Executive Summary

In today’s economy, digital transformation is crucial for survival and sustained growth. Emerging digital technologies allow organizations of all sizes to increase efficiencies, lower operational costs, and improve customer service.

Automation is one of the most transformational technologies being deployed today by organizations across multiple industries and the government.

Automation of IT infrastructure, in particular, allows organization to:

- Improve productivity and consistency of infrastructure performance
- Reduce downtime and costs
- Accelerate provisioning
- Reallocate employees to higher-value activities

A recent Forrester Research report, Predictions 2018: Automation Alters The Global Workforce, predicts that companies that master automation won’t just succeed—they will dominate their industries.

This paper explores:

- How automation can help enable and accelerate an organization’s digital transformation
- How to determine which of your enterprise’s processes are candidates for automation
- How to develop, implement, and accelerate your automation program

No matter where you are in your automation journey, this paper can help you understand global best practices.
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Enterprise Digital Transformation

In today’s fast-changing economy, digital transformation gives organizations a huge advantage over competitors that fail to adequately leverage digital technologies. Digitally transformed enterprises are agile, adaptable, and efficient, able to increase speed of delivery, lower costs of operation and improve customer service.

If digital transformation is the what, automation is the how. Automation of IT infrastructure processes, in particular, allows organizations to dramatically improve productivity and consistency of infrastructure performance, resulting in reduced downtime and costs, vastly accelerated provisioning and reallocation of IT employees to higher-value activities.

Organizations across multiple industries and governments are embracing IT automation today as a means of achieving digital transformation. In a survey for IDG’s 2018 State of Digital Business Transformation report, nearly two-thirds (64%) of IT leaders said they expect their enterprises to improve process efficiency through automation.

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**Benefits of Automating IT Infrastructure**

Organizations that automate their IT infrastructure are able to streamline network, computing and data management processes, making the entire digital organization more responsive and efficient. In addition to increased agility and flexibility, Unisys has seen a cloud cost reduction of as much as 27% through the use of automation. Automation of IT results in:

- **Lower Costs.** By automating processes historically performed by IT workers, organizations can reduce labor and training costs.
- **Accelerated Productivity.** Eliminating the lag time inherent in using manual labor to perform IT infrastructure-related functions can make an entire organization more productive.
- **Improved Quality.** Automated IT infrastructure is highly dependable and produces predictable outcomes because it is not vulnerable to mistakes and other human-related variables. Superior quality control results in higher customer satisfaction and lower costs.
- **Better Allocation of Human Resources.** Automation liberates IT employees from many routine though necessary IT infrastructure management, monitoring, and maintenance activities, freeing them to apply their skills and knowledge to more strategically important work.

**Greater Scalability.** Automated IT infrastructure is instantly responsive to fluctuations in workload demand, providing the ability to scale up or down without jeopardizing service level deliverables.

**Faster Recovery Time.** Just as IT automation accelerates productivity and speed of delivery, it also can reduce or even help avoid system and network outages through proactive functionality and faster disaster response.

**Stronger Intellectual Property Protection.** IT automation reduces exposure of intellectual property (IP) by limiting the number of new employees trained and minimizing the potential loss of IP when an employee leaves the organization.

The Power of Automation in the Cloud

One of the most compelling uses of IT automation is within a cloud-based infrastructure. Organizations increasingly rely on cloud platforms to deliver services to end users, whether they are remote employees or customers located anywhere in the world. Automating cloud-based IT infrastructure functions and services empowers end users through self-provisioning of applications and self-service support, while also ensuring governance.

Automation of cloud-based IT infrastructure improves efficiency by streamlining recurring workflow approvals and vastly reducing production and development time. With automation, IT tasks that take employees or outsourced workers weeks or even months to perform can be done in 3 to 15 minutes using automation.

“In the past, a marketing executive who wanted to spin off a web environment would submit a request to an IT infrastructure specialist, who might backlog the job for two or three weeks, and only then begin to design it,” explains Chris Wick, vice president of Cloud, Infrastructure and Application Services at Unisys. “But by leveraging pre-populated website blueprints that can be served up when needed, automation can complete the job in minutes.”

Or take the deployment of virtual machines (VM), which when executed by IT workers involves numerous steps, including submitting a change request, spinning up the VM, attaching the databases, configuring the network and firewalls correctly, and determining an expiration date. “Automation essentially makes all of this happen instantaneously, consolidating a long, drawn-out process into a well-governed, high-speed and highly consistent action,” Wick says.

IT automation literally enables self-service out of a services catalog, so IT developers – instead of having to wait for the IT infrastructure team to set up a development environment – can auto-provision through the catalog, setting policies, auto-scaling workloads, and configuring networks and storage, all under tight governance. All approvals, notifications, and security requirements can be automated.
Along with dramatically reducing the amount of time and resources necessary to complete specific jobs such as VM deployments, automation is ideally suited for monitoring and management of IT infrastructure. By automating the monitoring and management of infrastructure components, performance issues can be detected instantly, and an automated response initiated, all without involving IT personnel.

This automated rapid detection and response to events strengthens IT infrastructure reliability and overall enterprise efficiency by providing a form of self-healing. Thus, if a database unexpectedly goes down, rather than two or three IT workers spending hours or an entire day trying to get the database back up, the repair is done automatically and immediately after an incident is created.

In conjunction with technologies such as artificial intelligence (AI) and machine learning, automation also can be used to identify anomalies and predict incidents based on performance data gathered by automated monitoring and management processes. It is no surprise, then, that the self-healing and predictive capabilities automation and smart technologies bring can reduce IT incidents that hurt enterprises in terms of lost productivity and revenue as well as repair costs.

As the digital economy intensifies the pace of change, enterprise IT must be more agile and flexible than ever. In response, a growing number of organizations are becoming “software-defined enterprises.” They are moving away from traditional in-house IT infrastructures toward a combination of public and private clouds from which services are rapidly delivered and self-service is offered to end users without tying up IT resources. This emphasis on self-service and speed of delivery makes automation an indispensable part of any software-defined enterprise.

**Your Automation Journey**

AI and machine learning are advanced technologies that should be implemented only after enterprises have successfully integrated automation into their IT infrastructures for more basic functions. Ideally, the early stages of automation focus on the simplest of tasks that can be done without human intervention, such as creating user accounts or extracting performance and workload information from virtual machines via a PowerShell script. Orchestration of multiple automation scripts is the next logical step for initial adopters of automation.

### Figure: 1 Automation Journey

<table>
<thead>
<tr>
<th>Good</th>
<th>Better</th>
<th>Best</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Bi-directional integration with many demand signal sources and types</td>
<td>- Self initiated automation</td>
<td>- Perceives its environment</td>
</tr>
<tr>
<td>- Can perform the automation or delegate automation to another tool</td>
<td>- End-to-End process automation</td>
<td>- Natural language processing</td>
</tr>
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**Examples**

- BMC Atrium Orchestrator
- SN Orchestrator
- IPcenter
- HP SA

- Health checks
- Drift Management
- Deep analytics with recommendations on chronic incident reoccurrences

**Examples**

- BMC Atrium Orchestrator
- SN Orchestrator
- IPcenter
- HP SA

- Initiates automation by reacting to a demand signal
- End-to-End process automation

**Examples**

- Incident tickets
- Request tickets
- Change tickets
- Manually triggered
- Configuration Management

**Examples**

- Self healing
- Event correlation

- Uses cognitive decision making to decide best path to perform end-to-end process
- Traverses cognitive logic through extensive relationship mapping between tasks and configuration items
- Self learning

**Examples**

- Self healing
- Event correlation
Once enterprises have the basics worked out, they can use automation in more sophisticated and impactful ways. Entire processes such as configuration management can be automated end-to-end, while specific requests – such as change and incident tickets – can trigger an automated response. Proactive automation goes even further, performing tasks such as system performance checks without prompting. And as AI and machine learning are integrated with cloud-based automation, enterprises can leverage the benefits of self-healing and self-learning systems. At this part of the automation journey, machines can make and execute upon decisions within the context of a specific situation, using cognitive logic and relationship mapping. In its current, most advanced form, machine intelligence uses natural language processing, contextual awareness, and analytics to allow organizations to interact with end users through virtual agents and other technologies.

“Remember,” warns Chris Wick of Unisys, “once you automate an IT process, you’re turning over responsibility to a machine that has to run 24/7 without failure – because nobody will be around to fix it. That’s why it’s absolutely critical to get the process right.”

Even more important to the success of an IT automation program than the right process and methodology is choosing which functions to automate. While this step can seem overwhelming in large environments, methodical research coupled with the use of analytics can help decision-makers narrow down their choices. Two logical automation candidates are the most labor-intensive tasks and those tasks most prone to human error. Another good candidate for automation in an IT infrastructure is DevOps, a practice that improves coordination between IT development and infrastructure operations teams.

It’s important to understand that, unlike human workers, automated processes have no base level of knowledge that can be applied to a specific task. This typically requires some level of engineering before advancing to mechanization.

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The People Puzzle

Perhaps ironically, IT automation involves numerous people considerations as part of the planning and implementation processes. First, identify key stakeholders for each automation workflow. These stakeholders approve requirements, substantiate ROIs and pave the way for deployments. A skills assessment is next: Can our current IT employees work in a heterogeneous environment? Do they have the coding/scripting skills we need to automate? Do they understand development methodologies?

IT automation also requires specialty roles. For example, an automation analyst performs data analytics, captures requirements, builds process flows and coordinates deployments, while an automation developer creates the technical design, scripts automation routines, and performs unit and system testing. If those skills already aren’t in-house, acquiring them may be challenging — not to mention costly.

Steps for Building Intelligent Automated Operations

IT automation depends upon quality processes and optimized procedures. This is the heavy lifting of automation. Only after processes and procedures are properly set up can IT automation successfully be implemented. If there are defects in the process and/or procedures, automation will get you to a train wreck the fastest – the opposite of its intended effect!

A reliable process, by definition, begins with effective governance. Enterprise decision-makers must create a governance program that ensures IT automation investments align with strategic business priorities and yield the desired return on investment (ROI). Specifically, governance helps enterprise IT meet internal and external compliance requirements, create and enforce security parameters, provision accounts, manage cloud-based shared services, and more.

In building the architecture for an automation initiative, IT professionals must choose a rigorous methodology of process engineering such as Six Sigma, which is being used by many organizations to create, test and manage automated IT processes across multiple business domains.
By 2021, Gartner predicts, failure to keep up with intelligent automation technology will lead insourced organizations to outsource, increasing spending on infrastructure outsourcing by more than 50%. *

Other personnel considerations include determining whether automation-related positions are full- or part-time jobs, and how to overcome staff resistance based on fear of change or possible job loss. The latter may entail conducting a readiness assessment to determine staff-related obstacles and their sources, selling people on the benefits of IT automation (preferably through demonstration), and clearly communicating changes as they happen.

As demand for automation technology continues to outpace the supply of skilled workers, more enterprises will rely on outsourced skills. By 2021, Gartner predicts, failure to keep up with intelligent automation technology will lead insourced organizations to outsource, increasing spending on infrastructure outsourcing by more than 50%. Given this trend, enterprises may find it advantageous to engage a third-party IT infrastructure automation services and support provider.

**Technology and Tough Choices**

Once an enterprise has decided what to automate, it must choose which technologies to deploy as part of IT automation. As with any major strategic and spending decisions, choosing IT automation technology should be based on the customer’s needs, landscape and environment. Easier said than done, however, for IT departments that manage IT automation internally can struggle to keep up with the different technologies in an automated, heterogeneous environment.

This is another area where a third-party provider can offer insights into your organization’s best automation opportunities and potential risks or problems. An automation services provider would begin by conducting an initial assessment to determine where an organization’s resources are spending time, and why. This type of analysis allows IT to pivot to proactive mode, because it has full transparency into resource allocation and workflows.

Architecture is another critical factor in determining an organization’s IT automation strategy. Building from scratch may pay off eventually, but a mature automation capability utilizes both central and distributed automation platforms. Each are highly useful.

**Centralized Automation** operates as both an orchestrator and a discrete automation platform. It resides outside a customers’ network and uses a jump server to traverse into a customers’ network. Centralized automation is very helpful when responding to Inc/Req/Chg ITSM tickets.

**Distributed Automation** performs discrete automation but does not typically orchestrate. Architecturally, it resides inside a customers’ network and directly communicates to a device. This type of automation is very useful for configuration management and performing health checks on a device, especially when conducting health checks across thousands of devices simultaneously.

Since automation operates within a network in the same ways as a human being – accessing data, requesting services, etc. – it needs the same level of security that IT applies to people. In fact, security should be baked into the automation framework from day 1. As with IT automation processes, automation security done haphazardly or incorrectly can become a persistent problem that thwarts progress and worse. Therefore, it is critical not only to find a secure methodology and secure tools for an automation initiative, but also to ensure accountability by assigning someone to “own” the security aspect of automation.

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* From Gartner Automation metrics for leading MSPs – doc 344054.
Feb 2018 Once we have the final version will need to get Gartner’s permission to include this.
The Way Forward

Organizations at the beginning of the IT automation journey are likely to benefit from caution imbued with careful planning and analysis. Assess where your resources are spending time and determine your most labor-intensive IT tasks. Two excellent early applications of IT automation are in DevOps and elimination of configuration drift. The overall focus of IT automation should be on self-service and self-healing, which are essential functions in the software-defined enterprise.

The IT automation roadmap below outlines the strategic steps necessary – from establishing foundational processes to implementation of advanced technologies such as machine learning.

![Automation Roadmap Diagram]

### Figure: 2 Automation Roadmap

**Strategic Steps**

**Foundational Processes**
- Automated Discovery
- Harden CMDB to be DSOT
- Automation Assessment w/ROI
- Automation Metrics
- SDLC for automation development (30/60/90 roadmap)
- Automation governance
  - Platform readiness
  - Security compliance
  - Tool alignment
- Automation Team
  - Analysts
  - Developers
- Development/test environments

**Incident Management**, **Automation Road Map**, **Process Automation**, **Configuration Management**, **Health Check**
- Incident suppression
- Incident de-duplication
- Incident reoccurrence
- T1 Automation
  - Map 60-80%
  - 40% Auto Resolution
- T2 Automation
  - Map 40-60%
  - 20% Auto Resolution
- Create Configuration Management capability
  - Identify use cases
- Create Health Check capability
  - Identify opportunities

**Event Management**, **Automation Road Map**, **Process Automation**, **Health Check**, **Configuration Management with Drift Control**
- Event Correlation
  - Using relationships from automated discovery
- T1 Automation
  - Map 80%
  - 60% Auto Resolution
- T2 Automation
  - Map 80%
  - 40% Auto Resolution
- activate Drift Management
- 50% Configuration Management use cases
- 50% of Health Checks

**Machine learning Process Automation**, **Health Check**, **Configuration Management with Drift Control**
- Pilot automation machine learning platform
- T1 Automation
  - 80% Auto Resolution
- T2 Automation
  - 60% Auto Resolution
- 80% of Health Checks
- 80% of Configuration Management use cases

IT automation – a key focus area for Unisys – is built into its CloudForte™ solution. CloudForte enables you to accelerate adoption of cloud services, cloud modernization, and cloud development – regardless of where you are in your cloud journey. CloudForte enables industries and government organizations to reduce downtime and costs, accelerate provisioning, and reallocate employees to higher-value activities.

For more information, visit Unisys.com/automation

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For more information visit www.unisys.com

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