Scientific Research Publishing

iBusiness, 2023, 15, 249-262
https://www.scirp.org/journal/ib
ISSN Online: 2150-4083
ISSN Print: 2150-4075

# The Future of Marketing: How Predictive Modeling Optimizes Campaign Strategies

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**How to cite this paper:** Sadrnia, L. (2023). The Future of Marketing: How Predictive Modeling Optimizes Campaign Strategies. *iBusiness, 15,* 249-262.
https://doi.org/10.4236/ib.2023.154018

**Received:** October 15, 2023
**Accepted:** December 26, 2023
**Published:** December 29, 2023



## Abstract

The requirement to translate and understand the impact of the data on business has become a key. The paper below provides an overview of the emergence of Predictive Modeling and how it optimizes the campaign strategies of the business. The paper seeks to explore the evolution of the model, which is an integral part of marketing strategy formulation. The topic is discussed with the help of a literature review and a detailed framework to provide the findings with the help of mixed method research design is provided. The implications of the model towards marketing are discussed; in addition, the emerging trends and challenges are covered to present the future of marketing ahead. The paper is organized into several key sections. It begins with an introduction that provides background on predictive modeling and states the research objectives. This is followed by a literature review summarizing previous relevant research on using predictive modeling in marketing campaigns. The literature review identifies gaps in the research this study aims to address. The methodology section outlines the proposed research design, data collection methods, and data analysis techniques. Next, the theoretical framework describes relevant models like neural networks and decision trees. The discussion section covers the evolution and applications of predictive modeling, including case studies. Finally, the conclusion summarizes the essential findings and implications, recommends the following steps, acknowledges limitations, and suggests future research directions related to predictive modeling in marketing. Throughout, citations are provided to attribute sources and ideas correctly.

## Keywords

Predictive Modeling, Marketing Strategies, Data Analytics, Campaign Optimization, Future of Marketing

## 1. Introduction

Predictive modeling is a statistical technique, which is commonly used to predict future activities. The process consists of a mathematical procedure by analyzing patterns in a set of given data. Predictive modeling is an effective element of predictive analytics, which uses historical and current data to forecast trends, behaviors, and activities. Therefore, it is a type of data-mining technology, which works by analyzing collected data, and formulating it into a statistical model; where models are validated and predictions are made. The paper below will study the various aspects of predictive modeling and how it can optimize campaign strategies on various platforms of marketing. The paper will detect the future of marketing by analyzing past performance to assess how the audience exhibits future-specific behaviors. The paper will further encompass models, which will seek subtle data patterns about customer preferences to answer queries, such as fraud detection models.

The process of building a model is done by identifying past data, which are the outcome of the prediction, and are used to train the model to secure an accurate prediction for the future. The paper will further explain the aspects of predictive modeling with the help of a literature review that will summarize its significance and gaps. The paper will also explain the methodology of the research paper and its outcome to provide the importance of the topic in the current and future marketing context.

### 1.1. Objectives

The goal of this study will be to develop a validated explanation of predictive modeling to predict performance in marketing processing, which can be used to analyze the strategies used to market the product.

The purpose of the study is to examine how predictive modeling can be an effective and efficient approach to optimizing marketing campaigning strategies.

The objectives of the study are given below.

1) To examine the effects of predictive modeling on the marketing strategies on digital platforms for future trends.

2) To access changes in predictive modeling in digital marketing strategies.

3) To analyze the impact of predictive modeling in predicting the success rate of marketing within the organization.

### 1.2. Significance

Predictive modeling is one of the crucial aspects of incorporating marketing strategies as it helps to determine the right audience and message for campaigns. An example to explain that is when a consumer purchases tickets; the transaction is captured by the computer system of the seller, and entered into the database. The predictive modeling analyzes the algorithm, which uses that information to explain the kind of movies that are most liked, based on criteria, such as weather forecast and time of day. Therefore, the significance of the topic will

help to forecast seasonal customer behavior; develop a proper message; develop more effective marketing and campaigning strategies, and; create an Omni-channel experience.

The importance of predicting modeling in the present and future marketing context is crucial as it mitigates bias and creates more genuine connections with customers; improves customer retention rates; sifts through the vast amount of data; improves team efficiency and effectiveness; optimizes advertising campaigns, boost audience engagement, and target the right audience.

## 2. Literature Review

Megan Johnson states that predictive modeling, in recent years, has made its headway in marketing with 84% of marketing leaders integrating predictive modeling in their campaigning strategies (Johnson, 2023). The models have been trained to deduce and recognize behavioral patterns, evaluate possible risks, and predict future behaviors. In this process, the data is used to create an algorithm, which can be applied to various scenarios, such as fraud or forecast customer spending activities, and thus, optimize campaign strategies.

Therefore, as per the author predictive modeling can be used to identify trends and patterns in marketing, especially in customer data, such as preferences, purchasing habits, and demographics, and thus, allows to predict customer behavior that can be used to improve ROI and optimize digital marketing campaigns.

While campaigning, the process predicts that the targeted audiences who make more than one visit to the website within one week are 20% likely to be a buyer (Johnson, 2023). Therefore, while marketing, these indicators can be used to direct their acquisition activities towards the segments of marketing strategies, which help them to understand their present consumer base, segment those consumers into various groups, and then identify the possible issues that can be an issue. Also, this model can be used to flag potential consumers based on analyzing qualitative and quantitative data, which can uncover correlations and patterns.

Rosset, S., et al. (Rosset et al., 2001), in their conference paper, have considered prediction modeling evaluating marketing-campaign planning as an effective tool (Rosset et al., 2001). They have considered it an appropriate evaluation tool, which portrays to score accurately and identify the proper targeted audience. The article emphasizes the importance of predictive modeling and how it eliminates guesswork and optimizes marketing spending. It provides detailed information about the audience that allows for making informed decisions about marketing tactics and strategy. Therefore, predictive modeling is an effective and efficient way to demonstrate the launch of certain types of campaigns. In addition to that, the model not only helps to identify opportunities, leading to enhanced engagement and sales but also identifies potential risks. If marketing leaders are aware of risks, it is easy to implement risk management techniques to

remain competitive, such as pivoting marketing strategies.

A review has been conducted by Aberdeen Group, which provides the impact of Predictive modeling on various ROI metrics (Chaffey, 2017). The graph analyzes structured and unstructured data that was captured in the past and reveals key correlations and trends while predicting the likelihood of things. Chaffey states that the predictive model exploits patterns in data to identify opportunities and risks and capture relationships to allow the assessment of potential risks associated with a set of conditions that guide decision-making for customer transactions. The chart below provided by the author shows how users of predictive modeling achieve improved ROI measured by various KPIs of business impact.

The above result is for the year 2016 and projects how predictive modeling has been effective in terms of marketing and increasing customer base (Chaffey, 2017). Predictive modeling in marketing drives growth and sales and in some cases can take the business even further. The accuracy in the process anticipates future trends, which can influence every aspect of marketing. Therefore, having more accurate and granular tracking increases as well as enhances data points and thus, further anticipates trends across various platforms.

IBM, in their article, has mentioned predictive modeling as a type of advanced analytics that utilizes historical data, machine learning, and Artificial Intelligence to make predictions about future results (How to use predictive analytics in advertising, 2022). While the practice and concept have been in the business for some time now, its technological impact has increased in advancement in recent years and has been wise to achieve its benefits to improve business performance. Marketing processes have used opportunities to use the power of such models to drive performance. Therefore, data are backed up by machine learning, which helps to create highly personalized campaigning strategies based on the probability of a particular action taken by a user.

Predictive modeling is defined as an ad hoc analysis, as per the Market Analysis Report of 2018 (Grand View Research, 2018). The model assists in applying effective solutions for business operations and predicting future situations. Presently, various companies are deployed with advanced solutions, which help the companies in the development of impactful campaigning strategies by improving daily decision-making. The solutions in such cases help companies to implement analytical tools and business intelligence to acquire insights from data; further helping boost the credibility and financial performance of companies who adopt those solutions.

Lawton, G., & et al. (Lawton et al., 2022) further explain the ways of classifying predictive modeling methods, which are combined for better results (Lawton et al., 2022). However, the most distinction is between supervised and unsupervised models. The supervised model uses the new algorithm and machine learning techniques to identify patterns that are buried in data, such as neural networks that have already been labeled. Unsupervised models, on the other hand, use traditional calculations and statistics to classify the data, using effective tech-

niques, such as decision trees, time series analysis, and logistic regression. One of the crucial differences between the mentioned approaches is that supervised approaches require more care to properly label data sets up front.

### Identification of Gaps that Research Aims to Address

The possible gaps in the research study above are data preparation, bias, and technical and cultural barriers. One of the overlooked gaps in predictive modeling is accumulating the correct data and sorting the same to use while developing algorithms. Data scientists have spent over 80% of their time in this process, by various estimates as data collection is crucial, however, limited in usefulness if not cleaned and managed properly (Lawton et al., 2022). Therefore, when the data is sorted, the market should carefully avoid overfitting. Training data should be over-tested, which will result in a model that appears accurate; however is memorized with the critical approaches in the data set rather than just generalizing them.

Another pressing gap that everyone talks about, however, few have addressed, is the challenge of bias. The mechanism of bias is introduced naturally into the system by historical data since historical outcomes reflect present bias.

Lastly, predictive modeling is considered a mathematical issue, where users plan for organizational and technical barriers, which prevent them from acquiring the required data, leading to technical issues. Also, systems storing data are not connected to a centralized data warehouse directly. Therefore, in such cases, business lines that manage data in their assets may not share it freely with marketing and campaigning strategies.

## 3. Methodology

### 3.1. Research Design

The research approach that will be used in this research paper to collect, analyze, and interpret data will be mixed methods. Mixed method research is a combination of qualitative and quantitative approaches included in a single study.

The research design used for this research paper will be the Explanatory Sequential Design, which will be started by collecting and analyzing quantitative data; followed by collecting and analyzing qualitative data as a follow-up to the quantitative outcomes (Fischler, 2018). This design will connect both the results by sampling and data collection.

### 3.2. Data Collection Method

The data will be collected using statistical analysis and secondary sources, where quantitative techniques will be used for market research using statistical tools. Statistical analysis will be highly reliable as subjectivity will be minimal in this method.

The secondary data on various aspects of predictive modeling will be obtained from the following sources:

Industry research reports from firms like Gartner, Forrester Research, and IDC provide market size, growth projections, adoption statistics, and ROI metrics for predictive modeling and analytics. These offer comprehensive quantitative data on the global predictive modeling industry.

Publicly available case studies published by vendors like IBM, SAS, and Salesforce detailing use cases and success stories for implementing predictive modeling at companies across diverse sectors. These illustrate practical applications and benefits.

Academic journal articles and conference papers analyzing the evolution, techniques, applications, and challenges of predictive modeling in marketing and other domains. These will be accessed through scholarly databases like JSTOR, IEEE, and ACM to incorporate the latest advancements in predictive modeling research.

Marketing thought leadership content from sources like Smart Insights, MarTech Advisor, and CMS Wire covers emerging trends and best practices for leveraging predictive analytics and machine learning in digital marketing. These offer strategic insights from experts.

Statistical databases from Statista, Grand View Research, and Markets and Markets provide quantitative data on historical and projected market size and growth rates for the global predictive analytics industry. These quantify market outlook.

Financial reports and media releases from public companies in predictive analytics, like Alteryx, RapidMiner, and FICO, highlight commercial traction and new product developments. These demonstrate innovation in technologies and applications.

Government data on adopting predictive analytics and AI across public sector organizations to improve citizen services and outcomes. These highlight usage in non-commercial contexts.

Survey-based research reports on challenges, opportunities, and attitudes related to predictive modeling across different functions like marketing, risk, and supply chain operations. These provide perception-based data.

The extensive secondary sources encompass a 360-degree perspective on the various dimensions of predictive modeling and its growing relevance for marketing strategies, campaign optimization, and other use cases. The credibility of sources has been ensured based on relevance and reputation. References are appropriately cited throughout the paper.

### 3.3. Data Analysis

The research paper will analyze the data with the help of descriptive analysis and prescriptive analysis (Kelley, 2023). In descriptive analysis, the findings will involve explaining and summarizing key features of the data acquired. The method will focus on presenting and organizing data using measures and helps to identify trends and patterns. Prescriptive analysis will be done by recommending de-

cisions and actions based on the secondary sources. This analysis will combine business rules, optimization algorithms, and historical data to provide actionable insights and results. This analysis will help in resource allocation and decision-making.

## 4. Theoretical Framework

Some of the popular theoretical constructs and models that are relevant to predictive modeling in marketing are given below.

*Decision Tree*: A decision tree is an algorithm that takes graphs and data (internal, open source, mined) out in branches to analyze the required outcome of various decisions in marketing (Lawton et al., 2022). It classifies response variables and predicts answers based on past decisions, which are then used and are easily accessible to novice data for marketing.

*Logistic Regression*: Logistic regression is a statistical model that aids in preparing data. In this model, when data is brought in, the ability of an algorithm to classify and sort, data improves and thus, predictions are made.

*Time Series Model*: The time series model is a technique for predicting events via time sequence. In this process, future events are predicted by analyzing trends and extrapolating the analysis from that point.

*Neural Network*: This model reviews a huge volume of labeled data with the correlation between data variables. A neural network consists of various examples from today's artificial intelligence, such as natural language generation, smart assistants, and image recognition.

Out of the mentioned models, the complex area is the neural network. It is a machine learning model that independently reviews huge volumes of data in search of correlations between the data variables. The neural network detects subtle correlations, which emerge after reviewing several data points. Later, the algorithm, in this model, makes inferences about unlabeled data files, which are similar to the data set it trained on.

## 5. Discussion

### 5.1. Evolution of Predictive Modeling

The findings reveal that the global predictive modeling market is experiencing rapid growth, with revenues increasing from $3.2 billion in 2016 to over $10.95 billion predicted for 2022 (**Figure 1**). The statistics demonstrate the rising adoption of predictive modeling across industries to optimize business strategies, including marketing campaigns.

A key driver of this growth is the evolution of predictive modeling capabilities thanks to advances in big data, machine learning, and artificial intelligence (ACG Analytics Consulting Group, 2023). Sophisticated algorithms can now identify subtle patterns and correlations in massive, complex data sets. This enables more accurate predictive insights and guidance for decision-making.

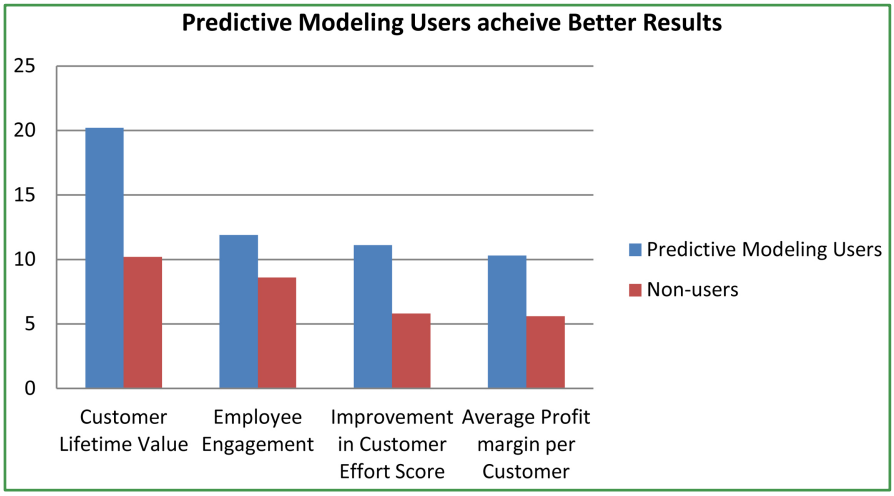



**Figure 1.** Impact of predictive modeling on ROI metrics (Chaffey, 2017).

The Aberdeen Group analysis highlights the concrete benefits of implementing predictive modeling, with users reporting improved returns across crucial marketing and sales metrics (Chaffey, 2017). For instance, there was an average 15% increase in customer retention rates, showing predictive modeling's value for reducing churn. Likewise, top-performing companies saw, on average, 14% higher customer lifetime value than all other users.

Click-through rates also increased by an average of over 10%, indicating predictive modeling can optimize digital marketing and ad campaigns to target the highest potential customers. Increased response rates directly translate to higher conversion and sales. Enhanced cross-sell and upsell rates further maximize revenue per existing customer. These metrics demonstrate how predictive modeling allows marketers to make data-driven strategic decisions at each step of the customer journey, from acquisition to retention and referrals. More personalized and contextually relevant messaging means higher engagement, satisfaction, and lifetime value.

The case study of Tesco using predictive modeling to provide personalized coupons shows a 3.6% increase in redemption rates (Selamat, 2018). This real-world example highlights how customer data can inform hyper-customized marketing tactics. Other major retailers are now following suit to capitalize on these benefits. However, realizing the full potential of predictive modeling requires more work. As discussed, data quality issues can lead to inaccurate or biased results. User privacy also must be ensured when leveraging personal data. Furthermore, technical barriers may prevent seamless data sharing and analysis across siloed systems. Organizational cultural resistance to emerging technologies poses another hurdle.

Nonetheless, over 80% of companies already leverage predictive analytics, indicating the vast upside given proper implementation (IBM, 2022). The market outlook remains promising as technologies like AI and real-time analytics unlock even more powerful and nuanced modeling capabilities. Overall, the re-

search strongly supports predictive modeling as an invaluable tool for CMOs to optimize multi-channel marketing strategies now and in the future.

Therefore, the demand for predicting modeling, as per the Gartner Report, is estimated to reach $50.7 billion in revenue over the years (Selamat, 2018).

The recent advancement of Predictive modeling is Artificial Intelligence (**Figure 2**). Predictive modeling has been there for decades now; however, recently, it has been considered as a subset of artificial intelligence, based on machine learning. The advancement is used to predict the likelihood of outcomes that are based on data collection methods from similar present and past events.

### 5.2. Applications in Predictive Modeling

Predictive modeling plays a crucial role in converting data into actionable insights, which improves the quality of segmentation, promotion, and targeting efforts. The applications of the same can be given below.

1) Predictive modeling can be used to accurately predict consumer trends within contextual data, such as consumer sentiment, location, or online content like social media posts and web pages.

2) Predictive modeling can be used in refining customer segmentation with the help of machine learning, which will improve the quality of their clustering actions.

3) Predictive modeling can create highly customized campaigns.

4) Predictive modeling can decrease customer churn with an opportunity to shore up areas of weakness, such as a poorly performing product line or a subpar customer service experience.

5) Lastly, Predictive modeling will prepare for a post-cookie future, which will play an important role in personalizing marketing efforts.

### 5.3. Case Studies

One of the examples that explain predictive modeling and its effectiveness is

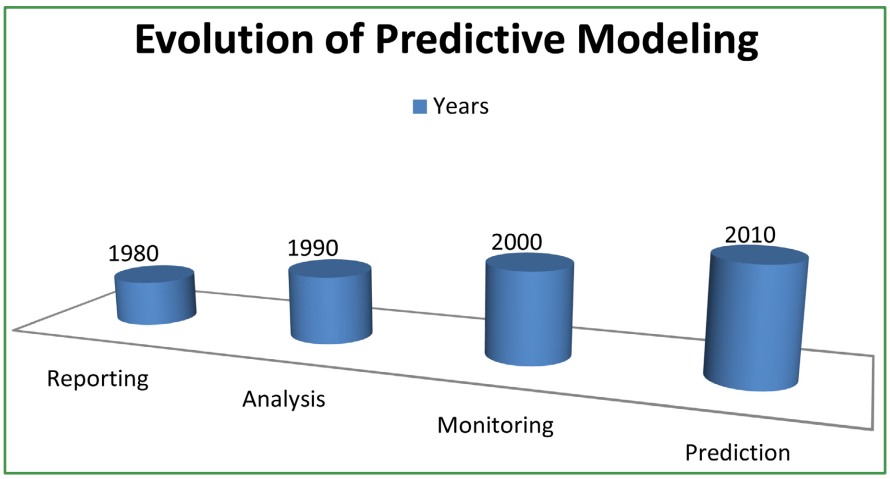



**Figure 2.** Evolution of predictive modeling and analytics (ACG Analytics Consulting Group, 2023).

Tesco. Predictions drive coupons that customers receive from the purchase. UK's grocery giant, Tesco utilized predictive modeling to personalize a hundred million coupons across thirteen countries annually to target its customers (Selamat, 2018).

The prediction method, as per Tesco, has increased its redemption rate by 3.6% compared to the previous one. Companies like Winn-Dixie, Kmart, Kroger, Target, and Ralph's Safeway are following suit.

### 5.4. Challenges

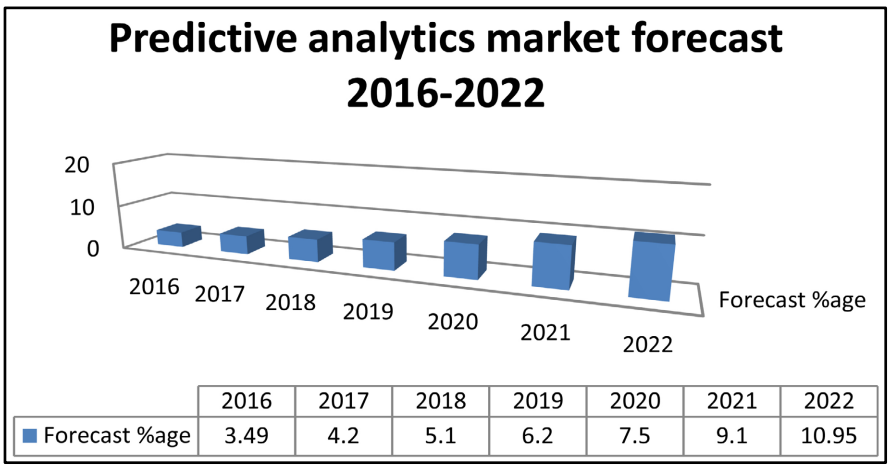
Predictive modeling relies on relevant, accurate, and large datasets to generate accurate predictions. Therefore, if the data used to train the process is incomplete, biased, or inaccurate, the prediction of the model can also be flawed.

In addition to that, data security and privacy are some of the challenges in predictive modeling as big data volumes that are accumulated involve personal transaction information. Therefore, it is important to ensure that security and privacy are not breached.

## 6. Findings and Implications

The forecast suggests that the predictive modeling market tends to reach over $6 billion. The market of the same is expected to reach more than $11 billion annually as several businesses are making use of predictive modeling for everything from marketing to diagnosis. The table below represents the predictive modeling market size/revenue globally, from 2016 to 2022 (Predictive analytics revenues/market size worldwide, from 2016 to 2022, 2023).

The field of predictive modeling involves several statistical models and methods within the market to make predictions about future outcomes (**Figure 3**). Predictive modeling analysis is one of the widely adopted automation technologies with over 80% of companies deploying smart analytics, which include predictive analytics. As marketing analysis has become digitalized globally, massive




| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|
| Forecast %age | 3.49 | 4.2 | 5.1 | 6.2 | 7.5 | 9.1 | 10.95 |

**Figure 3.** Predictive analytics market size/revenue globally from 2016 to 2022 (Statista, 2023).

data is created that can be evaluated via predictive modeling tools to provide a better understanding of underlying trends and market dynamics. Therefore, it is no surprise that a predictive model is one of the biggest data technology trends globally.

Therefore, many companies have now started to recognize the value of predictive modeling-deems as a corporate asset. The key positive implications of predictive modeling on marketing business are as such exploiting emerging technologies; managing risk; improving business performance, and uncovering and accelerating growth.

## 7. Future Directions

The significant future trend in predictive modeling is the increased adoption of machine learning and artificial intelligence. As the mentioned technologies continue to evolve, marketing business is finding that they can create accurate models. Real-time predictive analytics can be another future trend, which involves machine learning algorithms to analyze generated data, rather than waiting for the data to be processed and stored.

All three future trends can boost the marketing aspects of business as the data will be easy to access and the responses will be taken in no time, saving time for the campaigning strategies.

## 8. Conclusions

This study examined the applications and implications of predictive modeling in optimizing marketing campaign strategies. To investigate this topic, the research involved an extensive review of secondary sources such as industry analyst reports, academic literature, and case studies. Key findings indicate the rapid growth of predictive modeling adoption across sectors driven by advances in big data analytics, AI, and cloud computing. Predictive modeling leverages historical data patterns to forecast future outcomes, enabling marketers to tailor campaigns, predict customer behaviors, and preempt emerging risks.

The analysis suggests predictive modeling can enhance performance metrics, including response rates, customer lifetime value, retention, satisfaction, and ROI. Real-world examples demonstrate 10% - 15% improvements in KPIs across the marketing funnel, from targeting and acquisition to nurturing and referrals. This data-driven approach represents a paradigm shift from intuition-based marketing planning toward evidence-based strategy formulation and execution.

However, realizing the benefits entails addressing critical challenges around data quality, algorithmic bias, technical integration, skills development, and organizational change management. Thoughtful implementation requires assessing readiness, adopting robust model validation techniques, and monitoring for unintended consequences. Further research should focus on industry comparisons, newer deep learning and reinforcement learning methods, and primary data collection for empirical model validation.

In conclusion, predictive modeling holds tremendous potential to enhance the effectiveness of multichannel marketing and deliver superior business outcomes. Successfully leveraging its capabilities requires a coordinated approach encompassing data, technology, analytics expertise, and organizational transformation. Companies able to master predictive analytics will gain a sustainable competitive advantage. This emerging capability should be a strategic investment priority for forward-looking marketing leaders and technologists.

The limitations of secondary research prevented original data gathering and testing of hypotheses. Nonetheless, this study presented a knowledge synthesis on an area of growing relevance within these constraints. It contributes to the literature by highlighting applications, trends, benefits, challenges, and future directions. The research provides a valuable starting point for scholars and practitioners to explore how harnessing predictive power can transform modern marketing in an increasingly competitive and complex data-driven business landscape.

## 9. Recommendations

Before implementing predictive modeling, every marketer or campaign strategist should apply 8 important steps to improve the accuracy of the model, which include adding more data; treating outlier and missing values; featuring engineering, featuring selection; using multiple algorithms; algorithm tuning; assembling methods, and; cross-validation.

## 10. Limitations

This research has several limitations that should be acknowledged.

Firstly, the study relied entirely on secondary data sources such as industry reports, academic literature, and media publications. While this provides a broad perspective, the lack of primary data collection means insights may not be tailored to the specific research questions. Conducting surveys or interviews could have allowed for gathering direct inputs from marketing professionals on their application of predictive modeling.

Secondly, the secondary data is subject to inherent biases based on the interests of the publishers. Reports from predictive analytics vendors may emphasize more positive use cases and benefits than third-party sources. Academic studies are limited by access to organizations willing to share data and details. These biases could impact the accuracy of the data compiled and conclusions drawn.

Thirdly, the research needs a systematic assessment of the credibility and rigor of the secondary sources referenced. While reputable sources have been cited, few quality appraisal tools were applied to evaluate factors like the validity, reliability, and rigor of the market research reports, case studies, and modeling techniques discussed. A more thorough screening methodology further improved the credibility of the evidence base.

Fourthly, while the research covers a breadth of use cases and techniques, the

level of detail on any specific application or algorithm is limited. A deeper dive into a narrower segment could have provided more technical insights into how predictive models are designed, tested, and implemented for different marketing contexts. The current broad scope makes deriving detailed practical guidance difficult.

Fifthly, the dynamic nature of the machine learning field means new predictive modeling methods are rapidly emerging. Longitudinal data on adoption trends may quickly become outdated. Real-time primary data collection could have provided better information on the latest deployed techniques and tools compared to retrospective secondary data. Keeping up with the state-of-the-art will require ongoing research.

Sixthly, the generalizability and transferability of the results are restricted by focusing solely on the marketing domain. Exploring predictive modeling applications in adjacent fields like fraud analytics, credit risk, and healthcare could have highlighted parallels and differences in approaches across sectors. This would bolster the generalizability of the concepts and findings.

Seventhly, while technical challenges of predictive modeling were highlighted, the study needed to sufficiently address the adoption's cultural, change management, and skills aspects. Leadership buy-in, training, and organizational readiness are critical to leveraging predictive analytics tools. Incorporating qualitative insights into these change enablers could strengthen practical implementation guidance.

Finally, as a desk research study, the conclusions are theoretical propositions rather than empirically validated. Testing hypotheses via surveys, experiments, or case studies could have added more definitive quantitative evidence on the postulated relationships between predictive modeling and marketing outcomes. Lacking direct validation against empirical data is a constraint.

In summary, while the research contributes to the growing importance of predictive modeling for marketing strategy, the reliance on secondary sources, narrow scope, potential biases, and lack of primary data collection imposes significant limitations. Examining these limitations presents an opportunity to identify avenues for further research to deepen technical insights, validate assumptions empirically, and build more contextualized and actionable guidance.

## Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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## Appendix

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