Modernizing Workload Automation

Increasing Business Resiliency and Empowering DevOps With Workload Analytics

AN ENTERPRISE MANAGEMENT ASSOCIATES® (EMA™) INFOBRIEF
PREPARED FOR BROADCOM
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EXECUTIVE SUMMARY

Workload automation (WLA) software is involved in a majority of the applications and processes overseen by IT, and includes detailed documentation and results of the intended and actual outcomes. While WLA software has matured well past the initial job scheduling functions to become a key component of IT operations automation, WLA tools are more focused on the task of executing, monitoring, and alerting on workloads. They are not highly focused on analyzing the trends and outcomes over time. Analytics tools, particularly those specifically designed to analyze workload data, allow for the optimization of WLA. However, WLA analytics is often mischaracterized as simply and only WLA optimization. WLA analytics provides a powerful 30,000-foot view of all IT workloads and includes the ability to deep dive into the specifics around every IT outcome important enough to have been defined in and controlled by the WLA software in the first place. WLA data is a rich source of valuable information that should be used to advise a broad array of IT and business decision-making. The power of WLA analytics actually extends far beyond WLA optimization to include:

- Migration rationalization
- Risk mitigation
- DevOps support
- Business resilience

Broadcom was one of the first organizations to bring predictive analytics and visualization to workload automation, inspiring many companies and products with internal capabilities. Organizations with complex needs or multiple schedulers can quickly exceed the internal analytics capabilities of even the best WLA products, and will benefit from an integrated analytics solution specifically built to optimize and increase visibility around WLA environments.

To better understand the motivations for adopting WLA analytics, along with its uses and benefits, Broadcom engaged Enterprise Management Associates (EMA) to design and conduct a survey of 158 U.S.-based IT and business WLA users during May 2019. This report summarizes the findings.

STUDY OBJECTIVES, METHODOLOGY, AND DEMOGRAPHICS

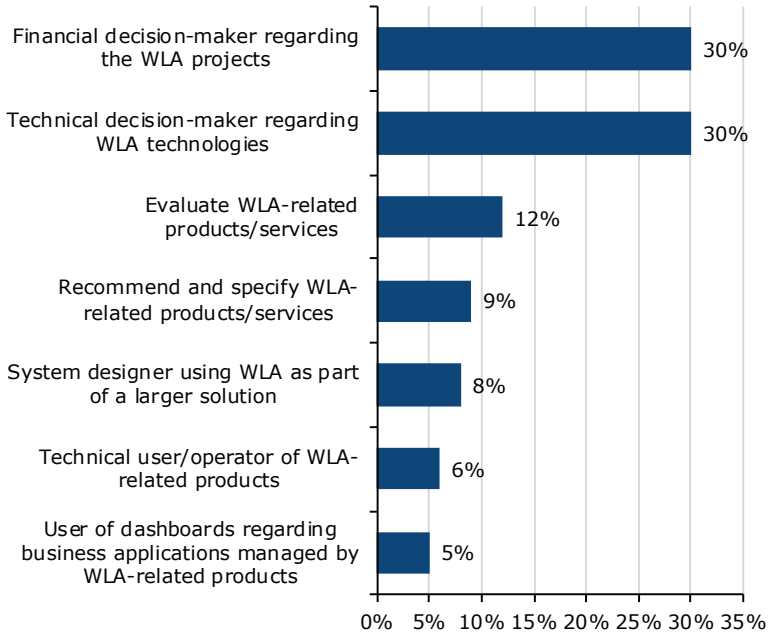
Broadcom engaged EMA to design and conduct a study of workload automation (WLA) users in North America to measure the impact of WLA analytics on enterprise IT operations. EMA conducted a web-based, email invite survey of 158 U.S.-based IT and business WLA users during May 2019.

Respondents belonged to organizations in a variety of industries, including software (15%), managed service provider (13%), manufacturing (11%), finance/banking/insurance (10%), retail (8%), education (8%), healthcare (7%), government (5%), and others (26%). These organizations range in revenues from less than $1 million to over $1 billion, with 65% being over $100 million.

To qualify for the survey, respondents had to work in organizations with at least 500 employees and be familiar with any WLA software used in their organization. For business users, who made up 10% of respondents, familiarity with WLA meant using dashboards to monitor or even start or restart jobs important to their line of business. For IT executives, who made up 25% of respondents, familiarity with WLA meant being a financial decision-maker, using dashboards to track job statuses or doing some more detailed WLA tasks. The remaining 65% of respondents were mid-managers, team leaders, or individual performers in a variety of IT departments for whom familiarity with WLA meant performing at least two WLA-related administrative or job definition tasks on a regular basis.

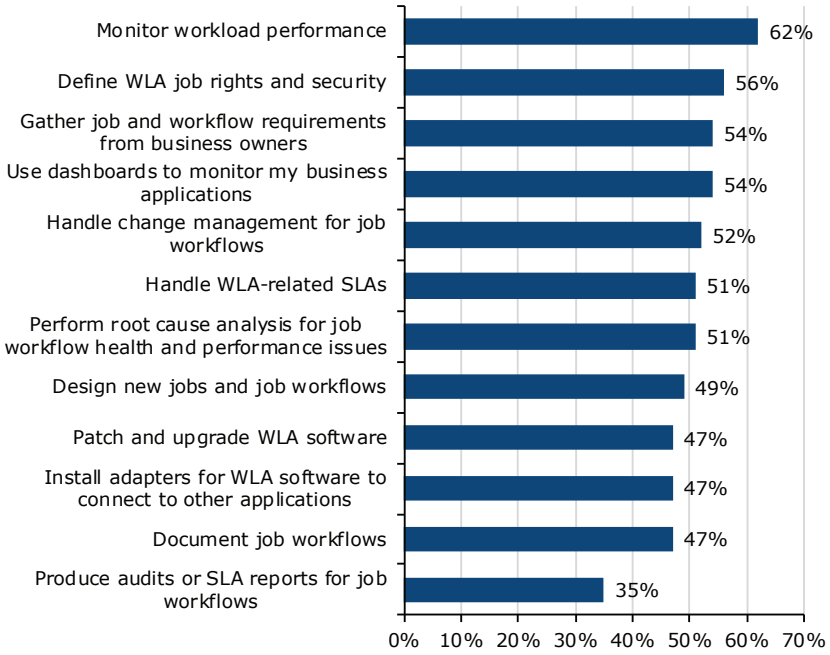
EMA believes this is a good representative sample of users of WLA and WLA analytics.

What is your role when it comes to selecting and implementing workload automation (WLA) technologies/solutions within your organization?



Sample Size = 158

Which of the following job functions do you perform?



STATE OF WLA

The workload automation market is one of the oldest IT management software spaces. Early business use of IT was batch-focused and the need to run jobs at certain times, on certain days, or when certain other jobs had finished, was quickly identified and addressed. Over the past 40 years, this class of software has evolved and adapted to encompass mainframes, mid-range, and distributed systems. It has added complexity to define business-specific calendars, handle complex month-end close requirements, and added event-based scheduling, reporting, file transfers, dashboards, and a host of other modern features. WLA continued to adapt and added support for cloud, big data, and containers. It has evolved right along with the rest of the industry and remained a central key form of management and automation for IT operations. WLA touches nearly every application, file, and function of modern enterprise IT. There are over 20 WLA products on the market, and respondents to this study represent users of nearly every product.

With such an important role to play in the IT operations of large enterprises, WLA is not without challenges to operate and manage. While some organizations have more than one million jobs defined, 58% of those surveyed have less than 25,000 jobs, with 1,000 to 5,000 being the most common number of jobs. For 75% of those surveyed the number of jobs is increasing, with 10% to 25% annual growth being the most common growth rate reported.

As a class of software, WLA has done a very good job of adapting to and absorbing new trends. Most vendors have modernized the software to include open APIs that allow users to make their own integrations to better control a wide variety of applications. Still, the most mentioned functional deficiency is ease of integration and a need for more robust APIs. The reality of modern IT, stressed by the drive to digitally transform business processes, has increased the pressure on WLA software to be even more open. Other key deficiencies mentioned include training time and finding or retaining experienced staff, security, and reliability.

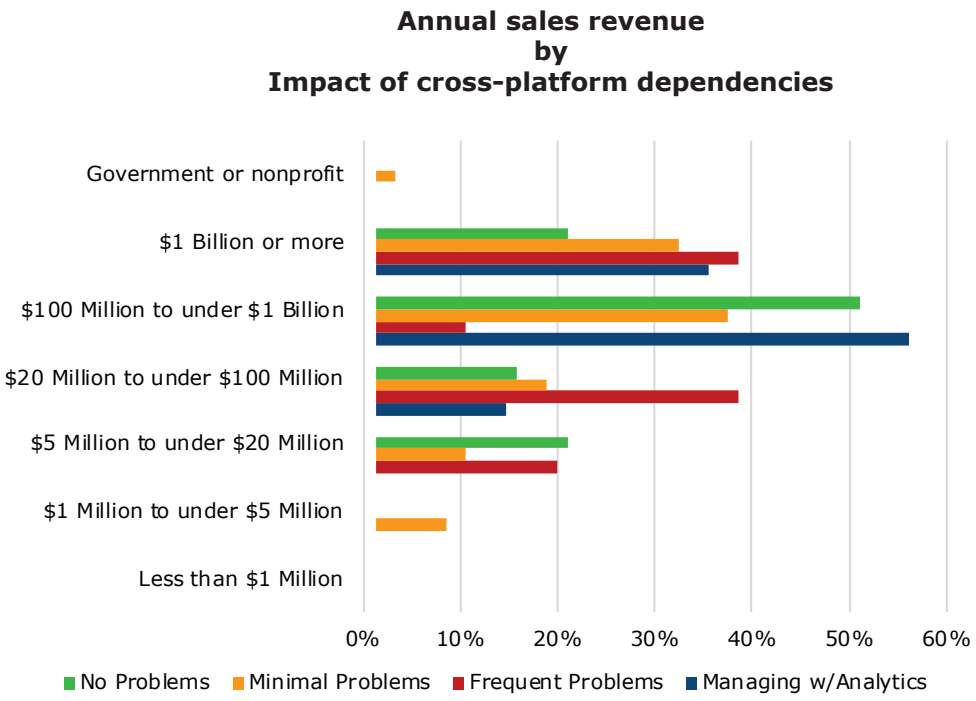
Respondents were also asked to name the three key pain points to operating WLA software. Cost (29%), software upgrades (27%), and high training requirements (27%) top the list. Performance monitoring (19%), ability to scale (18%), and ability to connect business applications (16%) were the next-most frequently mentioned pain points. Dealing with these and other challenges has led many vendors to consider adding additional WLA products, or migrate to a new product. Over the past six years, EMA has been tracking a trend in enterprise IT operations to switch to new WLA software. In 2016, EMA research revealed that 52% of organizations using enterprise-class WLA software were considering switching to a different WLA product. By 2018, this dropped to 44% of WLA users because many organizations had already migrated to a new solution.

While many vendors have adopted a new WLA solution, some still have the old solution in use, too. Others have accumulated several WLA tools over the years as a result of acquisitions or different divisions making their own product selections without an overall effort to standardize. Such a pervasive IT management tool as WLA software is not something to swap out lightly. Many organizations fear the migration process. However, modern demands on IT for faster development, application modernization, and digitalization of business processes often outweigh the fear and effort of migrating. Nevertheless, many organizations can remain stuck in analysis paralysis as they struggle with the challenges. The result is that 60% of organizations have more than one WLA product in use.

TOP 5 REASONS FOR MULTIPLE WLA PRODUCTS

1. Different groups require different scheduling tools	40%
2. Legacy systems	37%
3. Knowledge gap between different WLA solutions	36%
4. Functionality limitations	35%
5. In the middle of migrating from one to another	35%

Running multiple WLA products can create challenges when end-to-end processes span different schedulers. Of those with multiple WLA products, 77% have cross-platform dependencies. The challenges of multiple products are well tolerated by 49%, cause regular problems for 12%, and are managed using an integrated analytics solution providing a consolidated view by 16%. The following chart shows a breakdown of the impact of cross-platform dependencies by revenue. Larger organizations tend to have more issues with cross-platform dependencies. The group with $100 million to under $1 billion in revenues had the most issues, but more than 50% are managing those dependencies with analytics solutions that use data from multiple products to provide a single, holistic view. Fewer of those in the $1 billion or more group (32%) have applied analytics, while many more (35%) are still struggling with cross-platform dependencies. While many are using analytics solutions to mitigate the cross-platform dependencies, 88% of those running multiple WLA products plan to consolidate onto one WLA product.



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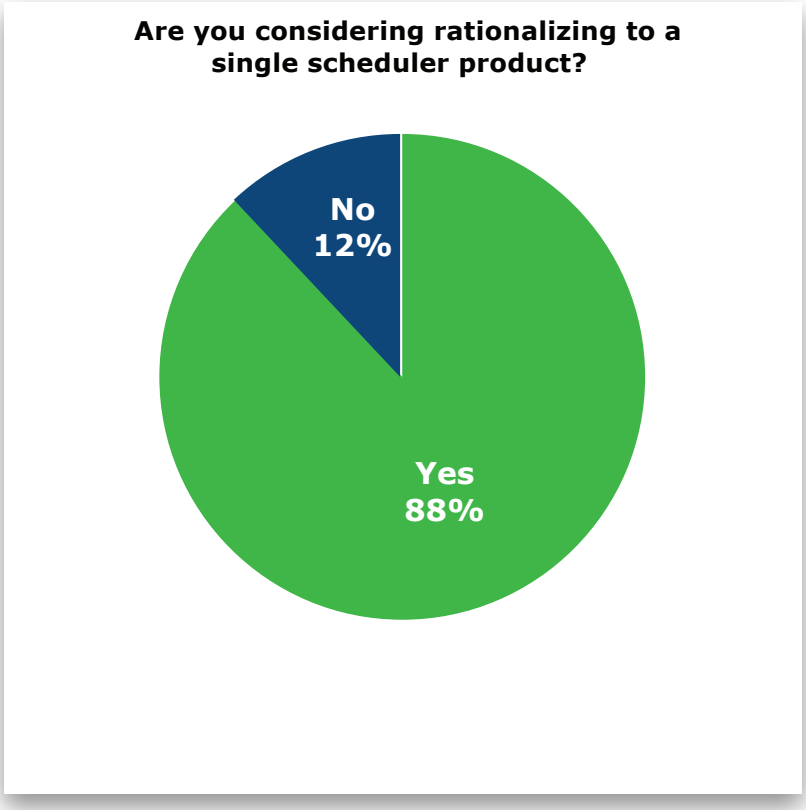


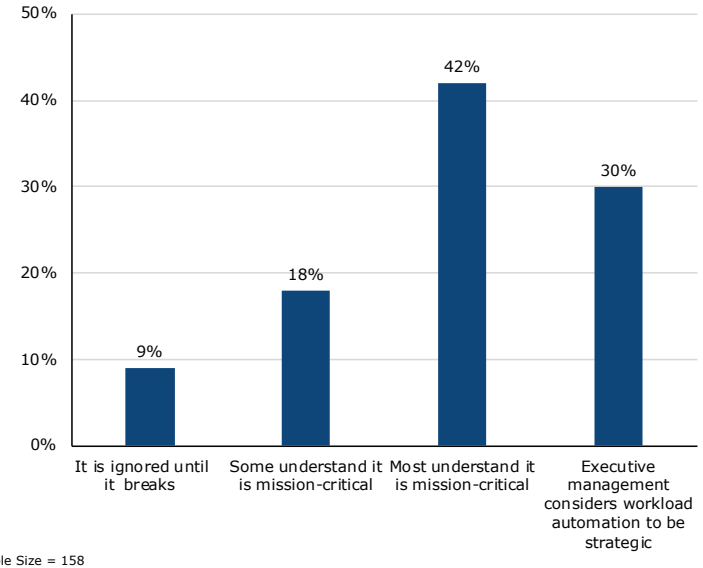
With all the changes in IT, WLA has adapted well. One outcome has been recent consolidation in the market since a number of acquisitions have taken place in recent years. This added increased pressure on organizations to consider their long-term solution to scheduling and automation management.

ANALYTICS IMPROVES WLA OPTIMIZATION AND MANAGEMENT

As the WLA market continues to mature and adapt to new IT trends, and as vendors continue to consolidate through acquisitions, users will experience additional challenges. Analytics for WLA helps in many ways to improve management of WLA, particularly when multiple products are involved. One major advantage of WLA analytics is better visibility for both IT and business users. There has been a trend in recent years in IT to be more transparent to business users and for IT to be more aware of the business impact(s) of IT outcomes. In fact, 80% of respondents believe they are business-aware and can identify the business impact of workflow changes or failures.

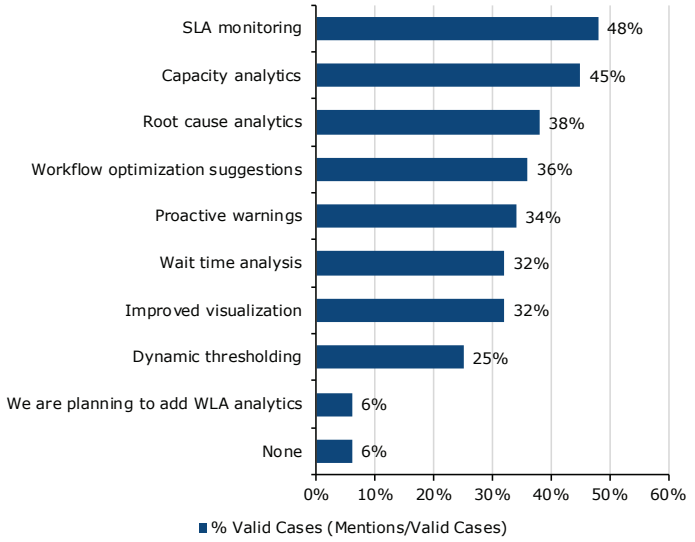
Respondents were asked how they think business executives feel about the batch environment, and 81% believe business executives have at least some understanding of the importance of batch processing outcomes. However, as shown in the following chart, only 30% have executive management teams that consider workload automation to be strategic. This is in line with other EMA research, which also showed that those organizations with executives who see workload automation as strategic generally have fewer missed SLAs, better success with DevOps, and are moving faster to achieve digitalization efforts. Of those using WLA analytics, 68% said business owners are contributing to the need for WLA analytics, while 22% said business owners are driving the need for WLA analytics, and just 10% said business owners are completely unaware of WLA analytics.

How do you think business executives feel about your batch processing environment and outcomes?



Sample Size = 158

What type of analytics capabilities does your organization currently have in production?

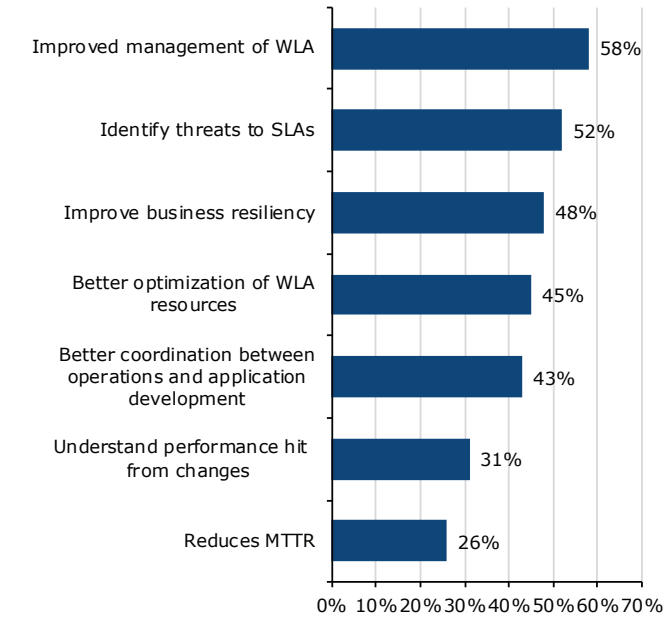


Sample Size = 158, Valid Cases = 158, Total Mentions = 476

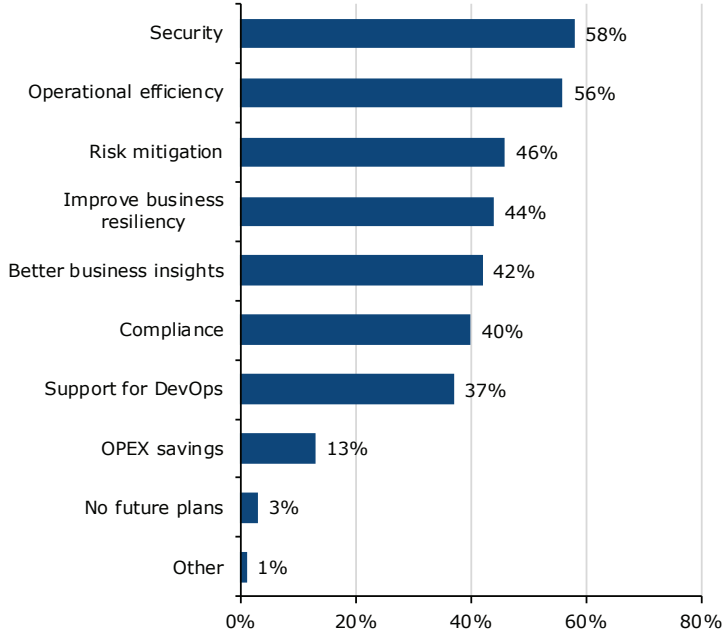
Eighty-five percent agree or strongly agree that their business would benefit from executives who better understand the impact of batch processing. When asked what could help executives better understand the importance of workload automation, 67% selected improved dashboards, 53% selected trend-based reporting, 52% selected alerts, and 44% selected emails. All of these and more can be improved with good workload analytics. The next chart shows the key WLA-related pain points that analytics can address. Prioritizing issues and capacity planning are the highest-ranked pain points that analytics can address.

Many (88%) are using some form of analytics with WLA as shown in the chart, with SLA monitoring (48%), capacity analytics (45%), and root cause analytics (38%) topping the list. Many WLA products include some analytics and 49% are using what is in their WLA product, while 39% are augmenting with a general-use analytics solution. Thirty-two percent are using integrated WLA-specific analytics like those from Broadcom. Of those using any form of analytics with WLA, 89% believe predictive analytics helps make WLA more efficient and aligned with the business.

Asking respondents specifically about the benefits derived from WLA analytics, 58% mentioned improved management of WLA. That in and of itself is powerful.



However, 52% mentioned identifying threats to SLAs, 48% mentioned improved business resiliency, 45% mentioned better optimization of WLA resources, and 43% mentioned better coordination between operations and application development. When asked about the key reasons for future investments in WLA-related analytics, the top five responses were security (58%), operational efficiency (56%), risk mitigation (46%), improved business resiliency (44%), and better business insights (42%). Also mentioned were compliance (40%), support for DevOps (37%), and OPEX savings (13%). Only 3% had no plans to make future investments in WLA-related analytics.



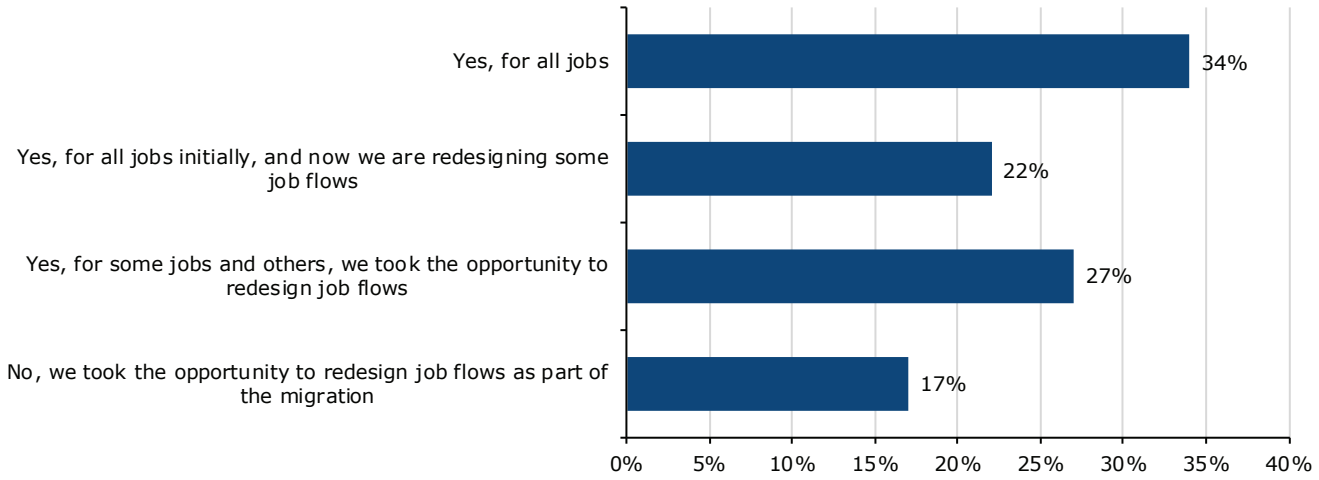
WLA analytics provides a means to manage workload infrastructure (server, network, storage, and performance) through a central dashboard. Only 4% of those surveyed said they did not have a requirement for a central dashboard, while 58% have the capability and find it effective, with 16% saying they have the capability but do not find it effective. Some are planning to add a central dashboard within the next 12 to 24 months (17%) and the remaining 4% have no plans, but would like to have a central dashboard.

These are all important topics, and any large IT organization should avail themselves of the benefits of analytics in conjunction with their WLA environment. Four of the most important benefits of WLA-related analytics are highlighted next.

I. MIGRATION RATIONALIZATION

Migration is a big issue in modern WLA. First, because 44% of organizations are planning to change products. Second, because 60% of organizations have multiple WLA products, and 88% of those are planning to standardize on a single product. Migrating WLA is assisted by job discovery and conversion tools offered by most products to assist in moving jobs from current products to the new product. However, this is only the tip of the iceberg, and 66% of organizations end up redesigning some or all job flows during the migration process to address performance or other problems that have been tolerated for years in the old WLA system. Of those running multiple WLA products, 26% say they are on multiple products because migrations consume too many resources.

Did you use conversion facilities provided with the new WLA software to assist in the migration?



WLA-related analytics can help alleviate the issues of running the wrong WLA product or multiple WLA products. The improvements to operating the wrong or multiple WLA products can be enough to significantly or indefinitely delay a migration. Certainly, operational improvements can allow an organization to schedule the migration with enough time for planning and testing and choose the timing when it is the least disruptive to other organizational priorities.

When the time comes to actually migrate, WLA-related analytics can be invaluable in fully understanding the current environment, then in planning and executing the migration. In the planning stages, analytics can bring what-if simulations that allow forecasting and simulating the new environment runtimes and ensuring all dependencies are properly established. Using analytics that can bring cross-platform visibility, migrations can be phased with jobs across both systems that are monitored through a single pane of glass via the analytics solution. Once migrated, analytics can be used to provide post-migration validation, comparing data from workload environments before and after migration. Organizations planning a WLA migration can benefit greatly by first establishing solid WLA analytics to make the process smoother and more predictable.

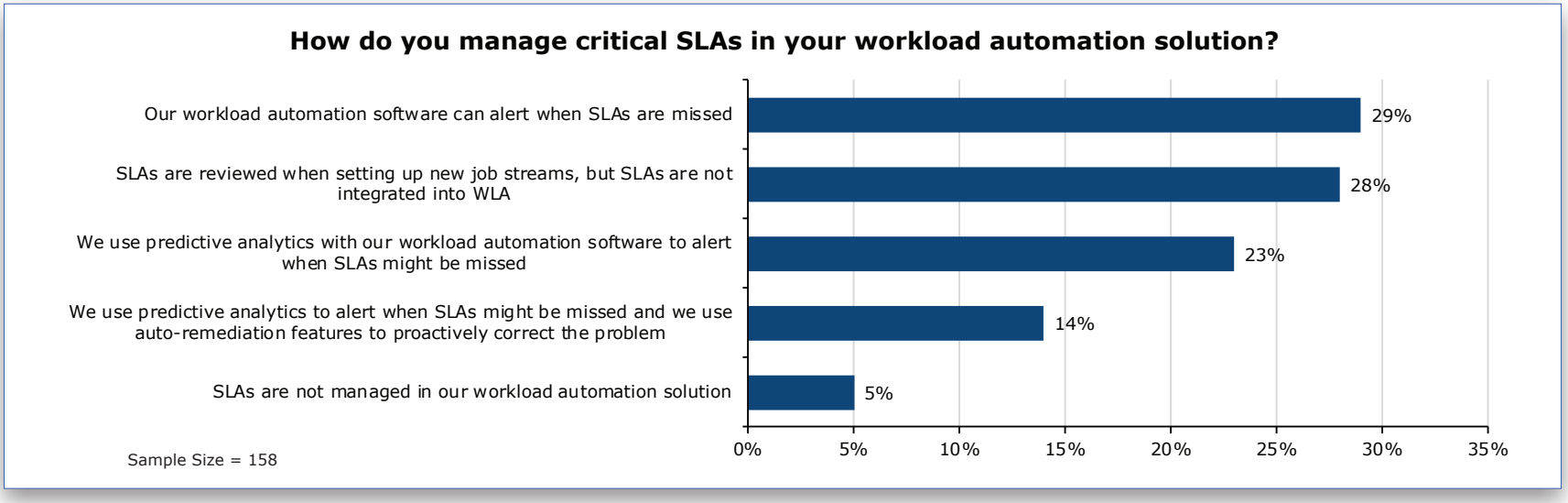
II. RISK MITIGATION

Workload outcomes can directly affect business users, trading partners, and customers. Consistently meeting SLAs is expected. Regularly missing SLAs causes disruption, along with wasted resources fixing the problem and communicating statuses, and harms client and trading partner trust and relationships. Mitigating these risks is a key concern for IT operations.

Mitigating risks starts with having the visibility to understand what is happening in workload automation environment(s). Those with multiple environments have a much more difficult challenge to see everything through a single pane of glass, particularly when there are job streams that span schedulers. Getting a full end-to-end view can be difficult. Of those surveyed for this study, 89% agree or strongly agree that they would benefit from a high-level, business application view of their workload environment. WLA-related analytics can radically increase visibility and help put the focus on problem areas or even potential problem areas before the problems become critical. Analytics data can provide an end-to-end application view that is not available in many WLA products or that can be difficult to assemble when processes run across two or more schedulers. Automic Automation Intelligence users overwhelmingly say that cross-platform visibility and analysis are their primary use cases for using Broadcom's analytics software.

Visibility is only advantageous if the right people can make use of important information. Of those surveyed for this study, 83% agree or strongly agree that processing issues need to be communicated more efficiently. Often, that communication is necessary beyond IT operations and needs to include those on the business side of the house who are affected by workload outcomes. When asked if Broadcom provides data that is easy for business users to consume, 67% said yes, very easy, while 25% would like more dashboards and 8% find that business users do not use this data.

Analytics tools can store and analyze large amounts of historical workload data to identify trends and predict problems before they lead to bad outcomes. It is far better to have a solid understanding of processing volume trends and foresee bottlenecks before SLAs are missed and with enough time to remediate the problem before it is a problem. Ninety-five percent are managing SLAs in some way in conjunction with WLA, with 37% using predictive analytics and only 14% combining auto-remediation features with predictive analytics.

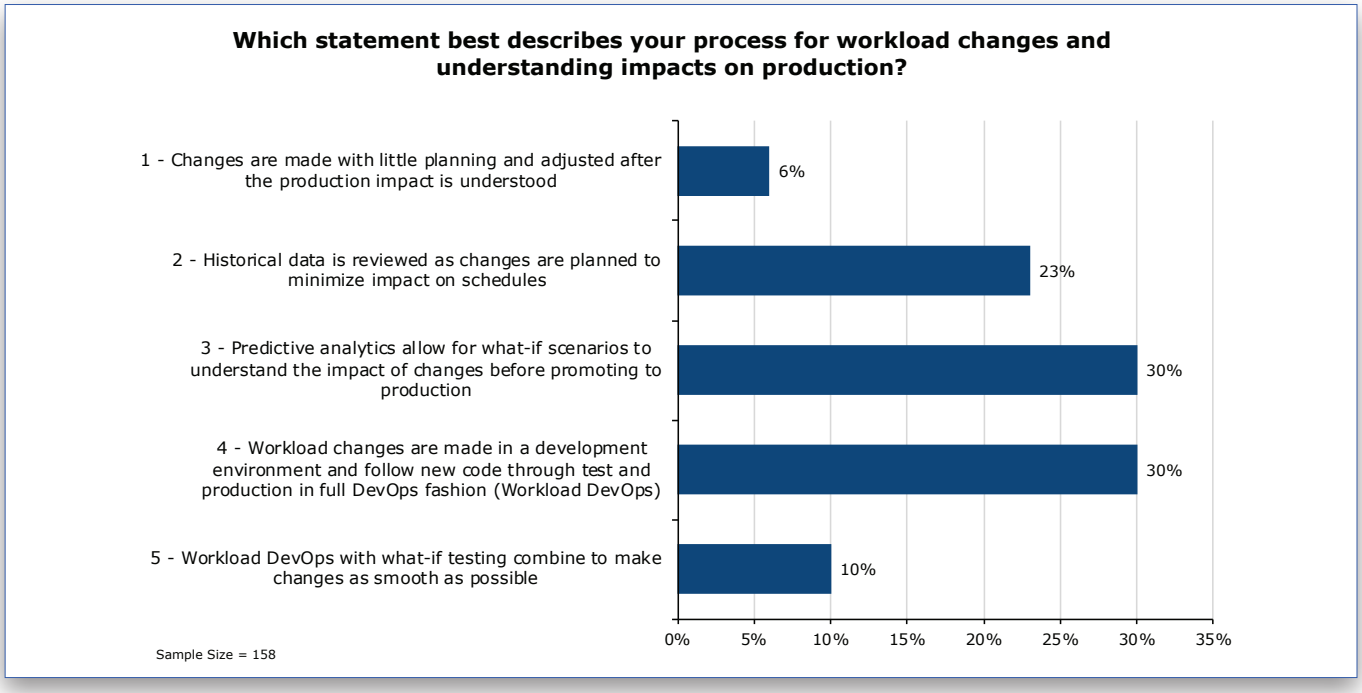


Combining the increased visibility, trend analysis, and what-if testing to simulate changes creates a powerful ability to understand current problems, see potential problems on the horizon before they cause missed SLAs, and prevent problems through simulation.

III. DEVOPS SUPPORT

When asked which terms are most relevant to workload automation, 66% said IT operations automation, which is not surprising. However, 35% said DevOps, which is the fifth of ten options listed. DevOps is integrally linked to workload automation and enhanced by WLA-related analytics. WLA products are mostly very mature systems that do not relate particularly well with one another apart from conversion tools meant to assist in migrating by capturing job definitions and setting them up in the new product. When they run side by side in an organization with multiple products, there is very little integration or awareness of one to the other. This can complicate daily operations as well as increase the time to make changes as new applications are installed.

Many teams are taking advantage of DevOps-supporting features. DevOps tops the list as most integrated with WLA performance or definitional data at 37% of responses. In fact, DevOps is a consistent theme of importance across the entire data collected for this study. The chart describes varies processes for workload changes and understanding their impact on production. Forty percent are using DevOps techniques with workload changes, but only 10% combine DevOps with what-if testing.



WLA is a critical part of the software development lifecycle, and the WLA administration benefits from applying DevOps principles to WLA change management. With a tool like Automic Automation Intelligence, enterprises can plan changes to their workload environments, build and test the most accurate production-like systems, and continuously monitor and verify that SLAs are not breached. Good analytics software for WLA provides helpful insights from the point of moving jobs into test environments, through staging, into production and the management of production, and with visibility by line of business users. In fact, 85% believe they would benefit from the ability to simulate changes to understand the impact before promotion to production. This is the kind of integration, communication, and collaboration required for teams to benefit from DevOps.

IV. BUSINESS RESILIENCE

Workload automation is a critical operations management tool directly connected to business activities. WLA-related analytics improves the management of WLA environments, which ensures the proper timing and proper completion of backend processing that is critical to positive business process outcomes. Analytics helps to easily visualize, understand, and optimize workload processing and job stream dependencies, even across multiple platforms. Analytics also provides dashboards, alerts, and other reporting so that all business and IT stakeholders have the data they need for informed decision-making. Combined with solid trend analysis, predictive capabilities, and what-if simulations, both production and change management can be managed to identify and prevent issues before they become a problem.

SEVEN BENEFITS OF WLA ANALYTICS

1. Improved management of WLA	58%
2. Identified threats to SLAs	52%
3. Improved business resiliency	48%
4. Better optimization of WLA resources	45%
5. Better coordination between operations and application development	43%
6. Understand performance hit from changes	31%
7. Reduced MTTR	26%

The table summarizes data from a chart shown previously, and is shown here for convenience. The third-most mentioned benefit of WLA analytics is improved business resiliency, which 48% of respondents selected. That is a direct comment on analytics support for business resiliency. However, many of the other benefits are tied to business resiliency. Overall improved management of WLA, the top-mentioned benefit of analytics (58% of respondents), provides a more orderly operation with better documentation, better understanding of the overall workflows, and confidence that SLAs can be met when things go as planned. When things don't go as planned, IT operations can react more quickly and confidently because they have a better understanding of the WLA environment.

The second-most mentioned benefit of analytics is the ability to identify threats to SLAs. Seeing problems on the horizon with time to react and remediating the situation before critical delivery windows are missed makes businesses more agile and resilient. The fifth-most mentioned benefit—better coordination between operations and development—helps the change management process. Since a significant number of operations problems result from changes, improving the change management can only mean less self-inflicted wounds and more consistently achieving positive business outcomes. The sixth-most mentioned benefit is understanding performance hit from changes, which also improves the change management process. Using simulation before moving changes to production allows time to make changes to workload placement and timing, or increase capacity ahead of changes being implemented. The final benefit mentioned, which is reducing mean time to repair (MTTR), helps get things back up and running faster when problems do arise. WLA analytics is an important part of business resiliency.

EMA PERSPECTIVE

A majority of the work done by IT systems is well documented in the workload automation (WLA) software used by enterprises to schedule and control everything from file transfers to the financial close. While WLA software has matured well past the initial job scheduling functions to become a key component of IT operations automation, WLA tools are more focused on the task of executing, monitoring, and alerting on workloads. They are not highly focused on analyzing the trends and outcomes over time. Analytics tools, particularly those specifically designed to analyze workload data, allow for the optimization of WLA. However, WLA analytics is often mischaracterized as simply and only WLA optimization. WLA analytics provides a powerful 30,000-foot view of all IT workloads, and includes the ability to deep dive into the specifics around every IT outcome important enough to have been defined in and controlled by the WLA software in the first place. WLA data is a rich source of valuable information that should be used to advise a broad array of IT decision-making.

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ABOUT BROADCOM

Broadcom, Inc. is a global infrastructure technology leader built on 50 years of innovation, collaboration and engineering excellence. With roots based in the rich technical heritage of AT&T/Bell Labs, Lucent and Hewlett-Packard/Agilent, Broadcom focuses on technologies that connect our world. Through the combination of industry leaders Broadcom, LSI, Broadcom Corporation, Brocade, CA Technologies and Symantec, the company has the size, scope and engineering talent to lead the industry into the future.

ABOUT ENTERPRISE MANAGEMENT ASSOCIATES, INC.

Founded in 1996, Enterprise Management Associates (EMA) is a leading industry analyst firm that provides deep insight across the full spectrum of IT and data management technologies. EMA analysts leverage a unique combination of practical experience, insight into industry best practices, and in-depth knowledge of current and planned vendor solutions to help EMA's clients achieve their goals. Learn more about EMA research, analysis, and consulting services for enterprise line of business users, IT professionals, and IT vendors at www.enterprisemanagement.com or blog.enterprisemanagement.com. You can also follow EMA on Twitter, Facebook, or LinkedIn.

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