Executive Summary

As digital technology permeates every industry, enterprises must stay relevant by quickly adapting to new applications, products and services.

The hybrid cloud is a powerful digital platform that helps organizations do so with speed and agility. It enables IT organizations to create highly virtualized, flexible, enterprise systems that operate across in-house legacy, private and public clouds and to more quickly develop, deploy and integrate new enterprise applications and services, including Internet of Things (IoT) environments at the edge.

Such hybrid clouds help meet significant IT challenges such as rapidly provisioning new infrastructure to meet changing business needs and reduce the effort and cost of replacing aging infrastructure and applications. The reason: upgrades are performed by the cloud provider to keep the platform evergreen. Implemented properly, the cloud allows enterprises to easily extend security and compliance controls to the business services that rely on it (e.g., data encryption, identity and access management etc., are available on demand and compliant with the latest regulatory requirements). Enterprises can also cut IT operational costs by consolidating unneeded or obsolete applications and reducing the requirement for supporting infrastructure.

How a Business-First, Agile Cloud Migration Factory Approach Powers Digital Success at Scale

By embracing a “factory” approach to hybrid cloud migration, IT organizations can more easily deliver enhanced operational agility and cost efficiencies, while widening the scope for business innovation.
According to market watcher 451 Research, enterprises in search of such benefits (and in an effort to compress lengthy implementation times), will move more than 60% of their IT workloads to the cloud by 2019. In addition, over 30% of organizations will move to public (rather than private or in-house) cloud environments.

But moving to the cloud can be difficult, cumbersome and risky for a traditional enterprise that relies on legacy, in-house systems to deliver services and revenue. Enterprises considering a cloud migration must choose among multiple service and deployment models, decide which workloads are best suited to the cloud, and assure that their chosen cloud model provides enterprise-level connectivity, security, compliance and service-level agreements.

This white paper details how a business services-led approach to cloud migration can deliver the greatest benefits with the least risk and how we help clients accomplish this by applying our industrialized Agile migration factory. The paper concludes with recommendations and best practices for achieving demonstrable business outcomes.
Keeping business impact top of the mind assures better choices in all things cloud, from service providers to applications to migrate, and in what order, to security controls, compliance and performance.

THE CLOUD MIGRATION CHALLENGE

Organizations face many challenges in migrating workloads to the cloud. They include:

- Deciding which workloads to move, and in what order.
- Maintaining the reliability and performance of critical business services while making the shift.
- Implementing proper levels of security controls and regulatory compliance.
- Choosing the right cloud provider from a performance, price and security perspective.
- Deciding which in-house IT infrastructure to replace, upgrade or eliminate as part of the migration.
- Combining the cloud migration with a move to more Agile development and deployment methodologies.
- Ensuring the migration doesn’t disrupt existing IT service management processes such as patches and enhancements, or the workloads of those managing such processes.
- Educating business stakeholders on the benefits of moving to the cloud to gain needed funding and management support.

Yet enterprises cannot afford to spend months or years puzzling through such questions to realize the benefits of the cloud’s appreciably lower operational costs and agility. To compete in the digital age, migrating applications and data to the cloud must be a routine, industrial activity, which business and IT stakeholders can launch quickly, efficiently and effectively.

Achieving such a “factory” approach requires IT not to focus merely on the specific hardware or software components, but on the business services they support. Keeping business impact top of the mind assures better choices in all things cloud, from service providers to applications to migrate, and in what order, to security controls, compliance and performance requirements.

A SERVICES-FIRST APPROACH TO CLOUD MIGRATION

IT organizations have historically organized their work around the underlying technologies they support, such as servers, applications, databases
and networks. However, as information technology has become exceptionally critical to every business function, users and managers care less about the IT “plumbing” and more about what they can do with it.

Business services describe those user- and customer-facing functions. They may include:

- Order entry.
- Production planning.
- Customer credit checks.
- Reporting.
- Inventory management.
- Customer service.

The proper functioning of these services is far more important to business users than the version of the database or application on which those services run, or whether that technology sits in a corporate data center or in the cloud. Even more important, the services used by employees and customers are rarely provided by a stand-alone application. The website, mobile app or corporate portal the user sees probably draws its data from (and provides updates to) multiple internal and external systems.

When a customer calls to check the status of an order, for example, the call center agent might need an update from a third-party supplier to see if the item shipped, a check with a third-party shipper to see if it was delivered, and an update to the corporate order entry system to send a replacement. A customer complaint about the missed delivery might trigger an update to a customer relationship management (CRM) system hosted in the cloud.

Each business service is thus made up of a complex mix of applications, running within or outside the enterprise. The failure of any of them could bring the business processes to a halt. A service-led approach helps enterprises understand the dependencies among these applications and services and migrate them to the cloud holistically with the least impact on the business.

Such a services-oriented approach also helps the enterprise choose what levels of cloud performance or security controls are needed for each underlying technology component, as well as what data must be located in a specific geography to comply with local data privacy or other regulations. The cloud provides the inherent ability to choose different types/sizes to drive greater performance and use cloud-specific security controls natively, or in tune with specific marketplace offerings). The cloud also addresses geographical requirements for data residence, which is critical in locations such UK South, UK West, Europe West, etc.)

Lastly, it speeds up the entire cloud assessment, migration and management process by giving all stakeholders a common language and a more rounded perspective on the needs of each business service. This also helps assess cloud providers, choose workloads to migrate and iden-
Identify and group applications and inter-application dependencies, assure appropriate security controls and performance levels and deliver ongoing management and optimization of the cloud environment. (See “Quick Take,” page 9.)

Challenges of a services-first approach include reaching agreement on the definition of each service, determining which business manager is responsible for each service, and determining how systems and services share data and which third parties use them. Organizations may also lack information about what regulatory or security requirements each service must meet.

Despite such challenges, a services-first approach can make it far easier to move beyond painful, one-off cloud migration projects to an Agile factory model that helps the organization extend and contract IT resources as business needs change, and to move new products and services to market far more quickly.

AN AGILE MIGRATION FACTORY

An Agile cloud migration factory follows a defined, repeatable set of processes built on what we call the Cognizant Cloud Steps Transformation Framework (see Figure 1 and read our solution overview). It breaks the planning and execution
Ensure the supporting infrastructure enabling migration is in place, including dedicated networks, firewalls, load balancers, etc., well in advance of the actual migration.

of a cloud migration, as well as the ongoing management and optimization of the cloud, into a series of strictly defined processes using the Agile methodology executed through Scrums. Each Scrum focuses on specific elements of the migration and is guided by rigorous processes and governance, with extensive reporting at each stage. All steps from blueprinting to service creation and testing to data transfer are performed in parallel, with a focus on failing fast (and fixing issues) to speed up service cutover to the hybrid cloud platform while improving migration quality.

CLOUD MIGRATION BEST PRACTICES

Practices that have worked best in helping clients apply an Agile cloud migration factory approach include:

• Accelerate automated provisioning with a catalog of operationalized cloud design patterns (configurations of resources such as servers or databases). These are customized to support various business services. Don’t go overboard with hundreds of patterns that will create a management headache. Instead, create several variants (such as for workloads with low, medium and high levels of complexity) for each IT resource. After your organization has gained experience with patterns describing individual IT elements, it can create patterns that describe the entire infrastructure needed to support each business service.

• Coordinate with your operational, support and change teams. Doing so will ensure that the migration of applications or servers to the cloud won’t interfere with their existing projects, release, enhancement or patching schedules. Your IT leadership doesn’t want to surprise users with unnecessary downtime or outages for server patching while it is migrating application services to the cloud.

• Carefully map existing management and maintenance processes to the cloud. Your IT staff won’t need to spend time and effort learning new processes to manage the cloud or, even worse, refusing to learn them. IT leadership should also carefully consider how current workloads will be affected by the cloud migration to determine if additional staff is required to manage both environments. For example, leadership may need to consider increasing the number of dedicated architects to quickly execute technical design authority (TDA) approvals, creating ring-fenced network, release and change management processes that limit the effects of changes to avoid service disruptions. They also may need to increase information security staffing to prevent security-related bottlenecks from clogging the Agile migration factory.

• Engage early with all stakeholders, clearly describing the benefits of the cloud migration to get their financial and political support. Include everyone from business operations, business relationship managers and the security and network teams to avoid unpleasant surprises such as unexpected

Ensure the supporting infrastructure enabling migration is in place, including dedicated networks, firewalls, load balancers, etc., well in advance of the actual migration.

CLOUD MIGRATION BEST PRACTICES

Practices that have worked best in helping clients apply an Agile cloud migration factory approach include:

• Accelerate automated provisioning with a catalog of operationalized cloud design patterns (configurations of resources such as servers or databases). These are customized to support various business services. Don’t go overboard with hundreds of patterns that will create a management headache. Instead, create several variants (such as for workloads with low, medium and high levels of complexity) for each IT resource. After your organization has gained experience with patterns describing individual IT elements, it can create patterns that describe the entire infrastructure needed to support each business service.

• Coordinate with your operational, support and change teams. Doing so will ensure that the migration of applications or servers to the cloud won’t interfere with their existing projects, release, enhancement or patching schedules. Your IT leadership doesn’t want to surprise users with unnecessary downtime or outages for server patching while it is migrating application services to the cloud.

• Carefully map existing management and maintenance processes to the cloud. Your IT staff won’t need to spend time and effort learning new processes to manage the cloud or, even worse, refusing to learn them. IT leadership should also carefully consider how current workloads will be affected by the cloud migration to determine if additional staff is required to manage both environments. For example, leadership may need to consider increasing the number of dedicated architects to quickly execute technical design authority (TDA) approvals, creating ring-fenced network, release and change management processes that limit the effects of changes to avoid service disruptions. They also may need to increase information security staffing to prevent security-related bottlenecks from clogging the Agile migration factory.

• Engage early with all stakeholders, clearly describing the benefits of the cloud migration to get their financial and political support. Include everyone from business operations, business relationship managers and the security and network teams to avoid unpleasant surprises such as unexpected
All steps from blueprinting to service creation and testing to data transfer are performed in parallel, with a focus on failing fast (and fixing issues) to speed up service cutover to the hybrid cloud platform while improving migration quality.
system downtime or compliance issues. Be sure to include any third-party service providers and outside users (such as business partners) so they can provide any help you need, such as information about licenses, required interfaces to suppliers’ systems or how the move to the cloud will affect managed services agreements with outside providers.

- **Learn how the move to the cloud will affect the cost of licenses for applications and underlying platforms such as databases.** You may not be able to transfer all your on-premise licenses to the cloud, and pricing for some of them may change in a virtualized, cloud environment. For example, if the vendor’s licensing is calculated based on all available resources in an environment even if your organization is not using them, its licensing costs could rise in a public cloud.

- **Define upfront what kind of cloud migration approach you need – infrastructure based, platform based or service based.** For a recent media client, for example, an infrastructure-based migration was best because upgrading and patching its numerous operating systems and bringing databases to the latest levels was most important rather than application modernization. It is also key that the relevant data migration approach (for SQL, Oracle or any other database technology) underpins the overall service migration. Ensure the supporting infrastructure enabling migration is in place, including dedicated networks, firewalls, load balancers, etc., well in advance of the actual migration.

- **Your organization’s approach should cover what levels of security controls, privacy and availability are required in the new environment (including new requirements such as the European General Data Protection Regulation) and how it will find and fix vulnerabilities before moving to the cloud.** IT leadership should also consider which design patterns are defined and how many operations must be automated (see the first bullet, above). All of these will have major implications for your choice of cloud provider, and what elements are needed in your organization’s migration factory.

Cloud Migration Factory Execution Model

![Cloud Migration Factory Execution Model](image-url)
Reimagining Business for a Major Energy Company

We helped a British multinational energy and services company improve customer service and drive innovation through a business services-led cloud migration program. By mapping business services to the application and infrastructure layer, then planning the migration of those services (i.e., energy trading and workforce management) to a hybrid cloud, we expect to help the company cut system provisioning times from weeks to hours and minutes through self-service and automated deployment.

The hybrid cloud will allow the development of self-service portals for common service issues, increasing customer satisfaction while reducing support costs. The company also hopes to use the cloud to leverage faster DevOps processes and the Hadoop big data analytics platform to speed digital adoption and innovation while minimizing costs.

Among the expected benefits from this program:

• 80% of the company’s business apps modernized to realize its “All in Cloud” vision.
• Near 100% conformance with platform and application security controls post migration.
• 70% faster product/business service launches.
• 35% reduction in IT operational costs.
• Business agility & control through seamless consumption of IT resources across a public (Azure, AWS) cloud and its private cloud.
• Hybrid cloud digital platform with:
  » Business-aligned service levels.
  » Self-service catalogs for automated end-to-end provisioning.
  » Common management platform, leveraging automation, analytics and near real-time reporting.
LOOKING AHEAD: AN INDUSTRIAL CLOUD FOR THE DIGITAL AGE

As digital technology becomes more critical to growth and innovation, business users must be able to tap information and application services quickly enough to beat competitors to market with new products and services. Such ease of use is especially true of the cloud, with its revolutionary capabilities to cut costs and speed the delivery of new applications.

Long and expensive cloud migration projects are the rule, rather than the exception, and if not implemented correctly can threaten an organization’s competitiveness, market share and growth. In our experiences, these projects can run into millions of dollars over several months/years.
FOOTNOTES


2 Ibid.

ABOUT THE AUTHORS

Swami Gandhi
Associate Vice President,
Cognizant Digital Systems & Technology Cloud and Infrastructure Services

Swami Gandhi is an Associate Vice President at Cognizant. He currently leads cloud transformation and digital programs within the Cognizant Digital Systems & Technology Cloud and Infrastructure Services business unit. His wide-ranging experience includes leading the Cognizant Infrastructure Services business unit, creating transformational customer solutions, enabling practice growth and nurturing strong client relationships. He has 25 years of experience in infrastructure services, and has a bachelor’s degree in electronics and communications engineering from Vellore Institute of Technology (VIT University), India. Swami can be reached at Swaminathan.Gandhi@cognizant.com.

Mohit Mehta
Vice President, Cognizant Digital Systems & Technology Cloud and Infrastructure Services

Mohit Mehta is a Vice President in the Cognizant Digital Systems & Technology Cloud and Infrastructure Services business unit. As the markets leader of the UK and Ireland (UKI) strategic business unit, Mohit has extensive experience in managing, structuring and advising on business transformational initiatives within digital systems and technology, including enterprise cloud transformation. Mohit’s previous experience includes incubation and growth of Cognizant’s Technology, Media & Communication business in UKI and a market maker for large transformation deals for another global services company. Mohit can be reached at Mohit.Mehta@cognizant.com.
ABOUT COGNIZANT DIGITAL SYSTEMS & TECHNOLOGY

Cognizant Digital Systems & Technology (CDS&T) enables clients to create and evolve applications, platforms and infrastructure that meet the needs of modern enterprises - unlocking the value in legacy technology environments, adapting to high-speed change, and ensuring integrity of the IT core. Cognizant helps enterprises execute the best cloud strategy to accelerate innovation and meet evolving business needs. Our outcome-based hybrid cloud strategy combined with compliant and evergreen IT services helps organizations enhance customer experience across their digital journey.

ABOUT COGNIZANT

Cognizant (Nasdaq-100: CTSH) is one of the world’s leading professional services companies, transforming clients’ business, operating and technology models for the digital era. Our unique industry-based, consultative approach helps clients envision, build and run more innovative and efficient businesses. Headquartered in the U.S., Cognizant is ranked 205 on the Fortune 500 and is consistently listed among the most admired companies in the world. Learn how Cognizant helps clients lead with digital at www.cognizant.com or follow us @Cognizant.