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A Study on the Role of Digital Marketing in Enhancing Supply Chain Operations

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Abstract: ***Digital advertising and supply chain management are becoming more interrelated - this trend is representative of a larger effort to run a business based on data. Digital advertising plays a significant role in both predicting and fulfilling supply and demand for goods & services, as well as creating supply and demand for goods & services. This research will examine how digital advertising can improve supply chain efficiency through increased visibility of demand, providing companies with real-time responses to market changes, and allowing for cross-function integration. Through the use of established theoretical models (SCOR model, DDSC model), we can infer how digital advertising and supply chain management work together within the larger context of a business.***

While integrating digital marketing and supply chain operations has benefits for business (they can make the supply chain quicker, more nimble, and more focused on customers), there are significant barriers making it hard for businesses to successfully combine the two processes. These barriers include issues with interoperability of data and capabilities, that make it hard for businesses to take full advantage of the benefits digital marketing can provide supply chain operations. The research brings new knowledge to the literature by framing digital marketing as part of an organization's operational strategy and not as a standalone operation that is separate from an organization's operational strategy.

Keywords: Supply chain, Digital marketing, SCOR Model

I. INTRODUCTION

There used to be a distinct separation between the way that marketing campaigns were developed and the operational constrictions associated with producing and delivering those campaigns; marketing campaigns could frequently be in the works for lengthy periods of time prior to being executed. However, there has been a trend toward lessening that gap - often creating challenges of coordination. Today, in the age of mega-brands, a single digital marketing campaign can shift the marketplace rapidly and therefore will force you to adjust your suppliers and/or adjust based on your suppliers' abilities to accommodate your change.

Companies like Amazon exemplify the reconfiguration of how demand and supply interact today, through technology-driven methods of collecting data from customers and the use of algorithms to track where their inventory is located, along with where and how they will be processing orders. Through this same process, Zara can capture customer preferences digitally while visiting their stores, thereby allowing for rapid production cycles. These two companies are not alone; these types of changes are indicative of how companies worldwide are utilizing technology in order to reconfigure how they supply products to their customers.

Many organizations continue to consider marketing and supply chain operations as two distinct functions despite the rapid development in marketing technology & supply chain logistics. This creates structural friction between the two functional units due to digital marketing providing detailed & timley data regarding demand; but due to the old supply chain processes, it is difficult for the supply chain function to incorporate this data and to respond appropriately.

The current work addresses this conflict. It examines a simple but multi-faceted question: what are the ways in which digital marketing can enhance the operation/supply chain; and under what conditions will this relationship succeed/fail? In the analysis, rather than assuming all things align perfectly, assessment is based on based on examining the various types of friction (technology, organisational, strategic) that impede on achieving a successful outcome to influence how the to reach an end result (outcomes).

II. LITERATURE REVIEW AND THEORETICAL FOUNDATIONS

A. From Functional Separation to Integration

Old studies have characterised marketing and supply chain management as following one another in a sequential manner. Marketing generates demand; fulfilment occurs through the supply chain (Christopher, 2016). The idea that marketing-dependent demands will subsequently create demand and supply exists in today's business world.

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As more businesses have adopted the integrated business model (Mentzer et al., 2001), marketing and supply chain management are processed together because each business function requires coordination. According to Chopra and Meindl (2019), businesses need to be able to share information across each stage of their supply chain so they can decrease the amount of uncertainty that occurs across each stage within their supply chain.

This transition is being hastened by increased Digitalization of business operations. There is now a constant flow of data produced by marketing activities (e.g., clicks, search queries, number of times someone interacts with a particular piece of content) that help to create insights for operating decisions. Kumar et al. (2016) suggest that the data collected from customers allows for the ability to forecast customer behaviour and thereby impacts how one develops a supply chain plan.

B. Demand-Driven Supply Chain (DDSC) Model

The DDSC Model provides an effective reference point here. Demand signals are positioned in the centre of all supply chain decision making (supply chain forecasting is included), to inform Page 4 of 9 - AI Writing Submission Submission ID trn:oid:::29034:137495691 Page 4 of 9 - AI Writing Submission Submission ID trn:oid:::29034:137495691 3 decision-making by using demand (reliable and predictive) instead of just using forecasts (Gattorna, 2015). Digital Marketing strengthens this model through the provision of real-time demand visibility.

Nevertheless, depending on demand signals creates volatility. Excessive speed in response to temporary supply chain fluctuations can cause inefficiencies; this is referred to as the bullwhip effect (Lee et al., 1997). Digital tools can lessen information delays but they do not remove behavioural and structural distortions.

C. SCOR Model and Digital Integration

A structured method for assessing operational effects is facilitated by the SCOR Framework (Plan-Source-Make-Deliver-Return). Digital Marketing has achieved a major impact in the Plan stage of the supply chain by improving forecasts of demand from suppliers. But there are many significant effects across the five stages: Plan - The ability to access real-time information about demand Source - Coordinating with suppliers based on forecasted demand Make - Scheduled production will be more flexible and on-demand Deliver - The logistics for last-mile deliveries will be optimized Return - Reverse logistics processes will be driven by customer feedback.

The integration, however, depends on data interoperability. Without unified systems, insights generated at the marketing level may not translate into actionable supply chain decisions.

D. Resource-Based View (RBV) and Capability Development

Organizational culture; technological base; and analytical skill. Also we see that development is uneven. Smaller firms report to not have the resources to develop integrated systems which in turn leaves them at a disadvantage to larger firms that although they have the issue of scale and complexity to deal with.

III. RESEARCH METHODOLOGY

In the present study we use Academic Literature from Peer-Reviewed Journals and Industry Documents and Case Studies. Also we have developed a Theoretical Framework which is based on SCOR (Supply Chain Operations Reference), DDSC (Design of Distributed Supply Chains) and Resource-Based Theory (RBT) elements. We have used an interpretive research methodology which is different from an empirical one. The research's approach is to put together what is already known and to identify trends in that information which in turn may not require the collection of primary data to test hypotheses.

IV. CONCEPTUAL MODEL: DIGITAL MARKETING–SUPPLY CHAIN INTEGRATION

The theoretical model will consist of three interconnected layers:

A. Input Layer: Digital Marketing Signals

- customer engagement
- Search trend and clickstream behavior
- Social media sentiments

B. Processing Layer: Analytical Integration

- Data analytics and AI tools

- Cross-functional information systems
- Demand forecasting models

C. Output Layer: Supply Chain Response

- Inventory optimization
- Production planning
- Logistics and distribution adjustments

What holds these layers together is not just technology, but coordination. Without alignment across departments, the system fragments.

V. ANALYSIS AND DISCUSSION

A. Demand Visibility vs. Demand Volatility

Enhanced digital marketing enhances visibility to businesses creating greater amounts of fluctuations in demand via viral marketing. Camapigning virally can create peaks suddenly in terms of demand therefore could create significant strain to the supply chain. In regards to flipping ecommerce retailers like Flipkart they have attempted to mitigate this issue by placingproduct in advance of specific sales event; however on occasion these systems still suffer from failures.

B. Real-Time Responsiveness

The expectation of an immediate connection between a demand signal and the supply chain is growing. In reality, the ability to respond will be dependent on infrastructure. Companies that utilize flexible manufacturing and decentralized warehousing will have a greater ability to adapt than those employing rigid systems.

C. Organizational Alignment

One of the most difficult challenges continues to be centered on internal organizational challenges. In many cases, Marketing organisations and Supply Chain organizations will have different metrics for measuring performance with Marketing typically measuring growth and Supply Chain typically measuring efficiency. Alignment across these two areas requires structural change and not merely technology change.

D. Sustainability Considerations

Sustainability should remain an ongoing priority for companies in the light of increased speed and responsiveness in supply chain management. Excessive growth and surplus production create great amounts of waste, especially in fast-moving consumer goods markets. Companies have used digital marketing and their ability to respond rapidly to consumer demand, but this has also encouraged consumers to "buy now."

VI. FINDINGS

1) Digital Marketing Aids in Capturing Demand; but You Need an Advanced Analytic Platform to Support This Initiative.
2) Enhancing Supply Chain Agility Through Cooperative Work; but The Amount of Improvement Will Change From Industry to Industry.
3) Organizational and technological barriers remain significant constraints.
4) Over-reliance on real-time signals can introduce volatility and sustainability concerns.

VII. CONCLUSION

Merging both digital-based marketing (on the Internet) and supply chain management involves not only upgrading technology but changing the way we think about demand and how we fulfill customers' orders. Traditional marketing tactics did not offer the same level of insight about customer activity, but using the Internet for promotional activities provides great amounts of data you can use to develop new processes and efficiencies. Translating this new insight into effective operations still takes a lot of work.

Companies that are successful at this integration see it as an ability rather than simply a means to an end. They are willing to invest in technology and coordinate, engineer skills, and establish long-term agreements. Conversely, those companies that do not succeed often have disjointed systems and alternative interests.

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It is clear that digital marketing will continue to influence supply chains, but the integration of digital marketing into company-wide operations will ultimately determine the extent of its impact.

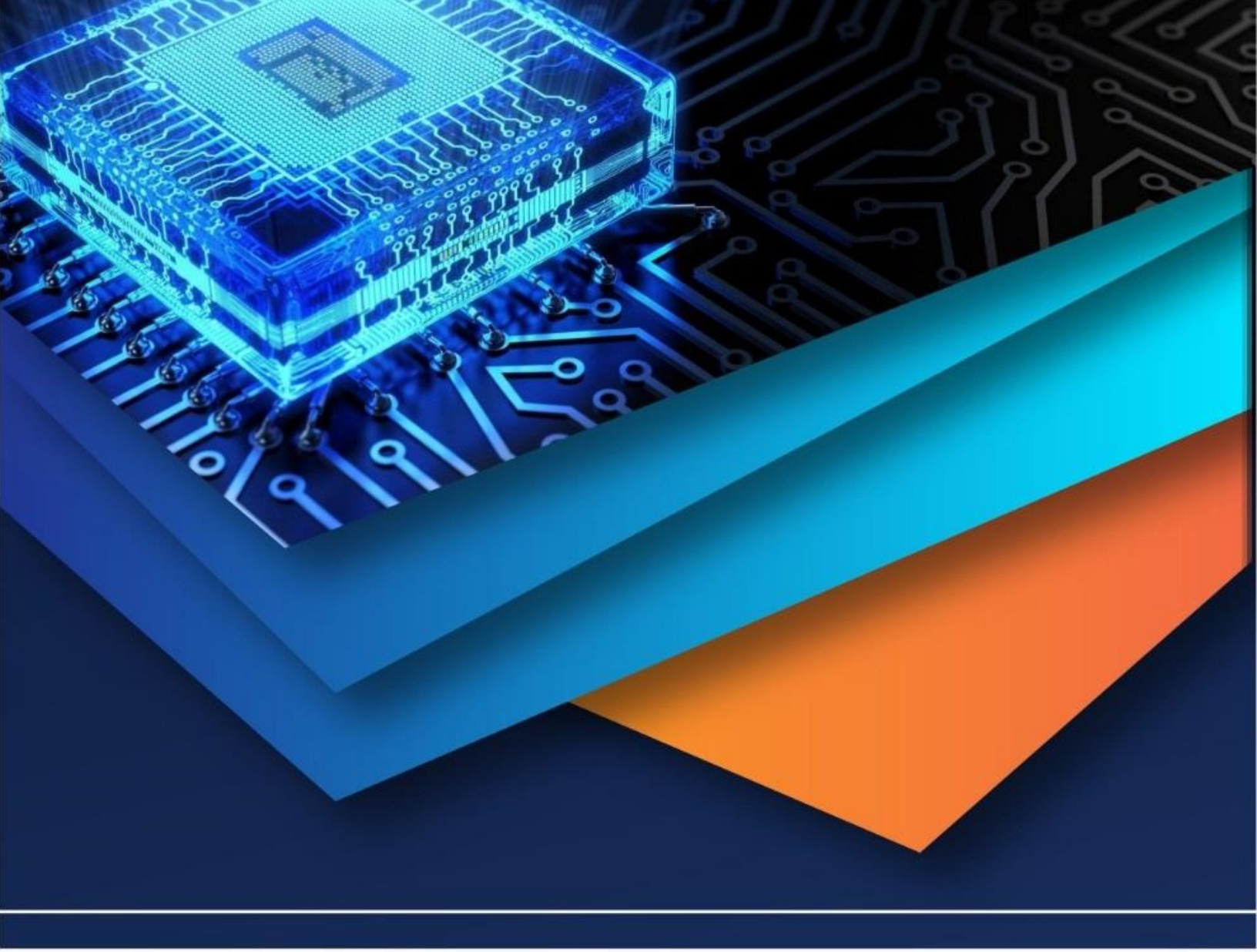
VIII. RECOMMENDATIONS

Build a single data ecosystem in which your sales and supply chain are integrated. Utilize predictive analytics to achieve a balance of responding to changing demand and creating sufficient stability in your supply chain for upcoming growth. Ensure that you have consistent measures of success across your various organizational functions. Leverage sustainability factors into the demand-oriented strategies that you've created for your overall supply chain planning efforts.

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