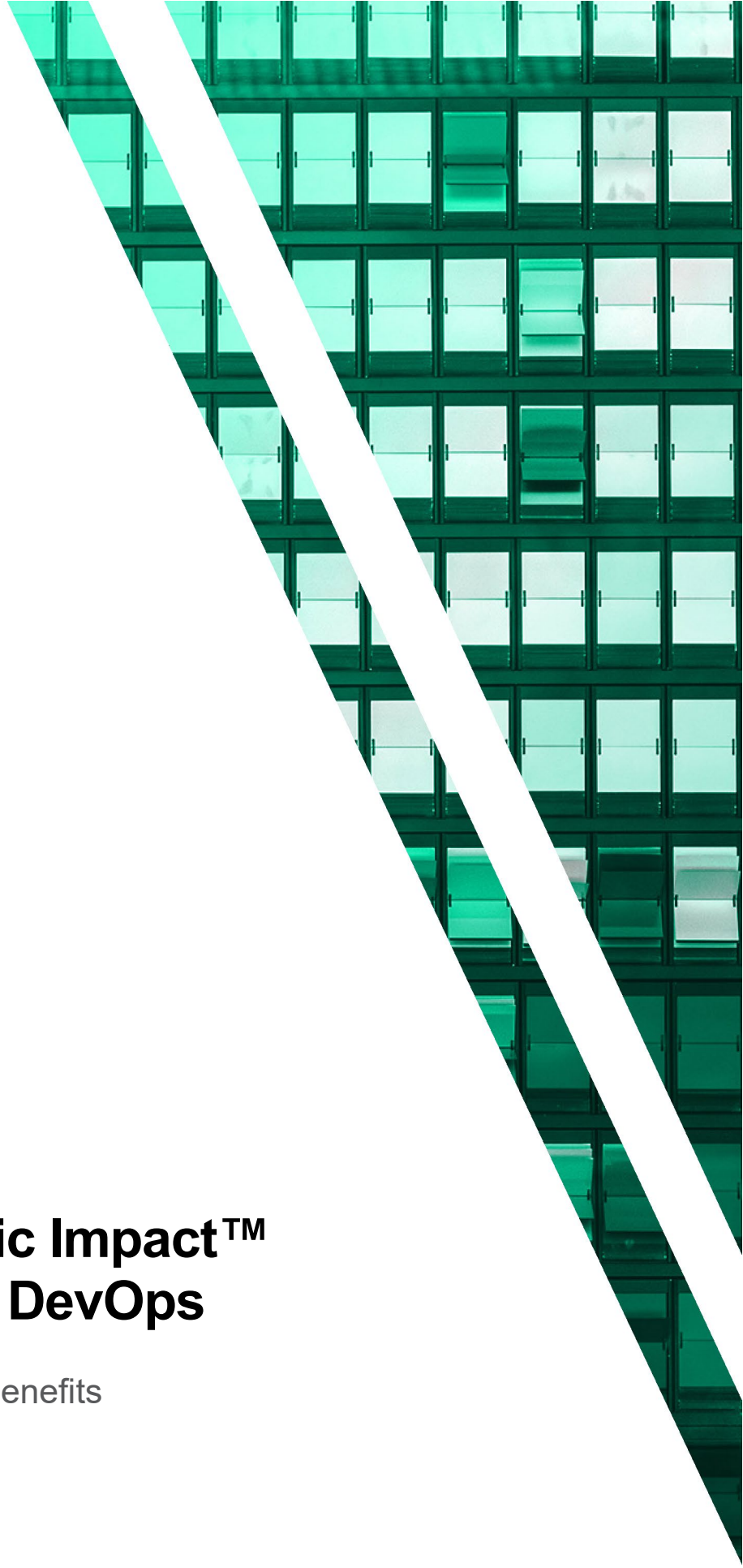
FORRESTER®



The Total Economic Impact™ Of Atlassian Open DevOps

Cost Savings And Business Benefits Enabled By Open DevOps

MARCH 2022

A FORRESTER TOTAL ECONOMIC IMPACT™ STUDY COMMISSIONED BY ATLASSIAN AND AMAZON WEB SERVICES

Table Of Contents

Executive Summary 1

The Atlassian Open DevOps Customer Journey 6

Key Challenges 6

Investment Objectives 7

Composite Organization 8

Analysis Of Benefits 9

Software Developer Productivity 9

IT Specialist Productivity 12

Software Licensing Cost Savings 14

Benefits From SDLC Improvements After Open DevOps 17

Unquantified Benefits 20

Flexibility 20

Analysis Of Costs 22

Jira Software Licensing Fees 22

Open DevOps Deployment And Implementation 23

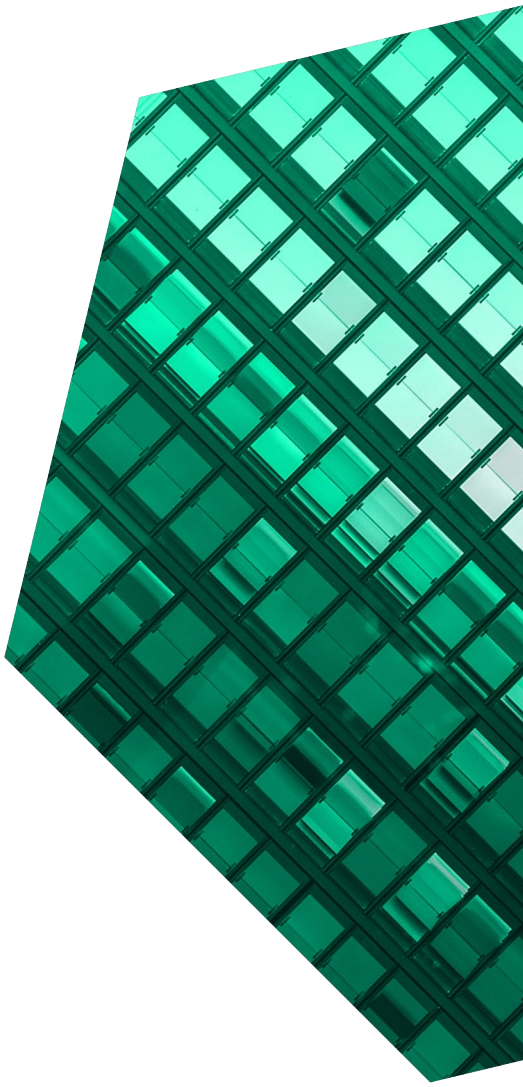
Training 25

Financial Summary 27

Appendix A: Total Economic Impact 28

Appendix B: Endnotes 29

Consulting Team: Jeffrey Yozwiak
Sanitra Desai



ABOUT FORRESTER CONSULTING

Forrester Consulting provides independent and objective research-based consulting to help leaders succeed in their organizations. For more information, visit forrester.com/consulting.

© Forrester Research, Inc. All rights reserved. Unauthorized reproduction is strictly prohibited. Information is based on the best available resources. Opinions reflect judgment at the time and are subject to change. Forrester®, Technographics®, Forrester Wave, RoleView, TechRadar, and Total Economic Impact are trademarks of Forrester Research, Inc. All other trademarks are the property of their respective companies.

Executive Summary

Software teams with sprawling toolsets struggle to implement the agile and DevOps processes that improve velocity and quality. However, using Jira Software, teams can connect diverse toolsets — even those with tools from third parties — into unified DevOps pipelines and automated workflows. Five organizations that did so substantially improved both software delivery and team productivity.

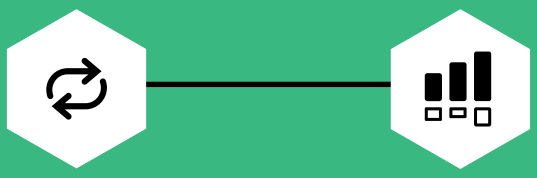
Atlassian Jira Software is issue- and project-tracking software for software development teams. Jira Software can be readily integrated with other Atlassian products (such as Confluence and Bitbucket) as well as an extensive range of third-party tools to create unified DevOps toolchains and pipelines. In addition, Jira Software includes a variety of built-in features — such as advanced roadmapping, reporting, and automation — to further support DevOps implementations. Atlassian Open DevOps is the use of Jira Software as the core product supporting DevOps within an organization.

Atlassian and Amazon Web Services commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying Open DevOps.[1] The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of using Open DevOps at their organizations.

"Jira Software is the center of our universe. It's seen as a utility — like electricity."

Senior manager, IT, data and analytics

KEY STATISTICS



Return on investment (ROI)
358%

Net present value (NPV)
$27.62M

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed seven decision-makers with experience using Open DevOps. For the purposes of this study, Forrester aggregated the interviewees' experiences and combined the results into a single composite organization.

Before using Open DevOps, the software development and IT teams at the interviewees' organizations struggled to collaborate. The teams had no standard tooling or processes. As a result, development teams worked in silos, and IT teams became bottlenecks as they strained to support growing numbers of tools. Morale was low.

After adopting Open DevOps, the organizations standardized their processes and integrated their tooling. The solution increased visibility, collaboration, and productivity: Both developers and IT specialists realized large productivity gains by automating routine tasks. Open DevOps helped

support the organizations' agile and DevOps transformations.

KEY FINDINGS

Quantified benefits. Risk-adjusted present value (PV) quantified benefits over three years include:

- **Developer productivity increased by up to 20%, contributing nearly $16.0 million in benefits.** Using Jira Software, the customers integrated toolchains and automated repetitive, low-value tasks. While such tasks might take only a few minutes to complete manually, automating them resulted in significant time savings at scale. Developers spent more time coding, and using consistent toolsets improved collaboration.

Developer time saved after using Open DevOps:

1.5 hrs./day

- **IT productivity increased by up to 10%, contributing $9.7 million in benefits.** Automating low-value tasks saved IT specialists time as well. Moreover, connecting toolchains with Jira Software improved visibility and made monitoring and reporting easier. IT specialists further saved time as their organizations curbed tool proliferation and thereby reduced maintenance effort.
- **Software licensing costs per employee decreased by up to 30%, contributing $8.7 million in benefits.** As the organizations implemented Open DevOps, they reduced shadow IT and retired redundant tooling. Organizations that migrated from on-premises Jira Software Data Center to Jira Software Cloud realized additional cost savings.
- **Deployment frequencies increased to biannually to biweekly (or faster) and code quality improved by 10%, contributing $918,000 in benefits.** By using Open DevOps, the customer organizations accelerated their transitions from waterfall practices to agile and DevOps. The organizations broke work down into smaller, more frequent releases. In addition, Jira Software integrations and automations helped them improve code quality. Two organizations reduced the number of code issues by 10%. By thus improving their software development lifecycles (SDLCs), the organizations completed more technology projects annually.

Unquantified benefits. Benefits that are not quantified for this study include:

- **Higher developer morale.** Interviewees noted that developers' morale improved as their productivity, autonomy, and collaboration increased.
- **Flexibility from extensibility.** By integrating Jira Software with a wide array of tools — including third-party tools — the organizations created customized workflows that maximized productivity. Teams used their chosen tools while still centralizing and coordinating in Jira Software.

Costs. Risk-adjusted PV costs include:

- **Jira Software licensing fees averaging $541,000 per year.** Jira Software is licensed on a per user basis, and Forrester's analysis of the composite organization assumes between 4,000 and 5,000 users each year.
- **Deployment and implementation costs totaling $439,000 over three years.** Interviewees reported that deployment and implementation took several months when handled by a small team. Interviewees said that although the planning effort was significant, the actual technical work to integrate toolchains and automate workflows was relatively light.

- **Training costs of $5.5 million over three years.** Forrester's analysis for the composite organization conservatively assumes that each technology employee receives 24 hours of training — time that is largely devoted to upskilling and training on new agile and DevOps workflows and processes.

The decision-maker interviews and financial analysis found that a composite organization experiences benefits of $35.34 million over three years versus costs of $7.72 million, adding up to a net present value (NPV) of $27.62 million and an ROI of 358%.

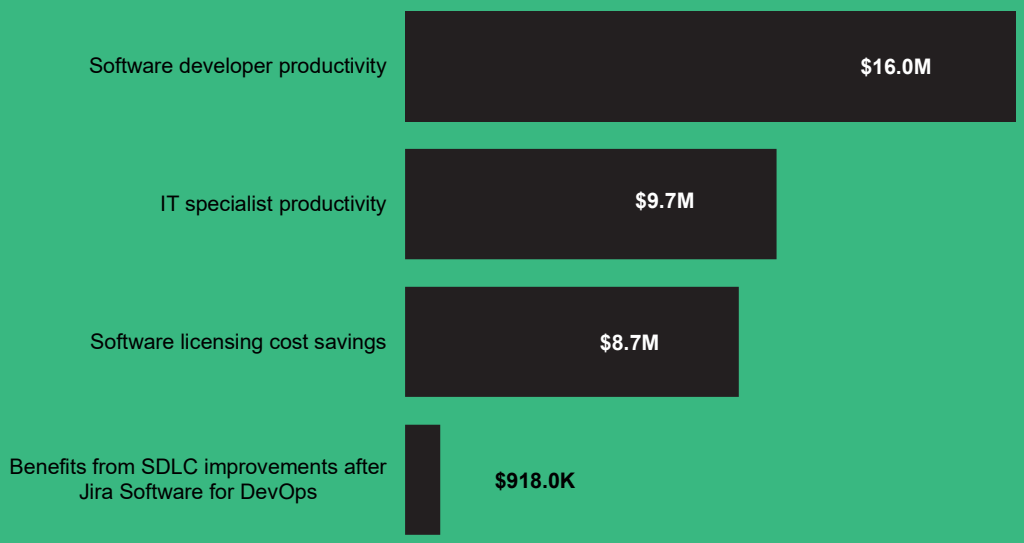
ROI
358%

BENEFITS PV
$35.34M

NPV
$27.62M

PAYBACK
12 months

Benefits (Three-Year)



“[Jira Software] is now much more open [and capable of] talking to other systems. This is a fundamental change. [Using Open DevOps], you can [integrate Jira Software] with other tools, and that’s helped us a lot. [We support] developer choice. [I] don’t want to tell [a developer] they must use a tool if it’s going to slow them down.”

— Senior manager, IT, data analytics

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 Open DevOps.

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 Open DevOps can have on an organization.

DUE DILIGENCE

Interviewed Atlassian stakeholders and Forrester analysts to gather data relative to Open DevOps.

DECISION-MAKER INTERVIEWS

Interviewed seven decision-makers at organizations using Open DevOps to obtain data with respect to costs, benefits, and risks.

COMPOSITE ORGANIZATION

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

FINANCIAL MODEL FRAMEWORK

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

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.

DISCLOSURES

Readers should be aware of the following:

This study is commissioned by Atlassian and Amazon Web Services 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 the Jira Software for DevOps.

Atlassian 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.

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

The Atlassian Open DevOps Customer Journey

Drivers leading to the Open DevOps investment

Interviewed Decision-Makers

Interviewee	Industry	Region	Jira Software Users
Senior manager, IT	Data analytics	Headquartered in North America	10,000 users
Head of IT	Finance	Headquartered in Europe	8,500 users
Business designer	Finance	Headquartered in Europe	8,500 users
Senior manager, IT	Networking	Headquartered in North America	800-900 users
Senior project manager	Retail	Headquartered in Europe	5,000 to 7,000 users
Senior program manager	Insurance	Headquartered in North America	600 users
Scrum master/project manager	Insurance	Headquartered in North America	600 users

KEY CHALLENGES

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

- **Toolchains were disconnected, and the tools in use were proliferating.** The senior manager of IT in the networking industry explained: "Everyone used whatever they wanted. Every team had a different stack. Getting [the information you wanted was hard]. It was all over the place." Tool proliferation led to many of the other challenges the organizations faced.
- **Teams were siloed, and collaboration was low.** The lack of standardized tooling hindered collaboration. The senior project manager in retail explained: "It was very difficult to collaborate across regions because everybody had their own [tools]. It was very difficult to work together and to see the status of projects. … We had a lot of scattered information." The scrum master in the insurance industry described a similar experience: "The bastardization — if I may use the term — of the tools [led] teams to work in silos within the organization, and that drove inconsistency. … Back when I first joined the company … it was a bit like the Wild West."

Similarly, the senior manager of IT in data analytics said: "Over the course of 10 years, people requested their tools of choice, and I just got them, right? … But that led to disconnected teams and [low] collaboration."

"We had all of the standard tools for collaboration, but not necessarily the processes. … Different teams were doing things different ways and with different tooling. [As a result], reporting, dashboards, and delivery were really hard. It was really chaotic. There was no planning and governance."

Senior manager, IT, data and analytics

- **IT was a bottleneck.** The interviewees said their IT teams struggled to support the myriad tools — more tools meant higher effort spent on maintenance. At the organization in the networking industry, technology team members were often using outdated tools and "old-fashioned solutions," according to the senior manager of IT. The scrum master in the insurance industry also explained: "We found ourselves inundated with work. … We quickly became a big, big bottleneck." He added: "Developers would open tickets without considering how loaded we were. … It was just overwhelming."
- **Low visibility impacted the business.** Because toolchains were disconnected, project management was time-consuming and issue recovery was slow. The senior program manager in the insurance industry explained: "[There] were high-profile initiatives [for which] certain key deliverables were missed or delayed [in part] because of the inconsistency between the tools and the lack of collaboration." The senior manager of IT in networking added: "[Diagnosing issues] was time-consuming. There were a lot of blind spots."

"IT needs to mirror what engineering does."

Senior manager of IT, networking

INVESTMENT OBJECTIVES

The interviewees' organizations searched for a solution that could:

- **Standardize processes and tooling.** The senior manager of IT in data analytics explained, "We wanted to ensure that team members could shift from one team to another and still have the same processes and tooling." Similarly, the senior project manager in retail said: "We wanted to make it far easier [for teams] to work together seamlessly across the globe. We wanted a seamless experience: integrated tools, automation, and a faster and more controllable pipeline. We wanted to standardize and align."
- **Improve delivery speeds.** For the finance organization — a storied institution that was founded in the 1800s — this was a business imperative. The head of IT explained: "This was a strategic challenge. We needed to change fast in order to compete with millennial organizations. We needed to be more agile and responsive to our customers' demands. The classic [waterfall] methods we [used] were too cumbersome."
- **Support the adoption (or improvement) of agile and DevOps.** Several of the organizations were relatively new to agile and DevOps. Even if individual teams were agile, practices across the organization were not standardized or coordinated. The decision-makers knew that agile and DevOps could help them deliver faster, so they sought tooling that could support their organizational transformations.
- **Balance standardization with flexibility and openness.** The decision-makers wanted to curb tool proliferation, but at the same time, they did not want to limit their teams. The scrum master/project manager in insurance also explained: "I want my tools to be flexible and customizable [so] we can make the tools work the way we would like them to work and not the other way around. That's pretty central."

  For the decision-makers, this meant a tool that was not only customizable but could also integrate with a wide variety of third-party apps. The senior manager of IT in networking said: "Even if we wanted to [use a tool other than Jira] for [tracking development], it would be a point

solution. We'd have to find other tools for [other tasks]. … Then, managers would be more focused on [tooling] and [finding information than] adding value to their deliveries."

"We call Jira Software a 'golden thread.' It gives people the ability to see the full picture, to see how they're contributing to an outcome, and to see how that outcome is contributing to [company goals]. It helps with democratization."

Head of IT, finance

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 seven decision-makers that Forrester interviewed and 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 billion-dollar company with operations across North America and Europe. The organization has both B2B and B2C business lines, and it has 10,000 employees. Four thousand of those employees are in the technology department supporting front-office business operations. One thousand employees are software developers, and 3,000 employees are in other IT roles. The composite organization is experiencing rapid business growth: Revenues are growing by 10% each year. To support that growth, the composite organization is hiring at the same rate.

Key assumptions

- **$1 billion in revenue**
- **10,000 employees total**
- **1,000 software developers**
- **3,000 IT specialists**
- **10% growth per year**

Deployment characteristics. Initially, the technology department uses waterfall development practices and has low agile and DevOps maturity. However, the organization wishes to transform and modernize its software development practices. The IT team surveys the myriad tools already in use by developers and decides to standardize and centralize on using Jira Software and its Open DevOps capabilities to support the organization's DevOps transformation. The IT team spends several months deploying Jira Software and integrating it with other applications and workflows. Over the next several years, the IT team uses the Open DevOps features in Jira Software to automate workflows.

"Jira Software is made for developers."

Senior manager, IT, networking

"Jira Software is becoming an industry standard, I think. If you're a developer, you've heard about it if not used it already."

Senior manager, IT, networking

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	Software developer productivity	$2,928,250	$6,442,150	$10,629,548	$19,999,948	$15,972,273
Btr	IT specialist productivity	$1,781,813	$3,919,988	$6,467,979	$12,169,779	$9,718,977
Ctr	Software licensing cost savings	$1,600,000	$3,520,000	$5,808,000	$10,928,000	$8,727,273
Dtr	Benefits from SDLC improvements after Open DevOps	$180,000	$376,200	$590,238	$1,146,438	$918,000
	Total benefits (risk-adjusted)	$6,490,063	$14,258,338	$23,495,765	$44,244,165	$35,336,523

SOFTWARE DEVELOPER PRODUCTIVITY

Evidence and data. Interviewees said that implementing Open DevOps improved developer productivity at their organizations. Interviewees reported developer productivity gains of between 10-25% — i.e., developers saved over an hour each day. The organizations realized these time savings by using Jira Software to:

- Integrate their disconnected toolchains and reduce context switching.
- Automate tedious and repetitive low-level work — e.g., administrative overhead and other miscellaneous tasks required for management.
- Standardize tooling, which improved visibility and increased collaboration.

Because these productivity gains were so significant, they are worth describing in greater detail.

- **Automation reduced overhead so that developers could spend more time coding.**
    - The senior manager of IT in networking explained: “Programmers by nature want to program. They don’t want to deal with all the stuff that as a manager I’m interested in. [For example,] logging their hours every time they finish [tickets]. Any tasks that are not related to development — that don’t add value to the product — give them less satisfaction and happiness.”

“The [time savings] are huge. [But] more than that, [developers no longer] feel like they have to do unnecessary [work].”

Senior manager, IT, networking

After the organization automated many administrative tasks with Jira Software, the senior manager of IT reported that: “Developers are happier. They no longer complain [about having to do low-level tasks]. [They] are focused on the job at hand — programming. They stay in the zone.”

- **A unified and connected toolset improved collaboration.**
    - The senior manager of IT in the data analytics industry said: “Everyone is in one system. That removes the disconnects and improves collaboration.”
    - The senior project manager in retail said: “Before, there was a lot of email, screensharing, and diverse toolsets. Now, everyone collaborates in Jira.” The senior project manager believed that collaboration was three to four times higher.
    - The senior manager of IT in networking said: “[Jira Software] is [now] a common language across every [team]. When you talk about a ‘Jira story’ or ask for a report, everyone knows what you’re talking about. [Having] that common language reduced overhead and management and simplified processes.”
- **Using Jira Software as a single source of truth saved developers time.** The organizations used Jira Software to improve visibility.
    - The senior manager of IT in data analytics explained: “[People] spend less time looking for things. … Before, [information] was hidden away on sticky notes on walls or spreadsheets or local computers. A 5-minute task [yesterday] would have taken me several hours [before] — waiting for someone to wake up, [etc.]. … Now, everyone knows the answer is going to be in Jira.”
    - The senior manager of IT in networking said: “It helps with knowledge transfer. … You know what people have worked on, [and] if you need to fix an issue, you can look at the history [and see what was

Voice Of The Customer

“We’re delivering more with the same or fewer resources than we had before.”
Head of IT, finance

“We’re able to deploy new functionality to our customers faster.”
Senior project manager, retail

“Overall velocity is far better. … [Features] that were taking weeks to be delivered [are delivered far faster].”
Senior manager, IT, data analytics

“The feature turnaround time is significantly better, and it’s not because people are working harder. Now, they have access to the tooling [they need] all the time and [they] work differently. … We can link [all of the] business processes with Jira.”
Senior manager, IT, data analytics

“[We look for] opportunities to automate things away … and that’s just reflected in the overall velocity.”
Senior manager, IT, data analytics

“[On the] web, [the] expectation now [is] that you can play fast. [As a developer], you should also be able to get all the answers and information [you need] fast as well.”
Senior manager, IT, data analytics

done before]. You don't have to look for [the answer in spreadsheets]."

The senior manager of IT explained further: "When you're onboarding a developer to a new project, everything is [in Jira]. That's one less thing the new person has to learn about. They don't have to navigate tribal knowledge."

"[Jira Software] just kind of does things on autopilot. [There are] fewer meetings, [and we spend] less time assigning things [and reporting]. It just becomes a process."

Senior manager, IT, networking

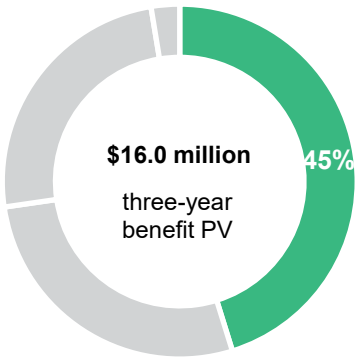
Modeling and assumptions. For the composite organization, Forrester assumes:

- In Year 1, the composite organization has 1,000 software developers. The number of software developers grows by 10% per year.
- Software developers earn a fully burdened annual salary of $110,000, and there are 2,080 working hours in a year.[2]
- Before the composite organization deploys Open DevOps, software developers spend 2 hours per day on administrative overhead — for example, communicating project statuses, updating documentation, switching between applications, reporting, and looking for the necessary information to complete tasks.[3]
- As the organization deploys Open DevOps, the time that developers spend on administrative overhead decreases. Each year, the organization automates more routine tasks and integrates more applications into its toolchains.
- Developers capture and productively use 50% of the time they save.

Risks. This benefit will vary based on:

- **Employee salaries.** Technology employee salaries vary widely based on a number of factors such as experience, region, etc.
- **Investment in the solution.** Organizations that spend more time integrating their tools with Jira Software as well as automating routine tasks will see greater benefits.
- **Agile and DevOps maturity.** Organizations with more mature agile and DevOps practices may find it easier to standardize processes and tooling and automate tasks.
- **Cloud versus on-premises deployments.** Jira Software Cloud offers significantly more features supporting Open DevOps than Jira Software Data Center offers. Forrester assumes that the composite organization has a Jira Software Cloud deployment. Benefits for organizations using Jira Software Data Center may be lower.

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 $16 million.



Software Developer Productivity					
Ref.	**Metric**	**Source**	**Year 1**	**Year 2**	**Year 3**
A1	Software developers	Assumption	1,000	1,100	1,210
A2	Software developer fully burdened hourly rate	US Bureau of Labor Statistics	$53	$53	$53
A3	Hours per day spent on administrative overhead before Open DevOps	Forrester research	2.00	2.00	2.00
A4	Hours per day spent on administrative overhead after Open DevOps	Interviews	1.50	1.00	0.50
A5	Percentage captured	Assumption	50%	50%	50%
At	Software developer productivity	A1*A2*(A3-A4)* 260*A5	$3,445,000	$7,579,000	$12,505,350
	Risk adjustment	↓15%			
Atr	Software developer productivity (risk-adjusted)		$2,928,250	$6,442,150	$10,629,548
	Three-year total: $19,999,948		**Three-year present value: $15,972,273**		

IT SPECIALIST PRODUCTIVITY

Evidence and data. Interviewees reported that IT staff productivity also increased as their organizations began using Open DevOps. Time savings varied by organization and by role, but examples reported by the interviewees included:

- A help desk bot integrated with an organization's Jira Software and Confluence instances as well as its internal chat software deflected 3,800 IT support tickets during its first month of operation. The interviewee estimated that this integration saved 50% of IT support staff's time.
- Automated documentation in Atlassian Confluence saved 40% of business analysts' time.
- At one organization, IT leadership realized 10% overall time savings (half a day per week) as they connected toolchains and automated data collection and reporting with Jira Software.
- At one organization, standardizing processes with Jira Software reduced the time IT leadership spent managing tickets by 75% (from 1 to 2 hours per day down to 15 minutes per day).

One organization had deployed hundreds of integrations and automations with Jira Software Cloud. The senior manager of IT in the data analytics industry estimated that each integration or automation might save between a few minutes to a few hours every time it was run. However, over the organization's 10,000 Jira Software users, the savings in aggregate were significant. "We think these are small [tasks], but [automating them] adds up to massive [benefits] at scale. … [Now], people are actively seeking out parts of their jobs that they can [automate]."

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

- In Year 1, the composite organization has 3,000 IT team members who are not software

developers. These IT specialists support internal technology operations as well as external customers. The number of IT specialists grows by 10% each year.

- IT specialists earn a fully burdened annual salary of $90,000 on average — some may earn much more and some may earn less — and there are 2,080 working hours in a year.[4]
- Before the composite organization uses Open DevOps, the IT specialists spent an average of 1 hour per day on administrative overhead. Such tasks might include triaging and managing help desk tickets, responding to help desk tickets, resetting passwords, etc.
- As the organization deploys Open DevOps, the time that IT specialists spend on these tasks declines. Each year, the composite organization automates more routine tasks and integrates more applications into its toolchains.
- IT specialists capture and use 25% of the time they save productively. (IT specialists save relatively less time than developers, and it is harder to use the smaller blocks of time productively.)

Risks. This benefit will vary based on:

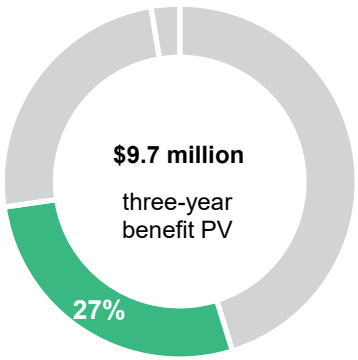
- **Employee salaries.** Technology employee salaries vary widely based on a number of factors such as experience level, region, etc.
- **Investment in the solution.** Organizations that spend more time integrating their tools with Open DevOps as well as automating routine tasks will see greater benefits.
- **Agile and DevOps maturity.** Organizations with more mature agile and DevOps practices may find it easier to standardize processes and tooling as well as automate tasks.
- **Cloud versus on-premises deployments.** Jira Software Cloud offers significantly more features supporting Open DevOps than Jira Software

Voice Of The Customer

"It's so important to make sure we have those [integrations] running all the time. [Each saves] hundreds of hours — there's no doubt about that."
Senior manager, IT, data analytics

People have seen that [using Open DevOps] helps them do their jobs. [We've automated] away the boring stuff so that they can get to the [fun] stuff. … Our team has won several [companywide] awards [since we started using Open DevOps]."
Senior manager, IT, data analytics

"We've taken a software [development] approach and [with Jira Software] applied that approach directly to IT ops."
Senior manager, IT, data analytics



Data Center does. Forrester assumes that the composite organization has a Jira Software Cloud deployment. Benefits for organizations using Jira Software Data Center may be lower.

Results. To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year, risk-adjusted total PV of $9.7 million.

IT Specialist Productivity

Ref.	Metric	Source	Year 1	Year 2	Year 3
B1	IT specialists	Assumption	3,000	3,300	3,630
B2	IT specialist fully burdened hourly rate	US Bureau of Labor Statistics	$43	$43	$43
B3	Hours per day spent on administrative overhead before Open DevOps	Interviews	1.00	1.00	1.00
B4	Hours per day spent on administrative overhead after Open DevOps	Interviews	0.75	0.50	0.25
B5	Percentage captured	Assumption	25%	25%	25%
Bt	IT specialist productivity	B1*B2*(B3-B4)*260*B5	$2,096,250	$4,611,750	$7,609,388
	Risk adjustment	↓15%			
Btr	IT specialist productivity (risk-adjusted)		$1,781,813	$3,919,988	$6,467,979
	Three-year total: $12,169,779			**Three-year present value: $9,718,977**	

SOFTWARE LICENSING COST SAVINGS

Evidence and data. Interviewees reported that using Open DevOps helped them curb tool proliferation and reduce both software licensing costs and the time previously spent supporting the tools they retired. Several organizations realized additional savings by migrating from on-premises Jira Software Data Center deployments to Jira Software Cloud. The interviewees reported the following experiences:

- **Elimination of shadow IT.** One organization found that it had four times more software licenses than it actually needed. The senior manager of IT explained: “We had a problem with shadow IT, and we didn’t know who was using [which tools]. … We had purchased licenses [for the entire company] for tools that did the exact same thing. [By retiring those tools], we’ve wiped line items out of the budget.”
- **Avoided administrative costs.** One organization consolidated multiple Jira Software instances and eliminated roughly 45% of its Jira Marketplace apps — they were redundant. The organization also reported saving four to five FTEs in on-premises infrastructure maintenance costs by using Jira Software Cloud.

Reduction in software licensing costs per employee:

30%

"[Jira Software is] flexible enough that you can [use the tools] you want [to use and still] connect into our pipelines and testing processes. … Tool proliferation [ended naturally] because people saw that they could do their jobs better if [they used our centralized toolchains]."

Senior manager, IT, data analytics

- **Cloud offered additional cost savings over on-premises deployments.**
  - The head of IT in the finance industry reported 20% total cost savings after their organization migrated to Jira Software Cloud. The savings came from consolidating Jira Software instances as well as no longer having to pay a third party to maintain on-premises infrastructure.
  - The senior manager of IT in data analytics explained: "Jira Software is a SaaS product, and Atlassian has hundreds of engineers whose sole focus is to improve processes of software delivery. Why would you want to use [a spreadsheet]? [By migrating to Cloud, we're] leveraging Atlassian's R&D. They speak to far more [IT] customers than I ever will."
- **Flexibility in addition to standardization.** The senior manager of IT in data analytics explained: "[Because Jira Software is] open to integrations, we don't have to blindside people by forcing them to switch [tools], especially if they [think that doing so] will hurt their productivity. … We haven't had to actually tell anyone to switch [tools]. People see that it's better to be with the [group and use the same tools as everyone else], and that's great for me."

For examples, the product managers at the organization switched to using Jira Software's Advanced Roadmaps organically. Although Advanced Roadmaps did not have all of the features of the organization's old roadmapping software, it was more collaborative. The organization eventually retired the old roadmapping software and avoided its $500,000 annual licensing costs.

The senior manager of IT reported that software licensing costs per employee used to be roughly $2,000 annually. At the time of the interview, that figure was 25% lower, and the senior manager of IT expected it to drop by 50% as the organization continued to implement Open DevOps.

"There are simply things that can be done in [Jira Software] Cloud that can't be done [in Jira Software] on-prem. … To get [faster] deliveries, you need to integrate with other tools [in the cloud]."

Senior manager, IT, data analytics

Modeling and assumptions. Forrester assumes:

- The composite organization spends 2% of annual revenue on software for its employees.[5]
- In Year 1, the composite organization reduces software licensing costs per employee by 10%. As the composite organization deploys Open

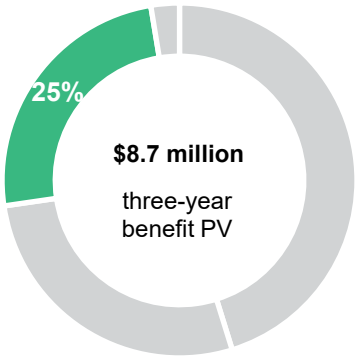
DevOps, it consolidates Jira instances, identifies and retires redundant tooling, reduces shadow IT, and curbs tool proliferation.

- The composite organization reduces software licensing costs by 20% in Year 2 and by 30% in Year 3. Implementing Open DevOps more widely enables the composite organization further to consolidate and standardize tooling.

Risks. This benefit will vary based on:

- **Extent of tool proliferation and shadow IT before the investment.** Organizations with software spending levels above industry benchmarks may be able to consolidate their software licensing costs further.
- **Investment in the solution.** Organizations that spend more time integrating their tools with Jira Software as well as automating routine tasks will see greater benefits.
- **Cloud versus on-premises deployments.** Jira Software Cloud offers significantly more features supporting Open DevOps than Jira Software Data Center does. Forrester assumes that the composite organization has a Jira Software Cloud deployment. Benefits for organizations using Jira Software Data Center may be lower.

Results. To account for these risks, Forrester adjusted this benefit downward by 20%, yielding a three-year, risk-adjusted total PV of $8.7 million.



Software Licensing Cost Savings

Ref.	Metric	Source	Year 1	Year 2	Year 3
C1	Software spending before Jira Software for DevOps	Assumption	$20,000,000	$22,000,000	$24,200,000
C2	Employees (total)	Assumption	10,000	11,000	12,100
C3	Software spending per employee before Open DevOps	C1/C2	$2,000	$2,000	$2,000
C4	Reduction in software spending per employee after Open DevOps	Interviews	10%	20%	30%
C5	Software spending per employee after Open DevOps	C3*(1-C4)	$1,800	$1,600	$1,400
Ct	Software licensing cost savings	(C3-C5)*C2	$2,000,000	$4,400,000	$7,260,000
	Risk adjustment	↓20%			
Ctr	Software licensing cost savings (risk-adjusted)		$1,600,000	$3,520,000	$5,808,000
	Three-year total: $10,928,000			**Three-year present value: $8,727,273**	

BENEFITS FROM SDLC IMPROVEMENTS AFTER OPEN DEVOPS

Evidence and data. Interviewees said that using Open DevOps accelerated their organizations' adoption of agile and DevOps practices. Several of the organizations had embarked on multiyear efforts to improve their software delivery processes. During those periods, they used Open DevOps to:

- Standardize processes across teams.
- Improve code quality by integrating Jira Software with third-party applications, e.g., to analyze code, automate testing, etc.
- Track and then improve key metrics related to their software delivery lifecycles (SDLCs).

According to the interviewees, the tooling changes facilitated process changes.

- **Increased deployment frequencies.** The senior project manager in retail explained their organization's experience: "We [used to] have a lot of traditional processes. … [They were] pretty complicated and cumbersome and lengthy. [But] now [we are] adapting and adhering to standardized, agile ways of working. [We are] defining those big, big releases into very small incremental batches. … We have some teams that deploy several times a day, especially the ones that support our customer-facing apps. They have really rapid deployment times. [As a developer], you can release features yourself very frequently."
- **Higher code quality.** Interviewees attributed this partly to process changes (e.g., from waterfall to agile) and partly to multiple integrations with Jira Software that enabled them to automate testing.
    - The business designer in finance reported that incidents at the organization were down by 10%. He explained: "There is now a common view of the work to be done, including testing. … What I love is that we're using Test Manager for Jira [an integration] … and I get a test plan and outcomes report every single sprint."
    - The senior project manager in retail also reported that incidents at their organization were down by 10%. They explained: "We use automation [in Jira Software] to kick off testing [in a third-party app]. … There are significant time savings, but [we've also improved] stability and quality. … [We test more than we] did in the past." The organization now uses Jira Software to automatically run 4,000 to 5,000 test scripts before every deployment.
    - The senior manager of IT in data analytics reported that incidents for one service line were down by 40%. They explained: "[That] pipeline has all been automated, so now we have constant delivery for those systems. Once the approvals are given in Jira, [the changes] deploy, and then any [issues] get reported back and dealt with." They added: "Our security teams can now get reliable metrics about bugs, issues, and defects. If they've identified something, they can see in the pipeline when it's going to be rectified."

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

- A typical successful technology project is worth $1 million in revenue over the course of a year.
- Before using Open DevOps, the composite organization typically completes technology projects in two major releases — a typical waterfall timeline.
- In addition, releases have impaired quality — either major or minor issues — 20% of the time.

Voice Of The Customer

"We [no longer] have a fixed delivery schedule of every six months. [Now, we deliver] every week."
Senior manager, IT, data analytics

"Code quality is absolutely through the roof. Testing has gone from mostly manual to automated."
Senior manager, IT, data analytics

"The quality of our work rapidly improved."
Business designer, finance

"We definitely see fewer [incidents] related to the code … itself."
Senior project manager, retail

"We've removed silos and massively increased the iteration pace."
Head of IT, finance

"Jira made it so easy to [go] agile … because it's so structured. It was a good way of transitioning us into [agile]."
Senior manager, IT, networking

"I want to build as fast as we can. That is better for customers, and it's better for [our business]."
Senior manager, IT, data analytics

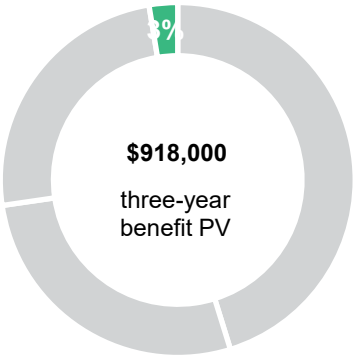
"[Besides] being faster, releases are more stable and reliable … because we're releasing in smaller batches."
Senior project manager, retail

- As a result, before using Open DevOps, the composite organization only successfully completes 80% of its technology projects each year.
- Using Open DevOps, however, helps the composite organization adopt an agile release schedule: In Year 1, the organization deploys quarterly; in Year 2, monthly; and in Year 3, biweekly.
- In addition, using Open DevOps helps the composite organization improve code quality by 10% each year.
- Thus, the composite organization transitions from large, infrequent, and low-quality releases to incremental, frequent, and high-quality releases.
- By changing its processes in this way, the composite organization successfully completes more technology projects than before.
- The incremental revenue from the additional technology projects is credited as a benefit after applying an operating margin of 10%.[6]

Risks. This benefit will vary based on:

- **Agile and DevOps maturity.** The interviewees reported that using Open DevOps facilitated and accelerated the adoption of agile and DevOps at their organizations. However, the extent of this benefit will depend on an organization's existing maturity as well as the speed and success with which the organization transforms.
- **Revenue generated by a successful technology project.** Revenue generated by a successful technology project as well as operating margin will vary by organization and by industry (e.g., the revenue may be higher for companies in the software industry).

Results. To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year, risk-adjusted total PV of $918,000.



Benefits From SDLC Improvements After Open DevOps

Ref.	Metric	Source	Year 1	Year 2	Year 3
D1	Revenue from a technology project completed without impaired quality	Assumption	$1,000,000	$1,000,000	$1,000,000
D2	Technology projects per year	Assumption	100	110	121
D3	Before Open DevOps: releases per technology project	Interviews	2	2	2
D4	Before Open DevOps: percentage of releases with impaired quality	Assumption	20.00%	20.00%	20.00%
D5	Before Open DevOps: releases without impaired quality	D2*D3*(1-D4)	160	176	194
D6	Before Open DevOps: technology projects completed without impaired quality	D5/D3	80	88	97
D7	Subtotal: before Open DevOps, revenue from technology projects	D1*D6	$80,000,000	$88,000,000	$96,800,000
D8	After Open DevOps: releases per technology project	Interviews	4	12	26
D9	After Open DevOps: percentage of releases with impaired quality	Interviews	18.00%	16.20%	14.58%
D10	After Open DevOps: releases without impaired quality	D2*D8*(1-D9)	328	1,106	2,687
D11	After Open DevOps: technology projects completed without impaired quality	D10/D8	82	92	103
D12	Subtotal: after Open DevOps, revenue from technology projects	D1*D11	$82,000,000	$92,180,000	$103,358,200
D13	Incremental revenue from SDLC improvements after Open DevOps	D12-D7	$2,000,000	$4,180,000	$6,558,200
D14	Operating margin	Assumption	10.00%	10.00%	10.00%
Dt	Benefits from SDLC improvements after Open DevOps	D13*D14	$200,000	$418,000	$655,820
	Risk adjustment	↓10%			
Dtr	Benefits from SDLC improvements after Open DevOps (risk-adjusted)		$180,000	$376,200	$590,238
	Three-year total: $1,146,438			**Three-year present value: $918,000**	

"[Jira Software gives people] the capability to see the full picture, see how they're contributing to an outcome, and see how that outcome is contributing to [the business]."

Head of IT, finance

UNQUANTIFIED BENEFITS

Additional benefits that customers experienced but were not able to quantify include:

- **The democratization of work.** Open DevOps improved collaboration while enhancing visibility and insight into the work being conducted within the interviewees' organizations. This created a cultural shift in how these organizations handle work and empowered users to understand and take responsibility for their contributions to the end result. The business designer at a finance organization described the value of having a clear view into the ownership of work: "Previously, we used multiple tools focused on project management, and work visibility would suffer because there was a disconnect between the people doing the work and the people reporting it. But with Jira, everyone is on one platform with a single source of truth, and it's clear to everyone who is doing which tasks and where we are in a specific project. It improves accountability." The solution's degree of structure makes it easier to democratize work and figure out who is doing what and what needs to be done next to bring an outcome to fruition.
- **Improved developer morale.** Open DevOps improved job satisfaction among developers. Developers appreciated not only the benefits of improved visibility and collaboration but also the consistency the solution added to business processes across the organization. This instilled trust and confidence in business processes, something that was previously lacking. The senior manager of IT at a data analytics organization stated: "There's peace of mind with a consistent process. Our developers can trust that everything is in good manner. It makes our jobs easier. And with that, we can move and adapt faster and have better-quality outcomes."

  The ability to automate low-value tasks further enhanced employee experience. The senior manager of networking at an IT organization explained: "Developers are happy. There's no noise about why they have to do something, because they are now solely focused on their actual job of programming. And they can track everything in one place. Jira is really made for developers."

"Atlassian has some new features and functionality coming that could help further improve efficiencies for our IT teams. We're really looking forward to adopting them."

Senior project manager, retail

FLEXIBILITY

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

- **Extending and expanding value.** Interviewees' organizations were looking forward to further reconciling legacy solutions and standardizing on Jira while continuing to adopt agile DevOps

practices. They also hope to expand their toolset by trying out or further deploying other products and features within the Atlassian marketplace, such as advanced roadmaps, the insights panel, and the numerous offered plug-ins.

  - The senior manager of IT at a data analytics company said, "We have plans six months out on what new Atlassian features and functionality we want to implement, and we're all excited to put them in our pipeline."
  - Regarding the Insights panel, the business designer at a finance organization mentioned: "Its ability to report the behaviors of our workflows is very powerful in terms of helping us identify real areas of improvement. It's an extremely useful tool."

- **Integrating more existing tools into Open DevOps.** The senior project manager at a retail company said, "Integrating our vital platforms into Jira would just continue to make things easier for our developers and make them more productive by looking at everything through a single queue." A decision-maker from a finance organization shared this sentiment. The head of IT stated: "We've started to have conversations about the integration between Jira and associated DevOps toolsets; we're just not there yet. But we're definitely going to start doing experiments in the not-too-distant future."

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

"When you're looking for a tool, you want a tool that is not a point solution. And that's what makes Jira so compelling for software developers — it's not a point solution. It gives you that elongated pipeline for DevOps, so people stay in the same environment."

Senior manager, IT, networking

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**
Etr	Jira Software licensing fees	$485,100	$485,100	$541,200	$597,300	$2,108,700	$1,822,133
Ftr	Open DevOps deployment and implementation	$197,800	$222,525	$24,725	$24,725	$469,775	$439,106
Gtr	Training	$0	$5,078,400	$507,840	$558,624	$6,144,864	$5,456,132
	Total costs (risk-adjusted)	$682,900	$5,786,025	$1,073,765	$1,180,649	$8,723,339	$7,717,371

JIRA SOFTWARE LICENSING FEES

Evidence and data. In general, Jira Software licensing fees are based on the number of users, features, and Jira Software instances/sites an organization requires. Most of the organizations that participated in this study had multiple Jira Software instances (although they frequently consolidated instances as they began implementing Open DevOps). Some features necessary to develop an Open DevOps solution are only available at the higher tiers, and some organizations paid licensing fees to third parties for integrations providing additional features. Finally, Jira Software Cloud fees differ from the fees for on-premises deployments of Jira Software. Jira Software pricing is public and available on Atlassian's website.

Modeling and assumptions. Forrester assumes:

- The composite organization purchases Jira Software licenses to support all technology employees (software developers and IT specialists).
- The composite organization has several preexisting Jira Software instances before it begins to standardize.
- The composite organization uses Jira Software Cloud and not Jira Software Data Center. Jira Software Cloud offers more features to support an Open DevOps solution than on-premises Jira Software.
- The composite organization invests in Jira Software at the highest tier.

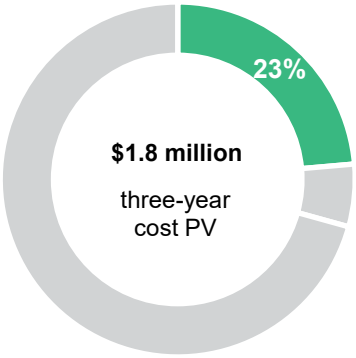
> **"We spend [a couple] million [dollars] per year on licensing, but there's no question that's valuable because [we're] supporting a [several hundred] million-[dollar] business. There are no concerns about that one." … Everyone can see that this is the right call for us."**
>
> *Senior manager, IT, data analytics*

Risks. This cost will vary based on:

- Organization size — i.e., the number of Jira Software licenses an organization requires.

- Costs for third-party apps and integrations. Organizations may wish to license third-party software to fully customize Jira Software to their specific DevOps needs.

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 $1.8 million.



Jira Software Licensing Fees

Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
E1	Jira Software users	A1+B1	4,000	4,000	4,400	4,840
E2	Corresponding licensing fees for Jira Software (Cloud Enterprise)	Assumption	$441,000	$441,000	$492,000	$543,000
Et	Jira Software licensing fees	E2	$441,000	$441,000	$492,000	$543,000
	Risk adjustment	↑10%				
Etr	Jira Software licensing fees (risk-adjusted)		$485,100	$485,100	$541,200	$597,300
	Three-year total: $2,108,700			**Three-year present value: $1,822,133**		

OPEN DEVOPS DEPLOYMENT AND IMPLEMENTATION

Evidence and data. Interviewees said that initially implementing Open DevOps was a one-time, multimonth project for a handful of IT specialists. Depending on their circumstances, the organizations migrated from other issue trackers; reconciled legacy Jira Software instances; integrated tooling; retired redundant tooling; and frequently migrated from Jira Software Data Center to Jira Software Cloud.

After this initial deployment work, the organizations also spent several months configuring Open DevOps. Again, a small team of IT specialists integrated tooling into connected pipelines; automated common

"[Atlassian] was really supportive when we started moving into execution. From [when we began] all the way up until we formally close[d] the project, they have been there."

Senior project manager, retail

tasks; and generally tested and improved their Open DevOps configurations. “After you do your migration, there are about six to eight months of optimization,” said the senior manager of IT in data analytics.

The interviewees said designing their Open DevOps systems was harder than the actual integration work. The senior project manager in retail said: “[Open DevOps] was really pretty straightforward to set up. [We spent] hardly any effort integrating all [our tools].” The senior manager of IT in data analytics also reported that automating a task with Open DevOps usually took one person two to three days (accounting for both development and testing).

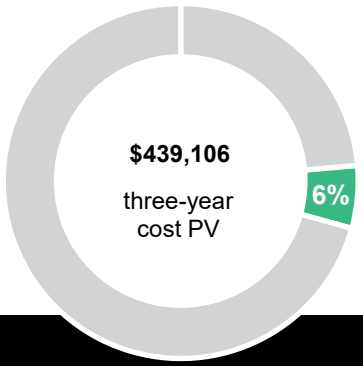
Modeling and assumptions. For the composite organization, Forrester assumes:

- A small team of IT specialists handle the deployment and implementation of Open DevOps.
- The initial deployment of Open DevOps takes about 4,000 hours total: A deployment team with five members will complete the work in about five months. This is time spent reconciling legacy systems, etc.
- Further implementation of Open DevOps takes around 4,500 hours in Year 1: An implementation team with five members will complete the work in five to six months. This is time spent integrating tooling and developing the first automations.
- Further configuration and optimization of Open DevOps takes 500 hours total in Year 2 and Year 3: three to four IT specialists might each spend about one month in these years developing automations and further improving the solution.

Risks. This cost will vary based on:

- **Legacy IT.** Organizations with more IT sprawl might expect to devote more resources to standardizing on Jira Software.
- **Cloud versus on-premises deployments.** Migrating from Jira Software Data Center to Jira Software Cloud could take additional resources.

Results. To account for these risks, Forrester adjusted this cost upward by 15%, yielding a three-year, risk-adjusted total PV of $439,000.



Open DevOps Deployment And Implementation

Ref.	Metric	Source	Initial	Year 1	Year 2	Year 3
F1	Hours deploying and migrating to Open DevOps	Interviews	4,000	0	0	0
F2	Hours implementing Open DevOps	Interviews	0	4,500	500	500
F3	IT specialist fully burdened hourly rate	B2	$43	$43	$43	$43
Ft	Open DevOps deployment and implementation	(F1+F2)*F3	$172,000	$193,500	$21,500	$21,500
	Risk adjustment	↑15%				
Ftr	Open DevOps deployment and implementation (risk-adjusted)		$197,800	$222,525	$24,725	$24,725
	Three-year total: $469,775			**Three-year present value: $439,106**		

TRAINING

Evidence and data. Interviewees said that training employees on the Jira Software and Open DevOps tooling was relatively minor. However, the organizations did make substantial investments to upskill employees and train them on new processes.

- The head of IT in finance said: "We've had to go through a profound cultural change; we're in the process of changing still. … [We've had] quite an extensive program of training and development to move from waterfall to agile, [all] supported by the tooling [(Open DevOps)]."
- The senior manager of IT in networking said: "There's a [misconception] that Jira is difficult [to use]. … You have to kind of ease [people] out of that. If I show [someone a process], they'll [usually] say, 'Oh, that it's it? That's all I have to do? I've got this.'"
- The senior manager of IT in data analytics said: "[Using Open DevOps] has changed how I recruit my team. [I now hire] people who can think [in] more advanced [ways] — who can look for automations and think about integrations. [And] the people [who were on my team before] have had professional growth."

"[Jira Software Cloud] is much more modern, much more responsive. [At first,] our own staff [said], 'Okay, this is refreshing. This is a step up from before.' But then after that, [they said], 'We can do things we couldn't do before.'"

Senior manager, IT, data analytics

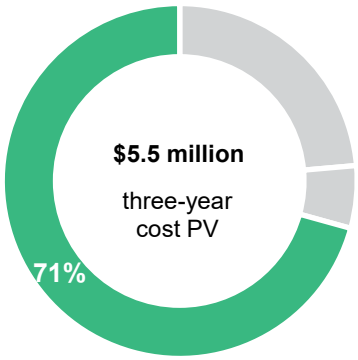
"We've utilized the same headcount to do more valuable [work]. … [Thanks to automation], we're shifting away from [doing] low-value [tasks]."

Senior manager, IT, data analytics

Modeling and assumptions. For the composite organization, Forrester assumes that all new Jira Software and Open DevOps users — both developers and IT specialists — receive a total of 24 hours of training.

Risks. This cost will vary based on agile and DevOps maturity. Organizations early on in their agile and DevOps transformations may expect to invest more in change management.

Results. To account for these risks, Forrester adjusted this cost upward by 15%, yielding a three-year, risk-adjusted total PV of $5.5 million.

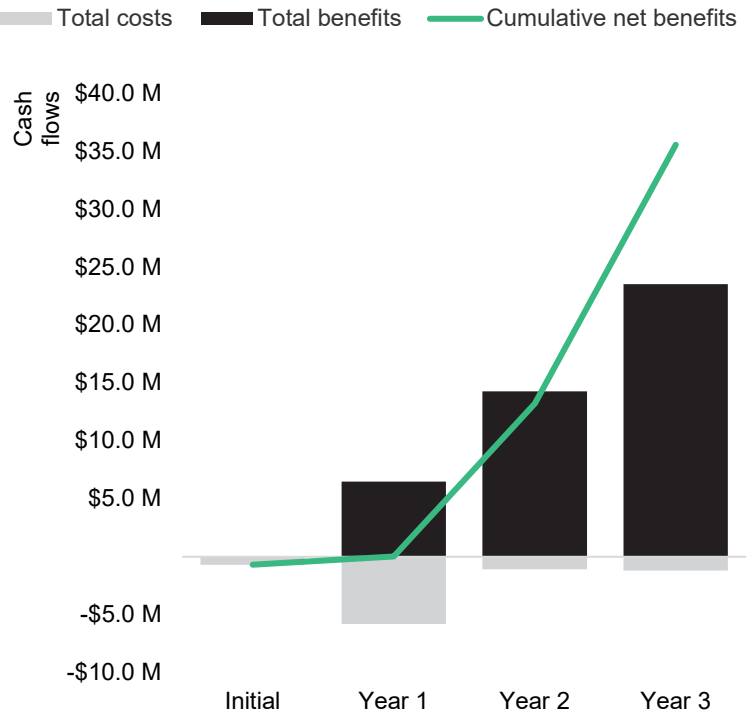


Training						
Ref.	**Metric**	**Source**	**Initial**	**Year 1**	**Year 2**	**Year 3**
G1	Jira Software users	A1+B1		4,000	4,400	4,840
G2	Users to train	$G1_t$-$G2_{t-1}$		4,000	400	440
G3	Training time per user (hours)	Interviews		24	24	24
G4	Average technology worker fully burdened hourly rate	(A1*A2+B1*B2)/G1		$46	$46	$46
Gt	Training	G2*G3*G4	$0	$4,416,000	$441,600	$485,760
	Risk adjustment	↑15%				
Gtr	Training (risk-adjusted)		$0	$5,078,400	$507,840	$558,624
	Three-year total: $6,144,864			**Three-year present value: $5,456,132**		

Financial Summary

CONSOLIDATED THREE-YEAR RISK-ADJUSTED METRICS

Cash Flow Chart (Risk-Adjusted)



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.

Cash Flow Analysis (Risk-Adjusted Estimates)

	Initial	Year 1	Year 2	Year 3	Total	Present Value
Total costs	($682,900)	($5,786,025)	($1,073,765)	($1,180,649)	($8,723,339)	($7,717,371)
Total benefits	$0	$6,490,063	$14,258,338	$23,495,765	$44,244,165	$35,336,523
Net benefits	($682,900)	$704,038	$13,184,573	$22,315,116	$35,520,826	$27,619,152
ROI						358%
Payback (months)						12

Appendix A: Total Economic Impact

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

TOTAL ECONOMIC IMPACT APPROACH

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

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

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

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

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

PRESENT VALUE (PV)

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

NET PRESENT VALUE (NPV)

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

RETURN ON INVESTMENT (ROI)

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

DISCOUNT RATE

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

PAYBACK PERIOD

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

Appendix B: Endnotes

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

[2] Source: "Software Developers, Quality Assurance Analysts, and Testers," *Occupational Outlook Handbook*, US Bureau of Labor Statistics, September 8, 2021 (https://www.bls.gov/ooh/computer-and-information-technology/software-developers.htm).

[3] Source: Forrester Analytics Global Business Technographics® Developer Survey, 2019.

[4] Source: "Network and Computer Systems Administrators," *Occupational Outlook Handbook*, US Bureau of Labor Statistics, September 8, 2021 (https://www.bls.gov/ooh/computer-and-information-technology/network-and-computer-systems-administrators.htm).

[5] Source: "US Tech Market Outlook For 2021: After The Election," Forrester Research, Inc., December 3, 2020 (https://www.forrester.com/report/US-Tech-Market-Outlook-For-2021-After-The-Election/RES162940).

[6] Source: "Margins by Sector (US)," NYU Stern School of Business, January 2021 (http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/margin.html).

FORRESTER®