The New Era of IT Automation for Digital Business

Support diverse infrastructures, disparate data sources, and accelerated application development with digital business automation

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Executive Summary

Many companies are aggressively working to transform their businesses to stay ahead of new digital competition. However, there simply is not a way to keep up with the required pace of change without automation.

Delivering digital transformation requires a new and comprehensive automation platform approach—Digital Business Automation. This next wave of IT automation builds upon and bridges existing infrastructure, data, and application

technology platforms with new, emerging digital-first technologies and processes. By automating in comprehensive new ways, development and operations teams can deliver innovation at the speed that business requires.

This white paper focuses on how IT automation needs to change for infrastructure, data, and applications to support digital transformation and achieve true Digital Business Automation.

INTRODUCING DIGITAL BUSINESS AUTOMATION

The effects of digital disruption are everywhere: new competitors suddenly appear, product lifecycles are shorter, profit margins are under pressure, and customers are harder to engage and easier to lose to digital-savvy competitors.

An estimated 80 percent of current products and services will be digitized, eliminated, or reinvented by 2020[1], and 75 percent of the S&P 500 will turn over in the next decade.[2]

To thrive in this environment, companies need to operate in ways their current information systems environment may not support.

Given all the pressure to go faster with higher quality, **companies are struggling to build upon their existing IT technology platforms and integrate these new digital-first automation capabilities and processes**. We believe a new approach to IT automation is needed, one that deals with the challenges of bridging from existing architectures to new modern tools, and one that enables development and operations teams to build new bridges of collaboration that can improve DevOps performance, and most importantly, results. This new approach is Digital Business Automation.

CHANGE IS NECESSARY

There are many types or categories of traditional IT automation. Workload automation, which includes enterprise job scheduling and management solutions, is at the forefront of addressing the business challenges of this changing market dynamic. Unlike other automation tools or categories, enterprise job scheduling tools exist at the heart of an IT organization, delivering the mission-critical business application processes in a holistic and interdependent way across highly heterogeneous infrastructures. They also deliver different forms of data from a variety of sources for "system of record" and "system of engagement" applications. Traditional workload automation applications live and work at the nexus of these key enterprise technology platforms.

It is not easy to transition from the current state to the many new digital-first technologies that are emerging, including software-defined infrastructures and containers, NoSQL and Internet of Things (IoT) data, and applications that are on-premises or in a hybrid cloud. In addition, an entire new class of automation tools have emerged to drive continuous integration and continuous delivery (CI/CD) of new applications in the software development lifecycle (SDLC) pipeline. CIOs and VPs of application development are under immense pressure to create smooth paths from the current state to the future technology ecosystem state. Furthermore, they must build new bridges between traditional IT organization and management with new philosophies and processes, such as DevOps, to drive agility, innovation, speed, and quality.

Three areas of change include:

- **Infrastructure**: The infrastructure for processing, delivering, and storing existing and emerging forms of data is changing dramatically. However, beyond the mainframe, enterprises are shifting their mix among private, public, and hybrid clouds, using more appliances and containers, and virtualizing or software-defining nearly everything.

- **Data**: There are plenty of interesting and often quoted statistics that document how the volume of data is growing, but focusing on the numbers tends to overshadow how the nature of the data is changing. **Enterprises are already working with more volume and forms of unstructured data than they have ever before, and will need to support even more** as social media, machine-to-machine (M2M), IoT, and other technology programs evolve.

- **Applications:** With applications, the most dramatic change in applications is the faster speed of development. Many organizations are embracing DevOps, with high performing companies deploying 200 times more frequently than low performers.[3]

1 "Gartner Predicts Three Big Data Trends for Business Intelligence,"
   Forbes, February 12, 2015, http://www.forbes.com/sites/gartnergroup/2015/02/12/gartner-predicts-three-big-data-trends-for-business-intelligence/#6b9944de66a2
2 "Where Do Firms Go When They Die?" The Atlantic, April 12, 2015, https://www.theatlantic.com/business/archive/2015/04/where-do-firms-go-when-they-die/390249/
3 Puppet Labs and DORA (DevOps Research & Assessment) "2016 State of DevOps Report"

> "Modern IT means multiple cloud environments, big data, advanced analytics, and an increased rate of change to existing and new applications. More workloads are focused on collecting a variety of data types. All that data must be moved, stored in big data environments, and processed through analytics tools. The digital transformation that is overtaking enterprises in all industries is further complicating the task of managing the changing workload landscape."
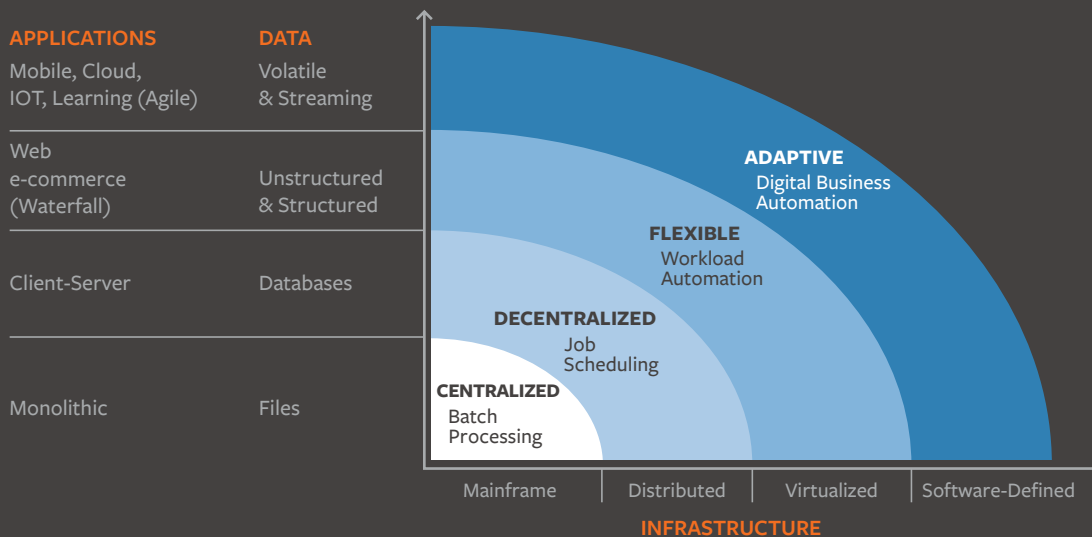
EMA Radar
Issues and Priorities in Modern Workload Automation Supporting Analytics, Continuous Delivery, and Digital Transformation
December 2016

The net effect of these changes is that **organizations need automation tools that can adapt to change and unknown futures, while still delivering stability and reliability to support the existing systems and processes that the business depends on**. BMC has supported the workload automation space for many years and has seen the space evolve from the era of batch processing on mainframes, to decentralized job scheduling, to flexible workload automation in the cloud.

The graphic below summarizes how today's workload automation has evolved and how it needs to continue to evolve to solve the challenges of digital business. Delivering digital transformation requires a new and comprehensive automation platform approach: Digital Business Automation. This emerging fourth wave of IT automation builds upon existing infrastructure, data, and application technology platforms, and adapts to and provides a path to the emerging digital-first technologies and processes to ensure continuous development-to-operations scalability and operational excellence.

WE'RE ENTERING A FOURTH WAVE OF AUTOMATION

APPLICATIONS	DATA
Mobile, Cloud, IOT, Learning (Agile)	Volatile & Streaming
Web e-commerce (Waterfall)	Unstructured & Structured
Client-Server	Databases
Monolithic	Files

ADAPTIVE
Digital Business Automation

FLEXIBLE
Workload Automation

DECENTRALIZED
Job Scheduling

CENTRALIZED
Batch Processing

Mainframe | Distributed | Virtualized | Software-Defined

INFRASTRUCTURE

WHAT SPECIFICALLY NEEDS TO CHANGE

Traditional workload automation is necessary but no longer sufficient and needs to change because infrastructure, data, and applications are rapidly converging and taking new forms. In this new fourth wave of automation, the primary objective is to be adaptive in helping IT organizations create new ways of doing business. Being adaptive means building upon existing resources, not leaving them behind. Enterprises must adapt existing infrastructure, data, and applications to take advantage of the emerging set of digital-first technologies as they go on their digital transformation journey.

Adaptive to Infrastructure

Today's essential workloads still need to run on-premises and in a multi-cloud environment, from mainframe to mobile and on any operating system platform. To achieve this, digital business requires platform-agnostic workflow automation that can

coordinate jobs and seamlessly pass data across a highly heterogeneous infrastructure. That infrastructure could include ERP and line-of-business applications, big data systems, social, IoT, and other data streams—all running on physical or software-defined infrastructure in a fluid combination of on-premises hardware and public and private clouds.

BMC has seen companies approach this dilemma by maintaining separate systems to manage workloads for different platforms, IT environments, and business units. This approach creates silos of automation that are difficult to integrate, especially when data sources must be shared for workflows on different systems. Seemingly simple tasks like synchronizing file transfers become very problematic and cause job failures on multiple systems. Users must be able to visualize and monitor 100 percent of enterprise jobs and application workflows from one screen without having to run multiple management systems.

Case Study: Unum Group

Unum Group, a multinational Fortune 500 company that provides employee benefits services, has evolved its infrastructure over the last 20 years from being 80 percent mainframe/20 percent distributed systems-based to 80 percent distributed systems/20 percent mainframe-based. Unum has managed this evolution with a single workload automation system, Control-M from BMC, that runs across its mainframes and servers, including on-premises and in the public cloud. The system is so automated today that access has been extended to 700 business users, who can schedule and monitor their own jobs using self-service functions. By using automation and self-service to decentralize operations and reduce dependency on specialists, Unum has enabled business users to access and interact with their core business applications to better serve their customers, and has achieved a **15x increase in the number of jobs it processes each month, with 60 percent fewer service requests from users to the IT department**.

Adaptive to Data

"Know your customer" is a foundational competitive advantage for digital business and is the driving motivation behind many big data projects and customer engagement application products. Knowing your customer is mission-critical, but achieving this can be a massive, data-intensive challenge. Gartner and IBM have calculated that by 2020, the average person will generate 1.7MB of data per day.[4] Most of that data isn't important to enterprises, but they still will need information systems to process this data. The Digital Business Automation system serves as a crucial conductor or orchestrator for accessing data from different sources and routing the data to the different systems and workflows that need it, exactly when they need it, and in the right sequence.

How can automation adapt to these changing data needs?

Automation must be able to manage file transfers and other data exchanges, including big data ingestion across different IT architectures. **File transfer should be part of an integrated, automated, and secure workflow process**, and not a separate process in a siloed organization. File transfer automation should also provide expected conveniences, such as end user self-service from desktop and mobile devices, centralized, single view status monitoring for all file transfers and associated workflows, and automatic retry when a transfer is interrupted.

Case Study: Navistar

International commercial truck manufacturer Navistar launched its OnCommand™ service that uses performance data collection from vehicle sensors to recommend when vehicles should have preventive maintenance. Navistar collects data on over 250,000 customer vehicles, which amounts to more than 20 million data records per day. The program uses a combination of traditional data (e.g., mileage) and IoT sensor data, and is processed in the Hadoop environment. Navistar manages its Hadoop big data workflows with Control-M from BMC, the same automation platform that runs its traditional batch processes. As a result, Navistar is able to deliver proactive and preventative maintenance information in real-time to its customers, and schedule repairs at the right depot location with the right parts to maximize vehicle uptime. **For Navistar customers, OnCommand has delivered a 40 percent reduction in unplanned downtime and 30 percent improvement in unplanned repairs—a critical bottom line business benefit in a highly competitive transportation industry**. Additionally, all this capability is delivered from a single point of control, managing more than 20,000 workloads that span Navistar's oldest and most cutting-edge systems, such that Navistar now gets actionable IoT datasets five times faster.

Adaptive to Applications

The clear imperative for businesses is to innovate faster, which means developers must deliver new digital services more frequently. **Development cannot be conducted in a vacuum and needs to account for the realities of how jobs will run and interact with other applications in the production environment**.

4 EMC Corporation, *IDC Digital Universe Study: Big Data, Bigger Digital Shadows and Biggest Growth in the Far East,* December 2011.

Organizations have traditionally used different tools and philosophies within the development and operations teams. One team is all about speed while the other all about stability. DevOps aims to break down these barriers and create a united, collaborative team to achieve both speed and stability. Most application development and releases are done with open source tools, while production and scheduling are done with a series of application-provided job schedulers, enterprise workload automation solutions, or scripting. The incompatibility of these tools causes friction between development and operations teams, even in the most mature organizations.
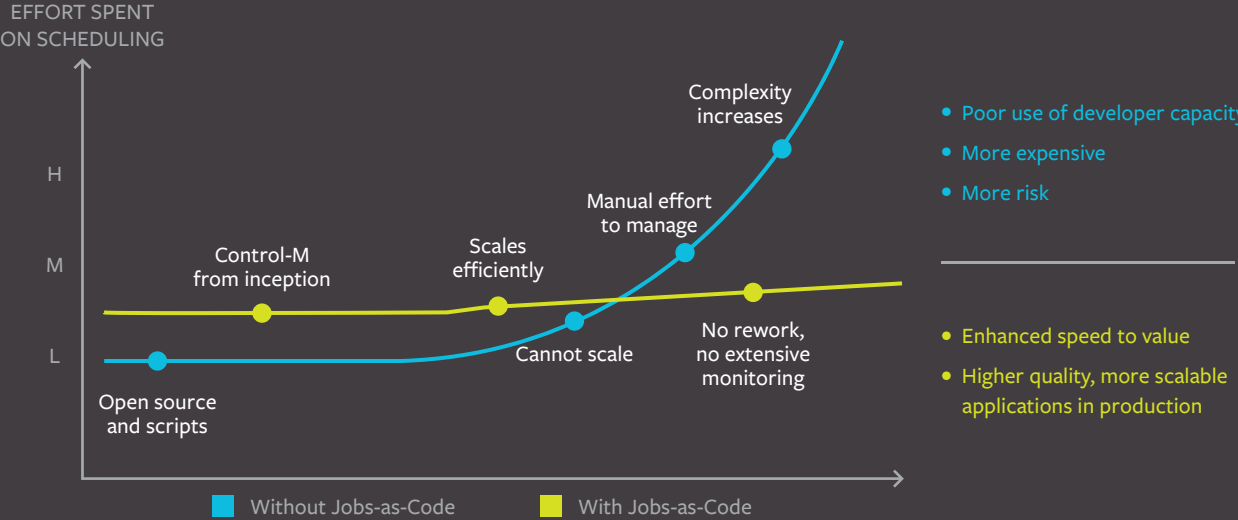
Here is an opportunity to apply the shift-left concept to bring development and operations closer together. If developers could build job scheduling and production controls into their code from the beginning, the testing, debugging, promotion, and scheduling phases could be more automated and operations teams could deploy with much higher confidence and less rework—enabling new business services faster with higher quality.

> "DevOps engineers can fully integrate the building, testing, and deployment of applications into their existing tool chain. The organization gets business services that are fully tested, ready for their production environments, and have the highest levels of reliability, availability, and serviceability. This shift-left job flow management improves application delivery, speed, and quality, while reducing risk and unnecessary rework."

Enterprise Strategy Group
Why Companies Need an Enterprise-Class Workload Automation Solution
January 2017

Digital Business Automation can give developers the means to create the jobs that will run their services and embed Jobs-as-Code into their applications. The artifacts that define jobs can be created using familiar, code-like notation, stored in an SCM with the code that implements the business logic, and managed just as any other source code or configuration file. When jobs and business logic are developed, stored, tested, promoted, and run together, there isn't an opportunity for them to diverge and ultimately require rework. Developers do not need to learn workflow schedulers or specialized scripting, and operations staff can put new services straight into production without rounds of preparation and testing. Furthermore, the Jobs-as-Code model is compatible with all CI/CD automation tools.

SHIFT-LEFT APPLICATION AUTOMATION WITH JOBS-AS-CODE

EFFORT SPENT ON SCHEDULING

- Complexity increases
- Manual effort to manage
- Scales efficiently
- Control-M from inception
- Cannot scale
- No rework, no extensive monitoring
- Open source and scripts

- Poor use of developer capacity
- More expensive
- More risk

- Enhanced speed to value
- Higher quality, more scalable applications in production

■ Without Jobs-as-Code   ■ With Jobs-as-Code

DEVELOPMENT PROCESS   Plan > Code > Build > Test > Package > Release > Deploy > Configure > Operate

Case Study: Large Retailer

One of the world's largest retailers used the Jobs-as-Code approach with its DevOps team to automate its development and deployment. The time needed to change a job and deploy it from Jenkins into production to Control-M was decreased from three hours to three minutes. This enabled them to implement application changes faster, and that led to more than double the number of stores fulfilling online orders during a peak holiday season, increasing comparable sales by 42 percent year-over-year. The Jobs-as-Code approach can reduce overall time to deploy workflows by 80 percent, application failure rates by 25 percent, and mean time to repair by 30 percent.

CONCLUSION

The rapid innovation and digital business disruptions occurring now will result in much different IT and business environments by 2020, with implications going far beyond. The emerging requirement is not only for companies to innovate and execute faster, but they must also accommodate the technological changes and innovations that are occurring in infrastructure, data, and applications. A new form of automation must evolve to meet these challenges as organizations will need automation that is specific to running the business in the digital age. Organizations must transition from traditional workload automation to Digital Business Automation, an adaptive approach to IT automation that builds on today's foundation and utilizes new technologies and processes—delivering greater operational efficiency and new business growth.

Control-M from BMC delivers Digital Business Automation—the next wave of IT automation beyond traditional workload automation—to meet the challenges of automating rapidly evolving software-defined infrastructures, massive and highly volatile data streams, and the demands of continuous integration and continuous application delivery.

FOR MORE INFORMATION

To learn more about Control-M, please visit
bmc.com/it-solutions/control-m

BMC is a global leader in innovative software solutions that enable businesses to transform into digital enterprises for the ultimate competitive advantage. Our Digital Enterprise Management solutions are designed to fast track digital business from mainframe to mobile to cloud and beyond.

BMC – Bring IT to Life   **BMC digital IT transforms 82 percent of the Fortune 500.**

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