

## Point of View

# Continuous Application Modernization and Governance

Incrementally and continuously modernizing the end-to-end enterprise application environment is critical to ensuring a more agile, scalable, and always-available architecture that promises a differentiated customer experience.



# 01

## Introduction

Digitalization and the bid to modernize operations have taken companies by storm, dramatically altering how they operate and do business. Since the coronavirus pandemic upended operations, the world witnessed a huge rush to migrate to the cloud, upgrade IT, and protect the business. And while the hyper-accelerated approach to cloud migration was widespread and sweeping, many organizations have struggled to get the full value of their investments. This is where the concept of "modernization" plays a key role.

The idea of system modernization is not limited to just migrating to the cloud. It involves reinventing the end-to-end enterprise application environment from its conventional legacy and monolithic form and transforming it into a more agile, scalable, and

always-available architecture. This is the foundation of a truly modern enterprise. It is no surprise then that the global application modernization services market is expected to touch USD \$24.8 billion by 2025, according to market research.

Key factors driving this surge include the continued focus on cloud services, large-scale migration of workloads to cloud-based and service-oriented structures, a growing need to transform and modernize legacy systems, and expanding demand for modern infrastructure for minimal business disruption. Application modernization involves a comprehensive, ground-up approach and several steps to deliver intended results, and a critical step in enabling this is to partner with the provider who can help streamline your:



## Application Portfolio Assessment

This high-level discovery phase includes developing a complete list of your enterprise applications and scanning and analyzing them to build a robust modernization strategy. It also involves making key decisions to retire, upgrade, train, or maintain your systems.



## Cloud Application Migration

As the name suggests, this involves moving your software and IT systems from on-premises to a cloud environment for better performance, reliability, scalability, and security.



## Application Integration

Seamlessly integrate independently designed applications to work together and deliver desired outcomes. As Gartner suggests, this involves maintaining data consistency across applications, orchestrating multiple disparate applications to operate in flow, and ensuring access to data and functionality from independently designed apps with a single user interface.



## Application Replatforming

This involves upgrading specific components of an app for its optimized functioning on the cloud. Users experience improved scalability, security, and profitability as an added benefit. It is vital to note that replatforming saves time and money compared to rearchitecting.



## Post Modernization

Once you have established a success-tuned modernization roadmap, it is vital to support staff long after the process is complete to ensure effective optimization in the long term.



## UI/UX Modernization

Any application modernization is incomplete without adopting UI/UX modules supported by modern browsers and devices. Often an overlooked aspect of modernization, legacy UI makes your business process and transformation more complex, slow, and expensive.

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## The Relevance of Continuous Application Modernization

Application modernization can never be undertaken as a one-off project. To be truly impactful and stay aligned with evolving business dynamics, modernization efforts must be ongoing and constant. This is called continuous application modernization.

According to Gartner, continuous modernization is an iterative and gradual approach that provides digital businesses with the prompt support and value they need. It comprises a conscious effort to address the challenge of technical debt before it leads to business disruption.

Legacy application architecture typically has dependencies and limitations that developers and operation teams tend to react to when it becomes an operational issue. Environment architecture dependencies and constraints lead to a high business cost impact and reduced application efficiency. Ensuring a successful ongoing cloud journey to transform applications requires constant integration and delivery, making continuous modernization a business imperative.

# 03 **The Need for Continuous Modernization**

Application modernization is critical to ensure continuous integration and continuous delivery. It helps reduce the time for developers and enables them to focus on coding while lowering operational costs, thereby improving return on investment. Along with time and cost, modernization introduces long-term efficiency to the environment.

The modernization assessment phase helps identify application- readiness to make them future-ready

by discovering the future state architecture of your application roadmap. The assessment ensures the right-sizing of the infrastructure for the cloud, determines the applications for which infrastructure enhancement is essential to make it cloud-ready, validates the applications based on the infrastructure inventory and proposes a target disposition, and assesses the existing identity and access management processes.

# 04 **The Need for Application Governance**

Given that data is at the center of all business actions today, ensuring its security, privacy, accuracy, availability, and usability is imperative for success. Organizations of all sizes and industries need robust, defined data management to ensure a well-architected digital-transformation journey. This is where data governance plays a key role. It clearly outlines actions and processes users must undertake and follow to maintain data integrity and the technology necessary to support the data life cycle.

Data governance is essentially a structured approach to managing data across its life cycle—from acquisition and usage to its disposal. Business leaders must have accurate, updated, and timely data available to make strategic decisions for enterprise growth. For instance, access to reliable data is fundamental for marketing and sales teams to assess customer needs and wants. Similarly, procurement teams rely on accurate data to ensure the availability of stock, lower manufacturing cost, and eliminate any supply chain disruption.

# 05 How LTIMindtree's Infinity Marketplace Drives Modernization

A study by Forrester and LTIMindtree suggests that nearly three-quarters (72%) of technology leaders agree that the cloud is critical to accelerating innovation. More than half (52%) also believe that a one-stop platform that provides better governance and visibility on the cloud is the need of the hour. And almost two-thirds (61%) believe that a centralized intelligence structure across the value chain is fundamental to cloud success.

There is no doubt that a clearly defined cloud strategy is the first step to ensuring success and

driving more nimble, flexible, scalable, and outcome-oriented transformations. And to achieve these goals, LTIMindtree has developed a powerful, unified multi-cloud platform—LTIMindtree Infinity—to drive excellence in the cloud lifecycle, from the blueprint to execution and operations. The advanced tech-based suite of modern engineering tools and processes ensures value, speed, and agility across the cloud migration journey by providing dashboards, recommendations, automated resolutions, intelligent monitoring, and predictive analytics.

## The LTIMindtree Infinity platform is instrumental to

 Ensuring that cloud strategy aligns with business objectives

 Addressing concerns around cloud governance and compliance

 Offering a holistic view of infrastructure, data, network, and applications

 Staying focused on business needs to develop comprehensive migration blueprints

 Providing business resilience and security in the cloud

# 06 A Comprehensive Approach to Modernization in Google Cloud Platform

As discussed above, modernizing applications and making them cloud-native is essential to rapidly scale in a cloud environment and maximize the value of your investments. The Google Cloud Platform (GCP) offers a structured and flexible approach to infrastructure modernization aligned with your business objectives. Whether rehosting or replatforming, it empowers enterprises to harness the power of added technologies such as AI and streaming analytics to innovate and push boundaries.

A robust application modernization strategy in the GCP cloud ensures businesses can innovate faster while keeping costs low. This is possible by providing a steady development and operations experience backed by leading cutting-edge tools

and direction. Additionally, evaluating modernization readiness for applications ensures that organizations have a comprehensive view of how well they can support applications once modernized before starting their cloud migration journey. This is made possible by identifying the business, functional, technical, and financial significance of an enterprise application and system across its tech stack.

*What's more, Google provides multiple options for building microservices applications in the cloud. These range from Kubernetes and PaaS to serverless containers and serverless functions.*

# 07 Google Cloud App Modernization Program

Along with infinity tools, LTIMindtree is adapting Google's reliable and proven approach to Cloud App Modernization Program (Google CAMP).

*Going by Google's own definition, "CAMP has been designed as an end-to-end framework to help guide organizations through their modernization journey by assessing where they are today and identifying their most effective path forward".*

Assessment and benchmarking are the most crucial factor to consider before any cloud journey. With the help of a comprehensive assessment, CAMP guides organizations on critical decisions, including where to start their application modernization journey. The assessment also helps identify bottlenecks in the enterprise's existing environment and architecture that may impede its modernization program.

Google CAMP brings various GCP products to help organizations build, secure, run, automate, and manage their legacy and cloud applications. Tools available for the customers include Cloud Build, Container Registry, Cloud Code, and Cloud Ops. To run serverless applications, customers have the added choice of using Cloud Run, GKE, or Anthos.

# 08 Success Story :

## Executing Application Modernization for a Top Consumer Goods Company

The client brand is synonymous with oral hygiene across the world. As a global leader, they undertook several philanthropic initiatives, including arranging camps to facilitate free oral health education and dental check-ups at various schools, colleges, universities, and juvenile centers. The web-application portal used to schedule and manage visits to the facilities needed significant upgrades to stay relevant to the customer's needs.



### The Challenge

Due to the increasing operational maintenance cost, the customer was looking to migrate their on-premises web application to GCP. They also faced challenges in ensuring application and database infrastructure scalability and integrating legacy systems with new-age technologies leading

to substantial cost implications. This resulted in overall technical debt making it difficult to address new business requirements and process improvements. The overall user experience was also impacted due to a higher response time.



## The Solutions

The LTIMindtree team undertook a complete assessment of the client's existing monolithic (.NET) web application and identified the components for a microservices (Java) based architecture. A completely new user experience was designed and developed to accommodate their current and future requirements. On the GCP front, LTIMindtree experts recommended leveraging cloud-run services (serverless aspect) to manage the infrastructure effortlessly and at a pocket-friendly price.

The database was also migrated from on-premises to GCP Cloud SQL to minimize manual database maintenance activities. In addition, we also enhanced the security posture of the web application with Okta authentication, Google Re-captcha, and integration with Hashicorp Vault. A new feature to create/update Google Calendar invites for the volunteers as per the scheduled visits was developed.



## The Outcome

- Application Modernization using best-in-class technology stack
- Costs savings of \$45K per year
- Highly efficient solution providing 100% performance improvement
- Enhanced user experience along with improved security posture
- Improved CI/CD with 10X faster release through DevOps automation

# 09 Success Story :

## Increasing Productivity and Minimizing Costs for a Leading Global Bank

The client is a global bank providing banking services in different segments across 68 countries. As a banking organization, they were known for their world-class technology adoption and digitization experience while being a leader in open banking. They had more than 3000 applications registered internally for different use cases.



### The Challenge

The client's current architecture had significant limitations with respect to scaling, as it was hosted on the premise and had a very long turnaround time. The existing database had major licensing and platform dependencies. Migrating workloads to cloud-native services was a hurdle to business

growth and customer experience. It was also vital for the client to always maintain the DR site since bringing on-premise infrastructure within low RTP and RPO was challenging to manage, adding additional expenses.



## The Solutions

LTIMindtree proposed application migration and modernization. With 100+ customer-facing applications in scope for migration, we defined a strategy for modernizing applications by converting them to a microservice-based architecture and using

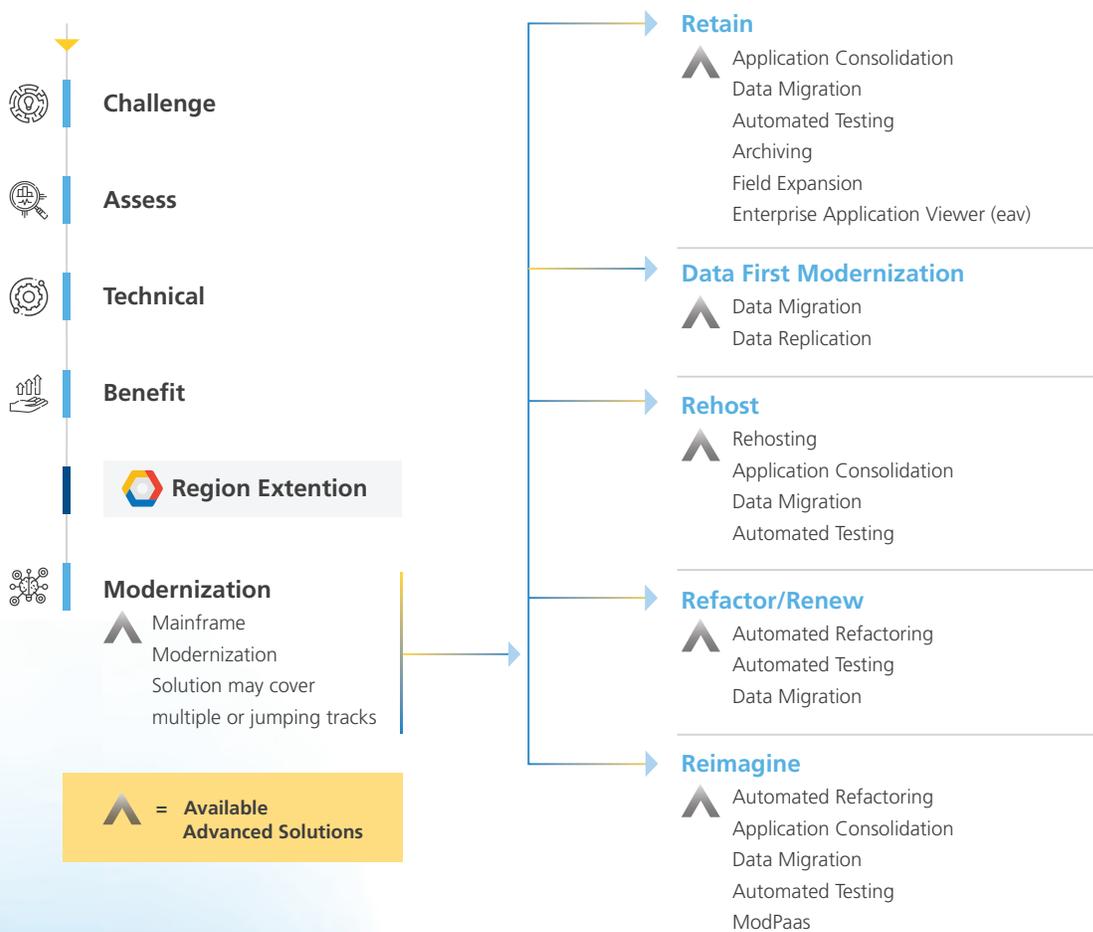
cutting-edge GCP technologies like GKE. In addition, our experts also determined the pipeline to migrate their existing database to cloud-native services with the latest migration services and without disruption.



## The Outcome

- Significantly reduced infrastructure cost
- A single view of application and infrastructure management
- Simplified operations management with cloud-native services
- Rapid (automatic) scaling (up and down) of resources
- Enhanced uptime
- Reduced overall cost due to managing passive DR site

# 10 A Comprehensive View of Application Modernization Governance



**Google Cloud**

<b>Services</b> Kubernetes Engine	<b>Microservices</b> Kubernetes Engine	<b>BigQuery</b>	<b>Cloud Storage</b>	<b>Java</b>
<b>Cloud Machine Learning</b>	<b>Cloud Pub/Sub</b>	<b>Db2</b>	<b>CDC Compute Engine</b>	<b>apigee</b>
<b>PostgreSQL</b>	<b>CloudSQL</b>	<b>MongoDB</b>	<b>Cloud Composer</b>	<b>kafka</b>

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## How LTIMindtree Can Accelerate Your Application Modernization Journey

LTIMindtree has expanded its strategic alliance in the application modernization area with Google Cloud to offer organizations an end-to-end suite of services and solutions that harness LTIMindtree's domain-focused innovation and Google Cloud's technologies. As a Google Cloud Premier Partner, LTIMindtree has seamlessly delivered GCP-based application modernization projects for global customers.

The Google Cloud Practice Unit at LTIMindtree offers consulting services for application modernization, data migration, assessing the migration of workloads, SAP on Google Cloud, Managed Services for GCP workloads, and using next-gen technologies such as GKE, IoT, Analytics, and AI/ML. Our cloud experts have excellent technical and domain skills and can provide value-added services to make applications future-ready for customers across the globe.

# 12 Tools Available to Ensure World-Class Governance

Core Component	On Cloud	On-Premises
Kubernetes Engine	GKE	Anthos cluster on VMware
Configuration Management	Anthos Config Management	
Service Mesh	Anthos Service Mesh	
Serverless Workloads	Cloud Run for Anthos	
Logging and Monitoring	Cloud Logging and Cloud Monitoring	
Migration	Migration for Anthos	
Marketplace	Kubernetes Applications	

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## Why GCP

Google Cloud solutions enable organizations to modernize their legacy applications and help organizations build faster solutions. Using GCP services, LTIMindtree leverages applications availability, reliability, and scalability, directly amplifying business outcomes. Google Cloud's Anthos is an excellent option for modernization and governance over all available hybrid and multi-cloud clusters. It offers a serverless, managed-service approach to application modernization and makes it easy for developers

to focus on application coding and business requirements.

Anthos GKE (Google Kubernetes Engine) is a managed environment for deploying, managing and scaling containerized applications on Google infrastructure. The Anthos GKE cluster also offers access to Google Cloud's extensive cluster administration capabilities, such as load-balancing, data, automatic scaling, automatic upgrades, node auto repair, logging, reliability, and monitoring.

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## Conclusion

Google and LTIMindtree have experienced together the application modernization necessary for business success and for the successful modernization, a perfect DevOps solution is required. LTIMindtree and Google have an experience working together to migrate and modernize your legacy infrastructure and applications. LTIMindtree will bring continuous improvement and modernization to the customer experience over applications.

Enterprise modern applications are complex and expensive to maintain. While a microservice architecture brings security challenges, Google Cloud's Anthos is a powerful tool to mitigate these hurdles. Anthos provides greater control over internal clusters, on-premises, and multi-cloud environments. The Anthos Service mesh capabilities enable organizations to connect, secure, and monitor microservices. Anthos helps you to achieve consistent network management, secure your microservices and improve the performance of your applications.

LTIMindtree's Application Modernization offering includes current application landscape assessment and architecting and implementing the To-Be state through levers. These include Platform/Technology Upgrade and Migration, Application Enhancements, Custom Solution Implementation, Enterprise Application Integration, Data Transformation, and Cloudification.

LTIMindtree delivers business-aware application modernization services, drawing from its deep domain expertise and rich experience in corporate and media applications, gained through working with leading global broadcasters, studios, and publishers. LTIMindtree's domain and technology expertise and experience is supported by its proprietary next-generation ADM platform, leveraging extreme automation and DevOps-based agile software delivery practices, enabling faster time-to-value.

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**LTIMindtree** is a global technology consulting and digital solutions company that enables enterprises across industries to reimagine business models, accelerate innovation, and maximize growth by harnessing digital technologies. As a digital transformation partner to more than 700+ clients, LTIMindtree brings extensive domain and technology expertise to help drive superior competitive differentiation, customer experiences, and business outcomes in a converging world. Powered by nearly 90,000 talented and entrepreneurial professionals across more than 30 countries, LTIMindtree — a Larsen & Toubro Group company — combines the industry-acclaimed strengths of erstwhile Larsen and Toubro Infotech and Mindtree in solving the most complex business challenges and delivering transformation at scale. For more information, please visit [www.ltimindtree.com](http://www.ltimindtree.com).