Data center automation: realizing rapid value

Business white paper

Automation and business transformation

For generations, businesses have seen automation as the answer to inefficiency. Today it is used as much to improve quality and facilitate flexibility as it is to increase productivity and reduce costs. This is as true for IT data centers as it is for manufacturing facilities. The fact is data center automation can play a major role in supporting business strategy—providing the controls needed for IT to ensure quality across a wide range of activities using far fewer resources. At a time when IT is being asked to do more with less, this is no small benefit.

For most IT organizations, however, automation is rarely automatic. That is to say, IT complexity often stands in the way of quick fixes. Much of this complexity has to do with the highly segregated nature of IT operations—where individual teams manage non-integrated point solutions in the context of operational silos.

True, even in such segmented environments, rudimentary automation can deliver measurable benefits. A system administrator, for example, might use a script to automatically patch security vulnerabilities across multiple servers. This level of automation certainly saves time and money, but companies today are looking to leverage automation to achieve far more significant ends—namely fundamental business transformation.

For many companies today, the data center is increasingly indistinguishable from the business itself. Banks, for example, need batch payment processes and a wide range of online services in order to compete effectively. Retailers need to collect and analyze market and customer data in order to understand what their customers want. Manufacturers need flexible business processes supported by robust technology in order to work effectively with their suppliers.

All of these requirements speak to the need for constantly improving data center performance at the level of operations. Without tackling the problem of segmented operations most organizations will find it increasingly difficult to take advantage of the latest developments in IT—such as virtualization and cloud computing. This, in turn, will adversely impact competitiveness and impede efforts at business transformation. This is why so many organizations seek to automate data center operations wherever possible. But a haphazard approach to automation will only lead to incomplete and inefficient point solutions. This is why organizations need to prepare.

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Preparation is the key to success.

Fundamental business transformation doesn't happen by flipping the switch on a new software product. If it were that easy, data centers everywhere would already be fully automated. Rather, transformation happens by carefully assessing where you stand on the operational maturity curve, defining your desired state, and implementing IT processes—automated by software technology—that deliver measurable value to the business. The benefits of such an approach can help ensure a successful data center automation initiative. And this can deliver tangible benefits to IT and the business—such as lower IT costs, enhanced service quality, reduced IT complexity, and less risk exposure due to compliance risks.

This paper looks at the steps your organization can take to prepare for data center automation. Special attention is paid to generating internal buy-in, defining specific value chains for IT, and implementing the ultimate solution with a clear understanding of the expected outcomes including return on investment. Following a clear course that lays the appropriate groundwork, your organization will be able to avoid the kind of downstream hurdles that typically derail automation initiatives.

Assessing operational maturity and developing a vision

To prepare for automation, you need to know the current state of operational maturity for any IT domain under consideration—network, server, storage, or client. Areas to consider include:

- **Baseline and tracking**—which focus on visibility into existing inventory, understanding capacity, and detecting changes when they are made
- **Provisioning**—which focuses on your ability to add and retire new IT elements—such as servers, networking hardware, and applications—and configure them appropriately to run smoothly in your data center
- **Security and compliance**—which focus on your ability to detect and address security vulnerabilities and manage compliance requirements in an efficient manner
- **Maintenance**—which focuses on your ability to establish repeatable maintenance processes and execute procedures such as upgrades and patches without disrupting IT operations

For all of these areas, your organization will fall into one of five levels of automation that correspond to where you are on operational maturity curve. These include:

- **Level 1: Ad hoc**—where IT activities are executed according to manual processes without coordination or the benefit of clear documentation, resulting in a high rate of errors and frequent downtime
- **Level 2: Reactive**—where efforts have been made to establish procedures that are semi-automated wherever possible yet IT remains in constant crisis mode unable to get out ahead of the problems that impede effective, efficient operations
- **Level 3: Proactive**—where procedures are clearly documented, specific tasks are automated using scripts or vendor-specific tools, changes are tracked, and the need for IT-wide coordination is recognized throughout the organization
- **Level 4: Element automation**—where IT elements, inventory, and changes are automatically discovered and tracked using a single, heterogeneous automation system that enforces IT governance policies and improves visibility throughout the data center
- **Level 5: Full solution-based business service automation**—where IT possesses all the abilities described in level 4 plus the abilities to view infrastructure element relationships in real time, orchestrate processes across domains, view compliance requirements in a single dashboard, and make changes with full awareness of dependencies and services impacted

An assessment of operational maturity using the criteria provided here can help you identify gaps that need to be addressed. From here, you can determine a vision of where you want your IT organization to go—including how IT is to be structured and organized. Keep in mind that developing a vision is in itself a process—one that requires input from all stakeholders on both the business side and the IT side. Transforming IT without the input of those people who will be most impacted is a recipe for failure. Generating enterprise-wide buy-in takes time and savvy organizational change management. The efforts invested up front, however, will pay off downstream as all parties involved are fully invested in the changes being implemented.

Defining comprehensive value chains

The next step in preparing for data center automation is defining a set of end-to-end value chains that describe automation flows and the ways in which IT interacts with its customers. While the specifics may vary from organization to organization, the value chains described below can serve as a starting point for your organization as it sets out to clearly articulate the process areas through which IT delivers value to the business.

Application code promotion

This involves the promotion of applications and smaller sets of code as they move through the stages of development, testing, acceptance, and production. Special attention is paid to effective change and configuration management to minimize the potential for errors that might otherwise reverberate through the IT infrastructure. From the business's perspective, the value of this process area is business agility—the ability to change quickly to respond to evolving market conditions.

OS provisioning

This involves the deployment of an operating system (OS) onto a physical or virtual machine. Activities can also include applying patches and vendor utilities. The value of efficient, effective OS provisioning is higher end-user satisfaction, improved infrastructure-wide predictability, and lower IT costs.

Patch, test, and deploy

This involves the testing and deployment of patches either on operating systems or application components. Activities also include patch analysis and application testing after the patch is applied. The primary value to the business is improved system stability and a lower risk of downtime and outages that might otherwise result from faulty process execution.

Software management

This involves the deployment, upgrade, or configuration of applications (custom built or off the shelf) that exist on previously provisioned infrastructure. Activities also include annual updates of infrastructure agents such as backup tools. The value of effective software management is improved competitive advantage through better software.

Monitoring and alert

This involves the management of monitoring systems to detect infrastructure events and the sending of alerts to appropriate parties in order to address the underlying issues. Activities also include service level reporting, continuous improvement, and creating incident tickets for follow-up. The value to the business is improved end-user and customer satisfaction due to higher service levels and reduced downtime.

Troubleshooting and repair

This involves the diagnosis and remediation of incident and problem situations. Activities also include service quality monitoring. The value to the business includes faster repair times and higher quality of service.

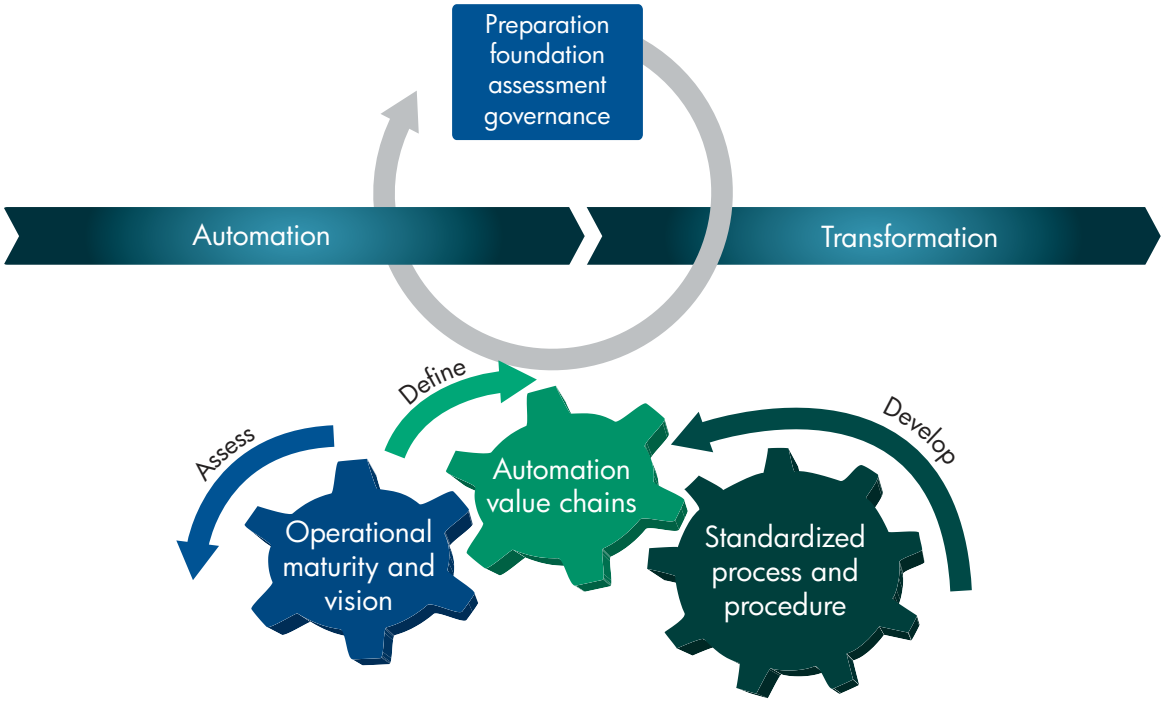
Audit and compliance

This involves the detection of variations from desired state and the actions required to remediate. Activities also include facilitating adherence to legal obligations and monitoring security as it pertains to service assets and configuration items. The value to the business includes lower regulatory risk and improved competitive advantage through more efficient auditing.

Developing standardized processes

Based on these value chains, you can take next steps to define gold standard processes. This requires an understanding of how the processes associated with each value chain currently run. For each process area, you need to identify current roles and responsibilities as well as any overlap or interdependencies. You also need to identify current software used to support each of the processes if relevant. You may also want to gather any benchmarks for each process that may be available. This can include metrics on process costs, time to execute, and error rates. Together, this information represents the as-is state for the process area under consideration.

Figure 1
The HP approach to automation and business transformation



Once the current process state is established, you need to choose a framework such as ITIL v3, Control Objectives for Information and related Technology (COBIT), or IT factory. The value chain you want to focus on is then associated with the processes defined in the framework you choose. For example, the value chain related to application code promotion would be associated with the first half of the ITIL v3 process for release and deployment. OS provisioning and software management, on the other hand, would be associated with the second half of the release and deployment process.

At this stage, many IT groups will choose a framework that already has a foothold within the organization. However, it is not uncommon for organizations to have multiple competing frameworks coming out of different business units or IT domains. Be sure to focus on the framework that best addresses your needs—and to stay focused on it throughout your data center automation initiative. In the end, your framework decision will help you organize your priorities as you set out to identify areas in need of change and define gold standard processes that can help deliver real ROI.

Implementing change

With a clear vision and well-defined processes that grow out of solid value chains, you are now ready to start developing specific projects designed to help your organization automate its data center. These projects should be chosen and executed according to the trajectory of a clear roadmap that outlines the aims of the overall initiative. Each project undertaken should represent a discrete set of steps along the automation maturity curve, and the aims of the project—as it fits into the overall roadmap—should be clearly communicated to all stakeholders to minimize confusion.

Understanding what success means

For each project you choose, it is critical to have a clear understanding of what success means. Much of this comes from a foundation laid with the gold standard processes developed earlier. Here, success needs to be defined both in terms of financial and organizational outcomes. This can be thought of as the vision within the vision—that is, the desired outcome for one specific project within the larger data center automation initiative.

Without a clear understanding of what success means, you can put your project at significant risk. For example, let's say you're focused on automating the OS provisioning process. This process touches multiple groups within IT. Centralized security for users may reside in one group, owners of the OS images in another, patching in another group, application stack (gold image) in another, and the implementers of the solution in another still. Changes made to the way one group operates will spill over to other groups. If those groups are not on board, you may face interdepartmental resistance.

This makes developing a big picture of who is impacted by the proposed changes extremely important. Project managers should approach each group individually and deliver demonstrations that show how the new solution and proposed changes will make life easier for that specific group. The managers of these groups need to understand how the changes will save money and improve productivity. These managers, in turn, need to know that the project has the full backing of the executive leadership. Fully understanding and mapping roles and responsibilities is critical to success. This helps to build organization-wide buy-in that can help propel the project toward successful completion.

Knowing ROI

For each stage of maturity—or for each project you undertake in your data center automation initiative—you need to know exactly what your ROI will be. From a roadmap perspective, this information can help convince the executive board to move forward with the initiative in the first place. With a clear business case for each planned project and good arguments for how it all fits into the overall portfolio of projects currently under management, you can help minimize the risks of moving forward.

The calculation for ROI is predicated in part on the analysis of baseline processes conducted earlier. Pain points identified during the analysis phase are associated with wasted time and money. The elimination of these pain points should lead to a reduction in waste and lower process costs, which should be taken into consideration as part of your ROI calculation.

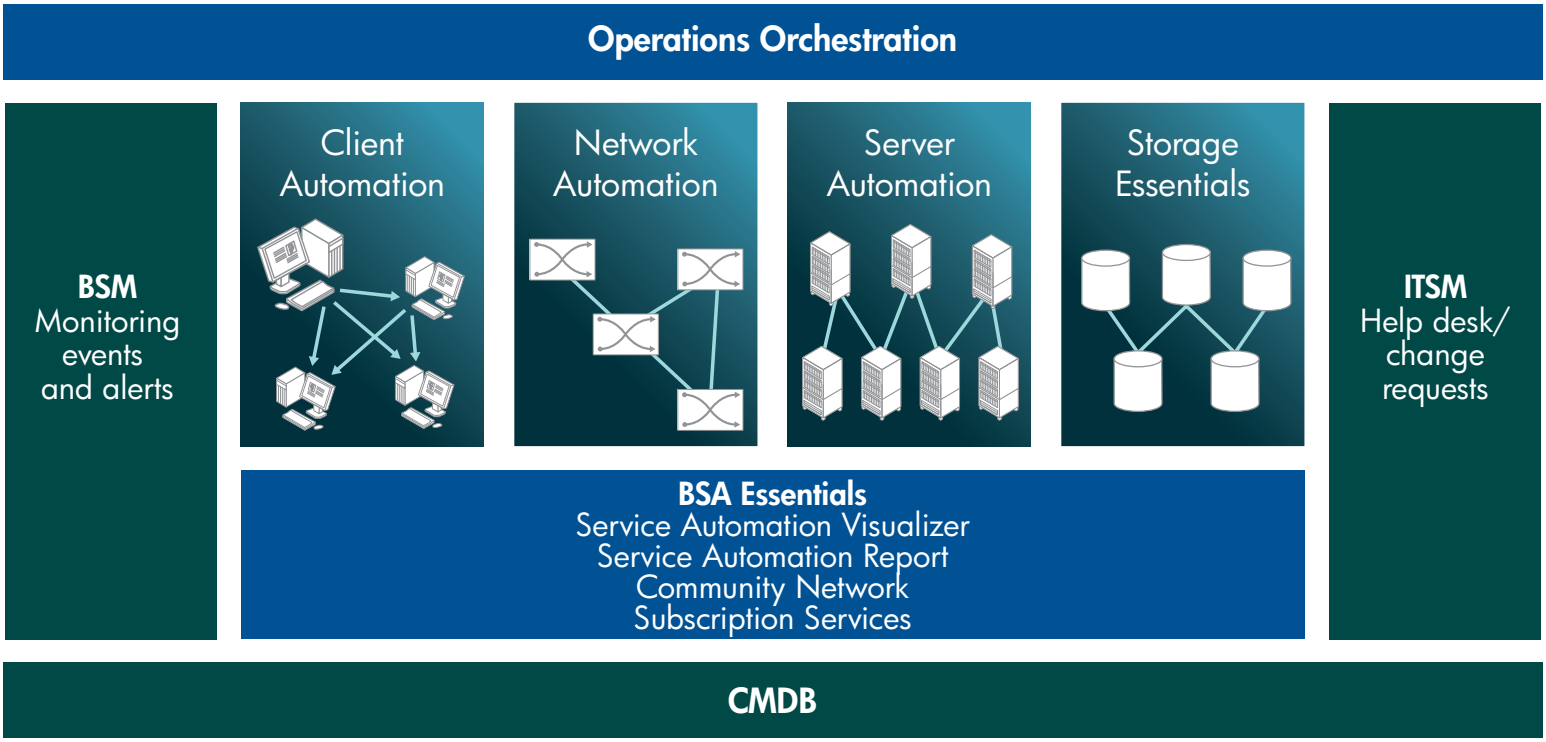
It should also be noted that the ROI for each project can be parlayed to fund future projects on the roadmap. This is one of the advantages of a phased approach to data center automation. The aim should be to perpetuate a self-funding mechanism where the financial benefits of one project are funneled into the subsequent project. This can help overcome funding resistance on the part of the executive leadership.

Mapping milestones and KPIs

For longer term, multi-phase initiatives such as data center automation, tracking progress is essential to keeping the organization focused. This is best accomplished by determining milestones and key performance indicators (KPIs) for each project up front. Milestones typically include deliverables such as baseline analysis and functional specifications or specific accomplishments such as gaining signoff across all groups touched by the proposed project.

KPIs focus more specifically on business metrics that measure performance throughout the project such as person hours dedicated or money spent on outsourced assistance. These KPIs can be established ahead of time and adjusted over the term of the project as mitigating factors demand consideration. In any case, the KPIs form the baseline against which project team performance is measured. By itself, the mere existence of a clear standard of performance can serve as a powerful tool that helps instill confidence in the executive leadership sponsoring the initiative. What's more, clearly articulated milestones and KPIs can help the project team—including the impacted IT groups—focus attention more effectively in the pursuit of project success.

Figure 2
HP service-centric, integrated automation suite



HP and data center automation: on the fast track to value

HP Software and Solutions is uniquely positioned to deliver the software and services you need to enable a successful data center automation initiative. Wherever you are on the automation maturity curve, our seasoned consultants can work with you to analyze your processes, determine your baseline starting point, build an informative roadmap, and efficiently execute projects that generate positive ROI and the confidence to continue moving forward.

Specific software used to facilitate data center automation is drawn from the business service automation tools and applications found in the HP Data Center Automation Center. These include:

- **HP Server Automation software** enables you to automate across the complete operational lifecycle of servers and software, including bare metal provisioning, patch management, software deployment, configuration management, application deployment and rollback, and audit and compliance.
- **HP Operations Orchestration software** automates IT processes, allowing you to automate the triage, troubleshooting, and repair of incidents and alerts as well as change and configuration management and repetitive maintenance tasks.
- **HP Network Automation software** provides real-time visibility, automation, and control for network compliance, security, and measurable cost savings.
- **HP Storage Essentials software** enables you to visualize the server-to-storage supply chain for fast troubleshooting and impact analysis, and gives you global visibility and utilization of your reporting storage infrastructure.
- **HP Business Service Automation (BSA) Essentials software** provides a flexible reporting engine that enables you to analyze and report on the servers and network devices deployed in the environment and their compliance status. HP BSA Essentials also provides a portal along with the content, infrastructure, and services that your user community needs to post and access security updates, compliance policy checks, and content and application management profiles.
- **HP Service Automation Visualizer software** gives you a complete, global, interactive picture of your environment, including all servers, software, network devices, storage, configurations, and interdependencies.

Complying with ITIL v3 recommendations, all of these tools and applications support objectives that are common to business service management (BSM) and IT service management (ITSM). These include service health monitoring from the end-user perspective, run-time service modeling to map infrastructure components to business services, information cataloging, and service desk management integration.

In addition, HP offers an array of services to help with your data center automation initiatives. These include:

- **Business and technology advisory services**—assessment, workshop, and roadmap services that verify that solution investments meet business needs
- **Solution consulting services**—strategy, design, and implementation services for automating, integrating, and optimizing your data center
- **Education and training**—knowledge transfer services so that your IT staff can manage your automated data center effectively and maximize the value of your software investment
- **Solution management services**—comprehensive support services that build on foundational and premier support options for your custom data center automation solution

Combined with HP software, these services can help you move forward with your data center automation initiative—enabling you to drive down IT costs, ensure compliance, and improve your ability to maintain competitive advantage in a fast-moving business environment.

Learn more.
To find out more about how HP can help you manage a successful data center automation initiative, call your HP representative today or visit us online at **www.hp.com/go/btoprofessionalservices**.

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