Everest Group
RESEARCH

IT Infrastructure Service Automation

A Lifeline for the Contemporary CIO

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EGR-2014-10-R-1172

Executive Summary

Infrastructure service automation helps meet the fundamental challenge of funding transformation with flatlining budgets.

We have observed cost savings of **15 to 20% by the end of the first year,** with significant promise for incremental TCO benefits over the long run.

More importantly, a comprehensive automation strategy enables the CIO to align IT cost-heads with business priorities, and shift executive focus away from operational governance to business enablement issues.

There is increasing pressure on IT to be more agile and responsive to the changing needs of business, while keeping costs under control. Most enterprise CIOs are grappling with the dual mandates of transformation and efficiency.

With shortening technology lifecycles, new technologies and vendors are being rapidly introduced to interface with legacy environments. This creates additional CIO challenges of driving effective enterprise governance across a hybrid IT estate.

Our research suggests that automation of the IT service lifecycle results in significant improvements. *Automation can help reduce costs, shorten time-to-market, establish tighter business alignment, improve service availability, and increase business agility.*

Consequently, there are significant ongoing investments towards automating IT services. However:

- *In the absence of a broader transformational context, few enterprises are able to generate a holistic vision of IT service automation.* While most CIOs need to prioritize heavily, absence of a broader automation strategy can lead to unconnected and ad-hoc initiatives that not only leave value on the table, but create technology lock-in

- *The automation story is not one of choosing the most appropriate IT management tool or platform.* The automation agenda has to be constructed as "service-led", rather than "technology-up" in order to create alignment between IT and business processes. Automation strategies need to create a framework for rapid provisioning of new business services, and supporting changes in existing ones

- A successful automation initiative needs to be able to orchestrate services across multiple towers and technologies, and create mutually-aligned economic incentives. *Enterprises need to seek agnosticism and alignment with a service-led philosophy while evaluating automation partners. Automation strategies should ideally facilitate consumption based economic models for end-to-end IT services without large, upfront capital investments that create lock-in risks*

This report is aimed at:

- Helping enterprises identify the key components of a comprehensive automation strategy

- Illustrating successful examples of infrastructure service automation along with resultant benefits

- Establishing a broad adoption sequence for IT infrastructure service automation and highlighting underlying success factors for the journey

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Need for Automation: Efficiency, Transformation, and Governance

IT organizations are witnessing a need to drive seemingly conflicting mandates of efficiency and transformation, characterized by a "do more with less" philosophy. *The key challenge for the CIO is to generate funding for the transformational agenda by driving greater efficiencies without compromising service delivery levels.*

Traditional approaches to service management involve significant manual intervention in key processes. Over time, human errors accumulate and lead to the following issues:

- **Operational inefficiency:** Human errors not only tend to be more numerous, but are also harder to isolate, take longer to resolve and recur frequently. Over a period of time, operational performance and costs become unpredictable, resulting in poor end-user satisfaction. *Automation not only helps eliminate errors, but also reduces time-to-resolution, and creates a consistent service experience*

- **Limiting transformation:** Traditional IT management approaches are unable to meet business requirements of rapid provisioning, release, and change management. *By enabling rapid provisioning and scalability, infrastructure service automation can transform how businesses launch new products and services through traditional and digital channels*

- **Opaque governance:** Traditional IT management methods seldom focus on mapping technology components with a particular business process. This creates lack of visibility and leads to the phenomenon of "ticket bouncing" in multi-vendor environments. Further, business-IT alignment takes a backseat as IT costs are decoupled from business outcomes. *Automation initiatives create transparent mapping between IT investments and business demand in a multi-vendor IT estate*

Most importantly, well-conceived automation strategies create rapid impact through operational cost savings (as much as 15% to 20% to start with) that can be used to fund a broader transformational mandate.

During the course of our research we came across several striking instances of enterprises reaping rich benefits of infrastructure service automation:

- A Fortune 10 conglomerate reduced the average time to resolve IT incidents by 90%
- A mobile insurance company reduced time to on-board new partners and customers from two months to less than one day
- Up to 40% reduction in operational IT governance costs were observed across several enterprises

Across all such examples, we observed CIOs using infrastructure service automation strategies to serve mandates of efficiency, IT-enabled business transformation, and enterprise governance.

Source: Everest Group and Microland

EXHIBIT 1

Observed impact of infrastructure service automation

Source: Everest Group

Benefits of infrastructure service automation

Observed impact of infrastructure service automation		
Operational metrics	Error occurrence	Reduced by 40 to 50%
	Time taken to conduct problem RCA	Reduced by 75%
Transformation metrics	Time-to-market for application stack change	Reduced from 2 months to less than 1 day
	Time-to-delivery for production plans	From hours to minutes
Governance metrics	Operational governance efforts	Reduced by 40%
	Accuracy and compliance	Audit compliance increased by 70%

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Key Components of Infrastructure Service Automation

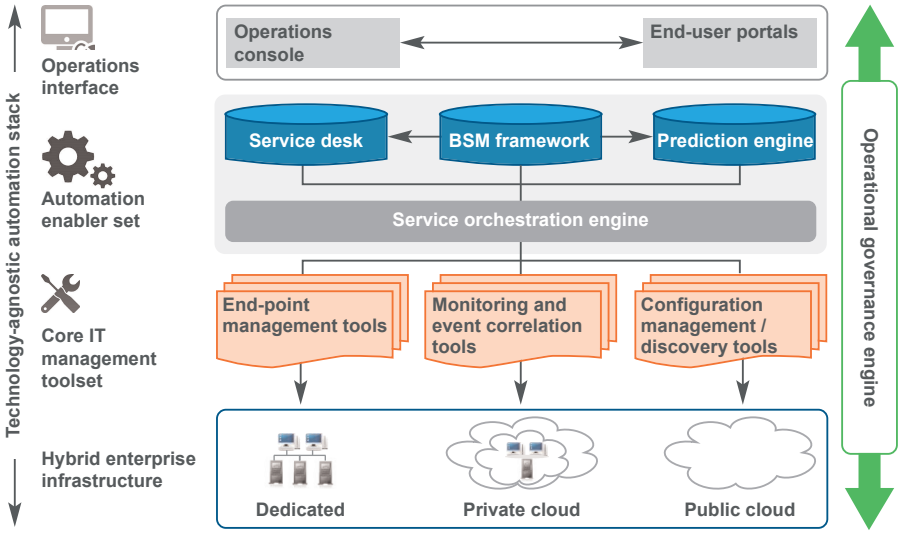
With the enterprise IT infrastructure environment becoming increasingly hybrid, there is an accelerated drive towards automation. Enterprises will need to start thinking of their automation strategy in a holistic multi-tower format, rather than isolated initiatives.

Exhibit 2 illustrates critical components of a comprehensive automation stack in a hybrid IT environment.

EXHIBIT 2

Comprehensive automation stack

Source: Everest Group; Microland



Service orchestration engine

The orchestrator contains a repository of workflows and process design components. The service orchestrator helps in triggering appropriate workflows, and in designing new ones to coordinate automated tasks across teams, tools, and environments. The service orchestrator becomes a repository of real-time process knowledge and supplants the traditional Known Error Database (KEDB). The service orchestrator provides the following benefits:

- Control, visibility, and accountability: Automates entire service lifecycle including notification and escalation processes
- Automate IT routine tasks: Eliminates labor-intensive manual interactions and automates key processes such as system, network, and application tasks
- Rapidly recover from IT incidents: Integrates, orchestrates, and automates the incident recovery processes

Integrated service desk

Building an effective foundation for IT management is a critical step in the delivery of robust IT services. An automated and integrated service desk typically operates on "one touch" mechanisms that trigger the appropriate service workflows from the orchestrator. Tickets are automatically routed, based on skill profile and individual ticket queues, with ITIL process automation and flexible workflow design.

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Business Service Management (BSM) framework

The Business Service abstraction maps all components of a business service provided by IT. A "business service" may be defined as the final consumption unit that is provided by IT to the end-user", (e.g., enterprise email or SAP FICO).

Business Service Management enables IT to communicate service performance and align with business objectives, while maintaining control over the infrastructure.

EXHIBIT 3

BSM framework: Key benefits

Source: Everest Group; Microland

Operational efficiency	• Visual representation of the dependencies between business processes, business applications and the IT infrastructure (servers, storage, networks, middleware, and databases), helps in defining incident/problem/change management priorities resulting in *reduced downtime* and *faster problem resolution*
Transformation	• **Business-IT alignment:** By mapping all IT components to individual business services, BSM framework enable transparency of IT asset utilization, and create a roadmap for aligning IT costs to business priorities • **Drive to preventive IT:** Visibility of the underlying infrastructure, and its correspondence to business services, provides the foundation for adoption of predictive engines based on system heuristics, as opposed to reactive agent-based approaches
Governance	• **Operational governance:** Business service views can be customized and enabled for business users, giving them an improved line of sight into IT infrastructure performance • **Contract governance:** Service levels are created for uptime of the final "business service" rather than the individual IT components. This is critical for multi-vendor governance and improved end-user experience

Prediction Engine (PE)

Self-learning prediction engines with machine learning intelligence recognize both normal and abnormal machine behavior. Using highly advanced pattern recognition algorithms, PE identifies potential issues across infrastructure components (storage, servers, networks, middleware, or databases). This helps in:

- *Reduction in L1 incidents by as much as 80%*
- Release of significant amounts of human and computing resources by eliminating false alarms; for instance, by establishing predictive server capacity thresholds, PE can eliminate false alarms of capacity overflow, and release system capacity for more effective utilization. *Our estimates suggest that enterprises can release up to 20 to 30% of system capacity and human efforts using PE*

Operational governance engine

Intuitive dashboards and flexible reporting ensure that CIOs, IT staff, and auditors can gain complete visibility into regulatory compliance and IT performance. Data from multiple IT feeder tools (data repositories) can provide a unique view into IT performance and can answer questions like:

- *"Do issues increase on Mondays following a holiday?"*
- *"Is an application over/under-engineered to the detriment of its uptime?"*
- *"What is the impact of Service Level 1 on Service Level 2?"*
- *"What is my net expected Service Level for the rest of the month, post a major incident to be compliant?"*

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Automation of the governance mechanism helps measure and manage IT compliance as an ongoing program through intuitive reporting mechanisms, enables audit compliance, and helps drive continuous service improvement programs.

Case Study 1: Automating for Efficiency

The enterprise

The enterprise is an American multi-national conglomerate, providing solutions in energy, technology infrastructure, capital finance, health, home, transportation, consumer and industrial manufacturing, across 100 countries with over 300,000 employees.

Business & IT challenges

The scale of this enterprise creates several challenges. The scope of its IT environment encompasses *close to 0.5 million mailboxes and tens of thousands of ports, and devices. The server environment requires several thousand "builds" every year.* Across the network environment, the enterprise works with numerous OEM and technology vendors. Such a hybrid landscape creates challenges of:

- Global coordination with multiple OEMs and vendors
- Consistency and accuracy in service delivery
- Managing configuration standards across the IT estate
- Ensuring transparent chargebacks to business
- *Most importantly, meeting business expectations of continuous reduction in IT costs while increasing service performance*

Automation solution

The client was working with Microland as a service and infrastructure system integrator. Along with implementation of ITIL V3 and Six Sigma process frameworks, Microland and the enterprise worked across several automation initiatives:

- Integrated vendor management workflows were designed and automated to enable seamless vendor management, and to deliver a consistent service experience
- Common service requests related to mailbox services were automated. T*he IT function could now sign up for uptime of the business service (e.g., email service availability) as opposed to IT service (e.g., mailbox or server availability)*
- *Server refresh "build" activities were automated*

Key benefits

- Creation of centrally managed infrastructure services model with high predictability and improved end-user satisfaction
- *TCO reduction in excess of US$50 million over five years*
- *Institution of outcome-based metrics beyond infrastructure element performance, e.g., email service availability at 99.9%*
- *Three cycles of technology refresh carried out over 10X data center consolidation initiatives, were achieved with zero defects*

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Case Study 2: Automating for Transformation

Service Automation offers a significant opportunity to underscore the business value of IT.

By thinking of infrastructure automation in the context of a mission-critical business process, an insurance company redefined its speed- to-market and created a globally scalable, agile, and compliant business model.

The enterprise

The enterprise is a leading mobile insurance provider in North America.

Business challenges

As part of its business model, the enterprise was required to:

- Ensure real-time activation of its services for new devices through partner telecom providers
- Rapidly provision new products to existing customers and partners, and on-board partners in new geographies
- Ensure PCI compliance at all times

Failure to achieve these goals would lead to significant revenue loss, poor user experience, and escalated compliance risk.

Technology and services environment

The enterprise's application teams needed to release software to help telecom operators manage the mobile insurance systems in a timely manner. The enterprise IT team was using a DevOps methodology with underlying private cloud infrastructure. The entire process comprised three steps:

- Infrastructure provisioning: Procurement of the underlying infrastructure needed to be approved by the client IT organizations for compatibility
- Platform provisioning: Once the infrastructure was procured, it was handed over to the platform services team. Platform components would be installed and stitched together to act as an application. These processes needed to be managed by logging service requests in the service management tool. During this stage, the Dev and Ops teams would work together to identify, diagnose and troubleshoot issues through a traditional incident and change management process.
- Application release: Once the application was developed, it would be sent for regression and UAT testing to the Test/ QA team, which would coordinate with Dev and Ops teams for troubleshooting. The Test/QA team would eventually release the application into production

Overall, this entire process used to take months, severely impacting time-to-market for new releases.

Automation solution

The enterprise launched a three-phased project with a view to reducing cycle time at each successive process step:

- Infrastructure provisioning in Phase 1
- Platform provisioning in Phase 2
- Application release and DevOps in Phase 3

Microland was engaged as the system integrator responsible for the task of building, integrating, and automating the solution. The entire process was automated across three project phases, starting from the infrastructure

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provisioning service requests to final integration, updating the CMDB, and application release. Key project components involved:

- Automated provisioning of private cloud infrastructure using an industry standard cloud management suite
- Workflow-based automation of platform overlay
- Continuous code integration using an open source solution
- Real-time shipment of code components to global QA teams, and automated workflow-generated test case deployment

Benefits realized

The following benefits were observed:

- *Faster time-to-market*, with overall cycle time to release applications reduced *from two months to less than one day, resulting in revenue assurance from Day 1, and improved customer experience*. Complete stacks and environments could be provisioned in five to six hours; earlier, infrastructure provisioning alone would take up to 14 days
- *Creation of a scalable business model* for onboarding new partners and expansion in new geographies
- *100% PCI compliance*
- *Monthly cost reduction worth US$100,000 through reduced manpower requirements*

Case Study 3: Automating for Governance

The enterprise

The enterprise is one of India's largest BFSI players, with extended offices across 70+ locations within the country.

Business & IT challenges

- The company had a fragmented portfolio of vendors providing hardware, software, and IT services
- Due to interdependencies across the services lifecycle, there were process delays, leading to poor customer satisfaction
- It was difficult to get a transparent view of operations in such a hybrid environment; there was very little linkage between IT costs, IT performance, and customer satisfaction scores

Automation solution

The company wanted to develop a governance and performance automation framework with three key objectives:

- Provide users with easy access to IT resources while ensuring governance policies
- Move IT management towards a more proactive paradigm, that could manage incidents before they occurred
- Create a "single pane of glass" for the CIO and auditors to monitor IT performance for all vendors and internal teams, and create a tight alignment between IT costs and performance

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The company engaged an agnostic infrastructure system integrator (Microland) to deploy:

- A comprehensive IT asset build and asset map linked to business processes
- A self-service module for end-users delivered as a service
- A system of dashboards and flexible, automated reporting, that provided complete visibility into IT performance

Key benefits

- IT management teams could assess performance of multiple internal and external teams across operational metrics, and on a continuous, real-time basis
- By recording performance data continuously, the company could schedule, or run on-demand audits
- By creating comprehensive asset maps the company reduced its variance between physical and book value of assets by 70%
- The system created a scalable framework for the company to evaluate and integrate new technology. By generating automated access to performance data across multiple systems, the company could analyze trends, create technology performance baselines, and also benchmark service performance

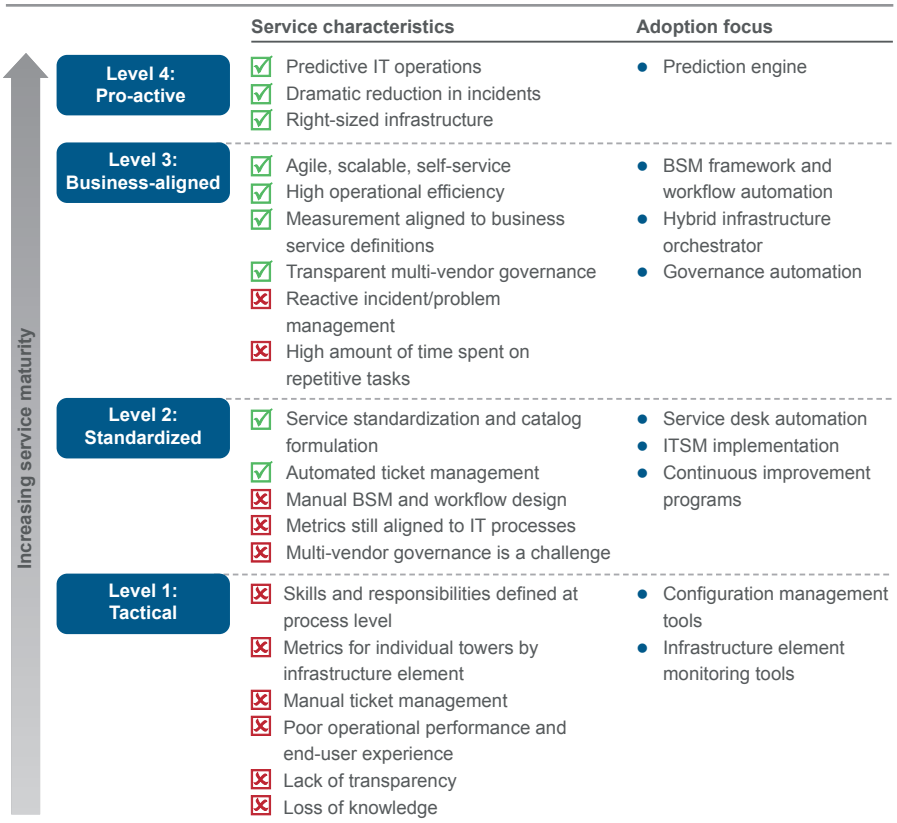
A Roadmap for Infrastructure Service Automation

Implementation of a comprehensive automation strategy requires a careful assessment of current maturity levels. While Big Bang approaches are unlikely to work, it is essential to develop a long-term vision for an integrated automation strategy. Most enterprises go through four stages of maturity, with distinct problem statements and adoption implications (Exhibit 4).

EXHIBIT 4

Infrastructure service automation: Maturity continuum and adoption roadmap

Source: Everest Group



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The adoption roadmap must be created with sufficient due-diligence on the as-is maturity state, mission criticality of business processes supported, and existing technology investments.

While "leapfrogging" is possible across the continuum, and particularly understandable within the context of generating "quick wins", some dependencies are logical (e.g., ITSM implementation usually goes hand in hand with service desk automation).

Conclusion: Mantras for the Automation Journey

Service-led infrastructure automation can offer a lifeline to enterprises struggling with the contemporary IT challenges of efficiency, transformation, and governance. However, the automation agenda also requires significant executive commitment, and change management is a critical success factor.

Most importantly, infrastructure service automation involves a mindset shift from technology to business service. This involves conceptualizing the IT infrastructure service function as a provider, orchestrator, and governor of business services.

During the course of our research we discovered three "mantras" that help enterprises embrace this mindset change, and survive the risks of technology lock-in:

- Service first: Most enterprises tend to lay excessive focus on the choice of the toolset. Hardware or tools-based approaches can create significant technology lock-in, constraining business cases for interrelated initiatives. The opportunity for automation lies in stitching technology suites into measurable business services. Successful automation initiatives require a "service-first" mentality. *Enterprise IT should be able to contract for "business services" rather than for licenses or FTEs*

- Agnosticism must: As a corollary, "agnosticism must" requires CIOs to abstract away from product stacks that are likely to create lock-in via economic costs or the threat of knowledge loss. An agnostic partner can help mediate across the broad spectrum of technology choices, and support best-of-breed technology adoption. *Enterprise IT must be able to integrate and manage across multiple technology suites without service interruption*

- Alignment constant: The true value of automation is realized when enterprises use systems data to drive technology choices, enable new services, and sunset applications and infrastructure pieces that have served their purpose. The process of alignment is a continuous one, and underlines the need for IT teams "to know", rather than "to think". *Enterprise IT needs to move away from "managing the mess" to focusing on data-driven decision-making, and building new business functionality*

This study was funded, in part, by support from Microland

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About Everest Group

Everest Group is an advisor to business leaders on next generation global services with a worldwide reputation for helping Global 1000 firms dramatically improve their performance by optimizing their back- and middle-office business services. With a fact-based approach driving outcomes, Everest Group counsels organizations with complex challenges related to the use and delivery of global services in their pursuits to balance short-term needs with long-term goals. Through its practical consulting, original research and industry resource services, Everest Group helps clients maximize value from delivery strategies, talent and sourcing models, technologies and management approaches. Established in 1991, Everest Group serves users of global services, providers of services, country organizations, and private equity firms, in six continents across all industry categories. For more information, please visit www.everestgrp.com and research.everestgrp.com.

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