Total Economic Impact

The Total Economic Impact™ Of BMC AMI DevX

Cost Savings And Business Benefits Enabled By BMC AMI DevX

A FORRESTER TOTAL ECONOMIC IMPACT STUDY COMMISSIONED BY BMC, JUNE 2025

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Executive Summary

Forrester's research finds that a majority of enterprises — 54% — plan to increase mainframe usage over the next two years.[1] The mainframe platform is here to stay, but technology leaders report one key challenge: staffing. Workforce development remains a major — and often urgent — concern for organizations as their tenured mainframe developers seek retirement and junior developers gravitate toward other platforms. The right developer tooling can help organizations mitigate these workforce demographic trends by providing a developer experience that attracts and retains new talent. In addition, organizations using modern tooling realize operational efficiencies and improvements in mainframe team velocity and software quality. When developers have an advanced, integrated toolchain, mainframe goes from being a slow, siloed program to a unified part of an agile enterprise.

BMC AMI DevX is an integrated software platform that provides mainframe development teams with modern application development and DevOps capabilities. The solution connects traditional mainframe environments with contemporary development practices through components for source code management, testing, debugging, and analytics. (For a complete list of the products and capabilities of the BMC AMI DevX platform, see Appendix D.)

BMC commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying BMC AMI DevX.[2] The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of BMC AMI DevX on their organizations.

217%

Return on investment (ROI)

$18.0M

Net present value (NPV)

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed eight representatives from six organizations with experience using BMC AMI DevX. For the purposes of this study, Forrester aggregated the experiences of the interviewees and combined the results into a single composite organization with $10 billion in revenue and 300 mainframe developers.

Interviewees said that prior to using BMC AMI DevX, their mainframe teams struggled with legacy development tools, both homegrown and purchased from other vendors. The limited functionality of these tools made working with old, complex codebases risky and challenging. Moreover, the interviewees' organizations faced an erosion of talent as senior mainframe developers retired. Since the mainframe remained critical to their organizations' businesses, the interviewees sought a solution that could help them both modernize mainframe development practices and improve the developer experience in the hopes of attracting new talent.

The interviewees noted that with BMC AMI DevX tooling, their mainframe teams' development operations improved. Velocity and quality both increased, which had tangible business benefits. The interviewees also reported workforce benefits: increased recruitment and retention of new developers; faster onboarding; and significant productivity gains for developers. According to the interviewees, switching to BMC AMI DevX tooling transformed the mainframe from a siloed, slow platform into a center of collaboration and innovation.

Key Findings

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

- **Software release efficiencies save two FTEs per year.** Before switching to the BMC AMI DevX platform, the mainframe team struggled with cumbersome, manual release processes created by the limitations of its legacy tooling. The team even had two dedicated release managers who coordinated releases and managed contentions full-time. However, with the BMC AMI DevX tools, the mainframe team automates much of its release processes, from version control and contention management to documentation. This frees up the release managers for higher-value work. This benefit is worth $655,000 over three years for the composite organization.
- **Development velocity increases as the mainframe team changes between three and 15 times more code per year.** Thanks to the efficiencies gained during releases, the mainframe team increases its release cadence by up to 50%, from four releases per year up to six. In addition, the BMC AMI DevX tools increase visibility into the organization's legacy codebase and make changing decades-old code easier. With the new tools, the mainframe team changes up to 900% more programs per release than before. The result of these two benefits — both releasing more frequently and changing more programs per release — is that the mainframe team ultimately changes up to 15 times more of its codebase per year — e.g., launching new features, fixing bugs, etc. The mainframe team's velocity approaches that of other, non-mainframe teams, and collaboration and coordination within the mainframe team improve as well. This benefit is worth $7.1 million for the composite organization.
- **Software quality and stability improve, and downtime falls by 99%.** Using the BMC AMI DevX tools, the mainframe team reduces its change failure rate by 33% (meaning that there are one-third fewer issues escaping to production). The number of issues falls thanks to automation — both of the toolchain and of testing — and thanks to features that increase developer productivity when debugging. In addition, when issues do surface, the BMC AMI DevX tools enable rapid rollbacks, reducing downtime by 98%. The net impact of fewer issues and less downtime per issue is that there is 99% less mainframe app downtime. This means fewer disruptions to the composite organization's core business, a benefit worth $1.3 million.
- **Junior developer headcount increases by 240%.** The BMC AMI DevX tools (as well as associated process changes) help make mainframe an attractive and accessible platform for new developers. As the composite organization's senior developers retire, it hires junior developers to sustain and even grow its mainframe team from 300 developers to 318 (a 6% increase). Junior developers increase from 10% of the workforce to almost one-third of the workforce. These changes are worth $7.9 million to the composite organization.
- **New developers onboard 50% faster.** The BMC AMI DevX tools improve knowledge transfer, and new developers ramp up to full productivity in four and a half months instead of the nine months they needed with the organization's legacy tooling. This benefit is worth $825,000 to the composite organization.
- **Developer productivity increases by 33%, with incremental output from the development team equivalent to 25 FTEs.** Using the BMC AMI DevX tools, the composite organization automates away tedious administrative tasks so that developers spend more time coding. Powerful features and modern capabilities in the tools also help developers work faster and more effectively. Since productive developers are happy developers, morale and culture improve. For the composite organization, the incremental output from the developer productivity gains is about the same as adding 25 FTEs to the development team, approximately an 8% increase in effective team size. This benefit is worth $8.1 million to the composite organization.
- **Toolchain administration costs fall by 50%.** The BMC AMI DevX platform is easier to administer and support than the composite organization's legacy tooling, resulting in savings of $357,000. (This benefit reflects IT time savings

alone. The composite organization could realize additional savings on licensing costs by switching platforms, but to be conservative, Forrester did not model those.)

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

- **Superior enterprise support from BMC.** Unlike other vendors, BMC partners with the composite organization to guide it through its mainframe modernization efforts.
- **Continued improvements based on data.** BMC AMI DevX tools provide metrics and insights that help the composite organization further improve its processes over time.
- **Upcoming AI features that may amplify benefits.** AI features on the BMC AMI DevX roadmap may increase benefits such as developer productivity even further.

Costs. Three-year, risk-adjusted PV costs for the composite organization include:

- **Platform licensing costs of around $10,000 per user per year.** For the composite organization, the total cost is $7.5 million.
- **Implementation effort of around 4,000 hours.** This work is completed by a few employees over several months. For the composite organization, this cost totals $427,000.
- **Ongoing administration effort of around 1,000 hours per year.** For the composite organization, this cost totals $231,000.
- **Training time per developer of 4 hours.** Developer training includes formal sessions as well as informal question-and-answer periods (e.g., “office hours”). For the composite organization, training developers to use the BMC AMI DevX platform costs $158,000.

The financial analysis based on the interviews found that the composite organization experiences benefits of $26.2 million over three years versus costs of $8.3 million, adding up to a net present value (NPV) of $18.0 million and an ROI of 217%.

> *“In terms of going where I wanted to go and being flexible enough to meet my needs, [BMC has been] phenomenal. Not even a question — easy decision. [BMC AMI DevX] has done everything we wanted it to do.”*
>
> **PDM, financial services**

Key Statistics

217%

Return on investment (ROI)

$26.2M

Benefits PV

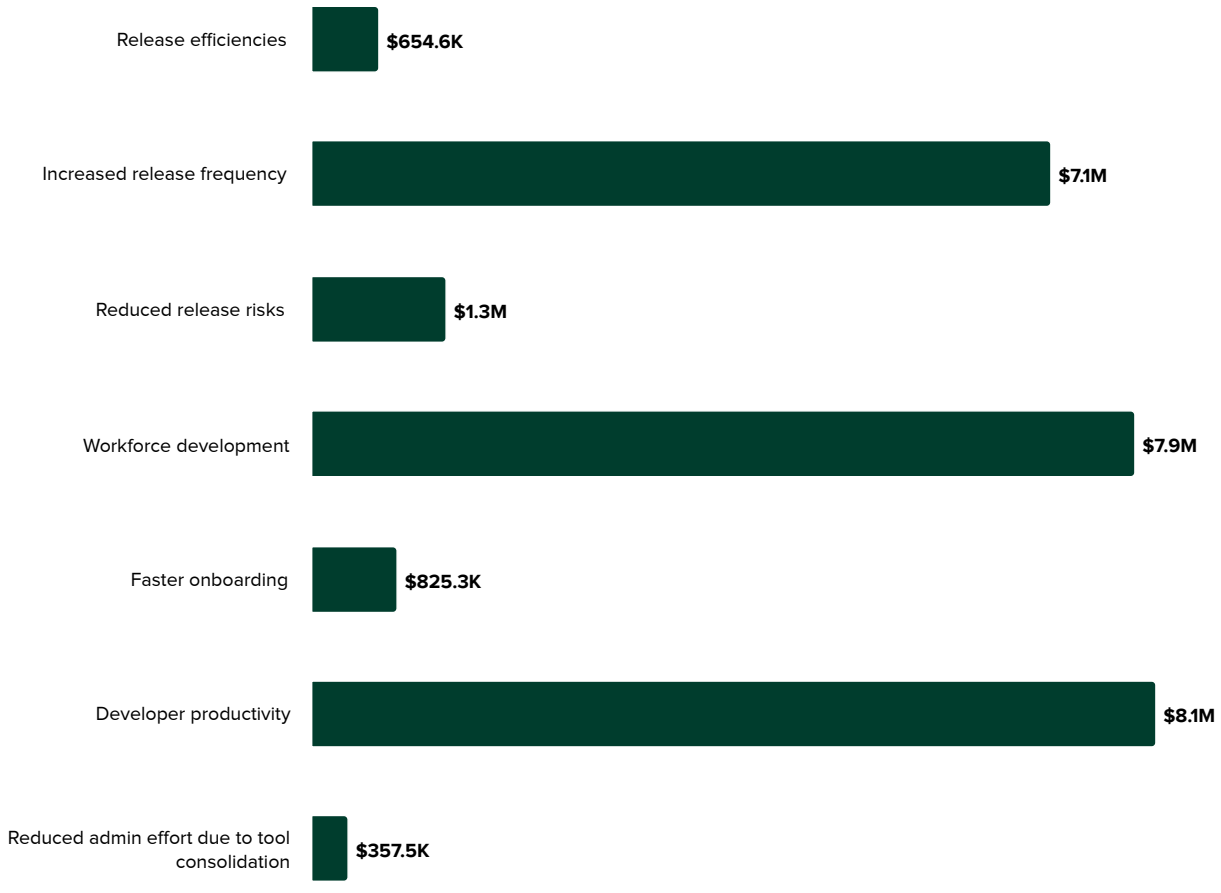
$18.0M

Net present value (NPV)

<6 months

Payback

Benefits (Three-Year)



The BMC AMI DevX Customer Journey

Drivers leading to the BMC AMI DevX investment

Interviews				
Role	**Industry**	**Region**	**Revenue**	**Mainframe Developers**
Mainframe systems engineer	Financial services	Europe/Middle East/Africa	$600 million	80 to 90 developers
Mainframe DevOps lead	Financial services	Europe/Middle East/Africa	$900 million	200 developers
Project lead, change management	Financial services	Europe/Middle East/Africa	$100 million	80 developers
Chief information officer (CIO)	Healthcare	North America	$600 million	100 to 200 developers
• Platform engineer • Product engineer • Platform lead, mainframe DevOps	Financial services	Europe/Middle East/Africa	$1 billion	200 developers
Programming development manager (PDM)	Financial services	North America	$12 billion	475 developers

Key Challenges

Before they adopted BMC AMI DevX tools, the interviewees' organizations lacked integrated, end-to-end toolchains for mainframe development. Four of the six organizations used tools from other vendors during parts of the software development lifecycle (SDLC), but they lacked tooling for the entire SDLC. The interviewees were also frustrated by limitations in the tools from other vendors. Two of the six organizations had built software development tools in-house, but these tools were costly to maintain. The opportunity costs of these homegrown tools were high: The developers could be writing new features instead of maintaining the tooling, and in one case, the developers who had built the in-house toolset decades before were retiring. Regardless of whether the organizations had tooling from another vendor or tooling built in-house, it was common for their mainframe development toolchains to lack many of the capabilities that the BMC AMI DevX tools offered.

The interviewees described several common challenges:

- **Legacy mainframe development tools — both homegrown and purchased from other vendors — were limiting.** The interviewees who used tooling from other vendors described specific shortcomings with those products. For instance, the mainframe DevOps lead in financial services said: "The toolset we were using at the time was [a product suite from another vendor]. We ran into some limitations and challenges. For example, contention management — [our old tools] were very rigid around the change set, and that caused some challenges. Plus, we wanted to start pushing pipeline automation. … I don't know whether [the other vendor] has caught up yet, but we were reaching out to their support team, and we weren't getting much joy — they weren't improving the products."

  Similarly, the CIO in healthcare said: "[Another vendor] changed their pricing — it was financially expensive. They're good products, but much more expensive. … I'm not saying that they weren't good tools, but they didn't have all the features that BMC AMI DevX has."

- **Experienced senior mainframe developers were nearing retirement, and recruiting junior developers was hard.** The PDM at a North American financial services organization said: "I'm trying to retire. My whole team is trying to retire. My team has been with me personally for over 30 years. Bear in mind, we showed up in the '80s. … But it's time to turn out the lights and go home. … I'd guess a quarter to a third [of the organization's mainframe developers] are looking to retire in the next two years. We're going to lose a lot of history."

  The PDM added: "There's a [mistaken] philosophy that mainframe is dead. So when [young developers] come in from colleges, they hesitate. There's some hesitancy because of the indoctrination they've received." The PDM hoped that BMC AMI DevX tools could help to overcome such misconceptions.

  Similarly, the platform lead of mainframe DevOps at a financial services organization in EMEA estimated that 70% of the mainframe developers at their organization would retire within the next 10 years. They said, "It's not a hypothesis; it's a well-known fact: We have a very aging mainframe developer population."

  The CIO at a healthcare organization said that 75% of their mainframe developers were over the age of 45. The CIO explained why recruiting new developers to mainframe was a challenge: "The learning curve in mainframe can be high. I think mainframe development in general is more complicated in some ways. It's just not common — it's a harder skill set to find. … Historically, it's been more of a challenge for us to find individuals, and that's the same for a lot of the third parties we work with. Even for our contractors, it's a problem. … We've tried to really improve our training programs to bring on new talent, [but] it's still challenging even with that. … So it is a concern, and part of the rationale for selecting [BMC AMI DevX] tools was to lower that barrier to entry."
- **Old and complex codebases that supported critical business functions were difficult and risky to maintain.** All the interviewees described their organizations' mainframe codebases as containing millions of lines of code, with some code dating back to the 1980s. The mainframe systems engineer in financial services explained that this could be another barrier to recruiting new developers: "The codebase is complicated. It's 40 years old. It's very complex."

  Nevertheless, for all the organizations, mainframe codebases were integral to business operations. The CIO in healthcare explained: "There are millions of different claims that we process — mainframe supports all that. … And there are mandates [(regulations)] from [the United States] Congress. … As laws change, we need to incorporate those changes." Similarly, the PDM in financial services said: "The back-end code is still all running on mainframe, of course. On our peak days, we see around 115 million transactions a day."

  The PDM added: "Mainframe's not dead. … Your parents' Social Security check, your credit cards, your bank statements — all big iron. [Mainframe] is what makes the money."

  For the interviewees' organizations, mainframe code quality was paramount. However, maintaining those high standards when their codebases were so complex and old was arduous.

Investment Objectives

The interviewees searched for a solution that could help:

- **Modernize mainframe development.** The mainframe DevOps lead in financial services said: "We realized that we couldn't just have good processes on the distributed side. We had to implement DevOps on mainframe as well." The PDM at another financial services firm echoed those comments: "Going agile was part of the reason for getting the new tooling in the shop. … [BMC AMI DevX] is a leg of that stool." And the CIO in healthcare summarized: "There's been a big change in our organization to move from a waterfall approach to agile over time, and I'd argue that [BMC] has designed [BMC AMI DevX] to really hit that. … If you're looking for a modern DevOps practice, [the BMC AMI DevX] tools really fit into that. They have a lot of flexibility. A lot of that is the integrations, but even the auditing and governance tools — especially for an environment like ours — are key. They do an excellent job with that."

- **Improve software delivery and quality.** The interviewees expected that using BMC AMI DevX tools would enable them to improve their software delivery processes and thereby reduce issues and improve quality. The mainframe systems engineer in financial services explained: "More and more of our external applications have connections from the mainframe, so we had a growing need to synchronize all the deployments. … One of our goals — which was fulfilled by [BMC AMI DevX] Code Pipeline — was to synchronize and have consistency in our deployments so that everything was on the same level. And if we want to fall back, we can fall back everything at the same time. [Now,] we can fall back in production very quickly. [Before,] without any tooling, [we did it] by hand, so it was very complex."
- **Recruit new mainframe developers.** The interviewees also said that BMC AMI DevX products were far easier to use than tools from other vendors, and they believed that this could help make mainframe more accessible to new developers (without alienating senior developers). (Since BMC AMI DevX tools offer both graphical and green screen interfaces, developers can use the tools in the manner they prefer.) The mainframe systems engineer in financial services said: "Young developers prefer to work on [a GUI] environment rather than the TSO [time-sharing option] environment. So it's easy for us to unblock them, and they can work with a tool they like. … [BMC AMI DevX] simply unblocks the new [person] and helps them start to work with mainframe tooling more easily. They're not afraid of what they're using."

  The interviewees believed that the BMC AMI DevX tools would not only help them recruit new mainframe developers but would also reduce developer onboarding times. As the CIO in healthcare said: "[Another product] is a very powerful tool, but it's much more complicated. Part of our justification for looking at the [BMC AMI DevX] tools, and part of the rationale for why we selected them, is ease of use. Learning the tools is easier, which shortens the implementation timelines, and that creates value."

Solution Requirements

The interviewees all evaluated multiple vendors before choosing the BMC AMI DevX platform. When asked to explain their decisions, they provided the following reasons:

- **The BMC AMI DevX tools were feature-rich and had specific capabilities to support modern software development practices.** Many interviewees noted that — unlike other options — the BMC AMI DevX products easily integrated with other tools in their development stacks (e.g., tools for managing projects, releases, and code quality). The CIO in healthcare said: "There were things that we specifically sought because [the developers] wanted the functionality. … [An alternative platform] has similar development capabilities, but the BMC products have a larger DevOps integration stack. The other big piece [of our decision] was the user interface. It's very modern; [BMC] has a very modern toolset."
- **The BMC AMI DevX tools featured a UI that was easy for developers — especially new developers — to learn and use.** The mainframe systems engineer in financial services said: "When we did our POC [(proof of concept)] for Code Debug, we found that it was easier for developers to work with the user interface rather than a terminal to debug. It was more intuitive. It was quicker. It was easier to handle."

  Similarly, the mainframe DevOps lead in financial services said: "It really came down to ease of use. [Another vendor's product] has pretty similar capabilities. But the setup and configuration with the BMC products was so easy, so straightforward — especially compared to the fairly complicated process we'd have to go through with [the other vendor]. … One big thing missing with [the other product] was something simple like doing copybook impact analysis. With the BMC tools, you right-click and view your impact**,** and there's your analysis. So it pretty much boiled down to ease of use."

  The PDM in financial services agreed: "We looked at nine platforms. … The big selling point was that [BMC AMI DevX Workbench] had two interfaces — a GUI and green screen. So I wasn't throwing the baby out with the bathwater, but

I could get new, younger developers involved."

The interviewees also expected that the UI would enhance developer productivity. As the project lead for change management in financial services explained, "A good part of the [BMC AMI DevX] toolchain is that our developers [now] have all their tools in one IDE [(integrated development environment)]."

- **Mainframe developers preferred the BMC AMI DevX tools.** As the interviewees evaluated different platforms, they sought input from their developers, and the developers consistently preferred the BMC tools over alternatives. For instance, at the healthcare organization, the developers were asked to rate their satisfaction with various tools on a scale from 1 (unsatisfied) to 10 (satisfied), and they consistently rated the BMC tools more highly than the tools from another vendor:
  - Code Debug was rated 9.5/10 versus 8.0/10.
  - Strobe was rated 9.6/10 versus 9.2/10.
  - Code Insights was rated 9.0/10 versus 8.0/10.
  - zAdviser was rated 9/10 versus 7.5/10.

The CIO at the organization said: "They've even commented how they like BMC's tools better. [And] when you look at the reasons people list, it comes down to usability and how the tools flow and operate."

- **BMC was a partner, not just another vendor.** The PDM in financial services recalled their initial conversations with BMC: "They were on the same journey [with agile] that I was going to attempt in a year or two. [I thought,] wouldn't it be nice to have a partner who could lead me through not just the technical stuff but the other stuff as well? And they were willing to spend time with me, to teach me and explain to me — to help me through that journey. Some of it was purely nontechnical. It was the same team whom I still talk to today."

  The CIO in healthcare said, "We were looking for a solution that was not just best in class but would also meet our needs and have the features and functionality we were looking for in the future." The CIO continued: "We looked at a lot of different players and determined BMC's offerings met a lot of our criteria, and it seemed like the company was forward-thinking and implementing new features and functionality at a faster rate than the competitors. That played into our decision rationale, and it's why we've implemented BMC products over time and why we continue to work with them."

> *"BMC understood what we were trying to do. It didn't feel forced for them. Everyone else felt forced."*
>
> **PDM, financial services**

Composite Organization

Based on the interviews, Forrester constructed a TEI framework, a composite company, and an ROI analysis that illustrates the areas financially affected. The composite organization is representative of the interviewees' organizations, 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 composite organization is a $10 billion-dollar business with regional operations in an industry subject to high levels of regulation (e.g., finance, insurance, healthcare, public sector, etc.). The organization's mainframe codebase supports critical business operations, but it is decades old, complex, and opaque. Similarly, the composite organization has 300 full-time mainframe developers, but this workforce is aging:

60% of developers are senior developers approaching retirement, and only 10% are junior developers at the beginning of their careers.

- **Deployment characteristics.** Before adopting the BMC AMI DevX products, the composite's mainframe development team used a mix of tools from other vendors and tools built in-house. There were some capabilities for which it had no solution. The composite organization then implements the BMC AMI DevX tools during the Initial year of the model and retires its prior solutions. The composite organization adopts a critical mass of BMC AMI DevX products — including Workbench, Code Pipeline, Total Test, File-AID, Abend-AID, Code Debug, Code Insights, Strobe, and zAdviser — so that it has a complete, end-to-end, and integrated toolchain.

  Lastly, before transitioning to the BMC AMI DevX tools, the mainframe team had been using some agile and DevOps practices during development. However, as the team adopts the BMC AMI DevX tools, it modernizes its software development practices even further.

KEY ASSUMPTIONS

- $10 billion in revenue
- 300 mainframe developers
- 20 million lines of code in mainframe codebase

Analysis Of Benefits

Quantified benefit data as applied to the composite

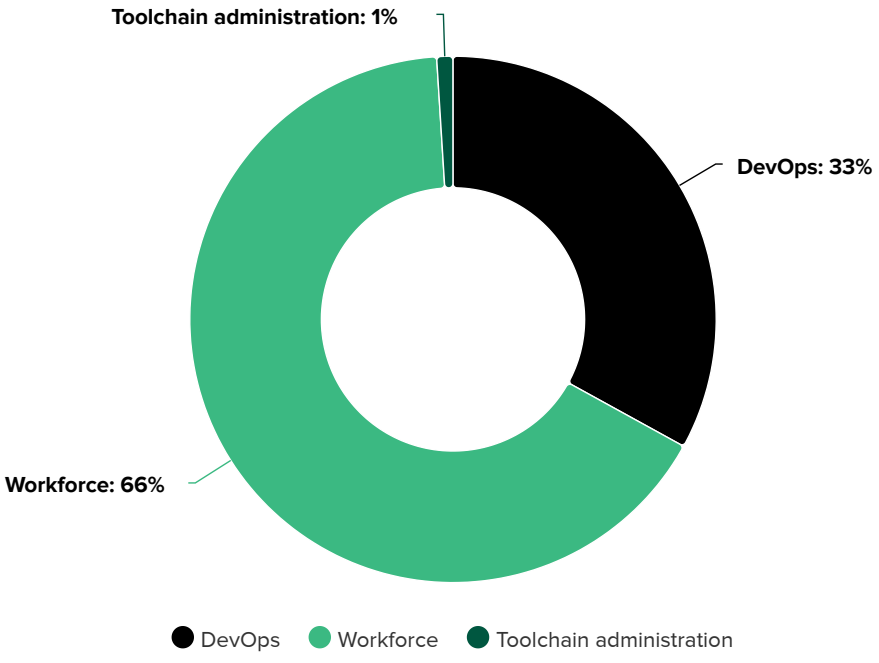
Total Benefits						
Ref.	**Benefit**	**Year 1**	**Year 2**	**Year 3**	**Total**	**Present Value**
Atr	Release efficiencies	$263,210	$263,210	$263,210	$789,629	$654,563
Btr	Increased release frequency	$918,000	$2,448,000	$5,712,000	$9,078,000	$7,149,196
Ctr	Reduced release risks	$413,063	$537,069	$620,031	$1,570,163	$1,285,209
Dtr	Workforce development	$1,640,250	$3,280,500	$4,920,750	$9,841,500	$7,899,326
Etr	Faster onboarding	$331,847	$331,847	$331,847	$995,542	$825,255
Ftr	Developer productivity	$3,345,594	$3,227,796	$3,140,330	$9,713,720	$8,068,425
Gtr	Reduced admin effort due to tool consolidation	$143,754	$143,754	$143,754	$431,262	$357,495
	Total benefits (risk-adjusted)	$7,055,718	$10,232,176	$15,131,921	$32,419,815	$26,239,469

Forrester found and quantified seven benefits for the composite organization. These benefits fall into three distinct categories or areas of value for the composite organization:

Types Of Benefits		
Type	**Benefits**	**Description**
DevOps	• Release efficiencies • Increased release frequency • Reduced release risks	Business value of improvements in mainframe software delivery processes (e.g., increased velocity and quality)
Workforce	• Workforce development • Faster onboarding • Developer productivity	Increased productivity of mainframe developers and growth of the mainframe development team (i.e., from recruiting new developers)
Toolchain administration	• Reduced admin effort due to toolchain consolidation	Cost savings from retiring legacy tools

For the composite organization, the relative magnitude of each category of benefit is as follows:

Types Of Benefits



Release Efficiencies

Evidence and data. The interviewees said that BMC AMI DevX tools enabled them to eliminate laborious release processes. With their legacy toolchains, they often had to manually manage changes and code promotions. Two of the organizations even had developers in gatekeeper roles dedicated to this work full-time. With BMC AMI DevX Code Pipeline, though, the interviewees' organizations automated their pipelines, documentation, and many other release processes, thereby saving their developers hours of effort per release.

- The mainframe DevOps lead in financial services summarized: "We had two full-time resources playing gatekeeper. … That was obviously a lot of manual overhead and effort. [But with BMC AMI DevX,] we effectively removed all of the overhead for developers having to document exactly what they are changing … plus the need for gatekeepers to manage the contentions, so we effectively saved two FTEs plus … about 8 hours' worth of documentation and admin per release, on average. That on its own was already a major, major improvement and savings."

  The same mainframe DevOps lead explained: "It was really a struggle for us [before BMC AMI DevX]. … In a lot of cases, we picked up contentions [(conflicts in the code changes)] quite far down the road, and there were quite a number of impacts, and it got really complicated. In some cases, it could get really, really complicated. If I were guesstimating, I'd say on average it could take about 2 hours to resolve conflicts."

  The interviewee also said that their legacy version control tools made matters worse: "[Our old tool] had a limitation where we could only deploy 10 programs at a time. … So at that stage, we were regularly missing our [maintenance] deployment windows."

  However, the interviewee said that with the BMC AMI DevX tools: "Now, it's just a completely different level. We've done deployments of close to 200 or even more programs, and then we're talking about it taking minutes. … We're

talking about, in all, five or 10 clicks of the mouse to deploy hundreds of programs and the added benefit of built-in approvals as well. [The BMC AMI DevX tools] really gave us the ability to empower the application owners to own and manage their own deployments."

- Similarly, the platform lead for mainframe DevOps at another financial services organization said: "We are seeing deployment efficiencies ... enabled by the tool [Code Pipeline]. [We've] reduced the deployment 'job' from about 400 [tasks] to four. ... We are seeing deployments go a lot quicker and a lot smoother, and there's a lot more transparency and confidence in the process. ... Now that we've moved onto Code Pipeline, our process takes milliseconds. It's not even seconds; it's milliseconds. I can't even measure it [because it's so fast]."

> *"With these tools, the mainframe is a platform just like any other one."*
>
> **Mainframe systems engineer, financial services**

Modeling and assumptions. Based on the interviews, Forrester assumes the following about the composite organization:

- Before implementing the BMC AMI DevX tools, the mainframe team released code to production four times per year. These were planned, major releases containing new features and fixes. (Minor releases and hotfixes were not considered for the model.)
- Before the BMC AMI DevX tools, the mainframe team also had two dedicated release managers. These two developers worked full-time managing contentions and changes to ensure smooth releases.
- In addition, for each release before BMC AMI DevX, other developers also spent a total of 7 hours documenting the changes.
- After adopting BMC AMI DevX tools such as Code Pipeline, the mainframe team automates much of the release process, including contention and change management and documentation. Based on the interviews, Forrester conservatively assumes that the mainframe team saves 96% of the time that it previously spent on each release.
- The average fully burdened hourly rate for mainframe developers at the composite organization before BMC AMI DevX is $97 (see Benefit D: Workforce Development).
- Developers recoup and use productively 75% of the time they save. Realistically, the developers might spend some of the time they save on coffee breaks, in meetings, etc. For the mainframe team at the composite organization, the total time saved is about two FTEs. These developers are reassigned from managing releases to writing new code.

2 FTEs

Total resources saved during releases with BMC AMI DevX

Risks. This benefit may vary from organization to organization based on how much time the mainframe team spends managing releases prior to adopting BMC AMI DevX tooling.

Results. To account for this risk, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $655,000.

> *"For the developers, these tools are a light in the fog. These tools help them to do their jobs better and do their jobs quicker."*
>
> **Mainframe DevOps lead, financial services**

Release Efficiencies					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
A1	Releases before BMC AMI DevX	Interviews	4	4	4
A2	Developer admin time per release before BMC AMI DevX (hours)	Interviews	1,047	1,047	1,047
A3	Percentage of time saved with BMC AMI DevX	Interviews	96%	96%	96%
A4	Developer admin time per release after BMC AMI DevX (hours)	A2*(100%-A3)	42	42	42
A5	Total time saved during releases (hours)	A1*(A2-A4)	4,020	4,020	4,020
A6	Average fully burdened hourly rate for a developer before BMC AMI DevX	D11/D1/2,080	$97	$97	$97
A7	Productivity recapture rate	TEI methodology	75%	75%	75%
At	Release efficiencies	A5*A6*A7	$292,455	$292,455	$292,455
	Risk adjustment	↓10%			
Atr	Release efficiencies (risk-adjusted)		$263,210	$263,210	$263,210
	Three-year total: $789,629		**Three-year present value: $654,563**		

Increased Release Frequency

Evidence and data. The interviewees noted that their mainframe teams' velocities increased without compromising quality (as discussed in Benefit C: Reduced Release Risks). This was due in part to the efficiencies they gained during releases (see Benefit A: Release Efficiencies). However, the interviewees also described additional benefits of the BMC AMI DevX tools at other stages throughout the SDLC — e.g., during program analysis and code review. In the aggregate, these benefits helped the mainframe teams to not only release more frequently but also to accomplish more — to release features and fixes faster than they had been able to before. Multiple interviewees said that their mainframe teams' velocities increased to be on par with those of teams on non-mainframe platforms (e.g., distributed, etc.).

> *"We actually deploy our mainframe changes even quicker than our program increment cycles."*
>
> **Mainframe DevOps lead, financial services**

The interviewees described several ways in which the BMC AMI DevX tools helped their teams increase velocity:

- **Visibility into legacy codebases made code changes easier.** The interviewees said that the BMC AMI DevX tools (e.g., Code Insights) helped their developers quickly analyze and understand the effects of changes. This was especially important because their codebases were complex and decades old. The BMC AMI DevX tools not only saved the developers time but also helped them be more confident about the changes they were making.

  For example, the mainframe systems engineer in financial services said: "Before, we had some sources of code and data that were more than 10 years old. We didn't know why they were there, what had changed inside of them — it was a complete mess. Now, we have statistics."

  Similarly, the platform lead for mainframe DevOps at another financial services organization attested: "We now have [features] like impact analysis [in Code Insights], which creates visibility into environments that many people didn't know. [These tools] are helping map out legacy systems that previously weren't well known or documented. [For example,] how the application sits together, what calls it, and when it's called — those kinds of things. [The BMC AMI DevX tools] are creating visibility."
- **Superior source code management improved team coordination.** The interviewees said that Code Pipeline enabled their organizations to better manage mainframe development. Before Code Pipeline, the mainframe teams had lacked reliable systems of record and sources of truth for their code. As a result, collaboration had required significant overhead, and the developers had tended to work in silos. However, Code Pipeline removed much of this friction, allowing developers to coordinate more easily. The interviewees also said that the BMC AMI DevX tools helped managers better oversee their teams' development efforts. Both of these factors contributed to higher velocities.

  The mainframe DevOps lead in financial services emphasized this the most: "For me, the most important part is Code Pipeline. Before Code Pipeline, we didn't have a clue [about] why a program was changing or going to production. Why, why, why — we didn't have a clue. Now, with Code Pipeline, we gain control. We know which source [code] is checked out, where it is, why it's changing, and what is being changed. We now have a history of what is pushed to production and why it's pushed to production. We have control of everything. That's a very, very, very important point."

  The mainframe systems engineer also described how the BMC AMI DevX tools made code review and parallel development not only possible but easy. They said: "It's easy to do peer review. You can see what has changed between the two versions. It's easy to just look at those lines [instead of] reviewing the whole program."

  The interviewee added: "[A developer] might create a new feature, wait, and then someone else might change the same source [code] and push it to production. Now, with Code Pipeline, you can't push something to production without taking the latest version to production. So we can be sure that the developers know [about new changes] and that they take care of that in their source [code]. That's the biggest, biggest benefit for us."

> *"The culture is changing in that the silos are coming down. We're still very [new], but there is an improvement, [especially] in teams where there is a mix of developers working purely on mainframe and developers working on distributed platforms."*
>
> **Product engineer, financial services**

- **Modern, integrated tooling supported enterprisewide alignment.** In addition to improving coordination among mainframe developers, the BMC AMI DevX tools enabled the mainframe teams to better coordinate and synchronize their releases with those of the teams on non-mainframe platforms. Many of the apps at the interviewees'

organizations used both mainframe and non-mainframe systems (e.g., a banking app might have web app UI but still process transactions on mainframe). However, with their legacy tooling, the mainframe teams at the interviewees' organizations had had tedious, idiosyncratic release processes that had made it difficult to align with their non-mainframe peers. According to the interviewees, the mainframe teams had often been the laggards. The BMC AMI DevX tools changed that, though, by supporting modern development processes. Interviewees from four of the organizations reported that mainframe development velocity was now on par with that of non-mainframe teams. (The interviewees from the other two organizations also believed that mainframe development velocity had improved, but they could only attest to this anecdotally. Their organizations were relatively new to DevOps and so did not have reliable measures of developer output.)

The mainframe system engineer in financial services said: "Now, with these tools and all the APIs they have, we've connected our mainframe platform to our enterprise deployment model. We've connected the [mainframe] platform just like any other platform. … And that's what we tell [developers]: The mainframe is a platform like any other one, and you can use it like you use [a desktop computer]. It's the same."

Similarly, the mainframe DevOps lead in financial services said: "What we've started doing as an organization is PI [(program increment)] planning [together]. We manage dependencies that way so that [development] cadences are constant across the organization."

Lastly, the CIO in healthcare reported that lead times for mainframe development projects had fallen by about 20% (e.g., from 12 months to 10 months) since their organization had adopted the BMC AMI DevX tools.

20%

Decrease in project lead times at a healthcare organization

> *"We have as fast a release schedule as other platforms."*
>
> **Project lead, change management, financial services**

Modeling and assumptions. Based on the interviews, Forrester assumes the following about the composite organization:

- Adopting the BMC AMI DevX tools helps the mainframe team release more frequently.
  - In Year 1, there is no change, and the mainframe team still deploys to production four times per year — the same release schedule it had with its prior tooling.
  - However, by Years 2 and 3, the mainframe team benefits from process changes enabled by the BMC AMI DevX tools, and the team increases its release cadence. In Year 2, the mainframe team achieves five major releases, and in Year 3, the team achieves six major releases.

50%

Increase in deployment frequency

- Adopting the BMC AMI DevX tools also helps the mainframe team change more programs per release. By leveraging features of the BMC AMI DevX platform — such as program analysis in Code Insights and an integrated development environment (IDE) in Workbench — the mainframe development team changes a greater percentage of its mainframe codebase per year. Ultimately, the team delivers more work with business value — e.g., new features, fixes, and so on.
    - Forrester assumes that the composite organization's mainframe codebase contains 20 million lines of code and that a mainframe program averages 2,000 lines of code. Therefore, the composite organization has around 10,000 programs in its mainframe codebase.
    - Before the mainframe team adopts BMC AMI DevX tools, it is only able to change 10 programs per release. This is due to both specific technical limitations of the team's legacy tools and suboptimal processes that the tools create.
    - With the BMC AMI DevX tools, however, the mainframe team changes far more programs per release: 33 programs per release in Year 1 (a 225% increase), 55 programs per release in Year 2 (a 450% increase), and 100 programs per release in Year 3 (a 900% increase). Features in the BMC AMI DevX tools (e.g., impact analysis, etc.) help the developers quickly and more confidently change legacy code. In addition, the tools enable modern workflows and faster, more efficient processes.

10

Programs changed per release with legacy tools

100

Programs changed per release with BMC AMI DevX tools (a 900% increase)

- To calculate the business value of the mainframe team's increased velocity, Forrester assumes that the composite organization earns $10 billion in annual revenue and that mainframe software drives or supports 10% of the composite organization's business.[3] Therefore, the value of the mainframe codebase is about $1 billion.
    - Before using the BMC AMI DevX tools, the mainframe team's slower release schedule and limited capacity to change programs means that, in aggregate, the team's annual development efforts affect only about 0.4% of the composite organization's mainframe codebase. Based on the value of the mainframe codebase to the composite organization, the mainframe team's annual changes are worth around $4 million.
    - However, with the BMC AMI DevX tools, the mainframe team both releases more frequently and changes more programs per release. In aggregate, the mainframe team's development work affects 1.3% of the codebase in Year 1, 2.8% of the codebase in Year 2, and 6.0% of the codebase in Year 3. Based on the value of the mainframe codebase, the changes are thus worth, in total, $13 million in Year 1, $28 million in Year 2, and $60 million in Year 3.
    - The benefit to the composite organization of increased development velocity is the difference in the value of annual mainframe codebase changes before and after BMC AMI DevX tooling.
    - Because the mainframe codebase changes are assumed to support annual revenue, Forrester isolates and calculates the benefit to the composite organization by applying an operating margin of 12%.[4] Applying an operating margin accounts for the business costs associated with generating revenue so that the final total for this benefit is net-new business value.

- Forrester assumes that the composite organization's annual revenue remains relatively constant at around $10 billion per year. That is, Forrester's model for the composite organization does not account for business growth — neither organic business growth nor growth that might result from the increased mainframe velocity (e.g., new features that drive customer acquisition, etc.). Forrester makes this assumption both to be conservative and to better isolate the discrete impact of the BMC AMI DevX tools on the composite organization.

3x to 15x

More code changed per year

Risks. This benefit may vary from organization to organization based on:

- Mainframe velocity prior to adopting BMC AMI DevX tools.
- Annual revenue supported by the mainframe codebase.

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 $7.1 million.

Increased Release Frequency					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
B1	Releases before BMC AMI DevX	A1	4	4	4
B2	Increase in releases after BMC AMI DevX	Interviews	0%	25%	50%
B3	Releases after BMC AMI DevX	B1* (100%+B2)	4	5	6
B4	Lines of code in mainframe codebase	Composite	20,000,000	20,000,000	20,000,000
B5	Lines of code per mainframe program	Composite	2,000	2,000	2,000
B6	Programs in mainframe codebase	B4/B5	10,000	10,000	10,000
B7	Programs changed per release before BMC AMI DevX	Interviews	10	10	10
B8	Increase in programs changed per release after BMC AMI DevX	Interviews	225%	450%	900%
B9	Programs changed per release after BMC AMI DevX	B7* (100%+B8)	33	55	100
B10	**Subtotal: Percentage of mainframe codebase changed annually before BMC AMI DevX**	**B1*B7/B6**	**0.4%**	**0.4%**	**0.4%**
B11	**Subtotal: Percentage of mainframe codebase changed annually after BMC AMI DevX**	**B3*B9/B6**	**1.3%**	**2.8%**	**6.0%**
B12	Revenue	Composite	$10,000,000,000	$10,000,000,000	$10,000,000,000
B13	Percentage of revenue supported by mainframe	Interviews	10%	10%	10%
B14	Revenue supported by mainframe	B12*B13	$1,000,000,000	$1,000,000,000	$1,000,000,000
B15	**Subtotal: Revenue influenced by mainframe codebase changes before BMC AMI DevX**	**B14*B10**	**$4,000,000**	**$4,000,000**	**$4,000,000**
B16	**Subtotal: Revenue influenced by mainframe codebase changes after BMC AMI DevX**	**B14*B11**	**$13,000,000**	**$28,000,000**	**$60,000,000**
B17	Incremental revenue influenced by mainframe codebase changes with BMC AMI DevX	B16-B15	$9,000,000	$24,000,000	$56,000,000
B18	Operating margin	Composite	12%	12%	12%
Bt	Increased released frequency	B17*B18	$1,080,000	$2,880,000	$6,720,000
	Risk adjustment	↓15%			
Btr	Increased released frequency (risk-adjusted)		$918,000	$2,448,000	$5,712,000
	Three-year total: $9,078,000			**Three-year present value: $7,149,196**	

Reduced Release Risks

Evidence and data. Interviewees reported an increase in overall mainframe software quality with the BMC AMI DevX tooling. They described several ways in which the tools helped their teams:

- Tools including Total Test, Code Debug, and Code Insights created efficiencies when testing and debugging. This time savings for developers plus automation features throughout the BMC AMI DevX suite reduced the total number of issues.
- When issues did escape testing (as inevitably happens in all software development settings), Code Pipeline and other BMC AMI DevX tools made it easy to quickly roll back to the most recent stable releases. Fast rollbacks minimized the fallout from any issues.

The result of these benefits — fewer issues combined with fast rollbacks — was that the interviewees' organizations experienced fewer mainframe issues even as their development velocities increased. On the whole, the BMC AMI DevX tools reduced the risks associated with changing legacy mainframe codebases.

> *"These capabilities have created visibility into what changes are going into the system under the "emergency" banner. It's not just the faster timelines [when we're] deploying on a regular basis. If it's an emergency change, [we have] visibility."*
>
> **Platform lead, financial services**

33%

Fewer issues in production at one financial services organization

The interviewees described multiple ways in which the BMC AMI DevX tools helped improve mainframe software quality at their organizations:

- **Toolchain automation reduced manual errors.** The mainframe DevOps lead in financial services explained: "In the past, we didn't control our JCLs [(job control languages)]; they were just copied from one environment to another. And in a lot of cases, we ended up with JCL errors. … You know, under pressure, when you're trying to resolve something very complicated, [it's easy to make mistakes]. In a lot of cases, we actually missed components, causing issues. But when we adopted pipelines [using Code Pipeline], we started including our JCLs as well. And just that on its own improved quality — just by removing those manual interventions."

  The CIO in the healthcare industry described similar benefits from automation with BMC AMI DevX File-AID: "We have to generate realistic datasets for testing. … But really, by improving our testing, we're ensuring privacy and compliance [with industry regulations]. … [With File-AID,] we've automated the data handling process, [and since we've] integrated with other [BMC AMI DevX] tools … the manual interventions [aren't there]. … [Our old tool] was very powerful, but pretty complex. … The fact that [File-AID] handles all [our] data types and has good compliance features [has helped us] reduce manual data handling by up to 30% and [increase] data compliance [with regulations] by up to 20%."

> *"One of the surprising effects of adopting BMC [AMI DevX] was that — before we even really started adopting automated testing — we immediately saw a drop in major deployment issues. … It's safe to say that there are about a quarter fewer issues with deployments because [we removed] manual interventions. … We only had to back out four programs last year. … We went from about one in every four deployments having some form of an issue to virtually zero."*
>
> **Mainframe DevOps lead, financial services**

From 25% to 0.01%

Reduction in deployment failure rate at a financial services organization

> *"I'm shocked [by how much quality has improved]. If I think back to the number of deployment failures we had in the past related to missing dependencies or 'fat finger' problems, I wonder if [the numbers] are really doing it justice."*
>
> **Mainframe DevOps lead, financial services**

- **Powerful features increased developer productivity when testing and debugging.** The CIO in healthcare explained: "[Our old tool] is a pretty commonly used tool, but it has a high learning curve. It doesn't have a great user interface. [In comparison, Code Debug] works so well and is easy to learn and has all of these features built in. When we switched from [our old tool] to [Code Debug], the speed of the whole [debugging] process improved. We've noticed a 20% improvement [in debugging times] compared to what we were doing before."

  The mainframe systems engineer in financial services also described how BMC AMI DevX tooling made debugging easier: "[Before, with our old tools,] if you had a problem or a program that failed, you just knew the source code [that had failed], but you didn't know what the change was. Now, [we] have the [change] history, so you can compare everything and [pinpoint] the problem. [You can see] that the problem is in a [certain] line [of code] because that line changed, not the 100 other lines. So it's very easy [for developers to debug]."

20%

Faster debugging at one healthcare organization

40%

Fewer manual errors at one healthcare organization

30%

Reduction in manual testing time at one healthcare organization

- **Rapid rollbacks minimized the impact of any issues.** The mainframe systems engineer in financial services estimated that the typical time to restore service after a failure (i.e., the mean time to repair or MTTR) went from one to two days down to minutes with the BMC AMI DevX tools. They also estimated that such failures occurred around 10 to 20 times per year, meaning that the BMC AMI DevX tools were significantly improving uptime at the organization.

  The mainframe systems engineer explained: "Before we had Code Pipeline, if you had something in production that failed and you wanted to fall back to the previous version, then you needed to ask someone on the storage team to do a restore, and you just hoped that the last backup they could change could take the load. … You'd lose time because you needed [to coordinate with] someone else. … So it'd take maybe one or two days before you could restore the service."

  They continued: "Now, if you want to restore a service because you want to fall back, it takes 2 minutes. … You just right-click, [and] it's done. You just fall back, and that's it. I think that's very important. … Actually, I can say that 80% [of the process] is automatic, and I think that in one or two months, we'll have a fully automatic chain."

From 1 to 2 days to 2 minutes

Reduction in time to restore service at a financial services organization

Interview Spotlight

Security And Compliance Benefits

The CIO in the healthcare industry described several ways in which the BMC AMI DevX tools had improved not only the organization's mainframe software quality but also its cybersecurity posture and degree of regulatory compliance.

The CIO said that tools such as Code Pipeline and Code Insights had contributed to:

- A 20% reduction in vulnerability patching time.
- A 25% increase in compliance with policies.
- A 35% reduction in time required to implement policy changes.

The CIO explained: "[These tools] are helping mitigate security risks. ... Not only the robust automation but the integrations [also] eliminate errors that may be part of [a manual] process. Essentially, we're able to implement policy changes and reduce [manual] errors. [We're now using] modern DevOps processes."

They continued: "[During] audit preparation, we go through [Code Pipeline] and use that to track changes. We generate reports, etc., [to ensure] compliance with all regulatory standards we [are subject to]. The fact that the tool does a very good job and provides a seamless way to that is why you're seeing those metrics. I think [the BMC AMI DevX platform] has improved accountability and overall compliance of the program."

The CIO also said: "[Our old tool] was a comprehensive offering, [and] there are some other good tools in the market. ... But why did we prefer BMC? [It was] the specialization [for] mainframe [and] compliance, and the fact that it was an easy-to-implement tool. ... Again, it comes back to usability."

(Because the CIO was the only interviewee who described security and compliance benefits in detail, Forrester lacked sufficient data to quantify these benefits in its financial model for the composite organization. However, enhanced security and regulatory compliance are likely sources of additional value for many organizations — especially organizations operating in highly regulated industries.)

Modeling and assumptions. Based on the interviews, Forrester assumes the following about the composite organization:

- Any mainframe software issues that escape to production disrupt business operations and result in downtime.
- Before the mainframe team adopts BMC AMI DevX tooling (i.e., with its legacy toolchain):
  - The release failure rate was 25% (that is, one in every four releases had an issue).
  - The average downtime after a failed release was 48 hours (i.e., it took around two days to restore service).
- After the mainframe team adopts BMC AMI DevX tooling:
  - The release failure rate falls by 33% (i.e., there are 33% fewer issues in production), from 25% to 17%. Automation reduces manual errors, and the BMC AMI DevX tools improve testing and debugging so that fewer issues escape.
  - The average downtime after a failed release also falls by 98%, from two days to about 1 hour. Rapid rollbacks enable the team to quickly restore service after an issue.

- In aggregate, these two improvements result in the composite organization experiencing 99% less downtime with its mainframe applications.

- With the mainframe team's legacy tooling, codebase changes were relatively risky because there was a significant chance of issues with each release. However, by helping to reduce both the number of issues as well as the fallout from those issues, the BMC AMI DevX tools reduce the risks associated with changing critical code. The benefit to the composite organization may also be thought of as an improvement in quality since there are fewer issues overall as well as greater system stability.

33%

Decrease in change failure rate

98%

Decrease in mean time to restore service

99%

Decrease in app downtime

- To calculate the business value of reduced release risks, Forrester assumes that any issue that escapes to production disrupts 75% of business operations supported by the mainframe. Forrester also assumes that the composite organization conducts business 24 hours per day, 365 days per year.
  - This means that for every hour of mainframe downtime, the composite organization loses (or misses out on) around $85,616 in revenue. In other words, for the composite organization, the cost of 1 hour of mainframe downtime is $85,616.
  - The benefit to the composite organization of reduced release risks is the difference in revenue lost before and after BMC AMI DevX tooling.
  - To calculate the net-new business value of this benefit, Forrester applies an operating margin of 12%.

Risks. This benefit may vary from organization to organization based on:

- Frequency and severity of mainframe issues (both minor bugs as well as major issues that disrupt the business) before adopting BMC AMI DevX tools.
- Annual revenue supported by the mainframe codebase.
- Adoption of BMC AMI DevX suite. Like the interviewees' organizations, the composite organization accrues benefits primarily from toolchain and pipeline automation (i.e., with Code Pipeline, etc.). However, organizations may realize greater benefits by leveraging more BMC AMI DevX tools (e.g., Total Test, Strobe, etc.) and by making more extensive investments in testing automation and performance than the interviewees' organizations did.

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 $1.3 million.

Reduced Release Risks					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
C1	Releases after BMC AMI DevX	B3	4	5	6
C2	Release failure rate before BMC AMI DevX	Interviews	25%	25%	25%
C3	Failed releases before BMC AMI DevX (average)	C1*C2	1.0	1.3	1.5
C4	App downtime after a failed release before BMC AMI DevX (hours)	Interviews	48	48	48
C5	**Subtotal: App downtime before BMC AMI DevX (hours)**	**C3*C4**	**48.0**	**62.4**	**72.0**
C6	Reduction in release failure rate with BMC AMI DevX	Interviews	33%	33%	33%
C7	Release failure rate after BMC AMI DevX	C2*(100%-C6)	17%	17%	17%
C8	**Failed releases after BMC AMI DevX (average)**	**C1*C7**	**0.7**	**0.9**	**1.0**
C9	Reduction in app downtime after a failed release with BMC AMI DevX	Interviews	98%	98%	98%
C10	App downtime after a failed release after BMC AMI DevX (hours)	C4*(100%-C9)	1	1	1
C11	**Subtotal: App downtime after BMC AMI DevX (hours)**	**C8*C10**	**0.7**	**0.9**	**1.0**
C12	Revenue supported by mainframe	B14	$1,000,000,000	$1,000,000,000	$1,000,000,000
C13	Percentage of business operations disrupted during downtime	Composite	75%	75%	75%
C14	**Revenue lost per hour of downtime**	**C12*C13/(365*24)**	**$85,616**	**$85,616**	**$85,616**
C15	**Subtotal: Revenue lost due to downtime before BMC AMI DevX**	**C5*C14**	**$4,109,568**	**$5,342,438**	**$6,164,352**
C16	**Subtotal: Revenue lost due to downtime after BMC AMI DevX**	**C11*C14**	**$59,931**	**$77,054**	**$85,616**
C17	Incremental revenue retained due to successful releases with BMC AMI DevX	C15-C16	$4,049,637	$5,265,384	$6,078,736
C18	Operating margin	B18	12%	12%	12%
Ct	Reduced release risks	C17*C18	$485,956	$631,846	$729,448
	Risk adjustment	↓15%			
Ctr	Reduced release risks (risk-adjusted)		$413,063	$537,069	$620,031
	Three-year total: $1,570,163			**Three-year present value: $1,285,209**	

Workforce Development

Evidence and data. The interviewees said that the BMC AMI DevX tools made it easier to recruit and retain new mainframe developers. They praised the usability of the tools, saying that the BMC AMI DevX tools were significantly easier to learn than other products. For the interviewees, this was critical because their teams were disproportionately senior developers nearing retirement. By making mainframe development more accessible, the BMC AMI DevX tools

helped the interviewees recruit the next cohort of developers and thereby support the longevity of the platform at their organizations.

> *"We switched about one to two years ago. ... We never forced someone to use [Workbench], [but] all the youngest people jumped in immediately. ... Twenty percent to 25% of the developers switched by themselves."*
>
> **Mainframe systems engineer, financial services**

- The project lead for change management at a financial services organization explained why the BMC AMI DevX tools appealed to new mainframe developers: "Eighty percent of junior developers worked with Eclipse [(an open-source integrated development environment [IDE] supported by BMC AMI DevX Workbench)] because in a lot of schools and universities, Java is the first programming language that they learned. All developers know Eclipse [as their] graphical interface. ... I remember that when I started, I saw the green screen, and I thought, 'What's that?' I think it's the same for junior developers who start in our company. It's easier to have a graphical interface. They have a modern platform. You can do [things] with clicks and not with commands."

  The PDM at another financial services organization echoed those comments: "They [junior developers] went to college and learned Git [(an open-source software version control system)] and Eclipse. So when I stick [Workbench in] Eclipse in front of their faces, they say, 'Okay, I know what this is.' So yes, it's infinitely easier [to recruit them]."

> *"When young developers come out of school, they can work with tooling that they already know. I'm convinced that what scares the young developers is not the technology itself but the tooling they have. If they have tooling they already know — if they have a debugger, source code management, and a GUI — then they are completely safe and can start to work without any fear."*
>
> **Mainframe systems engineer, financial services**

- The mainframe systems engineer in financial services reported retention benefits: "Retention is very good; I haven't seen a lot of young [developers] leave. Before [the BMC AMI DevX tools], retention was [harder]. Developers coming out of school wanted to work on fancy [non-mainframe] stuff. Honestly, now [with the BMC AMI DevX tools], they can work in the same ways; they have the same tools and the same processes. They just check out [code], compile, build, and so on. It's the same for them, and our goal is to simplify [even further], so that they don't have [to deal with] any technical complexities from the system, and [the system] just works like any other technology."
- The platform engineer in financial services said that the BMC AMI DevX tools appealed to new and experienced developers alike: "The newer [developers] prefer to work in Workbench because of its capability to visualize programs. They can do better analysis and have faster turnaround times. ... But there's a demand for training from [developers] who have traditionally used green screen [because they work with developers who use Workbench]. The interest is there; they're slowly coming."

> *"Some of the younger developers don't know the old TSO interface. They just work in [Workbench], and that's perfectly fine with me. ... Workbench — in Eclipse and now VS Code [(Microsoft Visual Studio Code)] — unblocks the new developer. They can start working with mainframe tooling more easily. They're not afraid of what they have in their hands."*
>
> **Mainframe systems engineer, financial services**

Interview Spotlight

Fostering Cultures Of Collaboration And Innovation

Interviewees from two of the organizations felt that the BMC AMI DevX tools had contributed to cultural changes within their mainframe development teams. They described their mainframe teams as more collaborative and flexible.

- The platform lead for mainframe DevOps in financial services said: "[The tools] are actually helping us work in more of a platform model where everyone collaborates, and this is helping us break out of silos. It's giving us efficiencies in the sense that teams are able to see what other teams are doing. [But also,] it's transforming that silo mentality: 'We're all in this together. ... We work together.'"

  The product engineer at the same organization added: "[The developers] have never been more open to change. If there's a mixed group, and the [developers] from the distributed space are talking about work quality, then the [developers] on the mainframe understand — they have a better understanding [of modern tools and DevOps]. There's inquisitiveness. We actually even have a few superstars who are playing around with tools [that integrate with] Workbench, something we wouldn't normally see."

  The platform lead for mainframe DevOps agreed with their colleague: "We have some early adopters who are very interested in the new features and functionalities of the BMC toolsets. [The tools] are creating a good spark of interest. I think they're [changing developer conversations] from 'This application is horribly built' to 'Hey, this is cool. I can use a lot of new tools and capabilities.'"
- The PDM at another financial services firm also said: "The [junior developers], by and large, are [doing the best]. If I tell a tenured COBOL programmer to learn a new language, [then they have trouble]. But if I tell a [junior developer], well, okay. They're constantly changing."

Modeling and assumptions. Based on the interviews, Forrester assumes the following about the composite organization:

- Before it adopts the BMC AMI DevX tooling, the composite organization has 300 mainframe developers.
  - Senior developers comprise 60%. These developers have decades of experience, and many are approaching retirement. At the composite organization, the average base salary of a senior developer is $175,000 (or $236,250 fully burdened). (A fully burdened salary is a base salary plus the cost of benefits. Forrester assumes that fully burdened salaries are 135% higher than base salaries.)

  - Midcareer developers comprise 30%. These developers have years of work both behind and ahead of them. The average base salary of a midcareer developer is $125,000 (or $168,750 fully burdened).
  - Junior developers comprise 10%. These developers are just beginning their careers, and many were hired right out of university. Junior developers have at most a few years of experience on mainframe. The average base salary of a junior developer is $75,000 (or $101,250 fully burdened).
- Ten percent of senior developers retire per year. (In other words, all senior developers would be expected to retire within 10 years.)
- As senior developers retire, the composite organization hires new junior developers to maintain and even grow its mainframe development capacity.
  - The BMC AMI DevX tools and the modern software development practices enabled by those tools make the mainframe an attractive and accessible platform for new developers, and the composite organization recruits and retains more junior developers than before.
  - With BMC AMI DevX tooling, junior developers are on average 75% as productive as senior developers. Thus, for every senior developer who retires, the composite organization hires more than one junior developer to maintain the team's overall development capacity.
  - By the end of Year 3, the number of senior developers at the composite organization has fallen from 180 to 126; the number of junior developers has risen from 30 to 102; and the mainframe team size has increased to 318 developers.

10%

Percentage of mainframe team who were junior developers before BMC AMI DevX

32%

Percentage of mainframe team who are junior developers after BMC AMI DevX

240%

Increase in new developer headcount

6%

Increase in mainframe development workforce

- To calculate the business value of the workforce demographic shift enabled by BMC AMI DevX tools, Forrester compares the composite organization's aggregate spending on mainframe developer salaries before adopting the new tooling to its spending afterward. Over the three-year study period, the total spending on mainframe developer salaries falls, yielding savings for the composite organization.

Risks. This benefit may vary from organization to organization based on:

- Workforce demographics (i.e., percentages of developers who are senior and nearing retirement versus midcareer, junior, etc.) prior to adopting BMC AMI DevX tooling.
- Average developer salaries and the differences between them. As the difference between senior developer and junior developer salaries narrows, this benefit decreases.
- Senior developer retirement rate. If senior developers retire faster, this benefit increases.
- Average junior developer productivity relative to senior developer productivity. Where senior developers are radically more productive than junior developers (e.g., twice as productive or more), organizations must hire far more junior developers to maintain total development capacity as senior developers retire. This decreases the magnitude of this benefit.
- Organization-specific efforts to recruit new mainframe developers and the success of those efforts.

This benefit reflects the composite organization's success hiring new mainframe developers as it confronts the pressing challenge of an aging workforce. This benefit does not suggest that organizations should replace senior team members with junior ones. Senior developers often possess irreplaceable skills and knowledge, which is why Forrester models them as more productive than junior developers. Organizations not expecting substantial numbers of retirements within the next few years can still realize success recruiting new mainframe talent, but they may not find this benefit applicable.

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $7.9 million.

Workforce Development					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
D1	Mainframe developers	Composite	300	300	300
D2	Percentage of developers who are senior developers before BMC AMI DevX	Composite	60%	60%	60%
D3	Senior developers before BMC AMI DevX	D1*D2	180	180	180
D4	Average fully burdened annual salary for a senior developer	Composite	$236,250	$236,250	$236,250
D5	Percentage of developers who are midcareer before BMC AMI DevX	Composite	30%	30%	30%
D6	Midcareer developers before BMC AMI DevX	D1*D5	90	90	90
D7	Average fully burdened annual salary for a midcareer developer	Composite	$168,750	$168,750	$168,750
D8	Percentage of developers who are junior developers before BMC AMI DevX	Composite: 100%-(D2+D5)	10%	10%	10%
D9	Junior developers before BMC AMI DevX	D1*D8	30	30	30
D10	Average fully burdened annual salary for a junior developer salary	Composite	$101,250	$101,250	$101,250
D11	**Subtotal: Aggregate spending on mainframe developer salaries before BMC AMI DevX**	**D3*D4+D6*D7+D9*D10**	**$60,750,000**	**$60,750,000**	**$60,750,000**
D12	Senior developer retirement rate	Interviews	10%	10%	10%
D13	Senior developers who retire	D3*D12	18	18	18
D14	Senior developers after BMC AMI DevX	Y1: D3-D13 Y2 and Y3: $D14_{PY}$-D13	162	144	126
D15	Average productivity of a junior developer as a percentage of the productivity of a senior developer	Composite	75%	75%	75%
D16	Junior developers hired to replace retiring senior developers	D13*(1/D15)	24	24	24
D17	Junior developers after BMC AMI DevX	Y1: D9+D16 Y2 and Y3: $D17_{PY}$+D16	54	78	102
D18	**Subtotal: Aggregate spending on mainframe developer salaries after BMC AMI DevX**	**D14*D4+D6*D7+D17*D10**	**$58,927,500**	**$57,105,000**	**$55,282,500**
Dt	Workforce development	D11-D18	$1,822,500	$3,645,000	$5,467,500
	Risk adjustment	↓10%			
Dtr	Workforce development (risk-adjusted)		$1,640,250	$3,280,500	$4,920,750
	Three-year total: $9,841,500		**Three-year present value: $7,899,326**		

Faster Onboarding

Evidence and data. Interviewees from five of the six organizations reported that the onboarding periods for new developers were shorter with the BMC AMI DevX tools than with their prior toolsets. That is, when new developers joined the mainframe team, they ramped up to full productivity faster. The interviewees attributed this both to the tools' ease of use and the improved processes that the tools enabled.

- The CIO in the healthcare industry said that after adopting the BMC AMI DevX tools, onboarding times fell by 25%, from 12 months down to nine months. They explained: "Coming over here, it's a different process in the government sector, so there are things [developers have to learn] that just inevitably go with that. [But] in general, we're looking at a 25% to 30% reduction in the amount of time for [new developers] to learn [BMC AMI DevX tools] versus our [old] platform. In my opinion, that's a significant time saving. Why? The BMC tools are easier to use. The intuitive interface, the modern [features], etc. But really, what does that do for us in the long term? It reduces our overall operating costs for managing and maintaining these systems."
- The mainframe systems engineer in financial services reported that typical onboarding times had fallen by 50% to 67%, from six to nine months down to three months. They said that new developers were usually only 50% productive during this ramp-up period, so reducing it had both increased velocity and resulted in savings. The mainframe systems engineer explained: "Before, [as a new developer,] you needed six to nine months to start working productively on [our old] tooling because you needed to know TSO, you needed to know the commands — you needed to know everything. Now, in [around] three months, you can be completely free and can start working productively because you have all [the BMC AMI DevX] tooling and because you don't need to [learn a] new interface."
- The mainframe DevOps lead at another financial services firm reported that new developers needed 50% less training than before — only 2 hours instead of 4. They said: "We [used] to run training sessions for 4 hours. [But now,] someone on the team needs to spend 2 hours with a new recruit, and they're up and running."
- The project lead for change management at third financial services organization also believed the BMC AMI DevX tools reduced onboarding times. They said: "It helps because they know the interface. [The BMC AMI DevX tools] are very easy to use when you know Eclipse. [Onboarding times] are a little bit individual, [but we have had] people who are very interested [(willing to learn)] and could do [their first] production changes in six months."
- The PDM in financial services said that onboarding times were faster because — in contrast to the organization's prior solution, a homegrown toolset — the BMC AMI DevX tools were standard in the industry and had ample learning resources available. The PDM said: "I can say [to a new developer], 'Here's a bunch of training videos. Here's a bunch of industry standard [resources]. Here's a bunch of BMC [resources]. Go learn.' So I spend less time training."

  The PDM added that BMC AMI DevX's support for both traditional green screen and GUIs also reduced onboarding times. The PDM continued: "There's less [time spent] getting [new developers] comfortable with the tooling. [I can say to a new developer,] 'Oh, what interface do you like? Okay, use that interface.' I didn't have that in my homegrown [tooling]. [We're] avoiding eight, 10, 12 weeks of training time [due to the support for] different user interfaces."

Modeling and assumptions. Based on the interviews, Forrester assumes the following about the composite organization:

- Before the composite organization adopts BMC AMI DevX tools, new developer hires take nine months to ramp up to full productivity.

- During this onboarding period, new developer hires are only 50% as productive as they could be. This is because they must spend time learning the mainframe team's systems, processes, tools, etc. (In the software industry, onboarding periods for new hires are normal.)
- With the BMC AMI DevX tooling, new developer hires ramp up to full productivity 50% faster.

50%

Faster onboarding with BMC AMI DevX

- To calculate the business value of this benefit, Forrester compares the total annual productive capacity of a new developer hire before and after BMC AMI DevX tooling.
    - Before BMC AMI DevX tools, new developers are 50% productive for nine months and 100% productive for three months. New developers therefore contribute 7.5 months of output during their first year.
    - After BMC AMI DevX tools, new developers are 50% productive for 4.5 months and 100% productive for 7.5 months. New developers therefore deliver 9.75 months of output during their first year.
    - Thus, with BMC AMI DevX tools, the composite organization gains around 2.25 months of incremental output for each new developer hire. For the composite organization, this additional developer output is about the same as adding 5 developer FTEs per year who use the organization's legacy tools.
- To model this benefit for the composite organization, Forrester assumes that the only new developers hired are the junior developers recruited in Benefit D: Workforce Development.
- To be conservative, Forrester applies a productivity recapture rate of 75%. Although the new developers gain 2.25 months of additional productivity, they may not use all that time on work that adds value for the composite organization. (E.g., they may spend some of the time on coffee breaks, in meetings, etc.)

Risks. This benefit may vary from organization to organization based on how much time new developer hires need to ramp up to full productivity with an organization's legacy solution.

Results. To account for this risk, Forrester adjusted this benefit downward by 5%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $825,000.

> *"It's easier to use, and you have graphical support. You can see which level your source [code] is and what it impacts. You can find [code] very quickly — there's lots of good filtering. You can automatically start a debug session. You can switch between the tools very, very quickly. [There are] reports, measurements, and so on. And all this is in one platform."*
>
> **Project lead, change management, financial services**

Faster Onboarding					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
E1	New mainframe developer hires	D16	24	24	24
E2	Average developer onboarding time before BMC AMI DevX (months)	Interviews	9	9	9
E3	Reduction in onboarding time with BMC AMI DevX	Interviews	50%	50%	50%
E4	Average developer onboarding time after BMC AMI DevX (months)	E2*(100%-E3)	4.50	4.50	4.50
E5	Developer productivity during onboarding	Interviews	50%	50%	50%
E6	Incremental months of productivity per new developer due to faster onboarding	(E2-E4)*(100%-E5)	2.25	2.25	2.25
E7	Average junior developer salary (fully burdened)	D10	$101,250	$101,250	$101,250
E8	Productivity recapture rate	A7	75%	75%	75%
Et	Faster onboarding	E1*E6/12*E7*E8	$349,313	$349,313	$349,313
	Risk adjustment	↓5%			
Etr	Faster onboarding (risk-adjusted)		$331,847	$331,847	$331,847
	Three-year total: $995,542			**Three-year present value: $825,255**	

Developer Productivity

Evidence and data. The interviewees reported that the BMC AMI DevX tools helped their developers save time on everyday tasks such as writing code. According to the interviewees, this was an additional benefit beyond the team-level benefits captured in Benefit B: Increased Release Frequency and Benefit C: Reduced Release Risks. The interviews said that the BMC AMI DevX tools helped developers work faster and more efficiently, and they provided anecdotal evidence that improving the developer experience this way had improved morale.

> *"The tools enable visibility and understanding. [Developers are] saying, 'I can now see stuff. I never knew that we integrate there. I never knew this program was still running.'"*
>
> **Platform lead for mainframe DevOps, financial services**

- The mainframe systems engineer in financial services estimated that developers completed code changes in one-third less time than they did with the organization's legacy tooling: "For the productivity part, I think they [the developers] have also cut a third of the time they spend on modifications because now they have more control. They know what they're changing, and they can also [roll] back more quickly if they have some trouble. So that's a third of their time saved."
- The mainframe DevOps lead in financial services mentioned, "I think [the BMC AMI DevX platform] has also changed development morale. I mean, if I just think about the amount of time [developers] had to spend creating documents, talking to gatekeepers, [and performing] complex copybook impact analyses. ..."

> *"There was a lot of admin work that the developers had to do, and we effectively freed up their time so that they could focus on the real value-adding [work] of developing code."*
>
> **Mainframe DevOps lead, financial services**

- The product engineer in financial services also explained: "I'll give you an example: [Take] something like the program analysis function. One developer said it [used to] take days to map out a program and follow through the processes in a program. But now [with the BMC AMI DevX tools], she does it in minutes, and on top of that, she's able to share with her team members her documentation in terms of when she submits her changes. It's more understandable; it's standard; it's easier. So when she's working with her analysts and they do impact analysis, it's now literally at the click of a button, whereas before it would take them days. ... It's much quicker; it's much cleaner. So [now] she doesn't even mind when the business wants more changes because she knows the information she's getting from the program analysis and impact analysis in Code Pipeline is accurate."

> *"The [developers] prefer the BMC products because of the usability, the user interface."*
>
> **CIO, healthcare**

Modeling and assumptions. Based on the interviews, Forrester assumes the following about the composite organization:

- Before the composite organization adopts BMC AMI DevX tools, developers spend around 24% of their time — or 500 hours per year — coding.[5]
- With the BMC AMI DevX tools, developers spend 33% more time coding and less time performing less-productive activities like administrative work.
    - With the BMC AMI DevX tools, each developer contributes around 165 more hours per year of coding output. For the composite organization, this additional development output is about the same as adding 25 developer FTEs per year who use the organization's legacy tools, an approximately 8% increase in effective team size.

33%

Increase in coding time per developer with BMC AMI DevX tools

- To calculate this benefit for the composite organization, Forrester values the productivity gains based on the average mainframe developer salary after the organization adopts BMC AMI DevX. This average developer salary is lower than before BMC AMI DevX because the composite organization hires new junior developers (as described in Benefit D: Workforce Development).
- To be conservative, Forrester also applies a productivity recapture rate of 75%.

> *"The tools are very easy to use and have a lot of functionality."*
>
> **Project lead, change management, financial services**

Risks. This benefit may vary from organization to organization based on:

- Productivity gains with BMC AMI DevX tools. Productivity gains may be greater or smaller than modeled for the composite organization, and productivity gains may vary over time based on adoption of the BMC AMI DevX platform.
    - Productivity gains are especially likely to be greater than modeled for organizations that — unlike the composite organization — have no solutions in place before adopting BMC AMI DevX tools. The modeling for the composite organization reflects the experiences of the interviewees' organizations, which all realized developer productivity gains after switching from alternative platforms.
- Adoption of BMC AMI DevX tools. Interviewees from two of the six customer organizations reported that all their developers were using the BMC AMI DevX tools (i.e., 100% adoption). Interviewees from the other organizations reported high but not full adoption (e.g., 75% to 90%). If developers do not use the BMC AMI DevX tools, then the total team productivity gains will be lower.

Results. To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $8.1 million.

Developer Productivity					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
F1	Mainframe developers after BMC AMI DevX	D6+D14+D17	306	312	318
F2	Average time per developer spent coding	Forrester research	24%	24%	24%
F3	Average time per developer spent coding before BMC AMI DevX (hours)	2,080*F2	500	500	500
F4	Increase in coding time after BMC AMI DevX	Interviews	33%	33%	33%
F5	Average time per developer spent coding after BMC AMI DevX (hours)	F3*(100%+F4)	665	665	665
F6	Average developer hourly rate after BMC AMI DevX (fully burdened)	D18/F1/2,080	$93	$88	$84
F7	Productivity recapture rate	A7	75%	75%	75%
Ft	Developer productivity	F1*(F5-F3)*F6*F7	$3,521,678	$3,397,680	$3,305,610
	Risk adjustment	↓5%			
Ftr	Developer productivity (risk-adjusted)		$3,345,594	$3,227,796	$3,140,330
	Three-year total: $9,713,720		**Three-year present value: $8,068,425**		

Reduced Admin Effort Due To Tool Consolidation

Evidence and data. On the whole, the interviewees' organizations spent about half as much time on toolchain administration for the BMC AMI DevX tools than they had spent with their legacy solutions. For some of the

interviewees — especially those at organizations with homegrown tooling — the most important benefit they realized from switching to the BMC AMI DevX platform came from retiring expensive legacy tools and consolidating their toolchains around a single trusted vendor.

While interviewees at all the organizations reported that the BMC AMI DevX required less administrative effort than their prior solutions, the interviewees at organizations with homegrown tooling reported the greatest savings. Often these homegrown tools were decades old and maintained by developers who wanted to retire, meaning that switching to the BMC AMI DevX platform was urgent and necessary to support mainframe infrastructure going forward.

- The product engineer in financial services explained: "One of the greatest successes for [Code Pipeline] is that we managed to replace one of the biggest, key, main dependencies and one of the biggest risks for the bank when it comes our source code management and deployment processes."

  The organization's prior source code management tool (SCM) was 30 years old. It had originally been built by four developers, but for the past 20 years had been maintained by just one developer who worked on the tool full-time. The platform lead for mainframe DevOps at the same financial services organization said: "He's a superstar, [but] he's retiring this year. So [Code Pipeline] is our gift to him so that he can retire peacefully and not stress."

  The platform lead continued: "The consolidation of the SCM means that we get to reduce some of the tool stacks and the footprint from multiple vendors. … It's a consolidation of tools; therefore, it's cost savings, and there's an improvement of processes, which will reduce the number of infrastructures we need."

  The platform lead described not only cost savings but also benefits from modernizing with the BMC AMI DevX platform: "From a strategic perspective, one of the top three benefits is risk mitigation. It's improving our risk posture because we're centralizing our tools, we're consolidating from five to one — that kind of thing. We're modernizing and re-architecting. … [The BMC AMI DevX tools] are creating the flexibility to integrate with modern technology and capabilities — not just BMC toolsets, but also things like SonarQube [(an open-source code analysis tool)]. … [This] is a modernization of our current processes and our current tool stack and technology, [and that reduces] risk."

  The platform lead also mentioned ancillary system optimization benefits: "We've identified batch jobs and stuff like that are running and supposed to be decommissioned. [That was] enabled that with the [BMC] tool set."

Modeling and assumptions. Based on the interviews, Forrester assumes the following about the composite organization:

- Before switching to the BMC AMI DevX tools, the composite organization has one developer FTE dedicated to maintaining and supporting its legacy tooling full-time.
- Once the composite organization switches to the BMC AMI DevX tools, it retires its legacy solutions, and the prior administration effort goes away entirely.
- The BMC AMI DevX tools require ongoing administration effort of their own. This work is captured and modeled for the composite organization in Cost J: Ongoing Administration Effort.
- The one developer FTE who maintains the legacy solutions is reallocated to other value-adding projects. Forrester applies a conservative 75% productivity recapture rate.

50%

Decrease in toolchain administration effort with BMC AMI DevX tools

Risks. This benefit may vary from organization to organization based on how much effort an organization spends supporting its legacy tooling.

In addition, this benefit total could be higher for organizations that also realize licensing cost savings by switching platforms. Third-party toolchains have two costs: the licensing costs charged by the vendor as well as the in-house effort to administer the tools (e.g., manage updates, support users, oversee integrations, etc.). For several reasons, Forrester calculates the benefit of toolchain consolidation for the composite organization based on administrative effort savings alone. First, platform licensing costs can be highly variable in the market (e.g., due to discounting, etc.). Second, the interviewees did not provide robust data on licensing cost savings. This was because for them, any licensing cost savings were far less significant than the administrative effort savings. Third, Forrester's approach is conservative; organizations that also realize licensing cost savings by switching to BMC AMI DevX can simply expect greater benefits. For more information on the BMC AMI DevX licensing costs for the composite organization, see Cost H: Licensing Costs.

Results. To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $357,000.

> *"The relationship I have with BMC is very good. I can't say that about other vendors."*
>
> **PDM, financial services**

Reduced Admin Effort Due To Tool Consolidation					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
G1	Developer admin time maintaining alternative tools before BMC AMI DevX (hours)	Interviews	2,080	2,080	2,080
G2	Reduction in time maintaining alternative tools with BMC AMI DevX	Interviews	100%	100%	100%
G3	Developer admin time maintaining alternative tools after BMC AMI DevX (hours)	G1*(100%-G2)	0	0	0
G4	Average fully burdened hourly rate for a developer before BMC AMI DevX	A6	$97	$97	$97
G5	Productivity recapture rate	A7	75%	75%	75%
Gt	Reduced admin effort due to tool consolidation	(G1-G3)*G4*G5	$151,320	$151,320	$151,320
	Risk adjustment	↓5%			
Gtr	Reduced admin effort due to tool consolidation (risk-adjusted)		$143,754	$143,754	$143,754
	Three-year total: $431,262		**Three-year present value: $357,495**		

Unquantified Benefits

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

- **Superior enterprise support.** The interviewees appreciated their partnerships with BMC, and they said they had stronger relationships with BMC than with other solution providers.

- The mainframe DevOps lead in financial services emphasized that BMC was at the forefront of mainframe technology: "It's quite ironic, just thinking about it. I went to the DevOps Enterprise Summit a couple of years ago, and on the stage, [our prior vendor] was talking about how they were only [recently] really embracing DevOps themselves. And that's funny because the person giving the talk was the same person whom we reached out to six years ago [with our problems]."

> *"Maybe [other vendors] will eventually start catching up to where BMC was years ago."*
>
> **Mainframe DevOps lead, financial services**

- The project lead for change management in financial services said: "The support by BMC is great. [The support representatives] are great support people — they're the best. They're very fast and very motivated. For example, when I open a new case, I'll get a response in 2 hours, [and it's from someone] competent. You really feel that they have knowledge in this area and that you're talking with [experienced] support. And that's great because then you can spend time on other things. [Our prior vendor] was not so professional. [With BMC,] it's very comfortable. I have a good connection with our key account manager. I can call them and discuss [my challenges,] and they're very helpful."
- The PDM in financial services appreciated BMC's product expertise: "The bottom line is they eat their own dog food or drink their own champagne — however you'd like to phrase it."

> *"When we talk to [BMC], they listen. So we might come up with an idea, or we might make a comment, and in a lot of cases, they actually deliver on those."*
>
> **Mainframe DevOps lead, financial services**

Flexibility

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

- **Continuous improvement with zAdviser.** Although not all of the organizations were using zAdviser, the interviewees from the organizations that were using it said that insights from its data helped improve their mainframe processes. In many cases, zAdviser provided data that the interviewees had never had before.
  - The mainframe DevOps lead in financial services explained: "The fact that we now have that level of data at our fingertips [is phenomenal]. We can track checkouts on specific programs; we can see how often [programs are] changing; we can see how many assignments we deployed on a daily basis over two years. So the insights from that data are invaluable, and [zAdviser] just gave us such a better grasp on the way we act. We now actually have a clear view from a mainframe perspective what our delivery guidance is. We can see clearly how much time we spend in each of the different stages."
  - The CIO in healthcare also said that using zAdviser reduced data collection and reporting times by 15%. They elaborated: "It's an excellent tool. [It] provides actionable insight into your workflow [and] benchmarking against industry standards. [You can] look how you allocate your resources [and] how you can boost productivity overall. … I'd say [it's] a differentiator."

- **Upcoming artificial intelligence (AI) features may deliver even greater benefits.** Several interviewees were excited about the AI enhancements for BMC AMI DevX tools that BMC was working on. At the time of the interviews, these features were not yet generally available. However, one of the interviewees had trialed some of the capabilities in a limited capacity, and a few of the other interviewees were aware of BMC's roadmap. The PDM in financial services said: "I want to do Code Explain with AI. I want to be a beta tester for that bad boy. I want to get it in my shop and start using it. I'm there! Why? I'm leaving. When I walk out the door, 200 years of knowledge walks out the door with me. I want Code Explain in place. It has got to be there."

> *"I'm absolutely convinced that [Code Explain with AI] is the right way to go."*
>
> **PDM, financial services**

Flexibility would also be quantified when evaluated as part of a specific project (described in more detail in Total Economic Impact Approach).

Analysis Of Costs

Quantified cost data as applied to the composite

Total Costs							
Ref.	**Cost**	**Initial**	**Year 1**	**Year 2**	**Year 3**	**Total**	**Present Value**
Htr	Licensing costs	$0	$2,945,250	$3,003,000	$3,060,750	$9,009,000	$7,458,905
Itr	Implementation effort	$426,800	$0	$0	$0	$426,800	$426,800
Jtr	Ongoing administration effort	$0	$97,650	$92,400	$88,200	$278,250	$231,402
Ktr	Training for developers	$133,860	$10,267	$9,715	$9,274	$163,116	$158,190
	Total costs (risk-adjusted)	$560,660	$3,053,167	$3,105,115	$3,158,224	$9,877,166	$8,275,297

Licensing Costs

Evidence and data. The licensing costs paid by the interviewees' organizations varied based on which BMC AMI DevX products they were using and how many licenses they had.

In aggregate, the interviewees did not feel like they were cost-burdened by the solution. In contrast, they suggested that the BMC AMI DevX platform was one of the more affordable solutions that they had considered, and several interviewees said that it was easy to justify the spending internally.

- The mainframe systems engineer in financial services said: "If you compare [BMC] with the tooling from [vendor X] or [vendor Y], it's less. But we still have contracts from [years ago], so maybe that's changed [for new customers]."
- The PDM in financial services said that the licensing costs for the BMC AMI DevX tools were a secondary consideration after the clear benefits of the platform became apparent. The interviewee explained: "Of course, price gets into it, but I don't do the numbers. … The spend wasn't enormous. My sourcing people do really well. But again, getting [new mainframe developers]; avoiding the eight, 10, 12 weeks of training time; [having] different user interfaces — it wasn't a hard sell. Once you add up all those things, and then the extra gravy of all the perks and benefits of Code Insights and all the [tools and features] that I get to add down the road — whether on day one, week one, or year one. … Eventually, you start adding on the additional [benefits of the platform], and it was not a hard sell at all."
- The mainframe DevOps lead in financial services noted that although their team had around 200 mainframe developers (both in-house and outsourced), the organization only needed to purchase 175 BMC AMI DevX licenses due to BMC's concurrent licensing offering. Each developer did not need all the tools all the time.

> *"In the end, we've never had any complaints [from finance], and we've never had anyone require us to stop any BMC AMI DevX product."*
>
> **Mainframe systems engineer, financial services**

Modeling and assumptions. Based on the interviews, Forrester assumes the following about the composite organization:

- It costs the composite organizations around $10,000 per developer to license all the BMC AMI DevX tools that the mainframe team uses.
- Total licensing costs are discounted by 12.5% to account for both a volume discount and concurrent licensing. All developers do not need all the tools all the time, so the composite organization purchases slightly fewer licenses than the total number of developers.

> *"[BMC provides] better-functioning tools at a more competitive price. Why wouldn't I select that?"*
>
> **CIO, healthcare**

Risks. This cost may vary from organization to organization based on the specific selection of BMC AMI DevX products that an organization invests in. To realize the benefits modeled, the composite organization (like the interviewees' organizations) invests in a majority of the BMC AMI DevX products, including Workbench, Code Pipeline, Total Test, File-AID, Abend-AID, Code Debug, Code Insights, Strobe, and zAdviser. Some tools like Workbench and Code Pipeline are integral to the solution set and were adopted by all the interviewees' organizations. However, other tools like Strobe and zAdviser might be considered ancillary — not required to realize benefits — because they were not universally adopted.

In addition, enterprise pricing can vary, and readers should contact BMC for more details.

Results. To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $7.5 million.

Licensing Costs						
Ref.	**Metric**	**Source**	**Initial**	**Year 1**	**Year 2**	**Year 3**
H1	Mainframe developers after BMC AMI DevX	F1		306	312	318
H2	Total BMC AMI DevX license cost per user	Interviews		$10,000	$10,000	$10,000
H3	Discount	Interviews		12.5%	12.5%	12.5%
Ht	Licensing costs	H1*H2*(100%-H3)	$0	$2,677,500	$2,730,000	$2,782,500
	Risk adjustment	↑10%				
Htr	Licensing costs (risk-adjusted)		$0	$2,945,250	$3,003,000	$3,060,750
	Three-year total: $9,009,000			**Three-year present value: $7,458,905**		

Implementation Effort

Evidence and data. The interviewees said that migrating from their legacy solutions to the BMC AMI DevX platform typically took several months and involved a small group of IT employees. In some cases, BMC's professional services team helped with migration.

- The mainframe systems engineer in financial services decided to handle the migration in-house, by themself, so they could learn and develop expertise with the BMC AMI DevX tools. They reported that they worked on the project about three to four days per week for one year. They explained: "I needed to understand how [the platform] works. ... Now, if I were to redo the [implementation], I think it'd take me three to six months because I know how [the platform] works." The mainframe systems engineer also mentioned, "We chose to do a 'big bang' — so not moving the tooling wave by wave — because [the change] is very complex."
- The mainframe DevOps lead in financial services said that implementation took six months and involved the efforts of three people working full-time. One of those resources was a local BMC partner. They explained: "We actually pushed quite hard. ... We didn't do a 'big bang;' we approached [the migration] one team at a time. We would migrate the source code after a prod deployment and then the next day do a training session."
- The project lead for change management in financial services said that implementation took about eight months and involved a handful of IT employees: the interviewee working full-time plus an IT administrator, three to four developers and software architects, and two BMC employees all contributing part-time.
- The platform lead for mainframe DevOps in financial services said that deploying Code Pipeline only took about six months. However, they mentioned that fully decommissioning the organization's legacy homegrown solution took longer — around 18 months to two years.
- Finally, the PDM in financial services said that migration took about four months. They said, "I did it department by department."

> *"The implementation was really easy. ... In the end, that worked very well, and the developers were happy."*
>
> **Mainframe systems engineer, financial services**

Modeling and assumptions. Based on the interviews, Forrester assumes the following about the composite organization:

- The effort to migrate from the composite organization's legacy solution to the BMC AMI DevX platform is proportional to the size of the mainframe codebase (i.e., a larger codebase takes longer to migrate).
- Based on the implementation timelines and codebase sizes reported by the interviews, each line of code in the mainframe codebase adds approximately 0.0002 hours to the total implementation effort.
- Thus, the total implementation time required for the composite organization is around 4,000 hours. This work may be completed by many resources over a shorter period of time or by fewer resources over a longer period of time. How the composite organization chooses to allocate and complete the work does not matter because the value of the total time spent on implementation is still the same.
- For the sake of simplicity, Forrester assumes that the implementation work is completed by IT employees earning the average developer hourly rate of $97.

Risks. This cost may vary from organization to organization for organization-specific reasons: e.g., the size and complexity of the mainframe codebase; the ease of migrating from specific legacy solutions; risks inherent to large IT projects; and so on.

Results. To account for these risks, Forrester adjusted this cost upward by 10%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $427,000.

Implementation Effort						
Ref.	**Metric**	**Source**	**Initial**	**Year 1**	**Year 2**	**Year 3**
I1	Lines of code in mainframe codebase	B4	20,000,000			
I2	Implementation effort per line of code (hours)	Interviews	0.0002			
I3	Total implementation effort (hours)	I1*I2	4,000			
I4	Average fully burdened hourly rate for a developer before BMC AMI DevX	A6	$97			
It	Implementation effort	I3*I4	$388,000	$0	$0	$0
	Risk adjustment	↑10%				
Itr	Implementation effort (risk-adjusted)		$426,800	$0	$0	$0
	Three-year total: $426,800			**Three-year present value: $426,800**		

Ongoing Administration Effort

Evidence and data. The interviewees tended to report that the BMC AMI DevX tools required minimal administration effort. Interviewees from four of the organizations reported that the platform needed no more than one FTE for ongoing upkeep, support, and maintenance.

- The mainframe systems engineer in financial services said, "[To keep the platform] stable and working for developers, it's not a lot [of effort] because the tooling is stable." They said they might spend one to three days per week on "continuous improvement" work (i.e., improving the platform and associated processes) and a few hours per week supporting developers.
- The mainframe DevOps lead in financial services said: "Very little [time is spent on ongoing administration]. We do regular updates of the products, [and] we have some user support. Most of the time, that's new people coming onboard who just have questions. [But] we've been very stable from a real issue perspective. We haven't been called out for a deployment issue in a very long time. … It pretty much boils down to, if anything, I need one full-time employee."
- The project lead for change management in financial services said: "We have one person who administers, does the maintenance, updates, and so on for all the BMC tools that we have in the software development lifecycle."

  They continued: "[The BMC AMI DevX platform] can be easily administered, and it connects to modern systems [for project management] and [continuous integration and continuous delivery (CI/CD)]. You have a lot of web APIs that you can connect to, for example, your own developed applications. You can create really good reports. The data structure from the tools — for example, Code Pipeline — is very easy to understand, and that's good for audits, regulations, etc."

They concluded: "[Our old platform used] external support. Code Pipeline can be self-managed, and that's better. For example, you can have different administration levels."

> *"The maintenance is really quick and easy, and there are very few times when we've actually had issues."*
>
> **Platform engineer, financial services**

Modeling and assumptions. Based on the interviews, Forrester assumes the following about the composite organization:

- The ongoing effort to administer the BMC AMI DevX platform is proportional to the number of programs in the mainframe codebase (i.e., more programs means a greater the scope for the BMC AMI DevX deployment as well as a greater potential for support issues, etc.).
- Based on the interviews, Forrester assumes that each mainframe program leads to an additional 0.1 hours per year of administration effort.
- Thus, the total ongoing administration effort required for the composite organization is around 1,000 hours. This is slightly less than half of one FTE, as a full-time or equivalent employee works 2,080 hours per year. This work may be completed by one IT employee or by many; either way, the total cost of the administration effort is the same.
- For the sake of simplicity, Forrester assumes that the implementation work is completed by IT employee(s) earning the average developer hourly rate.

Risks. This cost may vary from organization to organization for organization-specific reasons: e.g., the scope of the BMC AMI DevX deployment; unique attributes of an organization's mainframe infrastructure; etc.

Results. To account for these risks, Forrester adjusted this cost upward by 5%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $231,000.

Ongoing Administration Effort						
Ref.	**Metric**	**Source**	**Initial**	**Year 1**	**Year 2**	**Year 3**
J1	Programs in mainframe codebase	B6		10,000	10,000	10,000
J2	Ongoing administration effort per program (hours)	Interviews		0.1	0.1	0.1
J3	Total ongoing administration effort (hours)	J1*J2		1,000	1,000	1,000
J4	Average fully burdened hourly rate for a developer after BMC AMI DevX	F6		$93	$88	$84
Jt	Ongoing administration effort	J3*J4	$0	$93,000	$88,000	$84,000
	Risk adjustment	↑5%				
Jtr	Ongoing administration effort (risk-adjusted)		$0	$97,650	$92,400	$88,200
		Three-year total: $278,250			**Three-year present value: $231,402**	

Training For Developers

Evidence and data. The interviewees said that the BMC AMI DevX tools were easier to use than both their legacy systems and other solutions they considered. Accordingly, they reported relatively light training needs for developers. Interviewees leveraged instructional resources from BMC as well as created their own internal resources.

- The mainframe systems engineer in financial services said: “For all the tooling, [the developers] have maybe one to two weeks in total of training, but they redo the training every one to two years to refresh [their knowledge] — to [learn] new features and new functionality or [to remember] something they may have forgotten over time.”
- The mainframe DevOps lead in financial services said: “We run training sessions for 4 hours, and that’s pretty much it. Yes, we get some questions and calls for assistance, but [those training sessions] are effectively all that is needed.”
- The project lead for change management in financial services said that training varied depending on role. For example, only senior developers received training on File-AID, Abend-AID, and Strobe because, as they said, “You must have a lot knowledge to analyze the problems.” The interviewee had personally written a roughly 50-page document on Code Pipeline usage, and that was the organization’s primary training material for developers.
- The PDM in financial services said: “I do a ton of training. I do lunch-and-learns. … I do training classes — 4-hour sessions for every department. … I have a full recording studio. I do all my own training videos and everything. I write all my team’s documentation. I’m knee-deep in the code, but I [also] crowdsource support. … I have 400 people [(all developers on the team)] doing support.”

Modeling and assumptions. Based on the interviews, Forrester assumes the following about the composite organization:

- Each developer needs 4 hours of training time to become proficient with the BMC AMI DevX platform.
- Initially, all 300 developers are trained. In Year 1 through Year 3, only new developer hires receive training.

Risks. This cost may vary from organization to organization for organization-specific reasons: e.g., developers’ skills and experience; investments in internal training resources; etc.

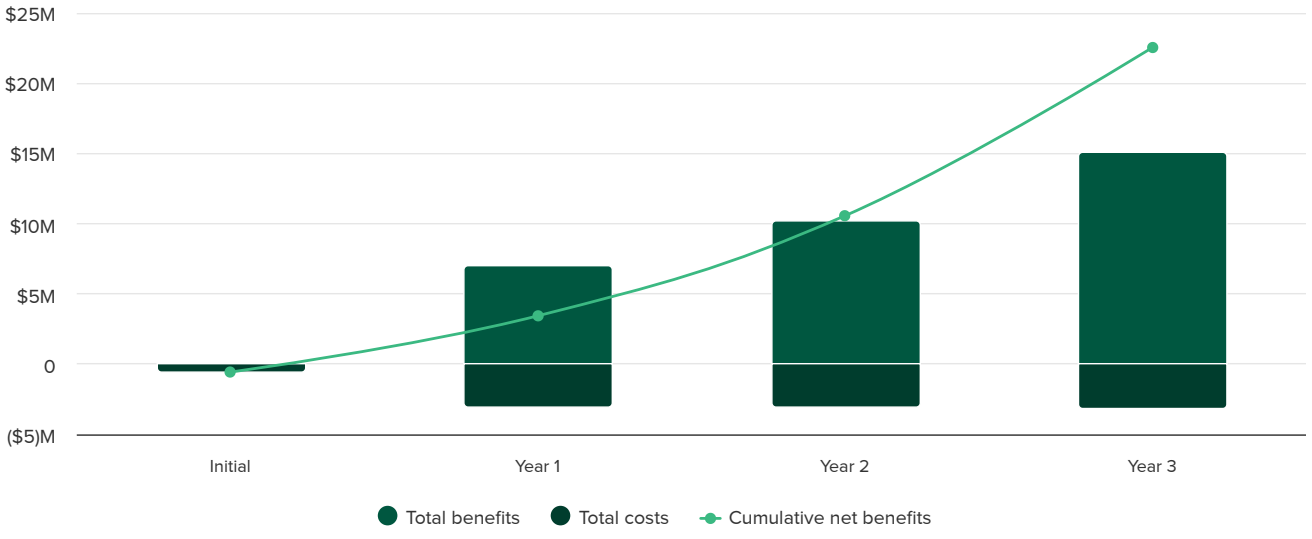
Results. To account for these risks, Forrester adjusted this cost upward by 15%, yielding a three-year, risk-adjusted total PV (discounted at 10%) of $158,000.

Training For Developers						
Ref.	**Metric**	**Source**	**Initial**	**Year 1**	**Year 2**	**Year 3**
K1	Developers trained	Initial: D1 Y1 to Y3: E1	300	24	24	24
K2	Training time per developer (hours)	Interviews	4	4	4	4
K3	Average fully burdened hourly rate for a developer	Initial: A6 Y1 to Y3: F6	$97	$93	$88	$84
Kt	Training for developers	K1*K2*K3	$116,400	$8,928	$8,448	$8,064
	Risk adjustment	↑15%				
Ktr	Training for developers (risk-adjusted)		$133,860	$10,267	$9,715	$9,274
		Three-year total: $163,116			**Three-year present value: $158,190**	

Financial Summary

Consolidated Three-Year, Risk-Adjusted Metrics

Cash Flow Chart (Risk-Adjusted)



Cash Flow Analysis (Risk-Adjusted)						
	Initial	Year 1	Year 2	Year 3	Total	Present Value
Total costs	($560,660)	($3,053,167)	($3,105,115)	($3,158,224)	($9,877,166)	($8,275,297)
Total benefits	$0	$7,055,718	$10,232,176	$15,131,921	$32,419,815	$26,239,469
Net benefits	($560,660)	$4,002,550	$7,127,061	$11,973,698	$22,542,649	$17,964,172
ROI						217%
Payback						<6 months

Please Note

The financial results calculated in the Benefits and Costs sections can be used to determine the ROI, NPV, and payback period for the composite organization's investment. Forrester assumes a yearly discount rate of 10% for this analysis.

These risk-adjusted ROI, NPV, and payback period values are determined by applying risk-adjustment factors to the unadjusted results in each Benefit and Cost section.

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.

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 BMC AMI DevX.

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 BMC AMI DevX can have on an organization.

Due Diligence

Interviewed BMC stakeholders and Forrester analysts to gather data relative to BMC AMI DevX.

Interviews

Interviewed eight decision-makers at six organizations using BMC AMI DevX to obtain data about 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.

Glossary

Total Economic Impact Approach

Benefits

Benefits represent the value the solution delivers to the business. The TEI methodology places equal weight on the measure of benefits and costs, allowing for a full examination of the solution's effect on the entire organization.

Costs

Costs comprise all expenses necessary to deliver the proposed value, or benefits, of the solution. The methodology captures implementation and ongoing costs associated with the solution.

Flexibility

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

Risks

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."

Financial Terminology

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.

Appendixes

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 solution providers in communicating their value proposition to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of business and technology initiatives to both senior management and other key stakeholders.

APPENDIX B

Supplemental Material

Related Forrester Research

2024 Mainframe Infrastructure Benchmarks, Global, Forrester Research, Inc., September 25, 2024

Enterprises Adopt DevOps To Modernize Mainframe Applications, Forrester Research, Inc., February 22, 2024

Tackle The Overwhelming Challenge Of Mainframe Modernization, Forrester Research, Inc., February 29, 2024

The State Of Mainframes, Global, 2024, Forrester Research, Inc., March 21, 2024

Understand Developer Experience To Improve Business Outcomes, Forrester Research, Inc., June 21, 2023

APPENDIX C

Endnotes

[1] Source: Forrester's Infrastructure Hardware Survey, 2023.

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

[3] Forrester's assumption that 10% of the composite organization's annual revenue is supported by mainframe software may be conservative. E.g., one of the interviewees — the mainframe DevOps lead at a financial services organization — said that their organization's mainframe platform could be responsible for up to 50% of annual revenue since it supported core banking systems.

[4] The global average operating margin for private-sector companies is 12.08%. Average operating margins vary by industry; businesses in some industries (e.g., financial services) may have operating margins higher than 12%. Forrester assumes the composite organization has a 12% operating margin both to be conservative and so that the financial model is as broadly applicable as possible. Source: Aswath Damodaran, Margins by Sector (US), New York University Stern School of Business, January 2025.

[5] According to Forrester's research, the average developer spends about 24% of their time coding versus performing other work activities (e.g., attending meetings, responding to emails, etc.). Source: Forrester's Developer Survey, 2023.

APPENDIX D

BMC AMI DevX

BMC provided Forrester with the following description of BMC AMI DevX: BMC AMI DevX is an integrated software platform that provides mainframe development teams with modern DevOps capabilities. The solution connects traditional mainframe environments with contemporary development practices through components for source code management, testing, debugging, and analytics.

Development Environment

- **BMC AMI DevX Workbench:** Modern IDE for mainframe development based on Eclipse or VS Code with integrated coding, testing, and debugging capabilities.

Code Management And Intelligence

- **BMC AMI DevX Code Pipeline:** Source code management system enabling concurrent development with RESTful API integration.
- **BMC AMI DevX Code Insights:** Visualization tool for code structure with AI-powered explanations to help understand and refactor complex mainframe applications.

Testing And Debugging

- **BMC AMI DevX Code Debug:** Debugging tool that helps resolve logic errors across multiple environments.
- **BMC AMI DevX Total Test:** Automated testing solution for unit, functional, integration, and regression tests.
- **BMC AMI DevX Performance Test:** Load and performance testing tool to verify applications meet production standards.
- **BMC AMI DevX Code Coverage:** Analysis tool that identifies which portions of applications have been tested.

Data Management

- **BMC AMI DevX Data Studio:** Tool for discovering, visualizing, and securing test data across mainframe and non-mainframe environments.
- **BMC AMI DevX File-AID:** Data management utility for handling, obfuscating, and preparing test data across various file types.

Operations And Analytics

- **BMC AMI DevX Abend-AID**: Application failure-monitoring tool that provides root cause analysis and failure recreation capabilities.
- **BMC AMI zAdviser Enterprise:** Analytics dashboard tracking SDLC metrics to improve software delivery processes.
- **BMC AMI Strobe:** Performance analysis tool that identifies CPU inefficiencies to reduce hardware and software costs.

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 BMC AMI DevX. For any interactive functionality, the intent is for the questions to solicit inputs specific to a prospect's business. Forrester believes that this analysis is representative of what companies may achieve with BMC AMI DevX based on the inputs provided and any assumptions made. Forrester does not endorse BMC or its offerings. Although great care has been taken to ensure the accuracy and completeness of this

model, BMC and Forrester Research are unable to accept any legal responsibility for any actions taken on the basis of the information contained herein. The interactive tool is provided 'AS IS,' and Forrester and BMC make no warranties of any kind.

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.

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