# RECLAIMING THE MARKET DATA VALUE CHAIN

LEVERAGING THE CLOUD TO OPTIMISE DISTRIBUTION AND PRODUCT INNOVATION

OCTOBER 2023

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# FOREWORD

Over the past decade, passive investment strategies and technological advancements have sparked fierce competition for liquidity and intelligence, transforming capital markets into complex data-driven ecosystems. Wholesalers, once reliant on a handful of global aggregators for access to consumers, now find themselves empowered by the benefits of cloud infrastructure, enabling them to confront channel conflicts and mitigate disintermediation risks. And the landscape is rapidly evolving, exemplified by recent exchange deals such as Nasdaq and Deutsche Bourse acquiring platforms that enhance access to the investment management community.

These deals also highlight how exchange groups have shifted gears, embracing cloud partnerships that lower distribution costs while nurturing closer consumer relationships. Through automated onboarding and data access, wholesalers can reach a wide consumer base, amplifying visibility and control.

Cloud also unlocks a diverse ecosystem of Fintech solution providers, offering a myriad of services that further reduce the costs associated with acquiring and consuming data. However, this long-tail of Fintechs often brings challenges, such as revenue leakage and licensing compliance issues due to limited administrative discipline and resources. The stakes are further raised by the looming prospect of A.I., which has the potential to disrupt existing commercial policies governing these relationships.

We envision broader potential through new forms of content syndication, harnessing the cloud's reach and following the footsteps of media companies that have embraced digital rights management. Wholesalers have tapped into this transformative momentum, forming partnerships with cloud-native apps to drive product innovation and revolutionise market dynamics. This strategic shift disrupts the dominance of data vendors, paving the way for wholesalers to reclaim wallet share.

As the value chain undergoes seismic changes in data origination, enhancement, packaging, and value-added services, the true power of A.I. lies in its derived outputs. In the long term, wholesalers will recognise the imperative to adapt their commercial strategies and data licensing relationships to thrive in the fiercely competitive realm of data and liquidity intelligence.  As we navigate this shifting landscape, managing commercial relationships amidst the exchange of raw and derived data becomes paramount. The market's response to these transformative changes will chart the course for its future trajectory. Brace yourself—capital markets are on the cusp of an unparalleled revolution.

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**Mark Schaedel**
CEO
**DataBP**

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**Benjamin Quinlan**
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# EXECUTIVE SUMMARY

The demand for financial market data is increasing at a rapid rate, with total industry spending growing at a robust CAGR of 5.4% since 2013, reaching ~USD 45 billion by the end of 2022. And with this rise in demand, we have seen a proliferation of service companies, a diversification of distribution models, and the emergence of specialised data vendors.

Traditionally, data providers would distribute their data directly to customers or, more commonly, rely on a suite of global data vendors. While data providers maintain direct distribution arrangements with their most significant clients, the lion's share of global market data revenue (i.e. 83%) is captured by vendors.

Both the direct distribution and indirect distribution models have distinct benefits and limitations. Direct distribution offers greater flexibility, along with a reduced time-to-market, but can create a highly fragmented consumer experience. In contrast, indirect distribution offers the convenience of a single feed of data but often in bundled data sets that lack flexibility. The dependency on data vendors can also reduce the velocity at which data providers can launch new products, restricting their ability to innovate and diversify, whilst also increasing the risk of non-compliance. In some cases, data providers have acquired data vendors to bridge the gaps, but this comes at a high cost.

We believe cloud presents an opportunity to deliver the best of both worlds.

Public cloud adoption provides greater distribution and commercial flexibility and a chance to hit reset on the end-user relationship with modern distribution models. It enables more direct distribution capabilities, providing total flexibility in product creation, along with more dynamic packaging and more responsive control. Cloud can also offer additional advantages such as operational efficiencies, infrastructure modernisation, and scalability. The increasing relevance of A.I. and the appetite to improve intellectual property ("IP") protection through strategies such as digital rights management further underscore the opportunities presented by cloud technologies.

The potential of this new approach reduces the barriers to entry for smaller and alternative data vendors, activating the 'long-tail' of providers through a cloud-based management framework that replaces the legacy 'trust' model with automation and technology, whilst reducing exposure to the traditional operational and commercial risks of operating as a vendor.

In this report, we analyse the above trends in detail, whilst also exploring some of the additional capabilities required by data providers as they navigate the possibilities created by cloud distribution, as well as examine how incumbent business models are evolving in an effort to capture the opportunities presented by the evolution of market data delivery.

SECTION 1

# THE STATUS QUO

# GLOBAL MARKET DATA SERVICING ECOSYSTEM

## KEY TAKEAWAYS

The conventional financial data ecosystem consists of three tiers: (1) data providers, (2) data vendors, and (3) data consumers:

**1. Data Providers**

Originate, generate, and / or capture from a variety of financial market activities. Typically includes stock exchanges, trading platforms and index providers that create and manage data content.

**2. Data Vendors**

Aggregate, normalise, and process data from providers and package into products and services for consumers. Index providers both create content and repackage data from providers.

**3. Data Consumers**

Data consumers (e.g. banks, asset managers) access raw data or data products to carry out a wide range of specific financial market activities (e.g. trading, investing, etc.). Consumers are becoming increasingly diverse.



## Financial market participants are heavily dependent on data providers (e.g. exchanges, trading platforms, etc.) and data vendors for their market data needs

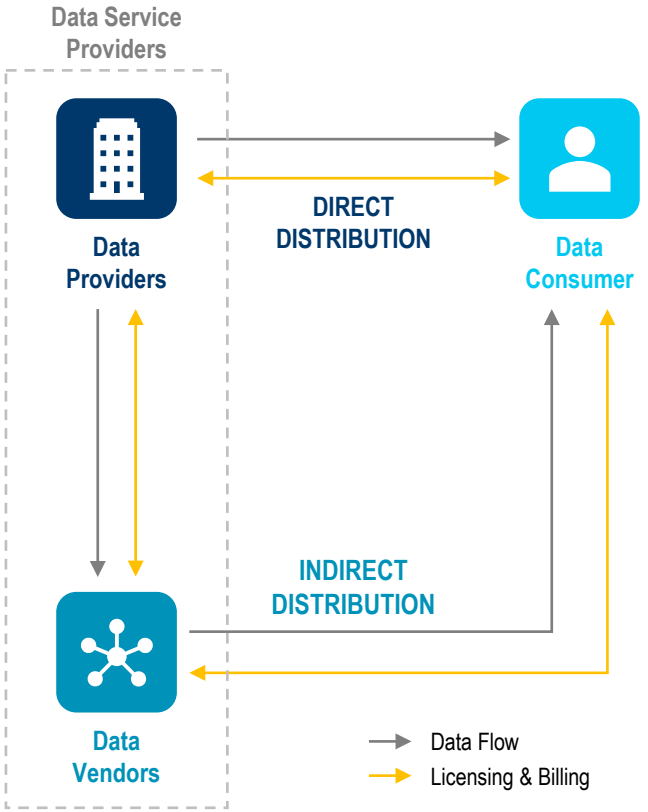
### Data Market Ecosystem
Stakeholders

| Description | Example Companies* |
|---|---|
| **Data Providers**<br>*Originate, generate, and / or capture from a variety of financial market activities.* | CME, ICE, London Stock Exchange Group, Deutsche Börse Group, TMX, JSE, ASX, SGX, SIX, DTCC, MarketAxess, Tradeweb, S&P Dow Jones Indices, FTSE Russell, QONTIGO, MSCI |
| **Data Vendors**<br>*Aggregate, normalise, and process data from providers and package into products and services for consumers.* | Bloomberg, Refinitiv, iress, barchart, enfusion, dxFeed |
| **Data Consumers**<br>*Search for and subscribe to available datasets in the market that are aligned with specific business goals* | Deutsche Bank, UBS, J.P.Morgan, Goldman Sachs, Schroders, Franklin Templeton, abrdn, Two Sigma, Virtu Financial, Citadel |

*Companies listed in this table is for illustrative purpose only. For example, data providers may become data vendors – and vice-versa.

Source: DataBP, Quinlan & Associates analysis

### Data Consumption Models
Financial Markets Context



# CONVENTIONAL DATA DISTRIBUTION MODEL

## KEY TAKEAWAYS

The two models for distribution have benefits and trade-offs:

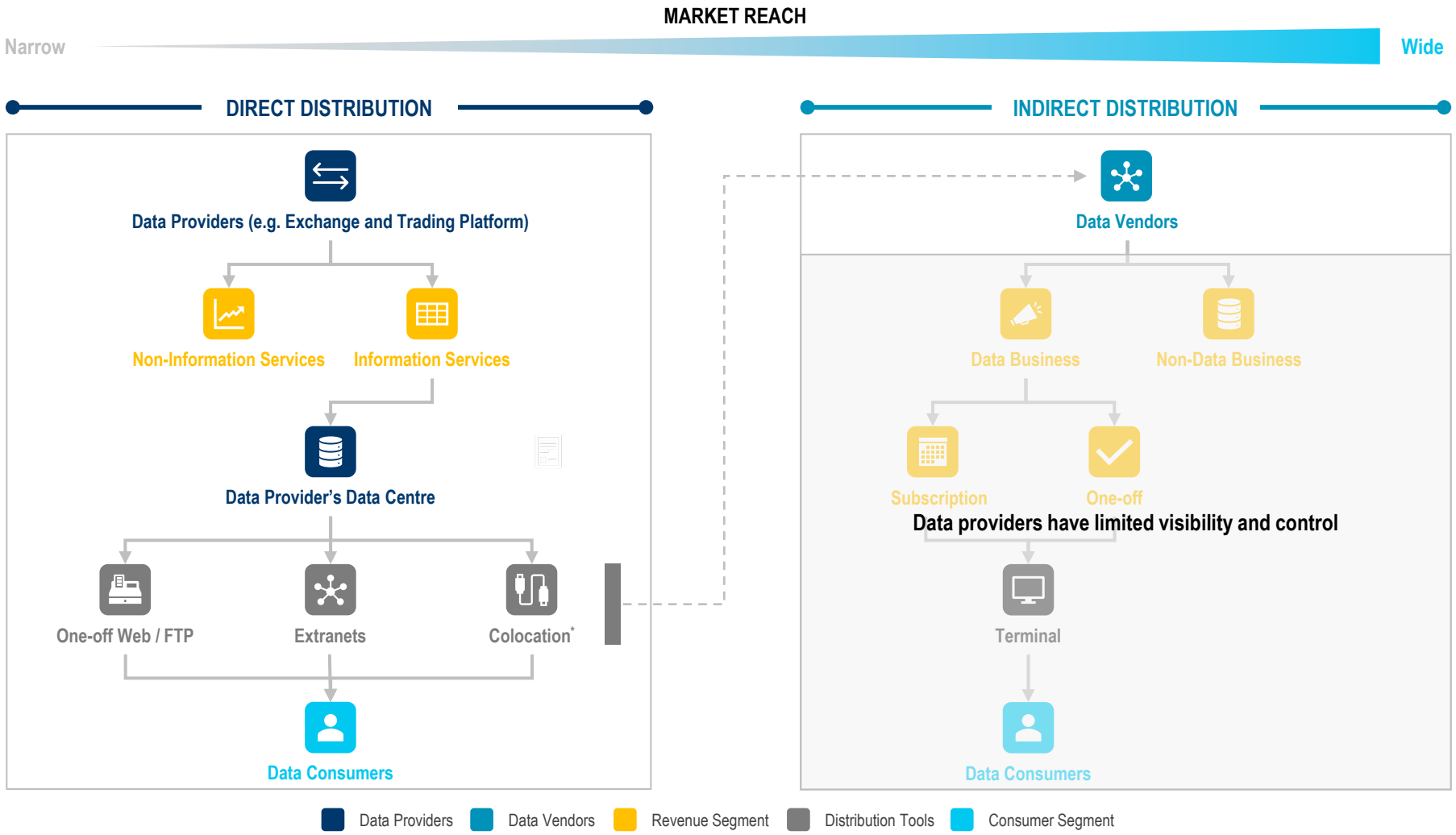
### 1. Direct Distribution

Direct methods of distribution include data feeds, file transfers and databases accessed via colocation, extranets, file transfer protocols ("FTP") servers, and websites. Benefits include controls and consumer visibility. For consumers, the tradeoffs include latency performance and high fidelity / raw data but higher cost and lower usability.

### 2. Indirect Distribution

The more prominent model is the wholesale model of indirect distribution, in which providers reach a broad market of consumers but require data providers to give up visibility and control over their data policy enforcement.

## To reach a broad and diverse market of consumers, the current indirect distribution model requires data providers to compromise visibility and control over their data




*Colocation space of an asset exchange may be managed and operated by a third-party organisation (e.g. NTT, Digital Realty, Colt Technology Services, etc.)

Source: DataBP, Quinlan & Associates analysis

# THE COST OF OVER-RELIANCE

## KEY TAKEAWAYS

### Distribution conflicts

The wholesale model provides a convenient and low-cost distribution solution for providers to minimize the operational risks and costs related to processing, packaging, and distributing data to a wide range of end consumers.

Typically, the vendors also handle the administrative and support burdens related to licensing, entitlements management, usage monitoring and reporting.

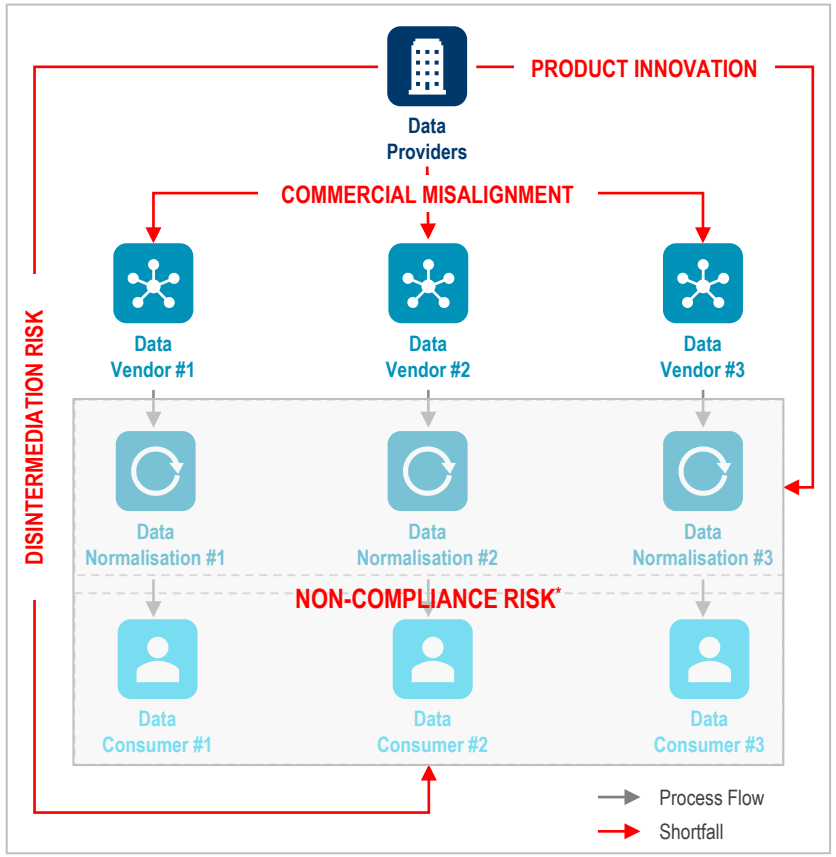
### Disintermediation

Outsourcing the administrative and support burdens means giving up consumer visibility, control and cross-selling opportunities resulting in significant revenue leakage and shortfall.

## An over-reliance on data vendors constrains providers' product innovation efforts and data monetisation potential while increasing the risk of non-compliance and disintermediation

### Indirect Distribution Model

Description




### Implication

Data Provider's Perspective

**Benefits of relying on Data Vendors**

| | | |
|---|---|---|
| *Consumer Reach* | ✓ | • Data vendors provide access to their expansive prospective and existing data consumer base |
| *Integration Support* | ✓ | • Vendors integrate the data across the front and back-end data platform infrastructure |
| *Licensing & Administration* | ✓ | • Data vendors manage licensing, billing, and usage tracking |
| *Customer Support* | ✓ | • Any customer enquiries and / or technical support are handled by the data vendor |

**Cost of relying on Data Vendors**

| | | |
|---|---|---|
| *Product Innovation* | ✗ | • The responsibility of data-related product / service development is left in the hands of data vendors |
| *Commercial Misalignment* | ✗ | • Misalignments in commercial interests and conflicts in data ownership can occur |
| *Non-compliance Risk* | ✗ | • Limited control and visibility over data policies may lead to unintended compliance breaches |
| *Disintermediation Risk* | ✗ | • Data vendors may opt-out from building or continuing data commercialisation arrangements |

*Causes of noncompliance include honest confusion with policies (e.g. non-display policy), administrative under resourcing, poor data governance practices, and data privacy

Source: DataBP, Quinlan & Associates analysis

✓ Favourable ✗ Unfavourable

# RECLAIMING THE VALUE CHAIN

## KEY TAKEAWAYS

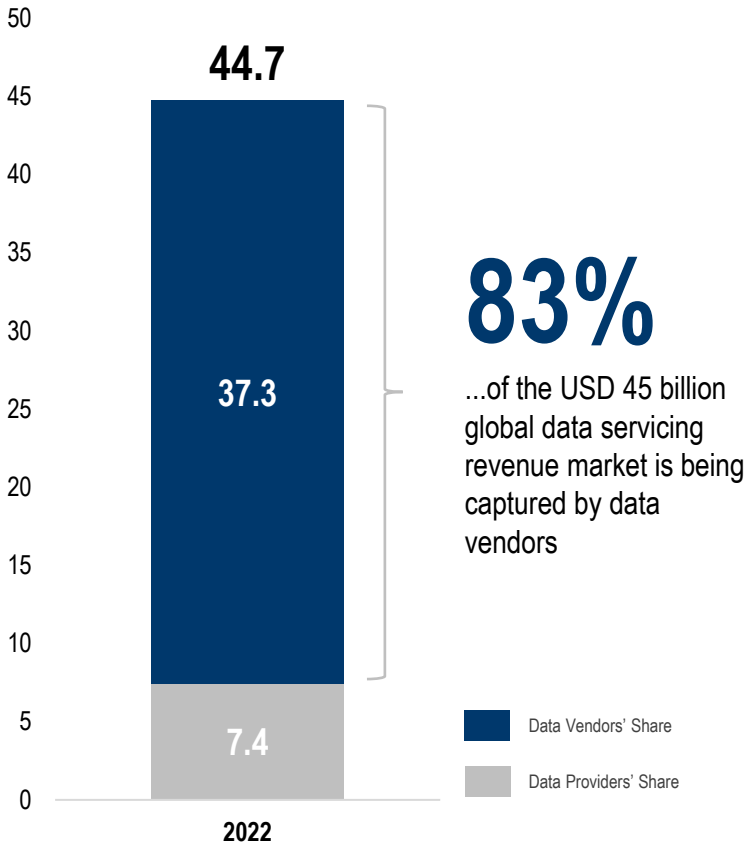
Data vendors currently capture 83% of the ~USD 45 billion global data servicing market data in 2022.

Competition for wallet share is driving many data providers to explore ways to service consumers directly, which requires providers to acquire new capabilities and build support functions.

# Competition for wallet share is driving data providers to acquire a greater portion of the data value chain

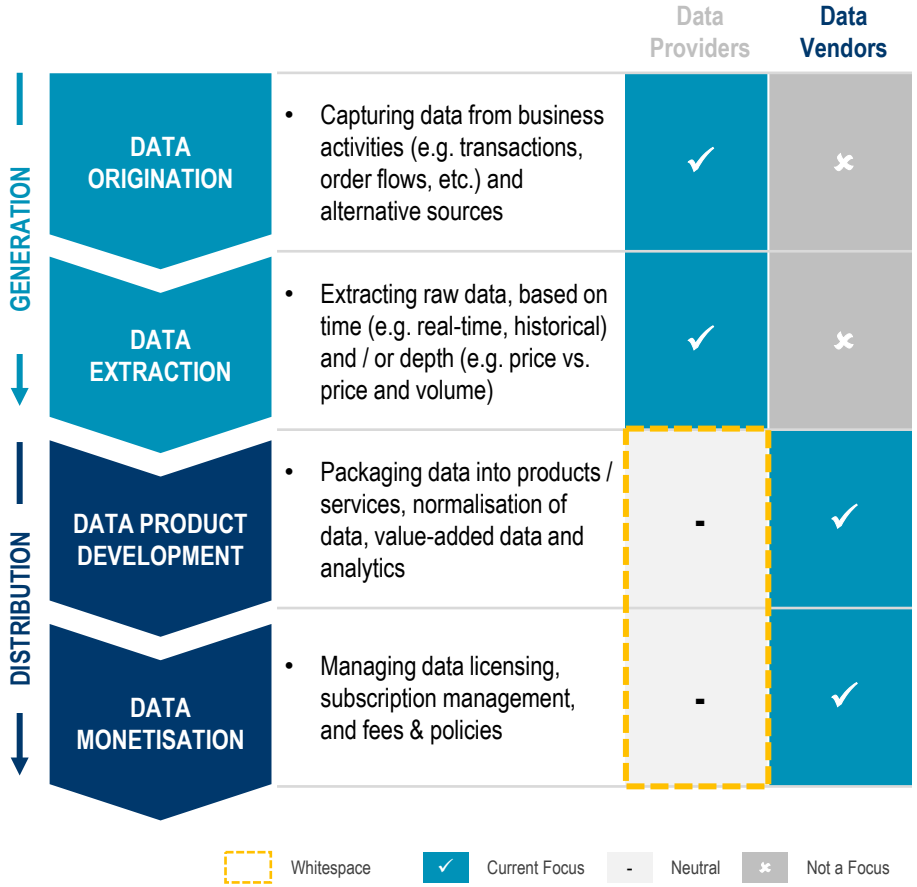
### Market Data Servicing Market Share

2022, USD billion




### Data Commercialisation Value Chain

From Origination to Monetisation




Source: World Federation of Exchanges, company disclosures, Quinlan & Associates proprietary research & estimates

# CONSOLIDATION

## KEY TAKEAWAYS

Some data providers have acquired data vendors to better serve their end consumers. However, this vertical integration strategy comes with significant costs.

For example, the London Stock Exchange Group ("LSEG") acquired Refinitiv in 2021 for USD 27 billion. While there was a notable increase in "Data Analytics / Information Services" revenue post-acquisition, much of this growth was attributed to the revenue that Refinitiv generated pre-acquisition, with the difference in revenue growth rates pre- and post-acquisition being negligible.

A similar story can be seen in the ICE's acquisition of Interactive Data in 2015.

# Several of the world's largest financial data providers are acquiring vendors to capture the revenue opportunities and reclaim control, albeit at a very high cost

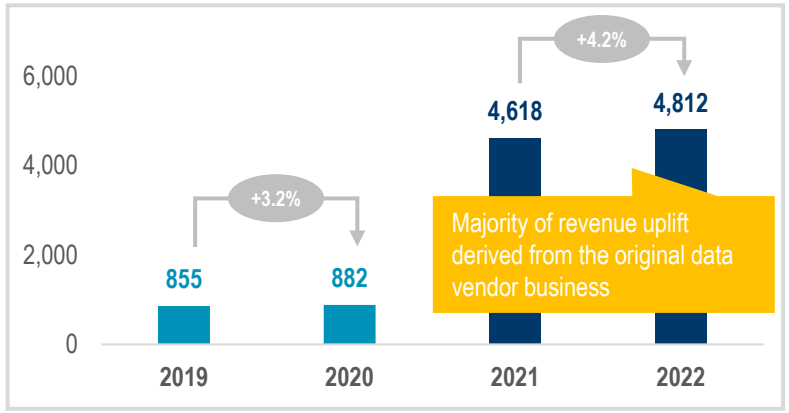
### Acquisition of Data Vendors
Case Study

LSEG ⟷ REFINITIV

In 2021, the London Stock Exchange Group ("LSEG") acquired Refinitiv, one of the largest providers of financial market data and analytics, transforming the exchange into a major data player

**USD 27 billion**
Acquisition Transaction Amount

### Data Analytics / Information Services Revenue
2019-2022, GBP million

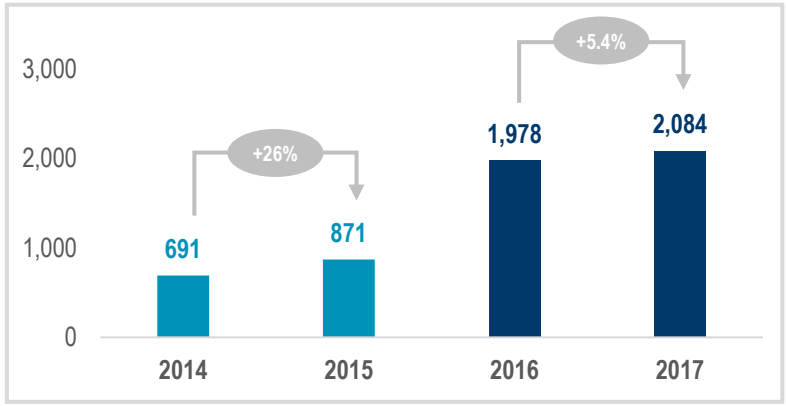



ICE ⟷ Interactive Data

In 2015, Intercontinental Exchange ("ICE") acquired Interactive Data Corporation ("IDC"), a leading financial data provider that specialises in alternative data, in order to expand its data offerings

**USD 5.2 billion**
Acquisition Transaction Amount

### Data Analytics / Information Services Revenue
2014-2017, USD million




Pre Acquisition  Post Acquisition

Source: LSEG, Refinitiv, ICE, Interactive Data, Quinlan & Associates analysis

SECTION 2

# CLOUD TO THE RESCUE

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# A NEW BEGINNING

## KEY TAKEAWAYS

Cloud adoption offers a more attractive proposition for data providers to capture monetisation opportunities across the value chain.

The technology not only offers cost-efficient and seamless data management but also provides a new way of operating market access, data servicing, and empowerment software, such as cloud-native application programming interfaces ("APIs") and artificial intelligence ("A.I.").

The race to cloud migration from various data providers has already begun, heralding a new era of cloud-powered infrastructure and data-driven innovation in the world of finance.

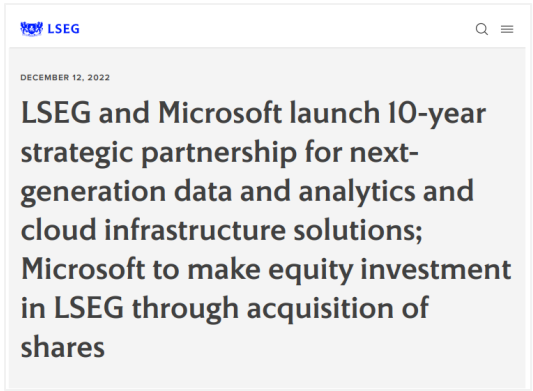
Notable investments and long-term partnerships have reshaped the landscape, including Microsoft's GBP 1.5 billion investment in the London Stock Exchange Group ("LSEG"), Nasdaq's collaboration with Amazon Web Services ("AWS"), and Google's USD 1 billion investment in CME Group.

## Cloud adoption is the cornerstone of the next stage of evolution in the capital markets ecosystem to fully unlock the potential of data-driven business opportunities

### Notable Cloud Partnership

LSEG / Microsoft (Dec 2022), CME / Google (Nov 2021), Nasdaq / AWS (Nov 2021)

LSEG Microsoft Azure


LSEG

DECEMBER 12, 2022

LSEG and Microsoft launch 10-year strategic partnership for next-generation data and analytics and cloud infrastructure solutions; Microsoft to make equity investment in LSEG through acquisition of shares

> *This strategic partnership is a significant milestone on LSEG's journey towards becoming the leading global financial markets infrastructure and data business.*

**David Schwimmer**
CEO, LSEG

CME Group Google Cloud


3 MIN READ PRESS RELEASE Save

CME Group Signs 10-Year Partnership with Google Cloud to Transform Global Derivatives Markets Through Cloud Adoption

By CME Group 03 NOV 2021

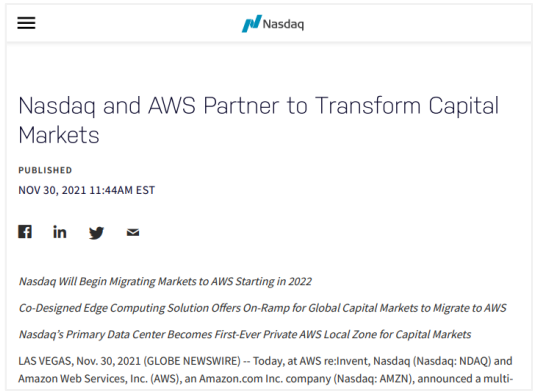
Companies to co-innovate to deliver expanded access, new products, and more efficiencies for all market participants

Google also makes $1B equity investment in CME Group

> *This partnership will enable CME Group to bring new products and services to market faster – all in a flexible and scalable environment that will create a wide range of opportunities for the marketplace.*

**Terry Duffy**
Chairman and CEO, CME Group

Nasdaq amazon web services


Nasdaq

Nasdaq and AWS Partner to Transform Capital Markets

PUBLISHED
NOV 30, 2021 11:44AM EST

*Nasdaq Will Begin Migrating Markets to AWS Starting in 2022*

*Co-Designed Edge Computing Solution Offers On-Ramp for Global Capital Markets to Migrate to AWS*

*Nasdaq's Primary Data Center Becomes First-Ever Private AWS Local Zone for Capital Markets*

LAS VEGAS, Nov. 30, 2021 (GLOBE NEWSWIRE) -- Today, at AWS re:Invent, Nasdaq (Nasdaq: NDAQ) and Amazon Web Services, Inc. (AWS), an Amazon.com Inc. company (Nasdaq: AMZN), announced a multi-

> *This landmark partnership with AWS seeks to power a truly cloud-based market infrastructure that is more resilient, scalable, and accessible for all market participants.*

**Adena Friedman**
President and CEO, Nasdaq

Source: LSEG, CME Group, Nasdaq, Quinlan & Associates analysis

# NEW MODEL: CLOUD DATA SHARING

## KEY TAKEAWAYS

Cloud data sharing is a complete game changer that offers data providers with an exceptional business case.

The setup requires migration to cloud, which allows real-time and seamless interaction between data and any proprietary and / or third-party data integration and application layers (e.g. cloud-native APIs, A.I., etc.).

Once the data platform is launched and operational, it allows data providers to:

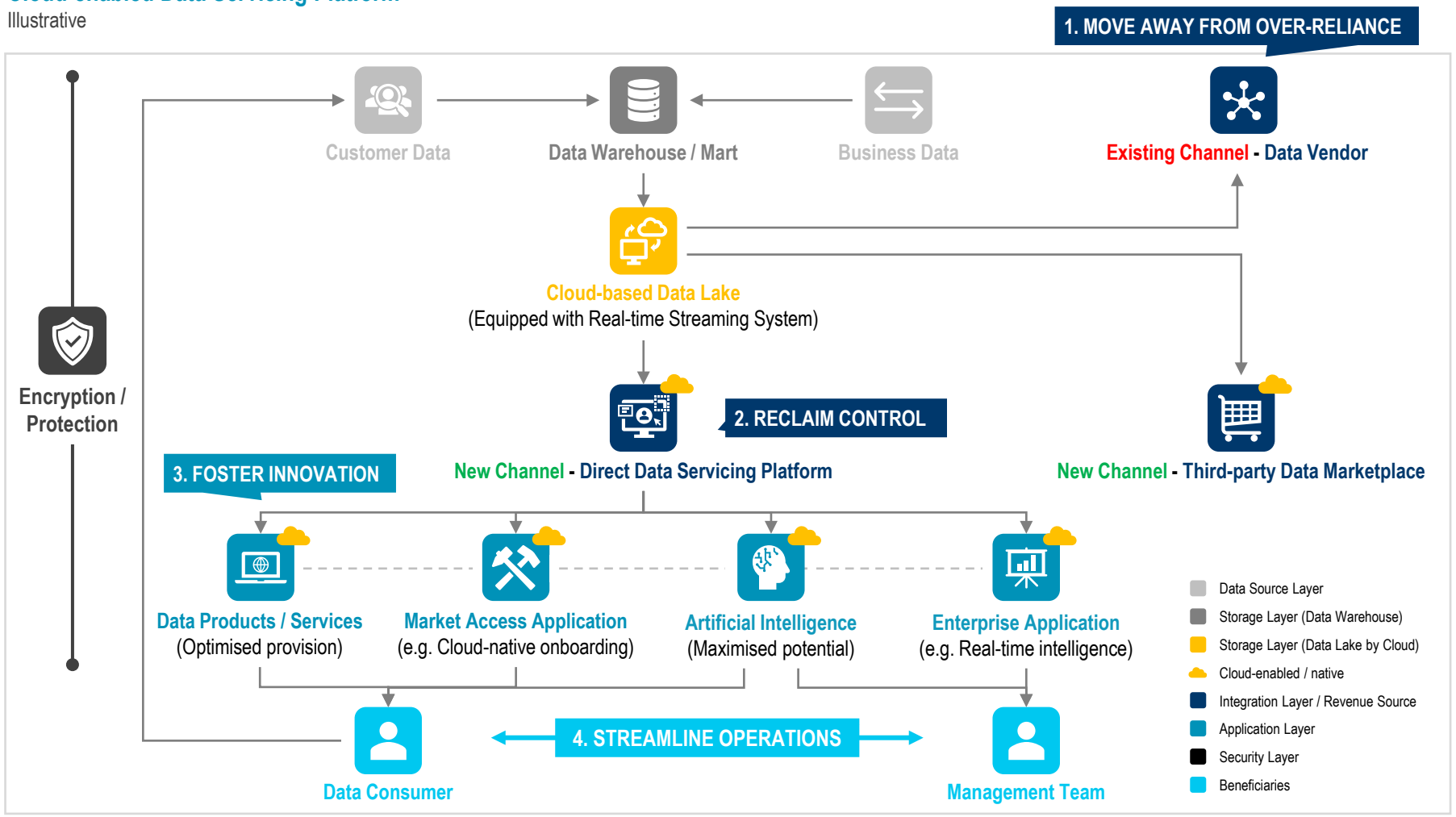
1. **Move away from overreliance** by opening up new monetisation channels, such as a direct data servicing platform and / or third-party data marketplace;
2. **Reclaim control** over user permissions and digital rights management, enhancing overall risk management;
3. **Foster innovation** by allowing data to seamlessly interact with data software; and
4. **Streamline operations** through real-time access to relevant data and timely updates on supporting cloud-native applications.



## Cloud-based data sharing requires migration to cloud infrastructure, which not only supports data commercialisation, but also digitally enables the entire business

### Cloud-enabled Data Servicing Platform

Illustrative




Source: Quinlan & Associates publication - The Real Lingua Franca (Part 2/2): Unlocking The Power of Data (2022)

# BENEFITS OF CLOUD SOLUTIONS

## KEY TAKEAWAYS

On top of the aforementioned empowerments, cloud infrastructure offers numerous benefits to both data service providers and data consumers relative to traditional on-premises databases:

- **Data Providers:** cloud allows data providers to manage operating costs and data capacity more efficiently and flexibly, with third-party cloud services offering on-demand pricing and instant deployment.
- **Data Consumers:** cloud enables users to access data products on demand, sourcing only what is required, when required, without having to worry about server failures.
- **Both:** cloud providers offer world-class security measures to protect data providers – and, ultimately, data consumers – against external cyber threats.



## Cloud infrastructure also provides efficient, cost-effective, and secure data environments for data consumers and providers, enabling on-demand access and optimised costs

### Benefits of Cloud Outsourcing

On-premises vs. Cloud-based Database

**BENEFITS OF CLOUD SOLUTIONS**

**On-demand Scalability**

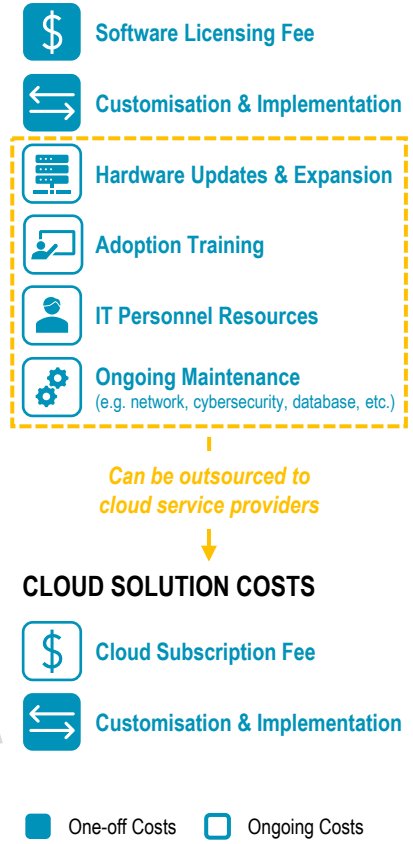
Cloud allows data service providers to dynamically and instantaneously reduce or expand server capacity, enabling seamless data operations

**Optimised Resource / Cost Efficiency**

Data service providers can effectively manage operating costs, given that the ongoing maintenance of hardware, software, and talent is fully outsourced

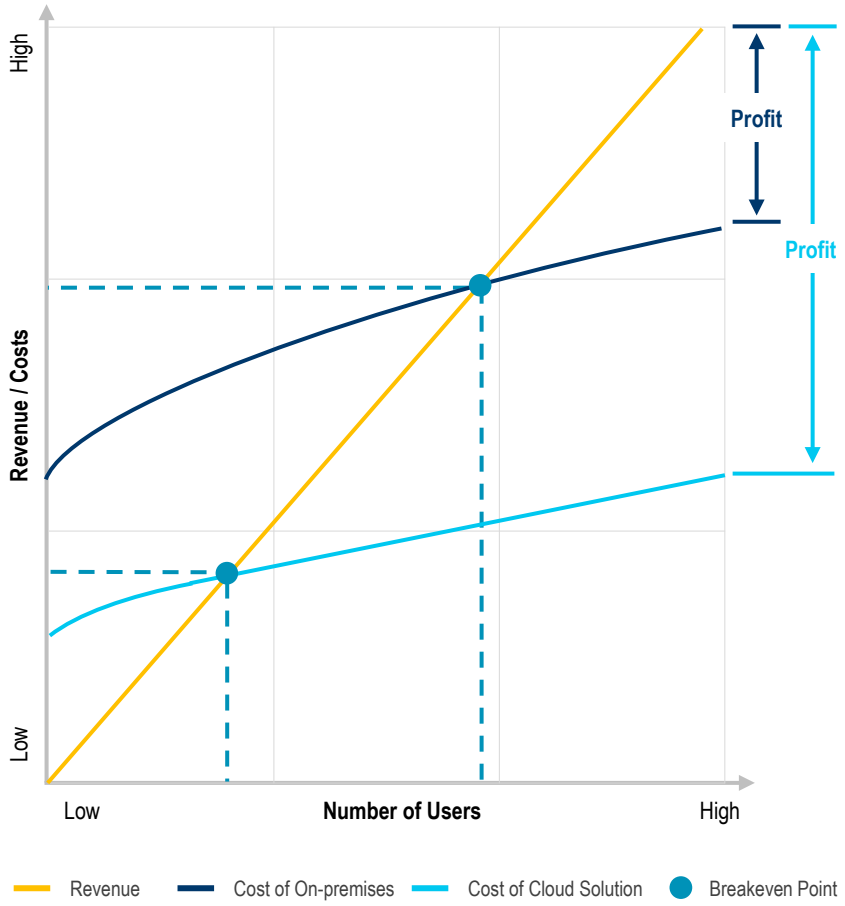
**Greater Cybersecurity**

Cloud service providers employ world-class cybersecurity measures to safeguard data providers and consumers from major cybersecurity threats




### Cost Benchmarking

On-premises vs. Cloud-based Database, Revenue / Costs vs. Number of Users




Source: Quinlan & Associates analysis

# DATA RIGHTS MANAGEMENT

## KEY TAKEAWAYS

As digital content grows via peer-to-peer file exchanges, torrent websites, and online piracy, data rights management ("DRM") is becoming increasingly crucial.

DRM assists companies in defending themselves against the cybersecurity threats that all businesses must contend with, including limiting software usage, safeguarding client data, guaranteeing and proving compliance, improving operational effectiveness, and avoiding downtime. Most importantly, DRM safeguards monetisation avenues for data / content providers.

A well-configured cloud environment streamlines the DRM process with real-time updates and automation. This empowers data providers with full transparency and control, while also offering users immediate content access or free trials to reduce onboarding hurdles.

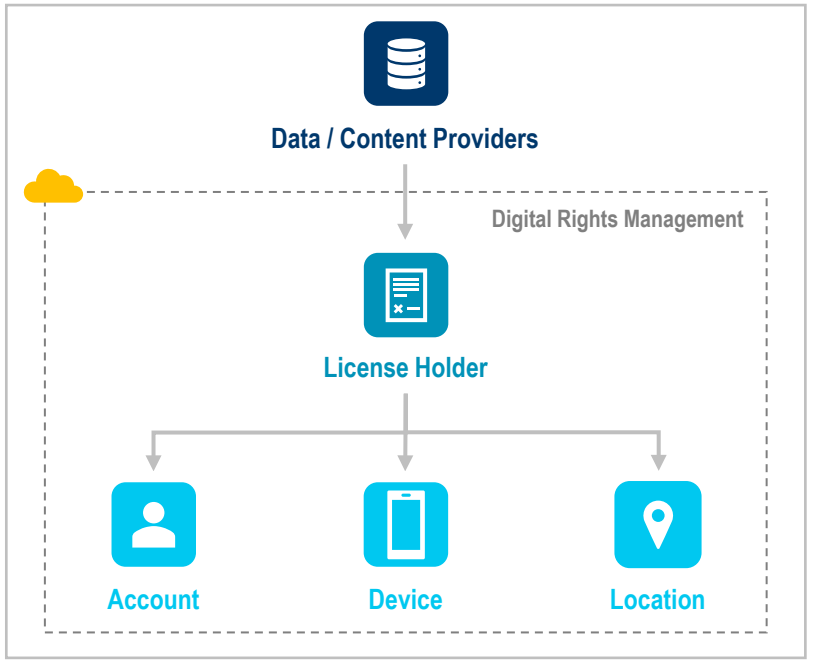
Data providers that embrace a cloud-based data distribution model will operate their businesses in a manner similar to platform-based media companies



# Data providers adopting cloud-based data distribution models can look to leverage lessons from content / media companies, especially with respect to data rights management

## Data Rights Management Process

Illustrative




### BENEFITS

- ✓ *Safeguarding Monetisation Avenues*
- ✓ *Protecting Critical IP*
- ✓ *Meeting Compliance Requirements*
- ✓ *Ensuring Cybersecurity*

## Data Rights Management in Practice

Examples

| Example | Method | Result |
|---|---|---|
| Microsoft | Anyone downloading the software must accept the company's user license and enter a key before installation | • *Track license compliance*<br>• *Prevent unauthorised use of its software* |
| iTunes | Audio files that users download from iTunes include data about customers' purchases and usage of songs | • *Prevent audio files from being accessed on unauthorised devices* |
| Healthcare Organisations | DRM enforces access controls to define and manage user permissions and access levels to health information | • *Protect health information*<br>• *Meet the HIPAA* requirements* |

*Health Insurance Portability and Accountability Act

Source: Microsoft, iTunes, Fortinet, Quinlan & Associates analysis

# LATENCY CONSIDERATIONS

## KEY TAKEAWAYS

Some data consumers are heavily reliant on real-time data as they operate in a very time-sensitive environment, such as securities trading firms, market-making firms, and many more. As such, some data providers (e.g. exchanges) provide access to ultra-low latency environments (i.e. co-location) via direct fibre-optic connection.

While cloud technology may not be ideal for ultra-low latency data consumers, the speed of information delivery through routed connections has improved significantly in recent years, reaching 50-100 milliseconds, faster than a blink of an eye (i.e. 100-400 milliseconds).

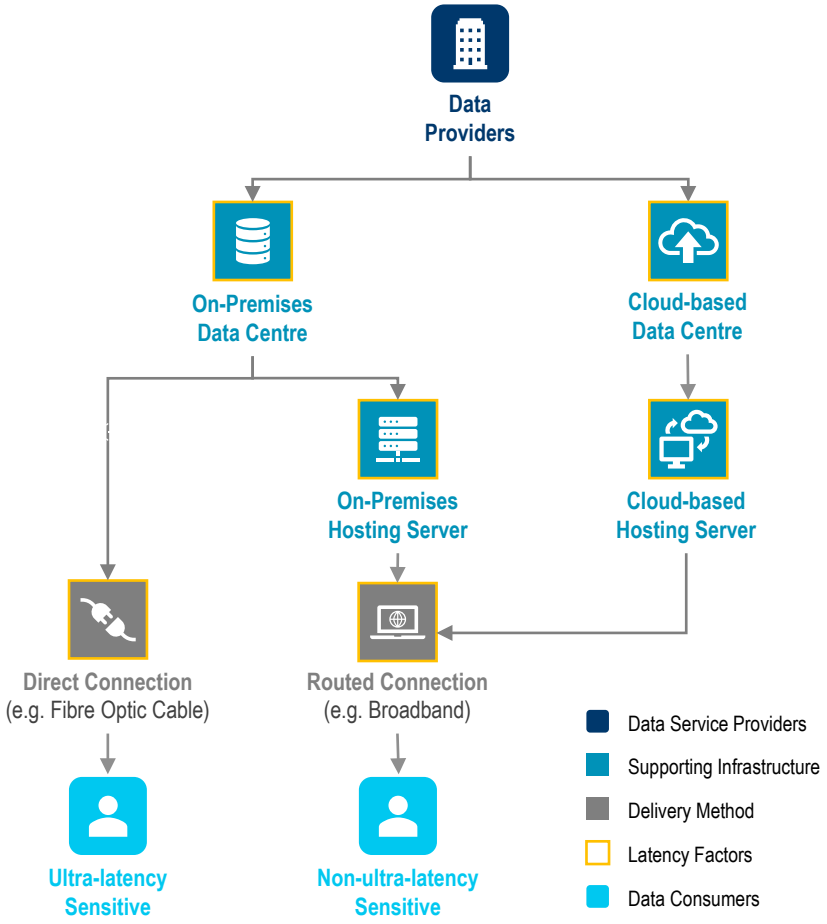
Such speeds satisfy the requirements of most real-time market data consumers, with only ~12% needing an ultra latency sensitive (< 2 milliseconds) environment, such as high-frequency trading firms.

Cloud storage and elastic computing principles are already being integrated into colocation environments.

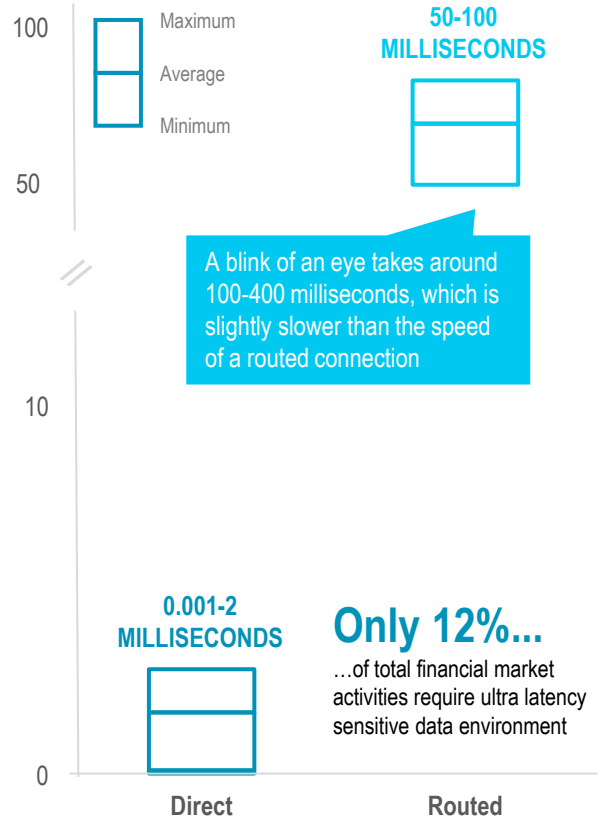


# Cloud is changing the value of speed; as cloud latency performance improves, only a small minority of consumers will benefit from the relative value of direct connections

### Direct vs. Routed Connection
Illustrative




### Direct vs. Routed Connection
Speed of Delivery, Milliseconds




Source: Quinlan & Associates analysis

# END-CONSUMER ACCESSIBILITY

## KEY TAKEAWAYS

Cloud-based database services are primarily offered by globally renowned information technology ("IT") companies, such as Microsoft, Google, and Amazon.

These companies serve ~5.8 million of the approximately 11 million corporations globally using cloud-based databases, or 51.6% of the total market, providing data providers with access to a large prospective customer base.

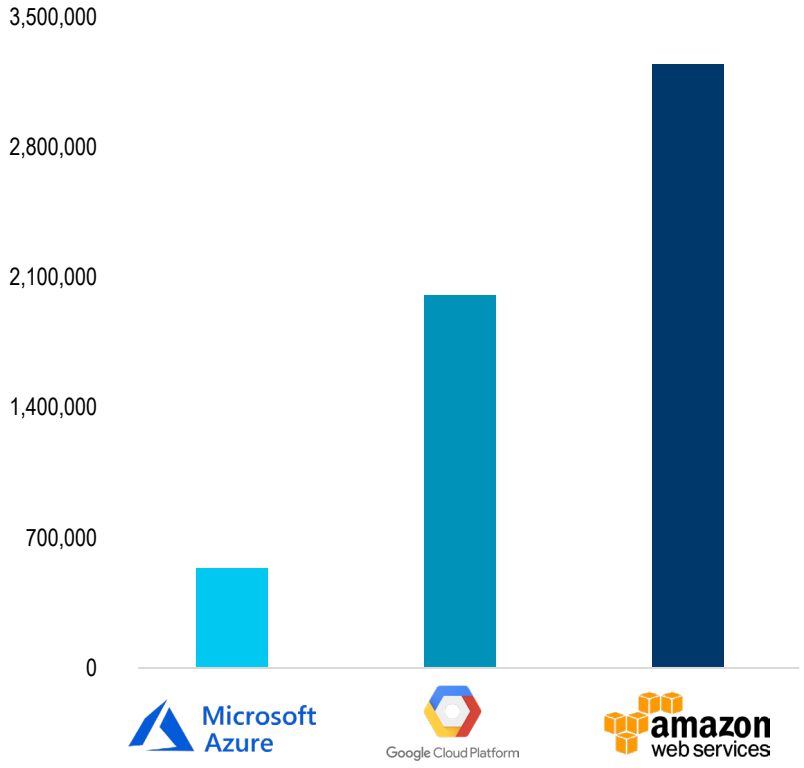
It is worth noting that 85.8% of the corporate clients served by the big three cloud providers generate annual revenues of less than USD 10 million.

Given that many data consumers with limited budgets are concerned about hefty subscription fees, such clients represent an ideal customer segment for data providers looking to expand their market reach.

# Cloud solution providers can also offer data providers access to their vast customer bases across various company sizes and sectors who are seeking market data solutions

### Total Number of Corporate Clients

Major Cloud Providers, 2022




| | Microsoft Azure | Google Cloud Platform | amazon web services |
|---|---|---|---|
| **Total Count** | **537,837** | **2,004,820** | **3,246,044** |
| *% Market Share* | *4.8%* | *17.9%* | *28.9%* |

### Aggregate Breakdown

By annual revenue and major sector

| By Revenue Size | % Total Count |
|---|---|
| < USD 1 million | **36.7%** |
| USD 1-10 million | **49.1%** |
| USD 10-50 million | **8.7%** |
| USD 50-100 million | **1.9%** |
| USD 100-200 million | **1.2%** |
| USD 200-1,000 million | **1.3%** |
| > USD 1 billion | **1.0%** |

| By Major Sector | % Major Sector |
|---|---|
| Retail | **9.9%** |
| Construction | **7.4%** |
| Information Technology | **7.3%** |
| Computer Software | **6.8%** |
| Hospital & Health Care | **6.3%** |
| Real Estate | **4.2%** |
| Financial Services | **4.1%** |
| Hospitality | **4.1%** |

Potential Interest Groups

Source: enlyft, Quinlan & Associates analysis

SECTION 2.1

# DATA PROVIDERS

# CLOUD DATA SHARING – DATA PROVIDERS

## KEY TAKEAWAYS

Exchanges are forming strategic relationships with the major cloud providers recognising that they are the future of infrastructure and will become important ecosystems.

Cloud providers recognise that exchanges are important sources of proprietary data, infrastructure demands for their own businesses and compute demand for their users.

As of 2022, 34% of global assets / securities exchanges globally had already migrated to cloud-based environments. These exchanges are actively exploring how they can best leverage the cloud to tap deeper into the market data ecosystem.

As they develop cloud distribution assets, most exchanges tend to start carrying third-party data given their relatively narrow proprietary data offerings. For customers, this lowers the costs of data acquisition, but the breadth of coverage remains narrow relative to the conventional data vendor offerings.

## Many assets / securities exchanges are already transitioning towards cloud-based data product / service offerings and distribution models

### Cloud Migration

Assets Exchanges

✓ Offered ✖ Not Offered

| | DATA TYPES | | DATA OFFERINGS | | | |
|---|---|---|---|---|---|---|
| Assets Exchanges | Proprietary Data | Third-Party Data | Files & Databases | Streaming Real-Time | Name of the Offering | Infrastructure Provider |
| Nasdaq | ✓ | ✓ | ✓ | ✓ | Nasdaq Data Link | AWS |
| LSEG | ✓ | ✓ | ✓ | ✓ | LSEG Data Platform | AWS / Microsoft Azure |
| CME Group | ✓ | ✓ | ✓ | ✓ | CME Smart Stream & CME Datamine | Google Cloud |
| ASX | ✓ | ✓ | ✓ | ✖ | ASX DataSphere | Google Cloud |
| DEUTSCHE BÖRSE GROUP | ✓ | ✓ | ✓ | ✖ | D7 | Google Cloud |
| Cboe | ✓ | ✖ | ✓ | ✓ | Cboe Global Cloud | AWS |
| TMX | ✓ | ✖ | ✓ | ✖ | TMX Datalinx | AWS |

Key Trend ✓ Offered ✖ Not offered

### NEW TREND

Exchanges are becoming vendors themselves as they look to leverage their cloud investments and broaden the range of content available to customers.

Source: Company disclosures, Quinlan & Associates estimates

# CASE STUDY (1/3) – NASDAQ

## KEY TAKEAWAYS

Nasdaq first migrated from an on-premises to a cloud-based database, which improved data collection processes across thousands of sources from its business operations.

Amazon S3 was used to form a data lake structure as part of the cloud migration, enhancing the flexibility and scalability of data use cases, particularly regarding extraction. AWS also offers cost-effective data archiving / backup services, ensuring business resiliency during unexpected risk events.

Through cloud migration, Nasdaq achieved enhanced data collection capabilities, faster data loading, optimised data querying, and improved business resiliency.

## CLOUD PARTNER(S)

amazon web services

## By facilitating cloud enablement, Nasdaq has yielded substantial benefits, including: (1) higher storage capabilities; (2) efficient data loading; and (3) efficient data querying

### Cloud Migration

Description

Nasdaq amazon web services

**Data Warehouse Migration**

Migrated from on-premises data warehouse to an AWS* warehouse

**Improved Data Collection**

Collect financial market data from thousands of different sources on a daily basis

**Data Lake Formation**

Built the foundation for a new data lake on Amazon S3

**Compute / Storage Separation**

Enable a separation between computing and storage, facilitating greater flexibility and scalability

**Data Archive & Backup**

Used Amazon S3 Glacier for data archiving and long-term backup

**Enhanced Cost Management**

Archiving data in a cloud-based environment can be more cost-effective

### ✓ Enhanced Collection Capability

*Data collection reached 70 billion records per day, on average, with a whopping peak volume of 113 billion*

### ✓ Faster Data Loading

*Reached its 90% mark for market data loading completion 5 hours earlier than before*

### ✓ Optimised Data Querying

*By optimising its data warehouse, Nasdaq was able to run Amazon Redshift queries 32% faster*

*Amazon Web Services

Source: Nasdaq, AWS, Quinlan & Associates analysis

# CASE STUDY (2/3) – LSEG

## KEY TAKEAWAYS

Microsoft Azure migration equipped LSEG with comprehensive infrastructure and integrated capabilities.

By leveraging these new capabilities, LSEG can re-platform its legacy Refinitiv infrastructure unloading costs and unlocking new integration potential across real-time market data, historical market data, and financial news.

LSEG also maintains its AWS partnership for many products and services illustrating a multi-cloud strategy in action.

## CLOUD PARTNER(S)

Microsoft Azure

amazon web services



## Supported by cloud enablement, robust data access controls, and efficient data querying, LSEG has the opportunity to reinvent itself

**Data Servicing**
Description

LSEG | Microsoft Azure | amazon web services

### DATA ACCESS CONTROL

Integrating Active Directory with Cloud Identity and Access Management ("IAM") controls

### COMPREHENSIVE CONTROL

Receives comprehensive access control linking sources to consumer desktops and distributed enterprise environments

### DATA QUERYING

Leveraged Microsoft Power BI and SQL enables data querying in the data warehouse and Amazon S3 data lake

### OPERATIONAL EFFICIENCY

By turning various data-like orders and cancellations into messages and archiving them, billing and reporting surveillance are enhanced

### API DEVELOPMENT

Developed API capabilities to allow access to financial data (including real-time market data) through cloud-based technology

### SEAMLESS EXPERIENCE

LSEG could facilitate one of the best-in-class customer experience via greater efficiency, flexibility, and scalability

**Real-Time Market Data** → **Historical Market Data** → **Financial News**

Source: LSEG, Microsoft Azure, AWS, Quinlan & Associates analysis

# CASE STUDY (3/3) – CME GROUP

## KEY TAKEAWAYS

CME made a bold move into cloud starting with Datamine for cloud data queries and then creating SmartStream for real-time distribution.

CME leverages DataBP for automated customer onboarding for both DataMine and SmartStream automating data access entitlements by linking to digitalised data licensing agreements. A clear success case enabling instant access to real-time data via the cloud over standard messaging protocols, providing consumer applicating with direct data access without the need for expensive ticker plants.

## CLOUD PARTNER(S)

Google Cloud

dataBP



# CME's SmartStream product provides instant access to streaming data via Google Cloud enabling applications to access real-time data directly without the need for a ticker plant

## CME

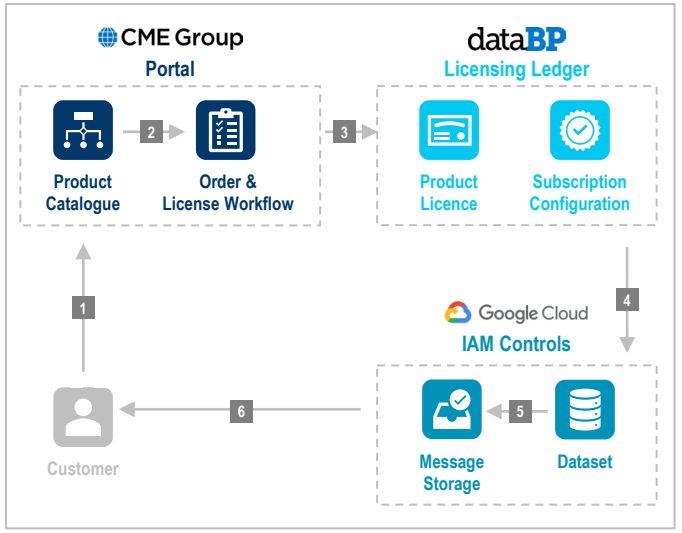
Description

CME Group Google Cloud dataBP

CME is the world's leading and one of the most diverse derivatives marketplaces that is partnering with Google Cloud to migrate its services to the cloud and launch new products / services such as analytics services

## Business Model

Data & Information Services




## CME Smart Stream

Steps and Benefits

| Steps | | Benefits |
|---|---|---|
| 1 | **Data Subscription**<br>Customers subscribe to a topic to receive certain data on an on-demand, pay-as-you-go basis | *Customers can enjoy cost savings on data access* |
| 2 | **Product Configuration**<br>The product team can define content packages through a management portal | *Integrates the customer experience for product access* |
| 3 | **Data Licensing**<br>Data providers may license their data to provide customers the rights to use data downstream | *Gain control over data with monetisation opportunity* |
| 4 | **Entitlements**<br>Send user credentials and entitlement instructions automatically by using the API | *Seamless access to cloud data and services* |
| 5 | **Data Storage**<br>Message storage ensures that published messages are retained on behalf of the subscription | *Provides secure and reliable storage of data* |
| 6 | **Message Distribution**<br>Data is distributed using standard messaging to each subscription via Google pub / sub | *Standardise the distribution of data via message* |

Source: CME, DataBP, Google Cloud, Quinlan & Associates analysis

# RECLAIMING THE VALUE CHAIN

## KEY TAKEAWAYS

Database migration from on-premises to cloud environments enables data providers to reclaim the market data value chain, which has long been dominated by data vendors.

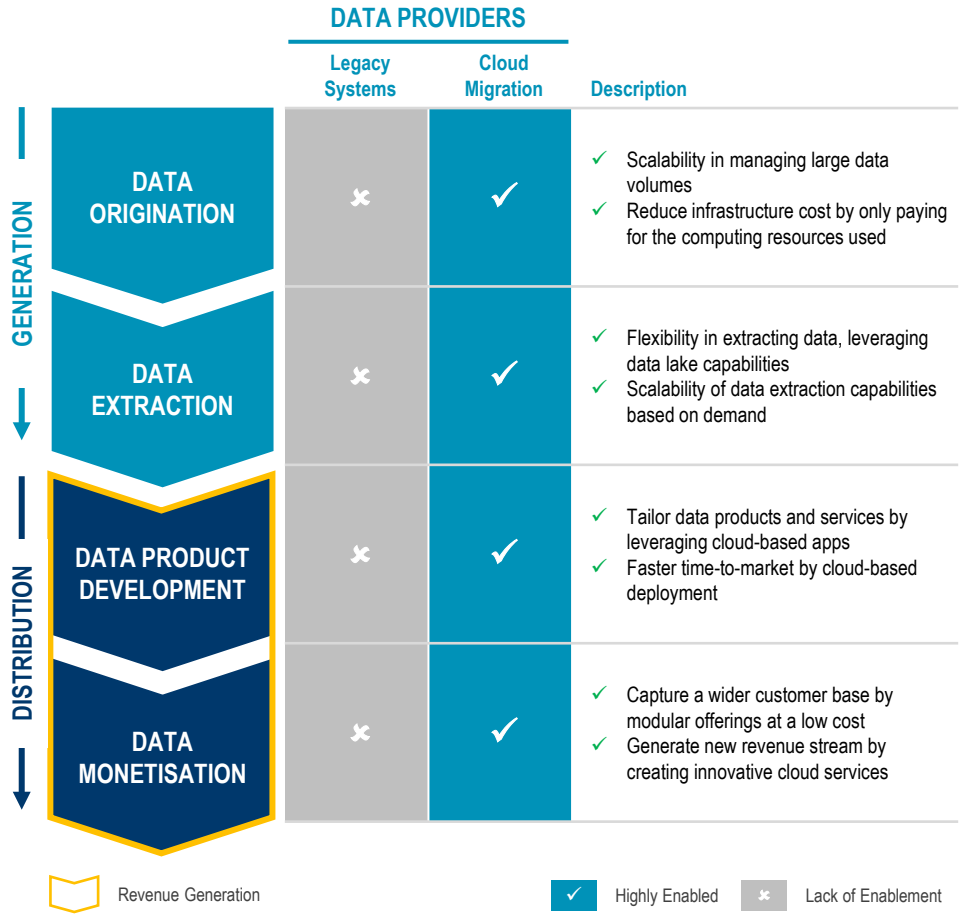
We forecast data servicing revenue to grow at a CAGR of 12% from 2022-25 to reach USD 64 billion, underpinned by a growing number of data providers migrating to the cloud and monetising their data without relying solely on data vendors.

We anticipate the total market share of data providers to increase from 16.6% in 2022 to 28.8% in 2025.

## We believe the cloud can enable data providers to take back ownership of data product innovation and monetisation, capturing revenue that would otherwise go to data vendors

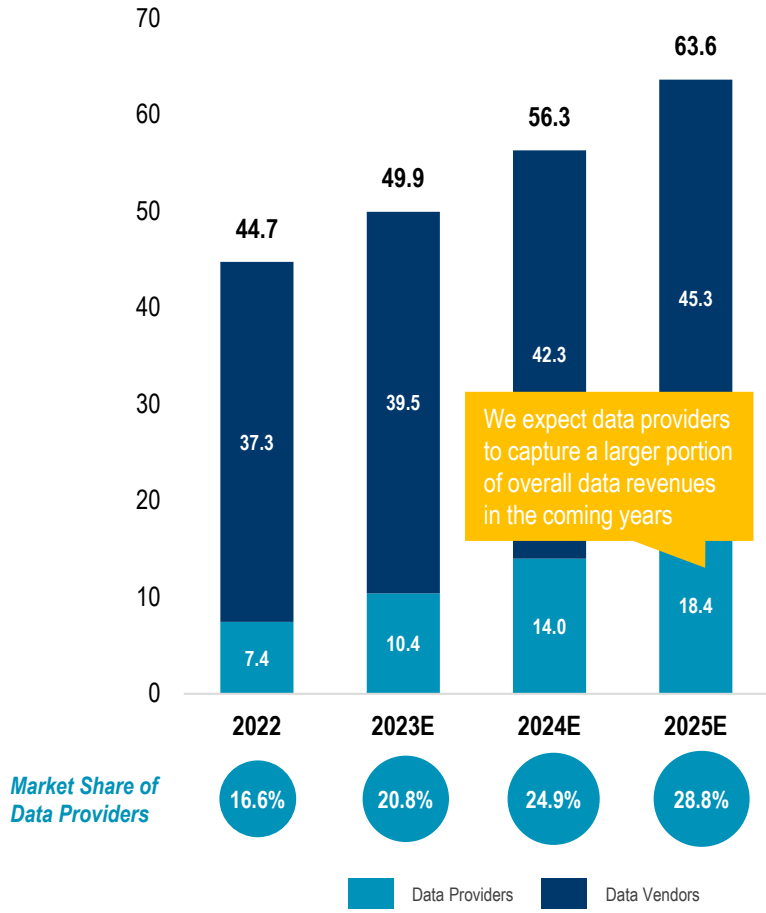
### Data Value Chain

Data Providers' Perspective




### Data Servicing Revenue

2022-25E, USD billion




Source: World Federation of Exchanges, company disclosures, Quinlan & Associates proprietary research & estimates

SECTION 2.2

# DATA VENDORS

# CLOUD DATA SHARING – DATA VENDORS

## KEY TAKEAWAYS

Recognising the benefits and potential disruption cloud technology can bring to their business models, many data vendors are also migrating to the cloud, offering cloud-based data services such as data feeds and real-time data.

These moves are both offensive and defensive in nature.

From an offence perspective, data vendors recognise the ability to capture long-tail data consumers unwilling to purchase bundled products (e.g. terminal access).

From a defensive perspective, there is an understanding that a growing number of data providers are looking to offer their products directly to end consumers.

## Understanding the threats and opportunities posed by cloud, a growing number of data vendors are also migrating to the cloud

### Competitive Benchmarking

2022, Cloud-based Real-time Data Specific

| | | CLOUD DATA SERVICE | | DATA OFFERINGS | | | |
|---|---|---|---|---|---|---|---|
| Companies (Data Vendors) | Data Source (#) | Cloud-native Data Feed | Cloud-based Real-time | Raw Data | Normalised Data | Name of the Offering (Cloud / Real-time Data) | Cloud Partner (Infra. Provider) |
| Bloomberg | 330+ (Exchanges) | ✓ | ✓ | ✓ | ✓ | B-PIPE | AWS* / Microsoft Azure / Google Cloud |
| REFINITIV | 250+ (Exchanges) | ✓ | ✓ | ✓ | ✓ | Refinitiv Data Platform | AWS / Microsoft Azure / Google Cloud |
| QUODD | 150+ (Exchanges) | ✓ | ✓ | ✓ | ✓ | Cloud Streaming | AWS |
| S&P Global | 200+ (Exchanges) | ✓ | ✓ | ✓ | ✓ | S&P Capital IQ | AWS |
| FACTSET | 200+ (Exchanges) | ✓ | ✓ | ✓ | ✓ | Exchange DataFeed | AWS* / Microsoft Azure* / Google Cloud |
| dxFeed | 36 (Exchanges) | ✓ | ✓ | ✓ | ✓ | dxFeed Cloud Platform | AWS |
| ALPHA VANTAGE | 9 (Exchanges) | ✓ | ✓ | ✓ | ✓ | Alpha Vantage | AWS |
| polygon.io | 6 (Exchanges) | ✓ | ✓ | ✓ | ✓ | Polygo.io | Google Cloud |
| barchart | - | ✓ | ✓ | ✓ | ✓ | OnDemand | AWS |
| IEX Cloud | - | ✓ | ✓ | - | ✓ | IEX Cloud | AWS |

*Major infrastructure provider

Source: Company disclosures, Quinlan & Associates analysis

✓ Offered - Unspecified / Not Applicable ✖ Not Offered

# BLOOMBERG B-PIPE

## KEY TAKEAWAYS

Famous for its physical terminal that provides financial market data from more than 300 different sources, Bloomberg is widely considered to be the leading data vendor in the financial services industry.

Bloomberg terminals are usually sold on an annual subscription basis, with a price of USD 24,240 per year (as of 2022).

Understanding data consumer pain points around slow deployment times (due to the terminal installation) and hefty price tags, Bloomberg introduced a cloud-based data product called “B-Pipe”, with the help of AWS.

Through B-Pipe, Bloomberg is offering modularised data products that can be better tailored to various consumer needs.

## For example, Bloomberg introduced a cloud-based data product called “B-PIPE”, with the help of AWS, to address data consumers’ common pain points

**B-Pipe by Bloomberg**
Data Consumer Pain Points & B-Pipe Proposition

**1**

***PACKAGED OFFERING***
*As of 2022, each Bloomberg terminal costs from USD 24,240 up to 27,660 in two years lease contract*

**MODULARISED OFFERING**
B-Pipe provides modularised data products, which offer data consumers greater flexibility and control

**2**

***DELAYED DEPLOYMENT***
*Given the required physical installation, end-to-end set-up can take a significant amount of time*

**RAPID DEPLOYMENT**
Without the need for physical installation, B-PIPE can be deployed within minutes after the purchase

**3**

***SPACE REQUIRED***
*Bloomberg terminals, circuits, servers, and switches require a significant amount of physical space*

**SPACE NOT REQUIRED**
Through migration to the cloud, the required physical space (e.g. rack space) is no longer needed

**REAL-TIME DATA**
Real-time data refers to information disseminated to users at a speed that is near-instantaneous or has a very short delay

**DELAYED DATA**
Delayed data refers to information disseminated to users with a time lag, usually within 10-20 minutes behind real-time quotes

**HISTORICAL DATA**
Non-real-time data including end-of-day summary and tick data, which is mostly used for projecting pricing trends and computing market risks

Source: Bloomberg, Quinlan & Associates analysis

SECTION 2.3

# DATA MARKETPLACES

# NEW CLOUD-BASED DISTRIBUTION CHANNEL

## KEY TAKEAWAYS

Both direct and indirect distribution models serve distinct data consumer priorities – flexibility in data selection and subscription fees with the former and user experience with the latter.

However, flexibility and user experience may not necessarily be mutually exclusive trade-offs.

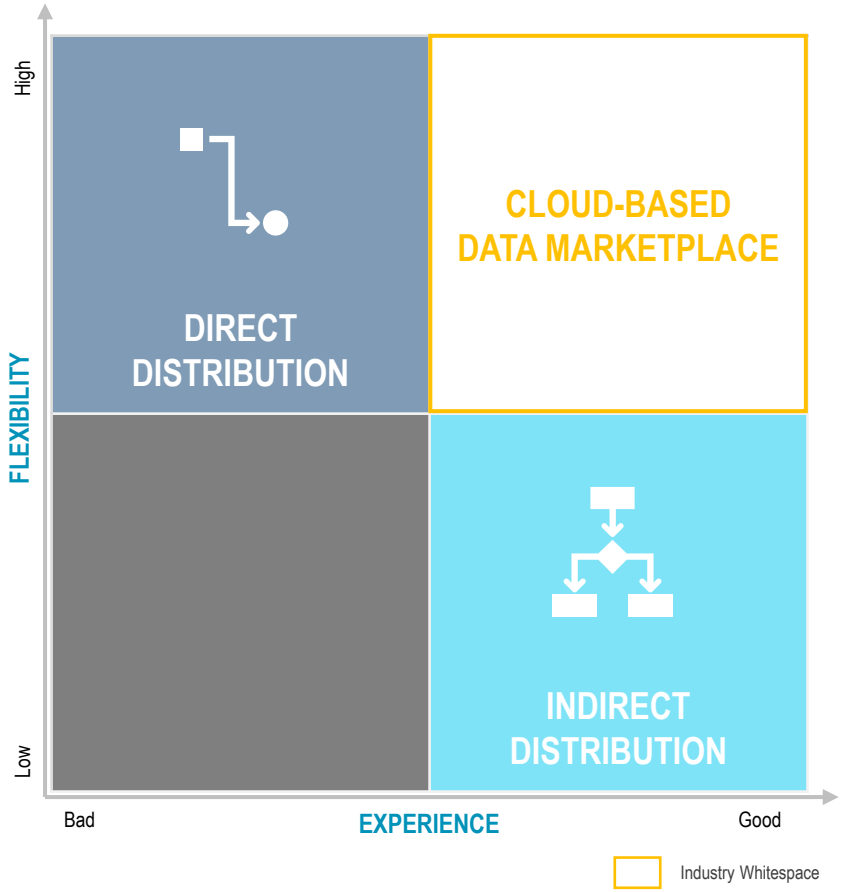
With the help of cloud technology that enables the market data ecosystem via a data lake facility, it is possible to fulfill both flexibility and user experience requirements simultaneously.

## With more data service providers shifting to cloud environments, cloud-based data marketplaces can offer enhanced data commercialisation and consumption experiences

### Market Inefficiencies

Flexibility vs. Experience

| | FLEXIBILITY | EXPERIENCE |
|---|---|---|
| DIRECT MODEL | **High**<br>Consumers can access relevant data at lower costs, without the need to install and pay for vendors' full suite of tools or terminals | **Fragmented**<br>The consumption experience is highly fragmented, which requires customers to convert and process data using tools themselves |
| INDIRECT MODEL | **Low**<br>Consumers have to sign up for aggregated / bundled data services / terminals, which are highly priced and often include irrelevant data | **Seamless**<br>Data is already normalised and processed by data vendors for easier consumption by the customers |




Source: Quinlan & Associates analysis

# CLOUD-BASED DATA MARKETPLACE

## KEY TAKEAWAYS

The cloud-based data marketplace leverages a data lake facility to optimise the data commercialisation and consumption experience by granting an elevated degree of control to both data providers and consumers.

In a cloud marketplace, data providers and vendors only need to upload data, following which the data lake packages and structures the data by interacting with a query tool.

Consumers only need to request data through this query tool, which will extract and structure data for their specific consumption needs.

Simultaneously, the management of licensing, billing, summarisation of insights, data revisions, and auditing services will be overseen by the cloud service provider.

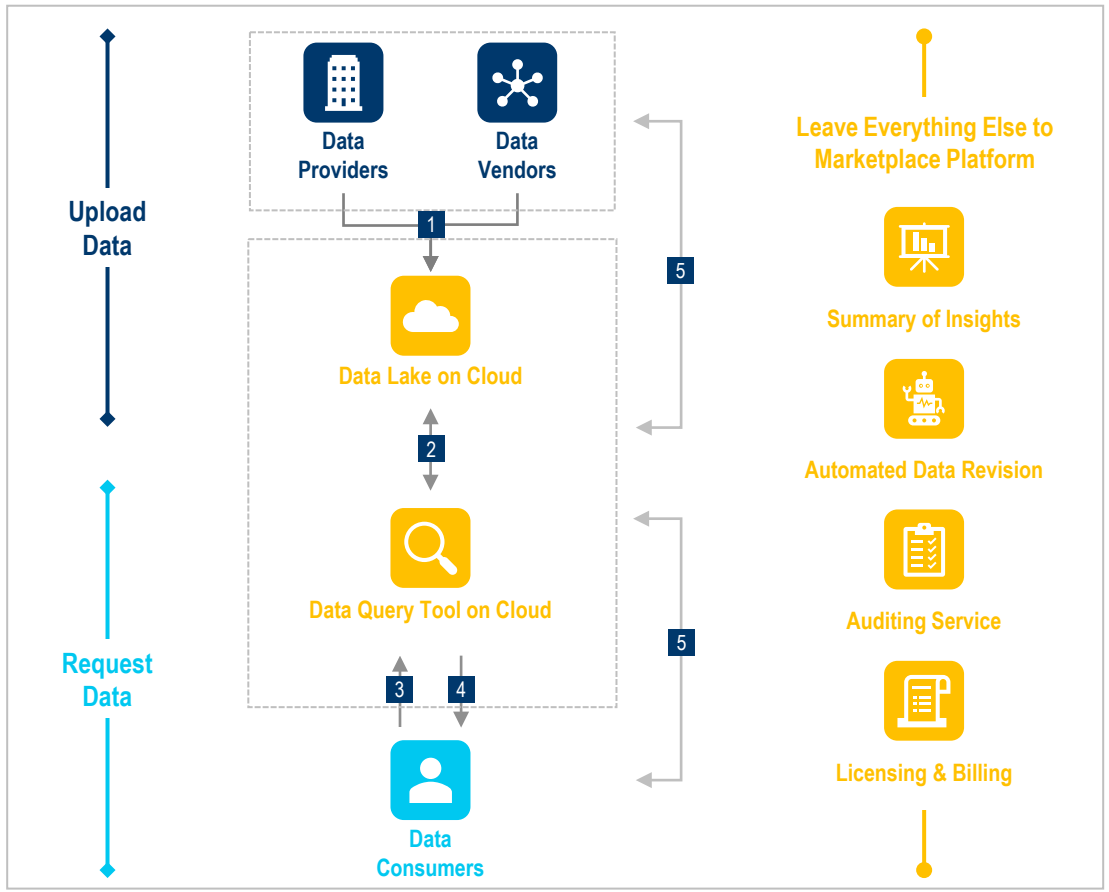
## DATA MARKETPLACE PLATFORMS

snowflake amazon web services



## Cloud-based data marketplaces seek to empower both data consumers and service providers with a higher degree of flexibility and control across the data usage journey

### Cloud Marketplace
Overview




**1 DATA UPLOAD**
Data provider / distributor uploads their data to the cloud

**2 DATA PACKAGING**
Data lake on the cloud interacts with data query tool to structure the data

**3 DATA REQUEST**
Data consumer with specific asks requests data through a query tool

**4 DATA DISTRIBUTION**
Data query tool on the cloud extracts and structures data for end-user consumption

**5 DATA LICENSING & BILLING**
Licensing and billing are supported in a centralised manner by the marketplace

Source: AWS, Snowflake, Quinlan & Associates analysis

# POTENTIAL BENEFITS & ROADBLOCKS

## KEY TAKEAWAYS

Cloud-based data marketplaces provide a potentially attractive alternative to using data vendors, allowing data providers to gain direct consumer visibility while providing consumers with a lower-cost alternative and embedded tools for consumption.

However, these marketplaces have shown limited uptake due to:

- **Commercial Misalignment** – These platforms charge participation fees, which reverse the model data providers use with data vendors and potentially raise concerns about fair access issues;
- **Data Licensing & Verification** – Data providers rely on a licensing-based business model, similar to that of the media industry. Currently, associated data licenses require separate, manual onboarding processes; and
- **Technical Limitations** – A lack of support for streaming data means limited utility for market data use cases.



Despite the significant benefits that data marketplaces can provide to both data providers and consumers, they have struggled to gain significant traction

## POTENTIAL BENEFITS

### CONSUMER COVERAGE

Data providers can access a broader consumer base active on cloud-based marketplace platforms

### REDUCED TIME TO INSIGHT

Data providers can reduce 'time to insight' for consumers to identify value in new data products

### REDUCED COST OF CAPABILITY ACQUISITION

Data providers do not need to set up technology infrastructure or employ labour for execution

### NATIVE INTEGRATION

Native data integration with cloud and its ancillary capabilities (e.g. IAM, multi-cloud compatibility, etc.)

### ACCOUNT & BILLING & LICENSING

Account, billing, and licensing are handled by the service provider under a single account

### DATA DISTRIBUTION

Data can be shared in a format specifically requested by the data consumers

## ADOPTION ROADBLOCKS

### INCOMPATIBLE COMMERCIAL MODEL

Marketplace participation fees contradict the conventional commercial models and raise potential fair access issues

### DATA LICENSING

Market data in the financial sector is primarily licensed, not sold on demand

### POLICY COMPLIANCE ENFORCEMENT

Lack of data policy enforcement mechanisms increases compliance risk

### OPERATIONAL LIMITATIONS

The absence of real-time streaming data support significantly restricts market data use cases

**LIMITED UPTAKE**

Source: DataBP, Quinlan & Associates analysis

# DATA MARKETPLACE DIGITAL RIGHTS MODEL

## KEY TAKEAWAYS

Data licensing plays a critical role in the commercial models for data providers. Integrating data licensing and rights management provides a path forward:

- **Current Model:** Data access is managed via a shopping cart check-out process. Data licensing processes are managed separately. Usage policies must be enforced by each consumer.
- **Integrated Model:** Data licensing workflows are integrated with data marketplaces via API allowing data providers to maintain control and customer visibility. Digital rights management technology enforces policies in consumer applications allowing the data marketplace provider and data consumer to avoid the administrative burdens of managing data policy compliance.

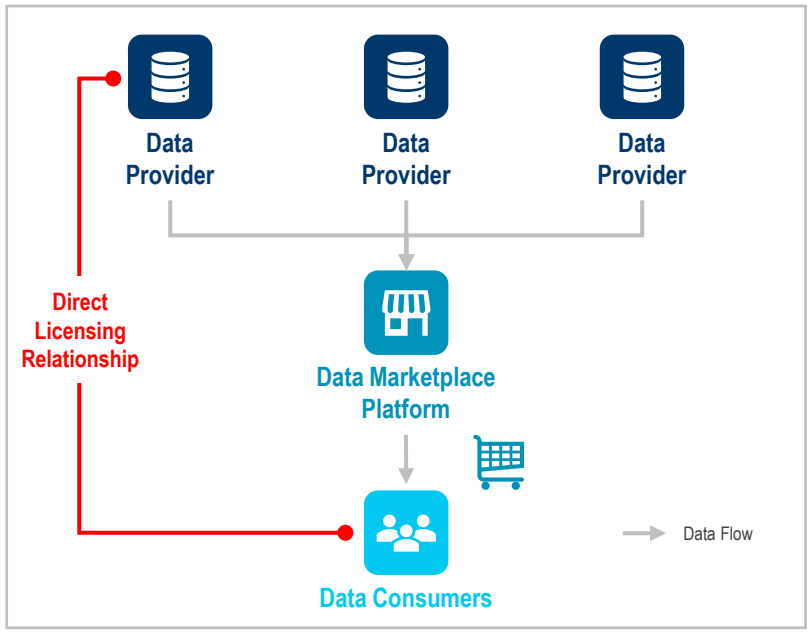
Similar techniques have been used in streaming media consumption for years. As more workloads move to the cloud, we see the integrated model emerging to better support data monetisation.



## Integrated data licensing processes and digital rights management techniques have the potential to significantly improve the data marketplace model

### SHOPPING CART MODEL

*Current*




#### BENEFITS

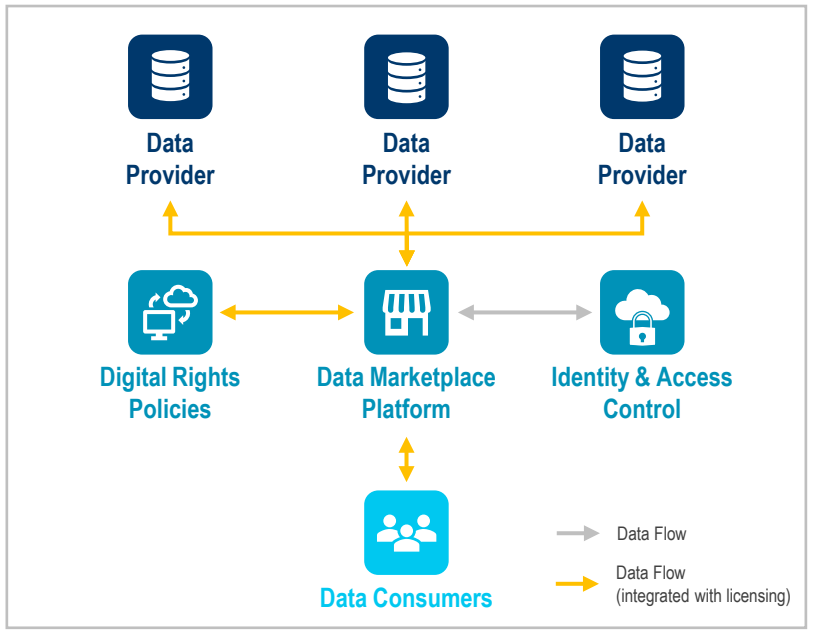
- ✓ *Lower cost of acquisition for customers*
- ✓ *Integration with cloud services and tools (e.g. Snowflake)*

#### CHALLENGES

- ✖ *Direct licensing relationships require a separate out-of-band verification process increasing onboarding friction*

### INTEGRATED MODEL

*Future*




#### BENEFITS

- ✓ *Data providers maintain full control and customer visibility*
- ✓ *Data marketplace providers and consumers avoid administrative burdens*
- ✓ *Data marketplace as "trustless agents", provides data to a wider customer base and eliminates the costs (and risks) typically associated with data redistribution*

Source: DataBP, Quinlan & Associates analysis

# DATA MARKETPLACE WHITE-LABELLED MODEL

## KEY TAKEAWAYS

A potential new model combines the benefits of data marketplaces without the costs of building individual data shops through white-labelling, similar to how Shopify became a global e-commerce leader.

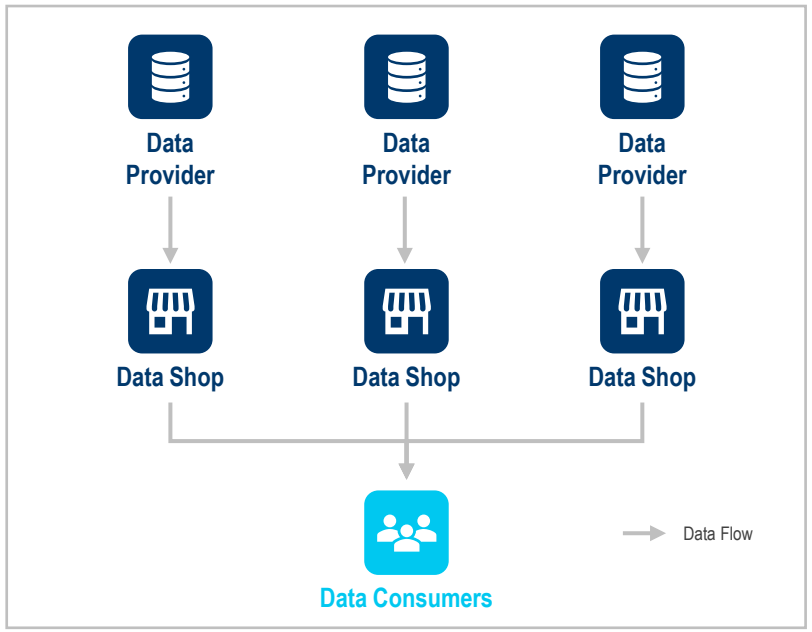
White-labelled data marketplaces will enable customised and data provider-branded versions of data marketplaces, which will allow the providers to directly control data access, maintain customer visibility, and enforce data policy compliance while avoiding the expenses associated with managing their own web shops.

Integrated data distribution and acquisition methods mean that proprietary data products are also available to data marketplace consumers (Snowflake, Amazon Data Exchange, etc.) without having to be managed separately.

Data marketplaces may provide a '*White-labelled*' alternative to each data provider's individual '*Data Shop*' and a convenient single one-stop-shop for data consumers

## DATA SHOP MODEL

*Current*

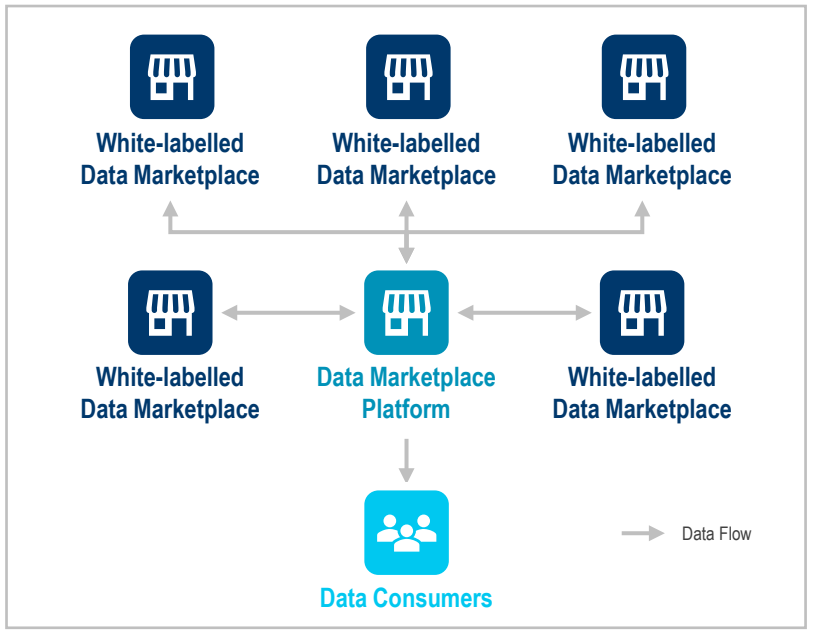



### CHALLENGES

- ✖ *Individual data shops developed and operated by each data provider for a narrow range of proprietary products*
- ✖ *Consumers manage multiple points of data acquisition*

## WHITE-LABELLED MODEL

*Future*




### BENEFITS

- ✓ *Avoids* the costs associated with managing individual data shops
- ✓ Benefits from the reach (convenience to consumers) without losing control or customer visibility
- ✓ *Allows data marketplaces to avoid the costs and administrative burdens associated with becoming a licensed redistributor ("vendor of record")*

Source: DataBP, Quinlan & Associates analysis

SECTION 3

# IMPLEMENTATION CONSIDERATIONS

dataBP QUINLAN &ASSOCIATES

# IMPLEMENTATION CONSIDERATIONS

## KEY TAKEAWAYS

The term “cloud” can be used broadly in different contexts, and such usage can create confusion in the market.

To this end, it is critical to delineate the term “cloud” based on whether it is used to describe a “database” or “business”, which are independent of one another.

For example, cloud migration, which refers to the migration from on-premises to cloud-based databases, concerns the “database”, while cloud-based data service refers to companies leveraging the capabilities offered by the “cloud databases” and monetising them to create additional revenue sources.

In other words, just because a company migrates to a cloud environment does not mean the company can magically start to monetise its data via the cloud – new capabilities need to be acquired, particularly in the context of data business operations.



## To achieve a seamless migration to the cloud, corporates must take into account a comprehensive array of strategic, operational, and financial considerations

**Considerations**
Strategic, Operational, and Financial Factors

| | | | | |
|---|---|---|---|---|
| **STRATEGY** | **BUSINESS-DRIVEN DATA STRATEGY** | **TARGET CUSTOMERS** | **PRODUCT / SERVICE OFFERING** | **DISTRIBUTION CHANNEL(S)** |
| | *What is your organisation’s level of maturity with regard to data strategy, and what should be done to start data commercialisation?* | *Which segment(s) should you target, based on their propensity to spend on data products and services, among other factors?* | *Which data products / services should you deliver via the cloud, and what pricing model and structure should you adopt?* | *What type of cloud-based technologies and services should you leverage to distribute your product / service offering(s)?* |
| **FINANCIALS** | **REVENUE POTENTIAL** | **COST BUDGETING** | **OVERALL PROFITABILITY** | **BUSINESS CASE** |
| | *How sizeable is the potential revenue upside / growth via the provision of cloud-based data products / services?* | *What are the various cost components (upfront and ongoing costs) that you will have to incur to launch cloud-based distribution?* | *What is the overall profitability profile of adopting cloud-based distribution, including factors such as the break-even timeline?* | *What is the overall upside that could be captured (and downside that must be considered) before launching cloud-based initiatives?* |
| **OPERATIONS** | **CUSTOMER ONBOARDING / ENGAGEMENT** | **DATA PRODUCT & SERVICE MANAGEMENT** | **DATA SERVICING BUSINESS OPERATIONS** | **GOVERNANCE / RISKS / COMPLIANCE** |
| | *What are various frictions faced by prospective data consumers and how can you ensure a seamless user experience?* | *How should you structure your data products offered on the data servicing platform to best serve customer needs?* | *What is the best approach to streamline business operations (e.g. licensing) of your data products and services?* | *While transitioning from traditional to cloud-based distribution, how can you remain in compliance with salient regulations?* |

Source: DataBP, Quinlan & Associates

SECTION 3.1

# STRATEGIC CONSIDERATIONS

# BUSINESS-DRIVEN DATA STRATEGY

## KEY TAKEAWAYS

BAIT is a framework that helps to showcase how a data strategy project should be approached, from formulation to execution, while detailing the individual components necessary for a successful data project.

The BAIT framework consists of four key parts, all of which represent a vital step in the overall process:

1. Business
2. Application
3. Information
4. Technology

Tying together a data strategy requires more than just the most advanced hardware, software, or talent; it requires a unifying change management strategy.

Companies need to carefully tailor their data strategy with these components in mind to match their business objectives. This should be paired with near-perfect execution of holistic data systems for all business decisions, as doing otherwise would result in, at best, a loss in productivity or, at worst, direct monetary losses.



# There are various business, application, information, and technology considerations that organisations must address before looking to commercialise their data

### Classifications & Relevant Components

Illustrative

## BAIT FRAMEWORK

**Business**
Identify the objectives and limitations that will shape future steps

**Applications**
Translate business requirements and convert them into technical specs

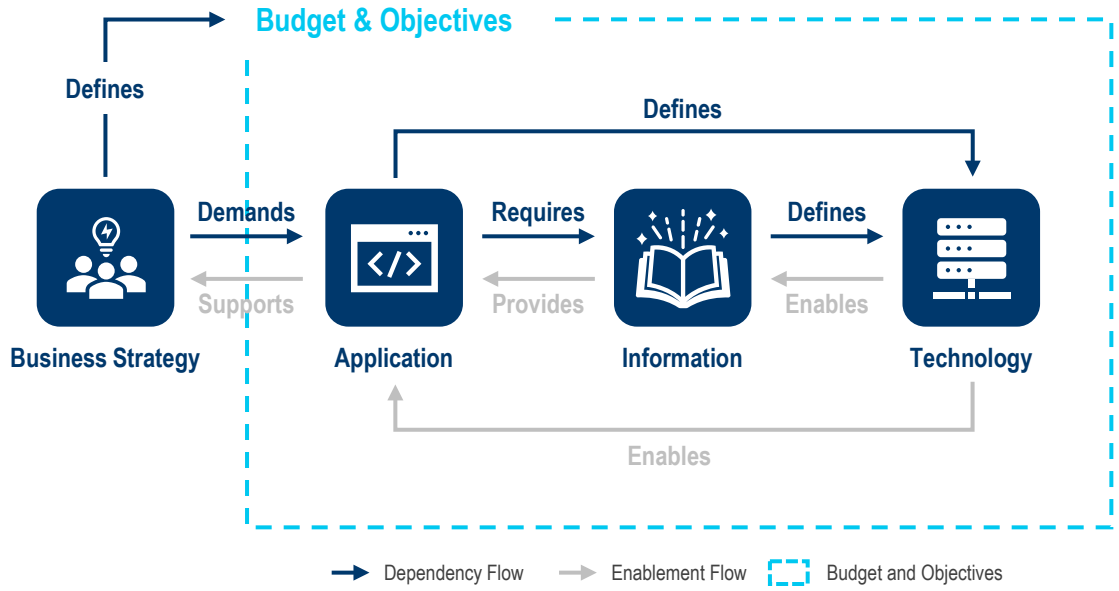
**Information**
Design schematics on data models, quality and platform designs

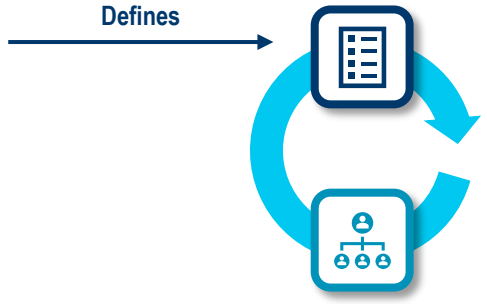
**Technology**
Enabling the previous stages' requirements through technology

## CHANGE MANAGEMENT

**Culture**
Crafting a data-centric culture with incentives and frameworks

**Governance**
Creation of clear communications strategy to champion change




**CHANGE MANAGEMENT STRATEGY**
(Impact Perspective)

A unifying strategy that ties together appropriate policies and incentives to develop a data-centric culture

Source: Quinlan & Associates Report - The Real Lingua Franca: Unlocking The Power of Data (Link)

# CUSTOMER SEGMENTATION

## KEY TAKEAWAYS

It is critical for firms to identify and assess the attractiveness of target customer segments, considering cloud-based data distribution is not sufficient for some of the data consumers.

In fact, depending on the company size and revenue scale, different prospective data consumers will have different budgets and requirements.

Additionally, understanding the level of alignment in the areas of financial sophistication (i.e. do they have relevant knowledge?) and technology compatibility (i.e. can their infrastructure support the data service we provide?) is also critical.

# To identify key pockets of demand for data products and services, data service providers should seek to conduct detailed customer demand segmentation / mapping and sizing

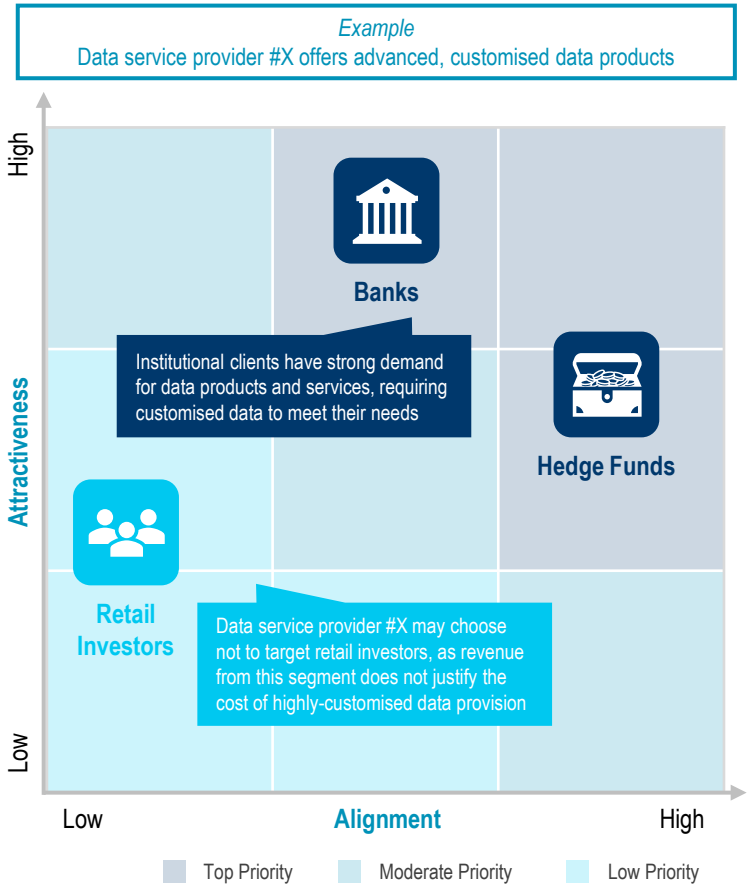
## Target Segmentation

Categorisation Criteria (Illustrative)

| | Category | Description |
|---|---|---|
| Attractiveness | Segment Size | Total number of individuals / organisations within a particular customer segment to determine the potential market size |
| Attractiveness | Customer Reach (B2B / B2B2C only) | Size of current customer base, and the ability to reach out and engage with additional retail customers |
| Attractiveness | Estimated Data Budget | The willingness of each individual / organisation in a segment to pay for data products and services |
| Alignment | Financial Sophistication | Level of financial expertise and knowledge possessed to determine data needs (e.g. advanced vs. simple data, etc.) |
| Alignment | Technology Compatibility | Level of alignment between the technology infrastructure of a segment with the data service provider's data offerings |

## Prospective Customer Segment

Illustrative




Source: Quinlan & Associates analysis

# PRODUCT-DRIVEN BUSINESS MODELS

## KEY TAKEAWAYS

Once a relevant data customer segment(s) is identified, data service providers should evaluate different pricing models, including objective benchmarking, to assess the most viable option(s) for their data services.

Some pricing models that may be considered for data servicing businesses include:

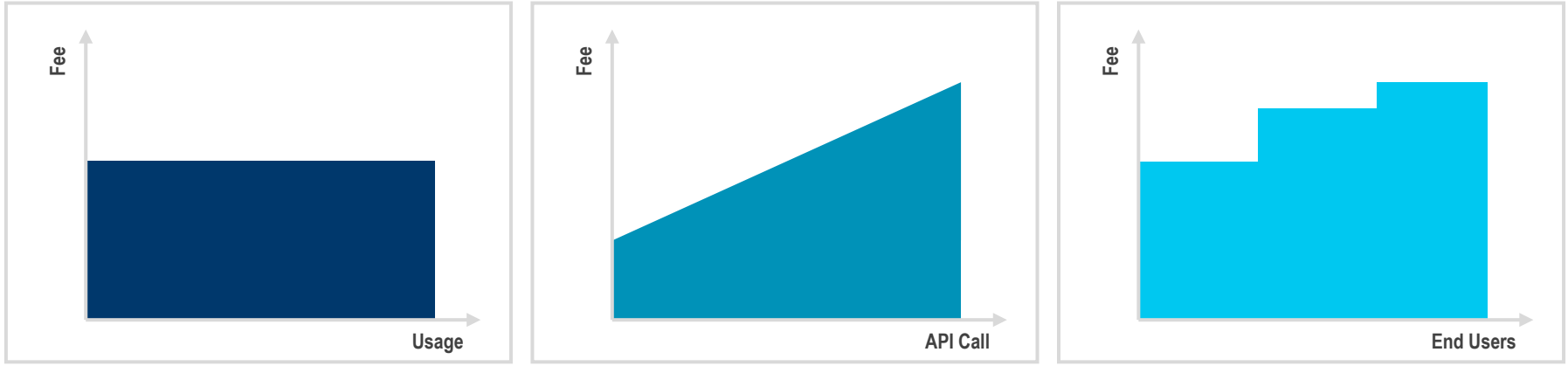
- Annual license
- Per API call
- Per user

## Different pricing models should also be evaluated, such as fixed license fees or variable fees based on API calls or the number of end users

### Potential Business Models

Examples*

| ANNUAL LICENCE | PER API CALL | PER USER |
|---|---|---|
| Fixed annual fee, regardless of usage / end users | Fixed min. fee, with incremental fee per API call | Tiered fees based on number of end users / accounts |




### POTENTIAL DRAWBACKS TO BE CONSIDERED

#### FAILURE TO CAPTURE GROWTH

*Since the annual licensing fees are fixed, cloud service providers may fail to capture upside potential from growth in usage, which may increase operational costs*

#### LOSS OF LARGE CLIENTS

*A per API call model may not be suitable for larger clients with high API call volumes, particularly those with rapidly fluctuating usage patterns*

#### RISKS OF BEING ARBITRAGED

*As fees are charged based on the number of users / accounts, data consumers may end up sharing their accounts with other potential consumers, inhibiting revenue growth*

*Examples provided are not collectively comprehensive

Source: Quinlan & Associates analysis

# PRICING STRUCTURES

## KEY TAKEAWAYS

Many data providers in the financial market are rich in data but lack proper data business experience, which is different from their core business operations (e.g., securities trading, market making, etc.).

As such, after developing a suitable business model, supporting the business with a robust pricing structure is equally important.

## A robust pricing strategy needs to be developed for cloud-based data products and services, with consideration given to pricing components, models, and fee ranges

### Pricing Structure
Components (Illustrative)

1

**Pricing Components**

What are the cloud services / products that are offered and charged for, across the data usage value chain, by cloud-based data service providers?

2

**Pricing Model**

What is the market pricing practice for each pricing component and how is it communicated and accepted by the target client base?

3

**Fee Range**

How much should the organisation charge for each pricing component, and what are the factors that drive differences in price levels?

**Pricing Basis**

The underlying basis that the total fee for the cloud products / services is calculated and imposed on

**Pricing Structure**

Differences in fee levels, based on groups of clients categorised by pre-determined conditions

**Pricing Methodology**

The pricing formula that calculates fees to be charged to end clients, which is adjusted based on the client tier

**Pricing Limit**

Pricing control measures that limit how low or high a client can be charged for the products / services

Source: Quinlan & Associates analysis

# DISTRIBUTION CHANNELS

## KEY TAKEAWAYS

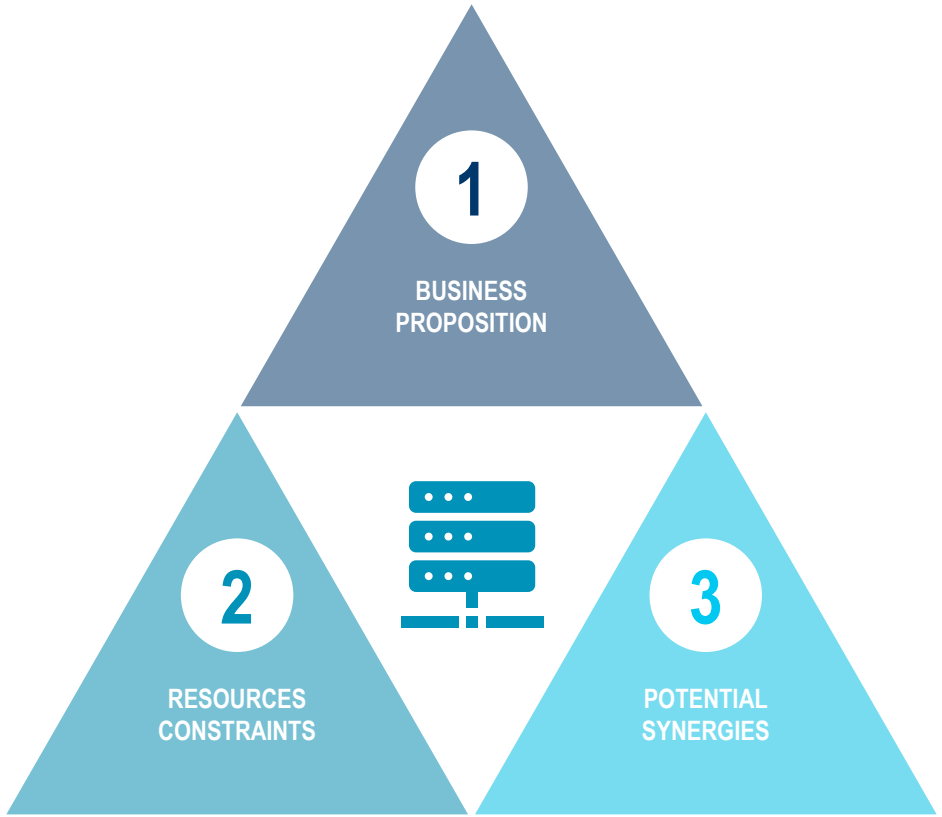
After identifying target customers and exploring suitable pricing models, data service providers should weigh up the merits of various distribution channels through which they could effectively target them.

The most optimal channel(s) may vary depending on the following :

- Business Proposition
- Resources Constraints
- Potential Synergies

## In order to determine the most suitable channel to offer data products and services, data service providers must consider the following dependency factors

**Key Dependencies**
Features




1

### BUSINESS PROPOSITION

B2B data service providers may opt for a more direct sales approach to reach out to institutional clients with customised needs, as opposed to B2C providers that can utilise online / digital channels

2

### RESOURCES CONSTRAINTS

Providers with large budgets may allocate their resources across channels (e.g. hold events, publish original content), while those with limited budgets must carefully select the most effective channels

3

### POTENTIAL SYNERGIES

Data service providers may explore potential synergies with other organisations (e.g. data marketplaces, indirect providers) and consider partnering with them to acquire more customers

Source: Quinlan & Associates analysis

SECTION 3.2

# OPERATIONAL CONSIDERATIONS

# ENGAGEMENT VALUE CHAIN

## KEY TAKEAWAYS

New operational capabilities are needed to effectively monetise market data, as data consumers will not open their wallets unless their experience across the end-to-end engagement value chain is adequately fulfilled.

### Engagement Value Chain

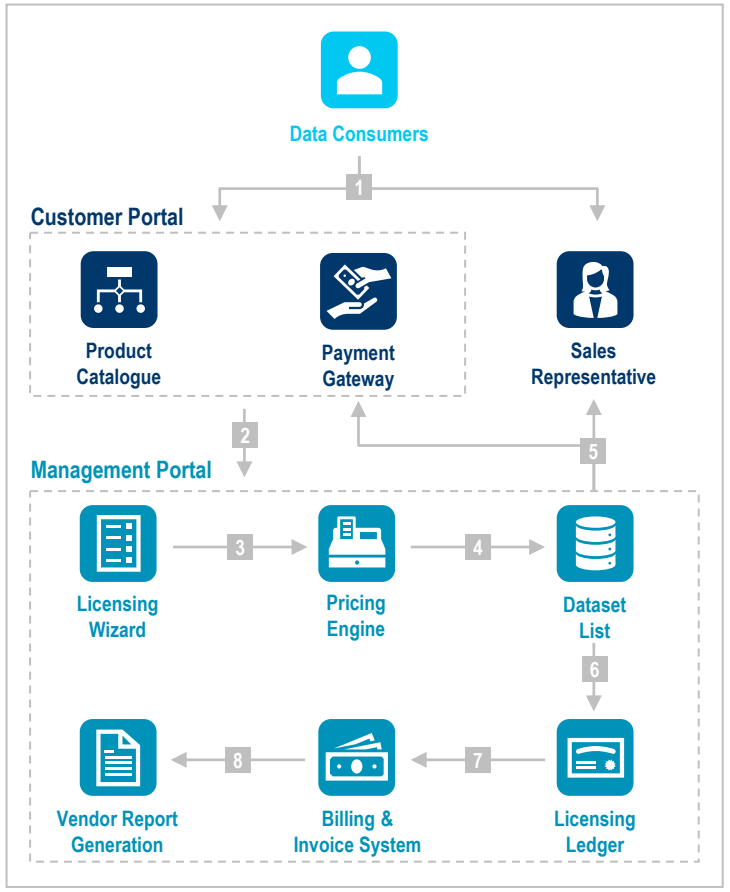
- Sales Initiation
- License Configuration
- Pricing
- Data Purchase
- Customer Approval
- Record Keeping
- Vendor Reporting



# Data service providers should look to fulfil customer needs / demands across the value chain by developing a clear customer engagement process

## Data Consumer Engagement Value Chain

Illustrative




| | |
|---|---|
| CUSTOMER ONBOARDING | Prospective data consumers are onboarded on a data servicing platform |
| SALES INITIATION | The customer initiates an order, either through the website portal or via a salesperson |
| LICENSE CONFIGURATION | The licensing wizard reviews the order and determines the relevant policies & terms based on the user's requirements |
| PRICE SETTING | The pricing engine calculates the variable and fixed fees, tiers, discounts, tax rates and currency conversion |
| DATA PURCHASE | Data purchases and licenses are carried out, upon which KYC checks occur to verify the customer's identity |
| CUSTOMER APPROVAL | Upon passing the compliance check, the purchase / payment is approved |
| BUSINESS RECORDKEEPING | Behind the scenes, all customer licensing, orders, billing, and reported usage are recorded in a secure system |
| BILLING MANAGEMENT | Billing details are processed, and the customer is provided with billing information |
| VENDOR REPORTING | Usage reports and entitlement reports are generated, which include details regarding data usage, access, and more |

Source: DataBP, Quinlan & Associates analysis

# DATA PLATFORM REQUIRED CAPABILITIES

## KEY TAKEAWAYS

To fulfill the customer value chain, two portals must be set up: (1) a management portal and (2) a customer portal.

**Management portal** is used by the data service provider to properly track and seamlessly operate the business:

- Customer Management
- Product Management
- Licensing & Subscription Approval
- Billing Operations
- Revenue Management
- Compliance Assurance

**Customer portal** is used by the data consumer to directly engage with the data service provider to make a purchase, set up workflow, receive bills, etc:

- Integration via SSO
- Data Catalogue
- Custom Licensing Workflows
- Billing & Reporting
- Online Purchases
- White-labelling



## A number of capabilities / features are required for a data service provider to better serve their customers and realise the monetisation potential of their data

### Required Capabilities
Management & Customer Portal

### MANAGEMENT PORTAL

**Customer Management**
Facilitate seamless customer onboarding and approval processes by integrating with CRM software (e.g. Salesforce)

**Product Management**
Support the management of product definition, configurations, and catalogue on the cloud (e.g. Oracle, Google Cloud)

**Licensing & Subscription Approval**
Simplify ongoing licensing and subscription management via an integrated enterprise workflow

**Billing Operations**
Enable the management of billing rules based on pricing models, made possible by the calculation engine

**Revenue Management**
Track and manage revenue streams by integrating with billing system and payment gateways (e.g. Stripe)

**Compliance Assurance**
Facilitate compliance by the availability of an entitlement reporting format and analysis feature, along with audit planning

### CUSTOMER PORTAL

**Integration via SSO***
Enable a seamless authentication method for users to access the platform in a single sign-on manner

**Data Catalogue**
Showcase information about datasets and sources available in the platform, such as data types, pricing, etc.

**Custom Licensing Workflows**
Manage the licensing of data, including tracking usage and billing

**Billing & Reporting**
Facilitate the billing process on customers for data access with built-in report generation

**Online Purchases**
Facilitate a secure and seamless payment experience by integrating the customer portal with payment gateways

**White-labelling**
Customise the features and display of the customer portal to align with the company's branding (e.g. logo, colours)

*Single sign-on
Source: DataBP, Quinlan & Associates analysis

# AVAILABLE OPTIONS

## KEY TAKEAWAYS

There are three options available to acquire operational capabilities: (1) outsource to third-party service providers with relevant capabilities, (2) acquire a company with data monetisation experience, and (3) build capabilities from scratch through hiring relevant talent, seeking advice, etc.

Considering various criteria (e.g., affordability, scalability, control, customisation, talent needs, and time-to-market), it appears that outsourcing the capability to a third-party vendor with a strong track record is the best option among the three.

## Given the level of investment and resources required to acquire / build relevant capabilities in-house, outsourcing may be the preferred option for many data service providers

**Potential Options**
Outsource, Buy, or Build

| | 1 OUTSOURCE<br>Cloud Service Providers | 2 BUY<br>Acquisition | 3 BUILD<br>Organic Development |
|---|---|---|---|
| **DESCRIPTION** | Outsource the data cloud migration process to third-party cloud service providers / partners | Acquire an existing player in the industry who offers robust cloud data products / services | Build relevant cloud capabilities to harness the migration process on your own, from the ground-up |
| **CRITERIA** | | | |
| **Affordability** | ✓ | × | × |
| **Control** | - | - | ✓ |
| **Customisation** | - | - | ✓ |
| **Scalability** | ✓ | - | - |
| **Talent Needs** | ✓ | - | × |
| **Time-to-market** | ✓ | - | × |

Key Focus ✓ Favourable - Dependent / Neutral / N.A. × Unfavourable

Source: Quinlan & Associates analysis


SECTION 4

# HOW WE CAN HELP

dataBP QUINLAN &ASSOCIATES

# WHERE WE CAN SUPPORT YOU

Together with DataBP, Quinlan & Associates can support data providers in achieving optimal cloud migration and cloud-based data distribution enablement across the following pillars:

**1. BUSINESS STRATEGY**

- Target Customers
- Product / Service Offering
- Distribution Channel(s)
- Monetisation Strategy

**2. COMMERCIAL OPERATIONS**

- Sales & Licensing
- Rights Management
- Cloud Management
- Billing & Compliance



## Quinlan & Associates and DataBP can support data providers in achieving an optimal direct distribution experience

**Areas of Deliberation**
Strategic, Operational, and Financial Factors

### BUSINESS STRATEGY

QUINLAN &ASSOCIATES

| TARGET CUSTOMERS | PRODUCT / SERVICE OFFERING | DISTRIBUTION CHANNEL(S) | MONETISATION STRATEGY |
|---|---|---|---|
| *Which segment(s) should you target, based on their propensity to spend on data products and services, among other factors?* | *What core products / services, such as data types, analytics, and other value-add services, should you deliver via the cloud?* | *What type of cloud-based technologies and services should you leverage to distribute the product / service offering(s)?* | *What is the overall business case for launching a cloud-based distribution model, including revenue potential and fully-loaded costs* |

### COMMERCIAL OPERATIONS

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| SALES & LICENSING | RIGHTS MANAGEMENT | CLOUD MANAGEMENT | BILLING & COMPLIANCE |
|---|---|---|---|
| *What is the best approach to simplify licensing and subscription management of your data products and services?* | *How can you establish proper governance of your cloud-based operations as you transition from a more traditional operation?* | *While transitioning from traditional to cloud-based distribution, how can you remain in compliance with salient regulations?* | *Should you customise cloud-native solutions / use standard ones, and is a full / partial integration of cloud tech. the most effective approach?* |

Source: DataBP, Quinlan & Associates

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