Whitepaper

The Masterplan to Optimize your Data Migration Journey to the Cloud
Abstract

Enterprises are witnessing two major growth trends:

- Increasing demand for business insights from data to gain and maintain their competitive edge
- An ever-increasing amount of data and data sources, both internal and external where these insights need to be derived from

This in turn has put an extremely high load on their existing systems of storage and analytics, typically residing on their in-house and on-prem data platforms. These data platforms were built to scale decades ago but are unable to stretch their limits in terms of storage capacity, processing power or analytical ability in line with the two trends mentioned above.

Cloud has emerged as the solution to this problem with its practically infinite storage capacity, very high processing power and modern, scalable and high-speed data and analytics platforms.

Key Takeaways

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Business challenges prompting the need for a right data migration strategy

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Use cases for data migration to cloud

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Solution architecture

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TechM’s Best Practices for Data Migration Journey
Introduction

As organizations want to migrate from their legacy systems to cloud, there is no ‘one size fits all’ approach. Every case is unique, and the right answer depends upon a multitude of factors, with key ones as follows:

- Current source systems and data growth rate
- Future source systems and data growth rate
- Business needs and use cases
- Variety, frequency, and recency of analytics required

Business Challenges Prompting the Need for the Right Data Migration Strategy

Cost and time have emerged as the primary challenge when it comes to enterprise data migration. Poor data quality and lack of visibility into associated issues have been cited as the most common factors behind delays and increasing cost. Another key challenge is choosing the right platform.

We help organizations develop a well-planned migration strategy by consulting with their business and technology stakeholders to outline the scope of data migration, the timeline, and the availability of resources in the new system. This enables organizations to develop a plan that is in alignment with overall business goals and ensures seamless and timely migration.

Few pointers that need attention while an organization are on their data migration journey:

- **Platform Selection**: Choosing the right tool is always a challenge when considering hybrid or multi cloud migration solution and it requires additional impact analysis on cost and compatibility
- **Data Quality and Cleansing**: Identifying right data cleansing rules is challenging as it requires context of the data and good business knowledge
- **Monitoring and Predictive Maintenance**: For big migration programme across hybrid environments the monitoring and maintenance is complex in nature and thus requires specialized tools
Considering the varied nature of stakeholders involved in a data migration, it becomes a very complex and proper strategy should be employed for project, communication, and risk management.

Extracting common metadata from unstructured and semi-structure data is complicated due to varied sources and sometimes requires specialized tools for conversion.

Specialized job planning and architecture consideration including accelerators are needed for performance scalability which required additional cost and effort.

For larger volume of data verification and validation become a major challenge and automation may require for better productivity.

### Data Encryption/Decryption
Data encryption/decryption at rest and motion with proper authentication and authorisation could become very cumbersome. Additionally, security management for test data requires use case-based planning and specialized tools for execution.

### Program Management
Considering the varied nature of stakeholders involved in a data migration, it becomes a very complex and proper strategy should be employed for project, communication, and risk management.

### System Performance and Data Throughput
Specialized job planning and architecture consideration including accelerators are needed for performance scalability which required additional cost and effort.

### Data Transformation and Conversion
Extracting common metadata from unstructured and semi-structured data is complicated due to varied sources and sometimes requires specialized tools for conversion.

### Verification and Validation of Data
For larger volume of data verification and validation become a major challenge and automation may require for better productivity.

### Data Migration Use Cases
Several use cases and situations can prompt the need to migrate data. While one of the foremost requirements stems from businesses undertaking a large digital transformation initiative where movement to cloud is all but necessary, an organization could be moving data to cloud just to get long-term cost advantage or leverage more modern technologies; it could also be a sudden need to moving and merging bulk data because of mergers and acquisitions. We have seen organizations that have required us to create a migration factory and implement migration-as-a-service for parallel migrations running across several geographies. Besides business needs for data migration, we have seen the need of data migration from varied data sources like migration of unstructured data or file systems. There are several trends on the approach of data migration as well—such as API and web-service-based migration or batch load.

To boost our customers’ strategy, we complement it with different IPs and accelerators. Our home-grown frameworks, solutions, and IPs benefit our customers to choose a cost-effective yet modern migration approach that suits them best to achieve their business goals.
Digital Transformation
- Moving database/data warehouse to cloud
- Setting up future proof data and analytics platforms on cloud
- Identification of the right migration tool
- Building an automation framework

Merger and Acquisitions
- Bulk migration for M&A
- Data merge
- Data audit
- Address and revenue validation

Migration -as- a- Service
- Leveraged for migration factory model
- Creating a common data model and exposing services from the common data model to consuming system
- Flexibility in migration depending on consumer need with embedded data quality and data governance

Transformation and Migration
- Heterogeneous database migration
- OLTP/OLAP to NoSQL
- Create a transformation layer and map to target DB with automation.

Application Migration
- Data migration for application such as ERP, CRM, and SAP
- This is not only data migration but need to consider business process and logic as well

Structured Data
- Files
- File systems (Json, XML, txt)

Unstructured Data
- Semi Structured Data

Bulk Load
- Lift & Shift
- Staged loading

API/Web Services
- Batch and Delta
Our Pillars

We follow a few key principles for data migration and make sure these principles are benefiting the organization while migrating their data to the target platform.

The most critical one is productizing the data. It is just not migrating the data, but we look at how that data will be consumed how can we deliver the data to the point of consumption with ease. The solution take cares of these aspects and we provide a framework that enables our customers discover the data that they are looking to consume.

We also provide an error resolution framework that takes care of every failure scenario with proper mitigation and reconciliation plan including provisioning of a self-healing mechanism.

Another important component of our framework deals with existing data issues and identification of process glitches. This helps restricting those issues migrating to the new system. The solution also establishes required cleansing and reporting processes to enable automated, governed and report based manual cleansing by users.

Our solution tenets not only bring the clarity of the process but also makes the organization future ready with ensuring business agility and modern trends of technology.

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- **Use Case Based Data Product**
  Data arranged as per business and consumption system-based use cases to ensure consistent governance and quality framework while delivering the data.

- **Data Availability**
  Each business product data made discoverable and shared by critical filtering elements such as Country and Language, using tagging and lineage with data access and security framework.

- **Error Handling & Reconciliation**
  Establish error framework at each point of failure to ensure proper mitigation and reconciliation including self-healing mechanism.

- **Data Cleansing And Data Quality As A Service**
  Establish required cleansing and reporting process to enable automated, governed and report based manual cleansing by users. Combination of business requirements and industry best practices to provide high quality data.

- **Multi-platform, Multi Format Usable Framework**
  Establish once, use many times, enable delta loads in both API and ETL format through global framework.

- **Optimized & Robust Cut Over Execution Plan & Mock Load**
  Decouple Data availability from data sharing.
Solution Architecture

The Way Forward

Data migration is a necessary part of maturing a company as a data-driven organization. It is always challenging and if we don’t carefully strategize and set up the right migration model that aligns with the business requirements, it’s all too easy for a promising mission to fail, stopping businesses from achieving digital transformation.

Selecting a deployment model that aligns with business requirements is essential to make sure that any data migration is both smooth and successful and delivers business value.
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### Data Migration

- **Data Discovery**
  - The first step in data migration is not field-level mapping, but entity-level analysis to determine the master data entities needed for the target application. Identify the source of product, customer, vendor data, and validate it against other sources.
  - Identify data quality problems through data profiling to reduce testing and reconciliation effort.
  - Identify data security requirement to ensure regulatory compliance and sensitive data tagging for test and production data.

- **Data Movement and Reusability**
  - Use a flexible, metadata-driven architecture that standardizes and reuses definitions across platforms and projects, e.g., global ingestion framework.
  - Establish error framework at each point of failure to ensure proper mitigation and reconciliation including self-healing.

- **Execution**
  - Optimized and robust cut over execution plan including mock loads, verification process, offline vs online load, and planning for parallel jobs.

- **Program Management**
  - Efficient program management to establish a program governance organization to identify and manage dependency across stakeholders from business to end consumers.

- **Infrastructure Planning**
  - Scalable infrastructure planning based on the data growth rate.
  - Tool selection for hybrid and multi cloud for cost effectiveness.

### Author

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