

**Publication date:**

28 July 2021

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# Modernizing Operations

Transforming the  
management of middleware  
technologies

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# Summary

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The IT industry is going through significant changes and, many would argue, a long overdue transformation. At the heart of this transformation are the new emerging technologies such as artificial intelligence (AI), machine learning (ML), deep learning, and natural language processing (NLP). The degree to which these technologies can deliver a rapid ROI, or where the deployment is a continual improvement where value is realized over an extended time period is less clear. Omdia believes that delivering the required business outcomes is linked to the maturity and culture of the organization. Matching these to the use of technology and the speed of adoption that makes sense for the business is the critical task the CIO must deliver.

AI operations (AIOPs) is a term that has been adopted by the market to define the way IT operations needs to perform in digital enterprises. The difference between AIOPs and its predecessor IT operational analytics (ITOA) is that ITOA was focused purely on reporting and insights and failed to address the integration and automation aspects required. AIOPs technology enables a greater degree of automation and for this to be applied across the different IT teams. For example, AIOPs enables the operational activities required as part of any security mandate to be applied and actioned quickly. This ability to respond to a known threat and make remediation quickly sounds reactive, but the reality is that organizations take months to apply remediation to known vulnerabilities because of the complexities of identifying and applying patches to those systems that need remediation.

Most organizations consider automation in terms of the codification of run books; however, this perception limits the imagination and restricts the potential of what automation can achieve. Currently, most IT and business processes and procedures operate on a people-centric model. While this fits with most current organizational structures, it does not map to an automated model of operational excellence. These current people-centric processes stifle the potential improvements to service-level agreements (SLAs) and quality of service (QoS) that business users or customers could experience by better use of automated processes.

The biggest operational running costs associated with delivering IT services are people, infrastructure, and energy costs. Therefore, the prospect of automation that can effectively perform tasks currently carried out by a full-time equivalent (FTE) employee is an obvious cost-saving benefit in terms of the people costs. Automation can also deliver operational efficiencies in optimizing infrastructure use and reduce the energy costs. However, the biggest restraining force to greater use of automation is the lack of trust senior management has in the technology, which is demonstrated by the need for a people-centric approval process.

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# Digital transformation is driving IT transformation

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## Putting digital transformation into context

Digital transformation is underway in 73% of organizations according to Omdia's 2021 ICT Enterprise Insights Survey. However, progress is slow and often directed inwardly. There is a need to reconfigure digital transformation initiatives to be customer-facing, which was the initial driver of transformation at the start when customers, as tech-savvy buyers, insisted that their suppliers dealt with them in digitally new ways. Omdia has noted that customer-facing applications and products significantly lag internal digital transformation progress, but transformation is not an either/or strategy and both internal capabilities and customer-facing initiatives must progress at the same pace.

## Understanding the challenges of meeting dynamic business demand

While digital transformation is about adapting to meet the business demand, the challenge for CIOs in meeting these often-dynamic requirements is how to achieve these given the existing constraints. One of the most common topics that CIOs identify as a barrier to delivering platform capability transformation is the high operational costs that supporting this incurs. In Omdia's 2021 survey on data center automation nearly 41% of respondents stated that IT management spending would increase in 2021 compared to 2020. In fact, 25% put IT operations as the highest spending department in 2021, which means CIOs must look at new technologies if they are to be aligned with the top business objective in 2021 (27% of respondents to Omdia's 2021 ICT Enterprise Insights Survey put the number one business objective as increasing operational efficiency). The challenge for CIOs is that of dealing with complexity.

Dealing with the complexity of heterogeneous environments, public cloud, hybrid cloud, and on-premises, introduces some specific challenges that CIOs must address. Automation, particularly intelligent automation, is seen as technology that can deliver specific business benefits in a number of ways to support the digital transformation journey.

## The level of automation adoption depends on organizational maturity

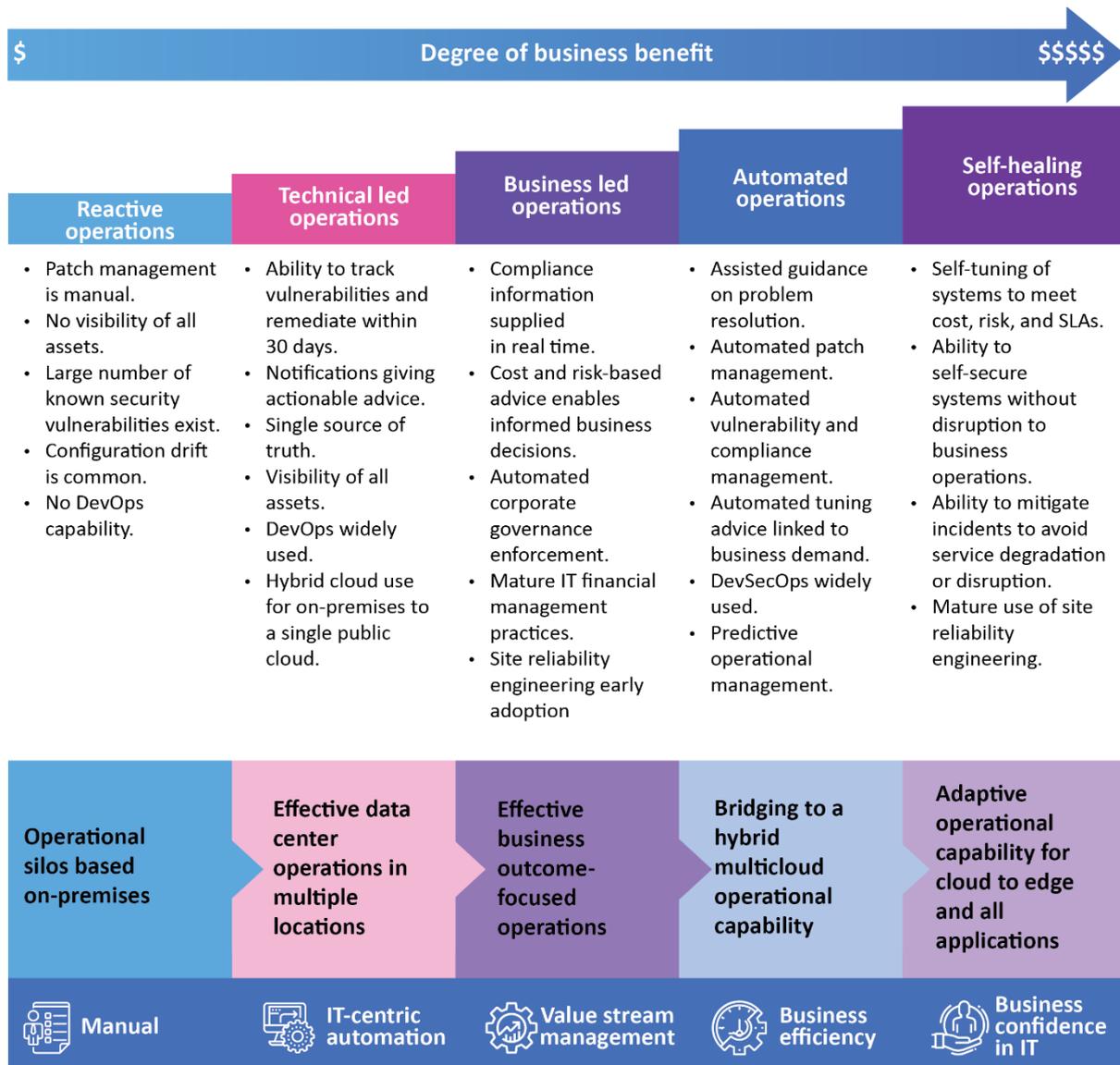
Addressing the automation gap, which is the gap between the manual ability to manage a data center and the complexity of the modern data center, is one of the biggest challenges faced by

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organizations today. **Figure 1** shows the Omdia maturity model for middleware management. Omdia believes this follows a simple five-stage process, in which each stage has a specific deliverable and objective.

- **Manual:** This level of automation is, as its name suggests, typically very basic and limited to implementing individual sequences that involves linking associated tasks to deliver a specific and known outcome. The scope is very restricted, and information is processed and made available to subsequent stages for further processing.
- **IT-centric automation:** This level of automation is focused on the technical aspects of any process/service and the tasks are not scheduled according to a predefined set of actions. At this level of automation maturity, the actions are controlled based on a defined set of responses to events/scenarios.
- **Value stream management:** At this level of automation maturity organizations can move to automate the delivery of services, which are combinations of applications, data, and end users' activities.
- **Business efficiency:** At this level of maturity the concept of self-learning is typically used in situations where policy or rule management are becoming overly complex. The behavior of employees and users is also changing, and greater use of assisted guidance is commonplace.
- **Business confidence in IT:** At this level of maturity, where services can be running in a number of different public clouds and on-premises cloud environments, hybrid and multicloud automation is required by companies. The business also needs observability of what potentially could happen and what decisions need to be made so incidents are avoided.

Figure 1: Omdia’s automation maturity model for middleware management



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# Changing IT to meet the new demand businesses need to survive in 2021

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## Recognizing the current reality

Globally, use of legacy applications remains flat at 19.3% of the market (according to Omdia's 2021 ICT Enterprise Insights, IoT, AI, and Cloud Survey). The static legacy market indicates the long potential tail for application modernization, and the fact that these workloads are remaining in legacy environments indicates the value equation is still weighted in favor of the challenges. By contrast, the virtual machine (VM)-based workloads show a steady decline according to the survey, with the cloud-native environments benefiting from this move. Globally, the decline in VM-based workloads is expected to show that, by 2022, VM-based workloads will account for less than 46% of all workloads. Omdia considers the move to adopt the cloud-native technologies at a faster pace demonstrates a desire by companies to become agile and use this to drive competitive advantage. Focusing IT spending on doing business-valuable tasks while increasing service quality is one of the ways CIOs can support the businesses' desire to become agile.

However, to achieve this objective CIOs must first identify ways to free resources and money so they can begin to invest in deploying next-generation technologies. Therein lies the problem, because according to Omdia's research, in 2020, a typical large US financial organization spent approximately \$400m on information communications and technology (ICT). This spending was roughly divided into \$335m spending for maintaining the current state and \$65m spending on transformation and change activities. This situation could be dramatically improved by efficiency gains in the IT operational activities. For example, a 5% efficiency gain in spending to maintain the current state would see an additional \$16m or about 25% increase in spending on transformation and change activities for this typical organization. This is what the CIO must aim to achieve from the current situation. Therefore, it is about making best use of the tools and resources they already have and finding solutions that will fit with them.

## The role of automation in mitigating the challenges of delivering an agile business

Respondents to Omdia's 2021 data center automation survey were clear in their expectations from investing in automation. The top benefits that CIOs expect are improved uptime (67% of respondents), better security (61%), reduced costs (59%), and rapid application deployment (58%). Omdia believes that business value can be achieved by combining benefits in new ways not

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considered before to gain the efficiency improvements needed so CIOs can begin to transform the IT department.

#### Addressing the security posture

The security posture and compliance requirements that IT operations perform are an example of where efficiency savings can be identified. Consider the time and effort IT operations spend on ensuring all the infrastructure is compliant with corporate governance and external regulatory demands. IBM WebSphere customers receive regular IBM flash notifications on vulnerabilities and patches to protect the application servers. However, IT operations currently need to maintain a record of every server, its current configuration, and software version (including patch level). Then for each flash notification, IT operations must develop a plan for applying the correct patches to the correct servers, then update the manual record. The concept of a self-securing application server is not new but has not been something that organizations have been able to apply to existing deployments; most require a complete replacement of the tools to be able to deliver this successfully. IBM WebSphere Automation has addressed this issue by holding information of the servers an organization has and collating all the patch information so that the patch updates can be applied to the correct server automatically. Estimates of the resource saving this approach can deliver depend on a number of factors, such as the number of servers, the frequency of patch updates, the skill level/experience of the IT administrators, and complexity of the server estate. For example, for 10 servers of a mixed complexity that receive patch updates every 90 days, the manual effort required can be anything from 10.5 to 33.5 FTE days per quarter, or 42 to 134 FTE days per year. **Table 1** shows the estimated low and high FTE effort for the main tasks involved in patch management, and while automation will not eliminate all of them it does reduce the FTE effort by approximately 60%.

**Table 1: Estimated time to patch an application server**

Task	Low estimated effort in FTE days	High estimated effort in FTE days	Ability to automate
Understand the different patch updates received	0.1	0.25	Yes
Analyze the patch in terms of relevance to a server based on the server's configuration	0.1	0.5	Yes
Prepare the relevant patches for the server	0.15	0.25	Yes
Check the production and test servers are identical	0.1	0.1	No
Test the patch updates in the relevant test environment	0.25	1	No
Agree when the production server can be patched and rebooted if needed	0.1	0.25	No
Apply the patch	0.25	1	Yes
<b>Total effort</b>	<b>1.05</b>	<b>3.35</b>	

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Source Omdia

The second-order benefit of a better security posture is improved uptime, which is likely to be achieved in many ways. However, one simple way uptime can be improved is as a result of increased visibility due to correlation-assisted dashboards. Presenting the IT operational team with the key relevant information in a format that is easy to access and understand can reduce the mean time to repair (MTTR) of any incident.

**Adopting new technologies**

A less obvious benefit of automation that is not reported from the Omdia data center automation survey is the ability to adopt new technologies at a speed the business can accommodate. To achieve this, organizations must modify how they think about change. By using solutions such as IBM WebSphere Liberty developers can quickly create cloud-native applications using agile methodologies by taking smaller, more clearly defined steps. However, tools like IBM WebSphere Liberty alone are not a silver bullet; they need additional help such as improved observability and insights. The end-user experience with applications delivered using cloud architectures is heavily dependent on the performance of the many different links in the delivery chain. Therefore, automated monitoring and reporting, or automated actions, are needed to ensure that all these elements are analyzed and coordinated to ensure that service quality, service availability, and performance match those expected. In an agile microservices-based environment lots of small changes can be delivered quickly, but if one of these changes adversely impacts any of the metrics used to determine success it can be difficult to isolate. However, using automation, any change can

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be tracked and “backed out” so the correct team can perform investigation and remediation, which can be supported by automation technologies through guided assistance capabilities.

Another benefit of automation with adopting new technology is its ability to improve employee engagement by getting people to learn and gain new skills faster. The key objective is to reduce any new technology learning curve. This view is supported by the findings of Omdia’s 2021 edge survey, which found the second biggest challenge (67% of respondents) was the fact that the lack of skills an organization has impacts its ability to deploy and manage new (in this case edge) technology. A second-order benefit of addressing the skills challenge with increased use of automation is that it will have a multiplier effect. Those pilot projects that could modernize the business but lack the skilled resources to implement now become possible, thereby forming a positive learning organization where the systems and people evolve by re-enforcing mutual improvements.

## How automation fits with modern approaches to operational management

AIOps is a term that has been adopted by the market to define the way IT operations need to perform in digital enterprises. Omdia defines AIOps as the overarching technology that can bring all the management practices in IT together. This concept does not translate to a single person or team that can now perform all these activities; rather, a single view can be obtained, and a single control point established.

The purpose of AIOps is to foster a culture of collaboration and sharing between the many different actors involved in the delivery of IT in an organization. The way the solution achieves this is a key measure of the technology; an AIOps solution must at its heart be easy to use and enable intuitive sharing of information. When this capability is looked at through the DevOps lens, the role of WebSphere automation becomes evident. The concept of the oversight layer must not appear as another layer of management or tooling; rather, it must appear seamless with existing tools. This characteristic in Omdia’s opinion should make AIOps and automation almost invisible to the users. In fact, it should enhance their existing tools and processes, and only in the mature organizations should it become evident by transforming processes and organizational structures. However, this collaboration must be managed in terms of access control and privileges, which again should be hidden from the users as they should see only what they need to see, and not get swamped in information just because it is available.

Integrating AIOps and automation is particularly beneficial to IT operations in the DevOps process, as mentioned above. Effectively, automation can enable wider collaboration by integrating data sources and making the information available to all actors involved in the DevOps process. While this ability is not new – many DevOps tools claim to offer this – the approach of applied automation to being a neutral technology is WebSphere Automation’s biggest strength. Omdia believes that using the ability of WebSphere Automation will advance the DevOps process to include current marginal actors such as security, data protection, and governance.

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# Making IT operate at the speed of the new technology

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## Getting IT and the business ready for self-healing operations

Having the IT processes aligned to the key objectives of the business is critical, but changing the behaviors of employees is key to being able to operate at higher maturity levels. Although the challenges and IT benefits from adopting automation have been covered, the real value of any technology is realized only on how it delivers business value. **Figure 2** shows the 2021 data center automation survey responses to this question. As expected, the ability to increase business agility is the top-rated business value. But the second-ranked business value is of more interest – automation and its ability to reduce employee churn rate. Organizations incur significant costs and disruption as a result of employee churn rate. Therefore, reducing it is an obvious benefit. However, the role of automation in reducing employee churn rate may not be quite so obvious. Automation helps with employee churn in two main areas:

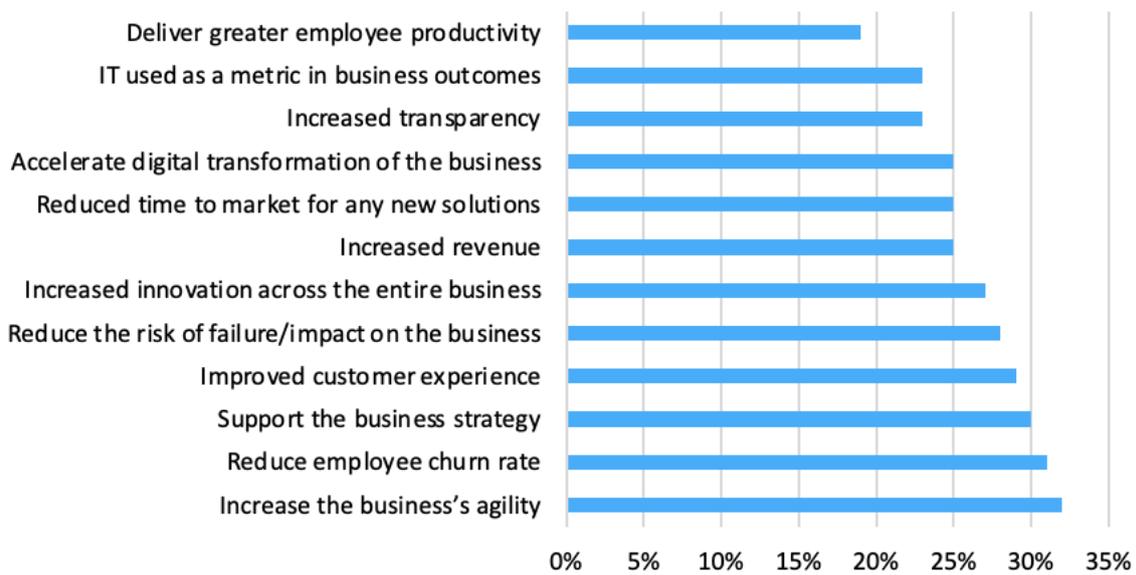
- For the IT employees involved in the DevOps process it enables them to stop performing repetitive and tedious tasks and enables them to focus on more interesting activities, helping them develop their careers
- The business users notice that solutions designed to solve challenges they encounter in their daily routines can be designed, built, and deployed faster and more reliably. By delivering solutions to solve business-operational issues faster, employees can see tangible evidence of improving working practices.

As organizations adopt higher levels of automation maturity (see **Figure 1**), the need to embrace self-healing systems that can further advance the benefits are introduced. It is at this stage that the technology and cultural transformations must coincide. Self-healing is effectively where the human is removed from the process and the technology has acquired sufficient intelligence to understand actions and consequences. The challenge with AI solutions is the ability of the AI technology to demonstrate it can be trusted; the impact of bias in the data used to train solutions is a core problem. When it comes to trust in AI, there are four pillars that any solution must meet: fairness, explainability, security, and accountability.

Embedding AI in the data center can enable enterprises to improve efficiencies and outcomes for employees and customers. However, it is easy to forget that decisions made by AI algorithms can have a tangible impact on people's lives (e.g., adjusting the resources allocated to an application based on its relative business priority may mean some customers receive a worse service than

others, which means the customer support team must explain that to those impacted customers that complain). There are also many questions around ethics and trust, and the responsibility to ensure that the AI algorithms do not develop biases, which is why any AI solution must be open and transparent. Self-healing automation in the data center is one small step to demonstrating in a controlled environment the progress made by AI and building the trust companies place on it.

Figure 2: Business value of automation



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# Appendix

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## Methodology

Omdia conducts a number of end-user surveys on a range of different topics. These surveys are of qualified IT buyers only, or dedicated line-of-business senior managers, and range in size from a few hundred to thousands of respondents. Omdia uses this data as well as market tracking data and models it has built on key technology sectors. Omdia analysts have regular briefings with technology vendors and also speak to Omdia enterprise clients as sources of additional information. This report uses a combination of all these sources and methods in developing its analysis of the middleware management automation challenges.

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## About IBM WebSphere Automation

IBM WebSphere Automation is a complete solution to help administrators and operators quickly unlock new value with increased security, resiliency, and performance. Organizations are being challenged to transform quickly and maximize ROI while keeping traditional and modern applications running together securely. Teams can use IBM WebSphere Automation to optimize their operations, respond to incidents efficiently, and promote stronger security of their IT estate. By leveraging AI and automation, organizations can achieve immediate savings and business benefits, while laying a solid and secure technology foundation for future growth.

Reclaiming productivity is key to giving teams back the time required to

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innovate. Extend the life and ROI of your WebSphere investments and reduce time spent on maintenance tasks, giving your team more time to work on strategic activities. Use that extra time to focus on unlocking new value for WebSphere while reducing the effort and risk of addressing common vulnerabilities and automating tasks.

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