ACHIEVING APPLICATION AND INFRASTRUCTURE SYNERGIES IN THE DIGITAL WORLD

Faster time to market is a top priority for enterprises today. CXOs want to accelerate the launch of new business products and shift to newer business models. This calls for agile and connected application and infrastructure services. But lack of integration across the tooling ecosystem and limited value from truly integrated product-based operating models are key challenges.

This paper examines the above challenges and demonstrates how an approach driven by technology, operating model changes, and governance can be used by CIOs to maximize synergies across application and infrastructure services.

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Introduction

Following the events of 2020, enterprises want to focus on improving resiliency, security posture, compliance with regulations, and total cost of ownership (TCO) of all internal functions including IT services.

These goals depend on application as well as infrastructure services. As a result, it is critical for enterprises to fast-track new-age synergies across application and infrastructure services.

Most enterprises face two major challenges in expediting these synergies. One is the absence of proper integration across tools in the landscape. Tools tend to be siloed, bought for a specific purpose, and rarely converge towards achieving common goals like business-focused resiliency across application and infrastructure services. Second, while many enterprises are keen to onboard an integrated 'productized' way of working, they struggle in realizing incremental benefits from changes made to the operating model while shifting to the product-based model. Associated challenges include designing the product organization to include the relevant components of infrastructure services and constructing shared services for the rest.

The way forward lies in making use of technology advancements such as everything-as-a-code to achieve extreme automation, observability, and AI Ops. It also lies in leveraging work share changes due to adoption of hybrid cloud coupled with SRE and DevSecOps.

Traditional synergies across application and infrastructure services

Organizations face several challenges impacting service to business in the traditional operating model. The challenges are:

- Large number of hops between teams for incident resolution, thereby increasing the resolution time
- Varying implementation of IT service management (ITSM) processes and communication protocols between application and infrastructure teams, causing duplicate, conflicting, or delayed communication to stakeholders
- Lack of an end-to-end view into issues and ownership across application and infrastructure teams
- Delays in performing root cause analysis after resolving the issue with permanent fixes
- Delays in getting on-demand data refreshes for application support teams to troubleshoot production issues and test workarounds, thereby impacting recovery time and affecting business outcomes, etc.

In order to improve the efficiency of operations and maximize synergies from current operating models and toolsets, enterprises need governance mechanisms such as:

- Integrated service level agreements (SLAs) at issue level cutting across application as well as infrastructure services
- Early involvement of application and infrastructure teams during development/engineering cycles, joint review of production changes, and periodic upgrades to avoid outages

- Promoting a culture of joint root cause analysis to identify and execute permanent fixes rather than continuing with costly automation and/or a shift-left approach.

A Service Excellence Office co-staffed with application as well as infrastructure leaders can drive most of these traditional synergies.

New synergies across application and infrastructure services

Advancements in technology and operating model constructs require application and infrastructure teams to collectively deliver synergies beyond improvement in mean time to resolution (MTTR). The main potential new synergies are:

1. Step improvement in resiliency and capability to influence business outcomes

The right technology integration, across application and infrastructure specific platforms leading to tracking the success of business KPIs in addition to application and infrastructure specific resiliency goals is the way ahead for enterprises. An accurate configuration management database (CMDB), comprehensive service discovery, and apt integrations across application and infrastructure tooling components coupled with site reliability engineering (SRE) adoption can elevate resiliency to become business KPI-centric. It can also ensure that IT plays a pivotal role in delivering business outcomes.

Example – Infosys helped a high-tech company build effective interconnections with their contract supplier's ERP systems and integrate all the IT layers end-to-end. Application of artificial intelligence and machine learning models have brought out insights and allowed leaders to take proactive action. It has created a resilient supply chain ecosystem that brings visibility to real-time business performance metrics. It has also improved on-time delivery metrics.

Example – IT infrastructure and application teams establish and maintain processes to facilitate recovery of Tier 1 applications/processes in the event of loss of services at the primary data center. As a part of the established process, quarterly disaster recovery tests are conducted. The results are published to the business after completion. This will provide companies with the ability to recover in the quickest possible time in case of production outages, thereby minimizing impact to business operations.

2. Improved agility in the product-centric model

Collaboration between application and infrastructure teams via automation and SRE-led levers ensures that the application teams can rapidly respond to demands from the business or from specific user personas. Incremental benefits brought about by integrated monitoring, SRE influx, DevOps ultimately leading to a common product-oriented organization will enable additional improvements in turnaround time through common prioritization of work items and significant reduction in TCO.

Example – For a leading Fortune 500 financial services organization, Infosys has established a collaborative team that follows agile practices. This has delivered quick turnaround on operational activities like changing capacity/ entitlements, patching activities, addressing vulnerabilities, etc. The operations team has become more flexible and accommodative of changes to achieve common goals like maintaining currency, conducting problem analysis, implementing permanent fixes, handling security incidents, and addressing zero-day vulnerability. This has greatly simplified change planning for the organization.

Example – For an Infosys client, during the recent zero-day attack that exploited the Print Nightmare vulnerability, 97.5% of the servers were patched and secured across development, testing, quality assurance, and production environments within 7 days. 100% of servers (3,500) were secured within 9 days. This entire exercise would have typically taken several weeks.

3. Higher ROI from transformational programs

As most large transformation programs (like enterprise cloud adoption) have both application and infrastructure elements, a co-governed approach across both lines of service will help achieve outcomes rapidly, ensure high quality of deliverables, and optimize timelines.

Example – Establishing an integrated and co-governed approach has helped a Fortune 100 Financial Services client improve turnaround time in migration and currency programs. Infosys executed workload migration to cloud for 35 servers with an integrated application and infrastructure pod unit, which was completed within 45 days. Earlier, this would have taken 90 days to complete with separate teams. The collaborative set-up helped reduce effort spent on workload migration per server by 40%. It also reduced costs related to communication and planning. Testing was completed in an agile fashion.

4. Optimal savings on total cost of ownership (TCO)

The new synergies outlined above will be delivered through improved visibility across applications as well as infrastructure observability. Leveraging AI Ops will provide insights and eventually drive aggressive automation across both application and infrastructure services. Both these levers will reduce human effort spent in the typical model, thereby improving cost and effort savings gained from traditional levers.

Using technology, operating structures, and governance for new synergies

1. Technology – Implement service-specific components integrated to deliver cross service synergies

Synergies addressed

- Resiliency and business outcomes
- Agility
- RoI from transformation programs
- TCO reduction
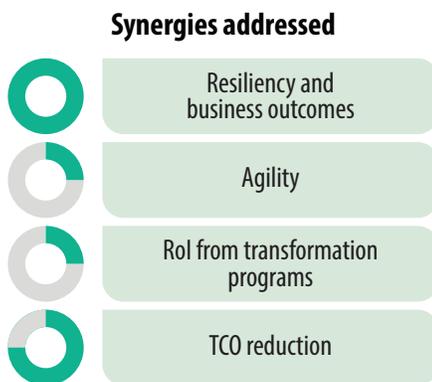
Of all the challenges enterprises face when improving synergies across application and infrastructure services, the foremost one to be addressed is correcting the disconnect among technology tools in the landscape. Resiliency and aligning to business outcomes are completely dependent on the right technology being in place, which can be accelerated, instead of adopting new operating constructs.

Leaders of application and infrastructure services want to improve monitoring, analytics, and automation. They also want to adopt service-specific technology advancements such as business process mining in application services and real-time brokerage algorithms for optimizing spend with hyperscale cloud providers for infrastructure services. CXOs also want their leaders to converge and provide a business process/KPI-specific view rather than just optimizing their individual areas.

Tasked with such requirements, the way ahead for CXOs is to implement technology platforms that are built to cater to application and infrastructure service-specific requirements as well as interact with each other to achieve business specific goals. These will allow individual service line leaders to shape the roadmap as per their priorities while, at the same time, consuming data from respective monitoring sources and ITSM repositories for effective cross-service correlation. This will elevate support from being IT-centric to business outcomes-focused.

Within the same organization, application and infrastructure-specific technology components should be built on common design principles, the most critical of which are:

- Have clear capabilities designed for application and infrastructure services with the ability to handle nuances like network, storage observability, and self-healing in infrastructure space and capabilities like batch monitoring and space and capabilities like batch monitoring and reprocessing in application space.

- Leverage available monitoring and automation tools, thereby protecting existing investments

- Adopt a platform approach so that all tools are integrated. Consuming entities like internal lines of business can simply hook on to this platform and tap into the benefits of all underlying tools.

- Define the design using open source. Adopt open-source options to fill gaps in the target tooling ecosystem.

- Fast-track benefits from new features by integrating underlying ITSM, monitoring, and automation tools.

- Standardized Toolchain that orchestrates and automates builds, tests and packaging deliverables

Components built according to the above design principles will improve application and infrastructure observability and enable AI Ops for correlation across monitoring sources. This is the foundation for improving resiliency and making support operations business-centric. Such tooling, along with corresponding changes in the operating model, will also reduce human toil at the L1 (level 1) layer, leading to incremental TCO optimization. The final outcome is resilient systems with better uptime and low MTTR.

2. Operating model – Transform operating structures, repurpose existing provisions

Synergies addressed

- Resiliency and business outcomes
- Agility
- RoI from transformation programs
- TCO reduction
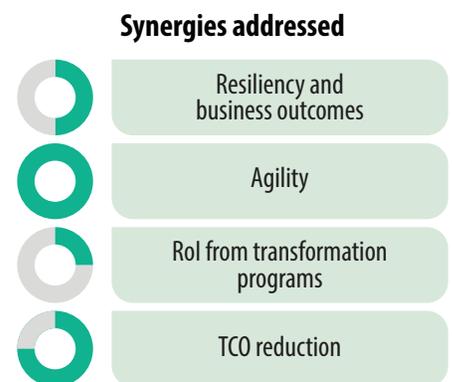
Large-scale changes like integrating application and infrastructure services or shifting to a complete product-based organization are complex and require purposeful roadmaps that begin with setting the right foundations. We recommend that enterprises adopt a series of changes

aimed at improving collaboration across application and infrastructure components and then evolve to a product-based organization.

Along with adopting the right technology platform, Infosys recommends implementing changes in the operating structure that deliver synergies across application and infrastructure teams and provide clear ownership when tracking collaboration on the ground. Key considerations when implementing these changes are:

- Application and infrastructure leaders retain control of corresponding service teams

- Optimize teams within application and infrastructure services by adopting DevOps and SRE principles, and providing service catalogs

- Evaluate cloud onboarding and revisit work sharing across hyperscale cloud providers and systems integrators.

3. Governance – Defining and tracking success metrics for synergies

Synergies addressed

| Resiliency and business outcomes |
| Agility |
| RoI from transformation programs |
| TCO reduction |

Even though there has been significant progress in implementing automation-centric levers in both application and infrastructure services, there is still room to improve how progress is tracked in most engagements. The same applies to synergies across application and infrastructure services.

The technology adoption and changes in operating structures (as described in earlier sections) will deliver synergy benefits, but enterprises along with their IT partners need to collectively adopt new metrics to track progress on an ongoing basis. These will be the new governance metrics for most organizations. Hence, CIOs, application and infrastructure leaders, and IT partners should collectively enhance the adoption of these metrics.

Achieving ROI from new application and infrastructure synergies

Synergies addressed

- Resiliency and business outcomes
- Agility
- RoI from transformation programs
- TCO reduction
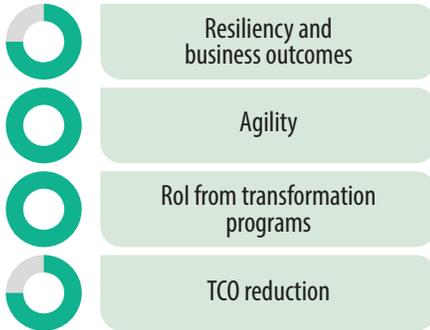
As described in the earlier sections, enterprises can greatly benefit from an approach that merges technology adoption, gradual structural changes in the operating model, and governance metrics designed to track synergies across application and infrastructure services. Additionally, a shift to an integrated product-based teams will result into additional benefits around time to market and TCO for the enterprise.

A pragmatic approach for organizations looking to realize the above benefits while in the journey towards a cloud native digital ecosystem with a continuous delivery team is suggested below:

1. Pilot product-centric integrated PODs

Given how many organizations are eager to become product-centric, an integrated POD with all the service teams will bring in significant control when meeting the priorities of the product.

Infosys recommends the following best practices in creating such PODs:

- Ensure the ITSM practice is sufficiently mature before constructing the POD.
- Create PODs with a principle of minimum dependency on other service teams. For example, the POD should have access to and consume service catalogs (as described in an earlier section) rather than depend on a specific team for a set of day-to-day tasks.
- The constituent roles within the POD should be chosen to support product-specific decision-making and leverage organizational efficiencies. For instance, even though PODs are product-specific, they should apply a hybrid model to benefit from economies of scale. In the hybrid model, certain roles like product-specific SREs and infrastructure specialists are dedicated to the POD; the POD also consumes services provided by shared horizontal SREs for functions like storage, network, security, etc. Such PODs should be tested based on application and infrastructure SMEs to report utilization metrics to individual application and infrastructure leadership and metrics aligned to product priorities.

Once such PODs are mature, i.e., product goals are achieved, the CIO's office should work with the business, product owners, and application and infrastructure leaders to formalize the structure and reporting.

2. Create need-based transformation PODs

Almost all large technology transformations are dependent on both application and infrastructure services. Be it cloud adoption, large-scale asset optimization, or shifting to a new product(s), all such transformations need application and infrastructure teams to work together for the success of the program.

In order to improve the ROI from such large transformational programs, Infosys recommends creating point-in-time transformation PODs. These pods will include all the necessary roles in architecture, design, implementation, etc., across enterprise teams as well as individual application and infrastructure specialists. The PODs will report to the transformation program manager or the CTO during the course of the program. Co-existence of application and infrastructure teams will drive improvements in cost, quality, and duration of the initiative. It will also ensure that benefits are spread across the services. For example, an application modernization exercise conducted in this way will help retire legacy applications and repurpose the corresponding infrastructure and licenses, leading to improved TCO savings.

This POD-centric approach along with technology accelerators for modernization and cloud adoption programs will deliver new synergies across application and infrastructure services.

Infosys value proposition

Infosys, with its rich experience in onboarding new operating models for clients, has mature technology offerings that collectively expedite operational synergies across application and infrastructure services.

Infosys Live Enterprise Application Management Platform (LEAP) and Live Enterprise Polycloud Platforms are key offerings designed for application and infrastructure services respectively. Both the offerings are built on common 'Live Enterprise' goals to create sentient organizations that sense and process information in real-time and bring out intelligent insights, leading to proactive self-healing systems. These help enterprises effectively respond to disruptions and opportunities.

By leveraging the existing ITSM platform and monitoring tools, Infosys helps ensure cost savings for clients. The platform is in-built with an AI Ops engine to bring out meaningful insights through a cognitive automation workflow. These additional automation models are built using open source design frameworks and provide solutions to identify and resolve gaps within operations. They shift operations from being a reactive silo-based model to a proactive, cohesive, and responsive model.

Delivered through Infosys Cobalt, Infosys provides a unified platform allowing all groups or lines of business to get uniform benefits. It ensures predictive upgrades with minimal disruption to business,

thereby improving reliability and enhancing the user experience. Infosys has mature and deep relationships with major monitoring, ITSM, and automation providers. As such, the Infosys Live Enterprise Application Management Platform and Polycloud offerings also provide clients with the advantage of accessing new features being rolled out by technology leaders.

While Infosys Live Enterprise Application Management Platform and Polycloud are customized to enable service-specific priorities, they are integrated to deliver common business centric goals by bringing agility in day to day support operations and optimize TCO by improving bot to human ratio.

Conclusion

To boost resilience, security, and compliance, enterprises want to align operations internally. Traditionally, application and infrastructure services have limited synergy due to a non-integrated landscape, disparate tools, immature ITSM processes, and lack of end-to-end visibility, among other factors. To win in a digital world, enterprises must infuse new synergy

and agility into application and infrastructure services. This requires a three-step approach in adopting the right technology, changing operational model structures, and implementing business-led KPIs for governance. Enterprises aiming to fast-track new-age synergies across application and infrastructure services will benefit from outcomes like step improvement in

business outcome-focused resiliency, agility in responding to day-to-day business demands, efficient execution of large transformation programs like cloud adoption, and increased optimization of TCO. The right set of solutions, services and platforms will play a crucial role in accelerating this modernization journey.

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