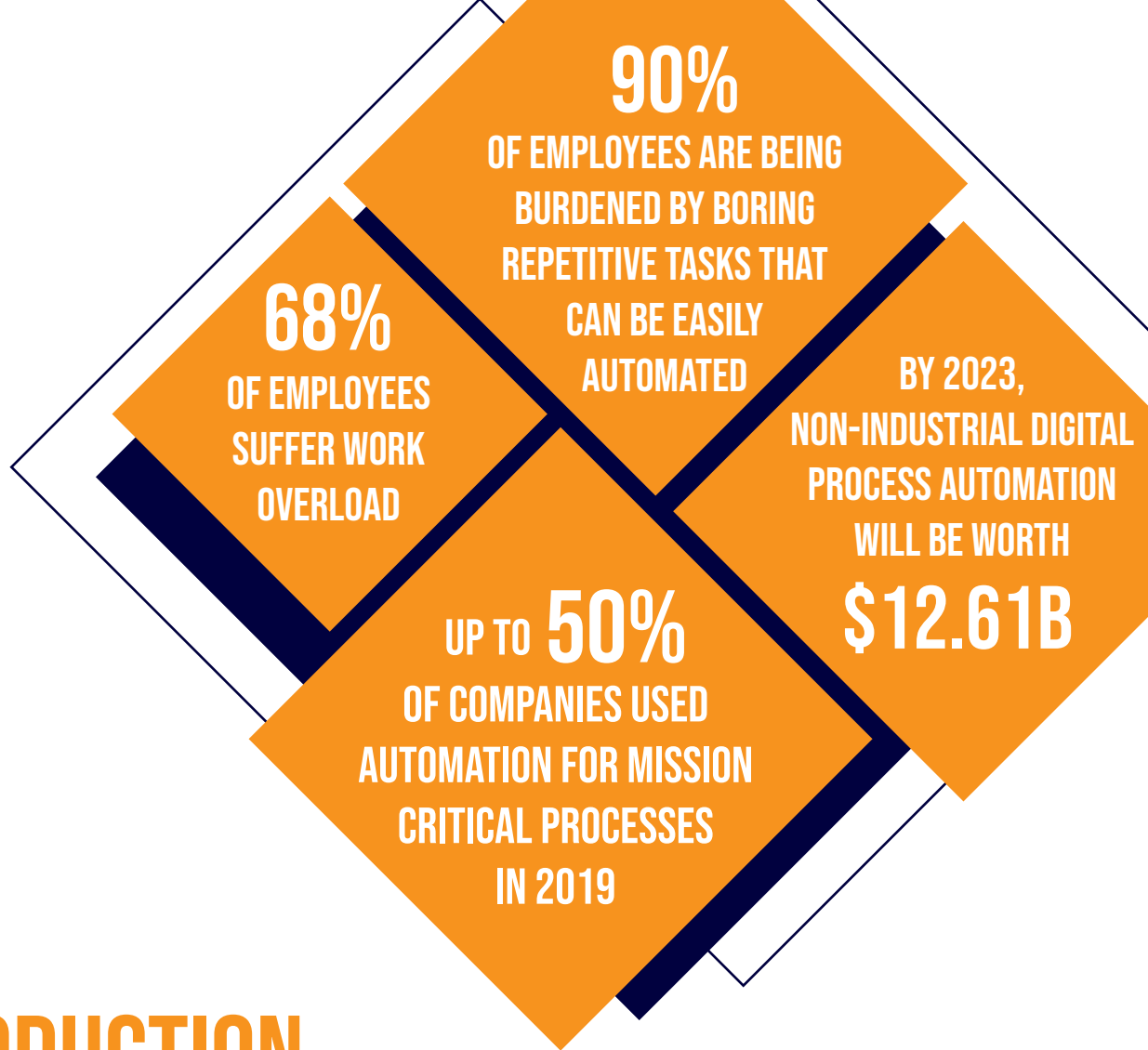


AUTOMATION IN INFRASTRUCTURE PROGRAMS

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INTRODUCTION

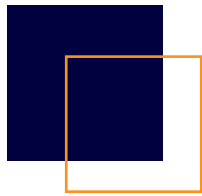
IT operations are expanding every year. Businesses and governments are constantly adding new technologies to their enterprises in an effort to boost productivity and stay competitive. As enterprises expand and become more complex, they require additional effort to maintain. Hordes of engineers and technicians are tapped to keep these growing systems online, and IT growth and development becomes prohibitively expensive over time.

This is where automation becomes critical in ensuring the success of a modern organization. Intelligent Automation allows IT operations to expand without increasing

costs. In fact, automating an IT enterprise will reduce costs over time while bringing a number of other benefits. As IT tasks are centralized and offloaded to software, engineers and technicians are given more time to focus on security, optimization, and future-proofing the enterprise.

A fully-automated enterprise is a healthy enterprise, where central management software is handling device monitoring, patching, and configuration. Automation software can allow engineers to see the state of the entire enterprise at any moment. Engineers then assess areas needing improvement as well as address any outages as they occur.

1. Key Market Statistics: Think Automation (n.d.) The global process automation market: statistics you need to know. <https://www.thinkautomation.com/automation-advice/the-global-process-automation-market-statistics-you-need-to-know/>



WHY AUTOMATE?

REDUCE COSTS

Automation offsets the extra work generated by expanding IT systems. Instead of hiring additional engineers and technicians to maintain a complex environment, maintenance tasks can be automated using secure software and smaller teams. This is a major cost savings in staffing both immediately and in the future as the environment continues to expand.

On average, IT Automation provides cost savings between 40% and 75%, with the savings being realized between several months to several years from execution.²

INCREASE AVAILABILITY

In a modern office, access to IT services and data are fundamental to productivity. Workers need access to files, email, the Internet, and a score of other essential services. When workers lose access to those services, productivity stops. It is therefore essential in today's world to maximize availability and reduce outages.

An automated IT environment sees significantly less downtime. Engineers are notified immediately when there is any loss of service, and they can apply crucial fixes much more rapidly.

Gone are the days of waiting for user complaints before engineers realize anything is wrong. In a well-automated environment, engineers can solve a problem before the user is aware it even existed.

IMPROVE IT VISIBILITY

Managing devices with automated software creates a visual landscape for engineers to understand their enterprise. In one location, an engineer can see every device, how it is connected, and what its current status is. Having that high-level view of the enterprise is crucial for monitoring system health, and it also streamlines the troubleshooting process. Engineers can more quickly assess the root cause of an issue because they can more easily see the big picture. This visibility of the enterprise also makes it easier to track security concerns like firmware updates and device lifecycles.

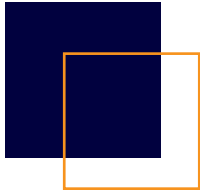
ENHANCE PRODUCTIVITY

According to a report published by McKinsey, 45% of currently paid activities performed by individuals can be automated by implementing and utilizing today's technology.³ Offloading menial IT tasks to software allows engineers to instead focus their efforts on improving the environment. Engineers can look ahead toward new technologies and security threats looming on the horizon. Engineers working in an automated environment have the freedom and capacity to help the environment evolve over time in what becomes a self-perpetuating cycle of optimization. The Accenture Institute for High Performance research indicates that by 2035, intelligent automation has the potential to increase labor productivity by 40%.

2. Kirk, D. (2017, September). How Much is Intelligent Automation Saving You? Forbes. <https://www.forbes.com/sites/kpmg/2017/09/21/how-much-is-in-telligent-automation-saving-you/#65ee5fb0604c>

3. Chui, M., Manyika, J., and Miremadi, M. (2015, November). Four Fundamentals of Workplace Automation. McKinsey Digital. <https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/four-fundamentals-of-workplace-automation#>

4. Branon, O. (2016, September). Artificial Intelligence Poised to Double Annual Economic Growth Rate in 12 Developed Economies and Boost Labor Productivity by up to 40 Percent by 2035, According to New Research by Accenture. Accenture. <https://newsroom.accenture.com/subjects/technology/artificial-intelligence-poised-to-double-annual-economic-growth-rate-in-12-developed-economies-and-boost-labor-productivity-by-up-to-40-percent-by-2035-according-to-new-research-by-accenture.htm>



AUTOMATED MONITORING

Automated monitoring software gives invaluable awareness and visibility of the environment. On one screen, engineers can see the health of the whole enterprise. The monitoring system becomes aware of any issues the instant they happen and then reflect those issues on screen. Devices in the enterprise send a constant stream of information to the monitoring system, allowing engineers to assess their condition in real time.

Having an automated monitoring system provides access to two crucial services: **reports** and **alerts**.

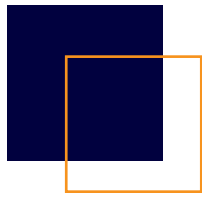
Automation in monitoring is especially useful in cybersecurity. SIEM (Security Information and Event Management) software such as Splunk Enterprise Security with Phantom monitors the enterprise and prevents, detects, and responds to security events in real time without human intervention. Engineers can configure and deploy “playbooks”, which are automated responses to various events. Splunk, and other similar programs, use these playbooks to take actions instantaneously as events occur. Security threats are eliminated in seconds rather than minutes or hours.

REPORTS

Reports are snapshots of the enterprise’s health at any given moment. Reports can be programmed to be sent weekly, daily, or multiple times a day. There could be a daily report at the beginning of the day to assess any issues that arose overnight, in addition to a second daily report at midday to gain insight to how the enterprise functions at peak operating times. Reports help engineers establish a baseline of expectations as well as address areas consistently needing attention. Anomalies can be easily identified and appropriate responses can be automated.

ALERTS

Alerts are immediate notifications sent by the automated monitor when it becomes aware of an issue. Engineers can establish their own criteria for what issues warrant an alert so that the alerts are tailored to the needs of the organization. This removes the necessity of having a team dedicated to watching a monitor. Instead, automated monitoring software learns what events warrant alerting an engineer and then sends those alerts instantly as issues arise. This also removes human error from the equation, eliminating the possibility that outages will go unnoticed.



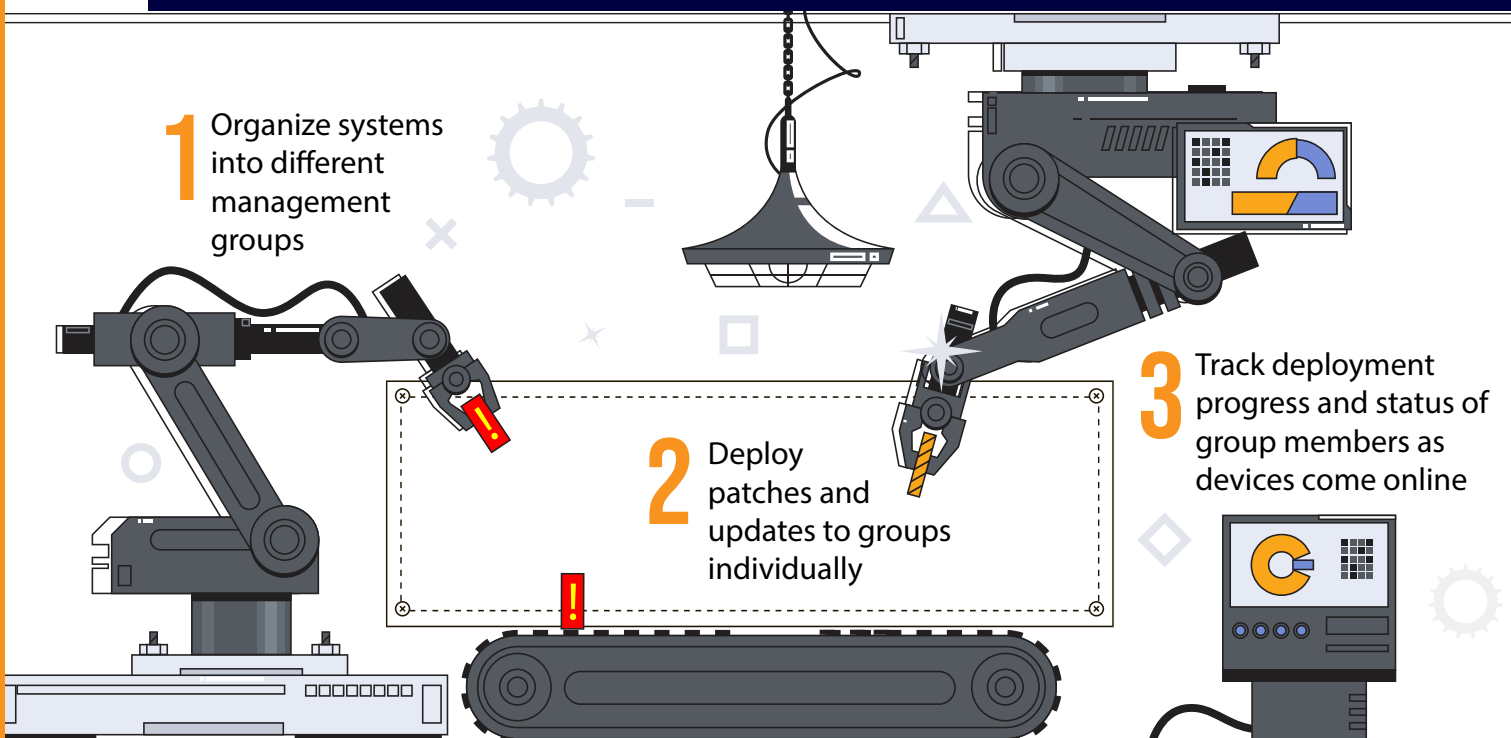
AUTOMATING SYSTEMS ADMINISTRATION

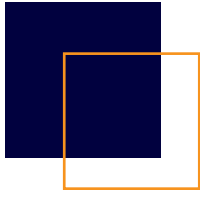
Managing servers and workstations from a centralized platform is a necessity in a modern enterprise. Maintenance of those systems is labor intensive and can be complex to organize. Patches need to be deployed to hundreds or thousands of workstations, and a vast inventory of servers need to be updated regularly.

There are a number of options for centralizing systems management such as Ansible, Chef, and Puppet. For example,

Ansible allows engineers to automate systems management processes using YAML playbooks. An Ansible control node can perform functions on a wide variety of systems and gear. Engineers can use Ansible to automate software package management, task scheduling, or any other process necessary for the system. Ansible has use cases not only for systems administration, but also cybersecurity and networking.

AUTOMATED CENTRALIZED MANAGEMENT PLATFORMS SIMPLIFY THE SYSTEMS ADMINISTRATION PROCESS.





AUTOMATING NETWORKS

Modern enterprise networks are becoming larger and more complex. Routers and switches are being deployed at ever increasing rates, creating huge inventories of network devices to manage. By 2023, there will be 5.3 billion global Internet users (66% of the global population), 29.3 billion connected network devices, 14.7 billion machine-to-machine connections (M2M), and the average global fixed broadband speed will be 110 Mbps.⁵

As more and more services are moving to the cloud, demand for bandwidth capacities and more efficient routing is increasing. Having an automated centralized manager to administer network devices is vital in order to keep pace with these demands. An IDC study revealed that organizations lowered networking costs by 33% when properly implementing network automation solutions.⁶

A centralized manager allows engineers to automate configuration processes and make changes to multiple network devices at once. Without a central manager, a network engineer must manually configure each network device individually through the command-line-interface. This is a tremendous burden as the number of network devices added to enterprise quickly outpaces the number of network engineers on staff.

Configuring devices individually is not only labor intensive, but it is also very slow. In a situation where an issue can only be remedied by a configuration change to many



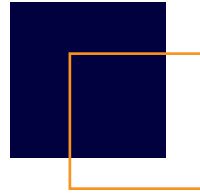
5. Cisco. (2020, March). Cisco Annual Internet Report (2018-2023) White Paper. <https://www.cisco.com/c/en/us/solutions/collateral/executive-perspectives/annual-internet-report/white-paper-c11-741490.htm>

6. IDG Communications, Inc. CIO (n.d.). Network Automation: Adding Up the Cost Savings and Benefits. <https://www.cio.com/article/3173703/network-automation-adding-up-the-cost-savings-and-benefits.html>

devices, needing to configure devices manually means it will take much longer for services to be restored. In order to adapt to network issues and vulnerabilities as quickly as possible, it is essential that network management be centralized and automated.

This is most commonly achieved with SDN, or Software Defined Networking. SDN is the process of controlling network devices with software using open API (Application Programming Interface). With SDN, the control plane of each network device is managed from a central system where engineers can make changes en masse.

Utilizing programmability on network devices allows engineers to automate a number of processes, and it also opens the door to making networks dynamically adapt to the requirements of the environment.



CONCLUSION

In a global environment that is changing daily with technological advancement, the IT enterprise must be automated to stay competitive. Automation makes IT services cost efficient and highly available, while allowing engineers to innovate even further. It is incumbent upon any organization to automate their IT infrastructure and give their operations the best chance for success. ■

