



# AI Ops – IT Infrastructure Services for the Digital Age

Codify to Conquer

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## Codified IT infrastructure: dawn of the digital infrastructure paradigm

The IT infrastructure services landscape is undergoing a significant shift, driven by digitalization. As focus shifts from cost efficiency to digital enablement, organizations need to reimagine the IT infrastructure services model to deliver the necessary back-end agility, flexibility, and fluidity. Automation, analytics, and Artificial Intelligence (AI) – comprising the “codifying elements” for driving AIOps – help drive this desired level of adaptability within IT infrastructure services.

In fact, 73% of large enterprises have included intelligent automation as a key theme for infrastructure services management as part of their broader IT services adoption strategy.<sup>1</sup> However, most enterprises are yet to realize commensurate gains from their codification investments. Siloed adoption, lack of effective change management processes, and poor governance mechanisms are some of the key reasons for this phenomenon. To overcome this challenge, enterprises need to have a holistic, business-aligned, risk-free, and phased adoption strategy, underpinned by an effective value measurement framework.

The vendor side is seeing a rapid proliferation of offerings, with both Independent Software Vendors (ISVs) and IT service providers investing in expanding their codification capabilities across the IT infrastructure services stack.

### EXHIBIT 1

Examples of codification offerings across provider segments for IT infrastructure services

Source: Everest Group (2018)



In this report, we

- Examined the reimagined role of IT infrastructure services in the digital age
- Explored the concept of codification of IT infrastructure services – its current maturity state and benefits delivered (compared to traditional automation)
- Established the need for an integrated IT infrastructure ecosystem and a robust value measurement (BASIC) framework to maximize codification benefits
- Identified adoption challenges and enterprise best practices
- Explored the third-party vendor ecosystem and the role of IT service providers

<sup>1</sup> Everest Group survey with 200 CIOs / IT heads of large enterprises (>US\$ 1 billion revenue)

**Codified infrastructure services as the bedrock of digital businesses**

71% of enterprises believe that they lack a meaningfully scalable and cost effective model for IT infrastructure services<sup>1</sup>

**Everest Group take:**  
 Increasing digitalization is creating a shift in the current infrastructure services model leading to the triple mandate of cost reduction, business agility, and services resilience.  
 Reimagining the foundational element of the digital architecture – the IT infrastructure services layer – by embedding the codifying elements of automation, analytics, and AI holds the key to unlocking the full value of digital initiatives.

**The new normal for IT infrastructure services in the digital age**

In today’s digital age where “applications are the business,” establishing an agile, resilient, and cost effective IT infrastructure has become critical for enterprises as they look to build and push new products to market ahead of their competition.

**EXHIBIT 2**

Impact of digital adoption on IT infrastructure services

Source: Everest Group (2018)



Quick to respond to marked demands	Provide back-end agility, fluidity, and flexibility
Well-aligned and efficient internal operations	Deliver cost-effective, as-a-service consumption models
Seamless customer experience and delight	Provide high services scalability and resilience; objectively measure customer experience
New business models and innovation	Enable and support next-generation applications
Freedom to experiment, fail fast, fail often	Be lightly integrated with development functions; offer rapid, elastic environment provisioning

Leading-edge IT delivery models such as cloud, DevOps, as-a-service, and user environment virtualization have consequently gained prominence as enterprises look to address the dynamic services requirements that the digital model demands. However, this adoption model has caused significant sprawl, spiraling TCO due to lack of standardization, and increased complexity at the IT infrastructure services layer, which continues to be monitored and managed using traditional methods.

72% of enterprises believe that their current IT infrastructure services setup is not agile or responsive enough to changing business requirements<sup>1</sup>

**EXHIBIT 3**

Evolution of IT infrastructure services codification

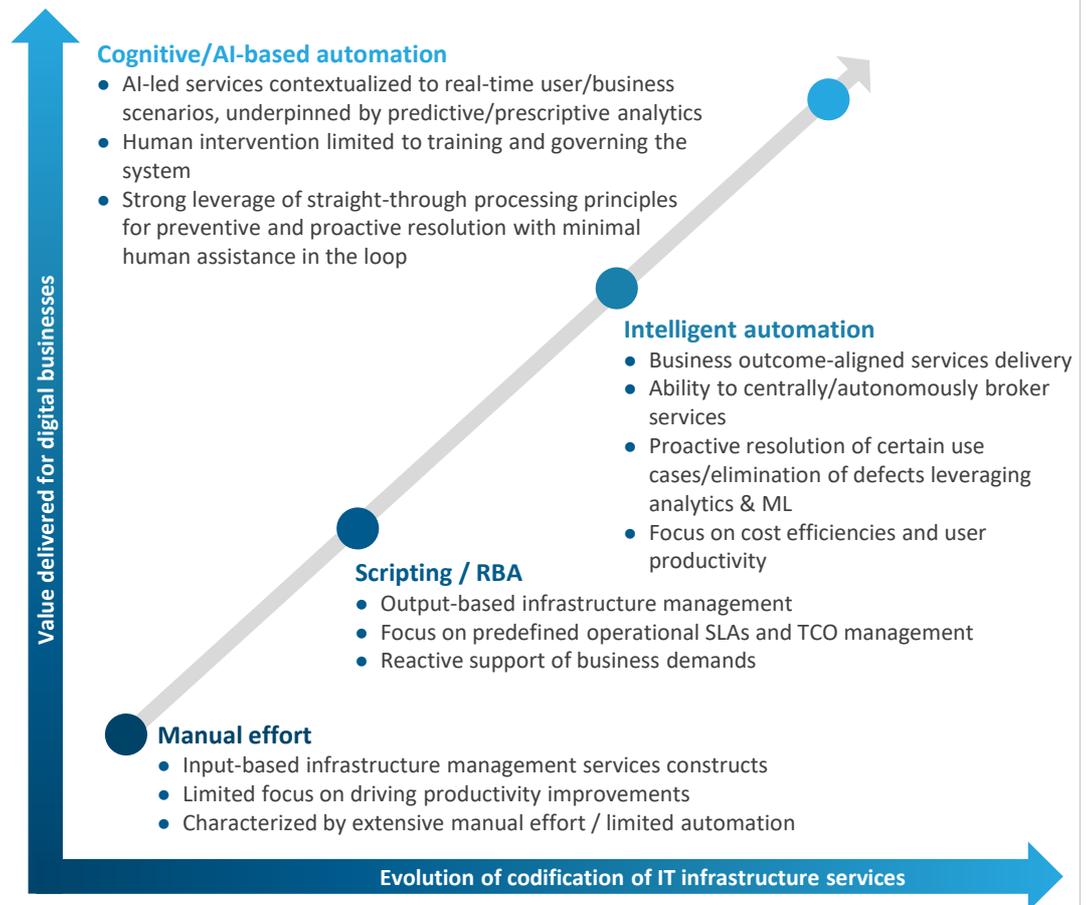
Source: Everest Group (2018)

73% of enterprises have included autonomies and AI for IT infrastructure management as a key theme in their IT services strategy/adoption roadmap.

Of these, 32% have already moved beyond the pilot stage and have achieved meaningful/scaled adoption across their organizations<sup>1</sup>

**AIOps – an idea whose time has come**

The dynamic requirements and complexities associated with today’s IT infrastructure services warrant adaptive, self-learning, self-correcting systems. The design should involve an optimal level of human effort/intervention targeted primarily at training, governing, and enhancing the system, rather than executing routine, voluminous tasks.



**Automation, analytics, and AI – which together comprise the “codifying elements” for driving AIOps–** help drive this desired level of adaptiveness within IT infrastructure services. Intelligent automation, leveraging analytics and ML, embeds powerful, real-time business and user context and autonomy into IT infrastructure services. Intelligent automation has made inroads in enterprises in the last two to three years, backed by a rapid proliferation and maturation of solutions in the market.

Cognitive automation represents the next frontier of IT infrastructure management. While current use cases involve the leverage of Natural Language Processing (NLP) for implementing virtual agents and preemptive resolution of L1 tickets, in the long run extensive leverage of AI and deep learning principles will create interactive and adaptive systems that can execute more complex, judgment-intensive processes

<sup>1</sup> Everest Group survey with 200 CIOs / IT heads of large enterprises (>US\$ 1 billion revenue)

Potential benefits of codification on IT infrastructure services

**Everest Group take:**

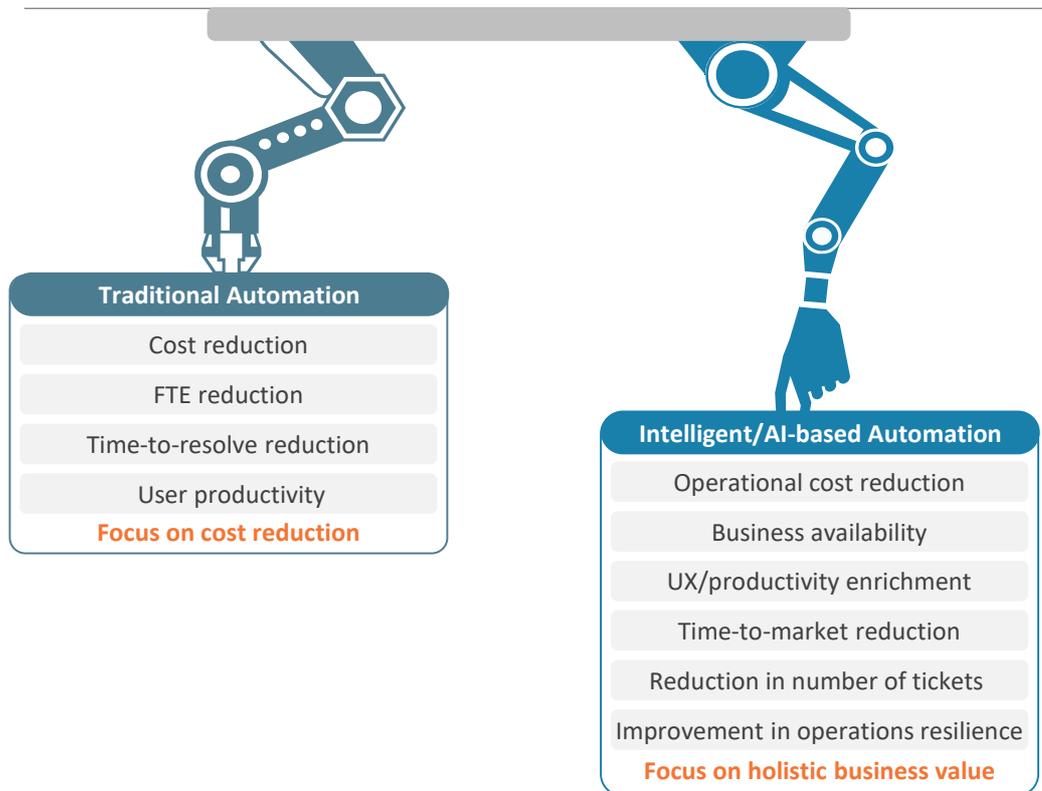
A phased adoption of automation, analytics, and AI within IT infrastructure services has the potential to offer exponential business value.

However, to realize the full potential of codification, enterprises need to embrace a lean operating model, underpinned by a technology-agnostic platform. The platform should embed the codifying elements within a tightly integrated infrastructure services ecosystem with end-to-end workflow orchestration and resolution.

**EXHIBIT 4**

Benefits weigh-in: Traditional automation vs. intelligent/AI-based automation

Source: Everest Group (2018)



**Benefits analysis – codification of IT infrastructure services**

Progressive leverage of analytics and AI, to drive an AIOps strategy, enables the introduction of a broader and more complex set of operational use cases into IT infrastructure services automation. As adoption levels scale and processes become orchestrated, the benefits potentially expand beyond cost savings to offer exponential value around user experience enrichment, services agility and availability, and operations resilience. Intelligent automation helps maximize value from IT infrastructure services by:

- **Improving the end-user experience** through contextual and personalized support
- **Driving faster resolution** of known/identified incidents leveraging existing knowledge, intelligent diagnosis, and reusable, automated workflows
- **Avoiding potential incidents and improving business systems performance** through contextual learning (i.e., based on relationships among systems), proactive health monitoring and anomaly detection, and preemptive healing

EXHIBIT 5

Illustrative list of use cases and key benefits

Source: Everest Group (2018)

Market participants	Illustrative use cases for traditional automation	Illustrative use cases for intelligent-/ cognitive-/AI-based automation
 <p>End-user engagement</p>	<ul style="list-style-type: none"> <li>• Chatbots with basic NLP (covering common uses such as password reset, printer fix)</li> <li>• Self-service/self-help portals</li> </ul>	<ul style="list-style-type: none"> <li>• Self-learning chatbots (tightly integrated to back-end systems)</li> <li>• Prescriptive recommendations to users based on previous conversations</li> </ul>
 <p>Service desk / IT Support</p>	<ul style="list-style-type: none"> <li>• Non-voice user contact (human chat, email)</li> <li>• Self-provisioning portals</li> <li>• Automated ticket status check</li> </ul>	<ul style="list-style-type: none"> <li>• User analytics-driven contextual support</li> <li>• Preemptive intervention and proactive user support</li> <li>• Mass diagnosis and resolution</li> </ul>
 <p>ITSM</p>	<ul style="list-style-type: none"> <li>• Incident notification and escalation</li> <li>• Automated ticket creation</li> <li>• Automation/self-service for common use cases</li> </ul>	<ul style="list-style-type: none"> <li>• Guided resolution using reusable knowledge articles</li> <li>• Automated ticket volume prediction / RCA</li> <li>• Auto triaging</li> <li>• Auto ticket prioritization</li> <li>• Intelligent bots</li> </ul>
 <p>IT operations</p>	<ul style="list-style-type: none"> <li>• Automated server restart/shutdown</li> <li>• Memory / disk space utilization</li> <li>• Active directory password reset</li> <li>• Network configuration automation/ diagnostics</li> </ul>	<ul style="list-style-type: none"> <li>• Risk-based patching</li> <li>• Automated cloud bursting</li> <li>• Automated event correlation</li> <li>• Digital assistants</li> <li>• Intelligent cloud cost management</li> <li>• Automated RCA for events across infra and security</li> <li>• Intelligent network policy management</li> </ul>
 <p>Monitoring and event management</p>	<ul style="list-style-type: none"> <li>• Monitoring and alerting for:</li> <li>• Server availability/uptime                             <ul style="list-style-type: none"> <li>– Disk space/backup logs</li> <li>– VM capacity / OS inventory / server status</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Continuous compliance</li> <li>• Performance / UX monitoring</li> <li>• Quantified application health / business process index</li> <li>• Unified dashboard/console for service management and IT operations</li> </ul>

Benefits attributable to automation <sup>1</sup>	Ticket count reduction	20-35%	35-60%
	TCO reduction	10-25%	25-45%
	MTRR reduction	10-20%	20-35%

1 Everest Group analysis – typical benefits garnered over a four- to five-year transformation timeline for a ~US\$10 billion enterprise with a high degree of offshoring and a meaningful level of services standardization and consolidation already achieved within the environment

Beyond strong benefits along traditional metrics, intelligent automation offers significantly improved business performance and end-user experience. For instance, intelligent automation initiatives can enable enterprises to achieve significant progression along the user experience index – a composite set of end-user metrics covering business app performance, device performance, and IT support delivery quality, measured in real time using end-user analytics systems, and business process index – a composite set of metrics including UX index, app performance, network, and resource performance

**Integrated systems – the key to maximizing codification benefits**

It is evident that intelligent automation can potentially offer significant operational improvements across individual IT infrastructure segments. However, in order to realize exponential benefits, it is critical that codifying elements are embedded within a tightly-integrated, lean operating model cutting across the IT infrastructure services stack.

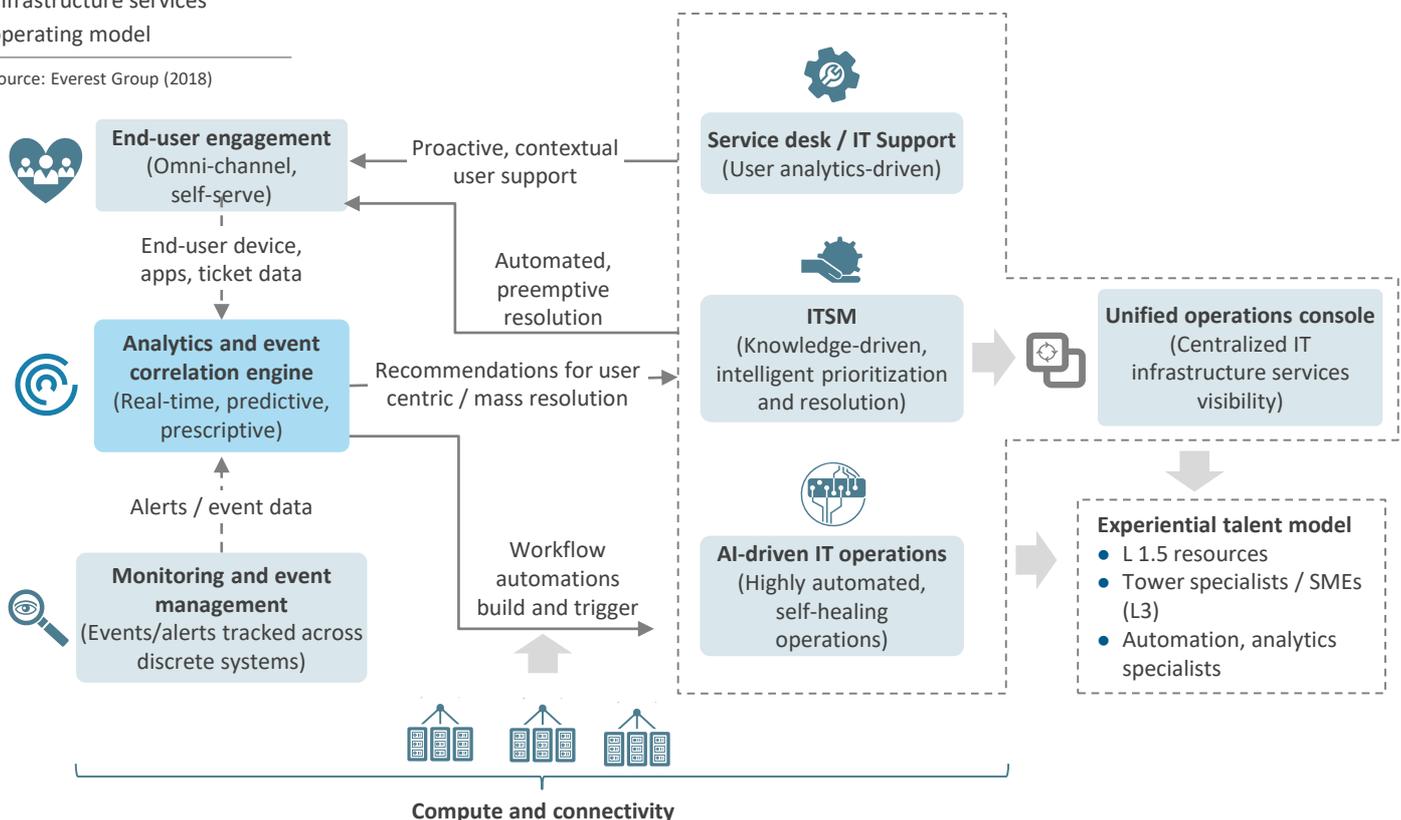
Increased auto-resolution and the elimination of effort through intelligent automation will help organizations to achieve this lean operating model. The design involves minimal L1 ticket management in a post-automation scenario, while also minimizing L3 escalations. For instance, by automating the root cause analysis process, human effort required to remediate complex issues will be significantly reduced (with minimal ticket bouncing).

The operating model should be anchored around a unified, technology-agnostic platform that is built to take in, analyze, and act upon data from discrete tools and technologies. The platform should enable enterprise to maximize returns from investments in existing technologies and enable true services orchestration to drive agility.

**EXHIBIT 6**

The lean, connected IT infrastructure services operating model

Source: Everest Group (2018)



## The BASIC framework: measuring the value of infrastructure codification

### Everest Group take:

Enterprises need to have a well-defined adoption roadmap for codified IT infrastructure services. A fundamental element of this roadmap is a strategic value measurement framework for identifying and tracking the right business-aligned metrics in a holistic, ongoing basis.

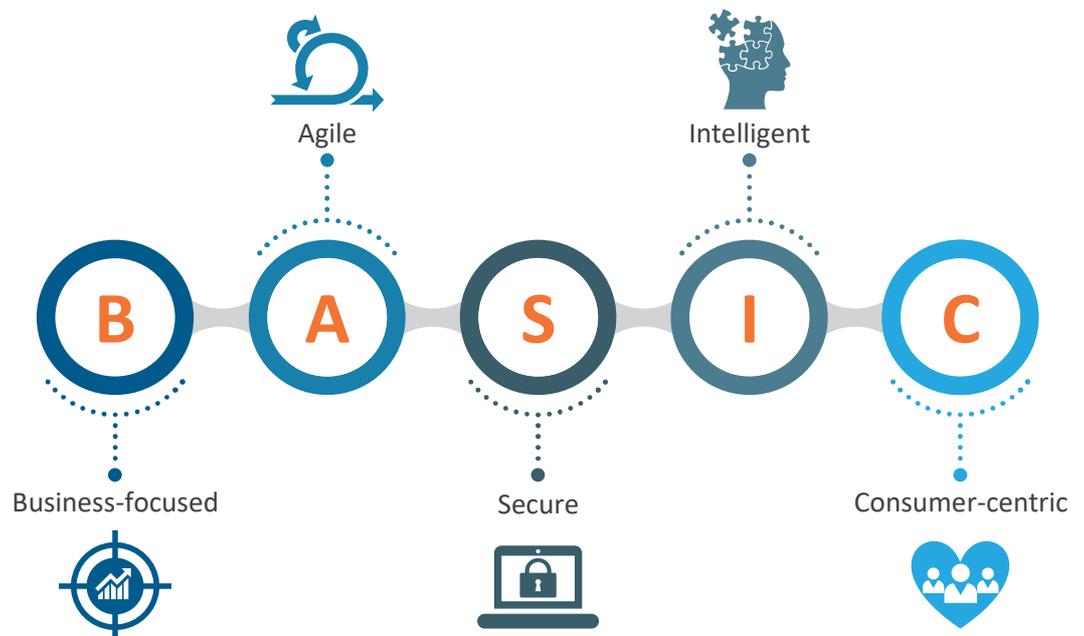
The BASIC framework offers enterprises a set of key dimensions that transcend traditional cost-reduction metrics to measure the true/holistic impact of codification.

As enterprises strive to derive value from IT infrastructure services codification, adoption needs to be underpinned by a comprehensive value measurement framework.

### EXHIBIT 7

BASIC framework for value measurement of codification initiatives

Source: Everest Group (2018)



- **Business-focused:** Impact of IT infrastructure automation initiatives needs to be measured from the perspective of the overall business, internal users, and customers. The chosen metrics should establish a strong correlation between IT infrastructure services KPIs and relevant business performance dimensions
- **Agile:** An agile infrastructure delivery model should enable enterprises to seamlessly orchestrate discrete toolsets, deploy applications more quickly, improve flexibility, and enable innovation through a fail-fast approach
- **Secure:** Enterprises need to adopt codified infrastructure services in a secure manner and leverage codifying elements to enhance security within infrastructure services
- **Intelligent:** The framework needs to include metrics that track/govern the level/extent of intelligence and autonomy being built into the IT infrastructure services layer
- **Consumer-centric:** The IT infrastructure services strategy needs to be driven with the consumer of services at the center. It is important to choose a set of metrics that reflect real-time consumer experience

EXHIBIT 8

BASIC framework – examples of metrics

Source: Everest Group (2018)

BASIC dimensions	Examples of next-generation metrics for the digital age
 <b>Business-focused</b>	<ul style="list-style-type: none"> <li>• % cost reduction / Increase in user productivity</li> <li>• % client retention</li> <li>• Reduction in revenue loss due to services downtime</li> <li>• Availability of business process application</li> </ul>
 <b>Agile</b>	<ul style="list-style-type: none"> <li>• % reduction in time for RCA</li> <li>• % reduction in time for automated provisioning of new environment</li> <li>• Reduction in time to onboard employee</li> <li>• Reduction in time to deploy new application features</li> <li>• Reduction in run time defects in applications</li> </ul>
 <b>Secure</b>	<ul style="list-style-type: none"> <li>• % reduction in compliance issues driven by automation</li> <li>• % automated suppression of false security alerts</li> <li>• % automated patching</li> <li>• % security incidents remediated through automation</li> <li>• Time to remove unneeded privileges</li> </ul>
 <b>Intelligent</b>	<ul style="list-style-type: none"> <li>• % incidents remediated using self-heal / straight-through processing</li> <li>• % accuracy of AI / cognitive engine</li> <li>• Number of human touchpoints eliminated using AI-based automation</li> <li>• % autonomous suppression in number of app-/device-related alerts</li> </ul>
 <b>Consumer-centric</b>	<ul style="list-style-type: none"> <li>• User experience index – based on survey + operational data</li> <li>• Net Promoter Score (NPS) / C-SAT</li> <li>• % number of incidents solved proactively</li> <li>• % reduction in time to resolve / service an end-user issue</li> <li>• % reduction in number of incidents per user per month</li> </ul>

Driving codification: key barriers, challenges, and best practices

**Everest Group take:**

While it is clear that codification can help maximize IT infrastructure’s value to business, a large proportion of enterprises currently struggle to derive commensurate value from their investments in automation and analytics solutions.

A key reason for this dissonance is a lack of a business-aligned codification strategy leading to siloed initiatives, poor change management, and lack of ongoing governance

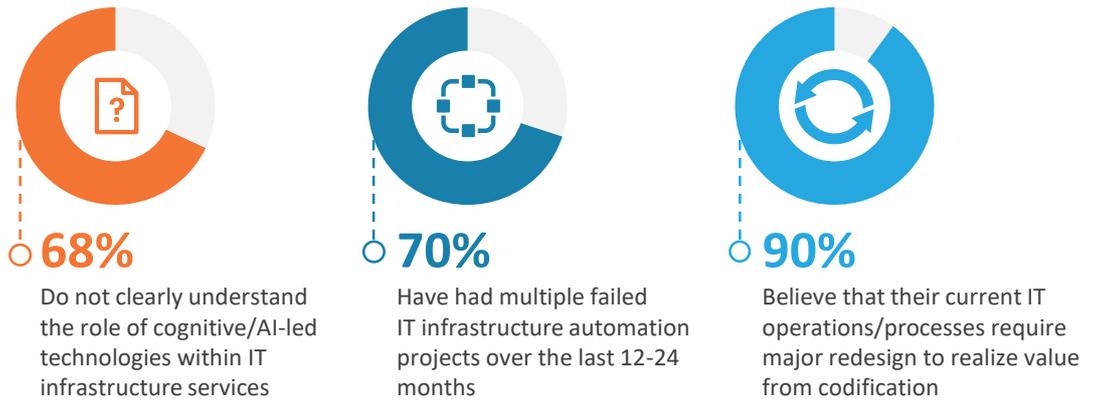
**Key enterprise pitfalls/barriers: driving codification within IT infrastructure services**

Despite adopting the latest automation and analytics solutions at various levels to manage IT infrastructure environments, many enterprises have failed to realize significant improvement in IT infrastructure provisioning, configuration, and management processes.

EXHIBIT 9

Adoption challenges<sup>1</sup>

Source: Everest Group (2018)

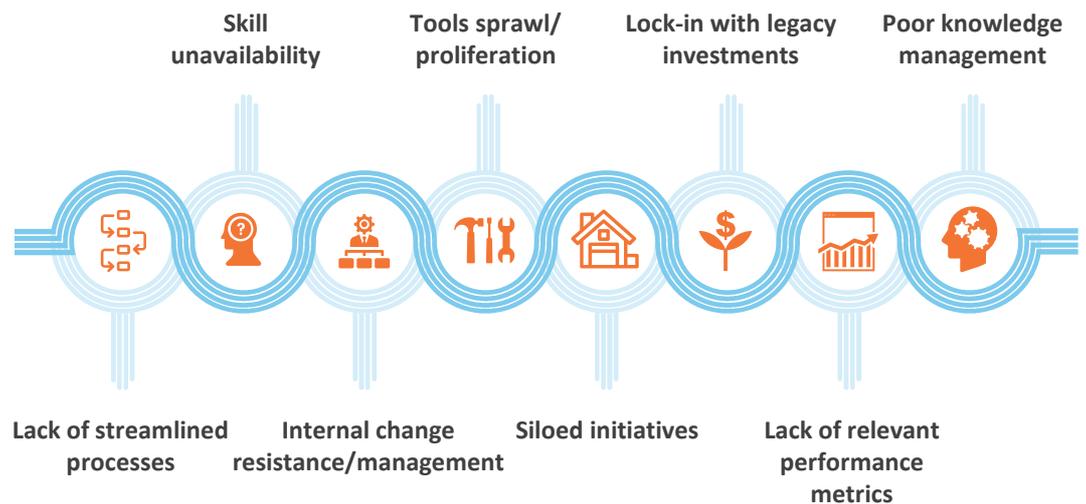


There are several barriers that limit meaningful adoption of codification initiatives within IT infrastructure services.

EXHIBIT 10

Barriers to large-scale adoption

Source: Everest Group (2018)



**Best practices for enterprises: scaling codification for IT infrastructure services**

Enterprises need to devise a holistic adoption roadmap/strategy for IT infrastructure services codification, underpinned by BASIC framework for ongoing value measurement.

- **Phased adoption:** Take a phased approach to implementing codification initiatives preceded by a robust as-is evaluation and identify use cases based on business ROI
- **Change management:** Drive business user education and active engagement through proactive initiatives and ensure buy-in from leadership to drive holistic adoption
- **Tightly integrated ecosystem:** A rationalized toolset integrated in a centralized console / platform to obtain a single view & ensure cross-collaboration to remove knowledge silos
- **Continuous governance:** Establish a robust governance framework and centralized capability / team, such as an intelligent automation Center of Excellence (CoE) to track the progress of initiatives on an ongoing basis and assume accountability for outcomes
- **Skill development:** Develop internal expertise across codification elements through hiring/training programs with a strong focus on developing cross-functional skillsets

<sup>1</sup> Everest Group survey with 200 CIOs / IT heads of large enterprises (>US\$ 1 billion revenue)

## Decoding the spectrum of offerings across provider segments

### Everest Group take:

Rising demand for codified IT infrastructure services is leading to a proliferation of tools/frameworks. ISVs are focusing on developing solutions catering to one or more aspects of codification such as analytics, aggregation, and automation. Service providers, on the other hand, are taking a technology-agnostic, flexible approach by developing in-house solutions, as well as leveraging ISV partners to deliver value across the codification spectrum.

The onus is on enterprises to assess various tools/frameworks and select options based on factors such as ease of integration with existing toolsets, extent of customization offered, flexibility, ability to scale, and overall impact created for the business, among others.

The offerings landscape for IT infrastructure services codification is proliferating as enterprises look to establish a cost effective, agile, and intelligent infrastructure to support digitalization. ISVs and service providers alike are investing to expand their codification capabilities across the IT infrastructure services stack.

- **ISVs:** ISVs continue to focus on developing specialized solutions targeting specific areas and use cases within the broad IT infrastructure services codification spectrum.
  - These include discrete tools with a narrow focus across one or two areas of codification such as analytics, aggregation, automation, and monitoring
  - ISVs typically provide consulting / implementation support for their tools
  
- **IT service providers:** Service providers address codification through a more holistic value proposition covering the full spectrum of IT infrastructure services. by offering:
  - In-house tools targeted at filling existing gaps in the ISV provider portfolio – levers of differentiation include cost effectiveness, wider feature/functionality sets, customized offerings based on requirements, flexible consumption/pricing models, and tighter alignment with managed services offered
  - Technology-agnostic frameworks/platforms for adoption and governance of codification initiatives leveraging third party / own offerings
  - A suite of professional services (consulting, implementation, and management of deployments) and ability to orchestrate across in-house and third-party tools, underpins the frameworks/platforms
  - Implementation as part of managed services construct or standalone automation-as-a-service offering

## A service provider checklist for codification initiatives

IT service providers can offer significant value within enterprise IT infrastructure services codification initiatives given their experience in driving large scale, complex transformations and significant IT infrastructure management experience. It is intuitive that the enterprise codification adoption journey will be critically dependent upon the capabilities of its IT infrastructure service provider in such cases.

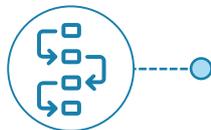
The following checklist is a guide for enterprises to assess service providers' codification capabilities within IT infrastructure services.

### EXHIBIT 11

Sourcing checklist for codification of IT infrastructure services

Source: Everest Group (2018)

#### Enterprise imperatives



#### What to check for

##### Capability development/roadmap

- Does the provider have the right talent pool / talent investments to drive sustainable codification initiatives?
- What is the provider's development roadmap for in-house solutions/frameworks for codification?

##### Agnosticism and protection of existing investments

- Can the provider offer credible proof points for committed RoI through coverage expansion of existing toolsets?
- Does the provider have a credible partnership ecosystem covering a wide choice of vendors?
- Can the provider showcase proof points of codification success across tools/technologies of choice? What is the spectrum of use cases included?

##### Business value

- Does the provider have well-defined value measurement frameworks aligned to business goals (e.g., improvement in business apps performance, UX index)?
- Is the provider ready to contractually commit to delivering business outcomes via codification?
- Does the provider have a set of pre-built knowledge articles / repeatable processes to showcase immediate value?

##### Streamlined processes

- Can the provider identify gaps in existing processes and enable streamlined workflows to make operations leaner?
- What are the provider's proposed roadmap and capabilities for driving effective knowledge management?

##### Scaled adoption

- Does the provider have credible proof points for scaled deployment of codification for IT infrastructure services?
- What is the provider's proposed roadmap for educating and engaging business users to drive adoption?
- Is the provider willing to invest in a joint CoE to drive programmatic adoption?

##### Change management

- Can the provider be an effective partner in driving change due to codification initiatives by influencing internal stakeholders?

## About Everest Group

Everest Group is a consulting and research firm focused on strategic IT, business services, and sourcing. We are trusted advisors to senior executives of leading enterprises, providers, and investors. Our firm helps clients improve operational and financial performance through a hands-on process that supports them in making well-informed decisions that deliver high-impact results and achieve sustained value. Our insight and guidance empower clients to improve organizational efficiency, effectiveness, agility, and responsiveness. What sets Everest Group apart is the integration of deep sourcing knowledge, problem-solving skills and original research. Details and in-depth content are available at [www.everestgrp.com](http://www.everestgrp.com).

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