FROM CABLES TO THE CLOUD

MONETISING MARKET DATA THROUGH THE CLOUD

FEBRUARY 2023

dataBP
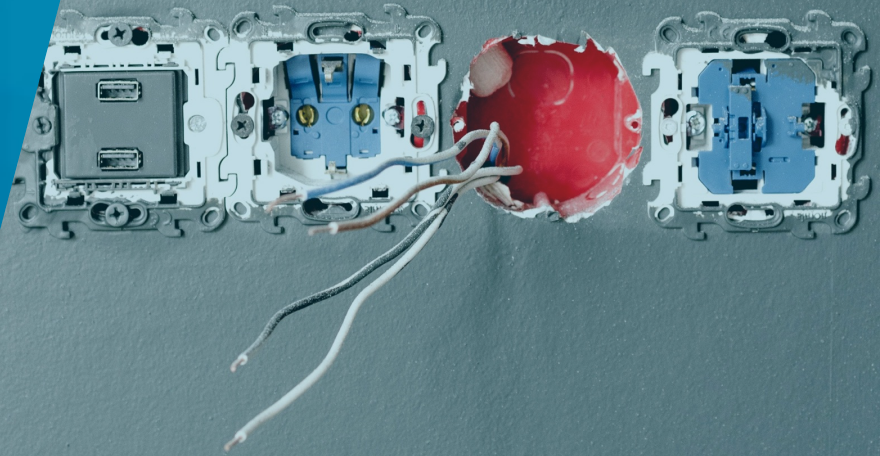
QUINLAN
&ASSOCIATES

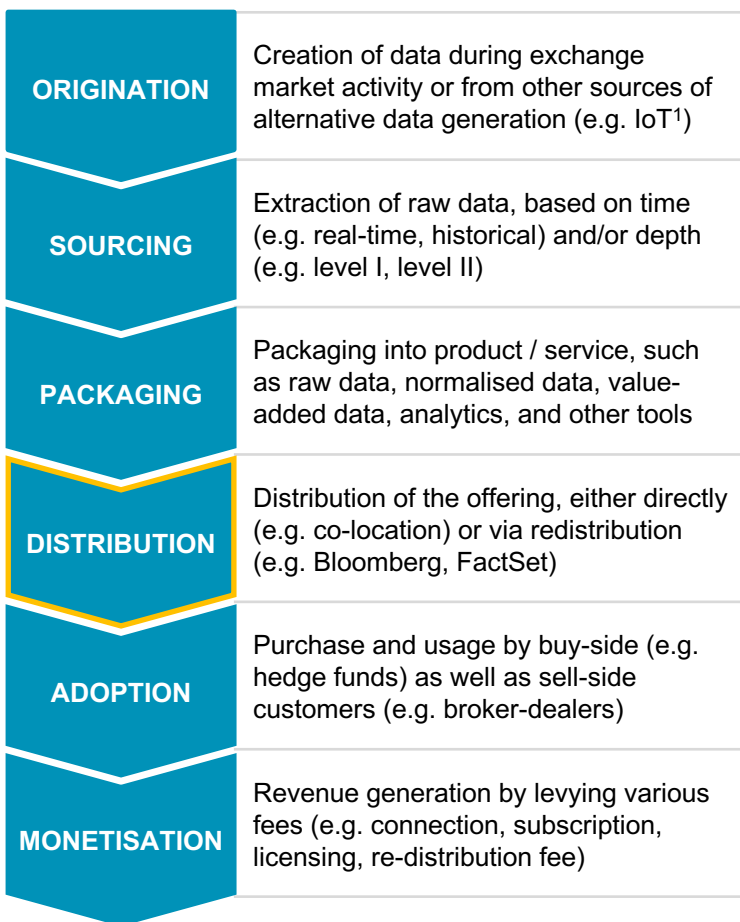# CONTENTS

SECTION 1

THE STATUS QUO

THE DATA VALUE CHAIN

Data is fast emerging as the new oil, as exchanges and re-distributors of their data are poised to rake in USD 56 billion by 2025, through provision of information services
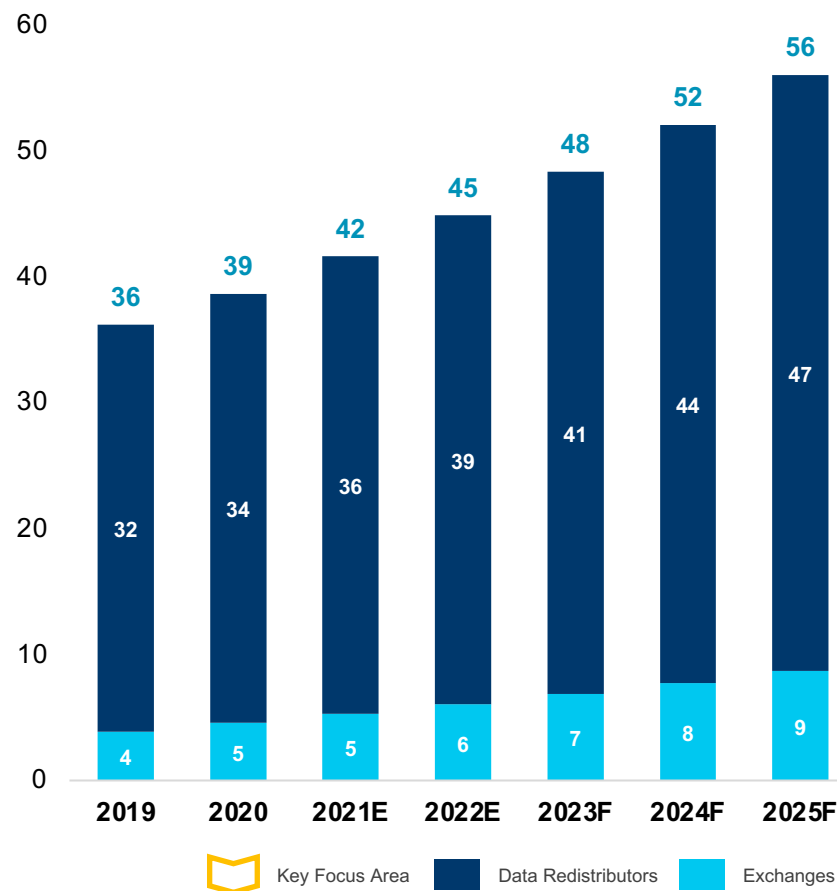
Data Value Chain
From Origination to Monetisation

ORIGINATION	Creation of data during exchange market activity or from other sources of alternative data generation (e.g. IoT[1])
SOURCING	Extraction of raw data, based on time (e.g. real-time, historical) and/or depth (e.g. level I, level II)
PACKAGING	Packaging into product / service, such as raw data, normalised data, value-added data, analytics, and other tools
DISTRIBUTION	Distribution of the offering, either directly (e.g. co-location) or via redistribution (e.g. Bloomberg, FactSet)
ADOPTION	Purchase and usage by buy-side (e.g. hedge funds) as well as sell-side customers (e.g. broker-dealers)
MONETISATION	Revenue generation by levying various fees (e.g. connection, subscription, licensing, re-distribution fee)

Data Revenue
2019-2025F, USD Billion

	2019	2020	2021E	2022E	2023F	2024F	2025F
Total	36	39	42	45	48	52	56
Data Redistributors	32	34	36	39	41	44	47
Exchanges	4	5	5	6	7	8	9

Key Focus Area   Data Redistributors   Exchanges

[1]Internet of Things

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

INDUSTRY WHITE SPACE

However, there exist significant inefficiencies in present distribution models, which carry inevitable trade-offs for both data consumers as well as providers

Market Inefficiencies
Control vs. Experience
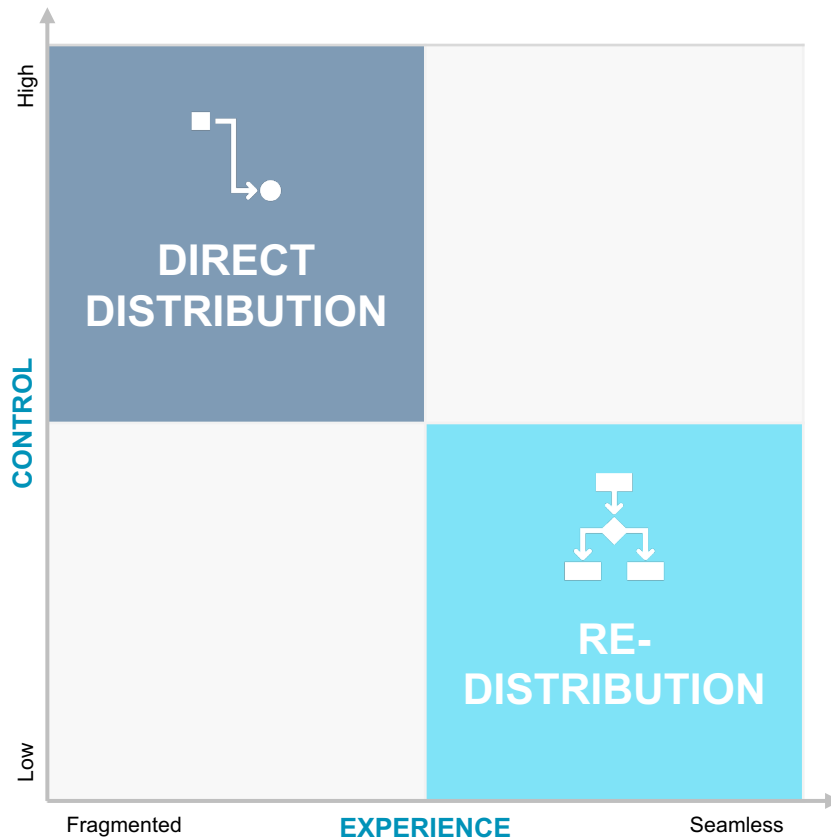
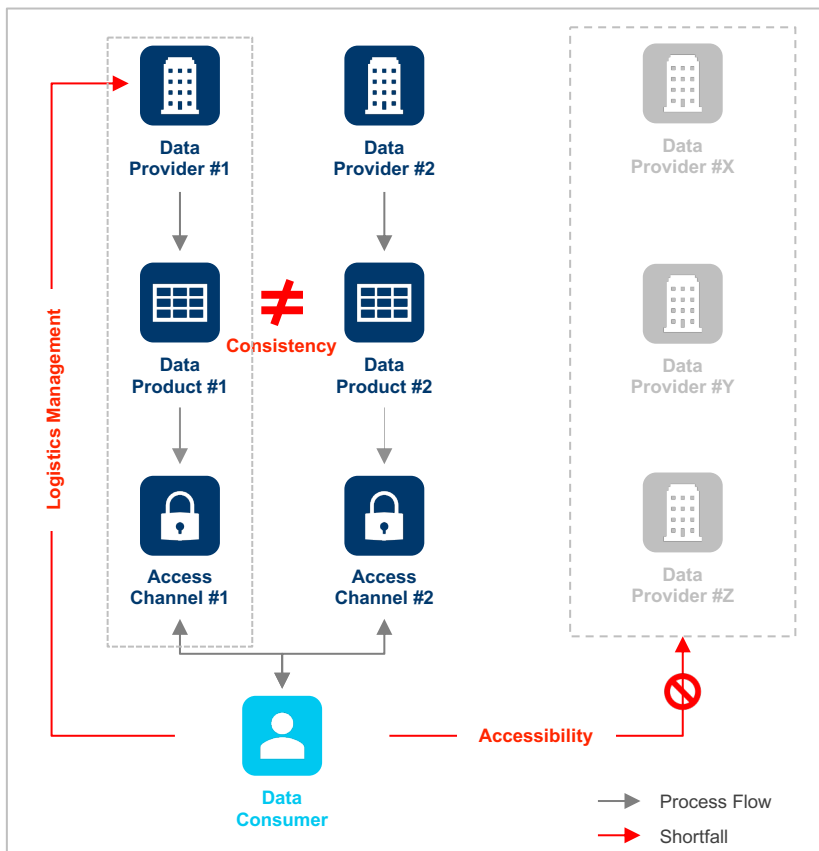## Description
Consumer & Provider Perspective

	CONTROL	EXPERIENCE
DIRECT DISTRIBUTION / CONSUMER	**HIGH** Through directly subscribing to exchanges, consumers can enjoy greater control	**FRAGMENTED** Existing practices are highly fragmented / inefficient, hampering the consumption experience
DIRECT DISTRIBUTION / PROVIDER	**HIGH** Through directly offering to consumers, exchanges can better control their data and business operations	**FRAGMENTED** High entry barriers and maintenance costs act as major barriers to directly offer their data
REDISTRIBUTION / CONSUMER	**LOW** Most redistributors offer a full data subscription package with a substantial price tag	**SEAMLESS** Normalise and process the data for easier consumption by the customers
REDISTRIBUTION / PROVIDER	**LOW** Data monetisation and the customer relationship are controlled by the redistributor	**SEAMLESS** Redistributors simplify both sourcing and licensing / billing processes for the data

Source: Quinlan & Associates analysis

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DIRECT DISTRIBUTION MODEL (1/2) – CONSUMER PERSPECTIVES

Experience remains a key pain point facing data consumers in the direct purchase model, particularly in terms of: (1) accessibility; (2) consistency; and (3) logistics management

Direct Distribution Model
Description

Data Provider #1
Data Provider #2
Data Provider #X

Data Product #1 ≠ Data Product #2
Consistency

Data Provider #Y

Access Channel #1
Access Channel #2

Data Provider #Z

Logistics Management

Data Consumer

Accessibility

→ Process Flow
→ Shortfall

Implications
Consumer Perspective

Level of Control

Data Customisation	✔	• Data consumers can define their own data needs, sourcing only what is required for their specific business application(s)
Subscription Fee	✔	• Data consumers may pay for data on-demand, without paying additional charges for an overall "data package"

Experience

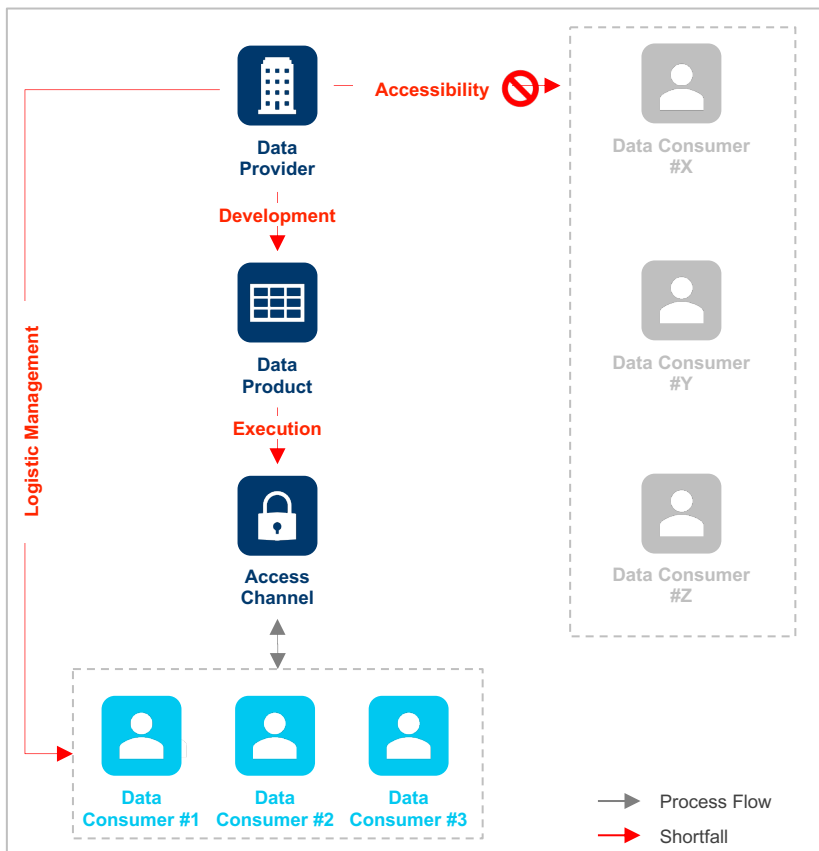|		
Data Accessibility	✖	• Data consumers cannot easily locate and evaluate data providers in the market, given considerable market fragmentation
Data Consistency	✖	• As data consumers develop and format their data products in silos, they are responsible for normalising the data (as necessary)
Logistics Management	✖	• Data consumers must deal with multiple data providers, including separate licensing, billing, and single sign-on arrangements

Source: Quinlan & Associates analysis

✔ Favourable   ✖ Unfavourable

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REDISTRIBUTION MODEL (1/2) – CONSUMER PERSPECTIVES

Data consumers also experience a lack of control in the redistribution model with respect to: (1) data customisation; and (2) subscription fees

Redistribution Model
Description

Data Provider #1 **Data Provider #2** **Data Provider #3**

Customisation

Data Redistributor

Payment

Core Data Package

Data Add-on #1

Data Add-on #2

Data Consumer

→ Process Flow
--→ Optional
→ Shortfall
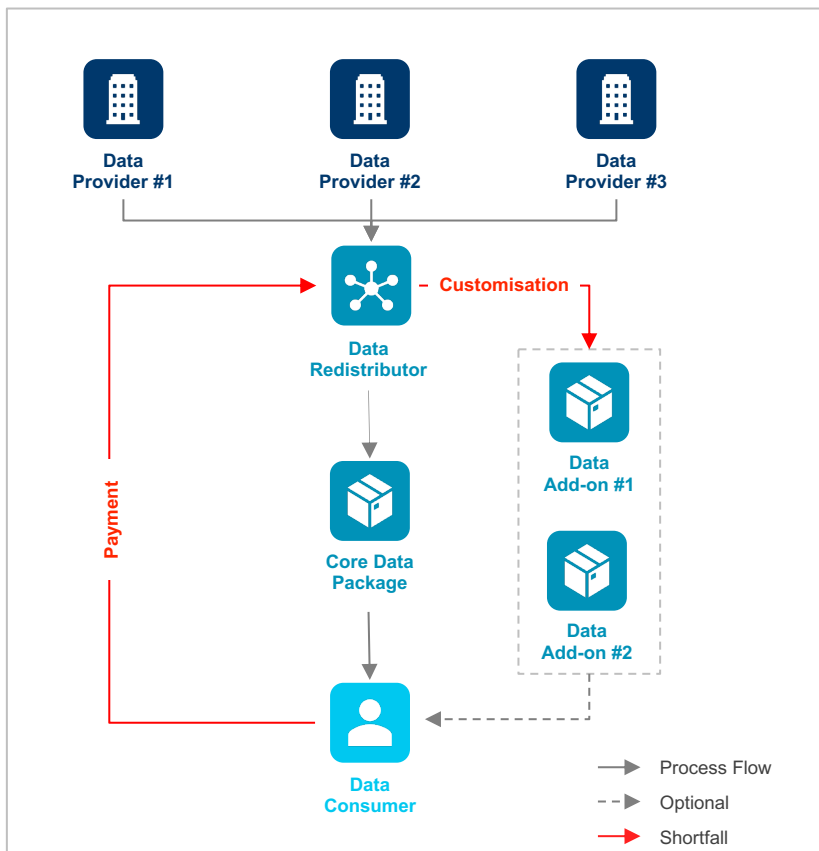
Implications
Consumer Perspective

Level of Control

Data Customisation	✖	• Data consumers are given a packaged product with wide data coverage, with limited customisable add-ons
Subscription Fee	✖	• Aggregation services are sold as a package, which is not only expensive, but requires consuming huge volumes of irrelevant data

Experience

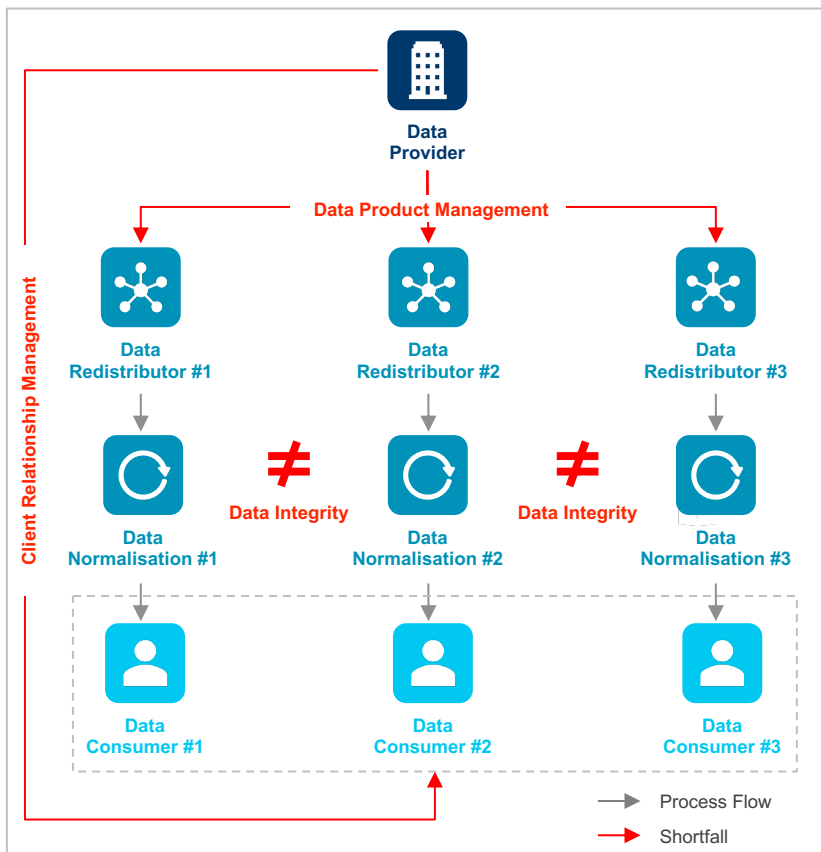|		
Data Accessibility	✔	• Data consumers can access a much larger volume of traditional and alternative datasets compiled by data redistributors
Data Consistency	✔	• Data consumers can use more consistently formatted data that is normalised and processed by redistributors
Logistics Management	✔	• Data consumers can consume multiple external data sources without managing multiple licensing / billing arrangements

Source: Quinlan & Associates analysis

✔ Favourable   ✖ Unfavourable

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Similarly, data providers experience a lack of control regarding: (1) data management; (2) data integrity; and (3) client relationship management

Redistribution Model
Description

Data Provider

Data Product Management

Client Relationship Management

Data Redistributor #1 | **Data Redistributor #2** | **Data Redistributor #3**

Data Normalisation #1 ≠ Data Integrity **Data Normalisation #2** ≠ Data Integrity **Data Normalisation #3**

Data Consumer #1 | **Data Consumer #2** | **Data Consumer #3**

→ Process Flow
→ Shortfall

Implications
Provider Perspective

Level of Control

Data Management	✖	• Data providers' reliance on data redistributors to monetise their data can limit the upside of their true revenue potential
Data Integrity	✖	• Raw data provided to data redistributors must go through a proprietary normalisation process before the data reaches consumers
Client Relationship Management	✖	• Data providers may have visibility on who their data consumers are, but the relationship is ultimately controlled by redistributors

Experience

Data Accessibility	✓	• Data providers can rely on data redistributors, who have sizeable subscriber bases, to distribute and market their data products
Product Development	✓	• Demand identification and data product development can all be outsourced to data redistributors with existing subscribers
Execution Enablement	✓	• Data providers need not invest in both technology and talent (e.g, sales teams) that are required for data monetisation
Logistics Management	✓	• Data providers can single-handedly face redistributors for licensing, billing, and single sign-on arrangements

✓ Favourable   ✖ Unfavourable

RESULTING IMPACT (1/2) – CUSTOMER CHURN

As a result, we expect ~6.5% of clients to unsubscribe from data redistribution services, especially driven by active funds' concerns over increasing costs and algo compatibility

Global Fund Asset Under Management
2016-2020, Active vs. Passive Split, %

Legend:
- Active
- Passive

Bar values (Active): 2016: 80%, 2017: 79%, 2018: 78%, 2019: 76%, 2020: 72%
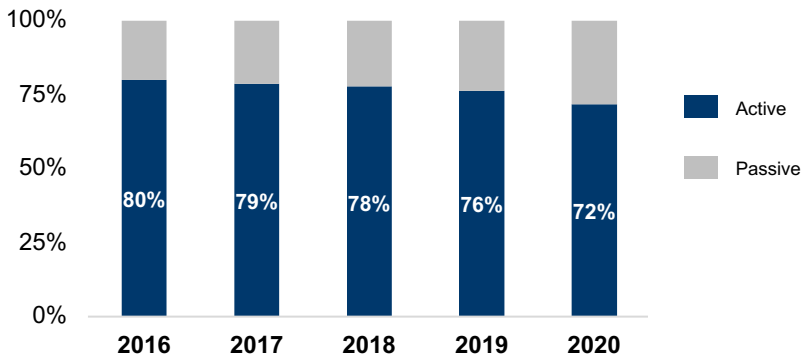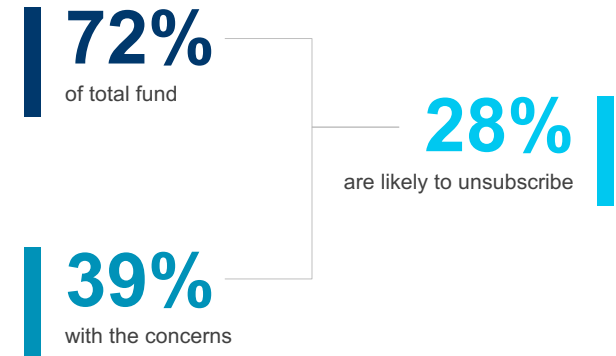
Concerns of Traders
Survey Result

25% …are concerned with the cost of data subscription — **Data Cost**

14% …are concerned with algo efficiency / compatibility — **Algo Compatibility / Efficiency**

Legend:
- Considered
- Not Considered

Maximum Unsubscribing Rate
2020

72% of total fund

39% with the concerns

28% are likely to unsubscribe
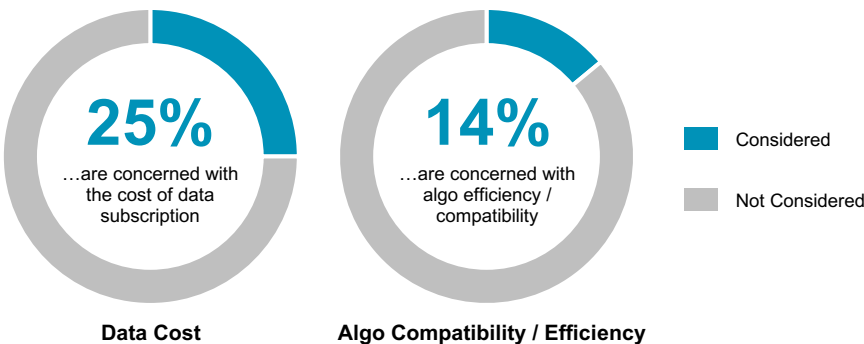
	AMER	EMEA	APAC
Investment Mgmt. (% Revenue)	31.0%	29.7%	23.3%
Likelihood (% Unsubscription)	28.1%	28.1%	28.1%
Unsubscribing Rate (%, Maximum)	8.7%	8.3%	6.5%

Source: Refinitiv, Waters Technology, Quinlan & Associates analysis

RESULTING IMPACT (2/2) – REVENUE LOSS

Forecasting a doubling of unsubscriptions every year, we estimate that overall unsubscriptions will amount to USD 3.4 billion by 2025

Impact on Revenues
Opportunity Cost

		2019	2020	2021E	2022E	2023F	2024F	2025F
AMERICAS	Revenue Projection (USD million)	15,598	16,434	17,550	18,743	20,016	21,376	22,829
	Unsubscribing Rate[1] (%)	0.0%	0.5%	0.5%	1.0%	2.0%	4.0%	0.7%
	Net Unsubscribed Amount (USD million)	0.0%	0.5%	1.0%	2.0%	4.0%	8.0%	8.7%
	Total Unsubscribed Amount (USD million)	**0**	**82**	**170**	**357**	**758**	**1,613**	**1,776**
EMEA	Revenue Projection (USD million)	10,706	11,280	12,046	12,865	13,739	14,672	15,669
	Unsubscribing Rate[1] (%)	0.0%	0.5%	0.5%	1.0%	2.0%	4.0%	0.3%
	Net Unsubscribed Amount (USD million)	0.0%	0.5%	1.0%	2.0%	4.0%	8.0%	8.3%
	Total Unsubscribed Amount (USD million)	**0**	**56**	**117**	**245**	**520**	**1,107**	**1,162**
APAC	Revenue Projection (USD million)	6,027	6,350	6,781	7,242	7,734	8,259	8,820
	Unsubscribing Rate[1] (%)	0.0%	0.5%	0.5%	1.0%	2.0%	2.5%	0.0%
	Net Unsubscribed Amount (USD million)	0.0%	0.5%	1.0%	2.0%	4.0%	6.5%	6.5%
	Total Unsubscribed Amount (USD million)	**0**	**32**	**66**	**138**	**293**	**503**	**503**
	Unsubscribed Amount (Grand Total, USD million)	**0**	**170**	**352**	**741**	**1,570**	**3,223**	**3,441**

[1]The model assumes the transition rate would double every year; [2]Maximum Unsubscribing Rate
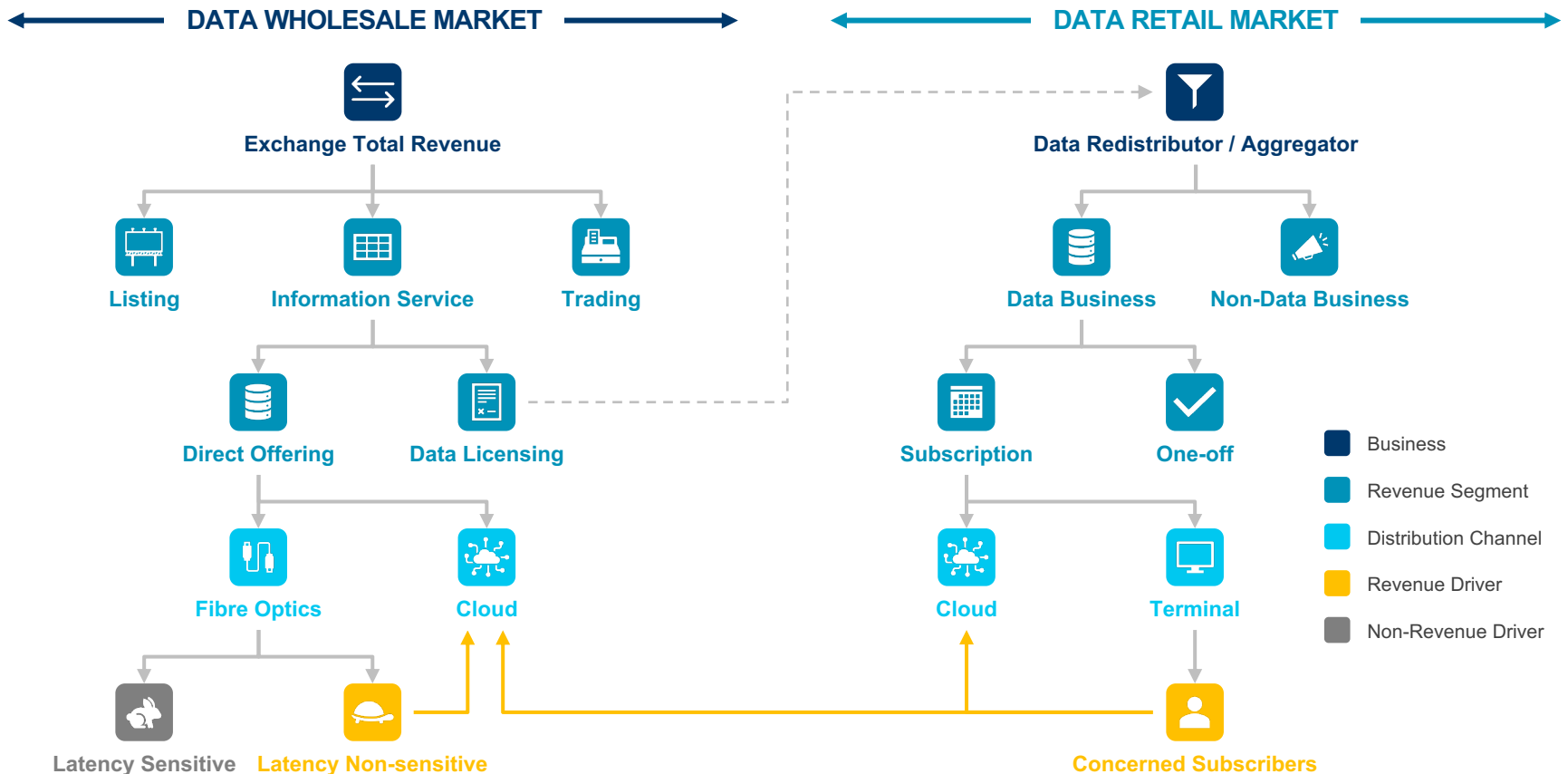Source: Quinlan & Associates estimates

SECTION 2

CLOUD TO THE RESCUE

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CLOUD-BASED DISTRIBUTION

There are two major models for cloud-based distribution of data, namely: (1) data wholesale market and (2) data retail market

DATA WHOLESALE MARKET

Exchange Total Revenue

- Listing
- Information Service
- Trading
  - Direct Offering
  - Data Licensing
    - Fibre Optics
    - Cloud
      - Latency Sensitive
      - Latency Non-sensitive

DATA RETAIL MARKET

Data Redistributor / Aggregator

- Data Business
- Non-Data Business
  - Subscription
  - One-off
    - Cloud
    - Terminal
      - Concerned Subscribers

Legend:
- Business
- Revenue Segment
- Distribution Channel
- Revenue Driver
- Non-Revenue Driver

Non latency sensitive (e.g. middle / back office functions) will naturally shift from cable to cloud distribution model

Subscribers with data compatibility and cost management challenges will shift to exchange-ran cloud data subscription

Source: Quinlan & Associates analysis

CLOUD TECHNOLOGY

There are three types of cloud infrastructures with different operating characteristics that are offered as IaaS,[1] PaaS,[2] and SaaS[3] models

Types of Cloud
Illustrative

1 **Private Cloud**
Cloud infrastructure dedicated to a single company that can either be managed by the company itself or a third-party vendor

2 **Public Cloud**
Cloud infrastructure provided by a third-party vendor under a shared hardware environment with virtual storage / computation power

3 **Hybrid Cloud**
Combined infrastructure that utilises private cloud, public cloud, and even on-premise databases for different business purposes

Cloud Servicing Models
Illustrative

Management	LEGACY	CLOUD		
	On-Premise	IaaS	PaaS	SaaS
Applications	✓	✓	✓	-
Data	✓	✓	✓	-
Runtime	✓	✓	-	-
Middleware	✓	✓	-	-
Operating System	✓	✓	-	-
Virtualisation	✓	-	-	-
Servers	✓	-	-	-
Storage	✓	-	-	-
Network	✓	-	-	-

✓ Managed by User   - Out-sourced to Service Provider

[1]Infrastructure-as-a-Service, [2]Platform-as-a-Service, [3]Software-as-a-Service
Source: Quinlan & Associates publication – Banking on the Cloud

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KEY ADVANTAGES

Many companies across the globe are migrating to cloud environments, given both cost and time effectiveness in managing data (and data-related business)
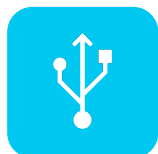
Cost Effectiveness
Illustration

Reduce Hardware Costs
Instead of managing in-house equipment, the costs to acquire, repair, and replace hardware are passed on to the vendors

Minimise Software Costs
With software mgmt. outsourced to third-party vendors, the upfront cost of licensing and price of constant upgrades can be eliminated

Lessen Electricity Costs
As the need for excessive power is significantly reduced, electricity costs can be meaningfully decreased

Lower Labour Costs
The responsibilities of managing, repairing, and replacing infrastructure are passed on to vendors, drastically lowering labour costs
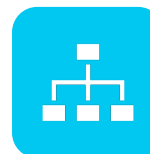
Time Effectiveness
Illustration

Eliminate Real Estate Acquisition
Real-estate acquisition time can be significantly reduced without having to purchase extra space for idle equipment

Reduce Installation Time
Instead of wasting weeks or months for a standard company-wide installation, cloud deployment can be done in a matter of hours

Facilitate Administrative Tasks
Cloud services can facilitate administrative tasks, saving time for sharing task lists, calendars, or attachment over e-mail

Improved Efficiency
Businesses can react to new and/or sudden developments or requirements as and when they arrive, improving operational efficiency

Source: Quinlan & Associates analysis

ONGOING PIVOT (1/2) – EXCHANGES

As a result, many exchanges are already transitioning towards cloud-based data product / service offerings distribution

Cloud Migration
Exchanges

Companies (Exchanges / Redistributors)	CLOUD DATA SERVICE		DATA OFFERINGS		Name of the Offering (Cloud / Real-time Data)	Cloud Partner (Infra. Provider)
	Cloud-Native Data Feed	Cloud-Based Real-time	Raw Data	Normalised Data		
Nasdaq	✓	✓	✓	✗	*Nasdaq Cloud API*	AWS
Cboe	✓	✓	✓	✗	*Cboe Global Cloud*	AWS
CME Group	✓	✓	✓	✗	*CME Smart Stream*	Google
SIX	✓	✓	✓	✗	*N/A*	Xignite

✓ Offered   - Unspecified / Not Applicable   ✗ Not Offered

Public Cloud Offering Rate
2022E, #, By Count

Region	Rate
AMR	43%
EMEA	23%
APAC	37%

34% Average
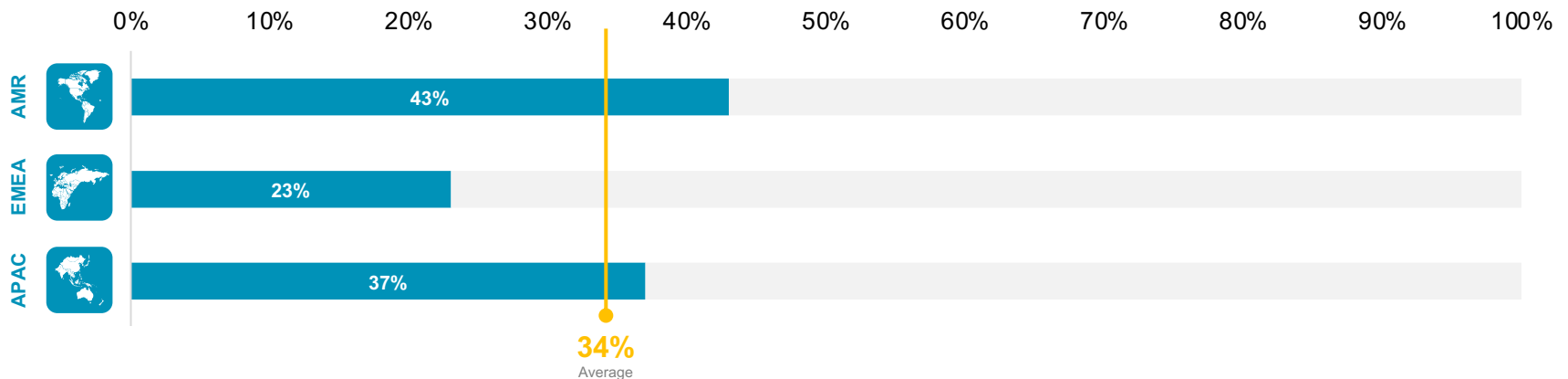
Source: Company disclosures, Quinlan & Associates estimates

ONGOING PIVOT (2/2) – REDISTRIBUTORS

Likewise, more redistributors are also offering cloud-based real-time market data services, but not all of them provide the data in a raw format

Competitive Benchmarking
2022, Cloud-based Real-time Data Specific

Companies (Redistributors)	Data Source (#)	CLOUD DATA SERVICE		DATA OFFERINGS		Name of the Offering (Cloud / Real-time Data)	Cloud Partner (Infra. Provider)
		Cloud-native Data Feed	Cloud-based Real-time	Raw Data	Normalised Data		
Bloomberg	330+ (Exchanges)	✓	✓	✓	✓	B-PIPE	AWS
REFINITIV	500+ (Exchanges)	✓	✓	✓	✓	Refinitiv Real-Time Optimised	AWS
xignite	560+ (Exchanges)	✓	✓	✓	✓	Cloud Streaming	AWS
FACTSET	50+ (Sec. Exchanges)	✓	✓	-	✓	Exchange DataFeed	AWS
S&P Global	302+ (Exchanges)	✓	✓	-	✓	S&P Capital IQ	AWS
QUODD	28 (Sec. Exchanges)	✓	✓	-	✓	QUOOD	AWS
dxFeed	36 (Sec. Exchanges)	✓	✓	✓	✓	dxFeed Cloud Platform	AWS
ALPHA VANTAGE	9 (Sec. Exchanges)	✓	✓	✓	✓	Alpha Vantage	AWS
polygon.io	6 (Sec. Exchanges)	✓	✓	✓	✓	Polygo.io	Google Cloud
SIX	-	✓	✓	-	✓	Market Data Feed	AWS
barchart	-	✓	✓	✓	✓	OnDemand	AWS
IHS Markit	-	✓	✓	-	✓	WSO	AWS
IEX Cloud	-	✓	✓	-	✓	IEX Cloud	AWS
DOW JONES	-	✓	✓	-	-	Developer Platform	Google

✓ Offered   - Unspecified / Not Applicable   ✖ Not Offered

Source: Quinlan & Associates analysis

NASDAQ CASE STUDY (1/3) – OVERVIEW

Nasdaq conducted a two-stage transformation process, including cloud enablement and data sharing through partnering with AWS

Nasdaq
Description

Nasdaq
Historical Journey

Nasdaq is an American stock exchange based in New York City. Currently ranked second on the list of stock exchanges by market capitalisation of shares traded, the exchange has amassed 4,000+ company listings.

Nasdaq
Cloud Migration

PHASE II

PHASE I

CLOUD ENABLEMENT
Migrating storage and hosting serviced to a cloud-native environment

DATA SHARING
Developing cloud compatible APIs to enable data sharing on the cloud

RISE TO PROMINENCE
Founded in 1971, Nasdaq has developed into one of the world's largest and most reputable stock exchanges

DATA MONETISATION
Recognising the lucrative opportunities up for grabs in the market data space, Nasdaq built out its information services business

CLOUD MIGRATION
In order to improvise its data offerings, Nasdaq partnered with AWS, embarking on a two-stage transformation process

REVENUE GROWTH
As a result, Nasdaq saw a boom in information services revenue, which reached **USD 414 million in 2021**

Source: Nasdaq, Quinlan & Associates analysis

NASDAQ CASE STUDY (2/3) – CLOUD ENABLEMENT

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

Cloud Enablement
Description

2014

Data Warehouse Migration
Migrated from on-premise data warehouse to an AWS warehouse

Improved Data Ingestion
Ingested financial market data from thousands of different sources on a daily basis

2018

Data Lake Formation
Built the foundation for a new data lake on Amazon S3

Compute / Storage Separation
Enabled separation of computing and storage, facilitating flexibility and scalability

2018

Data Archive & Backup
Used Amazon S3 Glacier for data archiving and long-term backup

Enhanced Cost Management
Data can be archived at a lower cost, facilitating cost management

✓ **Higher Storage Capability**

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

✓ **Efficient Data Loading**

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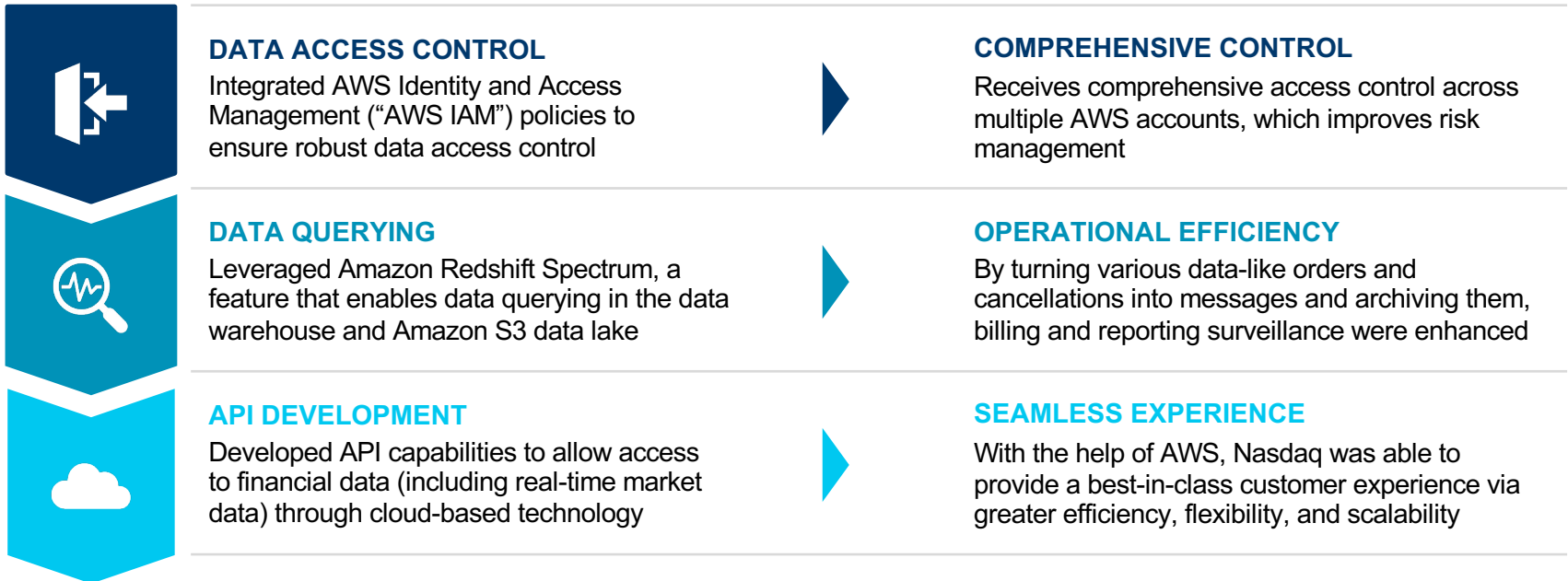
✓ **Efficient Data Querying**

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

NASDAQ CASE STUDY (3/3) – DATA SHARING

Supported by cloud enablement, robust data access controls, and efficient data querying, Nasdaq was able to share a variety of data via cloud APIs

Data Sharing
Description

DATA ACCESS CONTROL
Integrated AWS Identity and Access Management ("AWS IAM") policies to ensure robust data access control

COMPREHENSIVE CONTROL
Receives comprehensive access control across multiple AWS accounts, which improves risk management

DATA QUERYING
Leveraged Amazon Redshift Spectrum, a feature that 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 were enhanced

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

SEAMLESS EXPERIENCE
With the help of AWS, Nasdaq was able to provide a best-in-class customer experience via greater efficiency, flexibility, and scalability

Data Sharing
Offerings

1 REAL-TIME MARKET DATA

2 HISTORICAL MARKET DATA

3 FINANCIAL NEWS

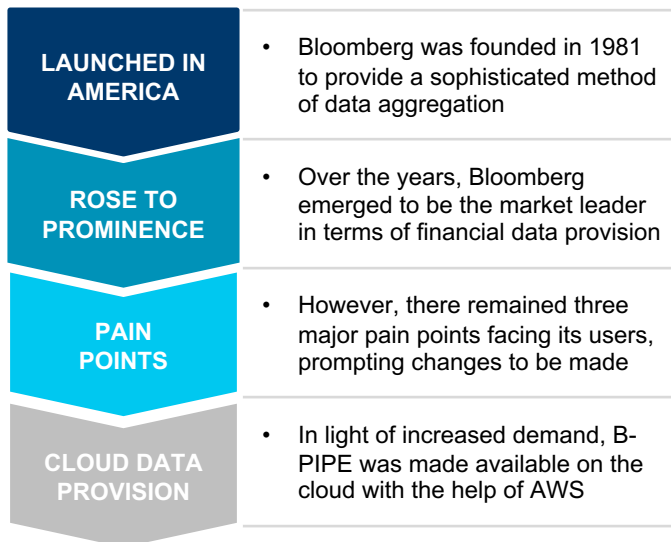Source: Nasdaq, Quinlan & Associates analysis

Apart from exchanges, data redistributors such as Bloomberg have also migrated to the cloud in order to address historical user pain points
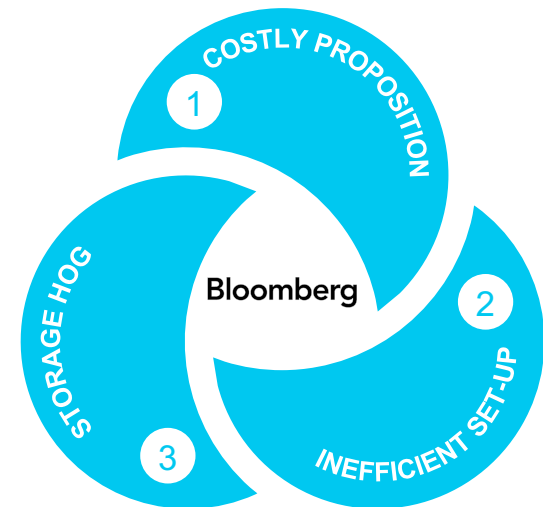
Case Study
Bloomberg

Bloomberg

Founded in 1981, Bloomberg is a privately held company providing real-time and historical market data, news, and data analysis for financial professionals.

Bloomberg
Historical Journey

LAUNCHED IN AMERICA	• Bloomberg was founded in 1981 to provide a sophisticated method of data aggregation
ROSE TO PROMINENCE	• Over the years, Bloomberg emerged to be the market leader in terms of financial data provision
PAIN POINTS	• However, there remained three major pain points facing its users, prompting changes to be made
CLOUD DATA PROVISION	• In light of increased demand, B-PIPE was made available on the cloud with the help of AWS

Bloomberg
User Pain Points

COSTLY PROPOSITION
Bloomberg terminals are extremely expensive, with each terminal costing USD 24,000 per year

INEFFICIENT SET-UP
Given that physical installation is required, shipping, installation, and configuration takes considerable time

STORAGE HOG
Bloomberg circuits, servers, and switches consume significant rack space

Source: Bloomberg, Quinlan & Associates analysis

BLOOMBERG CASE STUDY (2/2) – CLOUD DATA PROVISION

As a result, Bloomberg has been able to achieve numerous benefits, including:
(1) cost effectiveness; (2) time effectiveness; (3) space saving; and (4) holistic offering

Cloud Value Proposition
B-PIPE

1 **LOWER COST**
Without installing any Bloomberg equipment or circuits to connect, costs have been streamlined

2 **RAPID DEPLOYMENT**
Without the need for physical connectivity, it takes just minutes to install and set up B-PIPE

3 **REDUCED SPACE**
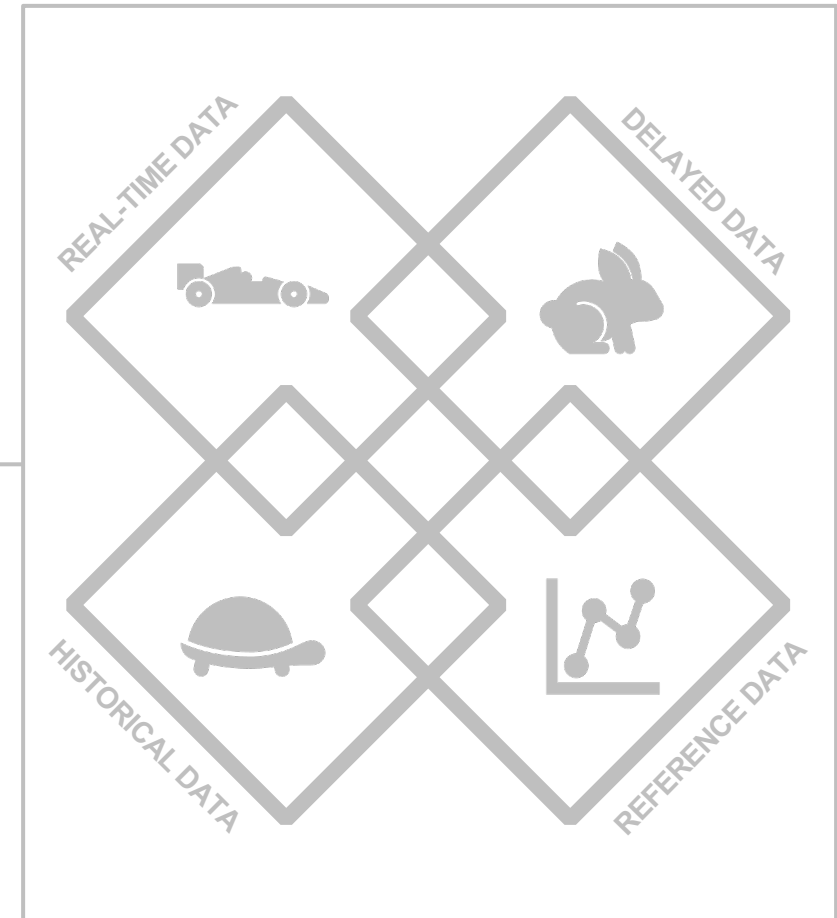By migrating to the cloud, the use of rack space and network ports has been minimised

4 **HOLISTIC OFFERING**
Users can gain unfettered access to the entire Bloomberg universe of content via APIs

Cloud Offerings
B-PIPE

REAL-TIME DATA

DELAYED DATA

HISTORICAL DATA

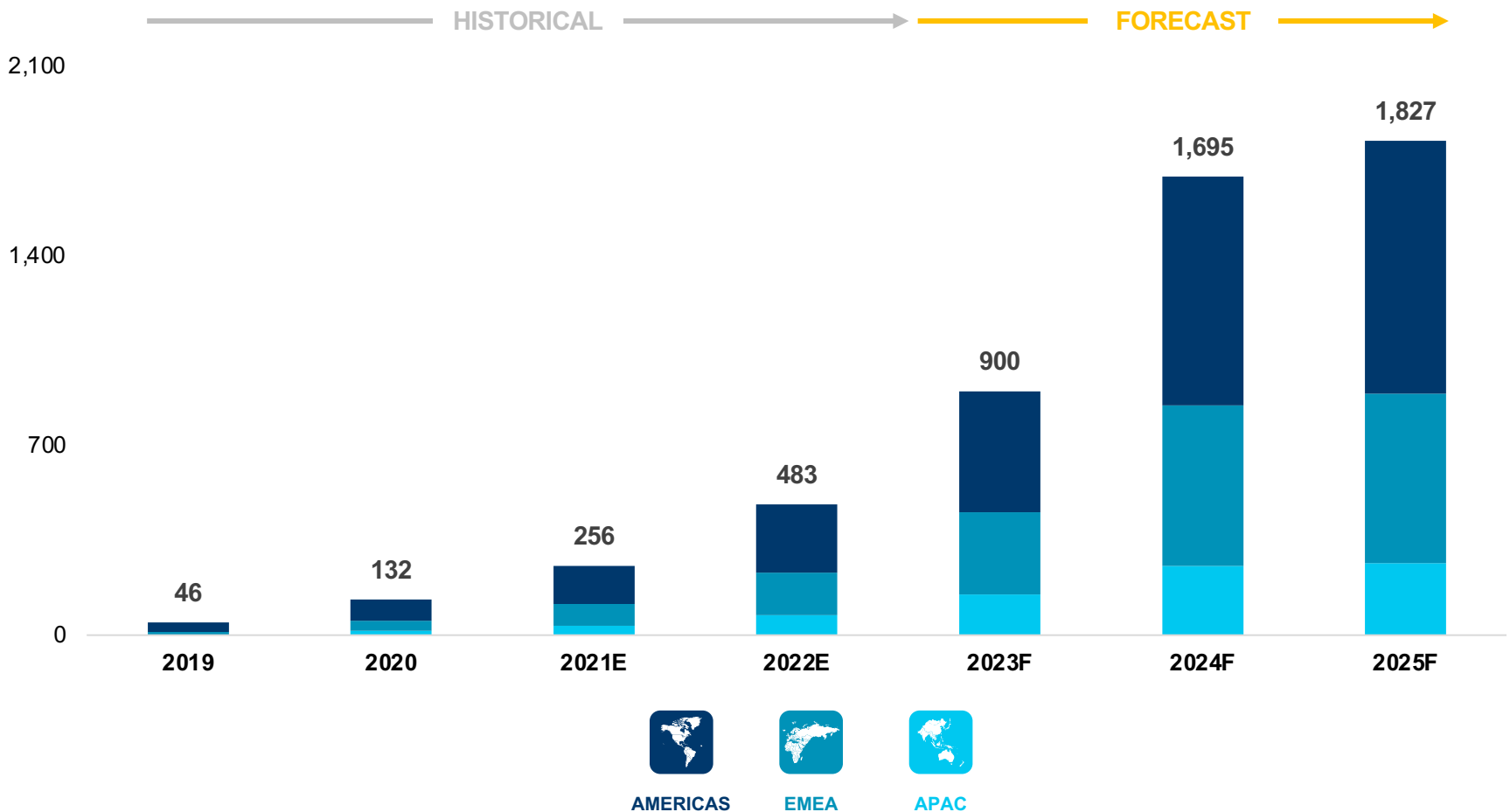REFERENCE DATA

Source: Bloomberg, Quinlan & Associates analysis

REVENUE OPPORTUNITY

Combining the wholesale and retail market transition together, the cloud-based data distribution market is expected to reach approximately USD 1.8 billion by 2025

Cloud-based Data Distribution Market Size
2019-2025F, USD Million, By Region

HISTORICAL → FORECAST →

Year	Value
2019	46
2020	132
2021E	256
2022E	483
2023F	900
2024F	1,695
2025F	1,827

AMERICAS   EMEA   APAC

SECTION 3
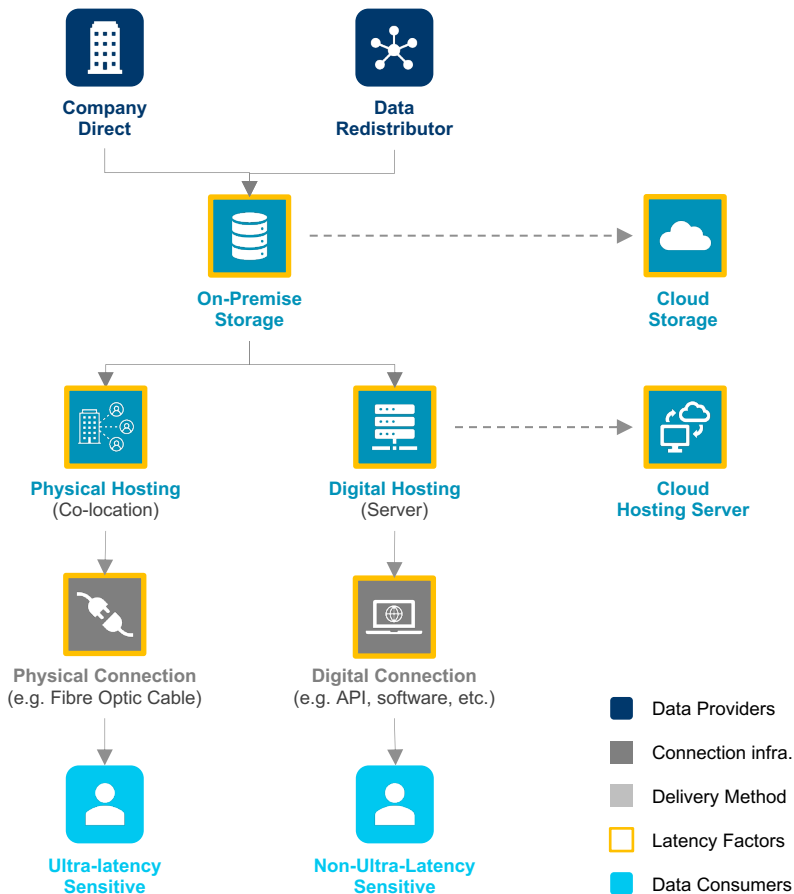
CONSIDERATIONS

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NOTABLE DISADVANTAGES

As cloud environments rely on data transfer via non-physical connections, speed of delivery (i.e. latency) is a key consideration for cloud migration

Data Distribution
Illustrative

Company Direct

Data Redistributor

On-Premise Storage

Cloud Storage

Physical Hosting (Co-location)

Digital Hosting (Server)

Cloud Hosting Server

Physical Connection (e.g. Fibre Optic Cable)

Digital Connection (e.g. API, software, etc.)

Ultra-latency Sensitive

Non-Ultra-Latency Sensitive

- ■ Data Providers
- ■ Connection infra.
- ■ Delivery Method
- ☐ Latency Factors
- ■ Data Consumers

Latency Factors
Illustrative

1

Storage Server (Upload: From Data Originators)
Since the only way to upload information to the cloud is via the internet, the speed of data transfer may be comprised vs. optic fiber

- • On-Premise: Physical / Internet connection for uploading
- • Cloud: Internet Connection for uploading

2

Hosting Server (Connect: For End-user Access)
The hosting server is required to deliver data through digital channels, adding additional hurdles that affect the latency of data transfer

- • Physical Hosting: No additional hosting server required
- • Digital Hosting: Additional hosting server required

3

Delivery Methodology (Download: To End Users)
Similar to uploading, the speed of data transfer is more stable (and faster) via physical cable connections when compared to digital connections

- • Physical Connection: Fast
- • Digital Connection: Dependent on internet speed

Source: Quinlan & Associates analysis

KEY DELIBERATIONS

As such, there remain an array of: (1) strategic; (2) operational; and (3) financial factors, which data providers need to deliberate upon, before taking the plunge

How We Can Help
Strategic, Operational, and Financial Questions

STRATEGIC	OPERATIONAL	FINANCIAL
TARGET CUSTOMER	**PEOPLE / TALENT**	**REVENUE POTENTIAL**
How should you appropriately segment customers based on objective factors and which segment(s) should you target?	How should you assess whether your current crop of talent is well-suited to cloud-based operations, groom them, and recruit more?	How sizeable is the potential upside for top-line growth via adoption of cloud-based distribution?
PRODUCT / SERVICE OFFERING	**ORGANISATION / GOVERNANCE**	**COSTS BUDGETING**
What product(s) / service(s), such as data types, analytics, and other tools, should you deliver via the cloud in particular?	How can you best distinguish governance of your cloud-based operations vis-à-vis other, more traditional operations?	What are the various cost components and their estimated size, which will have to be incurred by you?
DISTRIBUTION CHANNEL	**RISKS / COMPLIANCE**	**PROFITABILITY**
What type of cloud-based technologies should you leverage to distribute the product / service offering(s)?	While transitioning from traditional to cloud-based distribution, how can you remain in compliance with salient regulations?	What is the overall profitability profile, in terms of break-even timeline, gross / operating / net margins, etc.?
MONETISATION MODEL	**IT[1] INFRASTRUCTURE**	**OVERALL BUSINESS CASE**
What kind of pricing model, structure, and fee range should be adopted, such as tiered / non-tiered, flat / proportional, fee level, etc.?	Should you build organically, acquire an existing provider with relevant capabilities, or partner with a third-party to execute?	What is the overall opportunity cost of not adopting cloud or on the flip side, the economic case against adopting it?

[1]Information Technology
Source: Quinlan & Associates analysis

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