



where they realised that social media engagement has a comparable significance to consumer behaviour in regards to purchase. This finding is parallel to what Hasbullah et al.'s (2023) study shows with regard to how user-generated video builds brand equity and sustainable purchase intention in Generation Z's consumer behaviour. Geevitha and Hemalatha (2019) noted the advantages to consumer views concerning the online retail market space (i.e. Myntra) that benefited digital marketing and indicated that digital marketing visibly increased consumer trust and purchase behavior. More recently, Ramachandran et al. (2023) found that AI-supported decisionmaking systems in the marketing decision-making process had the potential to improve a range of variables linked with marketing strategies. They determined that the marketers that adopted AI and machine learning tools in their marketing strategies, the larger the effect on user customer satisfaction, personalization, and ultimately the financial ROI. Overall, these studies provide some evidence to support what Ahmed and Ali (2011) observed that the newer technologies such as AI, predictive analytics and user-generated content to enhance and measure IC's (i.e. social media) performance and could provide a valuable underpinning to inform the exploration of strong frameworks to evaluate social media ROI in different market contexts.

III. PROPOSED WORK

The present study will construct a template for evaluation of social media marketing (SMM) return on investment (ROI) across different types of campaigns and platforms. The study will acknowledge that the ROI of digital marketing is complicated, but will focus on identifying the approximate metrics, tools, and techniques businesses can use to measure the effectiveness of their social media marketing. The proposed work will first categorize SMM strategies into four types: organic content, paid advertising, influencer marketing, and user-generated content (UGC). Each type will be analysed in terms of specific performance metrics, such as, engagement metrics, conversion metrics, customer acquisition cost, and customer revenue attribution; which will allow the company to compare and contrast the potential ROI outcomes and identify the relative sustainability of each marketing approach in terms of cost and effectiveness. In addition, the project will assess current analytics platforms and measurement tools that are relevant to current data collection and analytical practices in the areas of

social media insights dashboards, customer relationship management (CRM), and tracking software from third parties. Much of the research component will also incorporate an evaluation of attribution models (first-touch, last-touch, and multi-touch) to see how effectively they model the consumer journey and the attribution of value to marketing touches. As part of the research, this work will also tackle some of the usual challenges in ROI analysis, including capturing indirect and long lasting contributions of brand awareness and brand loyalty, as well some attribution issues in multi-channel marketing campaigns when social media marketing efforts are one of the channels used with other digital and offline channels. The end deliverable will be a theoretical, evidence-based set of recommendations and practices that can be adopted by businesses of any size, and across any industry, to help improve the decision-making around social media marketing investments. By linking this paper to real-world examples with relevant emerging trends, this work will attempt to make a valuable contribution to the already burgeoning area of digital marketing measurement.



Fig 1: System overview

IV. IMPLEMENTATION

The implementation phase will employ a systematic collection, analysis, and interpretation of data collected across a variety of social media marketing programs to assess social media marketing ROI. The first actions will be the identification of businesses of varying industries and sizes to serve as subjects for a variety of social media marketing programs consisting of organic content, paid ads, partnerships with new influencers, and user-generated content (UGC). First, the data collection will be configured per the social media marketing program by using the analytics tool available in the platform (Facebook Insights,



Instagram Analytics, and LinkedIn Analytics), and by utilizing other third-party analytics applications (Google Analytics, HubSpot) to track engagement (likes, shares, comments), reach, click rate, conversion rate, and cost per acquisition. In addition, customer relationship management (CRM) systems will also be utilized throughout the implementation phase to track downstream effects associated with lead nurturing and sales from social media marketing touchpoints. To properly ascribe revenue and customer action-based outcomes throughout the customer journey, multi-touch attribution will be included within the implementation process. Multi-touch attribution will be configured to follow the customer journey to associate value to the various social media touch points that are before conversion. The research will execute and code first touch, last touch, and multi-touch attribution models during to analyze the impact on social media advertising ROI. The project shall engage in recording methods for indirect benefits whereby brand equity indicators (e.g., brand lift, customer loyalty) are explored using sentiment analysis and monitoring customer feedback. Qualitative data from surveys and interviews with marketing managers can be used as a supplementary contributor to the quantitative data to develop a fuller understanding. During execution identified issues/challenges, such as sourcing data from several platforms and determining attribution conflicts in multi-channel campaigns, shall be resolved by adopting data cleansing methods and setting up advanced analytics platforms that can reference reports across channels. The final step will involve bringing the data together into actionable insights so that businesses can accomplish their goals for the social media campaigns by identifying campaign effectiveness, decreasing acquisition cost and maximizing the long-term value of every customer the brand earns. The output to this process will be a repeatable framework to continually measure ROI and iterate on their social media marketing strategy.

V. ALGORITHMS

1. Engagement Rate

Measures how actively users interact with content.

$$\text{Engagement Rate} = \frac{\text{Total Engagements (likes + comments + shares)}}{\text{Total Impressions or Followers}} \times 100$$

- **Total Engagements:** Sum of likes, comments, shares, etc.
- **Total Impressions:** Number of times content was displayed

- **Followers:** Number of page followers (used if impressions data unavailable)

2. Conversion Rate

Measures the percentage of users who completed a desired action (e.g., purchase, signup).

$$\text{Conversion Rate} = \frac{\text{Number of Conversions}}{\text{Total Clicks or Visitors}} \times 100$$

3. Cost Per Acquisition (CPA)

Determines the average cost to acquire a customer through social media efforts.

$$\text{CPA} = \frac{\text{Total Campaign Cost}}{\text{Number of Customers Acquired}}$$

4. Return on Investment (ROI)

Calculates the financial return relative to the investment made.

$$\text{ROI} = \frac{\text{Revenue Attributed to SMM} - \text{Cost of SMM Campaign}}{\text{Cost of SMM Campaign}} \times 100$$

5. Customer Lifetime Value (CLV) Estimation

Estimates the total revenue expected from a customer over their relationship with the brand.

$$\text{CLV} = \text{Average Purchase Value} \times \text{Purchase Frequency} \times \text{Customer Lifespan}$$

- This helps evaluate long-term ROI beyond immediate conversions.

6. Attribution Models

Allocate attribution for social media touchpoints throughout the customer journey.

- First-Touch Attribution: The first social media touchpoint receives 100% of the attribution.
- Last-Touch Attribution: The last social media touchpoint begets 100% of the attribution before conversion.
- Multi-Touch Attribution: Multiple touchpoint attribution is spread across the different touchpoints.

Multi-touch attribution formula (simplified):

$$\text{Attribution Credit for Touchpoint}_i = \frac{w^i}{\sum_{j=1}^n w_j} \times \text{Total Revenue}$$

Where:



- w_i = weight assigned to the i-th touchpoint
- n = total number of touchpoints in the customer journey

Weights can be assigned based on time decay, position, or algorithmic models.

VI. RESULTS

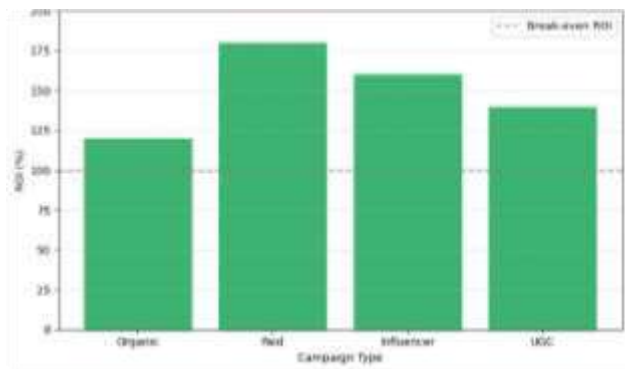


Fig 2: ROI Comparison Across Social Media Campaign Types

The bar chart depicts the Return on Investment (ROI) percentages for four kinds of social media marketing campaigns, which include Organic, Paid, Influencer, and User Generated Content (UGC). The graph shows that Paid campaigns deliver the highest ROI, with Influencer being the closest competitor. UGC and Organic are not as productive, however they are above the break-even ROI, represented by the dashed line. It is clear from the chart that all campaigns are profitable; but Paid has the best ROI. The data from this chart can help compare the effectiveness of strategies and support decisions for marketers who are trying to maximize their digital investment returns.

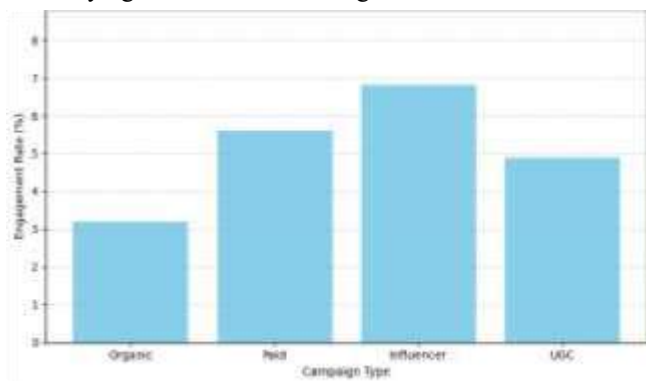


Fig 3: Engagement Rate by Campaign Type

The bar graph illustrates the engagement rates (percentage) of four different types of social media marketing campaigns: Organic, Paid, Influencer, and User-Generated Content (UGC).

Influencer campaigns had the highest engagement rate, followed by Paid campaigns. UGC was slightly below Paid engagement, and Organic campaigns were the lowest. The graph demonstrates that the use of influencer-based strategies will effectively gain audience attention and engagement, which can be useful for marketers looking to drive engagement, and it implies that marketers can achieve better engagement with their audience through influencer partnerships than organic or UGC strategies.

Fig 4: Conversion Rate vs Cost Per Acquisition by Campaign Type

This scatterplot shows even more information about direct relationships of conversion rate (%) and cost per acquisition (\$) across four social media campaign types (Organic, Paid, Influencer and UGC). Paid campaigns have the highest conversion rate (4.1%) but also the highest CPA (\$45). Influencer and UGC campaigns are intermediate with all campaign types having moderate rates and costs. Although Organic campaigns had the lowest CPA (\$~30), they also had the lowest conversion rate (~2.5%). The two stronger points made by this chart is that Paid Campaigns seem to better drive conversions, while all campaigns need consideration to balance costs without sacrificing conversion gains through return.

Fig 5: Attribution Credit Distribution (Multi-Touch Model)

This horizontal bar graph depicts attribution credit from disparate stages on a customer journey based upon a multi touch attribution approach. Attributed stages include Ad Click, Landing Page, Email Follow-Up, Retargeting Ad, and Final Conversion. The Email Follow-Up got credited the largest share of attribution, indicating the Email Follow-Up stage converts the most users. Of course, Retargeting Ads and Ad Clicks were given significant attribution credit too, indicating they have a



significant impact to increase a user's engagement with your product or service as well. The Landing Page and Final Conversion stages received slightly less attributed credit. Overall, this attribution model demonstrates the importance of evaluating marketing performance as a whole because a customer's decision-making process will typically be propelled by numerous touch points.

VII. CHALLENGES AND LIMITATIONS

ROI measurement for social media marketing has a multitude of concerns and limitations. First and foremost, attribution concerns—consumers use multiple channels before converting, and this makes attribution particularly opaque. There is no simple approach to assigning credit to campaigns and channels when users may traverse many platforms before converting. First-touch models or last-touch attributions can muddle messages of the consumer's journey and provide misleading account of true performance. Measuring other indirect return on investments can be equally difficult: brand awareness and equity, customer loyalty or ulterior long-term impacts, can be considerably difficult to ascertain. Due to the way we think about measuring, engaging with a brand's content likes or shares do not correlate to engagement that assists with conversion, yet they are not indicative of brand value over time. Data fragmentation can create the same type of barrier in some fashions. Today, businesses are using multiple social networks and various tools to implement marketing. It can quickly become difficult to wear the hat of an analyst, as tracking and placing many data points together inevitably makes us lose the same sight of the business. Moreover, privacy regulations (GDPR, and CCPA) further restrict our accessibility to data and userprovided analytics. Lastly, business data capabilities are severely hindered by changes in platform-related algorithms. At last, non-standardization of metrics and ROI across industries and platforms may cause evaluations to be inconsistent. Especially small businesses as they may not have the technical skills or ~~resources to leverage advanced analytics as they do not capture~~ **CONCLUSION** develop actionable insights. These challenges illustrate the need for a common measurement construct and strategy to maximize the value of social media marketing.

In today's competitive environment, social media marketing is a vital part of digital marketing for brand awareness, customer engagement, and conversions. As a result, quantifying return on

investment (ROI) for social media marketing is still difficult to navigate. This research focused on the various forms of social media marketing (organic, paid, influencer, and user-generated) and the metrics and tools used to evaluate results. Companies can identify key performance indicators for social media action and avoid the pitfall of indications like: engagement rates, conversion rates, cost per acquisition, and revenue attribution, to better understand how to realize value for money spent relative to social media marketing actions. Nonetheless, continuing obstacles – including disparate data sources, unique attribution pathways, and intangible benefits (like loyalty) – still affect accurate ROI measurement. Therefore, developing an all-encompassing data-enabled framework with multi-touch attribution models, applied insights and evaluating customer lifetime values, is crucial for actionable marketing decisionmaking. In the end, success in social media marketing is not solely about stimulating interesting and engaging content, but it is also about measuring, optimizing and accounting for how to spend your digital marketing dollars wisely. As tools and trends continue to shift and evolve, companies that thoughtfully take a holistic approach to measuring and tracking their social media interactions in the context of continually evolving consumer behavior will be positioned to achieve sustainable growth and a digital competitive advantage.

FUTURE WORK

The future of assessing social media marketing ROI will rely on integration of more innovative applications and data-driven methods. As artificial intelligence (AI) and machine learning (ML) accelerate, predictive analytics can help marketers be more accurate about predicting campaign outcomes and consumer behaviors. These types of tools will help refine attribution models by examining large multi-channel datasets in a time-efficient manner. As social commerce takes hold—where transactions happen directly on the platforms—engagement and revenue will link closer. This will allow businesses to simplify their ROI calculations. Tracking will improve. With the development of alternatives to cookies, and acceptable practices of data collection, regulations governing ethics, compliance and privacy will come to bear to create further improvements in tracking the ROI of social media strategies. Combining sentiment analysis and emotional AI into future measures can also help quantify the qualitative impacts associated with campaigns, including customer perceptions and brand loyalty



that traditional metrics often fail to see. The people, companies and brands who will leverage an adaptive approach to real-time ROI measurement and embrace automation of the process going forward will give them a compelling competitive advantage. Given how fast platforms are evolving, along with consumer behaviors, companies need to measure and adopt a more adaptive approach to better extract value from social media investments.

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