

## Structuring Customer Data Requirements for Sales Enhancement through Big Data Analytics

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### Abstract

Businesses increasingly face pressure to enhance sales performance while managing the rapid expansion of customer data generated from diverse digital sources. This data proliferation necessitates more structured and strategic Customer Data Management (CDM) approaches to fully leverage big data analytics. Accordingly, this study aims to develop a conceptual framework that identifies the essential customer data requirements for improving strategic decision-making and sales outcomes. Employing an integrative literature review, this research synthesizes contemporary studies on big data analytics, customer engagement, and data management systems. The findings reveal that effective data utilization requires the systematic classification of customer information into four key dimensions: identity, quantitative, descriptive, and qualitative data. This framework extends the conventional “five Vs” of big data by translating abstract data characteristics into actionable analytical domains. The study argues that organizations adopting this structured approach can construct a comprehensive single customer view, enabling more precise segmentation, personalized marketing, and improved customer lifetime value. This study contributes to the literature by offering a domain-specific model for CDM that bridges theoretical abstraction and practical implementation in data-driven sales strategies.

*[Bisnis saat ini menghadapi tekanan yang semakin besar untuk meningkatkan kinerja penjualan sekaligus mengelola pertumbuhan pesat data pelanggan yang dihasilkan dari berbagai sumber digital. Proliferasi data ini menuntut penerapan pendekatan Customer Data Management (CDM) yang lebih terstruktur dan strategis guna memaksimalkan pemanfaatan analitik big data. Oleh karena itu, penelitian ini bertujuan untuk mengembangkan suatu kerangka konseptual yang mengidentifikasi kebutuhan data pelanggan yang esensial dalam rangka meningkatkan pengambilan keputusan strategis dan hasil penjualan. Dengan menggunakan pendekatan integrative literature review, penelitian ini menyintesis berbagai studi kontemporer terkait analisis big data, keterlibatan pelanggan, dan sistem manajemen data. Hasil penelitian*

*menunjukkan bahwa pemanfaatan data yang efektif memerlukan klasifikasi sistematis informasi pelanggan ke dalam empat dimensi utama, yaitu data identitas, kuantitatif, deskriptif, dan kualitatif. Kerangka ini memperluas konsep konvensional “five Vs” dalam big data dengan menerjemahkan karakteristik data yang bersifat abstrak ke dalam domain analitis yang operasional. Penelitian ini berargumen bahwa organisasi yang mengadopsi pendekatan terstruktur ini mampu membangun single customer view yang komprehensif, sehingga memungkinkan segmentasi yang lebih presisi, pemasaran yang terpersonalisasi, serta peningkatan customer lifetime value. Studi ini berkontribusi terhadap literatur dengan menawarkan model CDM yang bersifat spesifik domain, yang menjembatani abstraksi teoretis dengan implementasi praktis dalam strategi penjualan berbasis data.]*

**Keywords:** Big Data Analytics, Business Sales, Customer Data Management, Sales Performance, Single Customer View, Strategic Decision-Making.

## **Introduction**

People worldwide increasingly recognize that the Internet and rapid digitalization have fundamentally transformed both business operations and consumer lifestyles. With the proliferation of social networking platforms, wearable technologies, and digital transaction systems, massive volumes of data are continuously generated. This unprecedented rate of data creation has resulted in highly complex and heterogeneous data structures that cannot be efficiently managed or stored using traditional systems. Consequently, organizations across the globe are confronted with vast datasets containing richer and more granular consumer information than ever before (Bhadani & Jothimani, 2016).

In today’s digital marketing landscape, effectively navigating this data deluge has become imperative, as institutions face intensifying competition. The post-CoronaVirus Disease-2019 (COVID-19) era has introduced a new paradigm in which data-driven decision-making generates measurable and strategic business outcomes. The ability to effectively manage and interpret complex streams of consumer data is now widely regarded as a critical determinant of organizational success (McKinsey & Company, 2020). Specifically, organizations must move beyond merely managing the exponential growth of consumer data and instead strategically analyze it to extract actionable insights that enhance sales performance.

Scholarly discourse on big data frequently emphasizes its defining characteristics, commonly conceptualized as the five Vs (Volume, Velocity, Variety, Veracity, and Value). Hariri et al. (2019) argue that understanding these dimensions is foundational, as the ultimate objective of big data lies in transforming vast and dynamic datasets into reliable and actionable knowledge for decision-making. Leveraging these characteristics offers firms significant

potential to establish deeper connections with consumers. Kunz et al. (2017) demonstrate that information and communication technologies facilitate the capture and analysis of extensive customer intelligence, serving as a key driver for sustained value creation and long-term engagement. However, establishing such relationships requires a nuanced and context-sensitive understanding of consumer behavior. Mazzarol et al. (2007) reveal that customer motivations for engagement and information sharing are highly heterogeneous—ranging from altruistic intentions to perceived social responsibility—indicating that generalized, one-size-fits-all analytical approaches are inherently insufficient.

Recent literature further reinforces the argument that an organization's analytical capability serves as a primary catalyst for transformation. Tetteh et al. (2025) argue that big data analytics capability is a critical enabler of business model innovation, with its effectiveness significantly mediated by a firm's strategic orientation under dynamic market conditions. Supporting this, Wang et al. (2025) employ a system dynamics approach to demonstrate that navigating the complexity of data-driven business models requires continuous and adaptive data integration to capture real commercial value. Furthermore, Ehsani and Hosseini (2025) show that leveraging big data in B2C retail marketplaces enables highly precise consumer segmentation based on spatial and temporal dimensions, thereby improving targeted engagement and sales performance.

Furthermore, the theoretical necessity for robust data management extends beyond traditional retail into institutional and philanthropic sectors. Ridzuan et al. (2025) highlight that integrating big data and Artificial Intelligence (AI) presents significant opportunities to optimize zakat management and stakeholder engagement, although it requires overcoming complex data architecture challenges. To ensure that these operations remain both accurate and compliant, Mat Jubri Shamsuddin et al. (2026) emphasize the importance of rigorous comparative evaluations of AI systems. Nugroho and Al-Giffari (2026) further argue that institutionalizing big data is not merely a technical endeavor but also a governance challenge, requiring organizations to navigate stringent regulatory frameworks while maintaining Sharia compliance and institutional trust. This emphasis on transparent data governance is echoed by Musika and Suhadi (2025), who stress that legal certainty and stakeholder protection are essential in managing complex data ecosystems. Collectively, these studies underscore that extracting value from big data depends fundamentally on strong analytical capabilities, sound governance structures, and systematic data categorization.

Despite these advancements, a significant operational and research gap persists regarding how organizations practically categorize and utilize customer data. The rapid growth of data acquisition continues to outpace the capacity of organizational Information Technology (IT) infrastructures to manage and analyze it effectively for improved decision-making (Nugraha et al., 2019).

Moreover, many existing analytical techniques remain inadequate for processing large-scale datasets and fail to capture the inherent complexity of massive data environments (Tsai et al., 2015). Consequently, there is an increasing demand for robust Customer Data Management (CDM) solutions to systematically collect, integrate, and analyze data in order to enhance customer acquisition, retention, and revenue growth (Heger, 2020). Without a clear alignment between data collection practices and strategic data management objectives, firms risk becoming overwhelmed by the very data they seek to leverage. Therefore, this study proposes a preliminary conceptual framework of customer data requirements for big data analytics aimed at improving business sales. The central argument posits that, to engage customers effectively without relying on fragmented and inefficient advertising strategies, organizations must systematically categorize their data into four distinct types: identity data, quantitative data, descriptive data, and qualitative data. By structuring these data requirements, this study provides a strategic framework to support organizations in optimizing data governance, enhancing strategic decision-making, and ultimately improving sales performance.

## **Literature Review**

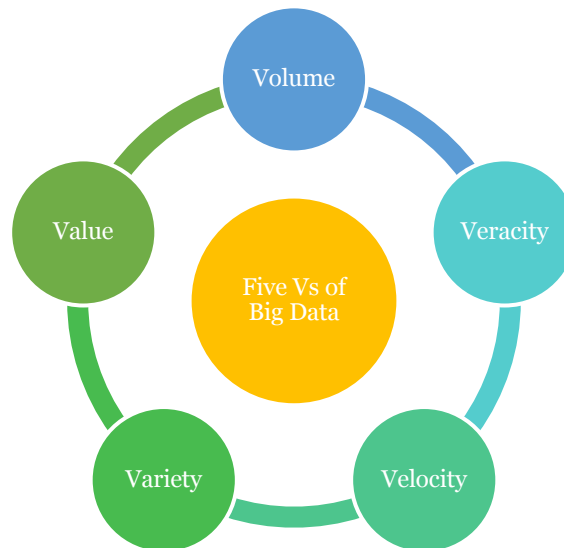
### ***Big Data and Its Characteristics***

In *The Third Wave*, Alvin Toffler introduced the term “big data” in 1980. In the contemporary era of the Internet, cloud computing, and rapidly evolving digital technologies, the concept of big data has acquired broader and more complex meanings (Guo & Wang, 2019). The term “big data” now encompasses not only the exponential growth of data but also the development and implementation of technologies that enable the right users to access the right information at the right time. The challenge lies not only in managing rapidly increasing data volumes but also in handling the growing diversity, complexity, and interconnectivity of data formats. As a multifaceted and dynamic construct, the definition of big data continues to evolve across different academic and industrial communities. Rather than being confined to a specific set of tools, big data is more accurately understood as a class of technologies and analytical techniques designed to extract value from large-scale datasets. As this field continues to develop, its conceptual boundaries remain fluid, shaped by ongoing innovations and emerging applications (Riahi & Riahi, 2018).

According to Hariri et al. (2019), big data is commonly characterized by five key dimensions, often referred to as the five Vs, as illustrated in Figure 1. Volume refers to the scale and magnitude of datasets, reflecting the massive amount of data generated continuously. However, establishing a universal threshold for what constitutes “big” data remains challenging, as it varies depending on context and data type (Gandomi & Haider, 2015). The growth in data volume is driven not only by increased data generation and storage but also by the expanding need

to extract value from it (Riahi & Riahi, 2018). Contemporary datasets often reach Exabyte (EB) or Zettabyte (ZB) levels, posing significant challenges related to scalability and uncertainty, as traditional database systems are often incapable of handling such magnitude. Consequently, many existing data analysis techniques remain inadequate for processing large-scale datasets and may fall short in scanning and comprehending vast amounts of data (Tsai et al., 2015).

**Figure 1**  
**Common Big Data Characteristics**



Source: Hariri et al. (2019).

Veracity refers to the quality and reliability of data, encompassing issues such as inconsistency, ambiguity, noise, and incompleteness. Ensuring accuracy and trust in big data analytics has become increasingly challenging due to the growing diversity of data sources. For example, social media platforms may contain both official corporate information and personal opinions, complicating analytical processes (Riahi & Riahi, 2018). While the preceding dimensions highlight the inherent challenges of big data, value emphasizes its ultimate purpose—namely, its utility in supporting effective decision-making. Leading technology companies such as Amazon, Google, and Facebook exemplify how big data analytics can be leveraged to generate strategic value. For instance, Amazon utilizes transaction data to deliver personalized recommendations, thereby enhancing sales and user engagement. Similarly, Google integrates location-based data to improve navigation services, while Facebook analyzes user behavior to deliver targeted advertising. These examples demonstrate how the transformation of raw data into actionable insights enables firms to enhance decision-making and achieve competitive advantage (Court, 2015).

### ***Big Data and Customer Engagement***

In recent years, big data has fundamentally reshaped the corporate landscape, offering both significant opportunities and complex challenges. The use of big

data to enhance customer engagement—particularly in creating, maintaining, and deepening customer relationships—has emerged as a critical area of both academic research and managerial practice. Information and communication technologies provide organizations with substantial capabilities to capture, analyze, and disseminate large volumes of customer intelligence through advanced big data methodologies. These capabilities enable firms not only to extract value from customer engagement behaviors but also to develop dynamic competencies that sustain long-term value creation (Kunz et al., 2017).

Customer engagement has long been recognized as a key determinant of organizational performance. Many firms invest heavily in engagement strategies with the expectation of achieving positive financial outcomes; however, the effectiveness of such investments depends largely on the organization's ability to establish meaningful and productive relationships with its customers. Achieving this requires a comprehensive understanding of customer motivations, including the underlying reasons, contexts, and timing of engagement behaviors. These motivations are highly heterogeneous, suggesting that standardized approaches are unlikely to yield optimal results. For instance, customers may share information due to altruistic intentions, social responsibility, or personal incentives (Mazzarol et al., 2007). Furthermore, understanding individuals' inherent tendencies toward relationship formation is essential in designing effective engagement strategies (Hazan & Shaver, 1990).

Despite these opportunities, empirical evidence indicates that many organizations remain underprepared to fully leverage their data assets. DalleMule and Davenport (2017) report that less than half of structured data is actively utilized for decision-making, while less than 1% of unstructured data is analyzed. Additionally, issues related to data accessibility and governance persist, with a significant proportion of employees having inappropriate access to data, and data analysts spending a substantial amount of time on data preparation rather than analysis. These challenges highlight the need for improved data governance, cross-functional collaboration, and real-time decision-making capabilities. Accurately capturing and managing customer data provides significant strategic advantages, prompting organizations to seek innovative data aggregation solutions. As a result, CDM has become increasingly critical for enabling effective big data analytics.

CDM refers to the systematic process of collecting, organizing, and analyzing customer data to enhance customer acquisition, satisfaction, and retention, as well as to improve communication strategies, data quality, and revenue growth (Heger, 2020). From a strategic perspective, developing a reliable customer database is essential for several reasons. First, customer acquisition is inherently costly; therefore, a well-structured database enables firms to engage customers more efficiently without relying on ineffective mass advertising. Second, consistent with the Pareto principle, a significant proportion of sales is

often generated by a relatively small segment of loyal customers. By implementing personalized and value-driven engagement strategies, firms can cultivate long-term relationships and stimulate positive word-of-mouth behavior. Third, access to high-quality customer data facilitates more accurate market segmentation, enabling firms to identify consumption patterns and tailor communication strategies in real time. Finally, the customer journey has become increasingly complex, involving multiple touchpoints across both online and offline environments. A comprehensive analysis of these touchpoints allows organizations to optimize each stage of the customer journey, thereby improving overall sales performance (Luenendonk, 2020).

### **Research Methodology**

This study adopts an exploratory and conceptual research design by employing an integrative literature review approach. This method is selected because the primary objective is to synthesize fragmented knowledge on big data characteristics and customer data management into a coherent and actionable framework for enhancing business sales performance. An integrative review is particularly appropriate for emerging fields such as big data analytics, as it enables the critical evaluation of diverse theoretical perspectives while facilitating the development of novel conceptual insights. Unlike conventional empirical studies that are often constrained by specific geographical contexts and limited temporal scopes, this study adopts a broader analytical perspective by focusing on contemporary global business environments. The analysis primarily draws upon literature published over the last decade to ensure relevance to recent technological advancements and post-COVID-19 digital transformations.

The data sources for this study consist entirely of secondary documentary materials. Data collection was conducted through a systematic retrieval of peer-reviewed academic journal articles, scholarly books, and authoritative industry reports (e.g., McKinsey & Company) related to big data analytics, customer engagement, and sales strategy. The literature search was guided by specific keywords, including “customer data requirements,” “big data analytics,” “strategic decision-making,” and “CDM.” By prioritizing high-quality documentary sources rather than primary data from human informants, this study ensures a comprehensive, reliable, and objective synthesis of current technological capabilities and data management challenges faced by modern organizations. The collected literature was analyzed using thematic analysis and conceptual synthesis, involving the identification of recurring themes related to customer data collection and their categorization based on their strategic relevance to sales performance. The analytical framework is grounded in the five Vs of big data, which serve as a conceptual lens for evaluating how diverse data inputs can be transformed into actionable business value. Through this systematic thematic categorization, the study logically derives and structures four

core dimensions of customer data requirements: identity, quantitative, descriptive, and qualitative data.

## Results

### *Thematic Framework for Customer Data Requirements*

Aligning with the research objective to identify foundational customer data requirements for big data analytics, the findings of this literature synthesis are systematically categorized into four central themes: identity data, quantitative data, descriptive data, and qualitative data. The effective collection and integration of these data types enable organizations to transform raw data volume and variety into actionable business value (Hariri et al., 2019). From a theoretical perspective, this categorization operationalizes abstract big data dimensions into a structured framework that enhances analytical precision and supports strategic sales performance.

#### 1. Identity Data: Establishing the Foundational Profile

The initial step in customer data management involves collecting identity data to establish a unique and verifiable customer profile. This foundational layer provides essential information required to support direct and personalized communication. As presented in Table 1, identity data includes names, personal identifiers, addresses, and account preferences. From a theoretical standpoint, capturing identity data corresponds to the “Variety” characteristic of big data, as information is aggregated from diverse sources such as customized sign-up forms and e-commerce registrations. From a practical perspective, once customer identities are clearly established, organizations can tailor communication strategies to specific segments and stages of the sales process, thereby avoiding inefficiencies associated with fragmented and non-targeted advertising.

**Table 1**  
**Customer’s Identity Data**

Type of Identity Data	Examples	Data Collection Methods
<b>Name</b>	Title, first name, last name	<ul style="list-style-type: none"> <li>• Customized sign-up forms</li> <li>• Pre-purchase or checkout processes</li> <li>• E-commerce account registration</li> <li>• Loyalty and reward programs</li> </ul>
<b>Personal Information</b>	Identification number, passport number, date of birth, region, gender	
<b>Address</b>	Email address, home address, billing address	
<b>Telephone</b>	Home phone number, work phone number, mobile phone number	
<b>Social Media</b>	Facebook, Twitter, LinkedIn	
<b>Account Information</b>	User IDs, payment preferences	

Source: Adapted from Heger (2020) and Hariri et al. (2019).

Customers typically provide this type of data during transactional interactions, such as completing online purchases, subscribing to newsletters, or voluntarily exchanging information for products, services, or incentives. This practice is standard across organizations that maintain even basic customer information systems.

## 2. Quantitative Data: Tracking the Customer Journey

Once organizations establish individual customer identities, it becomes essential to track how customers interact with the business through quantifiable operational data. As illustrated in Table 2, quantitative data includes online and offline transactions, inbound and outbound communication metrics, and digital activity patterns. This category reflects the “Velocity” dimension of big data, as it is continuously generated throughout the customer journey—from initial awareness to final conversion. Consistent with prior research, analyzing these transactional processes is critical for identifying performance bottlenecks and enhancing sales efficiency (Luenendonk, 2020). In practice, these metrics enable organizations to refine channel-specific technologies and accurately measure marketing effectiveness.

**Table 2**  
**Customer’s Quantitative Data**

Type of Quantitative Data	Examples	Data Collection Methods
<b>Online/Offline Transactions</b>	Type of product/service purchased, transaction value, payment time, purchase preferences	<ul style="list-style-type: none"> <li>• Web analytics tools (e.g., Google Analytics)</li> <li>• Cookies and mouse-tracking heatmaps</li> <li>• Email tracking pixels</li> <li>• Transaction history records</li> <li>• Customer support interaction logs</li> <li>• Social media interactions</li> </ul>
<b>Inbound/Outbound Communication</b>	Date, time, communication channel, open rates, click-through rates	
<b>Online Activity</b>	Website visits, product views, account registrations	
<b>Social Media Activity</b>	Social handles, group participation, interactions, interests	
<b>Customer Service</b>	Complaint records, customer inquiries, call center or email communication	

Source: Adapted from Luenendonk (2020) and Heger (2020).

Quantitative data is utilized to gain deeper insights into how customers make decisions when interacting with businesses. For instance, it enables organizations to determine how customers discover a brand, which channels drive the highest conversions, and how engagement evolves across the purchasing process. By continuously monitoring these metrics, firms can identify

high-performing touchpoints and allocate resources more efficiently. Furthermore, integrating real-time data analytics allows organizations to transition from reactive performance tracking to proactive behavioral forecasting. Ultimately, mapping the velocity and volume of customer interactions ensures that marketing strategies remain agile, data-driven, and responsive to dynamic consumer behavior.

### 3. Descriptive Data: Enabling Predictive Analysis

Beyond identification and transactional tracking, descriptive data captures the broader demographic and socio-economic characteristics of customers. As outlined in Table 3, this includes variables such as family status, lifestyle, education, and career background. Collecting high-quality descriptive data often requires more sophisticated approaches, including in-depth surveys and focus group discussions. From a theoretical perspective, this type of data enables organizations to contextualize behavioral patterns and extract long-term value from customer engagement (Kunz et al., 2017). Consequently, firms can move toward predictive analytics, improving both the timing and precision of marketing strategies.

**Table 3**  
**Customer's Descriptive Data**

Type of Descriptive Data	Examples	Data Collection Methods
<b>Family</b>	Marital status, relationships, number of children	<ul style="list-style-type: none"> <li>• Open-ended interviews</li> </ul>
<b>Lifestyle</b>	Property ownership, vehicle ownership, pet ownership, hobbies, collections, interests	<ul style="list-style-type: none"> <li>• In-depth surveys and questionnaires</li> <li>• Behavioral observation</li> </ul>
<b>Education</b>	High school, college, advanced education	<ul style="list-style-type: none"> <li>• Focus group discussions</li> </ul>
<b>Career</b>	Job title, job description, income level, professional background	<ul style="list-style-type: none"> <li>• Advanced lead forms</li> </ul>

Source: Adapted from Kunz et al. (2017).

Obtaining high-quality descriptive data requires more advanced and creative data collection methods. Organizations often gather this information through in-depth surveys that explore seasonal purchasing patterns, payment behaviors, and the duration of customer lifecycle engagement. These demographic and lifestyle indicators provide essential context that cannot be captured by transactional data alone. By enriching identity profiles with descriptive attributes, firms can construct highly segmented customer personas that support precision-targeted marketing. As a result, organizations can reduce irrelevant outreach, increase conversion rates, and strengthen long-term customer loyalty.

#### 4. Qualitative Data: Understanding Customer Motivations

Finally, qualitative data provides critical insights into the underlying motivations, attitudes, and perceptions that drive customer behavior. As presented in Table 4, this includes attitudinal evaluations, motivational drivers, and subjective opinions. Understanding why customers behave in certain ways is essential, given the significant heterogeneity in consumer motivations—for example, individuals may share information due to altruistic intentions, social responsibility, or personal benefits (Mazzarol et al., 2007). Although collecting qualitative data is more time-consuming and resource-intensive, it offers a deeper and more comprehensive understanding of consumer behavior. From a theoretical standpoint, qualitative data strengthens the “veracity” dimension of big data by ensuring that analytical outputs reflect genuine customer sentiment.

**Table 4**  
**Customer’s Qualitative Data**

Type of Qualitative Data	Examples	Data Collection Methods
<b>Attitudinal</b>	Perceived value, ratings, feedback, repurchase intention	<ul style="list-style-type: none"> <li>• Industry-specific review platforms               <ul style="list-style-type: none"> <li>• Social listening tools</li> </ul> </li> <li>• Customized newsletter sign-up forms</li> <li>• Rating or preference systems</li> <li>• In-depth feedback collection</li> </ul>
<b>Motivational</b>	Purchase motivation, customer needs	
<b>Opinion</b>	Likes/dislikes, preferences	

Source: Adapted from Mazzarol et al. (2007).

Collecting qualitative data requires more extensive effort, as it involves capturing nuanced insights into customer behavior. This can be achieved through direct methods such as interviews and focus groups, as well as indirect approaches such as social media monitoring and customer feedback analysis. Within the broader analytical framework, qualitative data functions as an interpretive layer that complements quantitative metrics by explaining the underlying reasons behind observable behaviors. Advanced CDM systems must integrate these subjective insights to identify the root causes of customer satisfaction or churn, thereby bridging the gap between behavioral patterns and motivational drivers. Ultimately, incorporating these insights enables organizations to design more effective and contextually aligned sales strategies.

The integration of these four data categories carries significant implications for business sales performance. From a theoretical perspective, this framework extends the conventional “five Vs” model of big data (Hariri et al., 2019) into a domain-specific structure for CDM, demonstrating how abstract data characteristics can be operationalized into actionable business insights. From a practical standpoint, the findings indicate that reliance on basic spreadsheets or

early-stage Customer Relationship Management (CRM) systems is insufficient for developing a comprehensive Single Customer View (SCV). To maximize Customer Lifetime Value (CLV) (Kellet, 2020), organizations must adopt more advanced solutions such as Customer Data Platforms (CDPs), which integrate identity, quantitative, descriptive, and qualitative data across multiple sources. These platforms eliminate data silos and enable real-time, personalized, and omnichannel marketing strategies.

### ***Data Management Tool***

Manually maintaining data in Excel spreadsheets or similar applications may initially appear to be a cost-effective solution. However, as organizations expand, the volume and complexity of the data they collect increase significantly, often leading to inefficiencies in managing the large and sophisticated datasets characteristic of the contemporary big data environment. This not only limits the extraction of actionable insights but also undermines the organization's ability to achieve a sustainable competitive advantage. More critically, such reliance on basic tools may result in neglecting existing customers and their CLV in favor of continuously acquiring new ones (Kellet, 2020). Over time, businesses inevitably require more advanced systems capable of storing, tracking, and analyzing incoming data effectively. Therefore, investing in appropriate data management technologies from the outset is a strategically sound decision, as it helps prevent customer attrition, reputational damage, and operational inefficiencies. Among the available solutions, CRM, Data Management Platforms (DMP), and CDP represent the most prominent tools for managing customer data and enabling personalized marketing strategies (Heger, 2020).

#### **1. Customer Relationship Management (CRM)**

The CRM systems emerged in the 1990s as one of the earliest platforms for structured data aggregation. Their primary function is to collect and manage first-party data—particularly identity and quantitative data—rather than more complex descriptive and qualitative dimensions (Sowards, 2019). CRM systems offer several advantages, including enhanced customer engagement, improved service delivery, and more informed marketing strategies. They enable organizations to centralize customer interactions, automate marketing processes such as lead generation and reporting, and improve cross-departmental accessibility to structured data (Gaille, 2015). Furthermore, CRM platforms can integrate with third-party applications, thereby extending their analytical and operational capabilities (Stobierski, 2017).

CRM systems, however, exhibit notable limitations. They are not designed to capture data from anonymous users prior to conversion, making it difficult to construct a comprehensive SCV that integrates data from multiple channels, such as social media, digital advertising, and web behavioral data (Stobierski, 2017).

Additionally, CRM systems often lack real-time processing capabilities and may become increasingly complex and difficult to manage as customization increases (Heger, 2020). Consequently, while CRM systems are effective for managing existing customer relationships, they are less suitable for holistic and dynamic data integration in modern big data environments.

## 2. Data Management Platform (DMP)

With the expansion of digital tracking technologies in the early 2000s, DMPs emerged as tools designed primarily for marketers to plan and execute targeted media campaigns. Unlike CRM systems, DMPs focus on aggregating second- and third-party data—often through cookies and other tracking mechanisms—to create anonymized user profiles (Matuszewska, 2018). This enables organizations to segment audiences and deliver personalized advertising content based on behavioral patterns. Despite these advantages, DMPs have several inherent limitations. Their reliance on anonymous data restricts precise customer identification and limits their ability to generate a unified customer profile. Furthermore, DMP data is inherently temporary, often constrained by the short lifespan of cookies (typically around 90 days), and its effectiveness has been further reduced by regulatory frameworks such as data protection laws. Integration with existing organizational systems can also be technically complex, requiring specialized expertise and presenting a steep learning curve for users (Heger, 2020). As a result, DMPs are less effective for long-term customer relationship management and comprehensive data integration.

## 3. Customer Data Platform (CDP)

As the big data movement has gained momentum, the volume of data has expanded significantly, creating a growing demand for flexible and scalable solutions capable of supporting enhanced customer experiences and omnichannel marketing strategies. The CDP, as the most recent development among aggregated data systems, is designed to seamlessly integrate with existing data infrastructures by consolidating first-, second-, and third-party data, as well as offline and unstructured data, into a unified system. While both CRM and DMP systems enable customer segmentation, the fundamental advantage of CDPs lies in their ability to centralize all customer data within an organization, regardless of the channel or device through which the data is generated. This approach shifts the analytical focus from channel-based data collection to a customer-centric data architecture. Consequently, the greater the diversity and volume of data sources available, the more robust and effective the CDP becomes (Early, 2018).

A CDP functions as the central infrastructure for constructing a comprehensive SCV. It enables real-time data processing and supports immediate actions throughout the customer journey, including personalized recommendations, audience activation, and cross-selling or up-selling

opportunities. This level of flexibility can be applied across multiple channels and strategic objectives, resulting in more effective and actionable marketing initiatives. Furthermore, CDPs are designed with usability in mind, allowing marketing professionals—not solely IT specialists—to utilize data insights efficiently. Their integrated, all-in-one architecture facilitates seamless compatibility with existing organizational systems, eliminating the need for complex interconnections across multiple platforms. By consolidating diverse data sources into a unified repository, CDPs enhance cross-departmental communication and ensure a consistent and integrated customer experience across all touchpoints (Matuszewska, 2018; Heger, 2020).

Despite these advantages, CDPs are not without limitations. Their effectiveness is highly dependent on the availability and quality of first-party data, meaning that organizations must actively invest in data collection initiatives. While such data is more accurate and personalized, firms may encounter constraints if sufficient data cannot be gathered to support large-scale marketing strategies. Additionally, compared to DMPs, CDPs may face limitations in incorporating broader external datasets, particularly second- and third-party data, into marketing operations. This constraint may reduce their flexibility in certain contexts where external data integration is critical (Heger, 2020).

## **Discussion**

This study aims to identify the foundational customer data requirements necessary for leveraging big data analytics to enhance strategic decision-making and improve business sales performance. The findings systematically classify these requirements into four essential pillars: identity, quantitative, descriptive, and qualitative data. In line with the research objective, the results demonstrate that organizations cannot rely solely on capturing vast volumes of digital information; rather, they must strategically structure their data acquisition processes to construct a comprehensive and integrated view of the customer. By operationalizing these four dimensions, firms can transition from managing fragmented and polymorphic datasets to implementing precise, data-driven sales strategies that minimize inefficiencies associated with uncoordinated and non-targeted marketing efforts.

These findings both align with and extend prior empirical research emphasizing the strategic importance of big data capabilities. While Ehsani and Hosseini (2025) demonstrate that B2C marketplaces achieve refined consumer segmentation through spatial and temporal dimensions, the present study systematically incorporates these elements within the broader constructs of descriptive and quantitative data. Similarly, Wang et al. (2025) highlight the necessity of continuous data integration within complex business ecosystems; however, this study advances the literature by offering a structured categorical

framework that operationalizes such integration. Importantly, the applicability of this framework extends beyond conventional commercial contexts. Studies by Ridzuan et al. (2025) and Nugroho and Al-Giffari (2026) underscore that optimizing institutional and philanthropic systems—such as zakat management—also requires sophisticated data infrastructures. In this regard, the present findings reinforce that both commercial and non-commercial organizations depend on a balanced integration of operational metrics and behavioral insights, thereby substantiating Mazzarol et al.'s (2007) argument that generalized analytical approaches are inherently inadequate.

From a theoretical perspective, this study contributes to the advancement of big data literature by translating the abstract “five Vs” framework into a domain-specific and operational model for CDM. Rather than treating data “variety” merely as a technical storage challenge, the proposed framework redefines it as a structured set of functional data categories—identity, quantitative, descriptive, and qualitative—each with distinct analytical value. This directly addresses the gap identified by Tetteh et al. (2025), who emphasize the need for more granular big data analytics capabilities to support business model innovation. Furthermore, by positioning qualitative data as a core component, this study strengthens the conceptual linkage between “veracity” and “value,” ensuring that data-driven insights are not only statistically robust but also contextually meaningful.

From a practical perspective, the findings suggest a critical paradigm shift in how organizations design and implement data management infrastructures. Reliance on manual spreadsheets or early-generation CRM systems is insufficient for capturing the complexity and real-time dynamics of modern customer data ecosystems. To develop a comprehensive SCV and maximize CLV, organizations must adopt more advanced and integrated solutions, such as CDPs. These platforms consolidate diverse data streams, eliminate organizational silos, and enable real-time, personalized, and omnichannel marketing strategies. However, as organizations implement these advanced architectures to capture deeper customer insights, they must also prioritize transparent and accountable data governance. As emphasized by Musika and Suhadi (2025), ensuring legal certainty and stakeholder protection is essential to maintaining institutional legitimacy and consumer trust in increasingly data-driven environments.

## **Conclusion**

This study establishes a conceptual framework for customer data requirements in big data analytics aimed at improving business sales performance. The findings demonstrate that, in the context of rapidly expanding digital data, effective data utilization depends not on the volume of data collected but on its systematic structuring. Specifically, organizations must categorize customer data into four key dimensions—identity, quantitative, descriptive, and qualitative—to enable

the development of comprehensive customer profiles, enhance segmentation accuracy, and support personalized, data-driven communication strategies. By translating the abstract “five Vs” of big data into actionable analytical domains, this study contributes to the literature by offering a structured, domain-specific Customer Data Management (CDM) framework for sales optimization.

From a practical perspective, the findings highlight that the strategic value of data is contingent upon effective management and integration. To build a comprehensive Single Customer View (SCV) and maximize Customer Lifetime Value (CLV), organizations must move beyond basic tools such as spreadsheets and early-generation Customer Relationship Management (CRM) systems and adopt advanced solutions such as Customer Data Platforms (CDPs). However, this study is limited by its conceptual nature, as it relies on an integrative literature review without empirical validation. Additionally, the rapid pace of data growth continues to challenge organizational Information Technology (IT) capabilities and workforce readiness. Future research should therefore focus on empirically testing the proposed framework across industries, examining the implementation of CDPs in real-world contexts, and exploring how employee competencies in big data analytics influence overall sales performance.

### **Generative AI Usage Statement**

During the preparation of this manuscript, the author utilized Google Gemini to assist with language editing, grammar checking, and structural formatting to ensure compliance with the journal’s submission and revision guidelines. Following the use of this service, the author thoroughly reviewed and edited all outputs under strict human supervision. The use of this generative AI tool was strictly limited to supportive functions and was not employed to generate scholarly arguments, literature reviews, data, data analysis, or conclusions. The author retains full and ultimate responsibility for the originality, accuracy, argumentation, citations, and ethical integrity of this manuscript. No AI tools have been credited as authors or contributors to this work.

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