

# DEMYSTIFYING THE DATA LAYER

FEBRUARY 2024



## THE TRANSFORMATION OF MARKETING DATA INFRASTRUCTURE



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## ACKNOWLEDGMENTS

This report would not have been possible without the significant contributions of the hundreds of marketing industry leaders who contributed their time and insights in support of this research. To all of them, we say thank you.

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This research's purpose is to provide insight into the rapidly evolving and increasingly complex "data layer" of the marketing and advertising technology ecosystem, with a specific focus on the trends and dynamics shaping the state of data infrastructure investment, how it is currently undergoing transformation and its trajectory for the future.

In the process of developing this paper, Winterberry Group surveyed 200 senior marketing, data, analytics and technology thought leaders across the US, UK, France and Germany and conducted in-depth interviews with over 50 industry experts and influencers across the supply chain of data management and identity solutions.

The result is an evidence-based examination of the current state and emerging trends within the evolving brand data layer architecture. This research sheds light on how brands are navigating challenges and opportunities across data management, integration, privacy, and talent, and provides valuable insights into the future direction of marketing and advertising technology.

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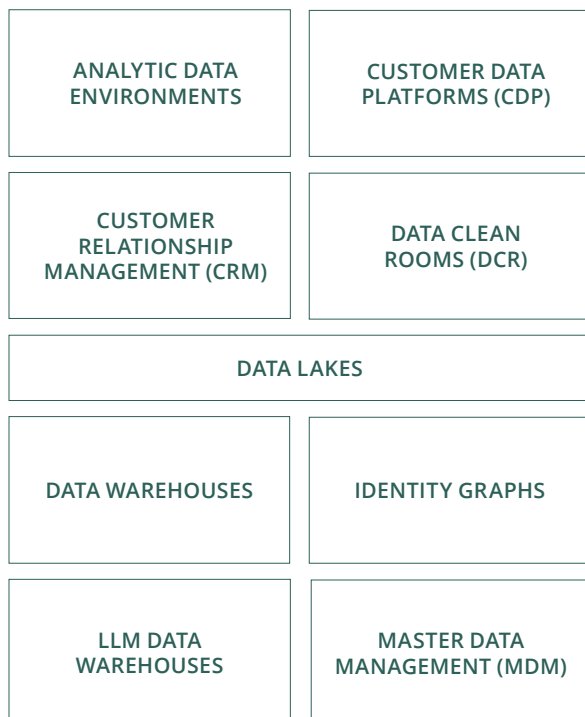
## EXECUTIVE SUMMARY

In a period defined by increasing privacy regulation, a rapid shift toward digital-centric performance media consumption, and the evolution of technology driven by machine learning and generative AI, the marketing and advertising technology solution stack is undergoing a profound transformation. Central to this transformation is the imperative of establishing a robust data foundation, or data layer, correctly integrated with an architecture designed to enable a myriad of data-driven use cases that represent marketers' diverse needs for insights, activation, optimization and measurement.

Winterberry Group has segmented the marketing and advertising technology ecosystem into three interrelated layers: **data**, **intelligence** and **activation**. These layers provide a holistic way to view and architect the access to and movement of data across various solutions, channels and customer touchpoints.

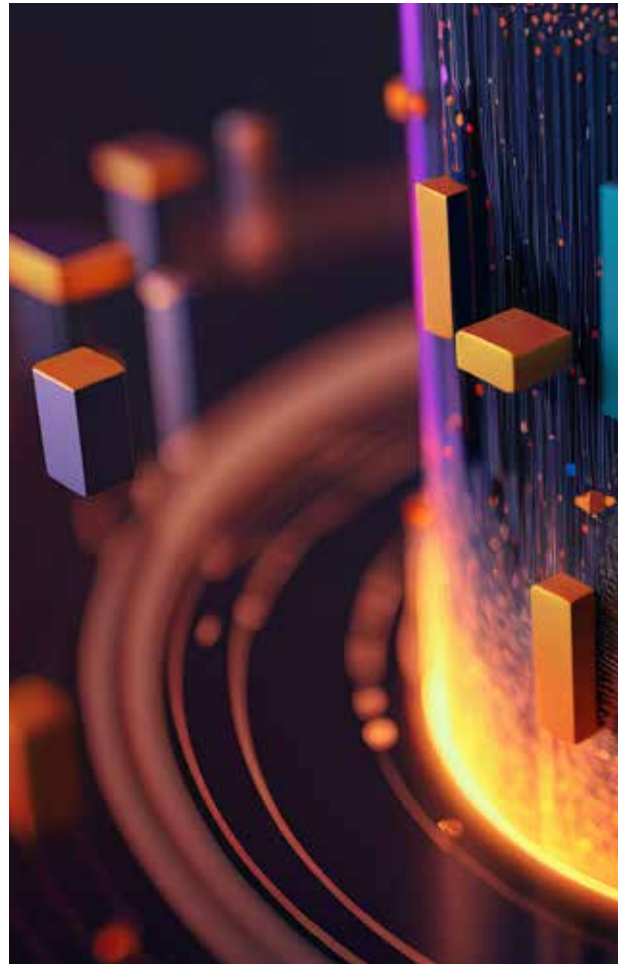
- **Data Layer:** Data is ingested, consolidated, and standardized for analysis and activation
- **Intelligence Layer:** Data is leveraged to derive insights and inform decisioning related use cases
- **Activation Layer:** Applications and platforms are used to communicate across outbound and inbound channels

The data layer is a foundational element of the marketing and advertising technology ecosystem that encompasses the ingestion, storage, processing, and activation of customer data across platforms and channels. At its core are nine critical solutions which underpin the management, analysis, and activation of vast volumes of first-, second-, and third-party data. These core solutions are:



Many brands are transitioning from integrated marketing suites to composable stacks comprising best-in-class data solutions, recognizing that no single solution component can adequately serve the needs of adtech and martech. This strategic shift underscores the necessity for enhanced agility and adaptability in response to evolving market conditions and consumer preferences. Key elements of this transition include:

**A shift towards cloud-based environments**, offering unparalleled scalability, flexibility, and aspects of cost-efficiency. Hybrid hosting approaches, combining on-premises and cloud environments, are gaining traction, enabling optimized performance while ensuring robust data security and privacy measures.



**The design and establishment of persistent first-party identity graphs** to seamlessly link proprietary PII data with third-party assets, enriching customer insights and personalization capabilities.

**The evolution of Customer Data Platforms (CDPs) from “systems of record” to unified intelligence and data management platforms** capable of integrating persistent and rapidly changing, non-persistent identifiers for real-time decisioning, orchestration and personalization.

**Growing demand for Data Clean Rooms (DCRs) to enable collaboration within and across brands and media owners, including publishers and retailers, for targeted planning, analysis and measurement.** As the market seeks to limit the movement of proprietary data outside of private environments, Data Clean Rooms emerge as preferred platforms for secure data collaboration across organizational boundaries.

**Addressing challenges in content and audience data adoption and integration, particularly structured and unstructured data residing in digital asset and content management platforms.** These efforts support the development of Large Language Models (LLMs) within the intelligence layer, enhancing data-driven insights and decision-making processes.

To achieve success, brands must adopt a holistic approach and prioritize their use cases, navigating a vast array of solutions

and providers while addressing data silos, quality and security. This requires defining strategies for:

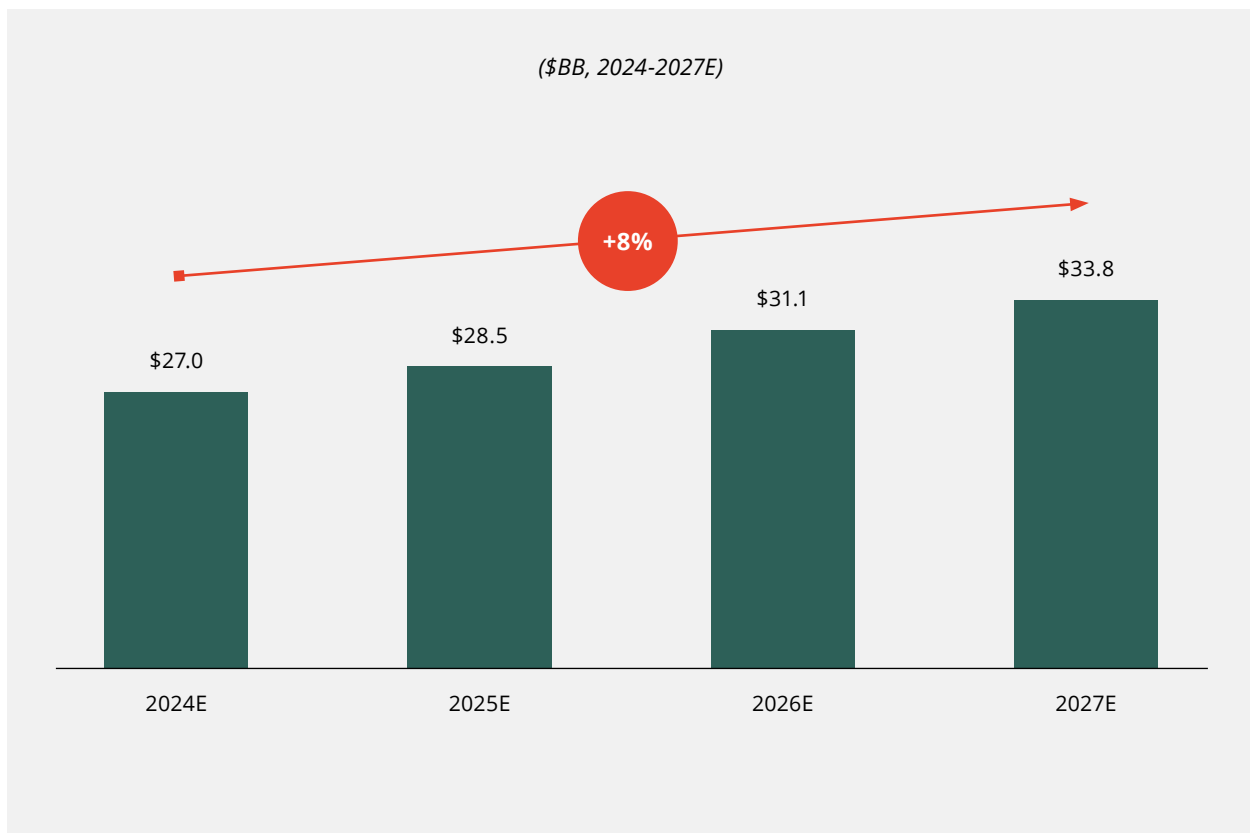
**Establishing responsibility and accountability within the organization**, potentially by elevating the role of marketing operations/marketing technology to coordinate with data, marketing strategy, IT and compliance.

**Implementing a hybrid integration process**, combining internal leadership with external support from marketing services partners who navigate diverse technology solutions, build microservices and APIs, and ensure best-in-class data governance; and

**Identifying and nurturing the talent and skills** necessary to manage the data layer effectively, prioritize use cases, maximize effectiveness (which surpasses efficiency), and manage the total cost of ownership of the solution architecture.

In response to the critical need for a privacy-compliant, secure and actionable data layer, investment in data, data services and data technology is forecast to grow from \$27.0 billion in 2024 to \$33.8 billion by 2027, reflecting a commitment to leveraging data as a strategic asset for driving business growth and enhancing customer experiences. As organizations adapt to these shifts, the journey toward architecting an effective data layer remains pivotal in shaping the future of marketing and advertising.

**FIGURE 1 – FORECASTED SPEND ON DATA, DATA SERVICES AND DATA TECHNOLOGY**



Source: Winterberry Group Spend Estimates (2024)

## INTRODUCTION

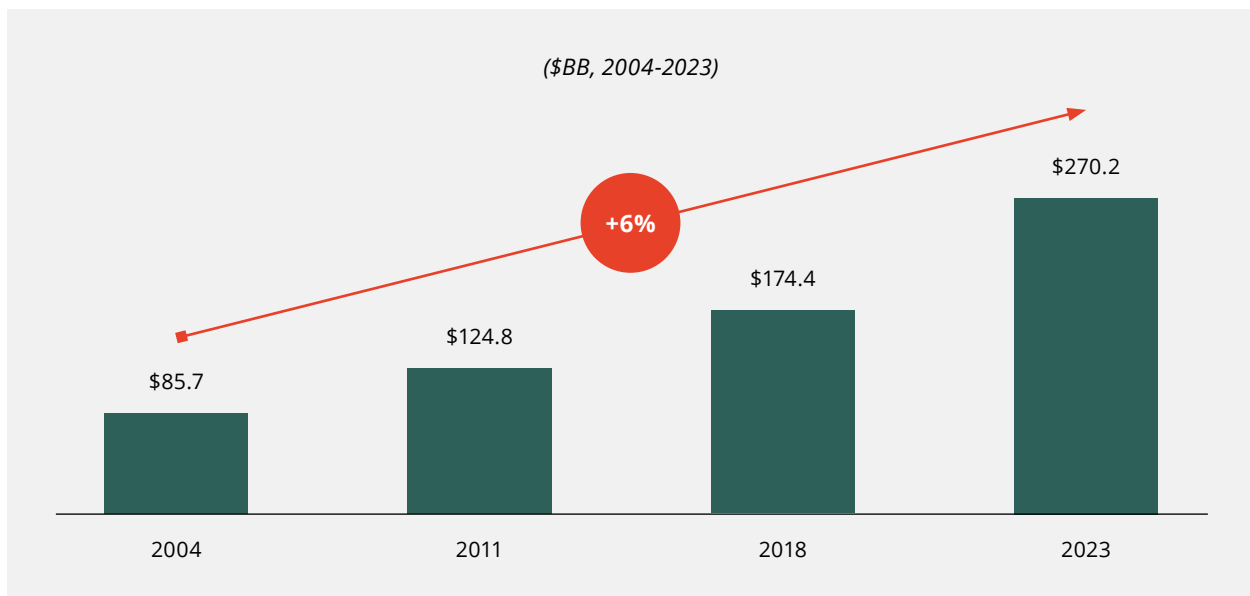
Database management has long served as a foundational capability for marketing and advertising organizations, evolving in lockstep with growing complexity induced by digital transformation. Initially designed to support a narrow range of traditional channels, the systems designed to support data ingestion, storage, and governance now extend across a wide spectrum of platforms encompassing paid, owned, and earned media.

The exponential growth in data-driven advertising spend in the US, from \$85.7 billion of Direct Mail and Direct Response TV spend in 2004 to \$270.2 billion in spend across myriad channels including connected TV, paid social and video in 2023, reinforces the critical role of data infrastructure in business operations and strategy.

As market spend and focus has expanded, the infrastructure required to support the current state has evolved significantly, with data infrastructure and the marketing technology ecosystem reaching a pivotal juncture in its evolution. This moment represents one of the few true inflection points in the industry since the rise of digital media, fundamentally transforming how organizations extract consumer insights, optimize campaigns, and personalize customer journeys at scale.



**FIGURE 2 - EVOLUTION OF US MEDIA SPEND ON DATA-DRIVEN CHANNELS**



Source: Winterberry Group Spend Estimates (2024)



## THE DEFINING ERAS FOR MARKETING DATA AND TECHNOLOGY

Marketers have embarked on a decades-long journey, experimenting with various approaches to better understand their customers by consolidating data into centralized repositories and making it accessible. This evolution can be delineated through distinct eras:



### DIRECT ERA 1980-2000

- **How Data was Used:** Data brokers emerge selling/ licensing mailing lists and third-party “household” data; Customer data centered on name, postal address accuracy, and other demographic, transactional, and modeled attributes
- **Channels:** Direct Mail, Direct Response TV, Telemarketing
- **How Data was Managed:** Data is stored in marketing databases using a combination of SQL, Unix (Oracle), DB2



### ECRM ERA 2000-2010

- **How Data was Used:** Digital era begins, resulting in a significant upswing in data volume, accompanied by the emergence of the “quid pro quo” model, where exchanging data becomes intrinsic to accessing free content
- **Channels:** Email and Direct Mail
- **How Data was Managed:** CRMs, Customer Data Integration (CDI) are leveraged to track relationships and resolve identities



### DIGITAL DATA ERA 2010-2018

- **How Data was Used:** Embark on the transition to a digital first world and begin to see the acceleration of cookie-based targeting driven by the growth of programmatic advertising across paid social, display and mobile
- **Channels:** Paid Social, Display, Video
- **How Data was Managed:** Vast amounts of data are collected and managed across Data Management Platforms (DMPs), Email Service Providers (ESPs), data warehouses and lakes. Identity resolution emerges as a requirement for activation



### OMNICHANNEL ERA 2018-PRESENT

- **How Data is Used:** Increased focus on customer experience and “always on” marketing across channels establishes the need for cross-channel identity and device matching
- **Channels:** Paid Social, Display, Video, CTV
- **How Data is Managed:** A combination of first-party data, first- and third-party cookies, and IP addresses are leveraged on identity graphs for personalization in a device-driven era. Speed of data, cross-channel identity, and device matching drive adoption of CDPs as systems of record

## MACRO FORCES DRIVING TRANSFORMATION

Change is an ongoing reality that continues to shape the trajectory of the industry. Since the onset of the omnichannel era, significant macro-level forces have converged, sweeping through the marketing landscape and reshaping the strategies and approaches of marketers and media owners.

Consumer behavior has undergone significant change, accelerated by the shift towards digital media consumption, such as streaming video, and the adoption of hybrid work-from-home and workplace models catalyzed by the COVID-19 pandemic. This transformation has been further propelled by the “hybridization” of buying patterns, blurring the lines between offline and online commerce and fueling the exponential growth of e-commerce. Simultaneously, there has been an increasing demand for seamless and consistent experiences across both physical and digital touchpoints, compelling brands to adapt their strategies to meet the evolving expectations of consumers.

In parallel with shifts in consumer behavior, the privacy and regulatory landscapes have experienced seismic shifts. Landmark regulations such as GDPR in Europe and CCPA (now CPRA) in California have set a precedent for more comprehensive privacy measures. New laws have now been instituted across 9 individual US states, with additional restrictions from sensitive data privacy policies including HIPAA, COPPA and VPPA. This complex patchwork - expected to broaden to over 20 distinct state and

“

In the late '90s and 2000s, the focus shifted to database marketing, emphasizing customer data analysis. Campaign management tools led to data silos, prompting the need for consolidation. Concepts like data warehousing and batch processing emerged, but the demand for faster data grew with the appearance of new channels. Clouds allowed data hoarding, yet questions about its use persisted. Unstructured data and data lakes added complexity, demanding cleaning and transfer processes. The quest for a single source of truth gave rise to Customer Data Platforms (CDPs). Concurrently, various vendors explored CDP territory, contributing to the current scenario where many embrace CDPs without a clear understanding of their use cases.

”

- EVP of Digital,  
Marketing Services and AdTech Provider

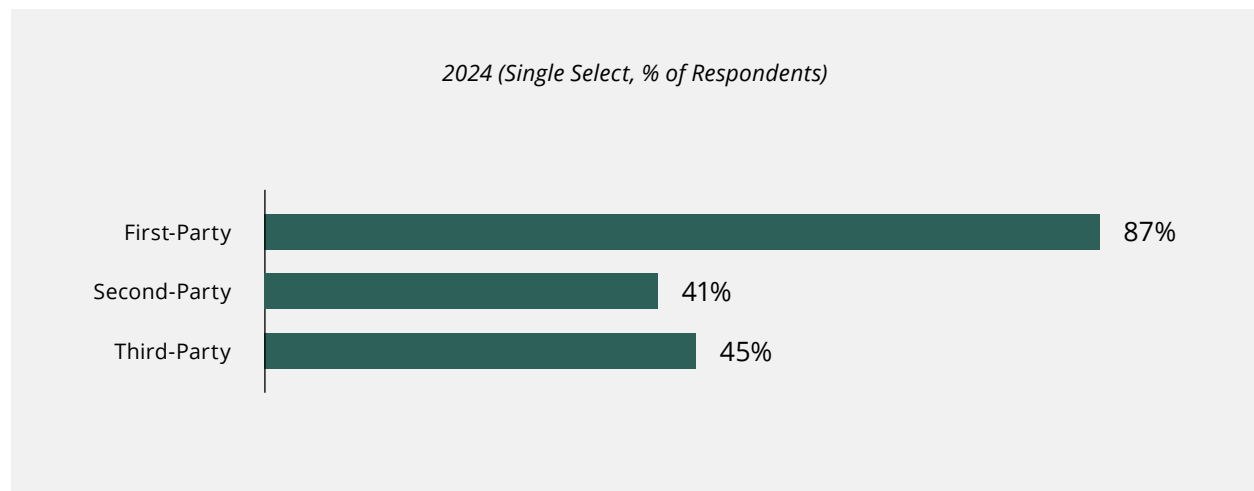
industry regulations by 2025 - has heightened compliance obligations for organizations.

Simultaneously, tech giants have taken significant steps to limit tracking in response to privacy concerns, including Apple's App Tracking Transparency (ATT) and Google's gradual deprecation of third-party cookies. Collectively, these actions signal a broader prioritization of user privacy and data protection, prompting a fundamental rethinking of data compliance and management practices. New consent obligations have introduced fluid requirements around permissible data sources, segmentation

logic, and activation channel use cases, necessitating careful navigation when constructing compliant yet flexible data architectures capable of supporting business needs in an ever-evolving privacy landscape.

In response to these dynamic shifts, marketers and media owners are adjusting their strategies, placing greater emphasis on the collection, management and privacy-centric sharing of first-party data to drive enhanced customer insights, measurement, activation, and optimization.

**FIGURE 3 – WHICH OF THE FOLLOWING TYPES OF DATA ARE YOU LEVERAGING?**



Source: Winterberry Group Data Layer White Paper Survey N=200

- **First-Party Data:** Data that an entity (brand or media owner) has collected with permission from the consumer. The permissions determine the rights of the entity for the use of the data. Most often the data may be collected in person, on owned websites and apps.
- **Second-Party Data:** First-party data that is shared in a dedicated environment with a clearly defined set of permissions and rights set between each of the parties and, most often, the technology provider managing the environment.
- **Third-Party Data:** Any information or data collected, purchased or licensed by an entity that does not have a direct relationship with the end user or data subject that the data is being collected upon. Third-party data is primarily collected from a range of publicly available offline sources, websites and mobile devices, built through analytical models and through the licensing of first- and/or second-party assets.



Accompanying this shift is the migration of advertising spend away from traditional channels toward digital mediums, leading to an expansion in the number of media channels leveraged by marketers. This change has occurred in tandem with a reprioritization of channels – moving toward a blend that requires more robust data support and prompting greater investment in data infrastructure and technology to facilitate personalized engagement, connected experiences and enabling more sophisticated measurement and analytics capabilities.

However, as channels continue to expand, marketers face the challenge of architecting a data infrastructure to support this diverse mix in a privacy-first, secure, effective and increasingly cost-efficient manner. In today's dynamic landscape, data management needs to transcend individual channels, operating at a foundational level to enable seamless activation and measurement across across paid, earned and owned media. As a result, marketers are focusing on standardizing data to gain a comprehensive view across all touchpoints and drive campaigns effectively across data-driven channels.

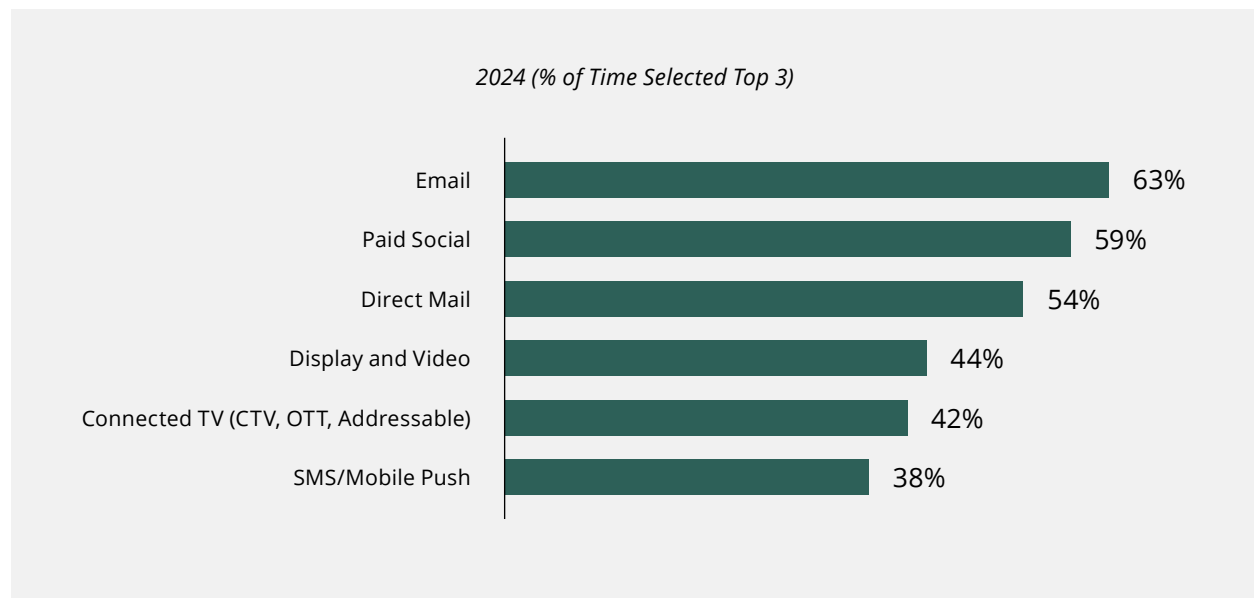
Advancements in technology have also played a pivotal role in the transformation of this landscape, with the rise of cloud-based solutions revolutionizing data storage, processing, and collaboration. The widespread adoption of machine learning and the recent introduction and adoption of Generative AI underscore the industry's growing reliance on advanced technologies that leverage data and are used to derive insights. Furthermore, the ongoing evolution of identity solutions, transitioning from cookie-based to first-party and alternative identifier-based models, reflects a concerted effort within the industry to minimize data movement while prioritizing privacy compliance, security, and processing speed.

Collectively, these forces are driving brands to increase their investments in data infrastructure and services, recognizing the imperative to adapt to the rapidly changing marketing landscape to remain competitive and responsive to shifting consumer demands and regulatory requirements.

The question and the opportunity lie in developing a scalable, modular data infrastructure that supports both the current data-driven marketing and advertising use cases while offering flexibility to adapt as use cases and technology evolve.

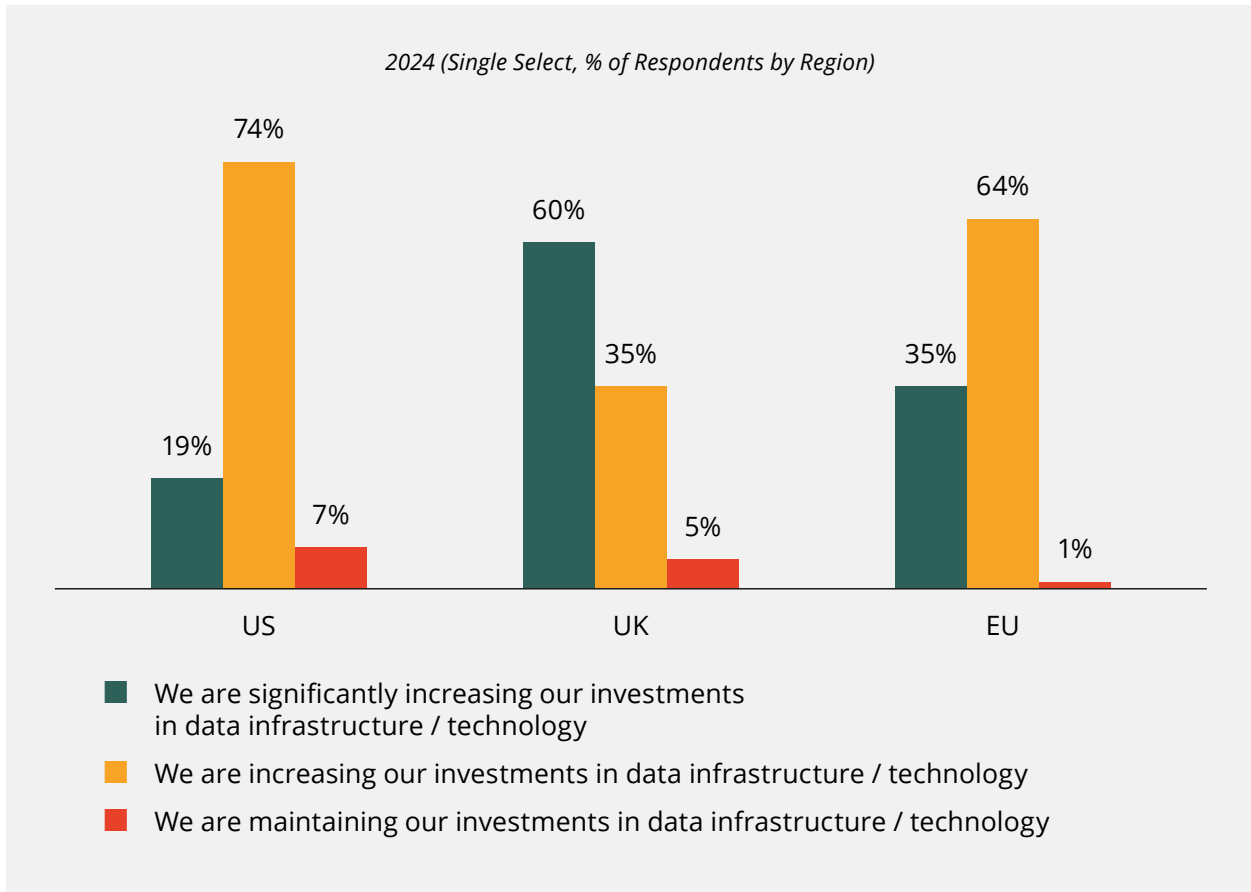


**FIGURE 4 – TOP CHANNELS DATA HAS BEEN LEVERAGED TO SUPPORT OVER THE PAST 1-3 YEARS**



Source: Winterberry Group Data Layer White Paper Survey N=200

**FIGURE 5 – IS YOUR ORGANIZATION INCREASING, MAINTAINING OR DECREASING INVESTMENT IN DATA INFRASTRUCTURE AND TECHNOLOGY?**



Source: Winterberry Group Data Layer White Paper Survey N=200



“ Data is where the value is. Technology is enabling and reporting can measure it but people are beginning to accept that data is the most important place to spend their time. Because of that, data infrastructure has been an investment priority. ”

- CEO, Data and Data Solutions Provider

“ Over the last 24 months, we’ve seen systemic evolution around data and data infrastructure. Brands have demonstrated growing motivation to control data and bring data infrastructure in-house. ”

- CEO, Data Solution Provider

## DEFINING THE ARCHITECTURE NEEDED TO SUPPORT MARKETING TRANSFORMATION

To simplify a complex solution stack composed of thousands of tools from hundreds of providers, Winterberry Group has categorized the marketing and advertising technology ecosystem into three interrelated layers: *data*, *intelligence* and *activation*. These layers provide a holistic way to view and architect the access to and movement of data across various solutions, channels and customer touchpoints.

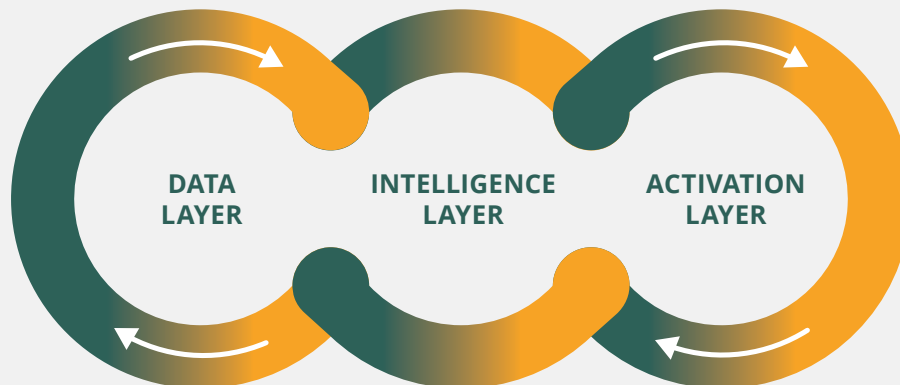
- **Data Layer:** Data is ingested, consolidated, and standardized for analysis and activation
- **Intelligence Layer:** Data is leveraged to derive insights and inform decisioning related use cases
- **Activation Layer:** Applications and platforms are used to communicate across outbound and inbound channels

As we assess the current market landscape, it's evident that the data layer has advanced to a stage characterized by substantial data volume and considerable solution complexity.

In evaluating the technologies underpinning data management, brand marketers, service providers, media owners and their internal and external data and technology partners must navigate and prioritize investments in technology, processes and infrastructure to support the expansion of marketing use cases. In today's customer-centric environment, the data layer assumes a crucial enabling role, necessitating thorough examination and strategic planning to ensure success.



FIGURE 6 –THE DATA-DRIVEN TECHNOLOGY ECOSYSTEM



At the data layer, **customer and prospect data is ingested, consolidated and standardized** with the end goal of using the data for analysis and activation

At the intelligence layer, **marketers and advertisers leverage customer profiles** to drive insights, gain audience intelligence and inform a range of marketing and advertising decisioning-related use cases

At the activation layer, **marketers and advertisers use applications and platforms** to communicate across outbound (email, display or Advanced TV) and inbound (website, app, or customer service) channels

Source: Winterberry Group (2024)

## DEFINING THE COMPONENTS OF THE DATA LAYER

### SOLUTIONS THAT COMPRISE THE DATA LAYER

The *data layer* comprises a complex array of interconnected platform solutions that serve critical functions in managing, analyzing and activating customer data. These nine solutions, excluding the data and identity services facilitating data movement within and between components of the data, intelligence and activation layers, represent the cornerstone solutions within the data layer.

Solution	Definition	What's it for
<b>Master Data Management (MDM)</b>	Centralized system designed to define and consolidate critical shared data entities across systems through data integration	Ensure data consistency and accuracy across systems and applications by providing a reliable single source of truth
<b>Data Lake</b>	Central scalable repository optimized for ingesting and storing structured and unstructured data	Store raw, unprocessed data from diverse sources at scale, enabling retention of large volumes of varied data
<b>Data Warehouse</b>	Repository organizing core transactional and attribute data into integrated schemas optimized for analysis	Store and analyze structured data from multiple sources to empower decision-making and reporting
<b>Identity Graph</b>	Graph that links multiple identifiers connected to the same individual, household or entity, providing a unified view or "profile" of the customer.	Create a consistent understanding of customers, their behavior and preferences by providing a unified view of people and household identities across solutions channels. <i>(Note: Most often stored in a data warehouse, CDP or provided as a 3rd party service)</i>
<b>Customer Data Platform (CDP)</b>	Secure data environment enabling insights, planning and scheduling of actions from data	Build comprehensive customer profiles by leveraging customer data and behavioral data and activate across channels to deliver personalization at scale
<b>Customer Relationship Management Platform (CRM)</b>	System managing customer data, interactions, and relationships across functions like marketing, sales, and service	Centralize customer data to track interactions, manage leads and opportunities, and nurture relationships
<b>Data Clean Room</b>	Collaborative, privacy-centric, secure environment for analyzing and processing permissioned data without exposing individual-level information	Derive aggregate insights from multiple data sets while ensuring compliance with each party's privacy regulations
<b>Analytics Data Environment</b>	Infrastructure and tools enabling collection, storage, processing and analysis of data for analytics use cases	Empower data scientists and analysts to explore data, build models, and generate insights to drive business outcomes
<b>LLM Data Warehouse</b>	Specialized data warehouse designed for high-velocity data at internet scale	Store and analyze massive volumes of fast-moving data from digital platforms and internet-scale applications

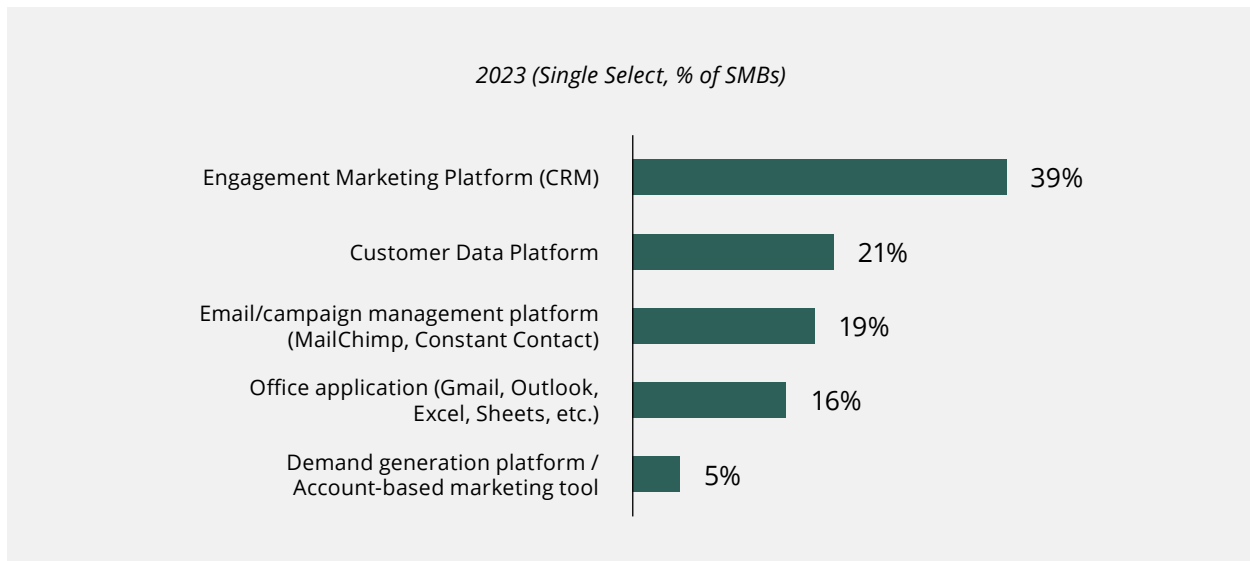
## HOW BRANDS ARE ASSEMBLING THE STACK

Brands are undergoing a significant shift in their approach to data management, moving away from traditional integrated marketing suites toward composable stacks comprising best-in-class solutions. This change is being driven by the surge in campaign volumes, the proliferation and diversification of use cases, and a strategic redirection of marketing spend in the US toward data-driven channels. With consumer engagement evolving rapidly, brands recognize the need for agile, tailored marketing strategies capable of adapting to dynamic market conditions.

The expanding set of solutions within the data layer is prompting brands to adopt hybrid architectures, blending the strengths of centralized platforms with specialized best-in-class solutions.

Comparing the strategies of SMB and mid-market brands against upper-mid market and enterprise brands in their approach to assembling the data layer illustrates this transition. SMBs, constrained by smaller marketing budgets and primarily focused on customer acquisition, prioritize cost-effective and easy-to-use solutions like Customer Relationship Management (CRM) systems and Customer Data Platforms (CDPs).

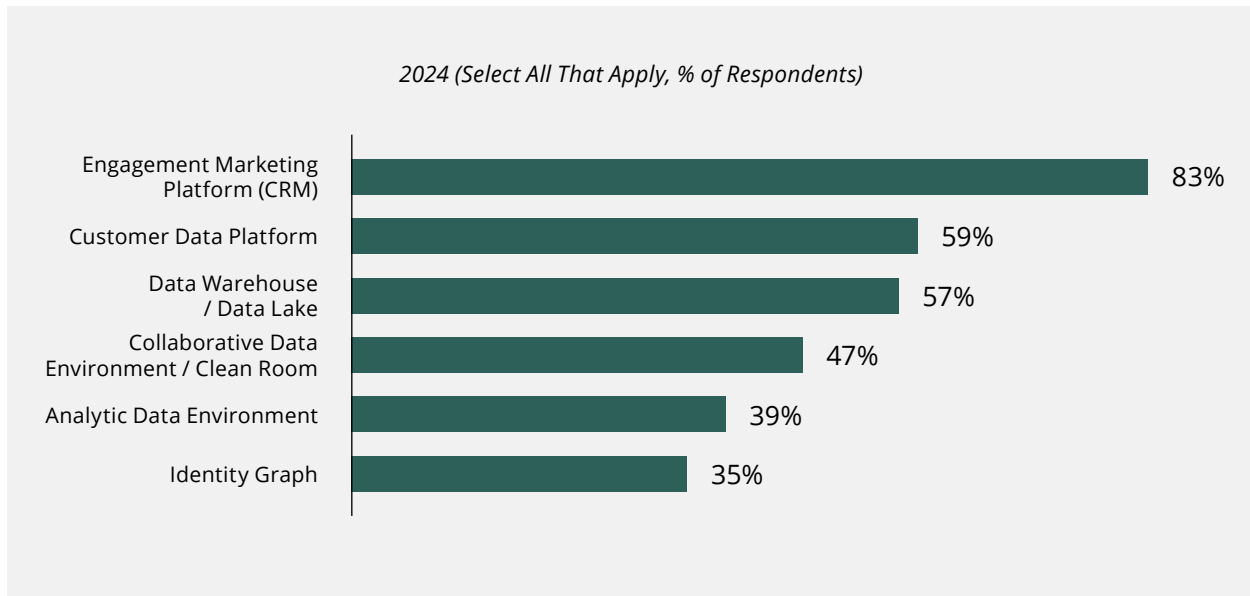
**FIGURE 7 - WHICH OF THE FOLLOWING SOLUTIONS DO YOU RELY ON TO STORE, MANAGE AND ANALYZE DATA? (SMB ONLY)**



Source: Winterberry Group Marketing/Sales Data Survey N=301 (2023)



**FIGURE 8 – WHICH OF THE FOLLOWING SOLUTIONS DO YOU RELY ON TO STORE, MANAGE AND ANALYZE YOUR DATA?**



Source: Winterberry Group Data Layer White Paper Survey N=200

In contrast, upper-mid market and enterprise brands leverage advanced analytics to support insights, engagement, and optimization, relying on a broader range of solutions such as identity graphs, clean rooms, and analytical environments.

Geographic differences across the US, UK and Europe further accentuate this trend. In the US, 22% of brands leverage a composable solution stack composed of best-in-class solutions, realizing the advantages of a more flexible ecosystem. Meanwhile, 37% opt for a hybrid approach combining best-in-class solutions with integrated marketing cloud platforms, with 41% still relying solely on integrated marketing cloud platforms.

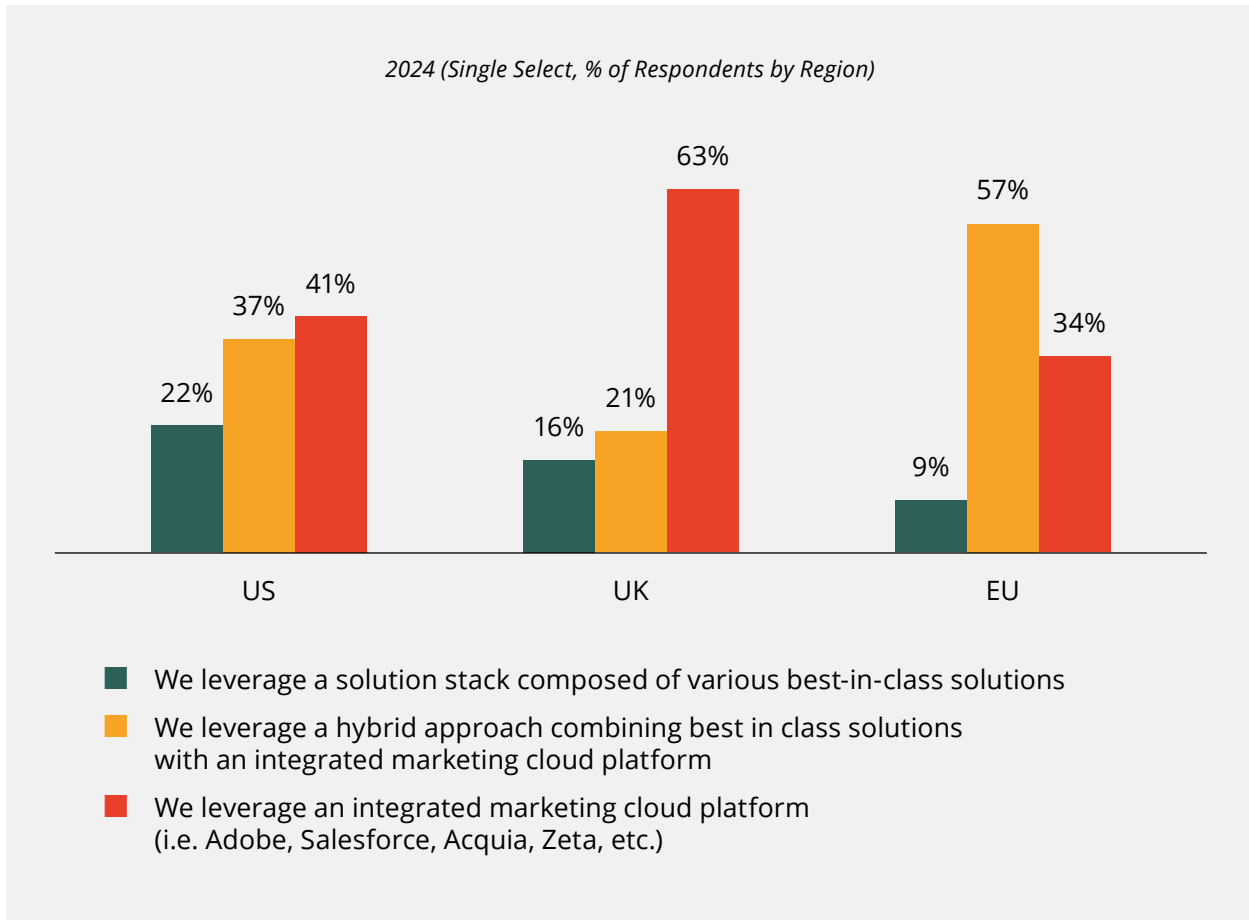
In the UK, where many organizations lack the scale or resources to implement and manage best-in-class solutions, integrated marketing clouds remain as the primary data management solution, with a reported 63% of brands relying solely on these platforms to manage and leverage data. However, a notable 21% of UK brands have already adopted a hybrid approach, while 16% have embraced best-in-class. In Europe, where many brands also lack scale, the landscape differs significantly, with 57% of brands adopting a hybrid approach, showcasing a reliance on integrated clouds alongside a preference for region-specific solutions.

While integrated marketing cloud solutions offer streamlined management and centralized control, they may lack flexibility and risk vendor lock-in. Hybrid architectures provide flexibility and scalability while maintaining centralized control but require tight integration and may incur higher costs. Pure best-in-class stacks offer the highest customization and innovation, leveraging specialized solutions for each component, but entail greater integration complexity and fragmentation risk. Achieving the optimal balance of control, flexibility, scalability, innovation, and cost is essential in architecting a data infrastructure that drives business success.





**FIGURE 9 – WHICH OF THE FOLLOWING BEST DESCRIBES YOUR ORGANIZATION’S APPROACH TO BUILDING ITS DATA SOLUTIONS STACK TO MANAGE AND LEVERAGE DATA**



Source: Winterberry Group Data Layer White Paper Survey N=200

### HOW BRANDS HOST SOLUTIONS WITHIN THE STACK

The landscape of hosting solutions within the data layer is experiencing a notable shift, reflecting the evolving dynamics of the modern marketing landscape. Historically, organizations heavily favored legacy on-premises infrastructure due to concerns surrounding data security and control, coupled with limited options in cloud technologies, and a comfort with the stability of on-premises environments.

However, with the proliferation of digital channels and the growing demand for real-time insights, the limitations of on-premises infrastructure have become increasingly evident. This realization has prompted a widespread adoption of cloud-based solutions. Yet, amid this transition, organizations face a myriad of considerations, including cost optimization, security, privacy, and performance.

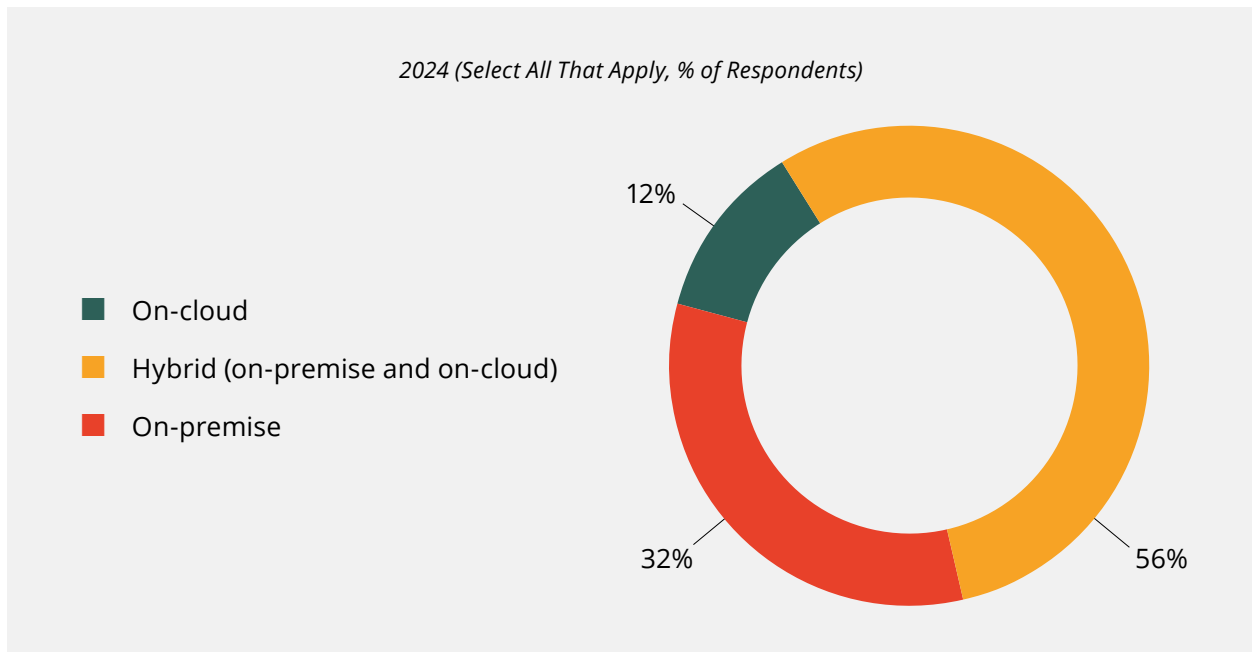
In response, many organizations are turning to hybrid hosting approaches to balance these considerations effectively. Presently, only a small percentage of organizations (12%)

have fully transitioned to cloud-based hosting for their data warehouses and data lakes, with a significant portion (33%) still relying solely on on-premises infrastructure. However, the majority (56%) have embraced a hybrid model, leveraging the benefits of both on-premises and cloud environments.

In the US, where organizations have historically heavily invested in on-premises solutions, there’s a noticeable shift towards hybrid approaches. Organizations opt for on-premises or virtual private clouds to maintain control, security, and scalability for sensitive data. Conversely, in the UK and Europe, where scale may pose challenges for on-premises solutions, reliance on cloud solutions is more pronounced.

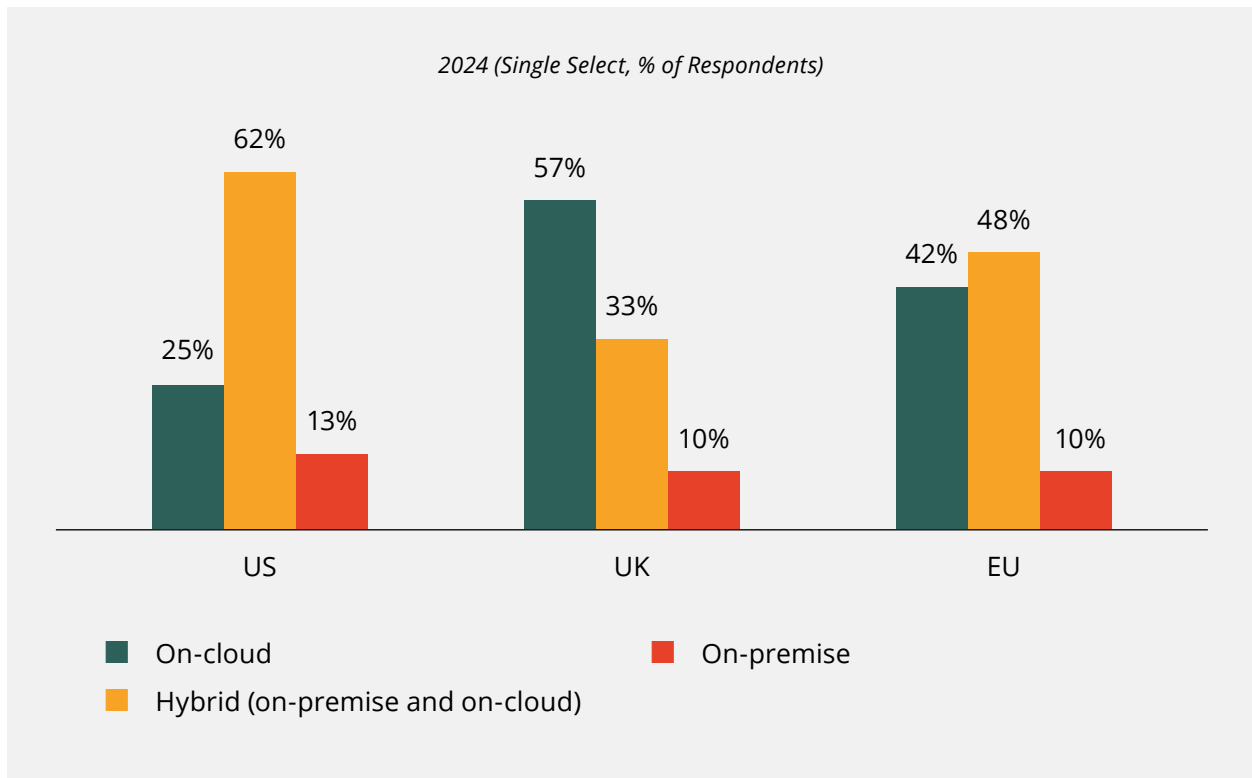
By adopting a hybrid model, brands aim to optimize costs while ensuring robust security measures and preserving agility in decision-making processes. Additionally, there’s a growing trend towards minimizing unnecessary data movement within the ecosystem, leading to the adoption of “zero copy” architectural approaches. These approaches minimize data duplication and streamline data flows, enhancing efficiency and reducing latency in data processing and analysis.

**FIGURE 10 – PLEASE SELECT THE OPTION BELOW THAT DESCRIBES WHERE YOUR DATA WAREHOUSE / DATA LAKE IS HOSTED?**



Source: Winterberry Group Data Layer White Paper Survey N=200

**FIGURE 11 – PLEASE SELECT THE OPTION BELOW THAT DESCRIBES WHERE YOUR DATA WAREHOUSE / DATA LAKE IS HOSTED? (BY REGION)**

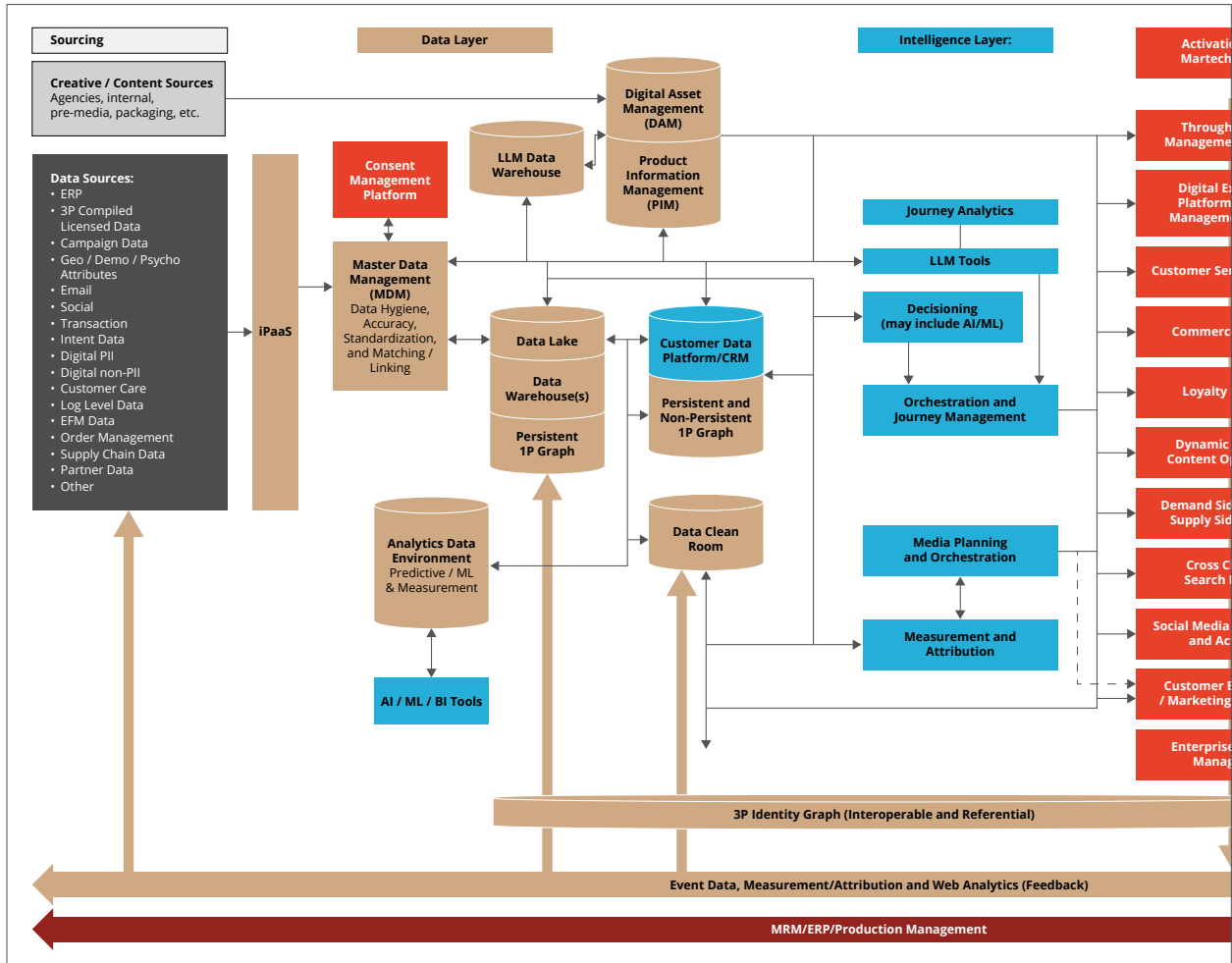


Source: Winterberry Group Data Layer White Paper Survey N=200

# THE EVOLVING BRAND DATA LAYER ARCHITECTURE

[CLICK HERE TO VIEW FULL GRAPHIC](#)

## EMBRACING THE EVOLVING BRAND DATA LAYER ARCHITECTURE: REPRESENTATIVE VIEW



The above diagram represents a view of how the technology solutions that power the advertising and marketing technology ecosystem could be architected for upper-mid market or enterprise brands, or even within disparate groups of a brand across geographies. While the number of solutions (and solution providers) may vary, with a component providing more than one capability, the overall architecture of the data layer must enable and facilitate access by intelligence and activation applications:

### DATA LAKES AND DATA WAREHOUSES

Data lakes and warehouses are the primary repositories for marketing data, serving as the hubs for enterprise data integration. These repositories supply data across layers depending on analysis, activation, and insights needs. Data lakes store unstructured and structured digital data, with or without unique identifiers, while data warehouses contain structured data organized in tables interconnected by unique identifiers.

Companies deciding between implementing a data lake or data warehouse must weigh critical factors such as data variety, volume, processing needs, governance, security, cost, and scalability/performance. Data lakes excel in managing vast volumes of raw, unstructured, and semi-structured data, offering flexibility for exploratory analysis, while data warehouses prioritize low-latency query performance and structured data analytics. Some platforms, known as data “lake houses”, offer a unified structure combining the functionalities of both warehouses and lakes. These repositories not only handle

ingestion and storage but also provide source data for other components of the data layer, tailored to the specific requirements of each component. Additionally, they can be directly accessed by business intelligence (BI) tools for analytics use cases and are often deployed on cloud platforms for enhanced flexibility.

“ The emergence of the cloud data warehouse has significantly changed the way customers organize their data. They’ve become more real-time but have not evolved enough to be utilized for real-time applications. Relational data in micro batches from data warehouses needs to be combined with real-time data and the CDP plays a role in enabling that. ”

- CEO, CDP Provider

### CUSTOMER DATA PLATFORMS (CDPS)

Customer Data Platforms (CDPs) have evolved from systems of record to unified platforms enabling swift data movement for real-time applications, including machine learning-based decisioning and personalization. CDPs now function as both operational data stores and intelligence platforms, offering

solutions across multiple layers of the data infrastructure. CDPs seamlessly bridge identities from the first-party (1P) data graph to non-persistent identifiers for real-time activation and dynamic personalization at scale.

CDPs incorporate audience identity matching capabilities to tie identifiers from paid advertising channels into unified customer profiles. This requires temporary storage of non-persistent identifiers, usually stored in cookies, to maintain responsiveness. However, strategies must be in place to reconcile privacy compliance within CDP data flows. The integration of generative AI within CDP user interfaces promises to further expand accessibility of segmentation, activation, and analysis features to business users through intuitive experiences.

“ You need a CDP as a separate application, you can’t solve it all with a cloud data warehouse. The value of a CDP is it enables you to unify customer data, create segments and activate them for marketing or cross-organization use cases. Your CDP must do that for real-time data as well as batch. ”

- Chief Product and Technology Officer, CDP Provider



## IDENTITY GRAPHS

Brands are establishing data warehouse-based, persistent first-party identity graphs centered on validated user IDs, leveraging directly identifiable PII such as names, emails, and addresses. This approach lays the foundation for robust, longitudinal first-party profiles of validated individuals, offering a more holistic view of customers across various use cases. Enrichment and enhancement with third-party data to the first-party graph should occur within this environment, given the persistence of attributes.

A combination of third-party identity solutions, interoperable as reference graphs, could be leveraged across the data, intelligence, and activation layers, enabling applications across use cases. Effective identity management must be integrated across data ingestion, intelligence, and activation systems to meet the speed requirements of real-time applications.

“ Identity services are beginning to distribute themselves across channels and platforms to bring the capability closer to data. Historically you had data stored in multiple places and had to send it to a singular place and pull it back which involved a significant amount of data movement and exposed organizations to risk. I think we'll see more identity services deployed in platforms to bring them closer to data. Identity won't live in a singular location. ”

- SVP of Data Products,  
Data and Identity Solutions Provider

## DATA CLEAN ROOMS (DCRS)

Data clean rooms constitute a discrete component of the data layer, ingesting data from various solution components while providing organizations the ability to move IDs or differential data sets into a permissioned, private, and secure environment. The purpose of the DCR is to provide an environment for sharing across the enterprise, especially where regulation or other permitted use may vary, with media owners, agencies and with other brands. These solutions remain standalone components

designed for external and cross-brand data collaboration sharing and should not be integrated into warehouses, lakes, or CDPs in order to provide the flexibility to share data between partners no matter where their data resides.

While the DCR is a stand-alone application, they often leverage third-party identity solutions which can be activated through data clean rooms, serving as the interoperable bridge between internally and externally provided datasets.

“ Identity doesn't live anywhere; it is the way you connect and manage data. Every brand will have their own first-party identity. They'll have their CRM, their CDP, their clean rooms and their measurement partners so identity has to be able to live everywhere. Identity can be an overlay, sitting on top of all of a brand's sources of data tying them together to be the glue. ”

- Chief Connectivity and Ecosystem Officer,  
Data and Identity Solutions Provider

## LLM WAREHOUSES

LLM Warehouses, specialized data warehouses tailored for high-velocity data at internet scale, enable Generative Artificial Intelligence (Gen AI) applications within the marketing and advertising landscape. These sophisticated warehouses serve as repositories for a diverse range of data, granting Gen AI systems access to both audience data sourced from the data layer and unstructured data encompassing creative assets and content stored within Digital Asset Management (DAM) and Content Management Solutions (CMS).

By bridging the historic gap between audience insights and content resources, LLM Warehouses facilitate a seamless integration of data and content within the broader data infrastructure. This convergence not only supports the functionalities of Gen AI but also lays the groundwork for the future evolution of omnichannel marketing strategies. As organizations continue to embrace the transformative potential of Gen AI and omnichannel marketing, LLM Warehouses emerge as indispensable components, driving innovation and enabling enhanced customer engagement across diverse digital touchpoints.



# INTEGRATING THE DATA LAYER

## THE KEY TO INTEGRATION: LEVERAGING MICROSERVICES AND APIS

Integration across platforms, whether leveraging best-in-class or integrated solutions, is critical to maximizing the efficiency and effectiveness of data layer solution components. These tools cannot operate in silos—they must seamlessly communicate and utilize data to unlock their full potential.

However, not all integrations are created equal: factors like data flow speed, volume, and directionality should inform technical approaches between various data layer solutions and downstream activation platforms. While brands may need constant access to bi-directional data for real-time personalization, large batch data uploads may better suit data not updated or leveraged in real-time. Mapping optimal protocols such as lightweight APIs (Application Programming Interfaces) or bulk transfers for each distinct connection is vital to balancing performance and complexity.

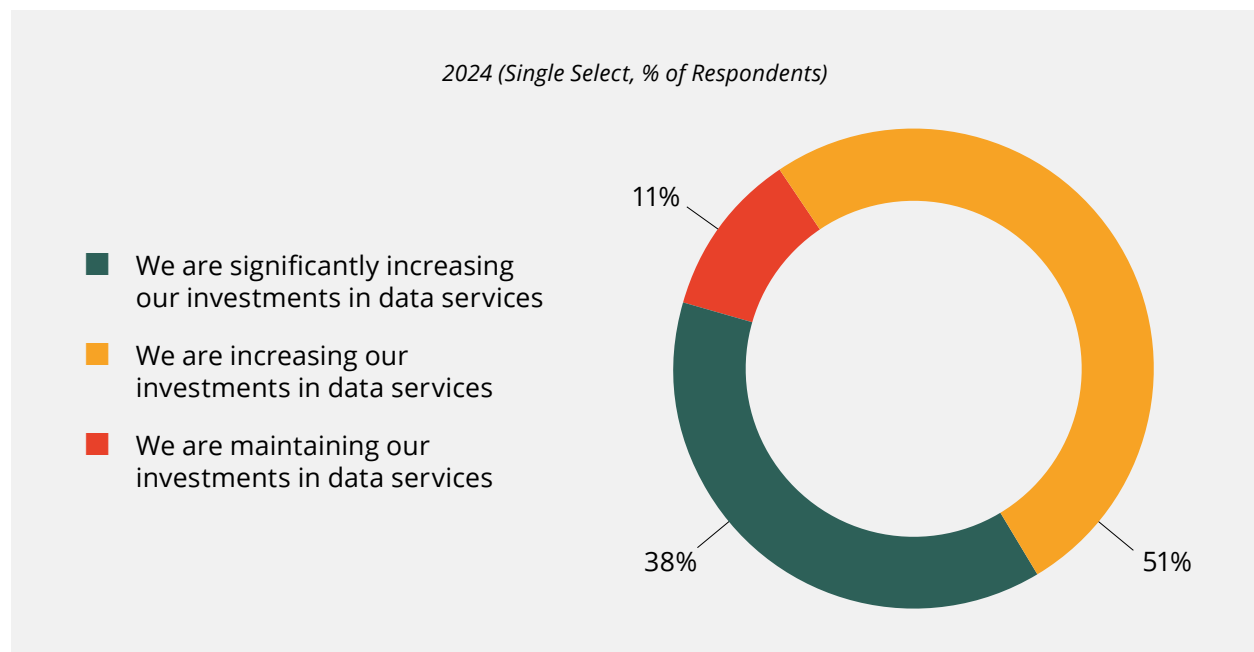
Integrating data layer components requires a combination of microservices and APIs. Microservices, a fundamental architectural design principle, involve breaking down applications into smaller, more manageable components that can communicate and interact with each other. This approach enables the integration of disparate platforms and solutions, facilitating smooth data flow and interoperability. Microservices are required both within a platform and disparate solutions to operate efficiently.

APIs define the methods and protocols for communication between different components, allowing systems to exchange data and execute functions seamlessly across the data layer. Integrating APIs with a solution requires careful planning and implementation through internal development or leveraging third-party partners.

By leveraging microservices and APIs, organizations can build flexible and scalable architectures that facilitate seamless data exchange and interoperability within integrated platforms or across diverse systems and platforms.

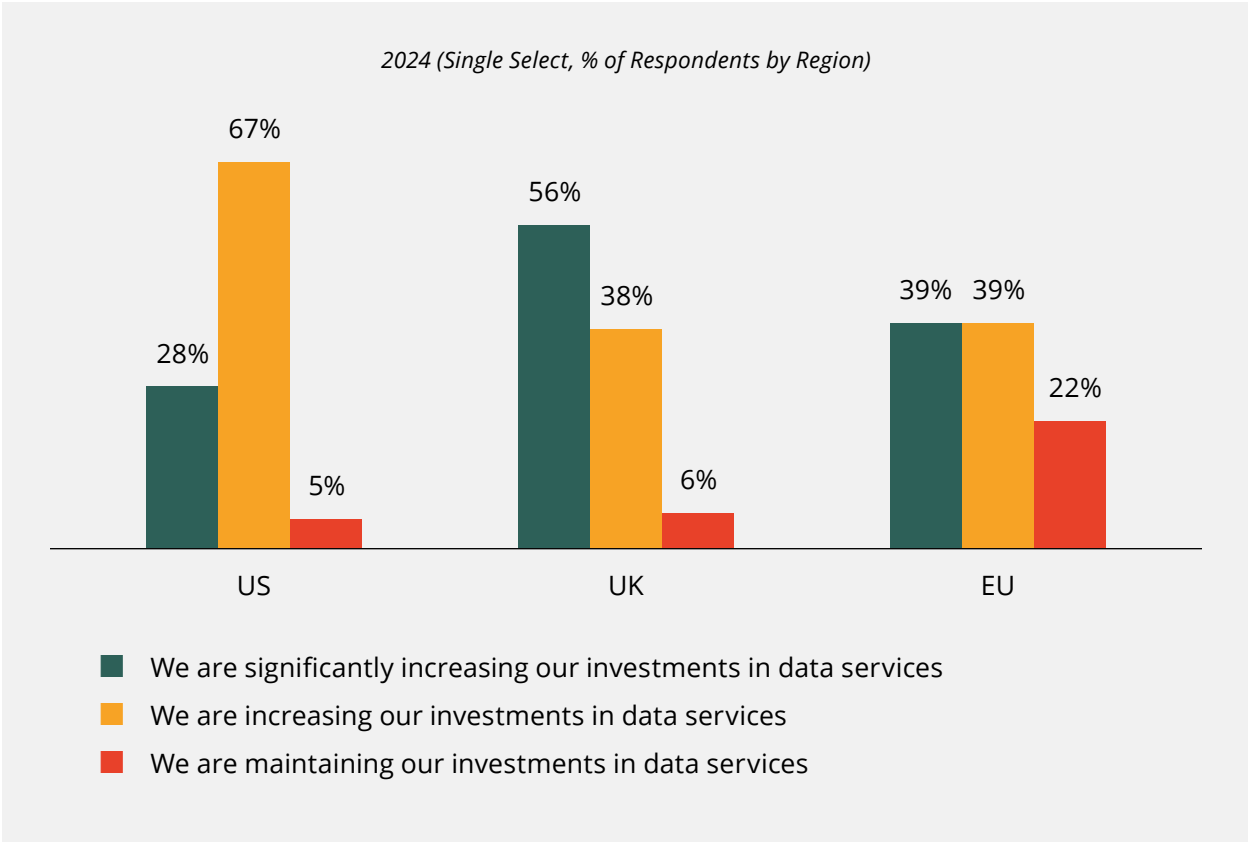
Amidst the increasing complexity of the marketing technology ecosystem, the vast majority of US brands (95%) express plans to increase investment in data services over the next 1-3 years, highlighting the critical importance of integration in realizing the full potential of the organization's technology stack.

**FIGURE 13 – IS YOUR ORGANIZATION INCREASING, MAINTAINING OR DECREASING INVESTMENT IN DATA SERVICES?**



Source: Winterberry Group Data Layer White Paper Survey N=200

**FIGURE 14 – IS YOUR ORGANIZATION INCREASING, MAINTAINING OR DECREASING INVESTMENT IN DATA SERVICES?**



Source: Winterberry Group Data Layer White Paper Survey N=200

**DATA QUALITY: THE REQUIREMENT TO DELIVER UPON THE PROMISE OF THE DATA LAYER**

Ensuring data quality is essential for delivering on the promise of the data layer. Brands must assess data quality based on established standards for accuracy, consistency, reliability, completeness, and timeliness.

Data quality efforts often begin within Master Data Management (MDM) systems, where critical shared data entities are defined and consolidated through data hygiene services. These efforts extend to other data layer components, such as data warehouses, CDPs, and individual components in the application layer.

There is a fundamental need for alignment between the data quality systems and consent management systems. Consent management systems are pivotal in ensuring data compliance and suppression. Without monitoring and managing data quality, flawed data inputs will yield inaccurate downstream outputs—in other words, “garbage in, garbage out.”

Just as a house will crumble without a strong foundation, data quality serves as the foundation for successful data layer implementations. Meticulously preparing and organizing data assets enables organizations to unlock actionable insights, drive personalized experiences, and optimize decision-making processes across the marketing and advertising technology ecosystem.



## CHALLENGES WITH PRIORITIZATION, INTEGRATION AND OPERATIONAL EFFECTIVENESS

Effectively leveraging solutions in the data layer to achieve desired outcomes requires marketers to navigate various complexities, including challenges related to data management, organizational structures, talent management, and compliance in a shifting regulatory environment. Each of these complexities presents unique barriers that, collectively, can impede the realization of a holistic data layer foundation for marketing.

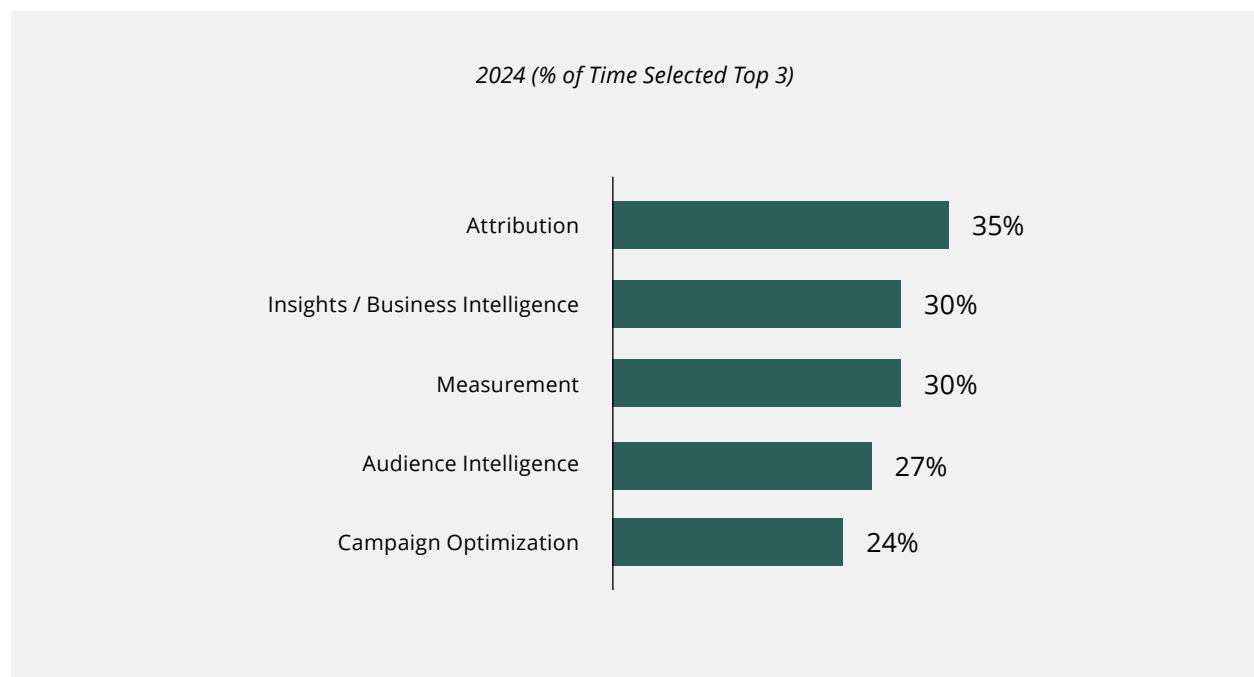
### USE CASE PRIORITIZATION AND DEFINING THE STRATEGY

One of the primary challenges faced by marketers is prioritizing use cases and defining a coherent strategy. Since the digital era began, the number of marketing use cases has expanded significantly, encompassing over 200 detailed requirements or “needs”. These use cases coalesce into seven broad categories spanning key marketing, sales and services objectives, such as planning and insights, customer acquisition, engagement, and measurement/attribution, among others.

Without strategic prioritization of these use cases, organizations struggle to develop a prioritized roadmap that defines the data and solutions architecture requirements in a manner that supports detailed investment rationale. Too often, technology and data decisions are made based on a siloed view of individual use cases achievements, rather than adopting a more holistic view that enables both-short term “quick wins” and long-term optimization of investments.



**FIGURE 15 – TOP FIVE USE CASES SUPPORTED BY SOLUTIONS IN THE DATA LAYER OVER THE PAST 1-3 YEARS**



Source: Winterberry Group Data Layer White Paper Survey N=200



## DATA AND TECHNOLOGY

### DATA QUALITY

“Garbage in, garbage out” remains a fundamental challenge in realizing the full potential of data layer investments. The effectiveness of leveraging data hinges on its accuracy, consistency, and validity for intended purposes. While incomplete data was once a significant obstacle, advancements in AI have mitigated this concern to some extent. However, challenges such as siloed information, inconsistent formats, outdated data, and evolving privacy regulations persist, collectively undermining data reliability and demanding immediate attention from marketers.

Inaccurate or unreliable data not only compromises audience targeting precision but also undermines the effectiveness of personalization efforts and casts doubt on the validity of analytical insights. In a data-driven decision-making landscape, compromised data quality jeopardizes the success of marketing initiatives. To address these challenges, organizations must prioritize data readiness, establishing a foundation capable of delivering reliable insights, personalized experiences and optimized decisioning.

### SECURITY AND MINIMIZATION

In today’s SaaS-driven landscape, the separation of data and applications requires data availability across the data, intelligence

Historically you had data stored in multiple places and had to send it to a singular place and pull it back which involved a significant amount of data movement and exposed organizations to risk.

- SVP of Data,  
Global Data and Identity Provider

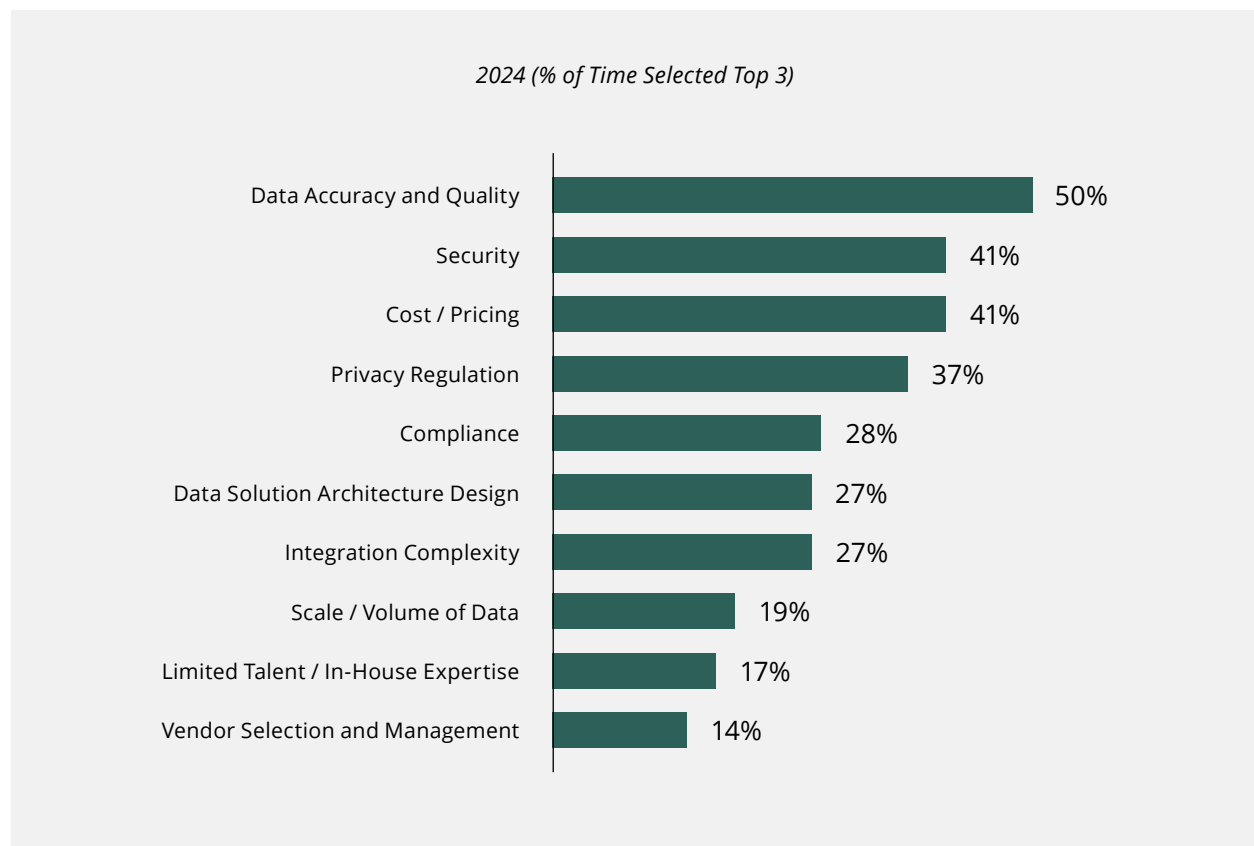
“

The invention of SaaS models helped create distance between data and the application, creating security problems, interoperability requirements, increasing latency and costs.

”

- SVP of Data,  
Global Data and Identity Provider

**FIGURE 16 – TOP BARRIERS TO EFFECTIVELY LEVERAGING DATA AND DATA INFRASTRUCTURE TO SUPPORT MARKETING AND ADVERTISING EFFORTS**



Source: Winterberry Group Data Layer White Paper Survey N=200

and application layers. While this shift towards greater data availability and interoperability offers benefits, it also heightens the risk of data leakage, unauthorized access, breaches, and misuse.

To address these security concerns, the industry is exploring proactive measures, with a growing focus on minimizing data movement between applications, environments, and collaborators. Among the various approaches being employed, one gaining traction is the emerging trend towards “zero copy” data solutions.

### CLLOUD COSTS AND PRICING

The transition to cloud-based solutions has unlocked new opportunities and potential for the use and management of data. Single and multi-cloud solutions offer unparalleled speed, scalability and flexibility. However, this evolution has also introduced a new challenge: the complexity of cost and pricing structures associated with cloud utilization for both storage and compute.

“ I think it’s a maturity issue—I don’t think it’s an inherent problem with the clouds but brands don’t know their use cases and are applying the wrong architecture adding complexity. At the moment a lot of companies are applying traditional architecture to cloud solutions creating very inefficient solutions. ”

- CEO, CDP Provider

To address processing costs in today’s interconnected landscape, organizations must conduct a holistic evaluation of their solution stacks, focusing on total cost of ownership. Architecting stacks that minimize data movement, store data where it’s required for specific use cases, and avoid unnecessary duplication are key strategies for reducing compute and storage costs, thereby optimizing cloud expenditure.

“ Cloud costs are [one of the biggest challenges for our clients]. Brands are still moving data back and forth from one cloud to another. Until brands create their own spines and connect source data across business siloes, 1P data sits in silos across brands. We have to bring that together to build the spine. Tools being used in siloes can point to the spine and no longer have to run on computers in the siloes...the biggest problem marketers have is there is no way to grasp total cost of ownership. Cloud costs are through the roof. ”

- CSO,  
Data Solutions and Infrastructure Provider

### INTEGRATION COMPLEXITY

The complexity of integrating multiple solutions and ensuring their interoperability presents a considerable challenge for brands, jeopardizing aspirations for unified and effective technology ecosystems. Without a well-integrated marketing solution stack, which includes both platforms and data services that facilitate data movement between platforms, brands will struggle to harness the full potential of their data, leading to fragmented insights, suboptimal targeting and operational inefficiencies.

Achieving proper integration of first-party solution components for individual and household identity and extending that integration across the data layer to other parts of the business and collaborators, as well as between adtech and martech solutions, is in its early stages. The evolving role of the CDP, use cases for data clean rooms, and the enablement of both machine learning and generative AI further complicate the landscape. Additionally, the rapid increase in the number of identity solutions, each built on different data sets and with different objectives, adds to this complexity.

To develop more efficient and interconnected marketing technology ecosystems, organizations will need to prioritize not just interoperability, but also a narrower number of core first- and third-party identity solutions that connect across different intelligence and activation platforms. Tackling the challenge of integration complexity will require a comprehensive understanding of data strategy and a strategic approach to infrastructure design.

### ORGANIZATION AND TALENT DATA SILOS

Probably the most prevalent of all organizational challenges is the silo-ization of data across the business. Repeated discussions (and numerous surveys) continue to highlight this gap as the greatest impairment to successful integration and operationalization. Sometimes these silos are required, specifically when compliance is a concern; however, just as often, data silos result from disconnected organizational objectives and responsibility.

### OWNERSHIP / ACCOUNTABILITY

For many organizations, determining ownership of data strategy and marketing technology has proven challenging, with potential owners ranging across technology, marketing, customer experience, or committees that include a chief data officer where the role exists. Historically, tension regarding the question of ownership has primarily fallen between IT and marketing departments, each with its own shortcomings- IT departments lack end-user experience, while marketers struggle to understand technical nuances.

“ Clients struggle with the question of ownership-IT, it becomes an ineffective sinkhole. Marketing drags it to CDPs and closer to the application layer. ”

- SVP of Data Products,  
Data and Data Solutions Provider

De-siloing not just data but also the strategy behind technology architecture design and management is critical. The ownership of data strategy and the technology has often been managed across

organizational silos rather than holistically. The title Chief Data Officer has typically been associated with the use of data for the organization rather than directly with technology. This gap between data requirements and data solutions is evident in variation seen in the survey responses below, where multiple parties influence the selection and management of data and data solutions.

“ If I was the CEO of a global 2000 I'd force IT to do it. In the 2000s we saw marketing have control and they build hodgepodge stacks. ”

- Chief Product and Technology Officer, CDP Provider

There is a growing consensus that accountability and responsibility for data and data infrastructure should go hand in hand. This recognition has led to the emergence of a new group, marketing operations/technology, which blends marketing experience with the technical expertise of IT. This group has the potential to bring together use cases and solutions, with support from the IT organization and compliance to deliver governance. Establishing dedicated marketing operations departments

ensures comprehensive understanding of marketing objectives and technical intricacies.

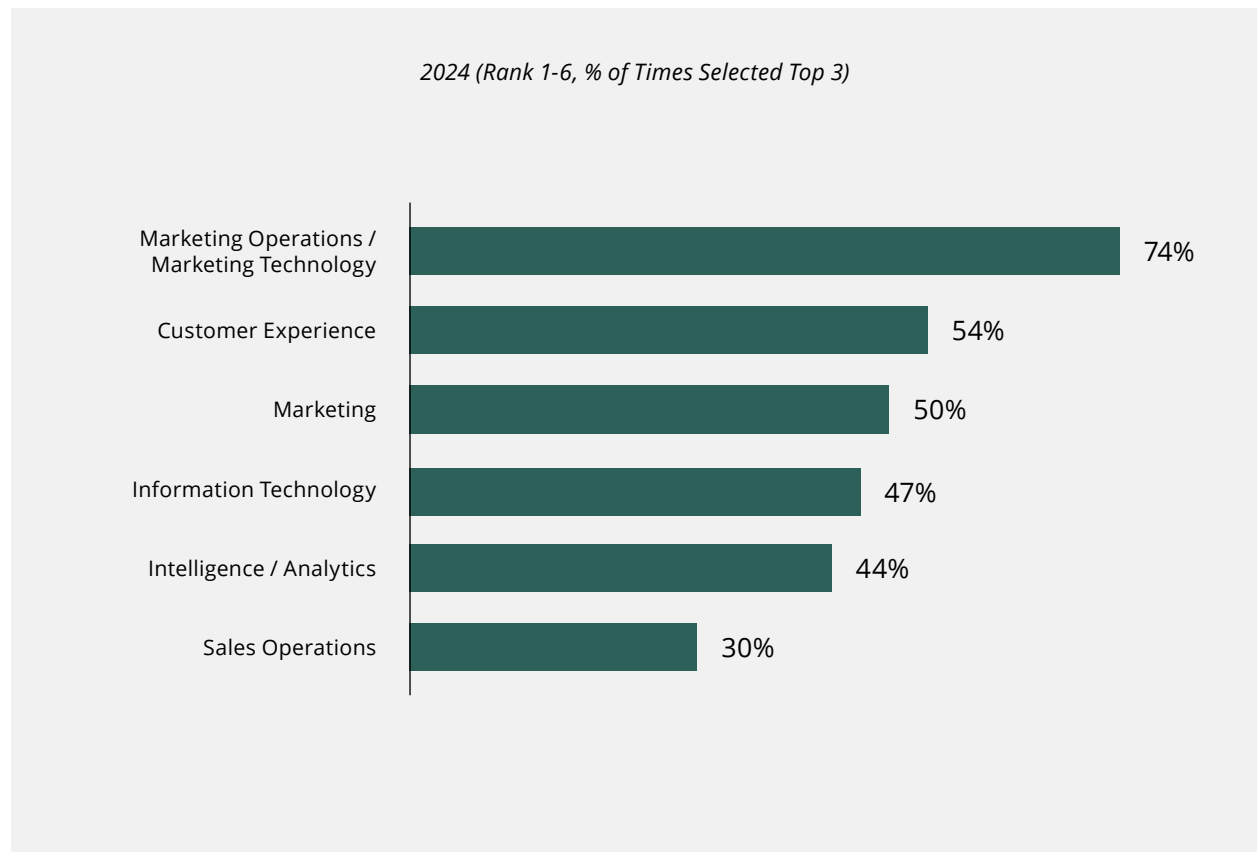
“ Marketing functions and IT functions are starting to merge. Historically, customer data management, identity were owned in the marketing world but now IT resources are getting involved. ”

- Global Head of Marketing Tech, Global Cloud Solutions Provider

“ There's been tension between marketing and IT for a couple decades now. In my experience, the solution isn't to say it should reside in one area or another. Those teams should work together. Data is a team sport. ”

- Global Head of Marketing Tech, Global Cloud Solutions Provider

**FIGURE 17 – DEPARTMENTS RANKED BY INFLUENCE AND RESPONSIBILITY IN THE SELECTION AND MANAGEMENT OF DATA SOLUTIONS**



Source: Winterberry Group Data Layer White Paper Survey N=200

### IN-HOUSE TALENT / EXTERNAL EXPERTISE

The transition toward integrating marketing and IT to establish marketing operations departments will not eliminate the need for ongoing external support and expertise.

“ A lot of this work was historically managed by IT but organizations are building new departments and attempting to poach talent from AWS which isn't working. Resources are slim and there's minimal education in the market regarding how to build infrastructure built for marketing. ”

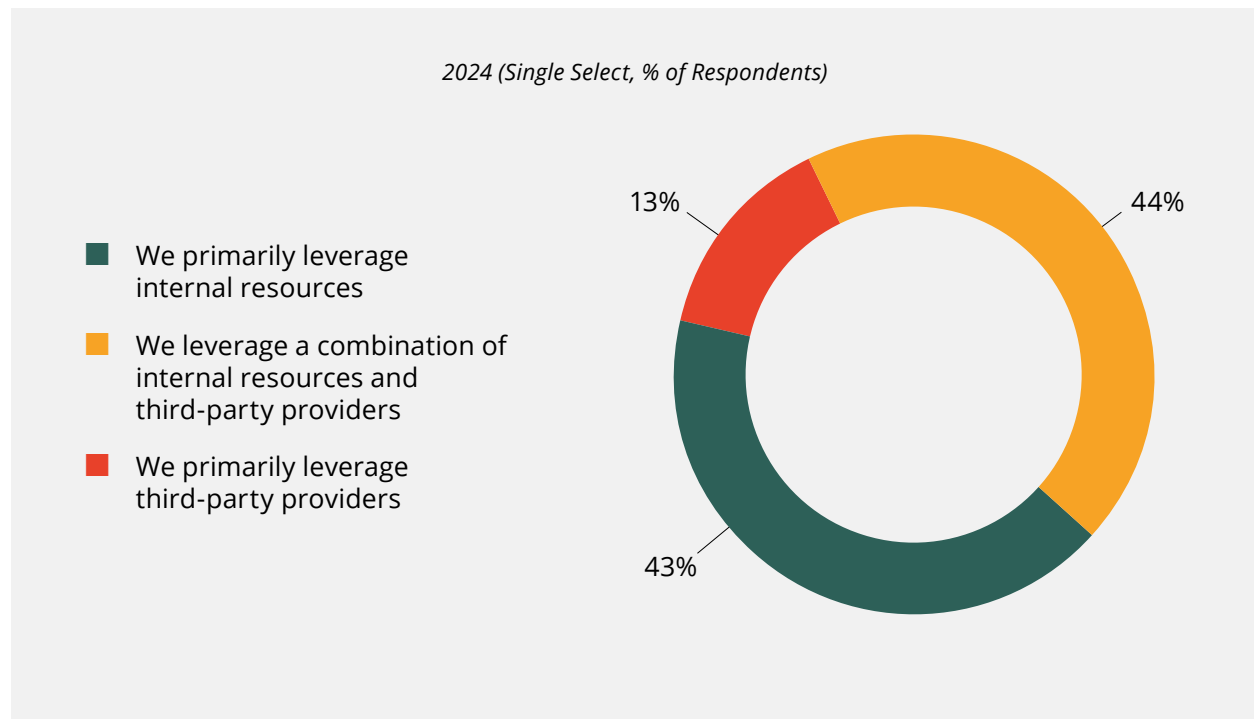
- VP of Sales,  
Data and Data Solutions Provider

While organizations are beginning to build internal marketing operations teams, many still lack the specialized skills required to fully implement and manage complex and evolving data solutions. Today, the majority of organizations rely on some form of third-party support to implement and manage data solutions:

Though organizations will seek to bolster in-house talent, platform intricacies, the rapid pace of change, and a scarcity of talent with the requisite blend of marketing knowledge and technical expertise may hinder organizations from becoming fully self-sufficient.

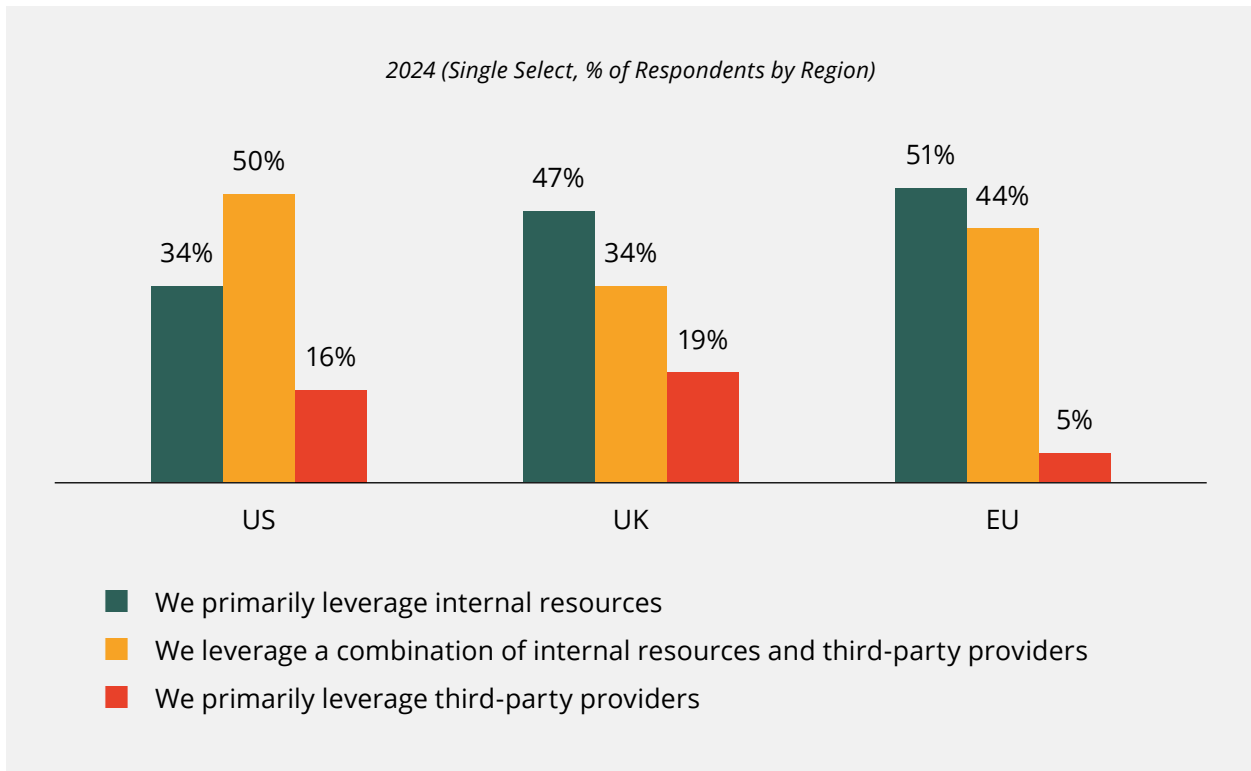


**FIGURE 18 - PLEASE SELECT THE RESPONSE THAT BEST DESCRIBES HOW YOUR ORGANIZATION IMPLEMENTS AND MANAGES DATA SOLUTIONS**



Source: Winterberry Group Data Layer White Paper Survey N=200

**FIGURE 19 – PLEASE SELECT THE RESPONSE THAT BEST DESCRIBES HOW YOUR ORGANIZATION IMPLEMENTS AND MANAGES DATA SOLUTIONS (BY REGION)**



Source: Winterberry Group Data Layer White Paper Survey N=200

### PRIVACY AND REGULATION

In an era marked by heightened concerns around consumer privacy, government regulation and policy measures implemented by walled gardens are reshaping the data landscape for marketers. Increasing restrictions on data collection, aggregation and utilization, coupled with the continuous loss of signals, pose new challenges. Additionally, data marketers and technology partners are having to navigate the different regulations brought forward by a range of authorities such as the EU, the UK (with currently minor divergence from EU law) and the range of US state-level privacy laws.

“ Years ago, compliance was an afterthought. Today, especially in light of recent breaches, brands are concerned about their reputation and want to make sure their implementations are CCPA, GDPR compliant. In RFPs it used to be one question, now it’s its own section. ”

- EVP of Digital, Marketing Services and AdTech Provider

Policy changes brought in walled gardens and some technology providers have been driven by a range of internal and external

“ Largest area of importance is privacy-forward-looking enterprises are not looking to just follow privacy regulations and compliance, but establish ethical data practices and trust. Trust and reputation are the number one things brands want to protect. This is their biggest liability and risk. They are leveraging these ethical practices as a competitive differentiator. ”

- CEO, Adtech Consultancy

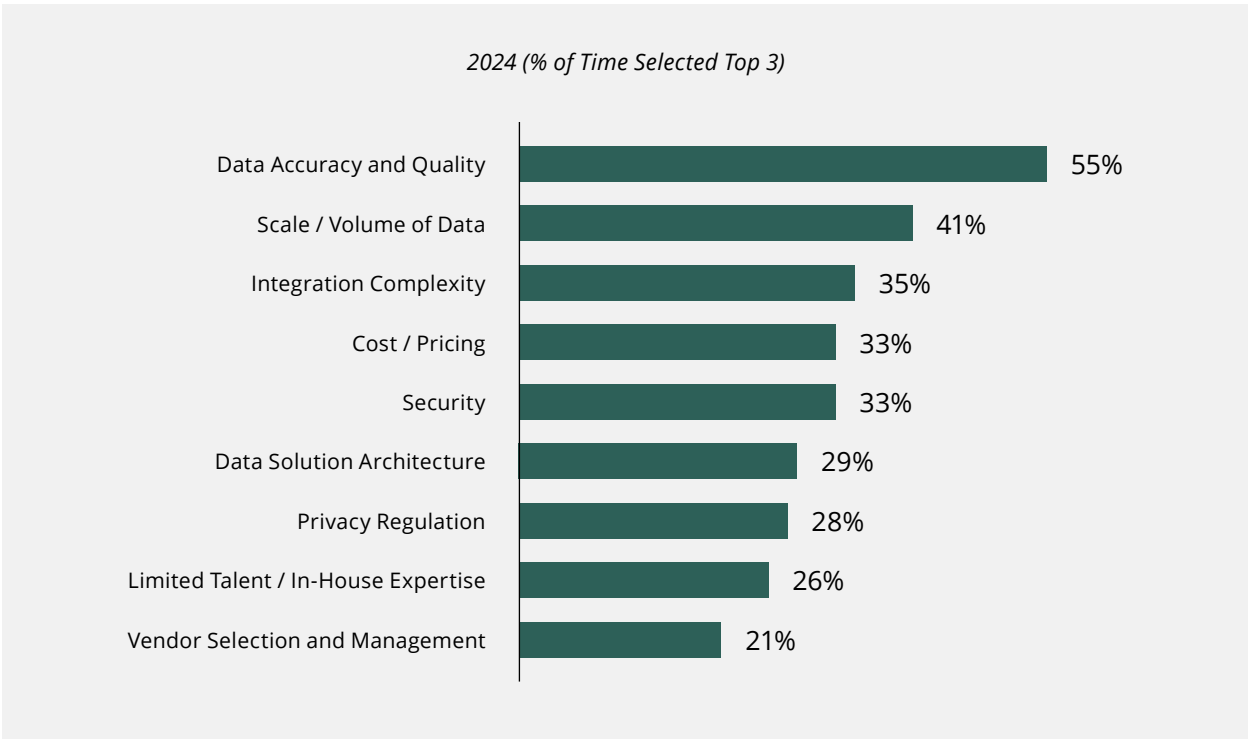
motivations, but their impact has been, and promises to continue to be, more widespread than many governmental interventions. While most of these changes are designed to benefit consumers and safeguard their privacy, the diminished scale, quality and accuracy of data may limit the overall effectiveness of some marketing strategies. Upholding compliance and effectiveness in this dynamic landscape requires ongoing resources and effort.

As organizations look to maintain compliance and effectiveness, the design of the data layer should be driven by a privacy-by-design approach where permission, opt-out, legitimate interest, and auditability are considered.

# MARKET OUTLOOK: CONTINUOUS EVOLUTION OF THE DATA LAYER

Looking ahead, the trajectory of the marketing landscape will continue to be shaped by various macro forces, including media fragmentation, increasing demand for personalization, evolving privacy regulations, and the widespread adoption of AI and machine learning. These factors are expected to not only persist but also intensify in the coming years, driving significant transformations in the way brands approach data and marketing technologies.

**FIGURE 20 – TOP CHALLENGES EXPECTED TO HINDER EFFECTIVELY LEVERAGING DATA AND DATA INFRASTRUCTURE TO SUPPORT MARKETING AND ADVERTISING EFFORTS OVER THE NEXT 1-3 YEARS**



Source: Winterberry Group Data Layer White Paper Survey N=200

### GREATER EMPHASIS ON FIRST-PARTY DATA

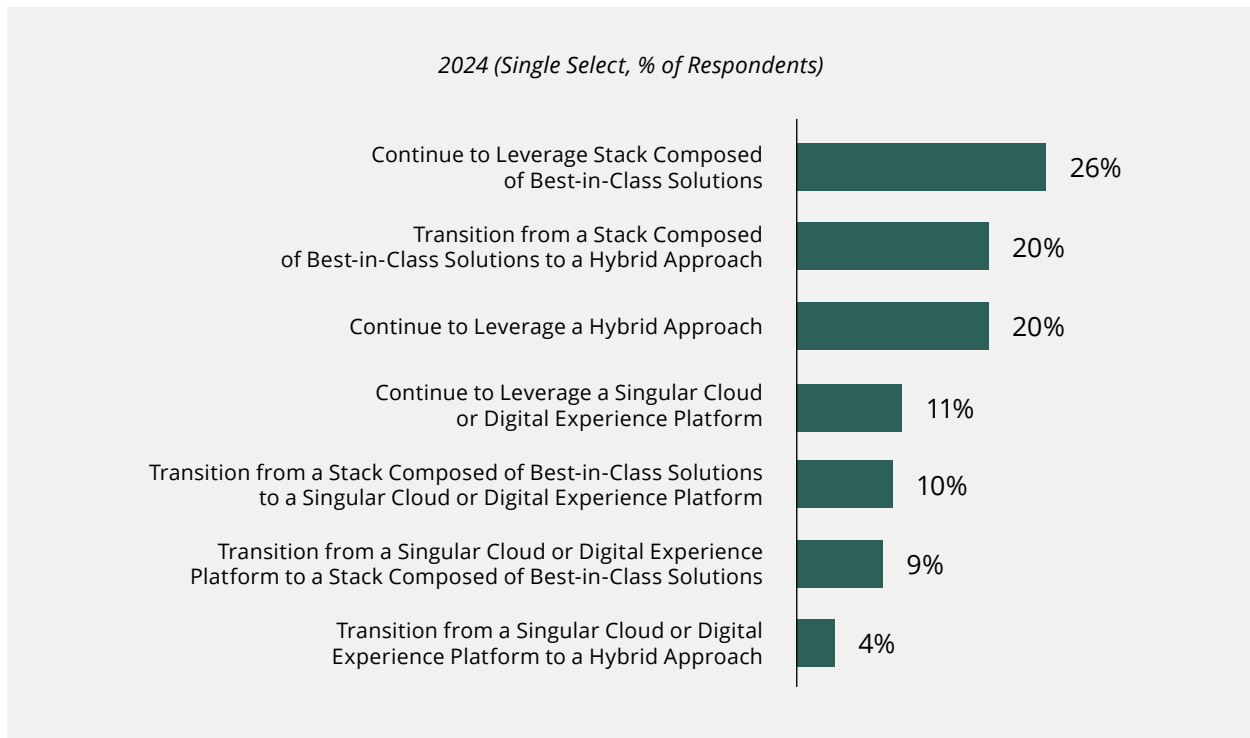
As brands increasingly rely on owned and permissioned data assets, there will be a heightened focus on enhancing the accuracy, depth, and breadth of first-party customer data. Efforts to improve data quality and enrichment, leveraging AI tools for real-time processing of growing data volumes, will be key.

### INCREASED ADOPTION OF HYBRID SOLUTION STACKS

Marketing technology stacks will continue trending toward hybrid models, blending various on-premise, private cloud, public cloud, and SaaS solutions to balance data accessibility, processing speed, configurability, security, and cost management.



**FIGURE 21 – THINKING AHEAD TO THE NEXT 1-3 YEARS, WHICH OF THE FOLLOWING BEST DESCRIBES HOW YOUR ORGANIZATION WILL APPROACH BUILDING ITS DATA SOLUTIONS STACK TO MANAGE AND LEVERAGE DATA?**



Source: Winterberry Group Data Layer White Paper Survey N=200

### STRICTER PRIVACY REGULATION AND ENFORCEMENT

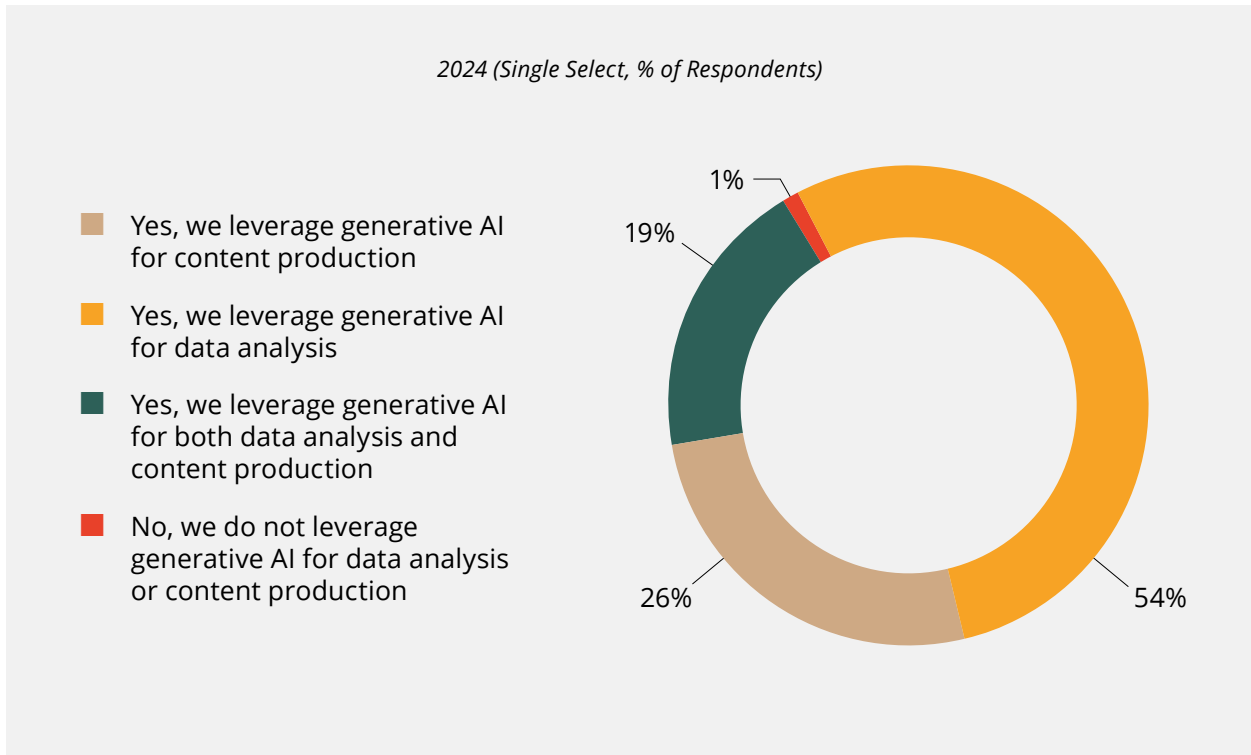
Regulatory mandates and browser pressures will impose restrictions on using identifiers and signals for adtech and martech purposes. As a result, prioritizing customer consent will become foundational for data layer integration, audience activation, and measurement. Notably, there may be divergence between the US and UK/EU regulatory environments, with the latter likely to advance further regulations with ambitions and scope similar to GDPR, DPDI, and the Digital Markets Act, while there is little confidence that the US will enact similar federal level legislation.

### INTEGRATION OF CONTENT AND DIGITAL ASSET MANAGEMENT (DAM) PLATFORMS

Technology and organizational silos separating content from audience data will collapse to support generative AI LLMs, enhance the speed of access to content for activation and optimization, and enable improved personalization.

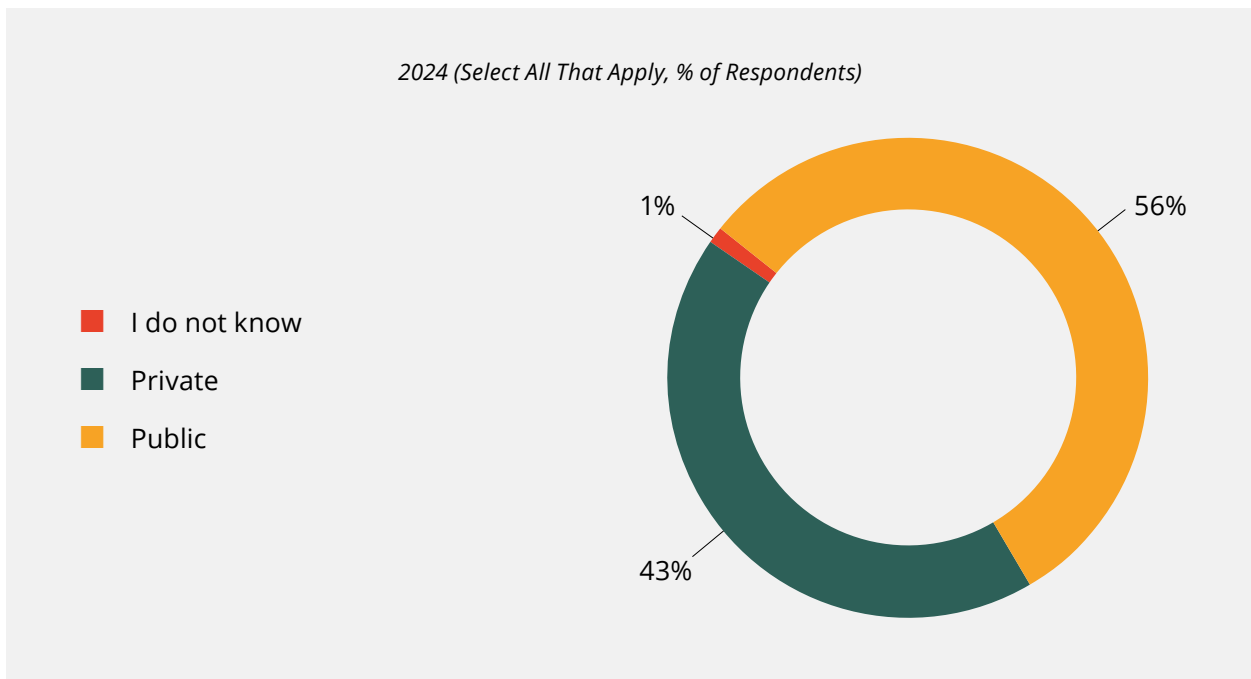


**FIGURE 22 – DOES YOUR ORGANIZATION LEVERAGE GENERATIVE AI FOR DATA ANALYSIS OR CONTENT PRODUCTION?**



Source: Winterberry Group Data Layer White Paper Survey N=200

**FIGURE 23 – WHAT TYPE OF LLMs DOES YOUR ORGANIZATION LEVERAGE?**



Source: Winterberry Group Data Layer White Paper Survey N=200



## CONTINUED RISE IN DATA LAYER INVESTMENT

Advancements in capability and the transition from legacy platforms to modern architecture will require continued and staged investment for at least the next three years as the market transitions.

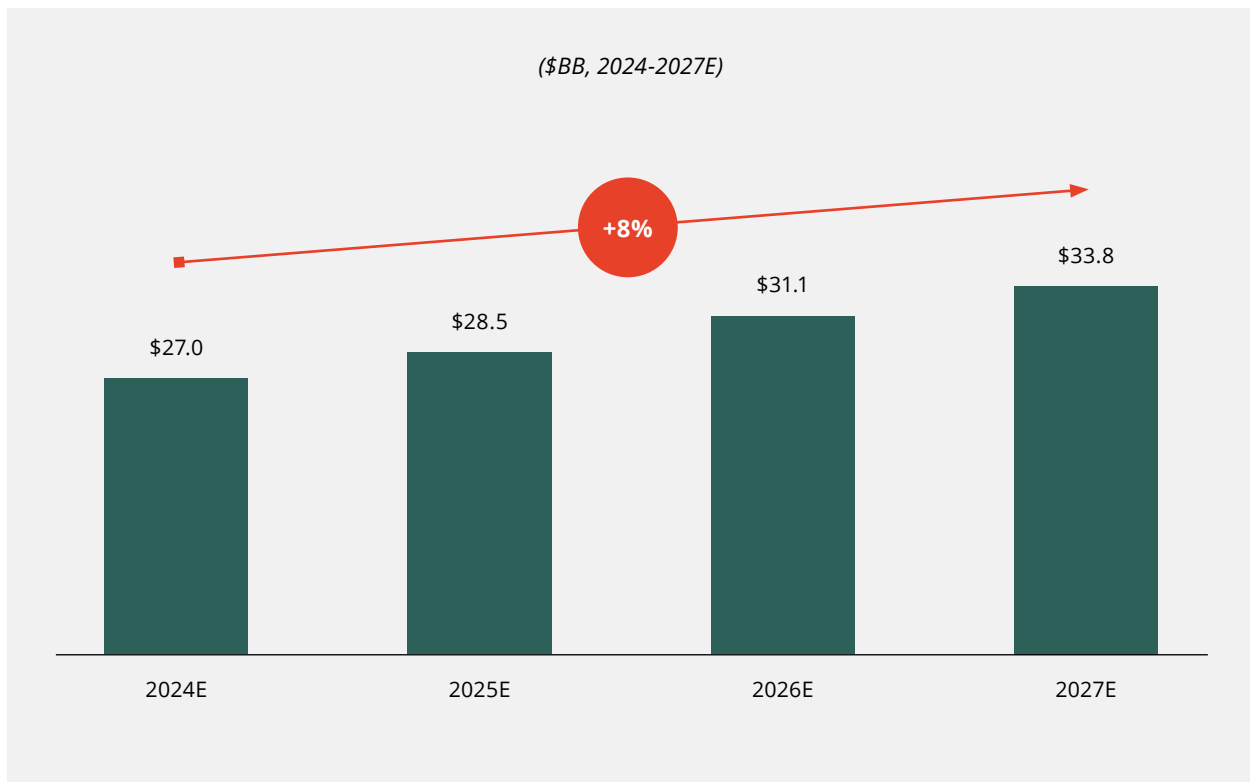
Investment in data, data services, and data infrastructure will remain a top priority for brands, with spending forecast in the US to grow from \$27.0 billion in 2024 to \$33.8 billion in 2027, reflecting a compound annual growth rate of 8% over the next three years.

This investment will drive performance and productivity advancements, but it will also bring greater scrutiny of storage and processing costs. Brands will need to make critical decisions regarding optimal data accessibility, movement, and tiered storage based on usage intensity. As the breadth of marketing data use cases expands and the need for interoperability grows, demand for internal skills and holistic approaches to data strategy and technology architecture will increase. However, addressing the combined gaps across organizational design and skill sets may prove challenging in the near term, if ever fully resolved. The dynamic nature of the marketing landscape ensures that there will always be new use cases, technology solutions, and data types to consider.

Winterberry Group anticipates that the market will continue to require a hybrid services model, tasked with delivering a best-in-class set of integrated solutions to meet the evolving needs of brands in the data-driven marketing environment.



**FIGURE 24 – FORECASTED SPEND ON DATA, DATA SERVICES AND DATA TECHNOLOGY**



Source: Winterberry Group Data Layer White Paper Survey N=200

## GLOSSARY

### DATA LAYER

The foundational layer of the marketing technology ecosystem responsible for managing, analyzing, and activating customer data across various solutions and channels.

### MARKETING TECHNOLOGY ECOSYSTEM

The interconnected network of tools, platforms, and solutions utilized by marketers to manage and execute marketing campaigns and strategies.

### MASTER DATA MANAGEMENT (MDM)

A centralized system designed to define, consolidate, and maintain critical shared data entities across systems through data integration, ensuring data consistency and accuracy.

### DATA LAKE

A scalable repository optimized for ingesting and storing structured and unstructured data from diverse sources, enabling retention of large volumes of varied data in its raw form.

### DATA WAREHOUSE

A repository organizing core transactional and attribute data into integrated schemas optimized for analysis, facilitating structured data storage and analysis from multiple sources.

### IDENTITY GRAPH

A graph that links multiple identifiers associated with the same individual, household, or entity, providing a unified view or “profile” of the customer across various channels and solutions.

### CUSTOMER DATA PLATFORM (CDP)

A secure data environment enabling insights, planning, and scheduling of actions from customer data, facilitating the creation of comprehensive customer profiles and activation across channels.

### CUSTOMER RELATIONSHIP MANAGEMENT PLATFORM (CRM)

A system managing customer data, interactions, and relationships across marketing, sales, and service functions, centralizing customer data to track interactions and manage relationships.

### DATA CLEAN ROOM (DCR)

A secure environment for analyzing and processing sensitive data without exposing individual-level information, enabling organizations to derive aggregate insights while ensuring compliance with privacy regulations.

### ANALYTICS DATA ENVIRONMENT

Infrastructure and tools enabling the collection, storage, processing, and analysis of data for analytics use cases, empowering data scientists and analysts to explore data and generate insights.

### LLM DATA WAREHOUSE

A specialized data warehouse designed for high-velocity data at internet scale, enabling the storage and analysis of massive volumes of fast-moving data from digital platforms and internet-scale applications.

### MICROSERVICES

A fundamental architectural design principle involving breaking down applications into smaller, more manageable components that can communicate and interact with each other, facilitating the integration of disparate platforms and solutions.

### APPLICATION PROGRAMMING INTERFACES (APIS)

Protocols defining the methods and protocols for communication between different components, enabling systems to interact, exchange data, and execute functions seamlessly across the data layer.

### HYBRID SOLUTION STACKS

Marketing technology stacks blending on-premise, private cloud, public cloud, and SaaS solutions to balance data accessibility, processing speed, configurability, security, and cost management.

### GENERATIVE ARTIFICIAL INTELLIGENCE (GEN AI)

Artificial intelligence technology that generates novel outputs or insights based on existing data inputs, facilitating advanced analytics and personalized experiences.

### PRIVACY-BY-DESIGN

An approach to system design where privacy considerations are integrated into the design and operation of systems, ensuring compliance with privacy regulations and safeguarding consumer data privacy.

### MARKETING OPERATIONS

A department or function within an organization responsible for managing and optimizing marketing technology and operations, bridging marketing objectives with technical expertise to drive efficiency and effectiveness.

### TOTAL COST OF OWNERSHIP (TCO)

The total cost associated with acquiring, implementing, operating, and maintaining a solution or asset over its entire lifecycle, including direct and indirect costs.

### INTEROPERABILITY

The ability of different systems, applications, or components to communicate, exchange data, and operate seamlessly together, enabling organizations to leverage diverse technologies and solutions within their ecosystem.

### ZERO COPY DATA SOLUTIONS

Architectural approaches aimed at minimizing data duplication and movement between applications, environments, and collaborators, reducing latency, enhancing efficiency, and improving data security.

### DATA INFRASTRUCTURE / TECHNOLOGY

The foundational framework and systems used to manage, process, store, and analyze data within an organization; includes database management & hygiene (CDP, CRM, data lakes / warehouses), data collection & ingestion tools, DMP and collaborative data environments (data clean rooms).

### DATA SERVICES

Services provided to manage, process, analyze, and interpret data; includes identity resolution (matching, linking, onboarding and destination charges), predictive/prescriptive analytics, measurement, attribution & verification and data solution integration.

### MARKETING DATA

Data related to marketing activities, campaigns, and customer interactions, including demographic information, behavioral data, campaign performance metrics, and customer preferences.

### FIRST-PARTY DATA

Data collected directly from customers or users by an organization through its own channels or interactions, typically considered the most valuable and reliable form of data for marketing purposes.

### SECOND-PARTY DATA

Data acquired from trusted partners or collaborators, typically exchanged directly between organizations, providing additional insights into target audiences and customer behavior.

### THIRD-PARTY DATA

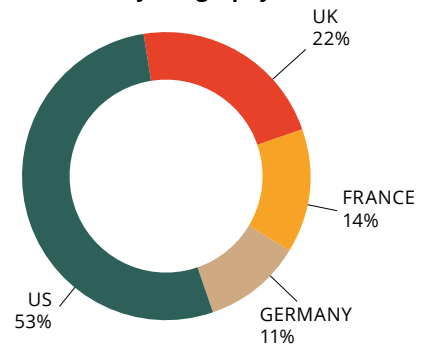
Data purchased or obtained from external sources, such as data brokers, aggregators, or vendors, offering insights into broader market trends, consumer behaviors, and demographic information

## METHODOLOGY

The insights in this report were validated by extensive industry research, including of-the-record conversations with some of the industry's top thinkers in the advertising, marketing, publishing, regulatory, legal and agency sectors. We are indebted to the more than 60 individuals who provided their opinions in video-conference interviews, conducted between October 2023 and February 2024.

In addition to industry research and expert interviews, this report incorporates findings from a comprehensive survey conducted among 200 respondents across the United States, United Kingdom, France and Germany. The survey aimed to capture diverse perspectives on key trends and challenges within the data layer. To ensure balanced representation, responses were carefully normalized across various business sizes, mitigating potential biases and providing a more nuanced understanding of the industry landscape.

### Country Geography

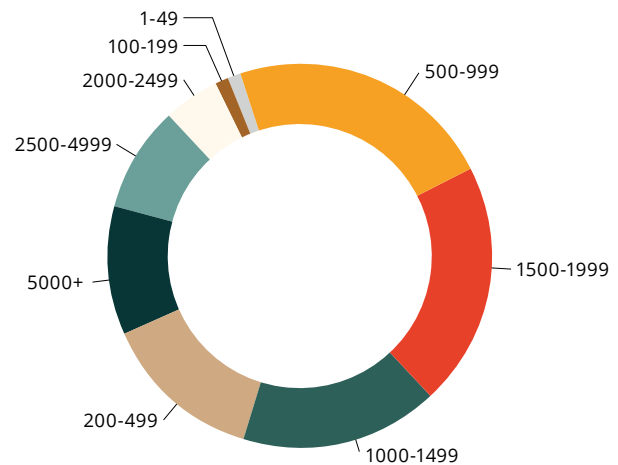


### Department / Functional Role (% of respondents, 2024)

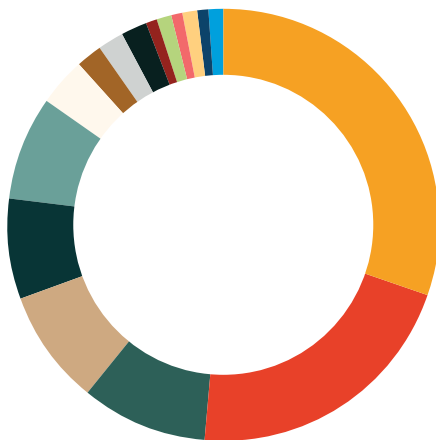


MARKETING / ADVERTISING	52%
DATA AND ANALYTICS	16%
ECOMMERCE	12%
INTELLIGENCE / INSIGHT	12%
INFORMATION TECHNOLOGY (IT)	9%

### Number of Full-Time Employees (% of respondents, 2024)



### Industry / Vertical (% of respondents, 2024)



RETAIL (INCLUDING DIRECT-TO-CONSUMER)	32%
MEDIA AND ENTERTAINMENT	22%
HEALTHCARE	10%
CONSUMER PACKAGED GOODS / FAST MOVING CONSUMER GOODS	9%
FINANCIAL SERVICES	8%
TRAVEL AND HOSPITALITY	8%
CONSUMER TECHNOLOGY	4%
INFORMATION TECHNOLOGY	2%
AUTOMOTIVE	2%
CONSULTING / CONSULTANCY	2%
INSURANCE	1%
CABLE AND TELECOMS	1%
HIGHER EDUCATION	1%
MARKETING	1%
SOFTWARE	1%
TRANSPORTATION	1%

## ABOUT OUR PREMIER SPONSORS



Acxiom partners with the world's leading brands to create customer intelligence, enabling data-driven marketing experiences that generate value for people and for brands. The experts in identity, the ethical use of data, cloud-first customer data management, and analytics solutions, Acxiom makes the complex marketing ecosystem work, applying customer intelligence wherever brands and customers meet. For more than 50 years, Acxiom has improved clients' customer acquisition, growth, and retention. With locations in the US, Europe, and Asia, Acxiom is a registered trademark of Acxiom LLC and is part of The Interpublic Group of Companies, Inc. (IPG). For more information, visit [Acxiom.com](https://www.acxiom.com).



Habu is a global leader in data clean room software, enabling companies to benefit from the value of data without the risk. Habu connects data internally and externally with other departments, partners, customers, and providers in privacy-safe and compliant ways for better collaboration, decision-making, and results. Habu was recently acquired by LiveRamp to strategically expand its collaboration network, and drive further adoption of LiveRamp's core identity and connectivity solutions. Together, they offer an industry-leading interoperable platform for data collaboration across all clouds and walled gardens globally. For more information, visit [Habu.com](https://www.habu.com) and [LiveRamp.com](https://www.liveramp.com).



LiveRamp is the data collaboration platform of choice for the world's most innovative companies, offering leading solutions across identity, connectivity, data access, and insights, including the LiveRamp Clean Room, powered by Habu. For more information, visit [LiveRamp.com](https://www.liveramp.com).



mParticle is a real-time Customer Data Platform that harnesses the power of AI to help marketing teams minimize guesswork, and maximize ROI. Companies like NBCUniversal, JetBlue, Venmo and many more use mParticle as the foundation of their first party data strategy to make better decisions at scale, improve customer experience and campaign execution, and scale ROI across the marketing tech stack. mParticle has raised nearly \$300M in funding. Founded in 2013, mParticle is headquartered in New York City with employees around the globe. For more information, visit [mParticle.com](https://www.mparticle.com).



Treasure Data empowers the world's largest and most innovative companies to drive connected customer experiences that increase revenue and reduce costs. Built on a big data foundation of trust and scale, Treasure Data is a customer data platform (CDP) pioneer and continues to reinvent the CDP by putting AI and real-time experiences at the center of the customer journey. Our CDP gives customer-centric teams across Fortune 500 and Global 2000 companies - marketing, sales, service, and more - the power to turn customer data into their greatest treasure. Visit [TreasureData.com](https://www.treasuredata.com) to learn more. Join Treasure Data's global CDP community at [CDP World](https://www.cdpworld.com), its annual summit for marketing and data leaders.

## ABOUT OUR SUPPORTING PARTNER



Aqfer's Marketing Data Platform-as-a-Service is designed to be white-labeled and fully interoperable throughout the MarTech and AdTech ecosystems. It empowers marketing solution providers to facilitate identity resolution, first-party data capture, secure data collaboration, and advanced media analytics while also delivering substantial cloud efficiencies and cost savings across massive Big Data sets. Learn more at [Aqfer.com](https://www.aqfer.com).

## ABOUT WINTERBERRY GROUP

Winterberry Group is a strategic consultancy specializing in the intersecting disciplines of advertising, marketing, data, technology and commerce. We collaborate with stakeholders across the advertising and marketing ecosystem—service providers, technology developers, media companies, brands and investor groups—to identify and activate growth opportunities that drive the creation of real and lasting value.

We bring decades of experience and deep industry, operational and M&A expertise that bridges strategic development and tactical execution—driving unprecedented speed-to-action. And through our highly collaborative approach, we enable knowledge transfer and actionability, giving our clients a competitive edge and powering growth in performance, team engagement and shareholder value.

## WINTERBERRY GROUP SERVICES

### Growth Strategy

Corporate strategy that drives growth is at the heart of what we do. We work with clients to identify core competencies, evaluate strategic alternatives and build comprehensive, actionable growth plans.

### Operational Design

We guide branding and marketing practices through business process planning efforts aimed at helping them achieve lasting competitive advantage.

### Mergers & Acquisitions

We leverage our industry knowledge to help financial investors make sound, value-driven investment decisions.

### Market Intelligence

We maintain an active research and publishing practice that gives our consultants direct access to insights from senior industry executives and complements our client engagements.

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