The 7 Domains of Change

A COMPLETE GUIDE TO YOUR CLOUD MODERNIZATION JOURNEY

Creating your modernization journey map

Modernizing in the cloud isn't something that happens instantaneously. At its best, it's a unique, fully customized journey—whether your organization is going all in on modernization or taking a more calibrated approach. No one knows this better than Onix.

Onix is a world-class, multi-cloud service provider that has been offering bespoke digital solutions for over 30 years. We've used proven deployment methodologies to move hundreds of clients successfully into their future, and we can do the same for you. But before we take a step forward, we want to share the knowledge and considerations that will help you understand what it takes to achieve modernization success.

95% *of those surveyed are pursuing a full range of initiatives to modernize their operating environment.*[1]

This white paper will outline best practices to support high-value changes along your cloud journey. It will also help you discover which of your capabilities are most valuable when combined with cloud technology. Most importantly, it provides a comprehensive set of interconnected topics to consider for your modernization journey.

[1] Source: IDG

We call these topics the **"7 domains of change."** In our experience, these are the most foundational areas organizations should consider when creating a complete, customized and transformative modernization plan:

1. **Infrastructure**
2. **Applications**
3. **Application data**
4. **Networks and integrations**
5. **Development and operational processes**
6. **Security and governance**
7. **Organizational and people changes**

The purpose of this white paper is to explore these seven domains and present them as a framework to help you determine which changes are most appropriate for your organization's business objectives.

Within each domain, we'll dive into the most important aspects to consider when planning your journey, as well as discuss the different ways to move incrementally toward your objectives.

Let's get started.

Key questions about modernization

- What business objectives are most important to your organization?
- Do you have a cloud strategy with guiding principles?
- Is technical debt dragging your organization down?
- Which systems are you looking to modernize? What are you hoping to accomplish by doing so?
- Have you decided on a cloud service provider or providers?
- Is there a system you'd like to modernize as a proof of concept?

DOMAIN 1:

INFRASTRUCTURE

As your organization grows, it's critical that your infrastructure scales alongside it. A cloud platform—a utility service that allows organizations to consume technology infrastructure as needed—gives your infrastructure the flexibility, stability and elasticity to do exactly that, all while helping you generate more meaningful and powerful digital solutions.

Here is why a cloud platform is the perfect foundation to build your modernization journey upon:

- **Exactly what you need, exactly when you need it**
  A cloud platform can almost instantaneously scale to match your growth and adapt to your changing needs. The size and horsepower needed for your workloads, data storage and connectivity can be readily adjusted.

- **Eliminate data center management**
  A cloud platform infrastructure eliminates the need for hardware, data center management and leasing space in commercial data centers. It allows organizations to focus on the most appropriate and precise cloud services capabilities for their needs.

- **More speed and flexibility means a faster track to business value**
  The delays from long procurement and provisioning processes are eliminated with modern cloud systems. The designing and building of digital solutions is simultaneous with the provisioning of infrastructure services.

- **Create dependable digital solutions**
  Build resilience and reliability into your infrastructure designs, rather than incurring the cost of redundant hardware. Further, avail yourself to serverless and auto-scaling options, which allow your resources to focus on business applications and less on the management of infrastructure.

- **A wide range of options**
  Cloud platforms offer a vast selection of compute, store and networking infrastructure services that underpin flexible and scalable digital solutions. Cloud infrastructure becomes foundational to an organization's modernization plan. Options like quick infrastructure changes, autoscaling and auto-recovery can help reduce ongoing management responsibilities and, in turn, your overhead.

It's easy to see why a strong infrastructure is essential for your cloud journey. It's the strength behind the reliability, flexibility and agility of your digital solutions. The right cloud platform can add a significant amount of capability, as well as lessen the pain points that hold you back like wasted time, money and resources, proving that infrastructure modernization is one of the most powerful domains of change.

67% *of enterprise infrastructure is cloud based.*[2]

Key questions about infrastructure:

- What type, size and quantity of compute and storage services do you need?
- How much of the infrastructure does your organization want to manage (where can serverless and containers ease your operational overhead)?
- What are the infrastructure services needed to support your development pipeline?
- Can your current applications and systems be auto-scaled, or do they need to be rearchitected?

[2] Source: Techjury

DOMAIN 2:

APPLICATIONS

Applications are the beating heart of your organization, supporting core processes and mission-critical workflows that keep your business firing on all cylinders. But if those applications are outdated, archaically designed, slow and inefficient, it's easy for them to hold you back.

If an organization truly wants to digitally transform, it must consider a modernization of its applications. One critical example of this is utilizing containers that package applications efficiently by bundling things like code, files and libraries all in one place.

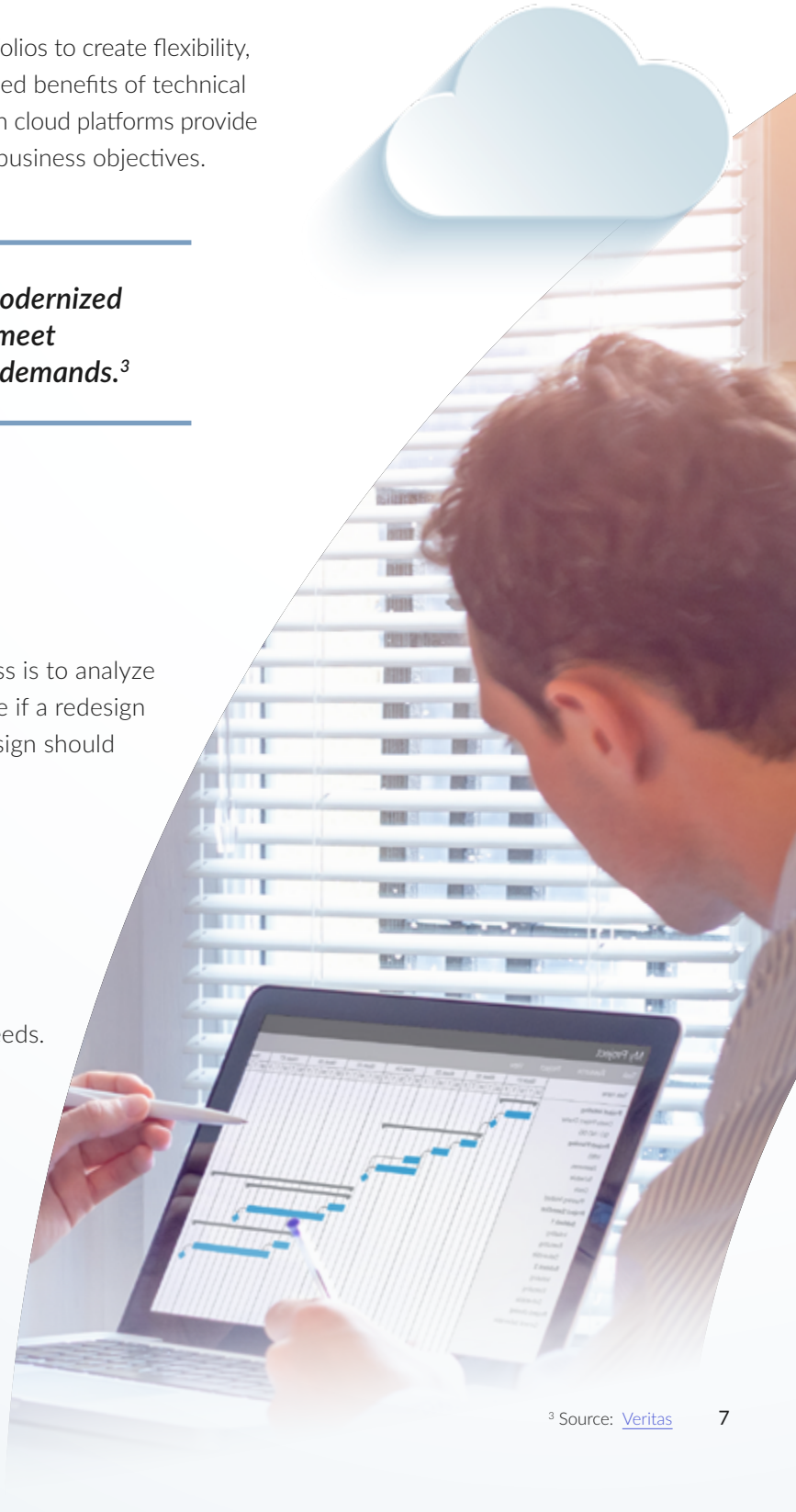
Modernization enables a refresh of your software portfolios to create flexibility, agility, and extended application lifespans. The combined benefits of technical innovations, modern principles, practices, and tooling on cloud platforms provide endless possibilities when it comes to achieving your business objectives.

88% ***of IT leaders agree that modernized IT systems are critical to meet emerging digital business demands.***[3]

Starting your application modernization

The first step in any application modernization process is to analyze application portfolios against key criteria to determine if a redesign is needed. The decision to move forward with a redesign should also be based on:

- Current design.
- Criticality to your business.
- Fit-to-need.
- Importance to business strategies and future needs.
- Suitability for cloud operations.
- ROI.
- Interdependency with other systems (i.e., shared code, underlying databases, integrations and interfaces with specific devices).



[3] Source: Veritas

With these criteria in mind, organizations should develop an incremental, on-going modernization roadmap that can guide them on their journey. It should detail which applications will be modernized and how, as well as the best way for resources to be effectively managed. This process is also known as application rationalization.

How a modernized application is built

While legacy systems were built as monolithic, standalone applications, modernized applications are built at a granular level to allow for extensive sharing of functionality, compartmentalized maintenance and to eliminate tightly bound interdependencies across the system. That's because they are:

- Constructed as modules and available as a service.
- Compartmentalized in containers.
- Replicated and distributed across environments and locations.
- A way to leverage the constructs of microservices like API integrations, containers and orchestration methods.

By this design, modernized applications become a portfolio of services for other systems and applications to use. Correspondingly, applications are not as procedural, and are less concerned about upstream and downstream processing. Instead, they're focused more on functionality. For example, a service may be triggered when an event occurs, rather than being a step in a sequence.

Containers

Containers are packages of everything that is needed to run an application or an application module. They include executable code, configuration files, libraries and other critical software, and they create an abstraction layer above the operating system and virtual machines.

It's common for organizations to adopt containers and container orchestration while modernizing their applications. This is because containers enable speed, agility and maintainability by virtualizing runtime environments. Containers have the ability to run across multiple, disparate environments and provide improved productivity and security. Best of all, they can be readily deployed across varying environments.

The most-used container platform is Docker, which offers both free and paid service options. When it comes to orchestrating containers—from deployment to management—a system software called Kubernetes is commonly deployed. Known as K8s, the software originated from Google, and its ecosystem, automations and capabilities continue to grow. Cloud providers support both Docker and Kubernetes, as well as several other services for implementing and managing containers.

Key questions about applications

- Which applications are the best candidates for modernization? Which deliver the most value, change often, are not resilient and/or cannot be updated easily?
- What design will best meet the desired use and experience for the application?

  TIP: Critical applications in monolithic, closed architectures that change often are great candidates for modernization.
- Which applications and what functionality can be replaced with off-the-shelf, open-source or already built services, including Software-as-a-Service (SaaS) and Platform-as-a-Service (PaaS) options?
- Should the functionality in any of your applications be offered as a shared application service, as opposed to embedded in each application?
- Should your organization adopt containers to generate greater value through virtualization and abstraction?

DOMAIN 3:

APPLICATION DATA

When modernizing systems, the databases behind applications are just as important as the applications themselves. The plethora of database options from cloud providers also provide an opportunity to save money, enhance availability and resiliency and automate management. For example, expensive database licenses can be replaced with right-sized, fit-for-purpose cloud database services.

As technologies have advanced, the availability and volume of data has exploded. Many digital transformations seek to gain operational efficiency, while also gaining additional insights from the data gathered within the processes. What's more, smart devices and IoT appliances are creating ongoing data streams and adding exponentially more data volume. Data is even being derived from static documents, pictures and sounds.

Modernized database services are available through cloud providers, and these include serverless options that can replace traditional, self-hosted and managed databases. These providers are also able to match you with the service that best fits your organization.

The benefits of these data services include:

- Using only the data storage you need, only when you need it.
- Eliminating expensive licensing fees and the costs of over-provisioning.
- Ensuring easy scalability that grows alongside your organization.
- Offering redundancy and backup and recovery options.
- Providing NoSQL and graph database offerings.
- Enhancing security and governance control.

Operational data (i.e., data collected within processes or upon user-actions in applications) does more than help you run your company—it is a gold mine available for analytics and insights. Cloud providers offer organizations a way to build their data stores around particular data and analytics (D&A) needs, dialing in the right design built on the right data constructs, for powerful insights.

This tsunami of data opens up exciting new potential for even greater insights and nearly real-time responses that can improve user-experiences and business outcomes—one of the most compelling reasons for database modernization.

These insights are paramount for an organization with a "data first" mindset, and they strive to discover them as data is ingested, processed and aggregated. Finding these "signals in the data" allows businesses to react more quickly—almost automatically—to issues, opportunities and anomalies.

While legacy processes may simply gather data, data-driven organizations with modern systems can leverage, enhance and enrich it. Further, the data can be fed into Artificial Intelligence (AI) / Machine Learning (ML) algorithms to create additional insights and new, innovative systems.

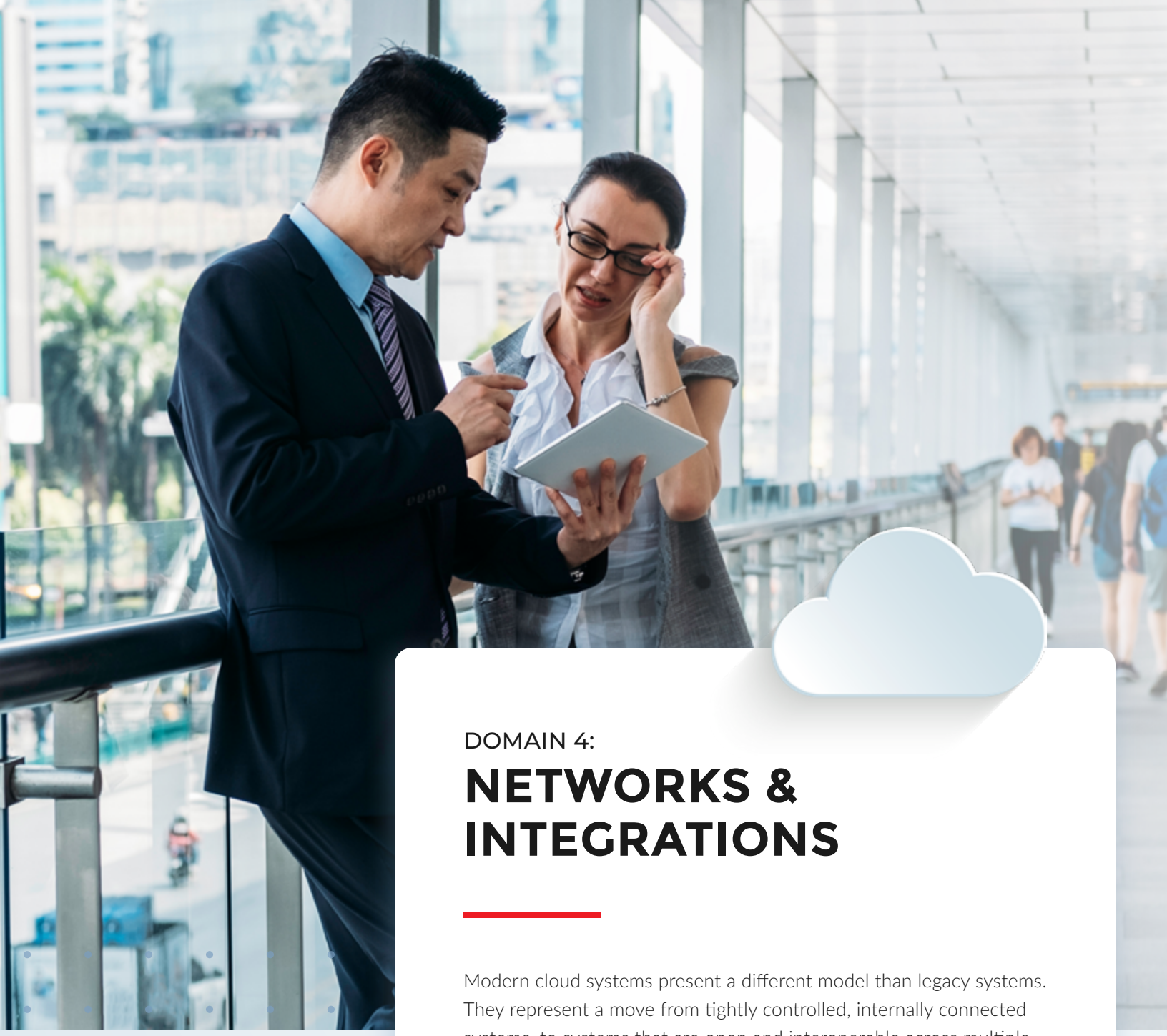
Being able to design databases with the purpose of collecting, managing and using it in a precise, laser-focused way is a huge advantage for organizations, and cloud services are designed to do just that.

Organizations need to be smart about their system designs, access controls and management of data to ensure its security and integrity. Best practices dictate that the data being used should be appropriately available across systems and ecosystems. And since cloud data storage is built on consumption and volume, businesses must still utilize basic data management principles to avoid unnecessary costs and overhead.

Key questions about application data:

- Which data is used across multiple applications and should be represented as a shared asset and service?
- How should the use and confidentiality of data be managed and governed?
- Which database and system design will best protect the quality and integrity of data?
- Which of your licensed databases are good candidates to be moved to open source databases and/or cloud-managed services?
- What data in which systems represent a business record or event-driven series or are used for analytical purposes? What is the most appropriate storage structure for these systems?

TIP: Onix's D&A practices include business intelligence, data analytics, data warehouses and AI/ML capabilities.



DOMAIN 4:

NETWORKS & INTEGRATIONS

Modern cloud systems present a different model than legacy systems. They represent a move from tightly controlled, internally connected systems, to systems that are open and interoperable across multiple platforms, ecosystems and external systems. Modernized, cloud-based systems are inherently distributed.

Interoperability is vitally important and may occur at multiple levels, including infrastructure, data-layer, applications and services, as well as across subnets and private and public clouds. They may even be physically distributed across geographical locations.

Two key points to remember in regards to networks and integrations:

- Modern cloud systems are designed with integrations in mind. They are designed for interconnectivity and interoperability.
- There are a variety of approaches to integrate systems, including APIs, shared files and databases, remote procedure calls and/or messaging.

Networks

Cloud platforms and services are a set of systems that are interconnected and interoperable through communication networks. With this in mind, it's easy to see why networks are such a crucial element of modernization.

Here are some important facts about networks you should be cognizant of:

- As with the other six domains featured in this white paper, architecture principles are applied to networks in order to maintain the value of critical components such as scalability, reliability, flexibility and adaptability.
- Successfully managing a network requires visibility—active monitoring, logging and alerting.
- Well-architected networks can enable better end-to-end control, visibility and management of systems.

Some organizations may choose to use a hybrid cloud network design that includes connectivity to proprietary data centers. Multi-cloud networks connect platforms from multiple cloud service providers or Software-as-a-Service platforms. But no matter which network design an organization chooses, it must be driven by business strategies/business objectives, and it should consider operating locations, compliance requirements, cost, customer/user experience and partner locations.

Integrations

At a more local level, systems are connected through application and service integrations. It's critical that these integrations are designed to enable an appropriate exchange of services, data and processes, while also including security controls, operational controls and failover options.

In modern systems, integrations occur at many different levels, including data, applications/services, business processes and end-user interfaces. In many cases, pre-constructed connections are built in, as is the case with ERP, EHR and CRM platforms.

Cloud providers are able to offer your organization a wide variety of integration services, including database integrations/synchronizations, message-based integrations for synchronous and asynchronous use-cases, remote procedure calls and more. Further, they offer API manager services to help maintain, orchestrate and monetize your APIs. These integrations should follow human design principles and value-stream management techniques to enhance the customer/user experience and to optimize processes.

In closing, networks and integrations provide the connective tissue across services, applications and data to make for systems, platforms and ecosystems.

Key questions about networks and integrations:

- What network topologies (hub & spoke, mesh, bus, star, hybrid, etc.) are most appropriate for your organization?

  NOTE: It's important to consider how and where your systems will be distributed.

- Which integrations and endpoints are in your system or systems (both internal and external)? With that in mind, what experience, performance and security is required?

- How much traffic do your networks and integrations need to handle? How scalable and elastic do they need to be?

- What devices and platforms are part of your systems? What type of connectivity do they need?

- Are you currently using an integration platform that could be extended or deployed into your cloud systems?

  TIP: Using your organization's existing networking/integration services or platforms that are compatible with the cloud can save costs of refactoring and retraining.

DOMAIN 5:

DEVELOPMENT AND OPERATIONAL PROCESSES

At its heart, cloud modernization is about enabling businesses with automated processes for faster delivery of value. But in order to reach optimal modernization, your organization needs to address its development and operational processes (DevOps). By modernizing these processes, you can optimize a modernization shift that is equal parts fundamental, foundational and transformative.

DevOps isn't just a modernization commitment; it's a cultural commitment. By unifying development and operations, a superior collaboration can be built between the teams, leading to more frequent, reliable and secure software deployment through automation.

Improved deployments are made possible due to the modular nature of the systems, and allow different components or business functions to be developed, tested and pushed for release in parallel. This is fundamentally different from the traditional, largely inefficient approach of building an entire application, testing it in its entirety and then releasing it.

As an organization evaluates its DevOps practices and capabilities, there are several key performance indicators (KPIs) that can be measured when it comes to speed and operational performance:

- **Change Lead Time:** The time from when a change is selected to when it's deployed.
- **Deployment Frequency:** How often production changes are deployed over a period.
- **Mean Time to Resolution:** The time between when an incident is discovered to when it's resolved.
- **Change Failure Rate:** The number of incidents or deployment failures over a period.

Infrastructure provisioning and management as a part of DevOps

A modernized software deployment process utilizes a pipeline that is enabled by a combination of infrastructure as a service, application modularity, emerging tools and data products. These DevOps capabilities allow the pipelines to be orchestrated and automated, and are known as Continuous Integration/Continuous Delivery (CI/CD).

Likewise, cloud-based services allow infrastructure to be deployed and maintained programmatically, which creates the concept of “infrastructure as code” (IaC).

With standardized scripts, tasks can be repeated with enhanced quality and consistency. Further, integrated structure encourages the creation of shared dashboards and, in turn, allows for continuous improvements and optimizations.

When it comes to infrastructure as code, the same tools and proven techniques of software projects can be applied. Engineers can apply the same development disciplines and rapidly deploy systems.

End-to-end, modernized systems can expedite the delivery of digital solutions, all while giving organizations a way to monitor, manage and maintain the systems in operation. In other words, development and operations become fundamentally integrated.

Business Continuity and Disaster Recovery (BC/DR)

Your systems operations must also consider resilience, reliability and recovery capabilities. BC/DR plans can be modernized by leveraging the capabilities of cloud providers and modern practices.

With these automations, CI/CD capabilities and IaC, your systems can easily be set up in multiple regions and locations to meet service-level objectives (SLO), recovery time objectives (RTO) and recovery point objectives (RPO). With application rationalization, you should consider the level of resiliency needed to protect the vulnerable and valuable.

Agility

Software development techniques have continuously improved since the creation of code, and the Agile Manifesto has grown from a set of ideas and principles to entire ecosystems, cultures and toolsets. The value of agile transformations has been realized by many organizations—most effectively by those that have embraced the cultural, product development, structural and delivery practice changes at the heart of the Manifesto.

Written in 2001, the Agile Manifesto is a document built on four values and twelve principles for agile software development.

Key questions about development and operational processes:

- What DevOps principles, practices and techniques will your organization adopt? At what stage?
- What ongoing operation and performance objectives does your business value?
- What Service-Level Objectives (SLOs) are critical to the success of your DevOps processes?
- Will your organization govern, manage and operate your modernized systems with modern mindsets, processes and practices?
- What are your organization's BC/DR plans? How will your modernized system work within those plans?
- How does your agile journey correlate with your modernization journey?
- How will you monitor, diagnose, and resolve incidents; detect and diagnose anomalies; and manage vulnerabilities across your integrated, modern systems?

DOMAIN 6:

SECURITY AND GOVERNANCE

In today's software-centric, data-driven world, every organization must make security a priority. And as attacks become more and more sophisticated, security needs to be top of mind at every turn of your cloud modernization journey.

94% *of data, privacy and security professionals say compliance with data privacy regulations is a top priority for their organization.*[4]

Protecting a cloud environment requires a dedicated and comprehensive effort across all technologies, controls, policies and processes involved in securing data and resources. A strong, reliable security foundation will ensure that systems can scale and adapt to your business requirements in a highly effective way.

Cloud platforms present a shared responsibility model:

- The providers are responsible for the physical security of infrastructure and the integrity of their security services.
- Organizations are responsible for how those services are configured and managed.

The power of modern security

Traditional systems approach security with a focus at the perimeter. But this is a one-dimensional approach that uses defensive products and one-off tools to mostly protect against intrusions beyond firewalls.

Modern cloud systems employ a "zero-trust" philosophy and utilize multi-level protections at data stores, software, networks, integrations/APIs and endpoints. Unlike traditional systems, security responses can be automated, and in some cases, the issues can be auto-remediated, eliminating management and overhead.

These systems are also designed to be more resilient and better protected against advanced cybersecurity threats and attacks, while also offering services for quicker recovery times when breaches occur.

BE AWARE: Because of the difference between cloud systems and traditional systems, threats and gaps may develop in new ways (e.g., poorly written scripts in IaC that could spread vulnerability to multiple systems).

[4] Source: TechBeacon

Modern cloud security systems give you a wide range of security controls, from notarizing containers, federated identity and access management to static and dynamic scanning for software vulnerabilities. Likewise, cloud providers offer robust data protections like encryption while data is at rest (in databases/data stores) or while data is in motion (being transmitted and/or processed).

Governance

Governing security is a delicate balance between rules to protect and permissions to enable. More specifically, guardrails are important to ensure proper control, but they should not become barriers to speed and agility. You must determine what permissions employees need to accomplish their responsibilities while simultaneously granting the least amount of privilege necessary in order to protect. Organizations should also put special focus on key areas of governance: identity and access controls, data protections and costs.

But be aware that these security practices reach beyond systems and must include:

- Managing authorizations based on roles.
- A robust set of policies, sufficient to meet regulatory and legal compliance.
- Awareness and policy training.
- Due diligence with vendors and partners.
- Agreements with partners.
- Customer privacy and terms of service.
- Regular testing.
- On-going risk and threat management.

Because security is embedded in development and operational processes, it is the responsibility of all employees, not just an organization's security team. However, automations can ease the burden of this responsibility by assisting with implementation, management and the update of security controls.

The security and governance domain has many critical elements that are ever-changing, and so it needs to be fluid and flexible. Regulations, threats, risks and vulnerabilities are always evolving and thereby require active management, including a documented register, regular reviews, risk categorization, prioritization and verified remediations.

What's more is that cloud providers can also be of assistance, offering advanced security techniques like denial of service protections, advance logging and monitoring services and AI-based anomaly detection to give your organization an added layer of protection.

Key questions about security and governance:

- What new and existing threats and vulnerabilities must be mitigated in your modernization initiative? Think both internally and externally.
- What policies, governance and controls need to be updated/put in place?
- What particular roles and permission are necessary for the modernized systems?
- Which application change controls, security testing, data protections/ encryptions and communication protections need to be in place to successfully achieve your target risk posture?

DOMAIN 7:

ORGANIZATIONAL AND PEOPLE CHANGE

If modernization is to be successful and remain effective, an organization's culture, structure and people are absolutely critical. Truly transformational change can only happen with new mindsets and behaviors, modern skillsets, supported organizational structures and engaged, trained workers.

> ***"Culture eats strategy for breakfast"***
>
> —Peter Drucker, 2006

In many ways, changing an organization's culture is more difficult (and important) than developing successful technology modernization strategies. While many businesses put the cart before the horse, the truth is that modern systems need to live and work within modern organizational cultures.

The most flexible, adaptive, resilient, innovative and modern systems are not products of siloed organizations with unclear objectives, rules-based cultures and disenfranchised workers. So how do these organizations turn their culture around?

- It starts with an agile mindset and training that can help employees adapt new ways of working in a highly adaptive environment.
- An organization's outlook must change from project-oriented to product-oriented, so that workers can focus on the user/customer experience and journey.
- The responsibility of making key decisions needs to be pushed closer to the teams performing the work, and issues need to escalate more quickly to the appropriate stakeholders.
- A data-driven mindset is critical. Organizations must adapt a perspective of data as an asset and put procedures, policies and processes in place to grow it as a valuable asset.

But that's not all. Organizations need to make changes structurally as well, and these changes need to support modern system roles, new processes and rapid delivery of solutions.

That means a reimagination and reengineering of governance structures and processes with a focus on speed and flexibility of the system.

NEED HELP? Centers of Excellence and Communities of Practice are organizational structures that allow an open flow of knowledge, successes, challenges, use-cases and modernization best practices.

Most importantly, however, organizations need to invest in their talent. While experienced employees with cloud native skills are difficult to hire and retain, current workers can be upskilled and cross-skilled to fit the development of an organization's modern systems. In fact, cloud providers offer a wide range of modernization training and educational programs.

Key questions about organizational and people change:

- What type of culture do you hope to grow when it comes to modernization?
- What barriers need to be overcome for speed and agility? How will your current governance/approval process be adapted to meet those new needs?
- What type of worker will be most critical for your modernized systems? For example: employee, contractor, consultant and/or partner.
- How will you acquire, develop and retain the leadership, new skills and mindsets needed to thrive in modern systems and cloud practices?

TIP: Organizations should create retention plans for employees that are acquiring high demand cloud skills and capabilities. This is critical for maintaining tribal knowledge as you transform your business.

Conclusion

As you consider these seven domains of change, the necessary redirections and reimaginings for a successful cloud modernization journey may seem daunting and insurmountable. However, with clear direction, determined intent, a step-by-step incremental approach and an experienced partner like Onix, you can build the right foundation and accelerate toward value.

Organizations can't be expected to modernize perfectly, especially as they first embark on their cloud journeys. That's why you should look at the seven domains outlined in this white paper as an in-depth guide to determine the path ahead—what to prioritize and plan for, and how to move forward in increments with continuous improvements and steady advancements.

Here are some key questions to ask before moving forward with your organization's cloud modernization:

- What needs to be in place for your organization to progress and continually improve on your cloud journey?
- What incremental work must be done in each domain and when in order to attain the best progressions?
- How might you define key "points of arrival" for your modernization journey, so that you can progress in increments and iterations, while adapting to changes along the way?
- How does your organization plan to embed cloud enablement and value delivery?
- Who will champion, support and lead your organization's cloud modernization changes?
- What organizational goals do you have that will help you prioritize your technology roadmap in accordance with key business outcomes?

The final question you should ask is, "Who can I partner with to optimize my cloud modernization journey?" The answer is Onix. We've helped organizations like yours achieve modernization success across these seven domains.

Whether you need assistance with strategy, processes or capabilities—or want full-service attention—Onix can help. Click below to schedule an introductory call during which we will assess your current cloud modernization status and recommend the steps you can take to quickly and efficiently reach your business goals.

SCHEDULE NOW

About Onix

Onix is a world-class cloud consultant, credentialed as a Google Cloud Premier Partner and an AWS Advanced Tier Services Partner. We strive to elevate every client embarking on their cloud journey through a prescriptive methodology built from decades of experience.

With proven success across hundreds of projects, our team of architects and consultants partner with you to create customized solutions that accelerate your journey in the cloud. We back our strategic planning and deployment expertise with the unparalleled service, training and support you need to succeed today and in the future.

You can learn more about Onix at www.onixnet.com