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Marketing Analytics: Driving Roi through Data-Driven Marketing Strategies

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ABSTRACT

An organization's ability to develop and execute strategy relies on its grasp of customer behavior, especially in today's volatile business climate. Achieving market dominance relies on it. Consequently, customer centricity should permeate all aspect of a company's operations. In order to assist businesses locate the "right" customers, retain and expand their customer base, and maintain growth and profitability, marketers must utilize big data through data driven marketing (DDM). Aiming to increase shareholder value through establishing "customer centricity" is the focus of this research, which also delves into DDM adoption techniques. The decision-making process has grown in significance with the advent of analytics and the raging digital era. Also essential to the process are intuition and judgment. Choosing the right thing to do isn't something that can be done purely rationally. This study provides the answers to the research questions about how data analytics in one department affects that department and the company as a whole. To be more specific, it uses an information value chain technique to hypothesize the link between the marketing unit's and the firm's performance in terms of quality data and the sensing capabilities of IT- based analytics. Supporting the predictions, a survey of 346 companies found evidence of both direct and partially mediated effects on sensing capabilities, as well as partially mediated effects on quality data.

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Introduction

The capacity of the organization to incorporate analytics into decision-making is a critical component of the BDA implementation's success, according to experts in the field who have researched the subject [1,2]. It is impossible to attain the kind of routine and continuing use that is necessary to bring strategic benefits to an organization if BDA analytics capabilities are not integrated. This is because they become disconnected from marketing decision-making. Consequently, it is essential to have a high-quality analytics capability within the organization. The fast-evolving BDA phenomena, on the other hand, is characterized by an abundance of data sources, updated analysis methodologies, and innovative software applications; managers would do well to make understanding this phenomenon a top priority.

Many different kinds of businesses are primarily concerned with how to become data driven and methodically make sense of an ever-expanding BDA environment. Previous research has identified a number of elements—for instance, that impact the adoption of BDA [3,4]. Among these components are the features of the system, the culture of the organization, and the infrastructure of the company. Nevertheless, there is a dearth of systematic and experimentally proven models in the existing literature concerning the effective utilization of big data analytics, particularly in the realm of marketing.

How can managers best apply big data analytics into an environment that is so complex and hard to understand? Present here is an article that fills this void in the literature. Managers at the highest levels can choose to give BDA experts more say in marketing strategy decisions if they want to see BDA adoption accelerate.

When it comes to making sense of advances in BDA, senior management may also choose to take a more organic strategy, which involves involving the marketing function in a communal effort. Both of these points of view aim to improve marketing insights and get more companies to use data-driven marketing.
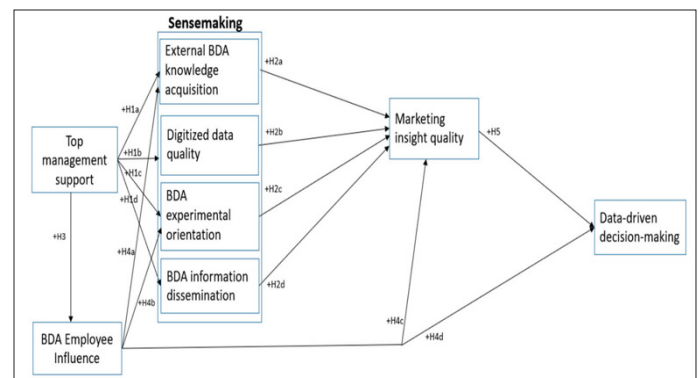
Figure 1: Data-Driven Marketing and Business Data Analytics (BDA)

The conceptual framework shown in Figure 1 provides evidence that the company's upper management is the main force behind

the implementation of data-driven decision-making inside the business. The marketing department's leadership, in particular, needs directives from upper management to become more data-driven. Department heads began a process of sensemaking to learn about BDA analytics and their role in the marketing campaign. These sensemaking events can be grouped into many types, such as acquiring external knowledge, improving the quality of digital data, sharing new approaches, and experimenting with data.

Concurrently, a rise in the effect of BDA-skilled individuals on decision-making may be implemented by upper management. There are two categories of research that may be used to categorize the effects of emerging BDA on marketing. The first category is conceptual models, which offer direction to theorists and managers for how they should think about BDA. When it comes to research, the second group consists of studies that investigate the efficiency and worth of utilizing BDA [5]. According to the findings of qualitative research, in order for firms to achieve the status of being truly data-driven marketers, they must first go through a series of four steps. In the first stage, known as sprouting, businesses try out different types of analytics.

This is the beginning of the stage. They then proceed to the following step, which is the recognition stage, which is then followed by the commitment stage and the cultural transformation stage, and lastly, they arrive at the stage that is completely driven by data. There are a number of qualities that set the completely data driven stage apart from the phases that came before it. The use of machine learning, predictive modeling, and third-party data integration are all features that fall under this category.

The authors who are making progress toward becoming completely data-driven marketers may be setting themselves up for failure if they neglect to experiment, if they allow themselves to become preoccupied with return on investment (ROI), and if they abdicate responsibility for data to other sources. Studies that evaluate the effectiveness of BDA in marketing shed light on the potential applications of combining big data with marketing analytics skills to enhance product creation and increase revenues. The application of empirical models and field tests enables this to be achieved. The goal is accomplished by making consumer targeting more successful and by making it easier to elicit behavioral responses from customers.

Companies who have a BDA system of a high grade are able to produce considerable improvements in the quality of their new product development [6]. It is important to keep in mind that the benefits of profitability do not come easily. When it comes to the product or service environment, they require a significant amount of customization, which necessitates collaboration across other disciplines, even with academic researchers. According to, the marketing organization needs to define and find a middle ground between marketing analytics and marketing creativity if they want to succeed as a whole [7,8]. If the company wants to succeed as a whole, this must be done. The purpose of this article is to give managers the sensemaking tools they need to understand a dynamic and unpredictable world and to pave the way for data-driven decision-making.

Literature Review
The present networked business environment is characterized by a number of factors that are considered to be key disruptive forces. Data availability and proliferation, as well as data collection, processing, and analysis tools and techniques, are among these

issues. The growing number of companies putting resources into data analytics to find ways to boost performance and stay ahead of the competition is hardly surprising. Practitioner surveys show that the number of companies making these types of investments has been on the rise recently [9].

A number of business-level competencies and performance outcomes have been studied and shown to benefit from data analytics in the academic literature [10]. The practitioners' investments in data analytics are reflected in this. Previous research that examined the link between enterprise-wide data analytics and company-level success has been recognized in multiple assessments of the strategic value of IT and data analytics. Nevertheless, these analyses make it quite evident that additional research is needed to determine how data analytics can affect the overall performance of the organization and its particular business units [11-14].

These current requests for unit-level data analytics studies are consistent with reality since companies typically deploy data analytics in specific departments or units to mitigate risks related to such areas [15]. Data analytics experts caution that implementing company-wide data analytics initiatives all at once is a common recipe for disaster. It is recommended to begin with a small area or unit to test data analytics in an incremental and iterative manner [16]. It is often left to the discretion of individual functional heads or business unit leaders to determine if data analytics should be implemented company-wide, even when CEOs advocate for it. With customer loyalty and retention rates on the decline, it's no wonder most businesses link data analytics with marketing and other customer-facing sectors [17]. According to practitioner surveys, marketing is the department that is utilizing data analytics to the greatest extent among all organizational units [18].
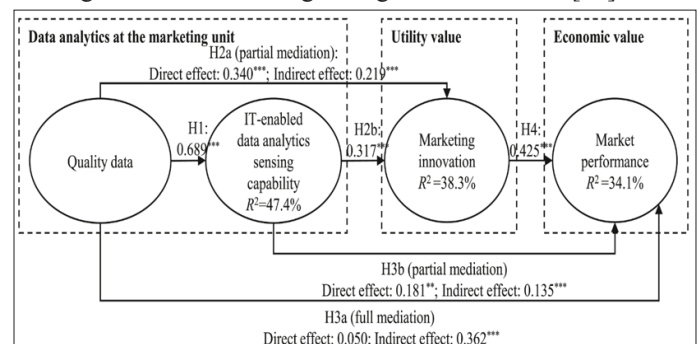
Figure 2: Impacts on market performance, both directly and indirectly *p < 0.05, **p < 0.01, ***p < 0.001, one-tailed test, with p < 0.10

We used a one-tailed 5000 subsample BCA bootstrap to determine the significance and strength of the alleged associations [18]. The results are shown in Figure 2. The use of information technology for data analytics sensing is clearly associated with high data quality, as indicated by a strong positive association (β = 0.689). This lends credence to hypothesis H1. Quality data (β = 0.340) and IT-enabled data analytics sensing (β = 0.317) are positively and strongly connected with marketing innovation (β = 0.340). Due to the fact that the utilization of IT-enabled data analytics sensing has a positive and statistically significant indirect effect on marketing innovation ($\beta1 \times \beta2$ = 0.219), partial mediation can be employed.

Thus, the evidence is in favor of hypotheses H2a and H2b. The bulk of data analytics initiatives are devoted to marketing

for four additional reasons. To start, there is a plethora of new opportunities for consumers and businesses to interact thanks to the widespread availability of mobile and wearable technology. Secondly, companies that didn't have the means or expertise to use marketing data analytics solutions are now able to do so with ease [19]. The third point is that customer-centric marketing and integrated marketing communication approaches lead to longer and more complicated customer journeys.

The steps a consumer takes to get to know and make use of a business's product or service is called a customer journey. As a result, data analytics and studies of marketing effectiveness face additional obstacles. Businesses have made marketing data analytics a major priority, with investments increasing by nearly 40% between February 2021 and February 2022, as a result of the circumstances brought about by COVID-19, which has led to disintermediation reaching its peak [20].

It-Enabled Data Analytics Sensing Capability for the Marketing Unit

An organization's data analytics capabilities can center around two main areas: first, the ability to deploy and manage data and IT assets so they can be used internally; and second, the capability to generate relevant knowledge by using the deployed data and IT assets to provide guidance for business decisions and actions [21]. The first one is more concerned with the capacity to deploy assets like data and IT, while the second one is more concerned with the capability that is made possible by using these IT assets. Understanding the sensing capabilities of IT-enabled data analytics is the primary objective of this research. These analytics can assess the performance of a product or service and identify trends in customer behavior, potential customers, customer profitability, market trends, and influential industry insiders and segments. The capacity to see one's surroundings in order to make judgments about changes to one's marketing mix is what we mean when we talk about IT-enabled data analytics sensing skills. With the help of analytical methods and processes included into the program, this is possible [22].

Take the analytical part of a standard CRM system as an example; it's job is to sift through all that data collected by the operational part. Data that might be studied as part of the analytical component include things like web traffic analysis, sentiment analysis in social media posts, and textual data from customer reviews [23]. In this way, the market (including trends, industry insiders, and influencers), the company's offerings, and the consumers (including profitability, behavioral patterns, groups/segments, and the identification of prospective customers) may all be better understood with the use of IT. An especially important dynamic aspect provided by IT is the ability to identify information about consumers, the market, and product and service performance, which the marketing unit has discovered to be the case [24].
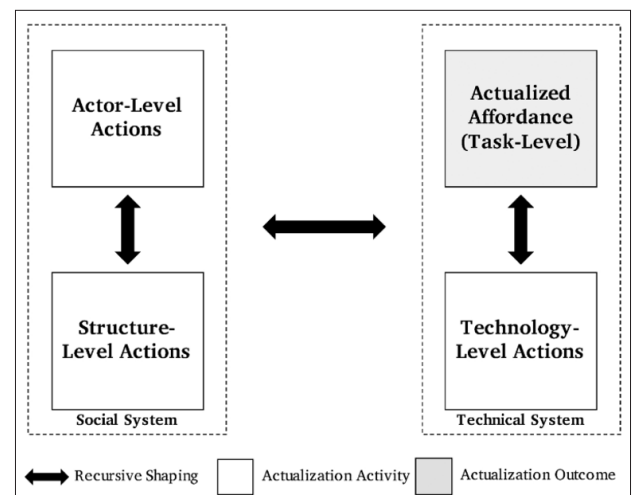
Figure 3: Affordance Actualization Model

A brief synopsis of our theoretical idea is shown in Figure 3. When an STS is operating at the task level, it makes use of affordances, which are action potentials. The ways in which a company goes about making changes to things at the structural, actor, and technological levels mirror the cyclical moulding of socio-technical entities that help bring affordances to fruition. The actualized affordance at the task level is the result of prior actions done at the structural, actor, and technology levels. To better understand the socio-technical factors that contribute to the realization of value, it is helpful to view BDA via a socio-technical lens and examine its actualization through an STS lens.

Data analytics for marketing decision-making and value creation The information value chain method, which has its roots in classical decision sciences and microeconomics, offers a framework for comprehending the ways in which various assets, talents, and activities pertaining to information are advantageous to both units and organizations. According to, this method improves the company's knowledge-based perspective [25].

This theoretical perspective has been utilized in various settings, such as the assessment of IoT applications, patents in SMEs, blockchain technology in the agri-food sector, patient self-care, and many more. It recognizes information as a critical driver of change and, thus, value creation. Another example would be resources and activities that are centered on organizations or networks. Information value chain theory lends credence to the study's knowledge-based approach to theoretically predicting the multiple value creation effects of data analytics (i.e., quality data and IT-enabled data analytics sensing capability) within the marketing unit, influencing marketing innovation decisions, and in the larger organization, specifically, the firm's market performance.

These different implications are further discussed in the section that follows. Data about machine runtime, downtime, and work queues is collected in manufacturing, for instance, to research and improve workload planning. This ensures that machines function at their best.

Data analytics has many applications beyond just optimizing manufacturing. Companies in the gaming industry employ analytics to create incentive systems that attract and retain gamers, while media companies use analytics to improve the placement and presentation of information, which in turn increases user engagement.

Types of Data Analytics
Data analytics can be broadly classified into four categories:
- Predictive (forecasting)
- Descriptive (business intelligence and data mining)
- Prescriptive (optimization and simulation)
- Diagnostic analytics
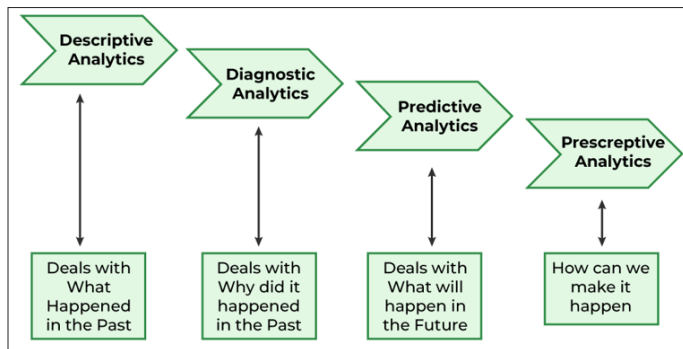
Figure 4: Data Analytics and its Types

Predictive Analytics
In order to make sense of and do something with raw data, predictive analytics is essential. Data is utilized in predictive analytics to ascertain the probable result of an occurrence or the probability of a condition occurring.

Data mining, game theory, modeling, and machine learning are just a few of the many statistical methodologies that fall under the general heading of predictive analytics. These methods analyze both current and past data in order to produce forecasts about what will happen in the year to come. Some of the methods that are utilized in predictive analytics are as follows:

- Linear Regression
- Time Series Analysis and Forecasting
- Data Mining

Basic Cornerstones of Predictive Analytics
- Predictive modeling
- Decision Analysis and optimization
- Transaction profiling

Descriptive Analytics
By examining data and experiences from the past, descriptive analytics aims to comprehend how to handle future occurrences. We do this to learn from past mistakes and improve our strategy for the future. For the purpose of understanding what factors led to prior successes or failures, it examines and comprehends past performance by mining historical data. We do this to find out what worked and what didn't in the past. This kind of analysis has numerous uses and is utilized extensively in nearly all management reporting formats, including those for sales, marketing, operations, and finance.

On account of the fact that it quantifies the correlations that are present within the data, the descriptive model is typically applied for the purpose of categorizing customers or potential customers into groups. The purpose of descriptive analytics is to identify a wide variety of links between customers and products, in contrast to predictive models, which are primarily concerned with forecasting the actions of a particular consumer.

Prescriptive Analytics
The generation of predictions is accomplished through the utilization of prescriptive analytics, which brings together the fields of big data, mathematical science, business rules, and machine learning altogether. Based on these predictions, decision options are then suggested.

Beyond just forecasting outcomes, prescriptive analytics also provides actionable insights and decision-maker-facing consequences for each possible course of action. With the use of prescriptive analytics, we can predict not just when and what will happen, but also why. In addition, Prescriptive Analytics may show the consequences of each decision option and advise ways to take advantage of future opportunities or reduce future risks. By combining operational and consumption data with data from external elements like economics and population demography, Prescriptive Analytics can help healthcare strategic planning, for instance.

Diagnostic Analytics
When conducting this kind of research, we often give historical data more weight than other kinds of data when we are attempting to find a solution to any problem or discover the answer to any question.

Using the problem's past data, we search for patterns and dependencies. In order to save time and avoid having to gather data individually for each problem, businesses opt for this type of analysis because it provides valuable insight into a problem while also allowing them to preserve detailed records about their disposal. Methods frequently employed in diagnostic analytics include:

- Data discovery
- Data mining
- Correlations

In the marketing department, data analytics—including quality data and IT-enabled data analytics sensing—contributes to the information value chain by informing marketing choices and initiatives [26]. The majority of marketing data analytics initiatives aim to provide insights that can direct adjustments to the marketing mix. These alterations, which comprise the introduction of novel marketing strategies, are referred to as marketing innovation. As an example, "changes in product design and packaging, in product promotion and placement, and in methods for pricing goods and services" fall under this category. Increasing the effectiveness of the marketing mix is an example of marketing innovation, which is referred to as an incremental innovation in the research literature.

The need of high-quality data for marketing mix innovations is underscored by the fact that incremental innovations, as stated in, build upon and strengthen the applicability of current knowledge [27]. Given the marketing function's association with marketing-mix process activities, knowledge assets, like high-quality data available in the marketing unit, deserve special attention.

It is possible to improve an organization's potential for incremental innovation by making use of high-quality data, which includes marketing campaigns, knowledge directories, and manuals that are up-to-date, easily accessible, complete, and pertinent [28].

Additionally, by putting in place systems, procedures, and practices that promote the reuse of knowledge, an organization can further enhance its capacity for innovation.

As previously said, the ability of a company to retain pertinent consumer and industry data is a key driver of innovation [29]. Marketing mix-implied service innovations also frequently originate from early data on local consumer demands and challenges [30]. In reality, businesses frequently require early access to consumer data in order to actively involve customers, for instance, in consultations regarding service improvement.

Businesses can now obtain new insights from marketing-related data by utilizing data analytics techniques, thanks to the advent of numerous IT-based solutions. Customer relationship management (CRM), social media management (SMM), marketing intelligence (MI) software, and customer journey tracking (CRM) are all part of these solutions [31]. Analysis of client profitability and product/service performance, identification of leading industry insiders and influencers, pattern recognition of consumer behavior, identification of potential new customers, market trends, and customer groups and segments are the guiding principles of marketing innovation decisions. This ability is made possible by IT. As a result, incremental marketing innovations involving changes to the designs, packaging, prices, and marketing campaigns of existing products and services are made possible by IT-enabled data analytics sensing, which in turn reveals hitherto unseen insights about consumer behavior and market trends.

Conclusion
This study, in a nutshell, explores the impact that the assets and capabilities of data analytics have on the marketing function of the company as well as the market performance of the company. This study demonstrates the practical importance of both high-quality data (i.e., assets) and data analytics sensing capabilities supplied by IT by supporting marketing innovation within the marketing unit. The knowledge-based vision of the organization is the bedrock upon which this idea rests, according to the information value chain analysis. As they progress along the information value chain, data assets lose some of their direct influence, but high-quality data has no impact on market performance because of the mediation. Despite the fact that IT-enabled data analytics' sensing skills directly impact a company's market performance, this remains true. Consequently, the connection between performance and marketing data analytics is now more understood thanks to this study. In doing so, it breaks down data analytics into assets and capabilities while taking firm-level and marketing unit-level performance into account.

References
1. Fleming O, Fountaine T, Henke N, Saleh T (2018) Ten Red Flags Signaling Your Analytics Program Will Fail. McKinsey Quarterly.
2. Rostamzadeh N, Abdullah SS, Kamran S (2021) Visual Analytics for Electronic Health Records: A Review. Informatics 8: 12.
3. Adrian C, Abdullah R, Atan R, Jusoh YY (2018) Conceptual Model Development of Big Data Analytics Implementation Assessment Effect on Decision-Making. Int J Interact Multimed Articif Intel 5: 101-106.
4. Cabrera-Sánchez JP, Villarejo-Ramos AF (2020) Factors Affecting the Adoption of Big Data Analytics in Companies. Rev Adm Empresas 59: 415-429.
5. Ahmad IA, Nuseir MT, Alam MM (2021) Organizational Performance and Capabilities to Analyze Big Data: Do the Ambidexterity and Business Value of Big Data Analytics Matter? Bus Process Manag J 27: 1088-1107.
6. Ahmad IA, Nuseir MT, Alam MM (2021) Traditional Marketing Analytics, Big Data Analytics and Big Data System Quality and the Success of New Product Development. Bus Process Manag J 27: 1108-1125.
7. Iacobucci D, Petrescu M, Krishen A, Bendixen M (2019) The State of Marketing Analytics in Research and Practice. J Mark Anal 7: 152-181.
8. Johnson DS, Muzellec L, Sihi D, Zahay D (2019) The Marketing Organization's Journey to Become Data-Driven. J Res Interact Mark 13: 162-178.
9. Business Wire (2021) New Vantage partners releases 2021 big data and AI executive survey https://www.businesswire.com/news/home/20210104005022/en/NewVantage-Partners-Releases-2021-Big-Data-and-AI-Executive-Survey.
10. Business Wire (2022) New Vantage partners releases 2022 big data and AI executive survey https://www.businesswire.com/news/home/20220103005036/en/New Vantage-Partners-Releases-2022-Data-And-AI-Executive-Survey.
11. Mc Kinsey (2021) The state of AI in 2021 https://www.mckinsey.com/businessfunctions/quantumblack/our-insights/global-survey-the-state-of-ai-in-2021.
12. The CMO Survey (2021) The transformation of Marketing: emerging digital, social, and political trends https://cmosurvey.org/wp-content/uploads/2021/02/The_CMO_Survey-Highlights_and_Insights_Report-February-2021.pdf.
13. The CMO Survey (2022) Managing digital marketing returns, privacy, and climate impact https://cmosurvey.org/wp-content/uploads/2022/02/TheCMOSurvey-Highlights_and_Insights_Report-February_2022.pdf.
14. Awan U, Shamim S, Khan Z, Zia N, Shariq S, et al. (2021) Big data analytics capability and decision-making: the role of data-driven insight on circular economy performance, Technol. For Soc Change 168: 120766.
15. Chatterjee S, Chaudhuri R, Vrontis M (2022) Big data analytics in strategic sales performance: mediating role of CRM capability and moderating role of leadership support. Euro Med J Bus 17: 295-311.
16. Cheng TCE, Kamble SS, Belhadi A, Ndubisi NO, Lai KH, et al. (2021) Linkages between big data analytics, circular economy, sustainable supply chain flexibility, and sustainable performance in manufacturing firms. Int J Product Res DOI: https://doi.org/10.1080/00207543.2021.1906971.
17. Corte-Real N, Ruivo P, Oliveira T, Popovic A (2019) Unlocking the drivers of big data analytics value in firms. J Bus Res 97: 160-173.
18. Dong JQ, Yang CH (2020) Business value of big data analytics: a systems-theoretic approach and empirical test. Inform Manag 57: 103124.
19. Mikalef P, Pappas IO, Krogstie J, Pavlou PA (2020) Big data and business analytics: a research agenda for realizing business value. Inform Manag 57: 103237.
20. Olabode OE, Boso N, Hultman N, Leonidou CN (2022) Big data analytics capability and market performance: the roles of disruptive business models and competitive intensity. J Bus Res 139: 1218-1230.
21. Buhalis D, Volchek K (2021) Bridging marketing theory and

big data analytics: the taxonomy of marketing attribution. Int J Inf Manag 56: 102253.

22. Gartner Research (2019) Hidden Forces That Will Shape Marketing in 2019 https://www.gartner.com/en/marketing/insights/articles/4-hidden-forces-that-will-shape-marketing-in-2019.

23. Saura JR, Ribeiro-Soriano D, Palacios-Marqu´es D (2021) Setting B2B digital marketing in artificial intelligence-based CRMs: a review and directions for future research. Ind Market Manag 98: 161-178.

24. Tueanrat Y, Papagiannidis S, Alamanos E (2021) Bridging marketing theory and big data analytics: the taxonomy of marketing attribution. J Bus Res 125: 336-353.

25. Coiera E (2019) Assessing technology success and failure using information value chain theory. Stud Health Technol Inform 263: 35-48.

26. Pereira V, Bamel U (2021) Extending the resource and knowledge-based view: a critical analysis into its theoretical evolution and future research directions. J Bus Res 132: 557-570.

27. Torres R, Sidorova A, Jones MC (2018) Enabling firm performance through business intelligence and analytics: a dynamic capabilities perspective. Inform Manag 55: 822-839.

28. Varadarajan R (2020) Customer information resources advantage, marketing strategy and business performance: a market resources-based view. Ind Market Manag 82: 15-18.

29. Cao G, Duan Y, Banna A (2019) A dynamic capability view of marketing analytics: evidence from UK firms. Ind Market Manag 76: 72-83.

30. Taleb I, Serhani MA, Bouhaddioui C, Dssouli R (2021) Big data quality framework: a holistic approach to continuous quality management. J Big Data 8: 1-41.

31. Conboy K, Mikalef P, Dennehy D, Krogstie J (2020) Using business analytics to enhance dynamic capabilities in operations research: a case analysis and research agenda. Eur J Oper Res 281: 656-672.