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# The Total Economic Impact™ Of Control-M From BMC

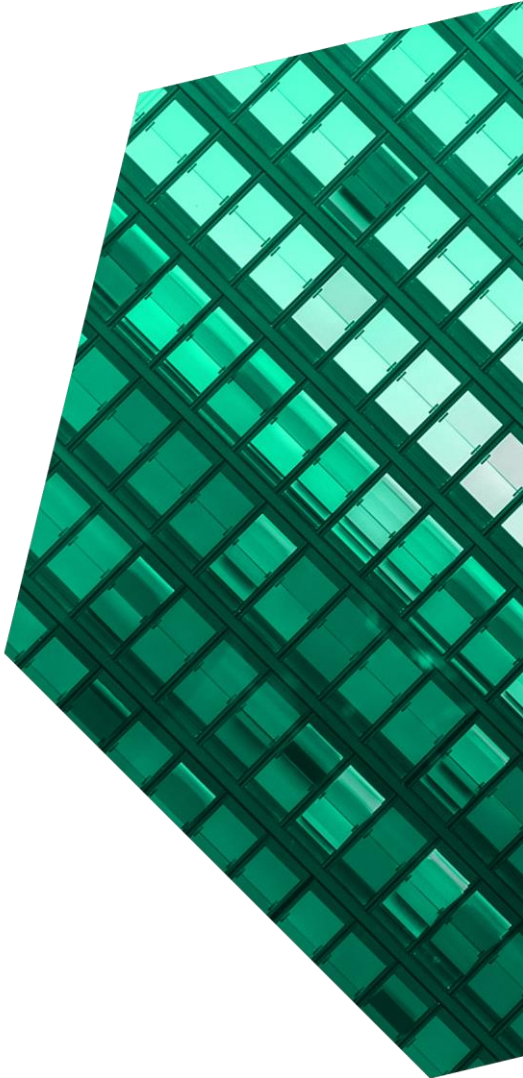
Cost Savings And Business Benefits  
Enabled By Control-M

**JANUARY 2023**

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Consulting Team: Erach Desai  
Eric Hall  
Adam Birnberg

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### ABOUT FORRESTER CONSULTING

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## Executive Summary

Business operations for large organizations run across diverse infrastructures that require navigating through multilayered workflows. Operations professionals look to intelligent automation to bolster workflow efficiency. Using Control-M as their centralized, enterprise-level application and data workflow orchestration platform, organizations can automate their workflows from a single pane of glass with efficiencies driving revenue retention and improving productivity for IT ops, developers, and business users.

Businesses across a wide swath of industries are under pressure to provide superior quality of digital experiences with high reliability and on-demand responsiveness for end users that span customers and employees. Their IT organizations are being challenged to support critical business applications while delivering on ongoing digital transformation initiatives.

Many digital applications (commercial and proprietary) are built from complex components and deployed across multiple environments. These include on-premises, public cloud, private cloud, hybrid, and various operating systems (especially for larger organizations that have grown through acquisitions). For large organizations, business operations deployed across such diverse infrastructure require navigating through multilayered application and data workflows. A Forrester study about intelligent automation (IA) found that data and analytics decision-makers look to IA to bolster operational efficiency.<sup>1</sup> The top benefits of adopting automation technologies are cost savings, higher levels of quality, and increased profit margins.

The aforementioned Forrester study categorizes workload automation as delivering high business value while being a high-maturity technology. More automation exists within systems of record than outside of them because that is where the important data resides for ongoing operations and where many employees spend most of their time. Workflow orchestration software helps schedule, initiate, run, and manage tasks (or jobs) related to business

### KEY STATISTICS



Three-year benefit (NPV)  
**\$9.76M**



Revenue retention  
**1.7% to 2.0%**

transactions. [Control-M](#) from BMC simplifies and streamlines application and data workflow orchestration and workload automation. Workload automation has evolved from traditional job scheduling towards supporting orchestration for modern applications, with containers and service meshes and other intricate components. Control-M has evolved to support the modern application stack, giving users freedom to innovate within a secure orchestration framework.

BMC commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential present value of economic benefits enterprises may realize by deploying Control-M.<sup>2</sup> The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of Control-M on their organizations.

To better understand the benefits and risks associated with this investment, Forrester interviewed 10 representatives with experience using BMC Control-M at six organizations. For the purposes of

this study, Forrester aggregated the interviewees' experiences and combined the results into a single [composite organization](#) that is a Global 5000 company with 20,000 employees, \$5 billion in revenue, and global operations driving high-volume transaction processing.

Prior to adopting Control-M, interviewees' organizations utilized multiple ad hoc job-scheduling approaches that ran the gamut of custom scripting, manual processes, and limited-function schedulers that were native to other software packages. These fragmented and disparate approaches to job scheduling and batch processing resulted in limited transparency into the nature of dependencies across the organizations' batch environments and inability to scale with growing business needs. The impact of delayed jobs (e.g., overruns) and failed jobs caused these firms to miss customer agreements and internal service-level agreements (SLAs).

After making the investment in Control-M, the interviewees' organizations were able to streamline application and data workflow orchestration with efficiency and reliability while meeting schedules and time-to-market requirements. Interviewees from large

companies said their organizations rely on Control-M to deliver critical business services that are made up of complex application and data workflows spanning multiple applications that run across complex, distributed compute and storage infrastructure. Furthermore, software developers were better positioned to orchestrate their applications with an as-code approach (often referred to as a jobs-as-code approach). Interviewees also said data engineers and business users were empowered to become self-service users and manage jobs independent of central IT operations (IT ops).

**“We have done major migration projects in terms of deploying automation technology. Some of it was our core banking solutions, and our CIO is very aware of the importance of Control-M. We are looked at like the hub of a spoke wheel: We touch everything, and we make the wheel spin.”**

*Automation engineering manager, regional banking*

**“With orchestration, we were finally able to create a direct line between when we can access the data and when our CIO was looking at his reports in the morning. It was like a sea change. We went from daily escalations requiring DBA (database administrator) or developer support to everything being up by 5 a.m.”**

*Principal data engineer, B2C e-commerce*

## KEY FINDINGS

**Quantified benefits.** Three-year, risk-adjusted present value (PV) quantified benefits for the composite organization include:

- **Savings of \$4.9 million from resilient and reliable workflow orchestration over three years.** The composite organization benefits from centralizing workflow orchestration to one platform with task management and real-time statuses of entire job streams across mainframe,

on-premises, and cloud environments. Its developers, business stakeholders, and business operations are more empowered to optimize processes. The ability to test entire job streams improves the composite's processes prior to moving workloads to production. Control-M's application and data workflow orchestration provides the organization with operational efficiencies and downtime reduction by providing dependency compliance, proactive monitoring and alerting, point-and-click problem tracking, and APIs enabling centrally resolving issues. Control-M enables revenue retention of 1.7% to 2.0% for the composite organization due to higher efficiencies and reduced operational risk.

reduction in production issues while also reducing the effort to identify and resolve issues. For the composite organization, the gross productivity gain for the central IT operations team after deploying Control-M is about 64%, with a net productivity gain of about 55%. Forrester applies a productivity adjustment to the gross benefit to reflect the percentage of productivity savings effectively captured. In this case, the adjustment is 85%.

**“Control-M has been a positive surprise during our replatforming program. The transformation of the scheduling functionality has been a key element in the program. The installation and the stabilization of Control-M on the Windows environment was effectively a lift-and-shift concept in our transformation.”**

*CTO, regional insurance*

**“With Control-M we just have a lot more functionality than before. But what’s the value? The question is how much does it cost us if the scheduling jobs don’t finish on time? I think after two days, the company isn’t there anymore. It’s a vital business capability.”**

*System programmer, financial services*

- **\$1.4 million in improved productivity for central IT operations team over three years.** The composite organization's IT operations team is more efficient and effective in managing IT workflows, and it garners greater participation from developers and business users. The implementation of Control-M leads to a significant

- **Productivity gains of \$1.6 million from improved development automation over three years.** The composite organization's developers are better able to support an expanding role in scheduling applications resulting from service meshes, working within containers, and other modern application and data components. Control-M also plays a greater role in the composite's testing job streams, leading to fewer production issues and, therefore, less developer involvement for recovery activities. The gross productivity gain for the composite's developers during deployment is 80% with a net productivity gain of 48% (after applying an 80% productivity adjustment).

- Productivity gains of \$1.1 million from workflow orchestration for key business functions over three years.** The composite’s business users who benefit from Control-M include a combination of individuals working on project teams as well as individuals who are directly involved in task administration, monitoring, and auditing. The composite organization finds Control-M easy to understand and simpler to work with than other solutions. Control-M also provides the composite’s business users with insights that previously weren’t available in one place. Time savings for data engineers are significant, and much of it is related to upstream and downstream dependency management. There are also significant time savings to regulatory and compliance auditing and reporting activities. The blend of business users for the composite organization derive gross productivity gains of 30% with a net productivity improvement of 20% (based on a 65% productivity adjustment).
- \$690,100 in depreciation or reduction of related legacy tools over three years.** The composite organization reduces costs through phasing out a blend of file transfer, job scheduling, and extract, load, and transform (ELT) tools. Some of these have direct costs while others are part of platform applications. Maintenance and support costs also reduced proportionally.

**Unquantified benefits.** Benefits that provide value for the composite organization but are not quantified in this study include:

- A single application and data workflow-orchestration platform.** Prior to the composite organization using Control-M, the complexity of scheduling, monitoring, and incident response involved logging into many applications. With Control-M, entire job streams are visible and managed without logging into additional

applications. This simplifies understanding application and data workflows, adhering to dependencies, and expanding the usability of all workflow-related tasks. Noteworthy examples include covering workflows with tasks in a combination of mainframes, various on-premises environments, and various cloud environments.

**“Our company measures everything by incidents and costs of impact of when we do have any incidents. We call ourselves invisibly perfect. That’s just ... a phrase that we use. Control-M has made us invisibly perfect because we have minimized critical incidents.”**

*IT manager, multinational auto manufacturing*

- Confidence in day-to-day operations and plans for disaster recovery.** The composite’s IT operations, data engineers, developers, and the application’s business stakeholders are more confident that daily processes will be completed on time and without errors. Furthermore, they no longer experience disruptions in day-to-day operations that relied on scheduling processes with dependencies. Interviewees also said they are confident their organizations’ disaster recovery processes within Control-M will minimize disruptions if a catastrophic event occurs.
- Support by knowledgeable and responsive Control-M experts.** Interviewees said they are pleased with Control-M’s support of usage

**“The ability to deploy components controlling software in the public cloud as well as on-premises is something that gives Control-M an advantage. ... We want to support both private and public cloud use and being able to manage dependencies between both, so that’s very appealing to us.”**

*Architect and VP, global financial services*

questions to dealing with more significant challenges, such as scaling or accommodating modern application technology stacks.

- **Time saved with the Control-M Conversion Tool.** Interviewees within organizations that utilized the Control-M Conversion Tool found that it reduced conversion efforts on a high percentage of existing work streams.

The representative interviews and financial analysis found that a composite organization experiences total benefits of \$11.89 million, resulting in a net present value (NPV) of \$9.76 million (discounted at 10%).

**“You see 14 systems in one view when you previously had to log into three or four systems.**

**Troubleshooting typically takes one-tenth of the time it used to take. In seconds, you see what happened, why it happened, and know how to fix it.”**

— Systems management specialist, multinational auto manufacturing



BENEFITS PV  
**\$9.76M**



REVENUE  
RETENTION  
FROM  
EFFICIENCIES  
**1.7% - 2.0%**



NET GAIN –  
CENTRAL IT  
PRODUCTIVITY  
**55%**

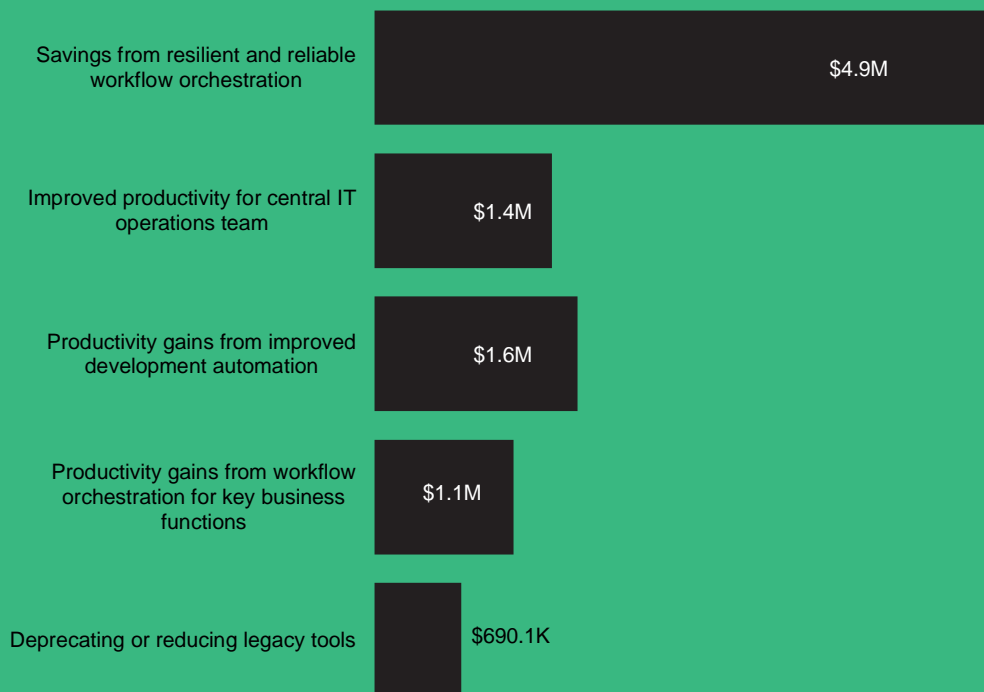


NET GAIN –  
DEVELOPER  
PRODUCTIVITY  
**48%**



NET GAIN –  
BUSINESS USER  
PRODUCTIVITY  
**20%**

### Benefits (Three-Year)





### TEI FRAMEWORK AND METHODOLOGY

From the information provided in the interviews, Forrester constructed a Total Economic Impact™ framework for those organizations considering an investment in Control-M.

The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision. Forrester took a multistep approach to evaluate the impact that Control-M can have on an organization.

#### DISCLOSURES

Readers should be aware of the following:

This study is commissioned by BMC and delivered by Forrester Consulting. It is not meant to be used as a competitive analysis.

Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that readers use their own estimates within the framework provided in the study to determine the appropriateness of an investment in Control-M.

BMC reviewed and provided feedback to Forrester, but Forrester maintains editorial control over the study and its findings and does not accept changes to the study that contradict Forrester's findings or obscure the meaning of the study.

BMC provided the customer names for the interviews but did not participate in the interviews.



#### DUE DILIGENCE

Interviewed BMC stakeholders and Forrester analysts to gather data relative to Control-M.



#### INTERVIEWS

Interviewed 10 representatives using Control-M at six organizations to obtain data with respect to costs, benefits, and risks.



#### COMPOSITE ORGANIZATION

Designed a composite organization based on characteristics of the interviewees' organizations.



#### FINANCIAL MODEL FRAMEWORK

Constructed a financial model representative of the interviews using the TEI methodology and risk-adjusted the financial model based on issues and concerns of the interviewees.



#### CASE STUDY

Employed four fundamental elements of TEI in modeling the investment impact: benefits, costs, flexibility, and risks. Given the increasing sophistication of ROI analyses related to IT investments, Forrester's TEI methodology provides a complete picture of the total economic impact of purchase decisions. Please see Appendix A for additional information on the TEI methodology.

# The Control-M Customer Journey

## Drivers leading to the Control-M investment

Interviews				
Role(s)	Industry	Region	Revenue, Headcount	Control-M Usage
Scheduling management VP Architect and VP	Global financial services	Global, headquartered in US	\$120 billion, 270,000	20,000 users
Principal data engineer	B2C e-commerce	North America, headquartered in US	\$8.9 billion, 21,000	75 users including 2 in IT support, 1,500 jobs per day average (2,000 peak)
Automation engineering manager	Regional banking	US regional	\$5.8 billion, 6,300	250 users including 11 in IT support, 7,000 jobs per day average (17,000 peak)
IT manager Systems management specialist Application product owner	Multinational auto manufacturing	Global, headquartered in EU	\$137 billion, 119,000	35 users in IT support, 500 applications supported, 30,000 jobs per day average (35,000 peak)
Chief technology officer (CTO)	Regional insurance	EU regional	\$115 million, 4,000	60,000 batch jobs per day, 300 dependencies
Head of production planning and control System programmer	Financial services	EU regional	\$5.4 billion, 16,000	17 users in IT/scheduling support, 30,000 jobs per day average (35,000 peak)

### KEY CHALLENGES

Forrester interviewed 10 decision-makers who oversee application and data workflow orchestration for six organizations, and most of them work within IT operations. They are each very familiar with deploying and overseeing the usage of Control-M across their organizations.

Prior to adopting Control-M, interviewees' organizations utilized multiple ad hoc job-scheduling approaches that ran the gamut of custom scripting, manual processes, and limited-function schedulers that were native to other software packages. With digital transformation and the related rise in complexity, these fragmented and disparate approaches to job scheduling and batch processing resulted in limited transparency into the nature of dependencies across the organizations' batch environments and inability to scale with growing business needs. The impact of delayed jobs (e.g., overruns) and failed jobs caused these firms to miss customer and internal service-level agreements (SLAs).

**“Control-M has been a facilitator for me because of the visibility and access that it has given to our development teams. They have been much more independent for the testing and the validation of the replatformed software.”**

*CTO, regional insurance*

The interviewees noted how their organizations struggled with common challenges, including:

- Limited functionality of native schedulers.** Interviewees explained how their organizations were using schedulers that were native to various software packages and designed for another function, which led to disparate environments and

IT ops having to write customized code to synchronize these schedulers. Other interviewees described using command-line utilities for UNIX operating system environments coupled with scripts for running jobs, which was a manual process and very error-prone. The notion of a failed job restarting overnight was not feasible.

**“We needed to accelerate software development lifecycle for new services, migrate apps, and drive modernization. The process with [our legacy vendor] was manual, unstructured, and error-prone.”**

*Head of production planning and control, financial services*

- **Lack of support for distributed and hybrid cloud environments.** Several interviewees’ organizations used commercial workload-automation solutions that ran on a mainframe or even on a distributed server environment. For large organizations with complex needs — especially those that grew through acquisitions — there was a need to support multiple operating environments spanning on-premises, public/private/hybrid cloud structures. With digital transformation and moving to a modern application technology stack, having the ability to support a hybrid cloud environment became an imperative. Interviewees found that their organizations’ legacy workload-automation tools were unable to adapt to these new demands.
- **Developers and business users needed self-service for scheduling.** In the modern

application technology stack, applications and data pipelines are built from complex components and by disparate development teams. Software developers who previously passed on the scheduling portions of code deployment in production are increasingly looking for tools that will enable them to do application configuration and support. Business users and data engineers are also looking to manage their own workflows for configuration and monitoring. Interviewees stated that traditional workload-automation tools were unable to adapt or scale to these emerging requirements.

**“Before [using] Control-M, an event in one system would cause a ripple in another system, and we would have to rely on tribal knowledge of what had to be turned off and restarted. It was a spiderweb of trying to maintain all of that. When we brought in Control-M, all of that was just like in pictures that we can lay out exactly how we wanted everything in the system to run.”**

*Principal data engineer, B2C e-commerce*

## PLATFORM REQUIREMENTS

The interviewees’ organizations searched for a platform that could:

- Simplify and streamline application and data workflow orchestration for efficiency, reliability, and improved time to market.

- Support large, complex organizations with multiple operating systems and distributed computing environments that span on-premises to hybrid cloud.
- Enable a jobs-as-code approach for software developers to orchestrate jobs within their code for agile product deployment.
- Empower self-service for business users and data engineers to configure and monitor jobs and tasks independent of IT ops.
- Allow users to interface across all scheduling tasks and dependencies through a single pane of glass.

**“Now that I’ve been working with the software for the last seven years, [Control-M] is by far a better product that we chose — not only for all of the capabilities it sold and delivered on out of the box, but also [for] things it has helped us customize.”**

*Automation engineering manager,  
regional banking*

### COMPOSITE ORGANIZATION

Based on the interviews, Forrester constructed a TEI framework, a composite company, and an analysis that illustrates the areas financially affected. The composite organization is representative of the 10 interviewees, and it is used to present the aggregate financial analysis in the next section. The composite organization has the following characteristics:

**Description of composite.** The Global 5000 company is focused on providing best-in-class

customer experience through its digital delivery platform. The composite organization has 20,000 employees and \$5 billion in revenue, which grows at 2.5% annually. Operations span the globe, and the complexity of the organization drives high-volume transaction processing. In its prior state, the composite used a mainframe-based legacy scheduling and workload-automation tool.

#### Key Assumptions

- **20,000 full-time employees**
- **15 to 17 central IT users support Control-M**
- **150 to 230 developers adopt Control-M**
- **80 to 120 additional users**
- **10,000 active jobs per day**

**Deployment characteristics.** To meet the demands of growth and digital transformation, the composite deploys Control-M to streamline application and data workflow orchestration supporting multiple operating systems and distributed computing environments. Scheduling operations are supported by 15 to 17 full-time professionals within the IT organization. Developers, data engineers, and business users ramp up self-service usage of Control-M based on an adoption rate of 65% in Year 1, 80% in Year 2, and 100% in Year 3. To support the complex transaction-processing needs of the organization, Control-M orchestrates an average of 10,000 active jobs per day, and up to 15,000 active jobs on peak days in Year 1, which ramps with the growth in adoption.

# Analysis Of Benefits

■ Quantified benefit data as applied to the composite

Total Benefits						
Ref.	Benefit	Year 1	Year 2	Year 3	Total	Present Value
Atr	Savings from resilient and reliable workflow orchestration	\$1,806,250	\$1,960,313	\$2,232,578	\$5,999,141	\$4,939,507
Btr	Improved productivity for central IT operations team	\$525,658	\$584,064	\$598,666	\$1,708,388	\$1,410,354
Ctr	Productivity gains from improved development automation	\$524,880	\$647,352	\$804,816	\$1,977,048	\$1,616,835
Dtr	Productivity gains from workflow orchestration for key business functions	\$360,000	\$450,000	\$540,000	\$1,350,000	\$1,104,884
Etr	Deprecating or reducing legacy tools	\$189,000	\$283,500	\$378,000	\$850,500	\$690,113
	Total benefits (risk-adjusted)	\$3,405,788	\$3,925,229	\$4,554,060	\$11,885,077	\$9,761,693

## SAVINGS FROM RESILIENT AND RELIABLE WORKFLOW ORCHESTRATION

**Evidence and data.** Interviewees described how having a centralized application and data workflow orchestration platform drove operational efficiencies, reduced operational risk, reduced downtime for applications, and improved business operations in general. By deploying Control-M for application and data workflows from a single point of control and enabling developers and business users to run their jobs independently, the interviewees' organizations were able to build resiliency and reliability. These

**“Control-M has reduced the frequency and magnitude of outages as well as the time to identify and recover from them.”**

*Automation engineering manager, regional banking*

business efficiencies resulted in improved revenue retention.

- In terms of faster troubleshooting for tickets, a systems management specialist for a multinational auto manufacturer said: “Instead of [having] 13 systems integrating to the ticketing system, we now have one interface to the ticketing system. File transfers and batch [transfers] go hand in hand. It’s not different departments running it. Troubleshooting literally takes [less than] a minute to see exactly what

Revenue retention from higher efficiencies and reduced operational risk

**1.7% to 2.0%**



happened, why it happened, and how to resolve it. So, just on the time spent on troubleshooting and implementations and all of that, it's a tenth of what it used to be."

- A head of production planning and control for a financial services group noted: "[Our legacy vendor's] workload-automation tool was only mainframe-centric and couldn't scale to our growth demands. The maintenance window was hours long, [which caused] outages in critical business applications. Each outage [whether] planned or unplanned stopped work for 2,000 employees and impacted customers." They also shared some insights from a case study conducted in 2019 that found: "Control-M provides workflow orchestration from a single point of control across mainframe and distribution systems. This was a key driver for change. Today, the business services underpinned by distributed workflows are still available during the maintenance window, increasing availability of critical business services by 3%."
- A scheduling management VP for a global financial service firm said: "The entire scheduling function — all the operations — was previously outsourced. We brought it all back in-house, which was a big cost savings right there. Control-M was a major reason we were able to do that."
- An automation engineering manager for a regional banking firm described the impact like this: "Our development teams had some SLA in place that said their batch loads would be done by 8:00 a.m. If the data wasn't ready, then what's the point of them beginning work? With our legacy system, that was a frequent problem. Implementing Control-M as our scheduler was a major win because we were able to resolve that issue, and it was because of [Control-M] that we were able to create real dependencies or centralized dependencies within their product." The interviewee also outlined a scenario in which

an existing tool frequently failed. They said: "We were using a data-replication system enterprise wide, and it was breaking a lot. It was taking [development teams] 2 to 3 hours per recovery. So, we automated it for them by using an out-of-the box API that came with Control-M. By streamlining all the data replication functions in Control-M, we were able to have jobs and dependencies trigger one after the other, thus speeding up that process up considerably."

- A principal data engineer for a B2C e-commerce retailer said: "For an e-retailer like us, having overnight scheduling runs [being completed] efficiently is critical. With Control-M, we went from being open for business at 9 a.m. to being open for business at 3 a.m. And we have stayed there for the past four years."

**"Ten years before [using Control-M], we had an interruption maybe for an hour or two. During this time, the whole mainframe was rebooted. We have a higher availability system with Control-M. So, we can work almost without any interruptions."**

*Systems programmer, financial services*

**Modeling and assumptions.** For the composite organization, Forrester assumes the following:

- Based on a 2.5% annual growth rate, overall revenues are \$5.0 billion in Year 1, \$5.1 billion in Year 2, and \$5.3 billion in Year 3.

- Only 25% of the composite's overall revenue is dependent on batch processing-driven operations vs. event-driven operations (that do not require scheduling).
- A broad swath of operational efficiencies (e.g., from reduced downtime, a reduced number of failed jobs, reduced operational risk, being open for business on a timely basis, etc.) impact the composite's business operations. The composite is able to retain 1.7% of revenues dependent on batch processing in Year 1, 1.8% in Year 2, and 2.0% in Year 3. This grows at half the growth rate of the number of jobs per year.
- To determine the bottom-line impact for the composite, Forrester converted the revenue benefit into net profits and assumes the composite's net margin is 10%.
- The percentage of revenues dependent on batch processing vs. event-driven operations, which will vary by industry, company, and product line.
- The revenue retention percentage, which will depend on the actual operational efficiencies and avoided downtime for the organization.
- Revenue growth and net margins, which vary by industry, company, and types of products sold.

**“I knew that orchestration was what we would link to the data warehouse and automate our online sales operations. So, we went from those full-on escalations to 12 days of uptime to all our reports being ready by 5:00 a.m. Without [that], we wouldn't have been able to get through that year's peak, which was Black Friday.”**

*Principal data engineer, B2C e-commerce*

**“The count of broken jobs has been dramatically reduced in the last 10 years. This is a result of the test environment enabled through Control-M.”**

*Head of production planning and control, financial services*

**Results.** To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of \$4.9 million.

**Risks.** Forrester recognizes that these results may not be representative of all experiences, and this benefit will vary between organizations depending on:

Savings From Resilient And Reliable Workflow Orchestration					
Ref.	Metric	Source	Year 1	Year 2	Year 3
A1	Revenue	Composite	\$5,000,000,000	\$5,125,000,000	\$5,253,125,000
A2	Percentage of revenue dependent on Control-M workflows	Assumption	25%	25%	25%
A3	Business efficiencies and reduced operational risk due to Control-M	Interviews	1.70%	1.80%	2.00%
A4	Revenue retention through Control-M	A1*A2*A3	\$21,250,000	\$23,062,500	\$26,265,625
A5	Net margin	Composite	10.0%	10.0%	10.0%
At	Savings from resilient and reliable workflow orchestration	A4*A5	\$2,125,000	\$2,306,250	\$2,626,563
	Risk adjustment	↓15%			
Atr	Savings from resilient and reliable workflow orchestration (risk-adjusted)		\$1,806,250	\$1,960,313	\$2,232,578
<b>Three-year total: \$5,999,141</b>			<b>Three-year present value: \$4,939,507</b>		

### IMPROVED PRODUCTIVITY FOR CENTRAL IT OPERATIONS TEAM

**Evidence and data.** Given that most of the interviewees are directly involved in supporting scheduling and batch jobs at their organizations from a central IT standpoint, it’s not surprising that they said deploying Control-M made their jobs more efficient and easier to manage. Most interviewees stated that while they did not necessarily reduce headcount for their organization’s central IT ops group, they were able to redeploy personnel and lower headcount through natural attrition.

- The principal data engineer for a B2C e-commerce retailer stated: “Before [using] Control-M, we had nine or 10 people who were working on orchestrating and managing jobs and scaling the database to manage the bursts of processing that had to happen throughout the system. I’d say [they spent] 30% of their time maintaining the system.” After installing Control-M, the interviewee said they found that two people spent

**“Within operations management, we have had solid cost savings. In terms of man-hours, it would definitely be in the range of [tens of] thousands of hours saved over the past seven years just from that aspect alone.”**

*Automation engineering manager, regional banking*

about 25% of their time supporting the system during the past few years.

- The head of production planning and control for a financial services group explained: “We started in 2012 with 26 people on my team, and now we have 17. That’s largely because of the automation from Control-M. I was able to reduce



some colleagues on my team, and I have not needed to replace the colleagues who have retired.”

- The CTO for a regional insurance firm that recently completed a multiyear replatforming project said: “We will likely decrease headcount by two on our batch control team of 10 [which is a 20% reduction]. I expect to have some efficiency gains because we will have one pane of glass [where] everything will be managed by Control-M and we will have a full view of what is happening on all the platforms.”

**Modeling and assumptions.** The focus for this benefit is on the composite organization’s central IT operations team supporting application and data workflow orchestration and backing up the self-service users. For the composite organization, Forrester assumes the following:

- Based on the range of reduction in central IT FTEs supporting Control-M, the composite’s gross reduction is 35%. For all productivity gains, Forrester applied a productivity adjustment factor that represents the percentage of productivity savings actually captured. With a 90% productivity adjustment, the net reduction in the number of IT FTEs is 32%.
- With Control-M deployed, the composite has 15 IT FTEs in Year 1, 16 in Year 2, and 17 in Year 3, which is in line with the growth in business. By applying the net reduction of 32%, the number of FTEs that would have supported scheduling

before Control-M are 22 in Year 1, 24 in Year 2, and 25 in Year 3.

- Before using Control-M, an IT professional allocated 45% of their time to support scheduling. With Control-M, the time they spend on scheduling drops to 25%. By applying a 90% productivity adjustment for this differential, the net percentage of time with Control-M is 30%.
- After deploying Control-M, the composite’s average gross productivity gain for its central IT operations team is about 64%. By applying an 85% adjustment, the net productivity gain is about 55%.
- The fully burdened annual salary for an appropriately experienced IT operations FTE is \$108,000, which translates to \$52 per hour. These professionals are primarily based in the US or EMEA.

**“We are improving [our batch control team’s] productivity, and we will not be bottlenecked anymore for the development teams in allowing them to set up their activities around batch workload automation.”**

*CTO, regional insurance*

**Risks.** Forrester recognizes that these results may not be representative of all experiences, and this benefit will vary between organizations depending on:

- The productivity impact both in terms of the reduction of FTEs and the percentage of time spent by those FTEs on scheduling tasks, which will vary based on the organization’s prior state.

Productivity improvement for central IT operations team

**Gross: 64%**

**Net: 55%**



- The actual number of FTEs deployed with Control-M, which will vary by the size of the organization, the percentage of transactions processing that is batch-oriented, and the mix between centralized automation vs. self-service users.
- The geographical distribution of such developers. For example, a higher mix of these deployment

developers in a lower-cost region would reduce the size of the benefit.

**Results.** To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of \$1.4 million.

<b>Improved Productivity For Central IT Operations Team</b>					
Ref.	Metric	Source	Year 1	Year 2	Year 3
B1	Number of FTEs supporting scheduling before using Control-M	B5/(1-B4)	22	24	25
B2	Percentage of time allocated to scheduling administration before using Control-M	Interviews	45%	45%	45%
B3	Total FTE hours supporting scheduling per year before using Control-M	B1*2,080*B2	20,592	22,464	23,400
B4	Net reduction in number of FTEs with deployment of Control-M	Interviews	32%	32%	32%
B5	Number of FTEs supporting scheduling with Control-M	Composite	15	16	17
B6	Percentage of time allocated to scheduling administration with Control-M	Interviews	30%	30%	30%
B7	Total FTE hours supporting scheduling per year with Control-M	B5*2,080*B6	9,360	9,984	10,608
B8	Total FTE hours saved per year with Control-M	B3-B7	11,232	12,480	12,792
B9	Fully burdened cost per IT professional per hour	TEI standard	\$52.00	\$52.00	\$52.00
Bt	Improved productivity for central IT operations team	B8*B9	\$584,064	\$648,960	\$665,184
	Risk adjustment	↓10%			
Btr	Improved productivity for central IT operations team (risk-adjusted)		\$525,658	\$584,064	\$598,666
<b>Three-year total: \$1,708,388</b>			<b>Three-year present value: \$1,410,354</b>		

## PRODUCTIVITY GAINS FROM IMPROVED DEVELOPMENT AUTOMATION

**Evidence and data.** For software developers, workflow automation has evolved from traditional jobs scheduling toward supporting the orchestration of modern applications with containers and service meshes and other intricate components. Developers are increasingly in need of leveraging configuration and infrastructure support during deployment of new software and upgrades that was traditionally the realm of IT Ops.

Interviewees stated that traditional workload-automation tools are unable to adapt or scale to these emerging requirements. While each of their organizations had varying levels of maturity with developers independently utilizing Control-M, the most common use was for testing and proactive monitoring during the deployment phase of the software development cycle.

- The principal data engineer for a B2C e-commerce retailer detailed what life was like for their organization’s developers before using Control-M. They said: “Before we integrated [Control-M’s] code as a service into the release process, the developers would have to move their code manually from one server to another server [and] from development to staging. They would make their changes and then ask the operations team to move that file from one folder to another and to change the scheduling and to set this. It was very painful and very slow and fraught with errors. Not all the packages would be

released. The schedules would be set incorrectly.” They estimated the effort required before and after the introduction of Control-M improved by 87.5%.

- The head of production planning and control for a financial services group explained: “With Control-M, we have been able to involve the development team, which was not possible before. We did a case study a few years ago, and [we] found that developers using Control-M for software deployment had accelerated their development lifecycles by 80%.”

**“We had six developers who were making changes in this environment every week [and spending] maybe 2 hours each. That was 2 hours on top of their development time just for the release process. That got reduced with Control-M automation to 15 minutes.”**

*Principal data engineer, B2C e-commerce*

**Modeling and assumptions.** The focus for this benefit is on the composite organization’s developers involved in the deployment and monitoring of production jobs as self-service users. For the composite organization, Forrester assumes the following:

- The number of developers using Control-M goes from 150 in Year 1 to 185 in Year 2 and to 230 in Year 3, which is based on higher adoption and overall growth.

Productivity improvement for developers in deployment

**Gross: 80%**

**Net: 48%**



- The composite’s gross productivity improvement is 80%. After applying a 60% productivity adjustment, the net productivity for developers during software deployment is 48%.
- On average, about 5% of developer time as a percentage of overall development time is expended during the deployment phase.
- The average fully burdened annual salary for a developer is \$162,000. These professionals are primarily based in the US or EMEA.

**Risks.** Forrester recognizes that these results may not be representative of all experiences, and this benefit will vary between organizations depending on:

- The productivity gains experienced during deployment.
- Organization type, complexity of code, etc.
- The relative expertise of the developers trained on Control-M and their geographical distribution. For example, a higher mix of these deployment

**“Control-M allows us to let the developers plan elements of the deployment themselves during production. It has facilitated transparency and visibility and made it much easier for them to see how the batches get executed during the night.”**

*CTO, regional insurance*

developers in a lower-cost region would reduce the size of the benefit.

**Results.** To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of \$1.6 million.

**Productivity Gains From Improved Development Automation**

Ref.	Metric	Source	Year 1	Year 2	Year 3
C1	Number of developers actively using Control-M for deployment	Composite	150	185	230
C2	Net productivity improvement for deploying and monitoring production jobs	Interviews	48%	48%	48%
C3	Deployment and monitoring time as a portion of overall development time	Assumption	5.0%	5.0%	5.0%
C4	Fully burdened cost per developer per year	TEI standard	\$162,000	\$162,000	\$162,000
Ct	Productivity gains from improved development automation	C1*C2*C3*C4	\$583,200	\$719,280	\$894,240
	Risk adjustment	↓10%			
Ctr	Productivity gains from improved development automation (risk-adjusted)		\$524,880	\$647,352	\$804,816
<b>Three-year total: \$1,977,048</b>			<b>Three-year present value: \$1,616,835</b>		

**PRODUCTIVITY GAINS FROM WORKFLOW ORCHESTRATION FOR KEY BUSINESS FUNCTIONS**

**Evidence and data.** Interviewees said business users who benefit from Control-M include a combination of individuals working on project teams as well as individuals who are directly involved in task administration, monitoring, and auditing. They said Control-M is easier to understand and easier to work with than previous solutions and that it provides business users with insights that previously weren't available in one place. They also said time savings for data engineers have been significant and that much of it is related to upstream and downstream dependency management. There were also significant time savings related to regulatory and compliance auditing and reporting activities.

- The automation engineering manager for a regional banking firm described the role that Control-M played for their organization's audit team. They said: "Because of the fact that we are a bank, we are highly audited. Since we are running so many of the bank's critical processes through this tool, we have to go through a series of validating procedures and document everything. Control-M has impacted the productivity of the audit process both internally and with our external audit teams."
- The head of production planning and control for a financial services group explained: "By using Control-M for self-service, business users [from]

some of the groups reported average efficiency gains of 25% to 30% through a combination of fewer people needed and less time [needed] per task for administration and monitoring."

**"By using Control-M for regulatory and compliance reporting, one group reduced the effort required to compile and produce reports to 5 hours per month. It used to take them 25 to 30 man-hours."**

*Scheduling management VP, global financial services*

**Modeling and assumptions.** The focus for this benefit is on the composite organization's data engineers and other business users (including auditing users) running their own jobs as self-service users. For the composite organization, Forrester assumes the following:

- The number of key business users (e.g., business stakeholders, data engineers, administrators, auditors) who use Control-M increases from 80 in Year 1 to 100 in Year 2 and to 120 in Year 3. This is based on higher adoption and overall growth.
- The composite's gross productivity improvement is 30%. Applying a 65% productivity adjustment, the net productivity for business users and data engineers is 20%.
- On average, business users reallocate about 20% of their time as a percentage of their overall workloads toward Control-M workflow automation.

Productivity improvement for business users

**Gross: 30%**  
**Net: 20%**



- The average blended fully burdened annual salary for a business user is \$125,000. This is based on approximately 75% of these professionals at the composite organization being more general business users and 25% being data engineers who receive higher salaries. These professionals are primarily based in the US or EMEA.

**Risks.** Forrester recognizes that these results may not be representative of all experiences, and this benefit will vary between organizations depending on:

- Organization type, the blend of business users, etc.
- The relative expertise of the business users who are trained on Control-M.
- Any geographic variances in compensation structures.

**“We have to validate our procedures, job inventories, recovery processes, etc. to match documentation. Centralizing everything in Control-M has improved audit results while saving thousands of hours.”**

*Automation engineering manager, regional banking*

**Results.** To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of \$1.1 million.

**Productivity Gains From Workflow Orchestration For Key Business Functions**

Ref.	Metric	Source	Year 1	Year 2	Year 3
D1	Number of key business users (e.g., data engineers, auditors, etc.) using Control-M	Composite	80	100	120
D2	Productivity improvement (workload automation vs. previous methods)	Interviews	20%	20%	20%
D3	Percentage of time allocated to workload automation	Assumption	20 %	20%	20%
D4	Blended fully burdened cost per business user per year	TEI standard	\$125,000	\$125,000	\$125,000
Dt	Productivity gains from workflow orchestration for key business functions	D1*D2*D3*D4	\$400,000	\$500,000	\$600,000
	Risk adjustment	↓10%			
Dtr	Productivity gains from workflow orchestration for key business functions (risk-adjusted)		\$360,000	\$450,000	\$540,000
<b>Three-year total: \$1,350,000</b>			<b>Three-year present value: \$1,104,884</b>		

## DEPRECATING OR REDUCING LEGACY TOOLS

**Evidence and data.** Most of the interviewees said their organization deployed Control-M as its application and data workflow orchestration platform many years ago. However, with continued innovation and enhancements in the platform, some were able to reduce the use of or totally phase out a blend of file transfer, job scheduling, and ELT tools that were part of other tools or applications. Most of these had direct cost impacts while others were part of platform applications. The ability to deprecate the cost of legacy tools implied that associated maintenance and support costs would be proportionally reduced.

- The IT manager for a multinational auto manufacturer said their organization was able to discontinue the use of two distinct legacy tools with Control-M. They said: “We switched off the [secure data transport tool]. We most likely saved the company about €400,000 to €500,000 a year just by moving that functionality to Control-M. ... Looking at [a direct connection tool], we’re probably looking at savings in the vicinity of about a million euros a year by the end of 2023 — assuming the migration to Control-M goes [as] smoothly as planned. [Those] savings [are] based on the cost of licenses, maintenance, and related support costs.”
- The automation engineering manager for a regional banking firm discussed how their organization was able to discontinue using a data-replication tool. They said: “We had a data-replication system that was used enterprise wide. However, it was very similar to how folks were automating using cron to trigger jobs and utilizing database tables to drive job dependency to trigger other jobs, etc. With Control-M, we were able to discontinue using that product. It was close to \$1 million of man-hours saved within a year. Over a five-year period, it was \$5 million to \$6 million in man-hours saved.”
- The CTO for a regional insurance firm explained that there are benefits of a multiyear replatforming endeavor. They said: “We have benefitted globally with that program. Control-M has played a central role in moving to the distributed platform. So, we have decreased the total cost of ownership by about 75%. Not all of that is attributed to Control-M, but it’s a major part of the cost savings.”

**Modeling and assumptions.** For the composite organization, Forrester assumes the following:

- The annual licensing cost of the composite’s discontinued legacy platform (for a file transfer, scheduling, or ELT tool) and the cost of maintenance was \$400,000. The composite deployed the legacy tool some years prior to Year 1.
- The composite avoids 5% of overhead inefficiencies by replacing the legacy function with Control-M.
- The composite phases out the legacy tool at a rate of 50% in Year 1, 75% in Year 2, and 100% in Year 3.

**Risks.** Forrester recognizes that these results may not be representative of all experiences, and this benefit will vary between organizations depending on:

- The specific functionality and pricing structure of the organization’s legacy workload-automation or ELT tool.
- Overhead inefficiencies, which are tool-dependent.
- The schedule for phasing out the legacy platform, which will vary by type of functionality being replaced and the organization’s standard procedures.

**Results.** To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of \$690,100.

<b>Deprecating Or Reducing Legacy Tools</b>					
<b>Ref.</b>	<b>Metric</b>	<b>Source</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>
E1	Cost of legacy file transfer, scheduling, or ELT platform(s)	Assumption	\$400,000	\$400,000	\$400,000
E2	Overhead inefficiencies avoided by Control-M adoption	E1*5%	\$20,000	\$20,000	\$20,000
E3	Consolidation and sunseting of legacy platform(s)	E1+E2	420,000	420,000	420,000
E4	Planned phase out of legacy platform(s)	Assumption	50%	75%	100%
Et	Deprecating or reducing legacy tools	E3*E4	\$210,000	\$315,000	\$420,000
	Risk adjustment	↓10%			
Etr	Deprecating or reducing legacy tools (risk-adjusted)		\$189,000	\$283,500	\$378,000
<b>Three-year total: \$850,500</b>			<b>Three-year present value: \$690,113</b>		



## UNQUANTIFIED BENEFITS

Interviewees mentioned the following additional benefits that their organizations experienced but were not able to quantify:

**“It felt really good when we could finally trace the entire job stream of the data collection, manipulation, and reporting processes for leadership’s daily reporting.”**

*Principal data engineer, B2C e-commerce*

- **A single application and data workflow orchestration platform.** Interviewees said that prior to using Control-M, the complexity of scheduling, monitoring, and incident response at their organizations involved logging into many applications. But they said with Control-M, entire job streams are visible and managed without logging into additional applications. This simplified the understanding of workflows, adhering to dependencies, and expanding the usability of all related tasks. Noteworthy examples included covering application and data workflows with tasks in a combination of mainframes, various on-premises environments, and various cloud environments.
  - The automation engineering manager for a regional banking firm described the operational efficiency like this: “Control-M has made a huge difference within our operations management area. Obviously, there are a lot of man-hours saved by having a single pane of glass to go and get the status or try to recover some process. This [is] as opposed to having to

go and log in to various applications or operating systems to go and try to find some process, determine its status, and try to recover it.”

- An application product owner for a multinational auto manufacturer said: “You log into one place, then you see all 14 systems in one view. That is absolutely always a winner when people see this — even with more complex setups where you have multiple systems and [those] with a central database. With Control-M, we can combine all those different systems into one view.”
- **Confidence in day-to-day operations and plans for disaster recovery.** IT ops, data engineers, developers, and the application’s business stakeholders are more confident that daily processes will be completed on time and without errors. Furthermore, their organizations no longer experience disruptions in day-to-day operations that previously relied on scheduling processes with dependencies. Interviewees also spoke of being confident that their organizations’ disaster recovery processes within Control-M will minimize disruptions if a catastrophic event occurs.

**“We know that we can do a full disaster recovery, which is a relief. We annually do a disaster recovery test of our whole enterprise. We then run all of those checks and balances of our secondary environment.”**

*Automation engineering manager, regional banking*

- **Support by knowledgeable and responsive Control-M experts.** Interviewees said they are pleased with Control-M’s support of usage questions to dealing with more significant challenges, such as scaling or accommodating modern application technology stacks.
  - The automation engineering manager for a regional banking firm said: “Our account and regional managers of the product ... really step in when we’re dealing with new technology or we’re trying to do something different with the product. They really work with you to get you the BMC support around where you need to go. Plus, the support ... when we have incidents and tickets and issues with the product is top notch.”
  - The CTO of a regional insurance firm said: “I’ve been quite well-supported by BMC. In fact, for me, it has been a positive surprise during and after our replatforming program. Plus, the trajectory we have been able to take with BMC under the distributed platform for Control-M has been positive.”
- **Time saved with the Control-M Conversion Tool.** Interviewees from organizations that utilized the Control-M Conversion Tool said it reduced conversion efforts on a high percentage of existing work streams.
  - A system programmer for a financial services group said: “In my opinion, the Conversion Tool made it possible ... [There were] too many things to convert. And the goal was to get the automation to convert as much as possible, so we were changing some definitions in the old system so [that] it’s convertible.”

### FLEXIBILITY

The value of flexibility is unique to each customer. There are multiple scenarios in which a customer might implement Control-M and later realize additional uses and business opportunities, including:

- **Enabling migration to the cloud and supporting a hybrid cloud infrastructure.** Almost every interviewee said their organization dealt with hybrid cloud environments in its digital transformation journey. While each organization was in a different stage of its journey and long-term strategy, interviewees noted how BMC’s development and support teams are eager to engage and work with them to support application and data workflow orchestration for a hybrid cloud environment.
  - The automation engineering manager for a regional banking firm recalled: “When we first picked up Control-M, all of our applications that we automated for were on-prem. As we started going into the cloud space and started using other SaaS [software-as-a-service] solutions for ETL products, our needs changed. When we approached BMC, they were willing to work with us, and they were able to deliver a solution and bring it to market fairly fast.”

**“BMC has worked very hard with us to deal with our volume and scale and level of complexity. ... whether it’s the number of users - we have 20,000 users, e.g. So, they’ve worked with us to find solutions to help us support our massive installation.”**

*Scheduling management VP, global financial services*

- The principal data engineer for a B2C e-commerce retailer outlined their organization's challenge as follows: "We use [a hyperscaler cloud vendor], and we have a robust set of tools in there for our data engineering, our toolsets, and everything. We manage a [cloud-based] database also. And Control-M has been able to help us make the bridge from on-premises to cloud. We not only coordinate jobs that are 100% being invoked inside of [the cloud provider] and running inside of [it], but we can also orchestrate moving data from third-party software into [the cloud provider] through that toolset. So, it's enabled a large part of our journey into the cloud."

- **Independence from other platforms and tools.**

Some interviewees described the flexibility of Control-M being outside of and independent of their organizations' hardware infrastructures, operating-system environments, or other productivity and automation technology platforms. The value derived from this independence is that the application and data workflow orchestration of operations can run on its own and not rely on other systems.

The principal data engineer for a B2C e-commerce retailer said: "The one thing that I've

been able to take advantage of with Control-M is that it is different. It is not in our cloud provider. It's not inside of our what's called database or ETL tools, etc. It's outside of everything. And it's always up, and it can always tell us what it thinks is going on in any one of the systems. That's the flexibility [that is] separate from everything else, and that's been a benefit for us."

**"Control-M will be used in all the batch execution of the future. We will continue to use Control-M to execute batches in the cloud, batches in the SaaS environment, and batches in the on-prem environment."**

*CTO, regional insurance*

Flexibility would also be quantified when evaluated as part of a specific project (described in more detail in [Appendix A](#)).

# Appendix A: Total Economic Impact

Total Economic Impact is a methodology developed by Forrester Research that enhances a company's technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

## TOTAL ECONOMIC IMPACT APPROACH

**Benefits** represent the value delivered to the business by the product. The TEI methodology places equal weight on the measure of benefits and the measure of costs, allowing for a full examination of the effect of the technology on the entire organization.

**Costs** consider all expenses necessary to deliver the proposed value, or benefits, of the product. The cost category within TEI captures incremental costs over the existing environment for ongoing costs associated with the solution.

**Flexibility** represents the strategic value that can be obtained for some future additional investment building on top of the initial investment already made. Having the ability to capture that benefit has a PV that can be estimated.

**Risks** measure the uncertainty of benefit and cost estimates given: 1) the likelihood that estimates will meet original projections and 2) the likelihood that estimates will be tracked over time. TEI risk factors are based on "triangular distribution."

The initial investment column contains costs incurred at "time 0" or at the beginning of Year 1 that are not discounted. All other cash flows are discounted using the discount rate at the end of the year. PV calculations are calculated for each total cost and benefit estimate. NPV calculations in the summary tables are the sum of the initial investment and the discounted cash flows in each year. Sums and present value calculations of the Total Benefits, Total Costs, and Cash Flow tables may not exactly add up, as some rounding may occur.



## PRESENT VALUE (PV)

The present or current value of (discounted) cost and benefit estimates given at an interest rate (the discount rate). The PV of costs and benefits feed into the total NPV of cash flows.



## NET PRESENT VALUE (NPV)

The present or current value of (discounted) future net cash flows given an interest rate (the discount rate). A positive project NPV normally indicates that the investment should be made unless other projects have higher NPVs.



## RETURN ON INVESTMENT (ROI)

A project's expected return in percentage terms. ROI is calculated by dividing net benefits (benefits less costs) by costs.



## DISCOUNT RATE

The interest rate used in cash flow analysis to take into account the time value of money. Organizations typically use discount rates between 8% and 16%.



## PAYBACK PERIOD

The breakeven point for an investment. This is the point in time at which net benefits (benefits minus costs) equal initial investment or cost.

## Appendix B: Supplemental Material

### *Related Forrester Research*

“Intelligent Automation Platforms Take Aim At Workforce Orchestration,” Forrester Research, Inc., April 9, 2021

“The Automation Fabric Landscape, Q4 2022,” Forrester Research, Inc., December 19, 2022

“The Forrester Tech Tide™: Process Automation, Q1 2023,” Forrester Research, Inc., January 11, 2023

### *Online Resources*

“Jobs-as-Code: The Business Processing DevOps Forgot,” Joe Goldberg, August 7, 2017 [<https://devops.com/jobs-as-code-business-processing-devops-forgot/>]

## Appendix C: Endnotes

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<sup>1</sup> “The Forrester Tech Tide™: Intelligent Automation, Q1 2020,” Forrester Research, Inc., January 8, 2020

<sup>2</sup> Total Economic Impact is a methodology developed by Forrester Research that enhances a company’s technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

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