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Amaze® for Data & AI:

A THREE STEP AUTOMATED APPROACH FOR ACCELERATING DW MIGRATION JOURNEY TO AWS REDSHIFT

WHITE PAPER

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1. Introduction

Companies successfully migrating their BI and analytics along with the DW or independently DW to cloud DW platforms like AWS Redshift have understood the fact that transformation to the cloud is a complex task with significant risks involved in cost and time overruns. Success in addressing these concerns is important to the ultimate goal of delivering value and ROI with zero disruption to business.

Therefore, it is advised to take a **three-step automated approach** enabled by Hexaware's proprietary re-platforming solution **Amaze® for Data and AI**, which is critical in ensuring a cost-effective, timely and successful migration:

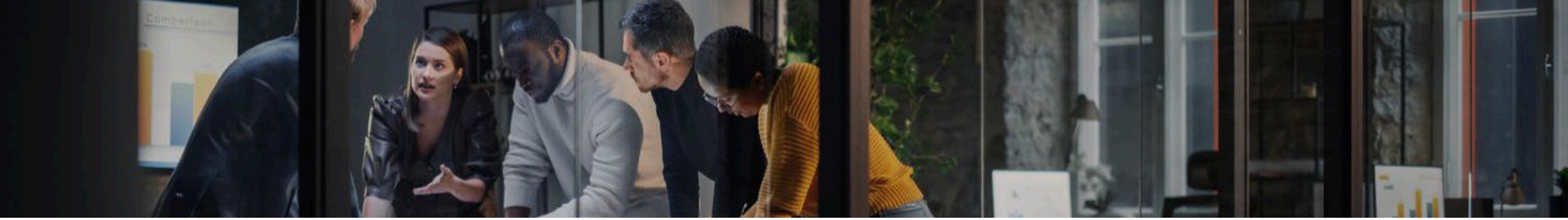
1. Planning and Generating a Business Case
2. Migrating to the Cloud
3. Living on the Cloud

2. A Three Step Automated Approach to Accelerating Migration to AWS Redshift

Hexaware has a well-defined data warehouse migration process that is enabled by its automation platform **Amaze® for Data and AI.**

Amaze® for Data and AI is an automation platform that specifically addresses migration issues when moving from on-premise legacy data warehouse appliances such as Teradata, Netezza, Exadata and accelerates the journey to a cloud data warehouse like AWS Redshift with minimum risk to business at a lesser cost.





Based on the existing position of an enterprise in the cloud adoption journey, the appropriate phases from the Hexaware's three-step transformation journey is applied as follows:

2.1 Planning and Generating a Business Case

This is a foundation step when an enterprise is exploring the cloud.

In this step, it is essential to understand the overall scope, timing, resources and schedule of the data warehouse migration journey. A data warehouse is built over many years, and there are high chances that there exist tables, queries, or reports which are not used or less frequently used and need not be migrated to the target data platform on the cloud.

Or there could be a scenario where there are gaps that were never rectified in the existing system because of the huge impact they potentially might have on other use cases, and this is the appropriate time to rectify these flaws within the new data warehouse solution.

This phase helps to understand the existing workload, data objects inventory, and list of applications that need to be migrated and those that need to be discarded. Also, the **business drivers** of migrating the data warehouse to the cloud are evaluated i.e., evaluating the costs of migrating to the cloud versus the business benefits of staying on-premises and the risks of migrating to the cloud and of not migrating to the cloud.



Using a TCO analysis can help take into account the operational and indirect costs and benefits of data warehouse migration. TCO analysis stands for Total Cost of Ownership analysis. It is a tool used by businesses to understand the overall cost of a business action — in this case, migration to Redshift — as compared to the short-term purchase price.

> "However, calculating these expenses is not always as simple as it seems."

A TCO analysis takes into account various costs, including capital, operational, and indirect expenses, to see how worth the purchase is. Migrating a business to Redshift is an effective solution for many companies, but not for all. When considering the move from the on-premise data warehouse to Redshift, it's vital to take into account the individual requirements of your company, and not just follow a trend.

2.2 Migrating to the Cloud

This is the most critical step in the journey of legacy data warehouses to AWS Redshift and is comprised of 4 sub-steps, viz. Assessment, Deep Discovery, MVP Pilot and Transform.

Assessment | Deep Discovery | MVP Pilot | Transform

Assessment

In this step, Hexaware builds an extensive questionnaire to gauge the on-premises DW, BI and analytics landscape and reveal the cloud adoption readiness of an enterprise. The length and depth of the questionnaire are aimed at extracting all the relevant details and will become a valuable tool in assessing the readiness of the data warehouse for cloud transformation.

The questionnaire will assess organizational data, IT, analytics and governance readiness to give a clear picture of the cloud transformation roadmap.

The responses will help to generate a feasibility score that can be used to advise the leadership team on what areas need to be addressed before undertaking the cloud journey.

As an outcome of this step, a cloud readiness report gets prepared. This typically takes 1 to 2 weeks.



Deep Discovery

After this, a deep discovery and evaluation of the DW application metadata, schema, ETL process, reporting and data visualization is carried out.

Hexaware recommends a comprehensive evaluation of the ETL function as it is one of the most complex and important layers of a data warehouse. It is also highly time-consuming, as it involves extracting data from different sources, cleaning it and uploading it into the target database. A deep discovery of the on-premises ETL function will help to understand the complexity in the migration process and to ensure that the ETL process on the cloud is seamless.

The second area of evaluation will be the reporting and visualization layer. A deep discovery of this layer should analyze the metadata, logical and semantic layer of the reports. This will help identify unwanted and duplicate reports and migrate only important, useful, and incisive reports to the cloud.

A consolidation of the data visualization landscape also contributes to improved user experience and user-friendly, data-driven outcomes.

Hexaware leverages its proprietary replatforming solution **Amaze® for Data and AI** to create visibility on the existing environment complexity and critical points.

The **Amaze® for Data and AI** platform has tools that automate metadata analysis of the database, ETL and reporting layer objects in order to derive inventory for migration, complexity and dependency analysis.

Complete understanding of the current inventory to define the scope of migration is a challenging task as it involves all the developments that have happened over years. Understanding the current environment is important for not only deciding on the end state architecture but also in coming up with the effort needed to reach there.

With Hexaware's **Amaze® for Data and AI** platform, this entire deep discovery process is expedited via automation and is **typically completed within 2 to 4 weeks.**

Some of the key outcomes of this step powered by **Amaze® for Data and AI** include:

- Establishing a strong business case for cloud adoption
- Aligning data, BI and analytics workloads with desired strategic outcomes
- Understanding the estimated timelines and budget of migration

MVP Pilot

When an enterprise has decided on the To-be cloud architecture, has visibility on the complexity of the existing data warehouse landscape and is looking for automating the transformation, the plan for cloud migration begins small.

An incremental approach vis-à-vis a big-bang approach will help to observe the journey and draw lessons without any risks or disruption to the business. The incremental process involves using an MVP (Minimum Viable Product) as an important migration strategy. It is an excellent starting point as it validates the migration approach and ensures that all specific customizations for maximizing automation are identified and implemented.

MVP also enables the team to test some of the challenging use cases, approaches for migrating non-supported objects, and finalize timelines for the overall migration project .It also helps to build a roadmap for the transformation.

Hexaware's Amaze® for Data and AI pilot solution demonstrates the automation possibilities to perform this MVP-based transformation rapidly thereby shrinking the timeline and delivering value at minimal cost.

This step typically takes 2 to 4 weeks.



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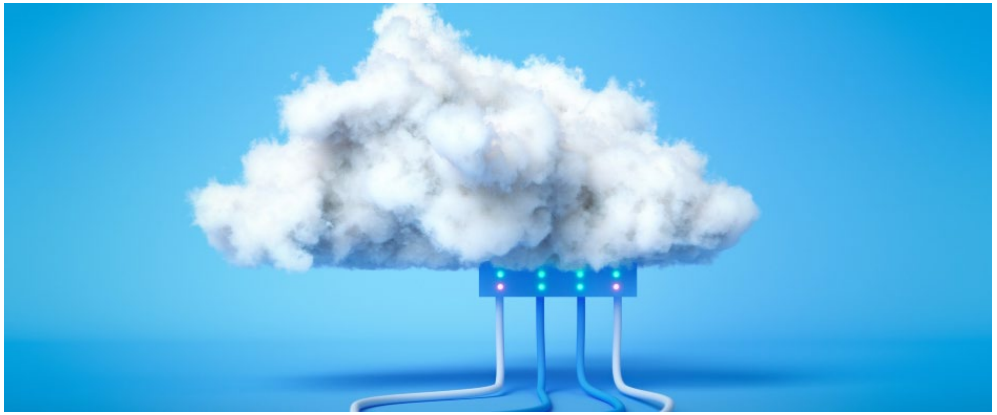
Transform

Armed with all the learnings and insights from the MVP, a full-fledged transformation of the DW or BI and analytics systems begins in a factory model with multiple iterations.

Starting with the migration of metadata with all its tools like data inventory, semantic framework and data lineage will help in ensuring business continuity. Metadata management techniques will help to look at the data across its entire lifecycle and therefore is core to the data strategy of an enterprise. Enabling data governance is also a critical aspect to be considered as it will allow for increased user adoption.

All key processes of transformation including the data warehouse platform assessment, data warehouse migration, metadata management, ETL interfaces and visualization are automated using Hexaware's Amaze® for Data and AI to make the transformation agile and cost-effective while ensuring business continuity and smooth operations.

Based on design decisions, Amaze® for Data and AI's configurations are updated across all three layers and the actual migration process happens that covers data objects including tables, views, procedures and other scripts, ETL packages, the BI semantic layer and reports.



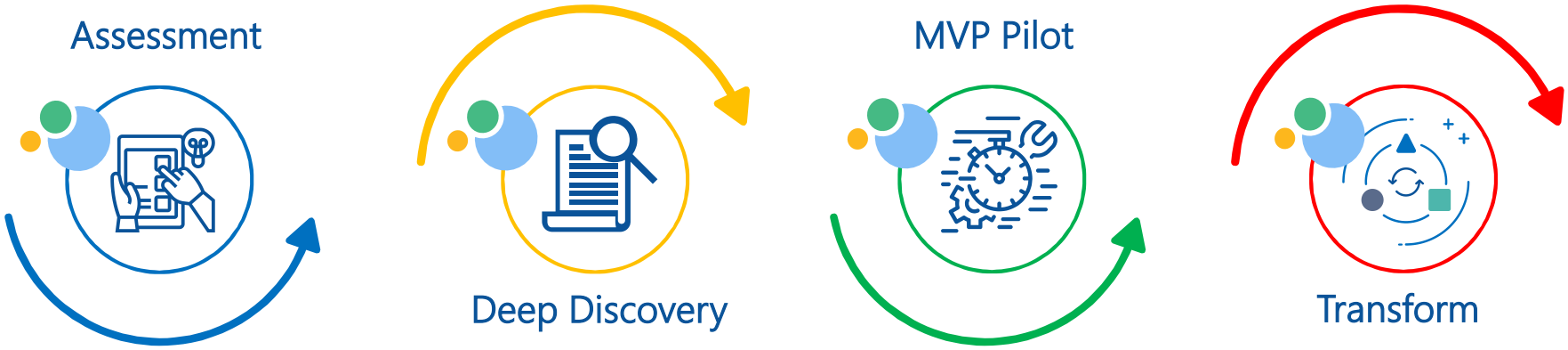
This will be a sprint based delivery varying from 3 to 12 months based on environment complexity.

High-impact benefits delivered by Amaze® for Data and AI during this step include:

- Over **60% efforts reduction through automation**
- Robust suite of accelerators
- Automated metadata analysis of ETL, database, and reporting environments
- Automated conversion of legacy to modern analytics ecosystem
- Metadata-based data ingestion framework for creating new pipelines for cloud

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4-step Methodology for Transformation to AWS Redshift



Assessment	Deep Discovery	MVP Pilot	Transform
Questionnaire-based Assessment	Automated Analysis of Schema ETL, Reporting layer	Quick Pilot of the Use Case	Subject/Layer – Model, ETL, Reporting Transformation
Application Functionality Mapping and Object Inventory	Complexity Analysis, Dependencies, Usage	Finalization of the Design Templates and Standards	Pre and Post Transformation Validation
Best Practices and Reference Architecture, TCO-ROI Analysis	Critical Solutions Components and Automations	Transformation Plan and Timeline	User Adoption and Support
1-2 weeks	2-4 weeks	4-6 weeks	Factory Model with Multiple Releases

Note: Based on the current state of your cloud migration plan, we can perform a quick, 2-week PoC (Proof of Concept) with Amaze® for Data and AI to demonstrate the automation value.

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2.3 Living on The Cloud

Managing analytical applications and services on the cloud requires a shift in approach from an on-premises eco-system. Here, we list the areas that require special focus:



Monitoring and tracking AWS resource usage such as compute usage, storage usage to optimize the performance and cost and scaling up or down to minimize wastage on AWS



Providing maintenance and support services which involve making sure the Redshift data warehouse objects; columns, tables, views, and schemas are accurate and up-to-date.



Investing in cloud architecture skillsets for expert management and supervision



Ensuring compliance, security and governance on AWS. COVID-19 and remote working is leading to a greater need for data democratization. Data needs to be made available to more users for faster outcomes and also to reduce dependencies on SMEs. In this scenario, role-based access control for business users who are not experts will need to be governed tightly to prevent breaches.

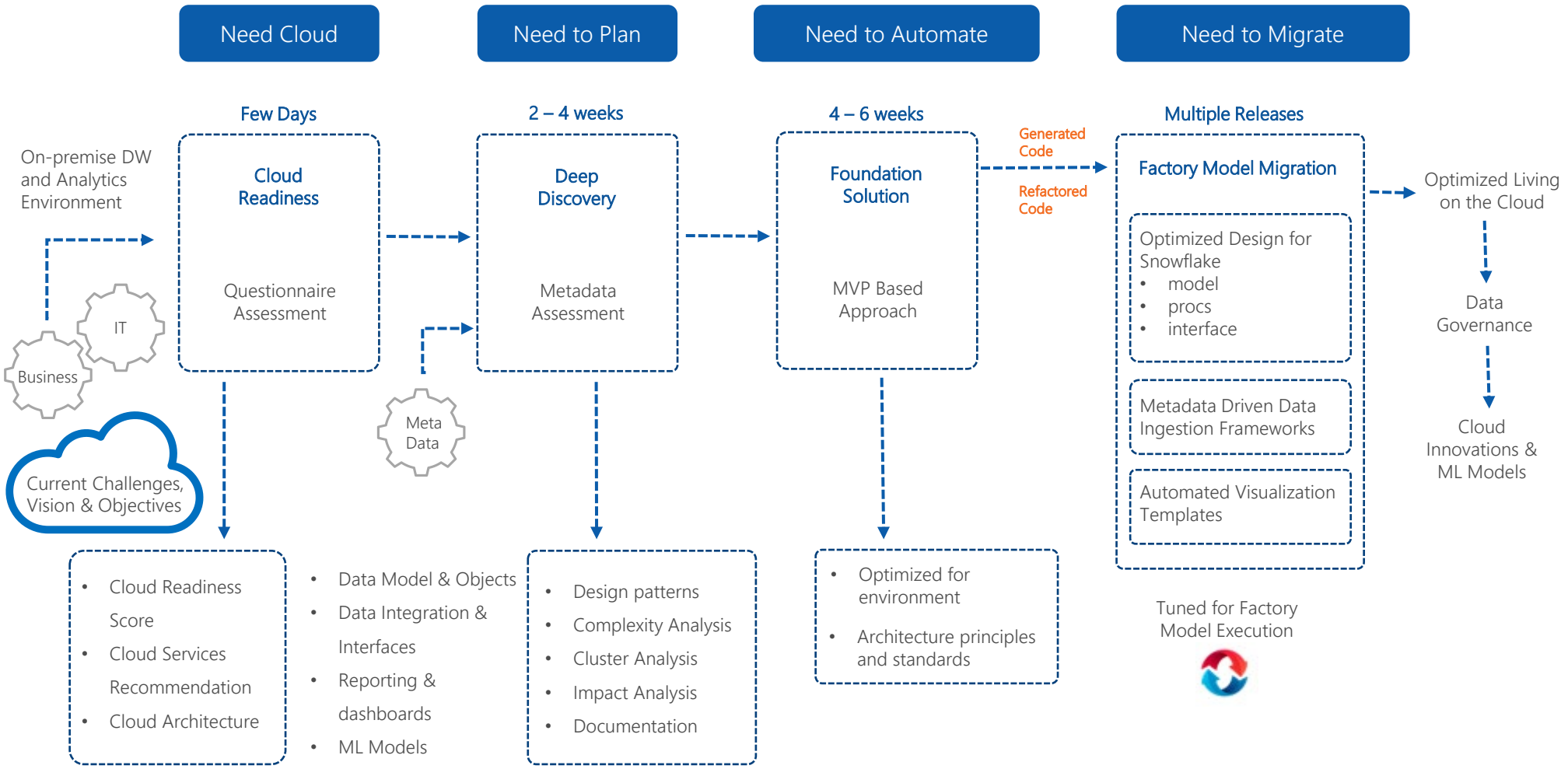


Ensuring that the AWS infrastructure is leveraged for advanced predictive analytics, machine learning and data science through the integration of reporting tools, analytics frameworks and machine learning capabilities. For e.g., leveraging Amazon Redshift ML to run an AI/ML workflow within Redshift itself using standard SQL for predictive analytics purposes.

Leveraging the full benefits of cloud modernization of legacy data warehouses like the ability to scale the organization's analytical capability for competitive edge requires expert cloud management.

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An end to-end schematic diagram of the migration methodology for accelerating on-premise data warehouse migration to AWS Redshift is highlighted below



Note: This migration methodology is tailored based on the enterprise need and current state of readiness

3. Value Delivered with Amaze® for Data & AI

Amaze® for Data and AI

AMAZE® for Data and AI is an end-to-end cloudification platform that brings in automation across all the three layers; Data Pipeline/Data/Data Analytics.

Key value proposition of Amaze® includes **Faster and better migration** of legacy data warehouses to cloud with in-built smartness to ensure a **cost-effective solution**.

Amaze® for Data & AI - Offerings

With **Amaze® for Data & AI**, we offer complete Cloud Data Application operations support, pre-built cloud-native AI / ML libraries that ensure that our customers leverage the full benefits of cloud.

Enterprises can build highly scalable advanced analytics solutions on top of the cloud ecosystem on platforms like AWS Sagemaker. Enterprises can also establish data governance policies that cater to compliances like GDPR and ensure complete data integrity and data protection.

High-impact benefits delivered by Amaze® for Data & AI include:

- Over 50% reduction in TCO
- Over 40% efforts reduction in the transformation through automation
- Over 40% effort reduction in support and maintenance when living on the cloud by automated metadata management

4. Conclusion

Modernizing Enterprise Data warehouses on the Cloud platform with Redshift could be among the cost optimization projects that any enterprise could take up. One of the primary considerations, apart from cloud readiness, will be the initial cost of migration. Using **Amaze® for Data & AI**, the time, effort and cost to migrate to cloud would be reduced, hence providing the impetus to move ahead.



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About Hexaware

Hexaware is the fastest growing next-generation provider of IT, BPO & consulting services. We serve over 350 customers from 36 global offices through 25,000+ consultants. Our three-pronged strategy of AUTOMATE EVERYTHING® ,CLOUDIFY EVERYTHING® & TRANSFORM CUSTOMER EXPERIENCES® fast-tracks enterprises into the digital era. Hexaware has been ranked at the top position consecutively since last 7 years among the Top Service Providers by Whitelane's IT Sourcing Study. Hexaware has 500+ AWS certified consultants and we leverage proprietary Amaze® platform to modernize and migrate applications and data warehouses in a faster, better and cost-effective manner to the AWS Cloud. Hexaware is also named a leader in AWS Consulting Services in the ISG Provider Lens™ – AWS – Ecosystem Partners 2021 – U.S. Quadrant Study

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Certain statements in this press release concerning our future growth prospects are forward-looking statements, which involve a number of risks and uncertainties that could cause actual results to differ materially from those in such forward-looking statements. The risks and uncertainties relating to these statements include, but are not limited to, risks and uncertainties regarding fluctuations in earnings, our ability to manage growth, intense competition in IT services including those factors that may affect our cost advantage, wage increases in India, our ability to attract and retain highly skilled professionals, time and cost overruns on fixed-price, fixed-timeframe contracts, client concentration, restrictions on immigration, our ability to manage our international operations, reduced demand for technology in our key focus areas, disruptions in telecommunication networks, our ability to successfully complete and integrate potential acquisitions, liability for damages on our service contracts, the success of the companies in which Hexaware has made strategic investments, withdrawal of governmental fiscal incentives, political instability, legal restrictions on raising capital or acquiring companies outside India, and unauthorized use of our intellectual property and general economic conditions affecting our industry.

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