UNIVERSITY OF BIRMINGHAM | BIRMINGHAM BUSINESS SCHOOL

**Student ID Number(s):** 2655175

**Programme:** MSc Business Analytics

**Module:** Data Management Strategies and Technologies

**Name of Tutor:** Dr Shuyang Li

**Assignment Title:** Individual Report

**Date and Time of Submission Time**: 6th May 2024, 5:40 PM

**Actual Page Count:** 3011

**Extension:** N **Extension Due Date:** N

I do wish my assignment to be considered for including as an exemplar in the **School Bank of Assessed Work.**

| |
|---|
| **The purpose of this template is to ensure you receive targeted feedback that will support your learning. It is a requirement to complete to complete all 3 sections, and to include this completed template as the first page of every assignment that is submitted for marking (your School will advise on exceptions).** |
| |
| **Section One:** Reflecting on the feedback that I have received on previous assessments, the following issues/topics have been identified as areas for improvement: *NB – for first year students/PGTs in the first term, this refers to assessments in your previous institution*<br>• I should add precisely the information required in the assignment<br>• Keep in mind the word count. |
| **Section Two:** In this assignment, I have attempted to act on previous feedback in the following ways<br>• I have added precisely the necessary information that was required in this assignment<br>• Word count has been taken care of. |

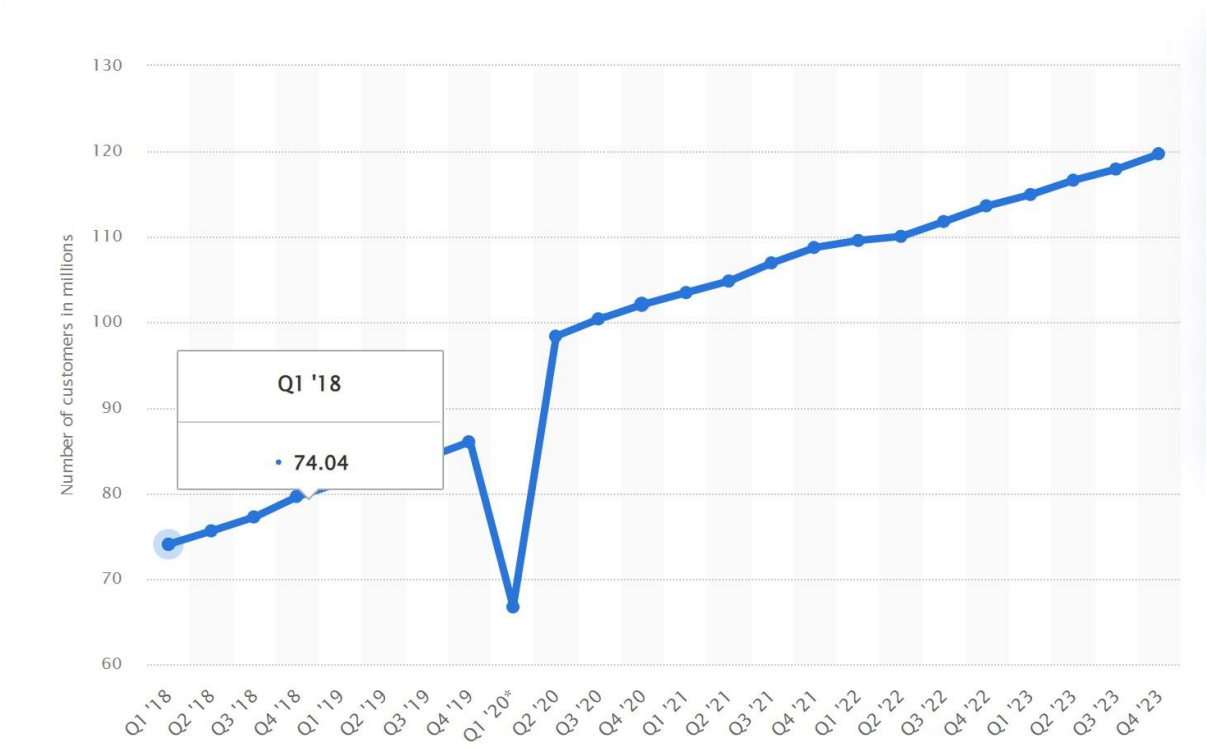
# Identification of existing company/product/service and its Data Management strategy

In this individual report, we will be studying the case of **T-mobile** company. T-mobile provides wireless telecom services, as well as a host of other services, including voice, text messaging, video calling, and data communications. T-mobile provides its sim and wi-fi services to masses.

During the *fourth quarter* of 2023, T-Mobile served more than *119 million* users worldwide. The combination of *T-Mobile* and *Sprint* in April 2020 resulted in a significant growth in the company's subscriber base during the first and second quarters of 2020. **(Ataccama, 2024)**

## Customer segment

As the brand's fastest-growing subscription base, *millennials* were the company's primary target demographic. Since millennials are known to check their phones up to 86 times a day, T-Mobile's loyalty program was designed with *mobile media* in mind.




From this dataset we can see the sky-rocketing of T-mobile customers from 2020 Quarter 2 to 2023. T-Mobile serves more than *210* countries and offers fantastic international plans.

*Branded Postpaid* and *Branded Prepaid* consumers make up the two customer segments that comprise T-Mobile's subscriber base today. Postpaid users comprise about 80% of the total customer base and make up the majority of its subscribers. **(Ataccama, 2024)**

# Data management technology in use

T-mobile uses **Ataccama** as its data management software. Sudden increase in customer numbers resulted in lot more and different variety of data than ever before. Because of its achievements, the company was managing and absorbing a higher volume of clients and their data than ever before inside an ever-more complicated infrastructure. T-Mobile's efforts to re-evaluate its data handling at scale were prompted in 2021 by a *data breach* and the subsequent negative effect on its share price. In order to assist this aim, it turned to longtime partner Ataccama for professional guidance and solutions to its large data handling and data breach issues.

An initiative called *"Data Scanning at Scale"* was created by the data governance team. This required continuously scanning 22,000 databases and an estimated 5,000 apps, totaling 8 petabytes of data.

In order to allow T-Mobile to protect its data at scale, maintain compliance, and activate its numerous data vaults for its ever increasing consumer base and for useful consumer intelligence, Ataccama worked on 3 goals. **(Ataccama, 2024)**

- Construct a system for centralized management. This would automate audit balance control, this saved T-Mobile a significant amount of time.

- Construct a reliable data quality system. To swiftly find sensitive or personally identifiable information (PII) in massive databases, T-Mobile needs an enterprise-grade tool. T-Mobile provided a significantly more detailed reference to its data landscape, as well as regulatory compliance.

- Provide an authoritative source for both internal and external data. Here, both operational effectiveness and enterprise-wide data trust are the goals.

Keeping in mind these 3 goals Ataccama provided Data Management services to T-mobile in following ways:

- ***Data Integration:*** Ataccama can be used to combine information from several T-Mobile sources, including billing systems, customer databases, service usage logs, and network statistics. Combined views are made possible by this integration, and proper data analysis and reporting depends on them.

- ***Data Quality Management:*** For every major organization, maintaining data quality is essential. Ataccama offers solutions for data standardization and cleansing, error detection and correction, and removal of duplicates. This procedure aids in the maintenance of trustworthy data that facilitates wise decision-making.

- ***Data Governance:*** Data governance pertains to the management of enterprise systems' data's accessibility, usability, integrity, and security. To guarantee that data is utilized appropriately and conforms with legal and regulatory requirements, Ataccama

offers *data governance tools*. For a business like T-Mobile, which manages a lot of sensitive consumer data, this is particularly crucial.

- ***Data Analytics and Reporting:*** Ataccama can assist T-Mobile in using this data to create insights through analytics and reporting tools after it has been integrated, cleaned, and controlled. Enhancements to customer service, operational efficiency, and business strategy can all be informed by these findings.

## Scope of Improvement for Ataccama

However there is still a lot that can be done by Ataccama. There is a scope for improvement with regard to how Ataccama manages the data. Some of these are mentioned below:

- ***Improved Data Profiling and Analytics:*** T-Mobile may obtain deeper insights into consumer behavior, network usage, and service performance by utilizing more advanced analytics and data profiling tools. Predictive analytics using machine learning models can identify patterns, possible network difficulties, and consumer loss before they become serious issues.

- ***Automated Data Operations:*** By automating standard data management procedures including data aggregation, validation, and cleansing, human labor and error rates can be greatly decreased. Additionally, by accelerating the analysis of data, this automation can provide decision-makers with more timely and relevant data.

- ***Advanced Data Security Measures:*** To further protect sensitive customer data from breaches and illegal access, data security measures can be improved through the use of encryption, anonymization, and real-time threat detection systems.

- ***Customer Data Platform Integration:*** By combining information from many sources, creating or integrating a customer data platform (CDP) can offer a single, comprehensive picture of every customer. Customer support interactions can be enhanced and personalized marketing techniques can be made possible by this single view.

- ***Data democratization:*** Encouraging more staff members to use data efficiently can be achieved by increasing access to data throughout the company while upholding governance and security standards. A data-driven culture can be promoted by putting in place self-service data tools and dashboards that let non-technical individuals produce insights.

- ***Integration of the Internet of Things (IoT):*** T-Mobile, a telecommunications firm, can offer new products and improve services by integrating IoT data from devices, which can supply extra data points through its website and the services that it provides. **(PeerSpot, 2020)**

# New technology for implementation

After thorough research and after studying the benefits and drawbacks of Ataccama as a data management software, I came to conclusion that there is a player in the market that offer good benefits over the Ataccama software and it can fulfill the gaps left by Ataccama for the T-Mobile company. The software is **Oracle**.

# Data management and business performance of Oracle

### 1. Advanced Technologies and Oracle Database

***Oracle Autonomous Database:*** A cloud-based, self-managing, self-securing database that guarantees high availability and security by automating standard database maintenance operations including patching, upgrading, and tuning.

***Oracle Exadata:*** Oracle Exadata is a hardware and software combination designed to operate Oracle databases at optimal performance, especially for mixed workload databases. It is the perfect choice for performing data analytics in the telecom industry.

### 2. Tools for Data Integration

***Oracle Data Integrator (ODI):*** An integration tool that makes high-performance data transfers and transformations between different data sources easier.

***Oracle GoldenGate:*** Provides replication and real-time data integration in diverse IT settings. For T-Mobile to guarantee that data is reliably synchronized across several platforms, the process becomes essential.

### 3. Cloud-Based Solutions

***Oracle Data Management Cloud:*** Services provided by it are Database as a Service (DBaaS), Data Warehousing, and Big Data Management.

### 4. Data Security and Privacy

***Oracle Advanced Security:*** Offers encryption at rest and in transit, along with redaction capabilities to protect sensitive data from unauthorized access.

***Oracle Database Vault:*** Restricts access to specific data within the database, helping to prevent insider and outsider threats without altering existing applications.

### 5. Data Governance Framework

***Oracle Enterprise Data Management (EDM):*** Assists in managing metadata management and data governance changes across enterprise data landscapes.

***Oracle Master Data Management (MDM):*** Ensures uniformity, accuracy, stewardship, and consistency by consolidating and managing important enterprise data.

### 6. Reporting and Analytics

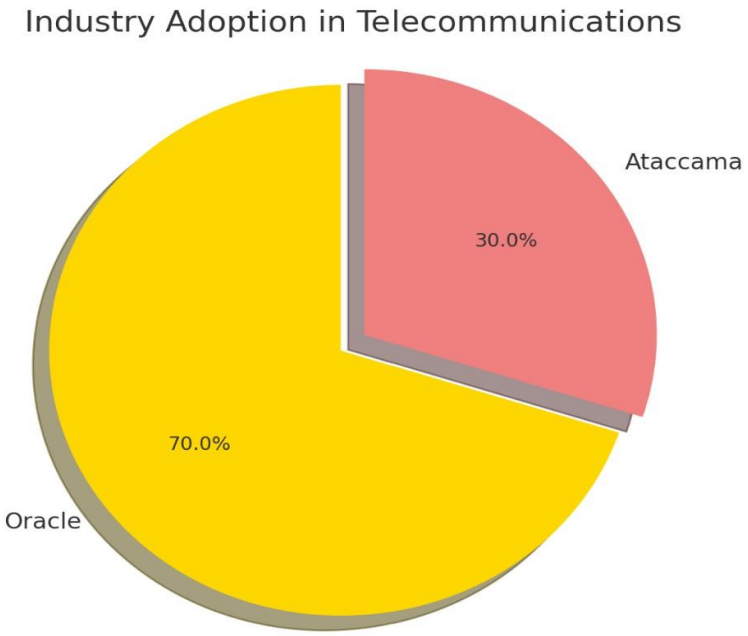
Oracle Analytics Cloud (OAC) provides T-Mobile with integrated business intelligence (BI) capabilities, machine learning algorithms, and advanced data visualization tools to help them extract insights from their data. (C. Annamalai, 2011)

T-mobile chooses to stay with Ataccama even after *data breach* and inefficiently handling of T-mobile's ever increasing database. This may be partially due to long time collaboration of T-mobile with Ataccama or they may be unaware of how differently the collected data can be utilized. Reasons of ***Oracle*** being a better software than Ataccama are:

1. **Features and capabilities of the product**

***Oracle:*** Well-known for its all-inclusive database solutions, Oracle provides strong data management features, such as machine learning integrations, smart analytics, and excellent performance while managing large volumes of data. Large-scale and sophisticated data settings can be supported by wide range of services offered by its products, which include *Oracle Big Data Service, Oracle Cloud Infrastructure,* and *Oracle Database*.

***Ataccama:*** Its expertise lies in data governance, master data management, and data quality. Still its something that Oracle does in a very efficient way.



2. **Efficiency and Expandability**

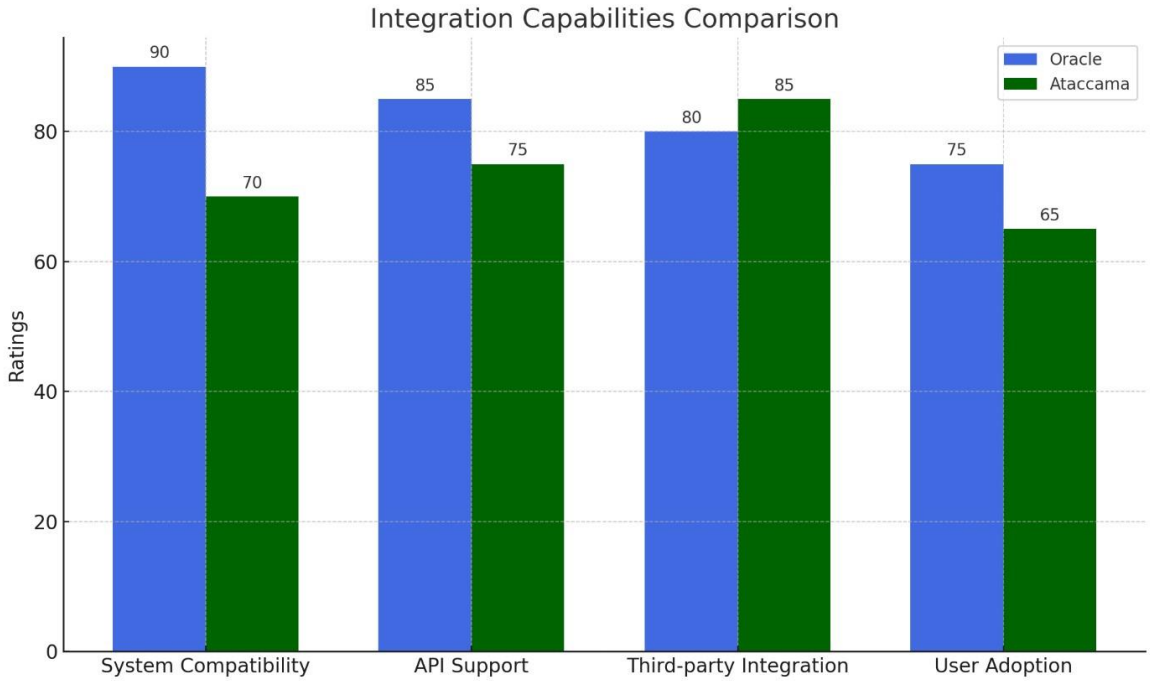
***Oracle:*** It provides scalable solutions capable of managing vast amounts and diverse types of data. The highly sought after situations that T-Mobile and other firms that process large amounts of data from many sources must be supported by Oracle's database technology and cloud solutions.

***Ataccama:*** It provides scalability as well but its supporting database technologies proves inefficient with large databases. **(GartnerPeerInsights, 2022)**


**3. Integration and Compatibility**

***Oracle:*** Offers comprehensive assistance for integrating with a wide range of apps and data sources. Large companies like T-Mobile that may have complicated systems architecture and need smooth platform integration will especially benefit from this, with its data governance tools

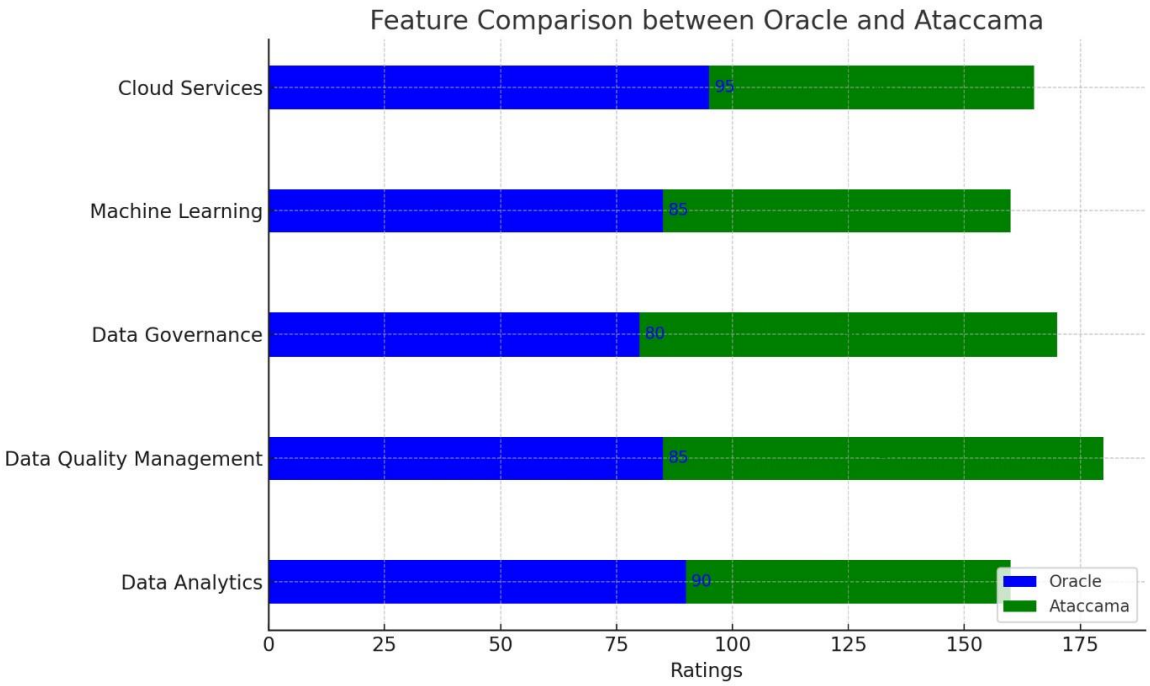
***Ataccama:*** Provides integration with pre-existing data management systems. It ensures compatibility across limited systems by supporting a narrow range of data sources. Oracle takes an edge on this too.




## 4. Industry Acceptance and Knowledge

***Oracle:*** Oracle is a dependable option for telecommunications firms like T-Mobile because of its lengthy history, solid industry reputation, and vast experience handling high-load systems and crucial applications.

***Ataccama:*** With a strong track record in data quality and governance, it may not have the same industry adoption as Oracle, but it is well regarded in this field. **(GartnerPeerInsights, 2022)**



# Potential benefits of adopting Oracle

A telecommunications corporation such as *T-Mobile* can reap great benefits from implementing Oracle database management software, particularly in terms of managing large volumes of data, guaranteeing high availability, and improving overall operational efficiency.

Here are a few main benefits:

**1. Improved Capabilities for Data Management**

Large, complicated datasets common to the telecom sector, such as call logs, customer, network, and transaction data, can be effectively managed by it.

***Performance:*** Oracle databases are designed with performance in mind, making them capable of efficiently managing large transaction volumes and complicated query loads.

***Scalability:*** T-Mobile is able to expand its database infrastructure in response to changes in data volume or query complexity since Oracle offers both vertical and horizontal scalability.

**2. Disaster Recovery and High Availability**

Oracle provides high availability capabilities like Automatic Storage Management (ASM) and Real Application Clusters (RAC).

***RAC:*** Provides fault tolerance, performance scaling, and high availability by enabling the operation of numerous Oracle Database instances on multiple systems.

***Data Guard:*** By keeping backup databases synchronized with the main database, it guarantees data availability and disaster recovery.

**3. Enhanced Security Functionalities**

***Encryption:*** Transparent Data Encryption (TDE) guards sensitive data from unwanted access by helping to secure data while it's at rest.

***Access Control:*** Even privileged database users cannot access sensitive data because Oracle Database Vault limits access to specific components of the database.

**4. Organizational Intelligence and Data Analytics**

***Insights:*** Improved capacity to assess operational effectiveness, network performance, and consumer behavior.

***Predictive Analytics:*** T-Mobile may more effectively plan and manage resources by forecasting trends, loss of clients, and network requirements by leveraging Oracle's machine learning capabilities.

**5. Reduction of Total Cost of Ownership (TCO) and Cost Efficiency**

***Automation:*** The requirement for substantial DBA involvement is reduced by features like automatic fixing, upgrades, and adjustments, which can drastically save labor costs.

***Integration:*** Oracle can further simplify operations and cut costs through its integration with other Oracle products and the current IT infrastructure.

**Support for Regulatory compliance**

Regulations governing the telecom sector are frequently very strict. Oracle's extensive auditing and compliance features aid in ensuring adherence to numerous standards and laws.

T-Mobile meets legal and regulatory compliance needs by using Oracle's broad audit features, which log sensitive data usage and access. **(Morawski, 2022)**

## Analysis of the potential challenges that could be faced when implementing Oracle

As was previously mentioned, there are a number of advantages to a large telecom corporation such as T-Mobile when they implement Oracle Database Management Software. Nevertheless, there are a few possible difficulties that could arise when putting it into practice. Effectively addressing these issues is essential to a deployment and operation's success. Here is a breakdown of possible difficulties:

**1. Expensive**

***Initial Investment:*** Oracle's hardware and software solutions can be costly, necessitating a sizable out-of-pocket expenditure. This covers the price of licenses, hardware, and any other features that are required for optimum performance if the deployment is happening on-premises.

***Ongoing Costs:*** After the initial investment, there are continuing costs like maintenance, upgrades, and possibly increased costs for scaling as requirements increase.

**2. The intricacy of integration and migration**

***Data Migration:*** It might be difficult to transfer current data from one database architecture to another when transferring it into a new Oracle system. In order to guarantee data consistency and integrity, this procedure includes data mapping, conversion, and validation.

***System Integration:*** It can be difficult to integrate Oracle with T-Mobile's other current IT systems and apps. It takes a lot of testing and configuring to maintain system performance and ensure compatibility.

### 3. Training Requirements and Learning Curve

***New Skills:*** Oracle Database systems can be complicated, and managing them well may call for specific expertise. The IT workers must receive training as a result, which can be expensive and time-consuming.

***Change Management:*** There are change management issues while implementing a new database system. Employees might have to adjust to new procedures and operations.

### 4. Performance and Scalability Issues

***Infrastructure growing:*** Although Oracle is very scalable, optimizing and growing the system to achieve optimal efficiency needs significant experience and meticulous design.

***Performance Optimization:*** After implementation, tuning and optimization may be necessary to reach the required performance levels. This can be a complex and technical procedure.

### 5. Concerns About Regulation and Compliance

***Information Security:*** Respecting strict data security laws and guidelines (such HIPAA and GDPR) is essential. Correct implementation of Oracle's security features is necessary to prevent breaches and guarantee compliance.

***Requirements for Audits:*** It can be difficult, but it is crucial to make sure the Oracle system satisfies all audit standards and has the capacity to log and submit data as required by regulatory agencies.

### 6. Dependency and Lock-in with Vendors

***Software Dependency:*** Using Oracle to perform essential database operations puts you at risk of being dependent on their updates and technology.

***Vendor lock-in:*** Because Oracle uses proprietary technologies and formats, switching to a different service provider in the future may be costly and complicated.

### 7. Upkeep and Assistance

***Technical Support:*** Although Oracle offers support, it might be difficult to find your way around the system and receive assistance quickly, particularly in urgent circumstances.

***Software Updates:*** In order to reduce downtime and possible operations disruptions, a plan for managing and installing Oracle patches and upgrades is necessary. **(Neosaplha, 2020)**

# How Oracle software could impact current work arrangements at t-mobile company

At T-Mobile, switching from Ataccama's data management software to Oracle's database management system would have a big impact on the way things are now done and would need to be carefully considered from a technical and practical standpoint. This article examines the potential effects of Oracle software on work arrangements and the technical factors that need to be taken into account while making the switch.

### Effect on Present Work Schedules and Operational Modifications

***Workflow Modifications:*** Oracle's sophisticated features, such real-time analytics and automated data optimization, may call for modifications to the way data is managed operationally. Teams would have to adjust to new procedures and maybe assume new roles.

***New Skills and Roles:*** The implementation of Oracle may need the creation of new positions or the restructuring of current ones, especially in relation to database administration, data security, and compliance. Employees will require training to handle Oracle's complex systems.

### Cooperation and Communication

***Interdepartmental Cooperation:*** Oracle's improved data integration and analytics capabilities could improve cooperation between IT and other departments. To fully take advantage of these new skills, teams must coordinate their efforts more.

***Change of Management:*** Change of management requires a lot of work. It involves handling employee expectations, properly explaining the changes, and making sure the transition goes well.

# Technical feasibility in order to shift to Oracle Data Management software

### System Integration and Compatibility

***Verify Compatibility:*** It is imperative to evaluate Oracle's interoperability with T-Mobile's current technologies. This covers the necessary hardware, interoperability with other software programs, and integration potential with the current IT infrastructure.

***Complexity of Integration:*** T-Mobile needs to integrate Oracle with a number of different platforms and systems. Technical complexity and resource requirements may arise from this, particularly if Ataccama is closely integrated with the current systems.

**Data Migration**

***Migration Strategy:*** It's critical to create a thorough plan for moving data. In order to guarantee data integrity and reduce downtime, this involves data cleansing, mapping, transfer, and verification procedures.

***Tooling and Expertise:*** Oracle offers tools for data migration such as Oracle Data Pump, Oracle GoldenGate, or third-party tools; however, their efficient use necessitates specialized knowledge.

**Future Growth and Scalability**

***Evaluation of Scalability:*** It is crucial to assess if Oracle's scalability capabilities match T-Mobile's anticipated expansion and future data management requirements.

***Benchmarks for Performance:*** testing Oracle's performance to make sure it can reach or above Ataccama's performance requirements.

**Regarding Costs**

***Cost-Benefit Analysis:*** Analyzing the expenses of licensing, migrating, training, and maintaining Oracle software against the advantages it offers in terms of scalability, future-proofing, and operational efficiency is known as cost-benefit analysis.

***Ongoing Maintenance Costs:*** A feasibility study should include an estimate of the long-term expenses for updates, maintenance, and scalability.

**Implications for Regulation and Compliance**

***Assurance of Compliance:*** ensuring that the Oracle system complies with all applicable rules and regulations, including those that pertain to data protection and the industry, that T-Mobile is subject to.

***Security Features:*** Analyzing Oracle's security features to make sure they either match or surpass Ataccama's security capabilities and resolving any possible security flaws throughout the transfer. **(Milenova, 2012)**

# References


Ataccama, 2024. *T-Mobile thrives thanks to data-at-scale initiative.* [Online]
Available at: https://www.ataccama.com/success-story/t-mobile-thrives-thanks-to-data-at-scale-initiative

C. Annamalai, T. R., 2011. *Enterprise resource planning (ERP) benefits survey of Indian manufacturing firms: An empirical analysis of SAP versus Oracle package.* [Online]
Available at: https://www.emerald.com/insight/content/doi/10.1108/14637151111136388/full/html

GartnerPeerInsights, 2022. *Ataccama vs Oracle.* [Online]
Available at: https://www.gartner.com/reviews/market/master-data-management-solutions/compare/ataccama-vs-oracle

Milenova, B. L., 2012. *SVM in Oracle Database 10g: Removing the Barriers to Widespread Adoption of Support Vector Machines.* [Online]
Available at: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.vldb.org/archives/website/2005/program/paper/wed/p1152-milenova.pdf

Morawski, A., 2022. *Why 15 out of 15 Top Telcos get better results with Oracle.* [Online]
Available at: https://www.oracle.com/communications/why-15-out-of-15-top-telcos-get-better-results-with-oracle/

Neosaplha, 2020. *Navigating Challenges In Oracle NetSuite Implementation: Tips And Strategies.* [Online]
Available at: https://neosalpha.com/navigating-challenges-in-oracle-netsuite-implementation/#:~:text=Poor%20data%20quality%2C%20inconsistent%20data,and%20errors%20in%20the%20data.

PeerSpot, 2020. *Ataccama ONE Platform vs Collibra Governance comparison.* [Online]
Available at: https://www.peerspot.com/products/comparisons/ataccama-one-platform_vs_collibra-governance