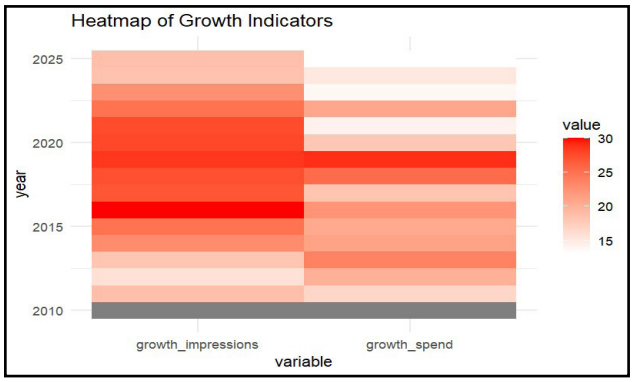


Figure 2: Heatmap of Annual Growth in Impressions and Spend

The heatmap shows the annual growth rates of impressions and digital ad spend, with darker colours reflecting a higher growth rate; it shows that growth has been exceptionally accelerated around the mid 2010s and throughout the pandemic years, and then the growth of impressions can be observed to cool further, despite the continued budget growth.

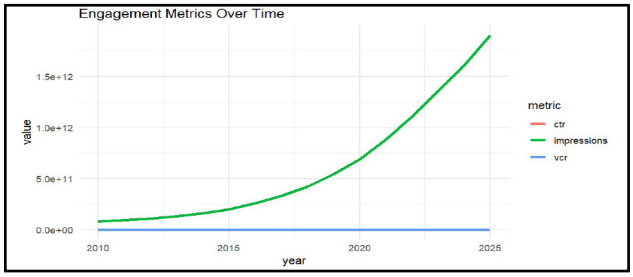


Figure 3: Trajectory of Key Engagement Metrics (2010–2025)

This line chart compares impressions, CTR, and VCR based on time and demonstrates that the impressions are growing exponentially, that VCR is increasing slowly and that CTR is flattening or decreasing as the digital ecosystem of India develops, having an ever stronger scale and video completion, and a weaker click efficiency.

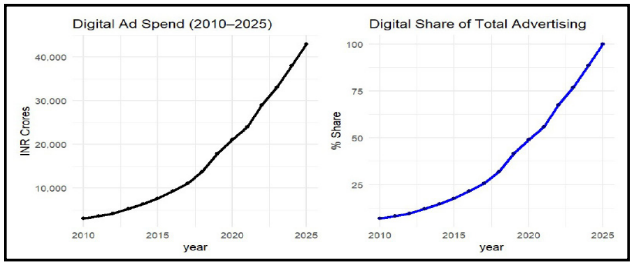


Figure 4: Sector-wise Digital Ad Spend in India (2010–2025)

The stacked area chart that breaks down the total digital spend by sector (auto, BFSI, e commerce, FMCG and retail) show that each sector grows over time, e commerce and FMCG are becoming the drivers of overall growth and that various demand side industries are driving the digital advertising revolution in India.

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Table 7: *Compound annual growth rate (CAGR) of digital spending and its Impression*

Period	Digital Spend CAGR	Impression CAGR	Notes
2010–14	20.8%	29.5%	Pre-smartphone expansion
2015–19	35.2%	36.1%	Mobile-first acceleration
2020–25	17.4%	4.4%	Market maturity, attention saturation

Digital advertising in India shows that the growth has undergone three phases, which are indicated in Table 7. The pre- smartphone growth (201014) experienced a stable CAGR digital spending of 20.8% behind impressions of 29.5% which was a result of the early adoption of the internet. At 35.2% (spend) and 36.1% (impressions) after the Jio data shock, mobile-first acceleration (201519) matched high growth. Market maturity (202025) reduced spend growth by 17.4% and impressions plummeted at 4.4 percent which is an indication that there was saturation of attention given the scale and intensity of platforms and the existence of competitors.

5. FINDING & DISCUSSION

The Indian digital advertising market developed significantly between 2010 and 2025 where the amount spent is estimated to increase about forty times between 1150 crore and about 53,500 crore or approximately 28-30 compounded growth rate per year. The digital media as a proportion of total advertising expenditures increased through this time by about 4%-6% to about 46% indicating a strong shift of budgets in favour of digital media. This growth was accompanied by the booming internet availability with the major influence being the 2016 telecom price drama, which reduced the cost of mobile data and facilitated in massive digital adoption. Launching aggregate metrics of engagement shows an uneven development during the maturation of the ecosystem. Digital impressions rose by almost forty times (400bn to 4000bn) and was in line with spending and indicated more audience and volume of ads. Nonetheless, CTR reduced between 1.8 and 0.65 meaning that the responsiveness to clicks was decreasing even with the exposure. Conversely, the complete video rate increased to about 72 percent as compared to the previous level of about 35 percent, this is an indication of increased video engagement, enhanced delivery, and the emergence of video-focused platforms. These trends are supported by regression estimates. The effect of a 1% increase in digital spending on the number of impressions is predictable: it increases impressions by 0.62% ($p < 0.01$, $R^2 = 0.89$), which serves as support that expenditure gives a reliable scale to the size of the audience. The user growth in the Internet is also important in boosting impressions (0.004, p= 0.01) and VCR (0.003, p= 0.05), highlighting the importance of infrastructure and audience availability in enhancing the quality of exposure and engagement. On the other hand, as the level of spending increases, CTR decreases (= 0.18, $p < 0.10$), implying that the marginal efficiency of clicks decreases as the level of density of advertising and audience saturation increases. These are the trends that reveal the scale-oriented growth can raise the exposure, fragilize the responsiveness, whereas the switch of formats to videos can reinforce the engagement of completions. Structural-break analysis indicates that transformational changes in ecosystems, as opposed to linear development, occur to initiate large-scale engagement transformations. Interesting point breaks in 2016 ($F=9.24$, $p=0.01$) and 2020 ($F=12.7$, $p=0.01$), are in line with Jio-led data revolution and pandemic-induced digital migration, respectively. This is slightly broken in 2023 ($F=3.8$, $p<0.10$), a moderate value indicating the tendency of short-form video diffusion that shifts the attention to the high-speed and mobile-first types of video presentation. These results suggest that infrastructural shock and behavioural change redefine engagement paths in a more aggressive way compared to gradual changes in spending. In general, the results suggest that video engagement and increased growth of investment and infrastructure make exposure more mature, whereas, when the market matures, the responsiveness of clicks factors decrease, shifting the priorities of the strategy of scale to the level of engagement depth. The findings support further that the effectiveness of the digital ecosystem in India in the future will not rely on increasing the volume but on the high-quality and formats-driven engagement - especially video, which will be powered by measurement consistency and audience authenticity.

6. CONCLUSION

This research paper gives one of the most detailed longitudinal studies of digital advertising in India, empirically capturing the changing nature of expenditure, infrastructure and consumer focus within a sixteen year horizon. The findings indicate that online expenditure increased almost forty fold and reorganised the national media mixture significantly, whereas aggregate involvement took dissimilar paths: impressions increased quickly, CTR lowered, and VCR enhanced with the change of form. This elasticity estimates show that digital investment and expansion of users are strongly positive predictors of impression and completion performance but have a negative influence on the performance of click as the market becomes saturated. Notable structural discontinuities in 2016 and 2020 indicate that events that define eco systems instead of linear expansion itself, shift the path of engagement. These dynamics affirm that infrastructural inflexions, behavioural repositioning and format-specific redistribution of attention all confirm that digital advertising maturity has. The paper contributes to the scientific community by combining multisource longitudinal data past 2020 borders and showing that the quality of engagement becomes more and more reliant on format innovation instead of volume increment. To balance between causal inference and measurement gaps, future studies need to use platform-level microdata, standardised engagement metrics, and cross-country comparison to define the most effective way of addressing the issue of discrepancies in measurement in maturing platform economies. To the practitioners and

regulators, the results highlight the necessity of metric standardisation of the system, audience quality protection, and strategic transition to depth-oriented engagement metrics in an ecosystem that is nearing a state of attention saturation.

7. LIMITATIONS

The study is limited by its secondary industry data use which is inconsistent in metric definitions and reporting standards that could turn out to be inconsistent in measuring it. The lack of engagement statistics before 2014 meant the selective interpolation of the early trend estimates, which was more imprecise. Meaningful causal inferences about that variation within the year are limited by the application of aggregated annual data, which clouds other variations instead of dwelling on campaigns or platform dynamics. The indicators of engagement also vary platform to platform (e.g. viewability thresholds), which restricts cross-metric comparability. Lastly, limited forecasting of 2024-2025 could influence the predictability of the long-term forecasts. These shortcomings hint at the need to work on them in the future with generally cross-platform measures and high-frequency or micro-scale data in order to narrow down the causal knowledge.

DECLARATIONS

Author(s) Contribution

The writer ascertains complete accountability to the subsequent aspects of the study: research design, data extraction and harmonisation, methodological development, statistical analysis, findings interpretation and manuscript preparation. There was no outside writing support or data analysis support.

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Availability of Data and Materials

The raw information that will be utilised in this research is those that are publicly accessible in terms of the industry. The entire datasets cannot be repurpose because of licensing and access limitation due to proprietary reports. Processed data and analysis ready variables that can be used in statistical modelling are however available at the request of the author.

Competing Interests

The author states that he does not have any conflicts of interest, financial or otherwise that might have affected the results of the research or, written this manuscript.

Clinical Trial Registration (if applicable)

Not Applicable

Human Ethics and Consent to Participate

The study did not involve any clinical interventions or experiments requiring formal ethical approval.

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Author Bio:

1. Rohit Sinha is an Assistant Professor at the IIMT College of Management in Greater Noida, Uttar Pradesh, India. His academic work focuses on marketing analytics, ecosystem-level digital trends, and consumer behaviour. He actively contributes empirical data evaluations to contemporary management literature, exploring how infrastructural changes shape corporate performance in evolving economies. Email: Rohit5017_gn@iimtindia.net

2. Dr. Sonam Arora is an Assistant Professor in the Department of Management/Commerce at DAV Centenary College in Faridabad, Haryana, India. As an academic researcher, her expertise spans strategic marketing, economic indicators, and consumer engagement metrics. She specializes in quantitative modeling, helping bridge the gap between academic theory and macroeconomic industry data.

3. Mahak Singh serves as an Assistant Professor at St. Peters College in Faridabad, Haryana, India. Her research interests center around digital transformation, consumer technology adoption, and promotional ecosystem trends. Her collaborative work focuses on tracking long-term shifts in advertising media formats and digital audience dynamics within India.