

MODERN DATA EXCHANGE CAPABILITY & OFFERING



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Introduction

Imagine that you are a leader managing a big team of associates with different skill sets and KRA. As the leader, you are privy to a lot of information that comes from the leadership of the organization. Some of these are for your eyes only, or for you to act upon. Some have to be anonymized and shared with certain associates for their information only. Some cannot be anonymized before passing on, even though it contains confidential information, because some associate needs to work further on that information and provide you back some value added information that needs to go back to your leadership. This analogy is akin to the modern world of Data Exchange. In the midst of all this sharing and exchange of data, it is your responsibility to ensure that the data does not lose its sanctity and relevance.

We all live in a connected world where we consciously and unconsciously share and forward a lot of personal and non-personal information that we receive while engaging in various activities of life on a regular basis. Now, let us extrapolate the same to the world of business. Organizations also have similar requirements, in fact, they have paramount responsibilities to ensure the privacy, compliance and secrecy of the information consumed and shared. With the changing times and needs, the speed of information sharing has significantly improved and so has the need for complying with various regulations.

Organizations have paid significant penalties and faced law suits due to non-compliance to information protection regulations while sharing information, but, information exchanges cannot be stopped in the new world. The only answer lies in process and methods improving.

The Fundamentals of Data Exchange

Data Exchange (DX) essentially means sharing of data between computer programs and applications. For facilitating the exchange of data between programs, it has to go through format changes so that the data can be consumed by applications. Data Governance is a critical step on the journey to fulfill the needs of DX. A detailed process should be set for discovery, security, and compliance of the data exchanged within the firewalled ecosystem of the organization.

Organizations in the B2B (Business to Business) and B2C (Business to Consumer) sectors should have additional security policies in place, since a good portion of data is moving beyond the organization's boundary. The data is likely to carry customer information, snapshots of financial transactions, and other key information, which, if hacked, results in reputation and financial damage.

Proper precautions should be taken to minimize the risk of cyber-attacks that might put customer and business data at risk.

Data Exchange for B2B and B2C Enterprises

Many corporate and government enterprises are leveraging data-driven insights for improving customer service, reducing Operating Expenses (OPEX), creating new business streams, and achieving overall business efficiency. As per the estimates by IDC (International Data Corporation), the world's digital footprint is estimated to reach approximately 160-180 ZB (Zettabytes) by 2025¹. Close to 30 percent of the world's data is estimated to be processed on the Edge, as edge computing becomes more relevant than ever.

¹ <https://www.seagate.com/files/www-content/our-story/trends/files/idc-seagate-dataage-whitepaper.pdf>

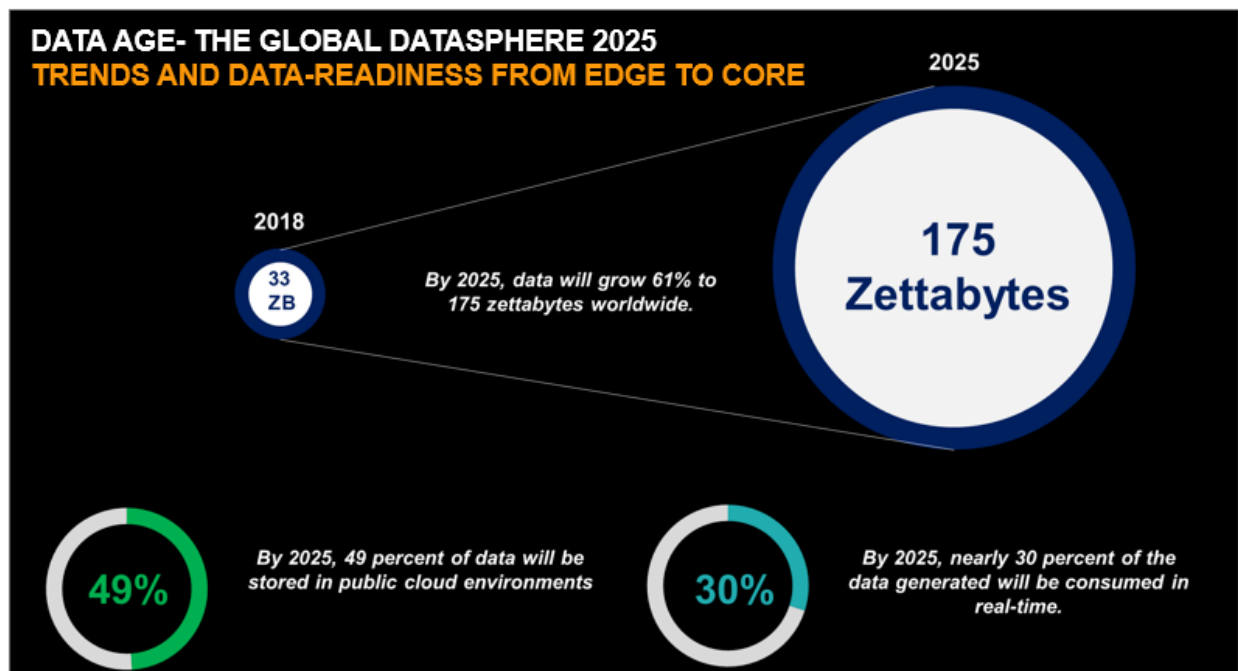


Figure 1 Source

Data (or Big Data) is the gold-mine of information and organizations sitting on that gold mine are leveraging data analytics platforms for drawing actionable insights. These insights help in improving their decision-making process and building new capabilities within the organization. Under GDPR (General Data Protection Regulation) and CCPA (California Consumer Privacy Act)², processing customer's data is generally prohibited, unless it is allowed by the law or explicitly consented³ by the data subject (i.e. customer)..

Without invading customers' privacy, the data can be used for gaining customer insights and targeted advertising. These insights can help businesses and society if they can be shared and exchanged in a scaled, seamless, and secure manner. The business environment is generally dynamic and the key pillars (i.e. vendors, suppliers, & customers) are slowly becoming a part of an integrated environment. Greater emphasis should be laid on simplifying and securing the process of resources and information sharing through process automation. These practices will result in the optimization of operational costs.

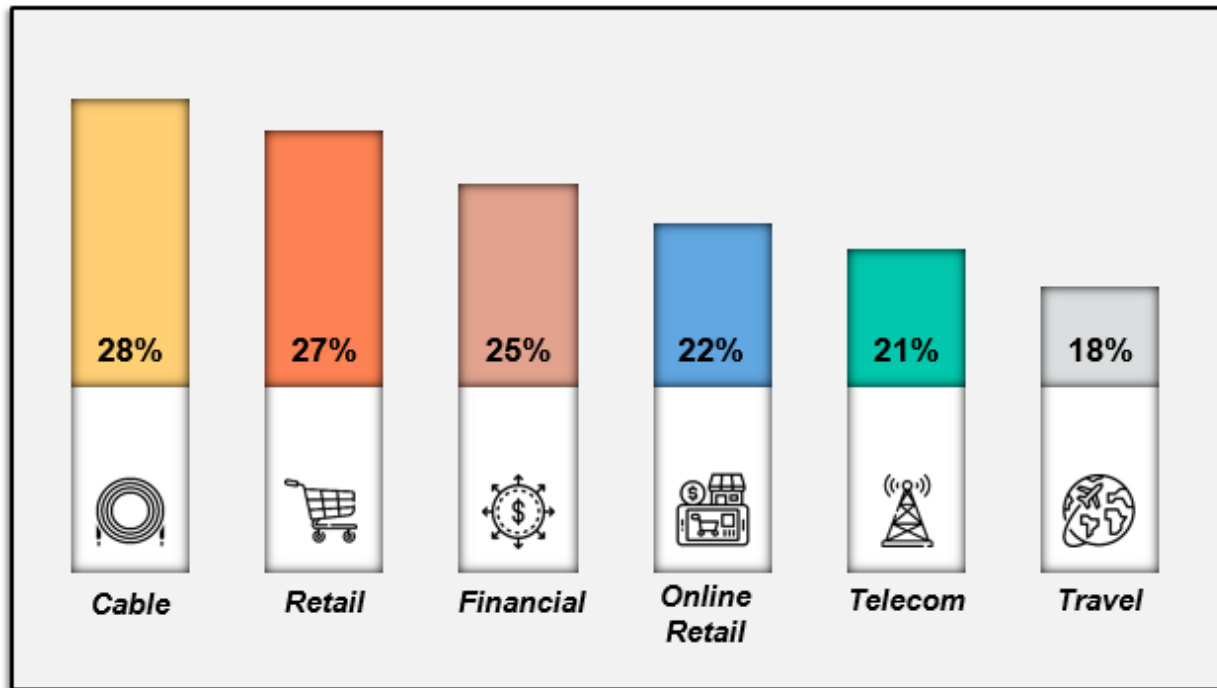
In the endeavor to enhance business operations, enterprises have realized the significance of Data Exchange (DX), whether it is internal data sharing or external data sharing.

Internal data sharing involves the sharing of data across Business Units (or subsidiaries) within the organization, whereas external data sharing involves sharing of data with external stakeholders such as partners, suppliers, vendors, etc.

² <https://www.networkworld.com/article/3286611/while-no-one-was-looking-california-passed-its-own-gdpr.html>

³ <https://gdpr-info.eu/issues/consent/>

At a global level, the telecommunications industry holds the lowest NPS (Net Promoter Score)⁴, which means that the industry has underperformed in customer experience for B2B & B2C clients. The customer churn rate⁵ is also significantly higher in that industry.



Customer churn rate in the United States in 2018, by industry

Figure 2 **Source**

Globally, telecommunication providers (or telcos) are transforming to build digital and analytics DNA to increase customer retention rate, improve customer experience, and simplify the digital experience. Secure and easy data exchange helps telcos reduce overhead costs and automate tasks between their B2B & B2C customer base.

Another important paradigm is monetizing customer's data through privacy and partnerships. Service providers have the essential profiling information such as location, online behavior, demographic information, etc. that might be of interest to advertisers⁶. The same data can also be used to provide anonymized television intelligence with content providers and media producers.

Data Exchange (DX) or Data Sharing provides enterprises an opportunity to generate improved insights, democratize data within the organization (and business partners) to streamline operations. It also opens an ocean of opportunities by building customer-centric products (or services).

Challenges with legacy Data Exchange Techniques

Many organizations maintain their internal data in various operational relational databases. Long before database techniques came into existence, Comma Separated Values (CSVs) was the commonly used

⁴ <https://customergauge.com/benchmarks/blog/telecommunications-nps-benchmarks-and-cx-trends>

⁵ <https://blog.comviva.com/efficient-ways-for-customer-churn-analysis-in-telecom-sector/>

⁶ <https://inform.tmforum.org/features-and-analysis/2016/02/8-ways-service-providers-can-monetize-customers-data/>

format for storage & retrieval of data. The mass-adoption of the internet and evolution of the API economy⁷ gave rise to data-formats such as XML (Extensible Markup Language) and JSON (JavaScript Serialized Object Notation).

XML lost the race to JSON, as it was bulky due to the tags used to define the data. JSON is a big data file format⁸ that is better suited for data analytics type of applications. JavaScript which is one of the prominent scripting languages in the Web world also supports JSON.

Data Exchange has been using APIs (for lightweight applications) or interfaces (for bulk data feeds) which takes the form of flat file feeds in a defined format. This approach limited innovation and was not considered ideal for open data communities⁹ where the consumption pattern is to discover (or add) new data and share it with the community. The data cannot be changed and worked upon collaboratively but can be only published and consumed.

Informatica Data Exchange and IBM Maximo Asset Management are some of the frameworks and tools that have capabilities like data integration (and transformations) and data movement. These features are used to handle various data integration scenarios that address different types of data exchange needs.

The traditional data exchange techniques are cumbersome, as the creation of data feed requires the development of interfaces using custom scripts (or ETL tools) through FTP (File Transfer Protocol). There was minimal robustness in the design, as any changes on the underlying data set (or structure) required high lead time.

The data being shared was stale since the static copy of the data was transferred for further usage. This led to issues such as data inconsistencies and inherent data latency that unnecessarily increased the transfer time. Lastly, the creation of such data copies also resulted in the consumption of critical system resources such as storage, compute power, etc. that were used for the execution of those scripts.

Data Exchange Capabilities for the Digital World

Organizations have to build capabilities in order to thrive in the data-driven digital world. Data should be used as an enabler to drive productivity and improve product (or service) offerings.

Data Exchange (DX) in the digital world has become an absolute necessity. The scenarios for Data Exchange are extensive, some of them are below:

- **Internal Data Sharing** (i.e. within an organization across Business units or subsidiaries)
- **External Data Sharing** (i.e. outside the organization for B2B scenarios where organizations need to manage partners that are a part of their ecosystem)
- **Sharing Data to Customers** (i.e. B2C)
- Monetization of **Data As A Service**
- Data as a tool for '**Collaboration**'

The overarching demand is to have a simple (and easy to operate) Data Exchange framework which is devoid of the past limitations of legacy (or traditional) techniques.

The modern data exchange capabilities can be broadly classified into

- Capabilities provided by Cloud vendors (like Snowflake)
- Data Exchange using Blockchain

⁷ <https://dzone.com/articles/what-is-the-api-economy-amp-why-it-matters-to-your>

⁸ <https://dzone.com/articles/stop-comparing-json-and-xml>

⁹ <https://opendatacommunities.org/home>

Let's look at each of them in more detail.

Data Exchange – Cloud Vendor capabilities

Snowflake Data Exchange (or Secure Data Sharing) provides a unique capability to elevate collaboration between Providers and Consumers through real-time data sharing. Hence, there is no need for maintaining multiple copies of the same data.

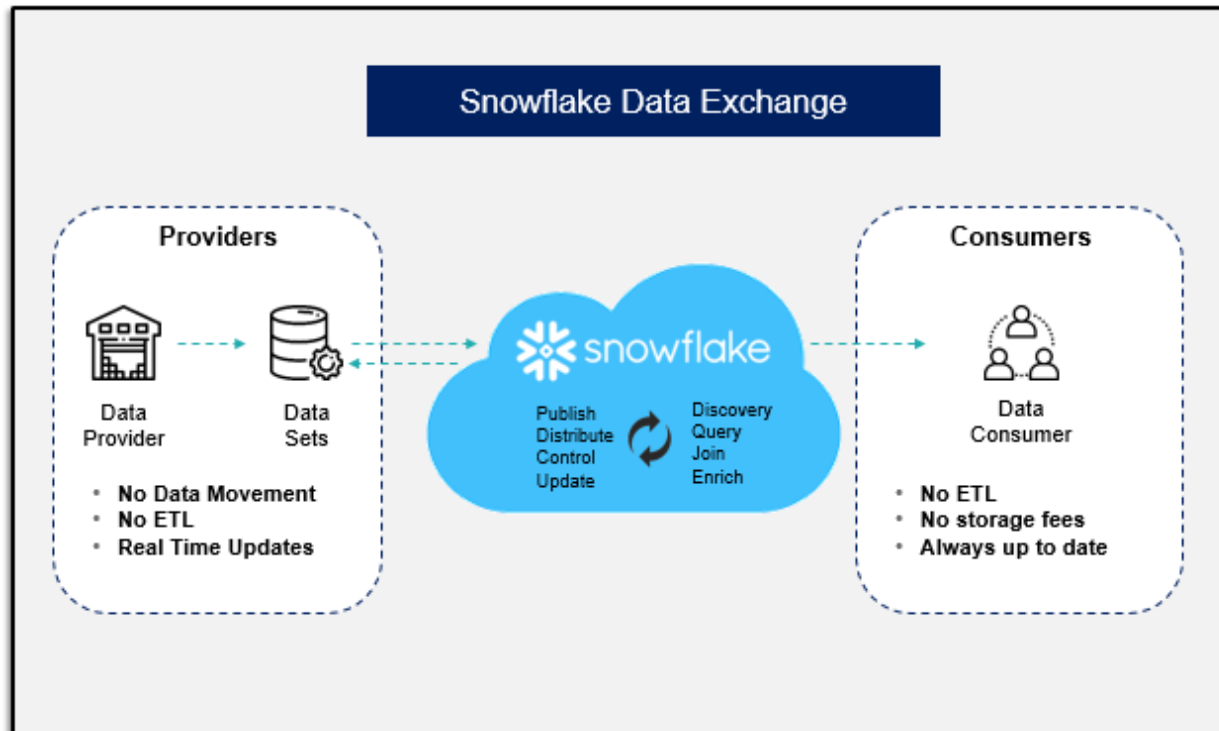


Figure 3 Source

Organizations like GreenHouse10 and others are using this capability for seamless sharing of data, without the need for any custom code (or ETL development). All data security norms are followed considering the push for stricter data security regulations. This expedites the client's ability to discover value from data and deliver optimized performance through data-driven collaboration.

Data Exchange (DX) - The Key Capabilities

The Data Exchange primarily consists of the following:

¹⁰ <https://resources.snowflake.com/case-study/greenhouse-accelerating-collaborative-digital-advertising-with-modern-data-sharing>

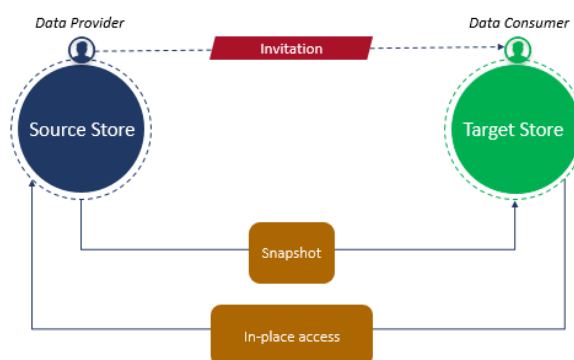
- **Loosely coupled Providers & Consumers** - Entity which shares data (Provider) and its recipients (Consumers) become a part of the publish-subscribe model
- **Live data exchange** - The data being exposed is a LIVE version of the data that resides within the database. This eliminates data inconsistency issues arising due to references to stale data
- **Minimize the cost of Data Sharing** - The process eliminates any need to develop ETL processes or traditional methods using APIs or FTP. It also eliminates the cost of extra storage and compute resources required for the periodic processing of ETL processes.
- **Data Privacy & Security and provision to Track, Analyze, and Monitor usage** - Snowflake Private Data Exchange is managed from within anyone's Snowflake account. It has the necessary functionalities to ensure data privacy, security, and governance (along with the ability to track and monitor usage).

Snowflake Private Data Exchange eliminates traditional data boundaries and helps in realizing real-time and frictionless data sharing that yield significant benefits in the long run¹¹. Private Data Exchange can be supported irrespective of whether the consumer owns a Snowflake account or not.

Data Sharing - Share data across Tenants in a Simple and Secure manner

A growing number of enterprises have come up with services through which data can be shared with a specific set of users within the organization or outside the organization. It serves the need of the big data world and provides complete visibility into the data-sharing relationships¹².

Snowflake provides a Public Marketplace¹³ wherein various industry data sets are available for subscription. This helps in leveraging public and private data, minimizing the cost to share data, and creating a data-driven organization.



Microsoft Azure has launched a capability called Data Share¹⁴ which is currently in public preview. Using Data Share; structured, semi-structured, and unstructured data stored on the Azure platform can be shared with data consumers. Data Share uses Azure's underlying security mechanisms to protect data. Figure 4 [How Azure Data Share works](#)

AWS Data Exchange is also a Public Marketplace where Subscribers can browse through the catalog to identify relevant data products for consumption.

¹¹ <https://www.snowflake.com/blog/5-reasons-to-host-your-own-private-data-exchange/>

¹² <https://azure.microsoft.com/en-in/services/data-share/>

¹³ <https://www.snowflake.com/data-exchange/>

¹⁴ <https://azure.microsoft.com/en-in/services/data-share/>

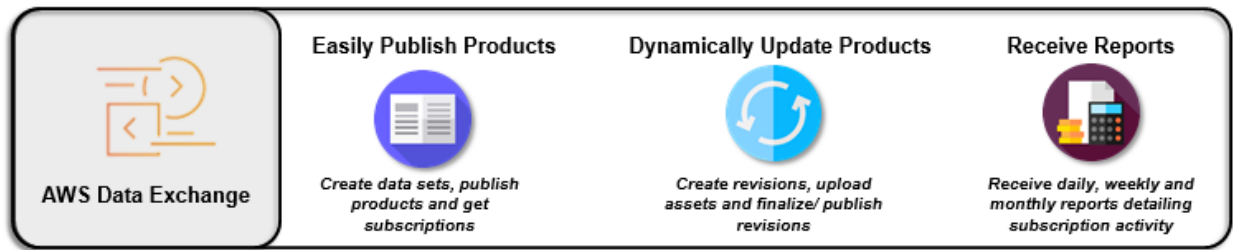


Figure 5 Source – AWS Data Exchange

Data Exchange using Blockchain

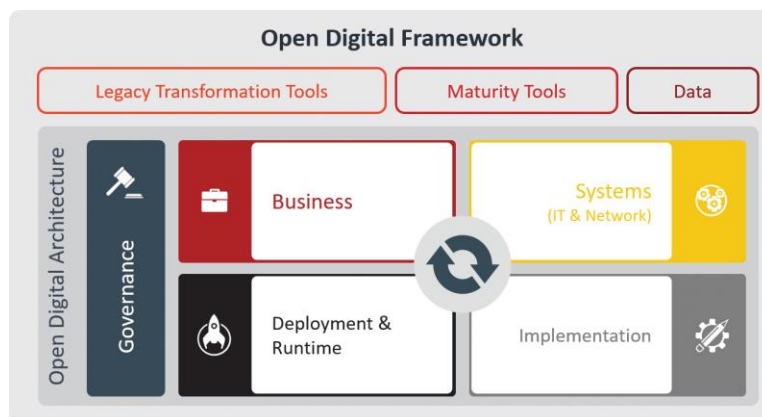
Blockchain, a peer-to-peer distributed ledger technology is witnessing increased adoption for data sharing since it makes the data inherently more secure and accessible. Blockchain breaks the industry silos and helps in promoting connectivity, collaboration between stakeholders within the organization.

Deep dive into Open Digital Framework (ODF)

The TM Forum Open Digital Framework (ODF)¹⁵ is a popular framework that accelerates the migration path from legacy IT systems to a cloud-native software that is orchestrated by AI (Artificial Intelligence). ODF addresses key data exchange challenges in scenarios wherein:

- **Data is present in silos** across multiple data centers of the organization
- Enterprise has **hundreds of partners (or customers)**
- Friction in business due to lack of **standardized value exchange flow**
- Concerns related to **security** and **data privacy**

Shown below are the core elements of the Open Digital Framework (ODF):



¹⁵ <https://www.tmforum.org/opendigitalframework/>

How China Unicom leveraged blockchain to create new data monetization revenue stream

China Unicom is one of China's 'big three' operators. The company's objective was to share data with enterprise customers, whilst complying with security & privacy and keeping a watchful eye on the overhead costs and data storage. China Unicom built a blockchain-based data-sharing platform to unify data across its data centers and subsidiaries.

It established a platform based on blockchain technology for data asset management and data sharing. It establishes a 'trust chain' between data consumers to producers. The platform's traceable data flow process meets the needs of privacy and data security within the enterprise through data masking, traceability, and anonymous data sharing of external data. Before the data is shared, it is desensitized and anonymized via the platform¹⁶.

China Unicom gained over 1,000 enterprise customers from over 20 industries for using their data-sharing platform to develop and augment services. The shift to blockchain also resulted in savings of \$22 million in IT investments, specifically related to data storage and management¹⁷.



Figure 6 Source

¹⁶ <https://inform.tmforum.org/casestudy/china-unicom-taps-new-data-monetization-revenue-stream-with-blockchain/>

¹⁷ <https://inform.tmforum.org/casestudy/china-unicom-taps-new-data-monetization-revenue-stream-with-blockchain/>

The platform primarily consisted of three key layers:

1. **Infrastructure-as-a-service (IaaS)** layer comprising of Cloud computing and Big Data capabilities
2. **Platform-as-a-service (PaaS)** layer that incorporates API enablement and access authorization. It also includes a unified data center, a GIS capability center, and an API gateway that uses a cloud-based micro-services framework
3. **Outward-facing Software-as-a-service (SaaS)** layer that makes data available to external parties

In-depth details of the implementation are available in TMForum's case study titled '*China Unicom taps new data monetization revenue stream with Blockchain*'¹⁸. With organizations planning for astronomical investments in 5G, usage of **blockchain for Data Exchange and Sharing** seems to be an avenue for data monetization.

The growing need for a 'Data Marketplace'

Data Exchange or Data Sharing is a key enabler for organizations to benefit from the data economy. It also provides a strong capability to create a Data Marketplace offering so that data can be monetized in collaboration with customers and partners.

As data democratization enables barrier-free access to data, a Data Sharing service (or Data Marketplace) can become the key offering of an organization.

It can follow a Freemium pricing model where a wide range of services can be offered under the Standard and Premium pricing strategy. The key steps towards creating a Data Marketplace offering will be identifying business use cases of data sharing, locating data across organizations & partners that should be integrated and augmented to comprehend the use case, and defining the target customer segment.

Based on these combined factors, a highly-secure and well-governed data marketplace platform backed by a sound pricing strategy should be created. Data Marketplace can eventually become a platform like App Store wherein data citizens can visit and go through a Catalogue of data assets to identify and choose the data assets that they need. It can become a one-stop destination for '*Anything and Everything related to Data Exchange*'.

With emergence of the data economy, companies need to transform into data-driven enterprises so that they can maximize the potential of data and gain actionable insights from them. Data is becoming pervasive in business and organizations with rock-solid internal and external data sharing strategies will have a huge upper hand on their competition.

¹⁸ <https://inform.tmforum.org/casestudy/china-unicom-taps-new-data-monetization-revenue-stream-with-blockchain/>

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Manish has 20+ years of experience in running delivery, operations and business development across the globe. He has deep understanding of the Data and Analytics domain which has evolved over time and has exposure in Big Data, Machine Learning and Artificial Intelligence. He currently serves as a Global Competency Delivery Head for BI, Big Data and Data Management services in Tech Mahindra, focusing on Communications, Media and Entertainment verticals. He is passionate about co-creating competitive techno commercial solutions with his customers by leveraging not just the leading Data and Analytics products of the market, but also collaborating with the thriving startup ecosystem in this space. You may reach out to him at Manish.Kampani@techmahindra.com

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