

Modernising Mission-Critical Systems to Build a Future-Ready Digital Enterprise

Modernising mission-critical systems is an important but complex exercise with long-term implications. A business outcome-driven approach can help enterprises achieve key transformation outcomes while minimising associated business risks.

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Introduction: Enterprise IT and a world in flux

As the world navigates a period of unprecedented uncertainty and disruption, we are entering a new phase of digital transformation focusing on enhancing enterprise agility, resilience, security, and sustainability. This will change how enterprises define their business objectives, and how they source and consume digital infrastructure. IDC predicts that:

- ▶ In 2023, over 60% of A2000 organisations will cite business resiliency to drive verifiable infrastructure supply chain integrity as a mandatory and non-negotiable vendor evaluation criterion.
- ▶ By 2023, most C-suite leaders will implement business-critical KPIs tied to data availability, recovery, and stewardship as rising levels of cyberattacks expose the scale of data at risk.
- ▶ By 2024, 60% of A2000 digital infrastructure requests for proposals (RFPs) will require vendors to prove progress on environmental, social, and governance (ESG)/sustainability initiatives with data, as CIOs rely on infrastructure vendors to help meet ESG goals.

AT A GLANCE

WHAT'S IMPORTANT

A more nuanced approach is needed to determine the right architectural model for an enterprise's future-ready digital infrastructure, instead of simply a "cloud-first" philosophy.

KEY TAKEAWAYS

A business outcome-driven approach to modernising mission-critical systems can help enterprises achieve key outcomes desired from their transformation initiatives, while avoiding the pitfalls of getting locked into suboptimal models and architectures.

These diverse enterprise imperatives highlight a key dichotomy in the emerging world of digital infrastructure. While the cloud is rapidly establishing itself as an operating model of choice for digital transformation, enterprises are also waking up to the limits of public clouds.

Data from IDC's *Future Enterprise Resiliency and Spending Survey 2022 (Wave 1)* suggests that almost nine in 10 Asia/Pacific enterprises are extremely or highly concerned about the growing technology investment — particularly in the cloud — needed to remain competitive. To address the cost management challenges, FinOps teams are establishing cloud cost governance and chargeback mechanisms, understanding how to optimise cloud spend for business benefit, and developing accurate cloud expenditure forecasts.

Management of runaway cloud costs is only one of the challenges associated with a hasty push towards the cloud. Other potential pitfalls include failed cloud migrations, project cost overruns, missed timelines, creation of new architectural silos, and increased management complexity. IDC's *European Multicloud*

Survey 2021 reveals that 28% of respondents indicated their public cloud deployments were unsuccessful. This shows that determining the right architectural model for an enterprise's future-ready digital infrastructure demands a more nuanced and considered approach than a simple cloud-first philosophy.

Instead of viewing digital infrastructure as individual asset silos, enterprises must treat the entire environment as a comprehensive platform for digital business transformation. This means investing in transforming their platforms, as well as operational environments, sourcing approaches, and financial models. The goal must be ensuring that the platform can effectively enable top-priority business outcomes.

For successful outcomes, the way forward requires reframing the business case for digital infrastructure far beyond the narrow calculus of destination (cloud versus non-cloud) and budget (capex versus opex). Instead, exploring architectural options that can unlock and amplify the value inherent in mission-critical systems should be at the forefront.

The unique case of mission-critical systems

Despite the burgeoning use of cloud, enterprises continue to run their mission-critical systems primarily on non-cloud infrastructure and platforms. The most common reasons are:

- ▶ Extremely high performance, resilience, availability, and security requirements of mission-critical workloads
- ▶ The enormous complexity of migrating to cloud applications and workloads, due to decades of organically grown business logic and custom integrations
- ▶ Enterprise familiarity and comfort with the traditional and time-tested skills, processes, operational models, and cost structures for these systems and workloads
- ▶ Increasingly stringent cybersecurity, regulatory, and compliance considerations, which can inform infrastructure decisions and choices. An example is the CI-SONs amendment to Australia's *Security of Critical Infrastructure Act*

This suggests that infrastructure platforms hosting mission-critical workloads will remain an integral part of the on-premises, non-cloud enterprise IT landscape for the foreseeable future. In fact, IDC's *Worldwide Quarterly Enterprise Infrastructure Tracker* reveals that the Asia/Pacific (excluding Japan) non-x86 server market — typically associated with hosting mission-critical workloads — grew from US\$1.25 billion in 2018 to US\$1.75 billion in 2021, at a CAGR of 11.7%. This underscores just how important these systems are in the enterprise IT landscape.



Why modernisation of mission-critical systems matters

While mission-critical systems will remain an important part of an enterprise IT landscape, it is crucial for enterprises to integrate them effectively into the wider enterprise IT estate as it turns increasingly hybrid. This is important for several reasons:

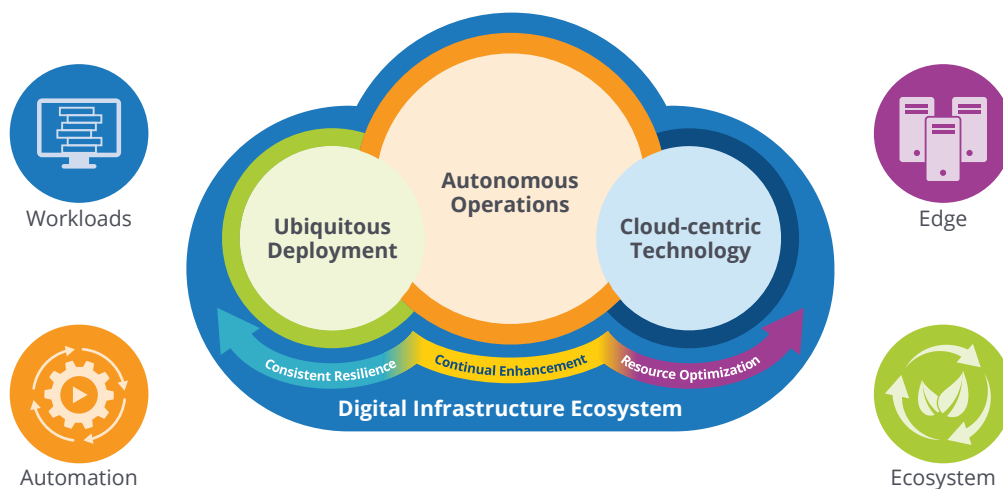
- ▶ Often, the most significant challenge enterprises face with mission-critical systems is the lack of alignment between IT capabilities of these systems and evolving business requirements.
- ▶ Unmodernised mission-critical systems that are not integrated with the rest of the enterprise IT environment create data silos, preventing organisations from unlocking crucial insights and value.
- ▶ Mission-critical systems that don't effectively employ modern architectural and environmental constructs — containerisation, microservices, API integrations — hamper innovation and agility.
- ▶ Finally, unmodernised mission-critical systems can leave enterprises locked into high operational costs and a perpetual shortage of crucial skills.

While modernisation of enterprise mission-critical systems is important, migrating them to the cloud merely to keep up with current trends (rather than objective-driven modernisation) can create serious long-term challenges.

Business outcome-driven digital infrastructure — a better way forward

IDC's Future of Digital Infrastructure Framework (see Figure 1) provides IT and business decision makers with a model for making informed infrastructure decisions that build successful digital businesses.

Figure 1: **IDC's Future of Digital Infrastructure Framework**



Source: IDC, 2022

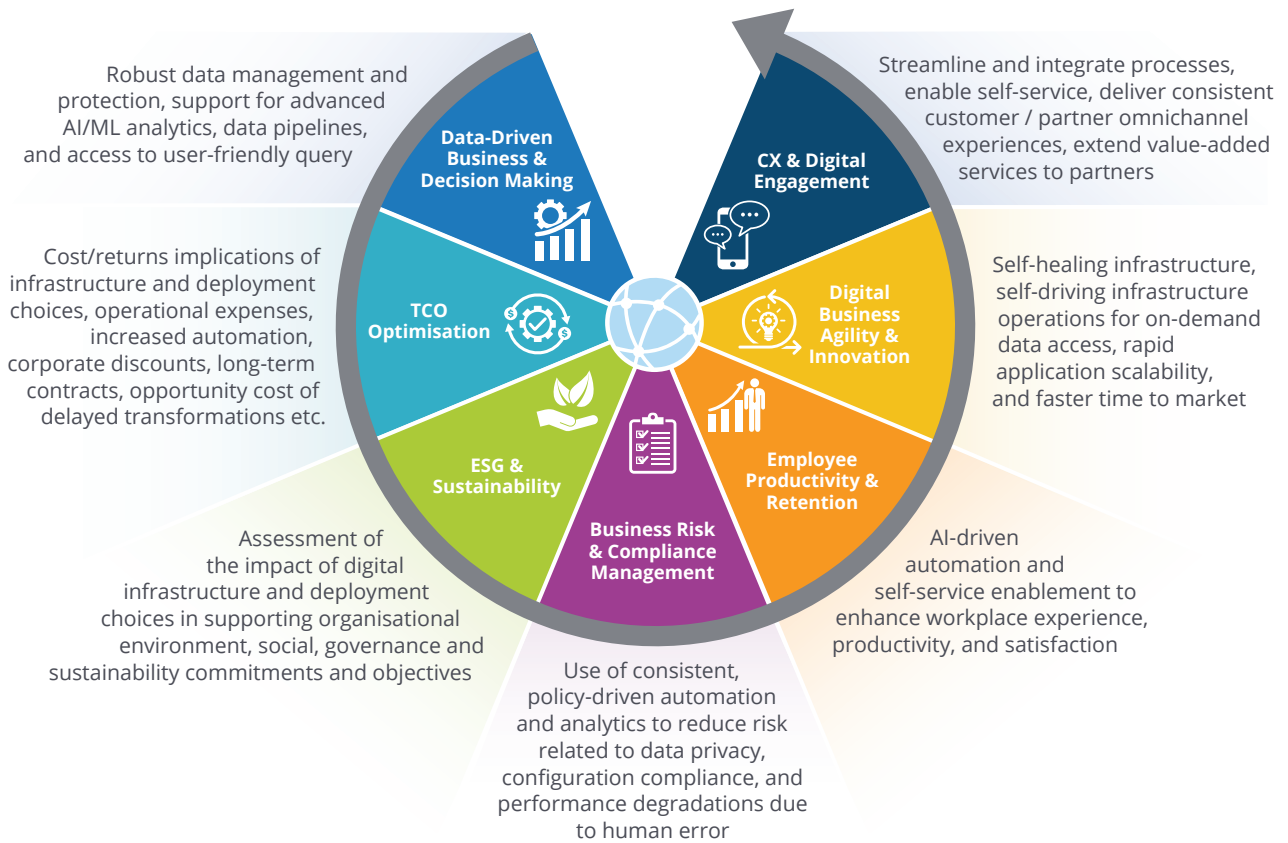
The three major tenets of IDC's Future of Digital Infrastructure model advise organisations to invest in:

- ▶ **Cloud-native technologies** that allow for on-demand resource scaling, agility, and flexibility. It is important to note here that cloud-native refers to the use of infrastructure that includes automatic provisioning, consumption pricing, evergreening of technology by a third party, current application architectures such as microservices or containerisation, and may run on premises, or in a hyperscaler cloud.
- ▶ **Autonomous operations** enabled by software-defined automation technologies paired with AI and ML analytics and best-in-class operational workflows, policies, and governance.
- ▶ **Ubiquitously deployed resources** enabled by consumption-based sourcing and consistent visibility and control across the full range of storage, compute, and network infrastructure and services used by the business, regardless of where they are physically deployed.

IDC recommends that enterprises employ outcomes-driven approaches to identify areas where traditional technologies and operating models create friction or slow down digital business transformation. They can then use this insight to transform the way they manage their infrastructure, applications, data, security, compliance, and employee work

environments to deliver specific business outcomes. The business outcome-driven Digital Infrastructure Framework detailed in Figure 2 can help enterprises identify the key outcomes desired from their digital infrastructure initiatives, and define meaningful KPIs to drive these initiatives to success:

Figure 2: **Business Outcome-Driven Digital Infrastructure**



Source: IDC, 2022



Taking a business outcome-focused approach to modernising mission-critical workloads

Modernising mission-critical workloads can be a complex exercise with long-term implications. This makes it vital that enterprises undertake such initiatives for the right reasons, and with careful consideration of choices. One effective way enterprises can do so is by decomposing modernisation use cases into the primary business outcomes desired from the initiatives. Often, a modernisation use case may help organisations achieve multiple business outcomes. For example:

- ▶ Modernisation of core mission-critical systems (on which much of the critical enterprise data resides) can be achieved through mechanisms such as running cloud-native analytics applications and mission-critical workloads in different logical partitions of the same physical infrastructure, with low-latency, secure APIs for data access. This enables enterprises to implement **data-driven decision making** to drive key business outcomes, while conforming to all necessary **business risk and compliance management** requirements. Securely opening up core systems through API-based access to data also allows construction of new service across the enterprise's ecosystem (partners, customers) to deliver a differentiated customer experience and richer engagement.
- ▶ Building a bridge between strategic business priorities and cloud capabilities, by taking an application portfolio approach rather than a single application-focused approach to hybrid cloud migration. A competent cloud professional services partner can help enterprises leverage proven frameworks and tools, established best practices and economies of scale to modernise a diversity of applications in the estate, ranging from small-scale standalone applications to highly complex mission-critical systems. This allows enterprises to realise business value rapidly and successfully from cloud enablement across domains and business units.
- ▶ The fundamentals of DevOps — collaborative cross-functional teams, agile software delivery methodologies, and automation — applied regardless of where an application is deployed. Adopting agile principles and DevOps tools that straddle both traditional systems (such as those hosting mission-critical workloads) and cloud-based systems is a key step towards improving software development and delivery quality, velocity, and efficiency in hybrid environments. More importantly, it improves organisations' ability to integrate mission-critical workloads with newer systems of engagement through modern constructs such as APIs, while simultaneously helping equip developers with the latest development tools, processes, and methodologies. All of this leads to improved **developer experience, productivity, and satisfaction**, while also simultaneously enhancing **digital business agility and innovation**.

Enterprises can use a similar approach with other use cases to ensure their modernisation initiatives are guided by organisational business objectives rather than market hype or other considerations that can yield suboptimal outcomes. Enterprises can then translate the identified desired business outcomes into metrics and KPIs that can be planned for and tracked. Quantification of the desired outcomes has an important role to play in the selection of the right approach to modernisation.

Enterprises need to stop thinking of modernisation of mission-critical systems in simple binary terms (cloud or on-premises), but as a broad range of options and a progressive sequence of modernisation choices, each defined by its business objectives. Some examples of such a calibrated approach to mission-critical system modernisation include:



Integrating mission-critical systems with the rest of the datacentre as part of a common DevOps framework and tooling



Modernising in-place by leveraging existing infrastructure, but modern architectural constructs (such as containerisation) and languages, with infrastructure becoming part of the enterprise hybrid cloud



Decomposing the technology stack that comprises the mission-critical system and transitioning parts (modules) of the critical workloads to a cloud-native, microservices and API-led architecture



Migrating the entire workload to the cloud and decommissioning existing infrastructure, where appropriate (as determined by evaluation of business objectives).

Modernisation of mission-critical systems is more than just a technology upgrade. It also requires modernising processes, development methodologies, systems management disciplines, and organisational culture. Engaging a modernisation partner that brings the relevant methodologies, IP/tooling, partnerships, professional services and change management capabilities can be an invaluable asset in planning and executing your organisational transformation journey.

Benefits of modernising mission-critical systems

The modernisation of mission-critical systems opens the path for integrating these systems fully and deeply into the enterprise hybrid IT strategy and architecture. The benefits are significant:

- ▶ **Agility:** Cloud-native technologies such as containers and microservices enables new levers of innovation and agility in mission-critical systems. Constructs such as API integrations redefine B2B (business-to-business) interactions and open new revenue opportunities through innovative services.
- ▶ **Developer productivity:** A federated, agile enterprise application and data architecture, combined with a hybrid IT environment improves developer experience and productivity, while accelerating innovation. Think shared DevOps tooling and CI/CD orchestration, and seamless data integration between on-premises relational and cloud databases.
- ▶ **Sustainability:** Modernising mission-critical systems infrastructures also improves organisational ESG goal attainment. By enabling operating model transformation, enterprises can optimise resource usage, reduce over-provisioning, and generally reduce both the absolute size and the carbon footprint of their IT estates.
- ▶ **Reduced risk and expenses:** Implementing consolidated, single-pane-of-glass management and automation capabilities across the entire hybrid IT estate simplifies operations and reduces operating risk and expenses.

Kyndryl's role in modernising mission-critical technology

As one of the world's largest IT infrastructure providers, Kyndryl helps customers around the world design, build, manage, and modernise mission-critical technology. With more than 90,000 skilled professionals who deliver advisory, implementation, and managed services — and years of experience managing mission-critical systems, Kyndryl has the expertise required to power complex customer transformations.

Pathways to transformation

The transformation journey can be a confusing one. With a variety of obstacles standing in the way, it is easy to lose sight of business goals. Simply lifting and shifting workloads merely to get to the cloud can mean sacrificing valuable innovation, insight, and enhancements along the way. When it comes to the cloud, the cost-effective solution is to place the right workload on the right platform — where “right” is based on application, data, and business requirements.

A successful transformation journey typically begins in one of four ways.



Infrastructure-led transformation

The first step towards IT transformation, this pathway helps enterprises lift and shift workloads before embarking on a full-fledged application-led modernisation journey. Benefits often include cost optimisation, streamlined operations, and reduction of technical debt.



Application-led migration and modernisation

Applications are the backbone of many digital transformation initiatives. With the continuous shift towards modernisation that is enabled by advanced, cloud-native technologies, there's a correspondingly lower emphasis on infrastructure-led, lift-and-shift migration. Benefits like improved customer experience, reduced processing cost, lower application risk profile, and near-zero downtime and on-demand scalability are the goals here.



Business-led transformation

The cloud has become the premier foundation to address current business priorities for digital transformation. Even with the clear value and power of the cloud, understanding how best to approach workload migration, platform modernisation, and modern operations can still present challenges.



Analytics-led transformation

With the rapid increase in digitisation, data is a strategic asset for today's businesses. Despite the volume of data they possess, many enterprises struggle to derive insights from their data. Culprits include operational inefficiencies, exponential data growth, poor data integrity, and a lack of data management and engineering skills.

Kyndryl's transformation services

Kyndryl's comprehensive services portfolio allows it to effectively address a broad range of enterprise transformation objectives. Its agile service delivery approach to transformation helps to reduce operating costs and accelerate cloud adoption. When combined with cloud provider services and adoption frameworks, these methods can help enterprises overcome some of the most common transformation challenges, such as business continuity, cost optimisation, and evaluating gaps in their current technology infrastructure.

On the business transformation front, Kyndryl can help enterprises evaluate transformation readiness, identify organisational gaps, define their technology vision and process modernisation approach, and deliver a prioritised road map, business case, and technology architecture crucial to helping meet business goals. Support for common operational challenges — like risk and regulatory compliance, gaps in skilled resources, and integration with existing applications and processes — helps minimise business disruption.

Crucially, Kyndryl also provides access to skilled experts and data fabrics to help modernise the enterprise data landscape, as well as build and manage a data platform that delivers critical business insights.

Conclusion

Success in the context of modern digital infrastructure demands a more nuanced and considered approach to determining the right architectural model than simply a cloud-first philosophy. This is particularly true when modernising mission-critical workloads, which can be complex exercises with long-term implications. It is important that enterprises undertake such initiatives for the right reasons and carefully think through their choices along the way. IDC recommends that enterprises employ outcomes-driven approaches to identify areas where traditional technologies and

Challenges

An unfortunate by-product of the hype surrounding transformation has been the blurring of the boundary between transformation (outcome) and cloud migration (destination). One of the biggest challenges associated with modernisation of mission-critical systems is remedying this misconception among key segments of enterprise business stakeholders. IDC recommends working with transformation services providers to frame modernisation discussions around the desired business objectives, and the architectural and infrastructure options best positioned to deliver these outcomes. This exercise will also serve to expand enterprise horizons on the art of the possible.

Another key challenge associated with modernisation of mission-critical systems is the availability of critical skills that are difficult to source. A capable transformation services provider with a robust internal training and skilling program is often best equipped to deliver these capabilities. Kyndryl, with its deep experience in delivering transformational outcomes for modernisation of mission-critical systems, and a broad talent pool that has access to constant upskilling, is well-positioned to help customers in their modernisation journey.

operating models are creating friction or slowing down digital business transformation, and use this insight to transform the way they manage their infrastructure, applications, data, security, compliance, and employee work environments to deliver specific business outcomes. Engaging a proven modernisation partner that brings the relevant methodologies, IP/tooling, partnerships, professional services and change management capabilities can be an invaluable asset in planning and executing an organisation's transformation journey.



About the Analyst



Linus Lai is a member of the Asia/Pacific Software and Services Research Group. He has more than 20 years of IT experience in the region. Based in Sydney, Australia, he has experience in several cloud, software, and services research programmes in Asia/Pacific excluding Japan (APEJ), which covers a wide range of technology and services markets across 13 countries.

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Our pivot to a digital-first world brought more technology, a bigger attack surface, and a hybrid reality along with it. We need to think differently about operational excellence today than we have in the past. It needs a strategy that elevates organisational resilience for a more technologically diverse and dependent enterprise, embracing six fundamental principles to make it happen:

01

Technology for purpose

Maximising the use of the technologies the enterprise already has while incorporating new and emerging technologies in the right (and measurable) way for the best business outcome.

02

Experience over destination

Ensuring exceptional client, prospect, vendor, and employee engagement while running the workloads where it makes sense for the current reality and future direction of the business.

03

Structured to scale

Keeping the estate as lean as possible for agility and speed to respond to business, market, and global change.

04

Implicit security and resilience

Integrating security and resiliency across organisational boundaries and embracing SecDevOps to embed security into every technology decision.

05

Continuous skills elevation

Constantly pushing to automate the mundane, elevating the work that matters, and cultivating the skills that need building.

06

Sustainability to the core

Holding every person, process, and piece of technology accountable for its environmental impact.