MARKETING ANALYTICS

For Strategic Decision-Making

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This book is dedicated

To Rusha and Ma

– **Moutusy Maity**

To Prashasth and Pratyoosha

– **Pavankumar Gurazada**

Preface

Consumer-related and customer-related data often form the cornerstones of decision-making for marketers. Examining the type and nature of data currently available to marketers, we note that technology-driven developments have given rise to new forms of data as well as have brought into prominence new ways of analyzing that data. We observe some of the following developments around data collection and analysis processes.

Analytics is playing an increasingly larger role in a marketer's everyday decision-making today. While there are several books that describe the collection and analysis of marketing data, most are written from a software developer's perspective. In addition, the huge number of analytics services options – both paid and free (albeit restricted) – available to the marketer today are pushing the marketer further away from the source of the data. While pre-built dashboards (e.g., Facebook Analytics) are valuable to answer a fixed set of questions, they are merely descriptive. It is our belief that fine-grained analysis is more than just a colorful line-chart describing what has occurred during the course of a marketing campaign.

First, marketers today often raise questions about the need for traditional marketing research, as the phrase *marketing analytics* has often come to mean a panacea for all data ills. There is a perception that somehow marketing analytics has *replaced* traditional marketing research. However, there is little holistic understanding of what marketing analytics stands for. Second, as technological advancements allow unprecedented opportunities for collecting and analyzing machine-trackable and machine-readable consumer/customer data, the marketer is often alienated from the data collection and analysis processes. However, the practice of collecting data from users of a product or a brand for the purpose of learning about consumers/customers is almost a century-old practice, and marketers have always been involved in the entire research design from problem identification to reporting, including data collection and analysis.

Given the rapid growth in the amount of data that is being collected, we note that analysis of this data needs a careful approach. Further, issues that are big from a developer's perspective (e.g., extraction of predictor variables from photos or videos) are not substantive from a marketer's perspective. Based on our observations among practitioners, we note that the impact of specific marketing actions (e.g., posting a picture instead of a text message on social media or promoting a social media post as opposed to organic reach), are more important to a marketer. The engineering associated with the assembly of massive data sets and black box models that mine predictions from these data sets are of lesser interest.

Given the above observations, there is a need to delineate the contours of marketing analytics, as well as to provide marketers with a book that allows them add technology-enhanced data collection and analyses methods, particularly those that relate to social media (e.g., extracting data from the Web, network analysis, text mining) to their repertoire.

Therefore, there is a need for a book on Marketing Analytics that addresses the above-identified broad issues and provide the marketer with a book that focuses on the marketer's perspective (and not the computer scientist's perspective). In keeping with the changing times, many business schools in India have incorporated courses that deal with marketing analytics that supplement traditional courses on traditional marketing research.

Motivation for Writing this Book

The topic marketing analytics, usually, sparks an animated discussion among students as well as professionals. The nature of online and offline data available today, necessitates that marketers develop understanding of the process of online data collection, as well as analyses methods appropriate for the data. An understanding of the two needs to go hand-in-hand. Most often than not, traditional marketers find themselves lacking in this regard.

While there are some books on business analytics that have been written from the perspective of the computer scientist as well as the data scientist, there is need for demonstrating to the marketers that in order to draw meaningful consumer/customer inference, the marketer needs to roll up her/his sleeves and, develop a hands-on familiarity with marketing analytics.

The manifold purposes of this book are to situate analytics in the consumer/customer context, supply an understanding of the fundamentals of marketing analytics, as well as to provide examples, illustrations and data sets to marketers, which allow them to evolve into more informed and able users of marketing analytics. This book takes everyday problems faced by marketers and answers these questions using battle-tested analysis tools. Our aim is to free marketers from being bound to paid services to analyze *their* own data.

In this book, we build a bridge between a marketing perspective and a software engineering perspective. Thanks to a large amount of attention devoted by the software community to the field of Data Science, there is a small subset of excellent and freely available analysis tools that we believe should enter the vocabulary of every marketer.

The objectives of this book are delineated below:

a. To illustrate a variety of marketing analytics methods that may be applied to structured and unstructured data, which will provide insights to the consumer and customer journey from preference to choice to engagement and electronic word of mouth (e-WOM)

b. To establish that traditional marketing research data and machine-generated data are both valuable for the marketer in understanding the consumer and customer

c. To explain the core concepts underlying consumer behavior on social network websites and methods to analyze social media data in a logical manner

d. To highlight how to collect data from social networking websites and the problems/ethical concerns associated with this process

e. To explain the significance of using the R programming language ecosystem and a reproducible work-flow to analyze data

f. To create a book that will use the state-of-the art data analysis tools to answer substantive marketing analytics problems. These are skills that are transferable beyond the marketing domain

The dual purpose of this book is to provide a basic understanding of the fundamentals of marketing analytics, as well as to provide extensive practice using pertinent datasets through hands-on exercises.

Salient Features

Integrated approach with an interlinking of various topics: A focus on practice An emphasis has been placed in discussing the practical applications of marketing analytics. This approach has been possible by providing extensive examples and exercises that apply a variety of analytics techniques. Such hands-on exercises are constant throughout all chapters.

A critical and thought-provoking approach The approach in this book has been to initiate a critical and tempered approach in understanding and deploying marketing analytics. This approach helps readers engage with the subject, and dwell on the various facets of marketing analytics that may benefit the company.

Each chapter in the book has numerous worked-out examples related to the topic to understand its application in different market situations. Every chapter has a set of dedicated questions that tests the application of the topic/concept discussed in the chapter.

Written in a simple language for better understanding Utmost care has been taken to write the book in a simple language so that the future managers understand the subject as well as applications in a better way. Each chapter also has concept review questions, critical thinking exercises, and assignments to make the topic/concept user friendly.

A managerial focus with an emphasis on applications The focus in the book is to provide an overview of marketing analytics to students of management studies. This overview will help them in developing a better understanding of the subject and its applications, which is likely to immensely add to the managerial roles that they take up.

Pedagogical Features

- **Vignettes**: These are employed to get the essence of the chapter.
- **Insights and Mini Activities**: Pertinent examples and illustrations are used in every chapter. Such features enhance the knowledge of the readers by making them understand the practical aspects of the concepts discussed. The examples provide comprehensive coverage of marketing analytics and its applications in the real world.
- **Guiding through:** Introducing a statistical programming language (i.e., R) and using it to tackle marketing problems in one book is no easy task. In addition, we include exercises and illustrations that use another software package - SPSS. The focus is on getting the big picture of how to think through things rather than focus on syntactical details of the language (this is a book for marketers!). All exercises demonstrating analytical concepts are presented in at least two of the following analytics software: R-language programming, SPSS or Excel.
- **Practice exercises**: Chapter-end exercises include Concept Review Questions, Critical Thinking Questions, and Projects/Assignments/Internet-based Exercises. The book includes numerous illustrations and lab exercises for students to practise.
- **Glossary:** A list of all elements mentioned in the book.

Online Resources

Online resources have been developed to complement the textbook and have, therefore, been provided for better use by faculty. It is available at india.oup.com/orcs/9780190130862. The content for the online resources is as follows:

- PowerPoint Slides
- Instructors' Manual including discussion on the questions included in every chapter

Coverage and Structure

Spread over 17 chapters, the book provides coverage of a marketer's analytics toolkit, keeping in perspective the demands faced by a marketer. Analytics techniques for structured and unstructured data, with attention to data obtained from social media, are presented in the book. Written in a lucid manner, the book is also useful for marketing professionals wanting to improve their understanding of marketing analytics.

Section I: The Need for Marketing Analytics

Chapter 1: *Marketing Analytics and Marketing Research:* This chapter introduces the topic of marketing analytics, specifically discussing the similarities and differences between marketing analytics (MA) and marketing research (MR). It is important to see the answers to these questions as this determines why marketers should care. Mapping the journey from a consumer to a customer and beyond is important.

Chapter 2: *Marketing Analytics: Data including Web Analytics*: This chapter discusses the objectives of data collection and nature of data obtained. Data may be primary or secondary in nature, and may be collected offline or offline, and may be structured or unstructured. Web analytics metrics and KPIs are discussed, and the framework of Paid media, Owned media, and Earned media are discussed.

Chapter 3: *Descriptive Analysis*: This chapter serves as an introduction to R. Statistical functions to summarize marketing data and the basic principles of statistical plots (bar charts, histograms, scatter plots, density plots) are discussed. Lab: Basic principles of creating clutter-free plots that convey insights (as opposed to information) using facets and other advanced plot types (in R programming) are presented.

Chapter 4: *A Primer on Machine Learning for Marketing Analytics*: This chapter serves as an introduction to understanding the machine learning workflow: How is machine learning different from statistical models used for marketing research? Real-world examples of machine learning in marketing analytics are presented. Lab: Worked-out example that contrasts problem solving from a traditional statistical modeling approach and a machine learning approach.

Section II: Understanding the Consumer and Customer: Using Structured Data

Chapter 5: *Correlation and Regression*: This chapter presents correlation analysis, linear regression, analysis of mediation and moderation effects, hierarchical and multilevel regression, regression models for predictive analytics, logistic regression, regression with dummy variables, decision trees, random forests and XGBoost. Lab: Illustrate model diagnostics and model selection for a predictive model.

Chapter 6: *Experimental Design:* This chapter discusses experimental designs, including conducting experiments, types of experimental research designs, analyzing data from experiments, ANOVA, ANCOVA, MANOVA, MANCOVA, and understanding interaction effects. Experimentation in practice is also discussed.

Chapter 7: *Advertising Analytics*: This chapter discusses media-related measurements including media budget decisions, measuring effectiveness of advertising, and optimizing media allocation. Lab: Using R for advertising analytics.

Chapter 8: *Consumer Perception, Consumer Preference and Customer Portfolio Management*: The eighth chapter focuses on factor analysis, segmentation, cluster analysis, multi-dimensional scaling, correspondence analysis, and conjoint analysis.

Chapter 9: *Customer Acquisition*: This chapter discusses customer acquisition cost, and lead generation metrics, customer activity metrics and survival analysis, Kaplan-Meier curve, Cox regression, and customer value metrics (size of wallet, share of wallet).

Chapter 10: *Customer Retention*: The tenth chapter focuses on customer churn, RFM analysis, customer lifetime value, customer satisfaction and loyalty.

Section III: Understanding the Consumer and Customer: Using Unstructured Data

Chapter 11: *Collecting and Understanding Social Media Data*: This chapter discusses data obtained and analyzed from social networks and social networking websites. An overview of popular social networking websites, and a walk-through of social network websites API is followed by how network data is stored by these websites, and how we may retrieve data. Observable aspects of consumer behaviour on social media (i.e., post as the stimulus and the reaction from the users as the response) and ethical concerns in collecting social media data (i.e., what is acceptable and what to avoid) are discussed. Lab: Introduction to interfaces in R to the APIs of social network websites; how to collect data? Advanced Lab: Automate your data collection process by scheduling data collection tasks on a computer/server.

Chapter 12: *Visualizing Consumer Engagement*: It discusses consumer engagement with a focus on the distribution of engagement on social media, the cumulative distribution function to summarize CE, and the different kind of posts (i.e., photos, videos and text). Lab: Further exploration of the dependence of CE on the content of posts.

Chapter 13: *Simulating Social Media Data Generating Mechanisms*: This chapter presents diffusion models for social media posts, agent-based models, a stimulus-response model for consumer engagement with posts, and discusses the role of social network structure in diffusion. Lab: Using parallel execution to speed up simulation execution times.

Chapter 14: *Analyzing Social Network Data*: This chapter discusses how to represent a network, edge-lists, adjacency matrices, centrality measures including degree centrality, betweenness centrality, and closeness centrality. Lab: Choosing a centrality measure that best describes a network.

Chapter 15: *Mining Meaning from Text*: It presents methods for parsing social media text for analysis, offers computing techniques for descriptive statistics and keyword extraction, and assigning sentiment to text. Lab: Detailed overview of R packages for sentiment analysis of social media text.

Chapter 16: *Collecting Unstructured Data in Offline Marketing Research*: It presents how unstructured data is handled today in traditional market research. An overview of emerging machine learning approaches in scaling the analysis of unstructured data is presented.

Section IV: Putting it All Together

Chapter 17: Coda: The final chapter concludes by discussing the application of marketing analytics in the context of the 5Ps (Product, Place, Price, Promotion, and Packaging) and the 4Cs (Customer Value, Convenience, Cost, Communication).

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Comments and suggestions from all the readers of this book can be sent to us at:
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Detailed Contents

Chapter

1

Marketing Analytics and Marketing Research

Learning Objectives

After going through this chapter, readers will be able to

- recognize the complementary nature of marketing analytics and marketing research
- recognize the need for supplementing existing marketing research practices with marketing analytics approaches for obtaining enhanced consumer and customer-related insights
- appreciate the need for marketing managers to adopt current practices in marketing analytics
- obtain an insight into the content that is presented in the rest of the book

VIGNETTE

Dhriti Chakravarty is an accomplished marketer, with a deep understanding of the traditional channels, and traditional marketing research. However, she has been noticing that some of her counterparts in other companies are using consumer/customer-related data obtained from new and emerging sources, and are also employing non-traditional methods for the purposes of analyzing the data. Some of the members of her team have suggested that they should also try to leverage such data and methods. Dhriti wants to gain an understanding of these types of data and methods, especially how these may be leveraged for the purpose of marketing. Are these data sources, types of data and methods substantially different from traditional data sources and types of data? Should marketing analytics be considered along with existing marketing research methods to obtain consumer insights?

1.1 INTRODUCTION

The marketing analytics market in the United States alone is valued at USD 847.81 million, with an expected CAGR of 12.9% over the years 2019 to 2024 (Globenewswire 2019). Companies have begun to realize the benefits obtained from marketing analytics, the outcomes of which contribute to better

customer acquisition, management and retention. Analytics solutions allow companies to keep track of the impact of the actions taken, and such benefits have resulted in the adoption of marketing analytics by many companies. Increasingly, marketers are having to demonstrate return on investment (ROI) obtained from the money spent by them on marketing-related activities.

Marketers are often confused between the application, use and efficacy of traditional *marketing research* and the value proposition offered by emerging *marketing analytics* approaches and solutions. Are these two terms coterminous? Or, do they mean different things?

Therefore, there is a need to examine the two terms – the benefits obtained and the constraints posed – by these two approaches. The complementing nature of the two approaches need to be recognized by marketers. In order to address the above issue, we probably need to consider the contexts in which the two terms have come to be used and adopted by marketers. In this chapter we look into the development of the marketing research as an approach that has aided marketers for almost a century now, and the context in which marketing analytics has emerged.

Insight 1.1

Over the course of the year 2017, technology giants (including Google, Adobe, Salesforce, and Oracle) added more data sources to their ever-growing marketing capabilities. This particular trend is expected to continue, as businesses of all sizes work to lessen the complexity of data collection, cleansing, and usage across their organizations.

Data sourced from:

Courtesy: https://www.globenewswire.com/news-release/2019/03/27/1773846/0/en/United-States-Marketing-Analytics-Market-2019-2024-Market-was-Valued-at-USD-847-81-Million-and-is-Anticipated-to-Register-a-CAGR-of-12-9.html

1.2 MARKETING RESEARCH

The emergence of marketing research as a set of methods and approaches that aid the marketer came into being toward the beginning of the twentieth century. The first set of methods are often attributed to Daniel Starch from the United States of America (USA), who developed a method of questioning/surveying people about the kinds of media they had been exposed to in the 1920s (Kierlanczyk 2016; Vasques 2011). Much of Starch's work was applied in the context of effectiveness of advertising.

Soon, many companies were offering marketing research services through aided recall as well as unaided recall – an example is George Gallup, who went on to form The Gallup Organization in 1935 in the USA. Much of marketing research began with the collection and analyses of quantitative data, and soon there were research firms that were collecting qualitative data from consumer personal interviews. With the advent of the computers in the 1980s, marketing research moved into an era where greater quantities of data could be handled to understand the consumer/customer better, and led to database marketing approaches (Stone 1997).

Presently, there was an increase in consumer-related and business-related databases that helped companies undertake complex model building and analyses for the purpose of understanding the consumer context and the business context. Such developments led to enhanced developments in the context of customer relationship management (CRM) in the 1990s (Fletcher et al. 1992).

Insight 1.2

"Marketing research is the function that links the consumer, customer, and public to the marketer through information–information used to identify and define marketing opportunities and problems; generate, refine, and evaluate marketing actions; monitor marketing performance; and improve understanding of marketing as a process. Marketing research specifies the information required to address these issues, designs the method for collecting information, manages and implements the data collection process, analyzes the results, and communicates the findings and their implications."

Data sourced from:

Courtesy: https://www.ama.org/the-definition-of-marketing/

The market research process refers to feedback obtained directly from the consumer/customer and has been deployed to obtain increased insights regarding core marketing-related concerns including brand management, product development, and consumer perceptions. Usually, studies are designed to collect data from the stakeholder (as opposed to covert tracking) with the aim of obtaining candid assessments from the target audience, so as to gain insights about consumer attitudes, usage and perceptions. Data can be obtained from the respondent through qualitative and quantitative studies. Gleaning insights from qualitative and quantitative data help in putting together a holistic view about the consumer. Such findings are used for the purpose of fine-tuning strategy options.

A close look at the methods and processes of data collection reveals that much of the data that were collected till the turn of the twenty-first century involved collecting data through paper-and-pencil methods (e.g., face-to-face, direct mail, phone-based). Toward the end of the 1990s, there was a movement toward collecting and analyzing data through computer-based methods.

Mini Activity 1. *Is the marketing research function outsourced by organizations or, is the function handled inside the organization? Find out by undertaking research on the Internet and by speaking to a few managers from different kinds of companies (e.g., B2C, B2B, C2C, Government).*

1.3 MARKETING ANALYTICS

Marketing analytics (MA) has been variously defined across various sources. **MA** has been defined as the discovery and communication of meaningful patterns in data from machine readable metrics such as web traffic, leads obtained through the Internet, sales, advertising, online promotions, web activity, social media activity, among others (Marketing Dictionary 2019). Marketing analytics essentially include a set of statistical and mathematical modeling and machine learning techniques and tools to analyze various types of data in huge amount and to drive transformative decisions and support sustained successful business practices in an organization.

Technology solutions deployed by companies to track consumer/customer behaviour on their websites allow these companies to collect data unobtrusively, and leading to precise tracking of consumer/customer activity that can be tracked like never before. Such tracking gives rise to voluminous amounts of data as compared to the marketing research process discussed above. Moreover, the adoption of

cloud technology and big data by many companies has contributed to increasing amount of data being collected by such organizations.

Big data was originally associated with three key concepts: *volume*, *variety*, and *velocity*. An extended list of seven V's includes: *volume*, *variety*, *velocity*, *variability*, *veracity*, *visualization*, and *value*. Big data often includes data with sizes that exceed the capacity that is handled by traditional data-processing application software, such that the data is processed within an acceptable time. Business intelligence may be obtained by systematically extracting information from big data. Challenges in handling big data include capturing data, data storage, and data analysis. Such large amounts of data may also give rise to information privacy issues.

In addition to the above, leading technology companies, including Google, Adobe, Salesforce, and Oracle have made more data sources available to companies, augmenting their ever-growing marketing capabilities (Globenewswire 2019). Though there is great complexity involved in the data collection process, cleaning data, storing data sets and undertaking analyses for business-specific needs, increasingly companies are embracing processes and methods that allow them to collect consumer-related data, as effective ROI can be demonstrated by data that has been collected on many aspects of consumer/customer behavior.

Insight 1.3

According to Hitachi Consulting Group (2005) marketing analytics is a "focus on coordinating every marketing touch point to maximize the customer experience as customers move from awareness, to interested, to qualified, to making the purchase."

Data sourced from:

Courtesy: Hitachi Consulting Group (2005), "Customer and channel analytics", available at: www.hitachiconsulting.com/page.cfm?ID=customer_channelAnalytics

Marketing analytics has gained acceptance in companies as technology now makes it possible for marketers to leverage data from large databases. While the process has existed for a long time – since the inception of marketing research, the implementation and use have proliferated in recent years. Access to such data allows marketers to undertake customer relationship management or total customer relationships (Hax and Wilde, 2001), which entails an individual-level tracking of the customer and the value obtained by both the customer and the company. In such a scenario, marketers are better-off with relevant customer-level information that can be collected ethically. Once collected, this data needs to be cleaned, verified, and turned into useable information. The researcher then analyzes the information, interprets the findings, and converts the findings into intelligence. Such business intelligence needs to be actionable, allowing the organization to take strategic decisions.

1.3.1 Marketing Analytics vs. Marketing Research: The Differences and Implications

One way of thinking about the approaches to data collection and analyses that is part of market research is presented in Figure 1.1.

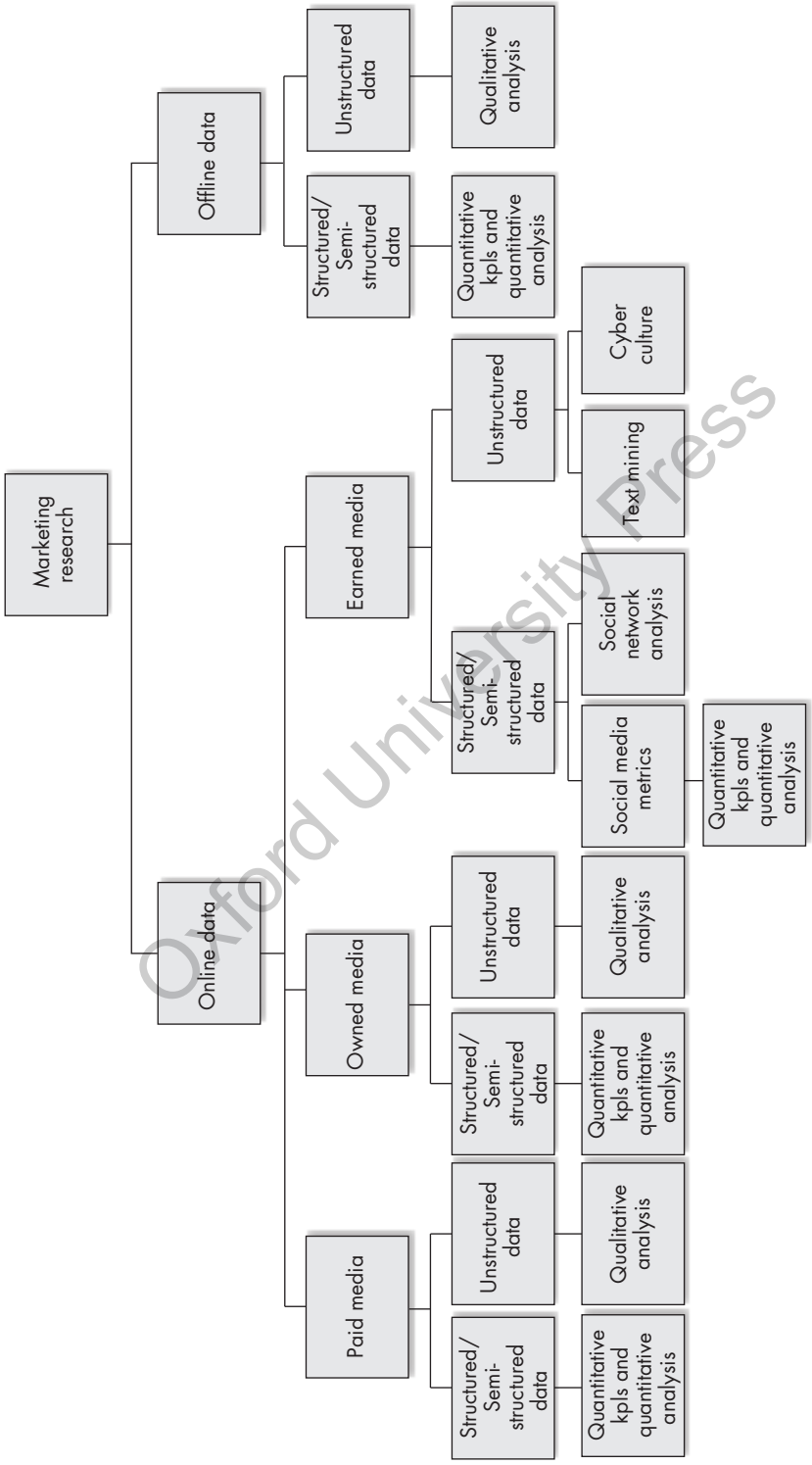

Figure 1.1 An overview of data sources and methods in marketing research

Source: The authors

Technology-led (and often automated) data collection and analyses of data, specifically, may be considered as marketing analytics (i.e., analysis enabled by technology).

1.3.2 Adoption of Marketing Analytics by Marketers

Despite the evolution of techniques and the availability of tools, marketers have been slow in fully adopting the marketing analytics component of the research process (Nada Nasr and Eshgi, 2005). Sometimes, such laxity is because of a limited perception that technology is a panacea to all data ills, and that packaged software solutions will do all the analytics work for marketers. It is seldom realized that marketing analytics is very much part of the research process – just that new ways of data collection procedures (powered by technology) have given rise to new forms/types of data and innovative ways of analyzing the data.

In addition to the above, marketers often do not undertake data collection and data analyses themselves, thus leading to an attrition in analytical skills. It could also happen that many marketers have never received any training in the above-mentioned areas. The marketer's core job is often considered as branding, advertising, story-telling and selling. However, the insight that marketers often miss is that each of these core functions of marketing today will immensely benefit from marketing analytics.

Such situations have facilitated management information systems (MIS) and information technology (IT) advantage in the area of analytics. Such technology-driven areas have been at the helm of developing and fine-tuning the processes of data collection and analyses over the past couple of decades (i.e., since the turn of the twenty-first century). However, there is limited understanding of marketing-related goals by specialists who may have excellent skills in data mining but lack a grounding in the basics of a customer-oriented approach.

Therefore, the mandate for the marketers is fairly straightforward. Marketers – those who are in core marketing-related functions – need to also take up roles where the core function is analytics (Greco, 2005). Missing sight of the forest may lead to the marketing function increasingly losing relevance, where some other department takes up the marketing analytics function.

Mini Activity 2. *Choose three companies in three separate industries. Speak with at least two senior managers from the marketing department to obtain an understanding of how traditional marketing research and evolving tools and techniques of marketing analytics are used inside each of the companies.*

Are the functions *outsourced to other companies, or are these functions handled within the companies?*

1.3.3 Application of Marketing Analytics by Marketers

The adoption and application of marketing analytics requires that the processes are continuously monitored. Individual-level interaction-related information needs to be collected for each customer. Such data may be collected through various touchpoints including traditional means (e.g., phone calls, revenue obtained (from the customer), letters and e-mails), as well as technology-driven means (e.g., online-based data obtained by tracking the movement and behavior of users on electronic platforms including the Internet). The tracking of user information needs to ensure that a holistic view of the consumer/customer emerges: attitudes and behaviors need to be comprehensively represented in the databases that are created to house the information. Thereafter, appropriate analyses have to be undertaken to draw pertinent insights about the user/consumer.

In addition to obtaining a holistic understanding about the consumer, another important application of marketing analytics is to predict future behavior (Class 2006). Such application can be used to fine-tune customer offerings such that optimal performance may be encouraged. The proper tracking of costs and revenues associated with each customer is gaining increasing importance so as to enable to marketer to identify the value obtained from every customer. Such an approach ensures that those customers that require a low (high) cost to serve may be encouraged to change their behaviors – or, the marketer may identify specific customers and incentivize the desired behaviors. Therefore, the decision-making abilities of managers may be enhanced through the use of marketing analytics.

1.3.3.1 The AIDA model and customer relationship management

There are various frameworks that marketers use in order to track the different phases into which a consumer/customer may transition. Such transitioning can be explained by the marketing funnel (a.k.a. The AIDA Model – Awareness, Interest, Desire, Action). The marketer can use marketing analytics solutions to monitor the consumer who becomes aware of product/service, and then evinces interest in the product/service. For example, during the awareness phase, marketing analytics may focus on understanding the consumer (who is a potential customer). An evaluation of whether the consumer is part of the appropriate target market may be ascertained (e.g., demographics, psychographics). The marketer may also be interested in knowing: Which are the channels that are effective in awareness creation? Why is a consumer interested in the product/service? How can more inputs be made available to the consumer?

In case the right offers are made to the potential consumer and there is a conversion – a customer is "acquired". This step is the first one in the process of Customer Relationship Management (CRM). Optimal interaction and targeted offers may lead to repeat buying, and the marketer now manages the interaction with the customer and retains the customer. Properly managed CRM during the lifecycle of the customer leads to greater satisfaction. Repeat purchase behavior on part of the customer leads to increase in profits.

Marketing analytics is also used to identify unprofitable customers, who may be encouraged to undertake interactions that make the relationship profitable for the firm, or may be considered as those whose requirements are fulfilled by offerings of other companies. Undertaking analytics for CRM-related processes involve data mining, analyzing the data using sophisticated modeling techniques, interpreting the findings, and using the findings for devising strategies.

Insight 1.4

The three stages of CRM are: customer acquisition, maintenance and retention.

1.3.4 Marketing Analytics and Academia

Education about marketing analytics need to be undertaken in a war-footing in business schools. Usually, academic training in marketing, with the exception of topics in marketing research, often focuses on frameworks (non-quantitative) that deal in emphasizing the core functions of marketing including consumer behavior, branding, advertising, sales, services marketing, product development and product management, among others.

One of the limitations that marketers have often experienced, is the inability of quantitatively account for the various activities undertaken as part of marketing a product. The marketer often struggles to establish return of investment (ROI) for many marketing-related functions. Without specific metrics, it is difficult to track and account for the efficacy and effectiveness of marketing investments. We note that these functions of marketing, traditionally, have not used precise/sophisticated measures to track consumer behavior.

Mini Activity 3. *Make list of the qualitative and quantitative methods and approaches that were developed in the context of traditional marketing research.*

Insight 1.5

A couple of ways to look at the differences between marketing analytics and marketing research are described below:

First, marketing research is often used to understand pre-purchase processes, while marketing analytics is often used to understand and track post-purchase processes.

Second, marketing research generally tracks usage and attitude regarding a product/service. Marketing analytics is able to track actual consumer/customer behavior.

For example, the depth interview approach or the focus group method is widely used in marketing research. The data obtained through these methods are usually in the form of text, and traditionally, have been analyzed through qualitative data analyses approaches that rely on man-power intensive processes (e.g., categorizing, coding, framework).

However, the increasing volume of data requires that collection and analyses of the data be undertaken through technology-led methods. It is in this context that academic institutions disseminating education on marketing management need to address the perception and practice regarding approaches to marketing analytics.

1.3.5 Marketing Analytics and Business Intelligence

Applying marketing analytics solutions to obtain business intelligence is to bring together tools, techniques and frameworks that provide greater visibility of business performance, aligns operations with business strategy, enhances collaboration between teams and decision-makers, and improves business processes. The promise of marketing analytics is to make real-time and actionable insights available through the analyses of data that is enabled by technology. Such capabilities contribute to building and maintaining decision-making support systems that leverage data mining techniques.

Understanding trends and identifying patterns include analyzing structured and unstructured data (see Chapter 2). Several categories of analytical applications may be identified in the context of marketing analytics: descriptive, exploratory, predictive and prescriptive.

Descriptive analytics include setting up scorecards that involve basic slicing and dicing of data, advanced filtering, and setting up pivot tables. These functions do not predict a target value, but focus more on the intrinsic structure, relations, and interconnectedness, of the data. Such analyses address the question of what happened.

Exploratory analytics include undertaking analyses of unstructured data (e.g., text analytics) as well as structured data (e.g., association analysis, classification) in order to make preliminary discoveries or obtain an initial understanding of the context/business situation from the data. Such analyses address the questions of what happened, as well as why it happened.

Predictive analytics attempts to divine unknown future events or actions based on data mining, statistics, modeling, deep learning and artificial intelligence, and machine learning (e.g., decision trees). Predictive models are applied to business activities to better understand customers, with the goal of predicting buying patterns, potential risks, and likely opportunities. Such analyses address the question of what is likely to happen.

Prescriptive analytics (e.g., optimization techniques) looks at what should be done – and is, therefore, prescriptive in nature. Such analyses address the question of what should/ought to happen.

Insight 1.6

Advanced analytics is the sum of the different methods and techniques used in various domains such as decision management, retail analytics, web analytics, supply chain management, customer profiling and segmentation, aggressive pricing, promotion planning, regression and predictive science, credit risk analysis, and fraud detection.

While advanced analytics has been used by statisticians for many years, it was not part of the mainstream analytics landscape. For example, even twenty-five years ago, business managers would sometimes take the help of such expertise in order to identify customers who were likely to churn. Statisticians made use of machine learning and churn modelling in order to identify specific customers. However, much of such analyses could not be undertake real-time, and there was a time lag between analyses and implementation (i.e., marketing strategies deployed to retain customers).

With increasing ease of data storage, data handling, computational power, and data analyses, such analytics have become much more accessible to marketing teams, and may be performed real-time, enabling enhanced business intelligence, faster decision-making and quicker implementation of strategies.

As marketers move toward adopting MA, there is also a need to remind ourselves that the basics of undertaking consumer research and obtaining business intelligence have not changed. It is necessary to ask the right question, gather the right data to address it, and design the right analysis to answer it in order to obtain pertinent insights.

Framing the problem means ensuring that important questions have been asked and critical assumptions have been laid out; for example, is the goal of a new initiative to drive more revenue or more profit? The choice leads to a huge difference in the analysis and the actions that follow. Is all the data required available, or is it necessary to collect some more data? Have alternatives been considered in terms of how to design an analysis to address the problem? Without framing the problem, the rest of the work will fall apart.

Pertinent analysis starts with framing the problem correctly. This includes assessing the data correctly, developing an analysis plan, and taking into account the various technical and practical considerations regarding the nature of data, data collection, and data analysis. Figure 1.2 depicts the typical processes that are followed in a typical marketing analytics project.

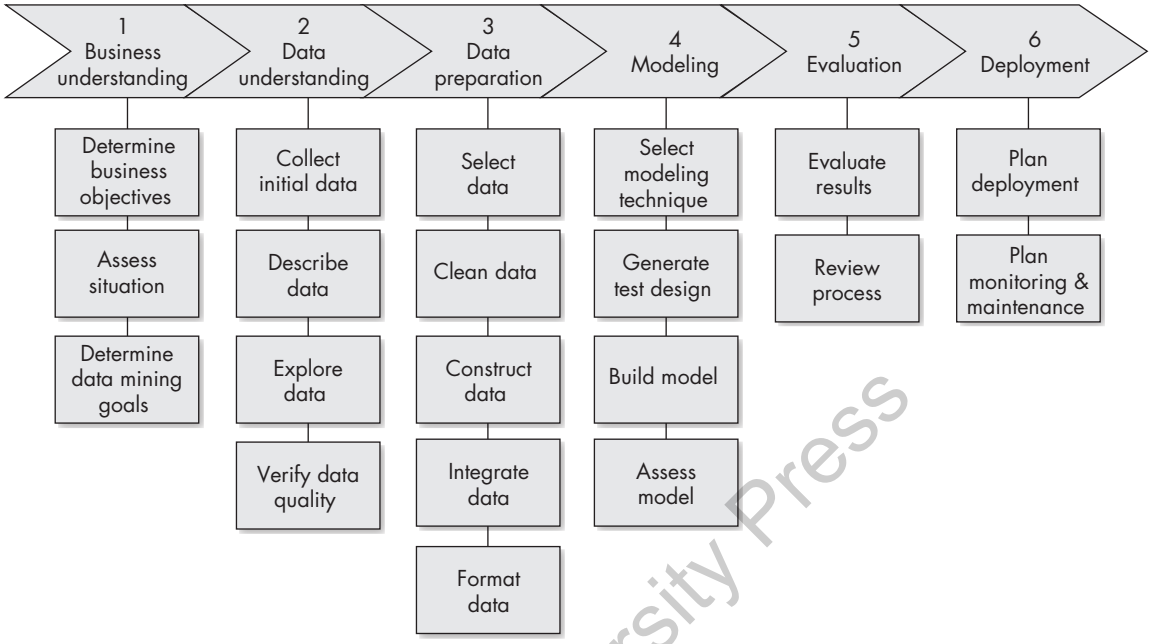

Figure 1.2 Processes followed in a typical marketing analytics project

DISCUSSION AND CONCLUSION

Today, with dozens of tools and methodologies at our disposal, market research agencies pull from a large ecosystem of methodologies and tools to provide a much more comprehensive view of the consumer. Integrated qualitative and quantitative approaches enable marketers to understand consumers at both the individual and group level. We can now use semiotics, social listening, and communications to understand how consumers interact with media and brand messages.

The Internet has had the biggest impact in this era, allowing us to conduct surveys on much more massive scales; research news, communications, and culture with ease; and create hyper-segmentations on the minutest scales.

Perhaps the most important evolution in present day thought is the recognition that consumers don't exist in a vacuum. It's just as important to understand the context surrounding consumers as it is to study their choices and behaviors. Techniques such as Cultural Insights have emerged to assist researchers in constructing a comprehensive analysis of the ecosystem in which the consumer operates.

This chapter presents a brief overview of the differences between marketing research (the traditional approach to data collection and analyses) and marketing analytics (technology-powered data collection and analyses). The chapter also identifies challenges faced by practicing marketers and academics in

embracing the marketing analytics approach. Subsequent chapters discuss the types of data that are available in the ecosystem in which companies and consumers/customers exist, and discusses specific marketing analytics approaches and methods to address marketing-specific problems. The data collection processes and analyses approaches are presented and exercises are included which may be practiced using the SPSS and the R software. The aim of the book, therefore, is to arm marketers (practitioners and academics) with enough understanding of marketing analytics so as to contribute toward their personal and professional growth.

KEY TERMS

Big data is data that is characterized by seven V's that include: *volume*, *variety*, *velocity*, *variability*, *veracity*, *visualization*, and *value*.

Descriptive analytics include setting up scorecards that involve basic slicing and dicing of data, advanced filtering, and setting up pivot tables. These functions do not predict a target value, but focus more on the intrinsic structure, relations, and interconnectedness, of the data. Such analyses address the question of what happened.

Exploratory analytics include undertaking analyses of unstructured data (e.g., text analytics) as well as structured data (e.g., association analysis, classification) in order to make preliminary discoveries or obtain an initial understanding of the context/business situation from the data. Such analyses address the questions of what happened, as well as why it happened.

Marketing analytics has been defined as the discovery and communication of meaningful patterns in data from machine readable metrics such as web traffic, leads obtained through the Internet, sales, advertising, online promotions, web activity, social media activity, among others.

Marketing research is the function that links the consumer, customer, and public to the marketer through information–information used to identify and define marketing opportunities and problems; generate, refine, and evaluate marketing actions; monitor marketing performance; and improve understanding of marketing as a process.

Predictive analytics attempts to divine unknown future events or actions based on data mining, statistics, modeling, deep learning and artificial intelligence, and machine learning (e.g., decision trees). Predictive models are applied to business activities to better understand customers, with the goal of predicting buying patterns, potential risks, and likely opportunities. Such analyses address the question of what is likely to happen.

Prescriptive analytics (e.g., optimization techniques) looks at what should be done – and is, therefore, prescriptive in nature. Such analyses address the question of what should/ought to happen.

EXERCISES

◈ *Concept Review Questions*

1. What is marketing research?
2. What is marketing analytics?
3. What are the similarities and dissimilarities between marketing research and marketing analytics?
4. Why do marketing managers need to embrace emerging methods of collecting and analyzing consumer/customer data?

◈ *Critical Thinking Questions*

1. How has the evolution of the Internet impacted data collection on the Internet and analyses methods that may be used to analyse the data so obtained?
2. Who are some stakeholders involved in the data collection process in the context of marketing research and marketing analytics? What are the similarities and differences?
3. Can the two ways of thinking about data collection and analyses be integrated within the same department in an organization?

◈ *Projects/Assignments/Internet-based Exercises*

1. Conduct interviews of at least three people who work in the market research industry (i.e., in market research firms like The Nielsen Company, Kantar, IPSOS). Obtain an understanding of the kinds of methods they use for collecting data and for data analyses. Similarly, conduct interviews involving three people who work in the analytics space. Draw up a comparison of your findings.

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