

# Proactive Marketing Decision-Making in Digitalization Age: How Can Data-Based Methodologies Help to Marketing Research?



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**Abstract** The advancements in the marketplace and reactions of market actors are the key factors in the history of marketing research and decision-making. The various changes in the market environment play a crucial role in understanding and reacting to different marketing situations. From this perspective, the new data sources, contexts, and methodologies have been instrumental in understanding cases in the market environment and marketing-related concepts. Examining the marketplace and understanding the market cannot be sufficient for proactive marketing management, since the new marketplace requires a sophisticated approach evaluating the market actors and acting regarding the changing market variables. As the popularity of social media platforms and data-based technologies increase in the marketplace, the amount of produced data, the variety of data contexts, and the need to use new data-based methodologies increase. The “new” marketplace uses many social media and digital platforms daily and produces a large volume of data in different formats surrounding the customers and businesses in the marketplace. Digital platforms have begun to offer innovative data formats for internet users to express themselves as ephemeral media or multimedia formats, and these data formats as contexts require different data-based methodologies for understanding. The study seeks to examine the current data-based methodologies concept for marketing decision-making and marketing research. For this purpose, the study employs a review approach to evaluate the data-based methodologies for marketing research and decision-making context. The study evaluates the topic in three sub-sections: the big data, emerging data contexts and data-based methodologies. The comprehensive approach included in the study will contribute to a better understanding of current data-based methodologies and how can they be used for marketing decision-making.

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## 1 Introduction

Marketing science, whose origins are based on the science of economics, has gone through many different stages called production, product, sales and marketing through history. Elements of the marketing environment could be summarized as; the exchange transaction between the seller and the buyer, which is the subject of a benefit, the product or service subject to the exchange, a market where the exchange transaction takes place, and the seller and buyer actors performing the exchange transaction. The marketing periods are affected by many factors from various market characteristics such as production quantities, sales of products or services produced, competitiveness. Today, the elements in the market environment witness change in the markets. Nowadays, online platforms are used as the “market,” buyers and sellers come together through online channels, and competition conditions are affected by digital platforms’ conditions.

The evaluation of Web’s history indicates three main period: Web 1.0, Web 2.0 and Web 3.0. According to Curran, Murray, and Christian (2007), Web 1.0 refers to read-based usage, content created by authors of websites and tend to be static. However, Web 2.0 mostly relies on writing and contribution, content created by everyone and has the dynamic characteristic. Web 2.0 can be defined as “*a collection of open-source, interactive and user-controlled online applications expanding the experiences, knowledge and market power of the users as participants in business and social processes*” (Constantinides & Fountain, 2008). The difference between the Web 2.0 and Web1.0 indicates how content produced, how it is used and the characteristics of the content. In addition to these periods, Web 3.0 is another topic for Web technologies, and it includes semantic web concept. According to (Yu, 2007) “*It is about having data as well as documents on the Web so that machines can process, transform, assemble and even act on the data in useful ways.*” The three web concepts can be summarized as the beginning of web content by individuals, improving web content by people online and enhancing of Web by machines.

Following digital platforms and technology, one of the most important factors for today’s marketing decision is consumers. Today’s consumers intensely experience traditional purchasing behaviour and socialization behaviours through digital platforms, along with digital platforms and technology. If the consumer, which was the subject of marketing 30 years ago, is compared with the consumer that will be the subject of today; differences can be seen in terms of (1) the form and frequency of shopping, (2) the technological tools used in their daily life, (3) the way they interact with their immediate surroundings and social environment, (4) their interaction with businesses, and (5) the information they share with businesses. Today’s consumer is different in all these aspects, and this difference should be carefully evaluated in terms of marketing decision-making.

Understanding the data is the key to understanding the “new” customer. According to we are Social and Hootsuite (2020), the total population is 7.75 billion people, and internet users refer to 4.54 billion people while active social media users

refer to 3.80 billion. A consumer with a smart mobile phone with mobile applications can use chat apps for interacting with other people, social media apps for expressing themselves, location-based apps to share the locations they visit and multimedia apps for listening music or watching movies. All these consumer behaviours can lead to data production in different forms, and business can use the data for marketing decision-making. The data topic in marketing environment could be examined in three main topics: the produced data (big data), the data contexts and the requirement of new data-based methodologies. From this point, the study aims to address the data-related issues with these topics and employs a review approach to investigate the sub-topics. The study consists of two main sections: strategic marketing management section which examines the current business environment in the digital age by management approach, data-based methodologies and marketing research section which evaluates the methodologies in three sub-sections. The final part of the study proceeds with a summary of the conclusion and future research directions for marketing research.

## **2 Strategic Marketing Management in Digital Age**

Strategic decision-making and proactive approach concepts within management science scope are essential for today's marketing decision-making, especially in a digitalized market environment where competition is increasing. When the proactive approach is evaluated from a marketing perspective, it refers not only to identify or interpret market-related variables but also refer to take actions to direct them. At the same time, it could also include making predictions for the future by going beyond understanding the current situation. Hence, today's market environment requires an advanced research approach to understand the current market variables and make future predictions.

In today's digitalized marketing environment, strategic thinking and strategic decision-making are essential for competitive advantage and survival in the market. From this point of view, it can be concluded that a successful marketing strategy requires following the developments in the market, analysing them with appropriate methods and reacting accordingly. When the proactive strategy is examined in terms of social media communication, tracking social media posts about the brand and spotting anomalies is an example of a reactive marketing approach. On the other hand, by reacting according to the customers' reactions, directing these reactions in favour of marketing management is an example of a proactive approach.

In today's digital world, brand-consumer communication has a very dynamic structure. Customers react to brands using many different digital channels, competitors in the market make competitive moves using differentiated digital advertising strategies, and many different actors shape digital markets. At this stage, some issues need to be evaluated strategically in marketing decision-making. These issues can be listed as: (1) a clear definition of the presence of the business in digital environments and the structure of business-consumer communication channels, (2) measurements

related to the marketing activities in the market, determining the “normal/average” metric values for the detection of abnormal cases can take place in future, (3) identification and listing of the types and contexts of data produced related to the activities in the market, (4) decision of choosing the appropriate methods for processing the listed data types.

In addition to the requirements for understanding the current situation, predicting the future of market variables has become one of the critical issues with the use of data mining methods, which have become widespread in recent years. It is very beneficial for strategic marketing management and proactive approach, making inferences about the next actions to take place in the market by recording market variables’ current situation as numerical metrics or lexicon-based interpretation structures.

Proactive marketing strategy and complex market structure require a comprehensive approach as the market environment includes various sub-contexts and variables. The employed approach in the study refers to the data side of the market environment, and the next section presents an overview regarding data-based methodologies in marketing research as listing three sections for data-based approach. The sections will evaluate “what?” question by the big data section, “what/how?” questions by the data contexts section and “which?” section by the data-based methodologies section.

### **3 Data-Based Methodologies and Marketing Research**

The data concept in the digital world has a crucial role for industries and marketing decision-making, while the scope of the content is quite broad with sub-components. The study evaluates the complex data concept from a marketing perspective with a proactive approach and divides the concept into three main sections: big data, data contexts and data methodologies. Big data section simply refers to the amount of produced data in the marketplace which consists of text-based, multimedia and other types of data. On the other hand, the data contexts section is related to new data contexts emerging in recent years. The contexts included in the section are mostly related to the changes of social media usage patterns, as it includes ephemeral media, prominently visual media and multimedia content. The final section has a complementary role in understanding the data-based methodologies approach since it focuses on different data methodologies for the data produced in digital platforms. Marketing decision-making must evaluate the data included in digital platforms, the data contexts/types in the platforms and employing of different methodologies for the data.

### 3.1 *The Contribution of “Big Data” to Marketing Research*

Big data is defined by Gartner (2020) as “*high-volume, high-velocity and/or high-variety information assets that demand cost-effective, innovative forms of information processing that enable enhanced insight, decision making, and process automation*”. The amount of data refers to “high-volume” part and high-velocity refers to the speed/rapidity of the data in the digital platforms, while the different types of data like text-based, multimedia based content refer to high-variety of information. As Fan and Bifet (2013) point out, variability refers to the changes in data structure and the way of interpretation of data by users, while the value is related to the value of competitive advantage that is given to businesses regarding using the data and benefit regarding decision-making.

The presence of big data in the marketplace must be considered for today’s marketing. The growing popularity of the social media platforms and using of technology makes the social media channels as a crucial part of consumers’ daily lives. As time passed in the digital world increases, the amount of data produced by consumers and brands also increases and it becomes a crucial part of marketing decision-making. The consumers today share the micro-moments of daily lives on social media as “Story”/“Snap” or other types of ephemeral media, write their opinion in text format on Twitter, send the location of the place they visit on Swarm and use Spotify and Netflix for their multimedia preferences. All of the elements surrounding the customers on the web make the data potential for marketing research, as the marketing research could employ these data for market insights.

For the academic side of big data-marketing relationship; Amado, Cortez, Rita, and Moro (2018) examine the big data literature in the marketing area with the 1560 articles published between 2010 and 2015 and they conclude that although there are lots of researches for big data in the marketing area, there are limited studies pointing the advantages related using big data in marketing. It can be concluded that big data has popularity as a concept in marketing research; however, the benefits of using the concept could be more emphasized.

For the business side of the big data-marketing relationship, a marketing mix framework for big data management concept is presented in the study of Fan, Lau, and Zhao (2015), the framework consists of three main parts (data, method and application) with the 5 marketing P’s (people, product, promotion, price and place). The data section of the framework includes various data types for the big data management: demographics, social networks, customer review, product characteristics, location-based social networks, promotional data, and transactional data. On the other hand, the application section of the framework signals how marketing decision-making can use big data concept for business cases. Some of the applications included in the study refer to customer segmentation, customer profiling, promotional marketing analysis, recommender systems, location-based advertising, and community dynamic analysis. Big data concept presents an opportunity for marketing decision-making with providing a large quantity of data and different application opportunities.

For the strategy side of big data analytics and marketing strategies relationship, Ducange, Pecori, and Mezzina (2018)'s analysis on social big data focusing on the literature with 52 studies concludes four clusters for social big data and marketing strategies: (1) integration of traditional market research and strategies with defining new scenarios, innovating products and services or analysing competitors, (2) development of online and off-line advertisement campaigns, (3) analysis of perception and reputation management in terms of brand, products or services for a specified company, (4) managing of customer relationships. For the implementation or processing the big data side; Erevelles, Fukawa, and Swayne (2016) examine the big data consumer analytics concept and employ resource-based theory to present a conceptual framework. Physical, human and organizational capital are included in the framework and the processes of collecting and storing consumer activity data, extracting consumer insight from big data and utilizing the insight for improving adaptive capabilities are moderated by these resources.

Recent studies in big data concept in marketing include a variety of contexts such as CRM information systems (Talón-Ballester, González-Serrano, Soguero-Ruiz, Muñoz-Romero, & Rojo-Álvarez, 2018), production success (Saidali, Rahich, Tabaa, & Medouri, 2019), real-time big data processing (Jabbar, Akhtar, & Dani, 2020), sales in B2B (Hallikainen, Savimäki, & Laukkanen, 2020), B2B analytics (Holland, Thornton, & Naudé, 2020), commercial social networks (Kauffmann et al., 2020) and so forth. In the first part of the study, the subject of big data, which has been an essential topic of agenda in recent years, and its place in terms of businesses are examined, the next section will examine the subject in the context of data types.

### ***3.2 Emerging of New Data Contexts***

The traditional data contexts are the subjects of a large and growing body of literature in the last 20 years with the popularity of social media and internet platforms. There are many studies in the literature which focus on different types of platforms like Twitter (Lahuerta-Otero & Cordero-Gutiérrez, 2016) and the content on social media (Smith, Fischer, & Yongjian, 2012; Swani, Brown, & Milne, 2014). However, the subject of new data contexts is mostly concerned with competition and marketing activities related to businesses that have occurred in the market in recent years.

The first topic in new data contexts refers to ephemeral media content type, as the popularity of "Snap" concept by Snapchat platform continues with "Instagram Stories" concept in Instagram platform and other platform products. The ephemerality concept included in the different product names refers to time-constrained social media content enriched with interactive and graphical elements. This new concept indicates a different customer behaviour related to self-expression and could be evaluated for different segments of customers.

The second topic in the new data contexts refers to the multimedia side of the content, as the social media platforms offer a wide range of interactivity in the content. Yu, Xie, and Wen (2020) focus on the visual side of social media content and examine the Instagram content in terms of colour psychology, while they evaluate the colours with Instagram post popularity. In another study, Park and McMahan (2020) study the YouTube content with content analysis while they include different variables including video types, message tones and message appeals.

The final topic in the new data contexts refers to sub-elements included in the data on web platforms. These could refer to interactive elements, emojis or any specific communication element in the data. For example, McShane, Pancer, Poole, and Deng (2021) evaluate the emoji element with brand engagement on Twitter while they conclude a positive relationship between emoji use and brand engagement. In another study, Xu and Zhou (2020) study on hashtag homophily in Twitter networks and uses topic modelling approach to examine more than 100.000 tweets.

The new data contexts in the marketplace could be employed in two perspectives: (1) understanding the data-specific characteristics, (2) evaluating the engagement side of the data (consumers in the market). The first perspective contains a data-based approach and focuses on the technical/structural side of the data context which could refer to sub-elements or unit-based characteristics. The questions in the first perspective could lead to:

- What are the main characteristics of the new data context? (for example, ephemeral media)
- What are the dominant characteristics included in the specific platform for the new data context? (for example, top used multimedia elements in video marketing)
- How can the characteristics of the new data context be clustered?

On the other hand, the second context focusing on the engagement side leads to consumer-data engagement questions:

- What are the optimal characteristics of the new data context? (for example, detection of the most liked elements in the audio-based content)
- Which relations/causalities can be estimated between the data context and consumer engagement? (regression-correlation based studies focusing on engagement factor with different elements of the data context)
- How can the current relations/causalities be used for forecasting/estimating the future actions of consumers?

Recent studies in the new data contexts discuss many contexts including audio attributes of songs by Spotify API (Pınarbaşı, 2019), video mining (Li, Shi, & Wang, 2019), the role of colour psychology (Yu et al., 2020), mobile application reviews (Dinçer, Yüksel, Canbolat, & Pınarbaşı, 2020; Pınarbaşı & Canbolat, 2018). As the big data concept and new data contexts are discussed in the first two sections, the next section will focus on “how can data be used with different methodologies?” question for marketing decision-making.

### 3.3 *Employing of Data-Based Methodologies*

Big data requires marketing science to employ different disciplines including data science, audio-processing, text-processing and machine learning (Chintagunta, Hanssens, & Hauser, 2016) and there are lots of data-based methodologies and approaches in the literature and the marketplace, however, a generalization would help to a better understanding of data-based methodologies. For this purpose, the data mining models structure in the Ngai, Xiu, and Chau (2009) study is employed for the base structure of this section, as the authors include the models mentioned in previous studies with data mining models. The seven models include association, classification, clustering, forecasting, regression, sequence discovery and visualization. The models could be employed in the study with various sub-methodologies/ algorithms, Ngai et al. (2009) include some examples for data mining algorithms as association-rule, decision tree, neural networks, k-nearest neighbour, linear/logistic regression and genetic algorithm.

Association models are related to finding the association between the items in the specified context. Market basket analysis and cross selling programs could be example for the association models (Ngai et al., 2009). Solnet, Boztug, and Dolnicar (2016) study the market basket analysis in tourism context and they conclude that existing data could help to tourism operators with the approach. Classification refers to detecting the significant distinctions between variables and assigning them to specific classes. The engagement status of a consumer regarding a tweet could be an example of classification task, if users take the actions of liking or retweeting functions, the classification can be assigned to “engaged”. Sánchez-Franco, Navarro-García, and Rondán-Cataluña (2019) use the classification approach for customer satisfaction and focus on detecting the attributes linked to customer satisfaction in hospitality context. Clustering process is related to grouping the dataset/items into distinct groups regarding different attributes. Employing demographics and social media related behaviours to group the consumers could be an example of clustering process. Regression as a common methodology between traditional methods and data mining evaluates the variables with causal links which refer to a causality between variables. The interactivity of social media posts could be the reason for post-engagement and this causality can be examined in regression-based studies.

The data-based approaches can be used for (1) understanding the existing marketplace, (2) prediction of future actions. The marketplace can be identified as the networks of variables regarding market, consumers or companies and the variables related to these actors could be examined with correlation/regression or clustering methodology. The data-based methodology approach must be aligned with the aim of marketing decision-making.

Beyond the general approaches/data models, there are popular approaches in the marketing research related to social media data. Text mining approach has a growing interest in marketing research recent years and it simply refers to examine the text-based content for interpretation. Text mining could be used for detection of



significant/meaningful patterns from the large data of text or examines the content with different aspects. For example, topic modelling methodology could be used in text mining when the context or research question mostly depends on detection of topics in the conversation of text-based content. Topic modelling can be also helpful for large size of jobs. Bastani, Namavari, and Shaffer (2019) study the consumer complaint narratives for The Consumer Financial Protection Bureau (CFPB) with topic modelling approach, as they indicate manual evaluation of narratives is not feasible. Online reviews are one of the topics in the topic modelling research. Wang, Feng, and Dai (2018) use latent Dirichlet allocation as topic modelling methodology for investigating online consumer reviews regarding two competitor products. They present the unique topics, competitive superiorities, and weaknesses with the help of the framework. Another topic in the topic modelling research refers to Twitter posts as they reflect the expression of social media users. Prabhakar Kaila and Prasad (2020) focus on Twitter in Covid19 context and use sentiment analysis and topic modelling together to evaluate that topics in #coronavirus hashtag.

The other methodology—sentiment analysis—can be used for evaluating the consumers' reactions to market actors. Sentiment analysis simply means detecting the sentiments or emotions from the text content. Sentiment analysis can use pre-built lexicons or machine learning approach to detect the sentiments and this approach is useful for understanding consumers reactions in different cases including online reviews with customer satisfaction and product attributes (Wang, Lu, & Tan, 2018), tourists' sentiments (Liu, Huang, et al. 2019), e-WOM (Canbolat & Pinarbasi, 2020). As the data-based methodologies include various methodological/variable-based approaches, there are many methods/variable-based approaches examining marketing contexts, network analysis (Pinarbasi, 2020a), language style matching variable (Liu, Xie, and Zhang 2019).

Marketing decision-makers could start the marketing research process either by model-based approach or specific methodological approaches. The preference of the starting relies on several conditions like the scope of the problem (large-small), the aim of the research (identification/optimization) or the data characteristics (text-based, visual-based). All the three sections in the study would help marketing decision-makers to understand: (1) what does the big data concept mean for marketing, (2) what are the data contexts for research and (3) how can data be used for marketing intelligence.

## 4 Conclusion

The study sets out to examine the marketing decision-making through the marketing research perspective, and the study evaluates the current state of the marketing decision-making in terms of data-based methodologies and their contribution to marketing research with example studies. The study highlights the proactive management approach in the first section of the study and concludes three different ways

for the contribution of data-based methodologies; the contribution of big data, emerging of new data contexts and employing of new data methodologies.

The first issue addressed in the study refers to the “Big Data” concept as a popular topic recently. Marketing decision-making could employ the concept surrounding the customers in the digital world to have better insights related to market and consumers. Today’s customer produces different types of data related to themselves, such as daily moments, photos, videos, and information of visited locations. The marketing research could focus on one or many content types to evaluate the customers in different approaches. For example, the traditional approach in CRM systems which evaluates the standard information related to customers could be enhanced by providing social media-based customer information. The second issue in the study refers to new data contexts emerging in the social media platforms in recent year. Ephemeral media or audio-based content could lead to new research questions in terms of customers and brand sides. Expression of selves in social media through new data contexts could require new methodological approaches, while brand communication is also affected through these types of contexts. The final issue in the study focuses on the data-based methodologies, and it integrates with the previous issues. The big data and new data types could contribute to marketing research by employing new data-based methodologies. Detecting the corresponding research methodology for the individual data types or contexts is crucial for this step. Marketing decision-makers should evaluate the marketplace about the data types and contexts and investigate the best matching solutions for marketing intelligence.

Future research might explore one or many of the three issues highlighted in the study and investigate them in specific contexts. For example, big data issue for marketing research could lead to innovative research questions in various marketing contexts like apparel or e-commerce. Using big data and consumer data to predict the fashion-related consumer-behaviours could be the agenda of marketing in future. On the other hand, the market environment has different contexts like sharing economy (Pinarbasi, 2020b), ephemeral content (Kircova, Pinarbaşı, & Köse, 2020) emerging in the recent years which can be used for marketing research. Besides, the combination of the issues could also contribute to new research approaches. Using Instagram as the data source and employing ephemeral media content as a new data type with a relatively new methodology approach (like object detection or visual analysis) could lead to new marketing research questions. As another example, audio-based social media data could require audio mining methodologies, and this has the potential for marketing researchers. In conclusion, understanding “new” marketing in terms of data would help marketing decision-making either academic or industrial knowledge.

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