Open Source Tools Are Essential For Modern Application Delivery

But They Can't Do It All: Commercial Extensions Fill The Gap

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Executive Summary

Open source application development and delivery tools provide compelling value. Developed by developers for their own use, they meet needs that commercial products often fail to fill. But they can't do it all; even the best open source tools have functional and support gaps that have created opportunities that companies offering commercial support extensions have stepped in to fill. By combining the potential of open source delivery tooling with the support of commercial extensions, developers can help their organizations create high-quality applications faster.

In May 2016, CloudBees commissioned Forrester Consulting to evaluate the current state, benefits, and challenges of using open source tools in the software delivery pipeline. Then to further explore this trend, Forrester developed a hypothesis that commercial extensions built on top of open source software development tools can fill capability gaps and increase the value of those tools.

> **Fifty-eight percent of organizations reported that open source application delivery tools played a major or significant role in their software delivery pipeline.**

In conducting in-depth surveys of 150 US application development and IT professionals responsible for software development life-cycle tools at their organizations, Forrester found that while open source tools play a significant and important role in most organizations' software delivery pipeline, they are not a magic bullet. Often they have capability gaps that must be filled, and they require significant (and costly) customization to integrate. Commercial offerings can help address these weaknesses and provide additional capabilities to add value to the open source tool.

KEY FINDINGS

Forrester's study yielded three key findings:

› **Open source application delivery tools are essential to organizational success.** Eighty-five percent of organizations reported that application delivery capability was critical or mission-critical to their organization's success, and 58% of respondents said that open source

software played a major or significant role in their software delivery pipeline.

› **Open source tools can suffer from serious security vulnerabilities.** Security is a major concern for most organizations, and open source software can leave them vulnerable to attack. Commercial support offerings can help them close these gaps quickly.

› **Commercial open source extensions fill open source functionality gaps.** Open source tools are often built with a single developer or small team in mind. Commercial extensions help organizations scale the deployment of these tools by providing advanced features and administrative capabilities that the base products lack.

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# Open Source Tools Are Essential For Application Delivery

In today's age of digital disruption, every company is a digital business, demanding fast delivery of high-quality applications that delight customers and innovate their business. Application delivery, now more than ever, is an essential component of organizational success across all industries — 85% of our survey respondents ranked application delivery as mission-critical or critical to their organization's success (see Figure 1). It is no surprise that the people at these organizations responsible for selecting software development tools understand the importance of their role in selecting tools that help their organizations speed delivery while improving quality. What may surprise people is that more often than not, that solution is open source. Our survey shows:

› **Open source tools have widespread use in app delivery.** Most organizations using open source delivery tools rely on them to play a significant role in their delivery pipeline. Fifty-eight percent of our respondents said that over half of the tools in their delivery pipeline are open source tools (see Figure 2).

› **Open source tools deliver new capabilities with both speed and quality.** Professionals responsible for selecting software development tools see open source tools as on par or even better than existing non-open source commercial offerings when it comes to delivering new capabilities with speed and quality. Fifty-five percent of survey respondents said that open source software development tools deliver new capabilities faster than commercial tools, and 52% said that open source tools deliver new capabilities that are of higher quality than commercial tools (see Figure 3).

› **Open source tools are perceived to be less costly, at least initially, and offer unique capabilities.** A majority of our survey respondents think that open source tools are less expensive (64%) and offer capabilities that are not available in commercial offerings (59%).[1] But as supported by this research, these perceptions are often based on a short-sighted view of initial purchase cost. While open source tools are free to acquire, they can still be costly to support.

FIGURE 1
App Delivery Is Critical To Organizational Success

"On a scale of 1 to 5, how critical is application delivery to the success of your organization?"
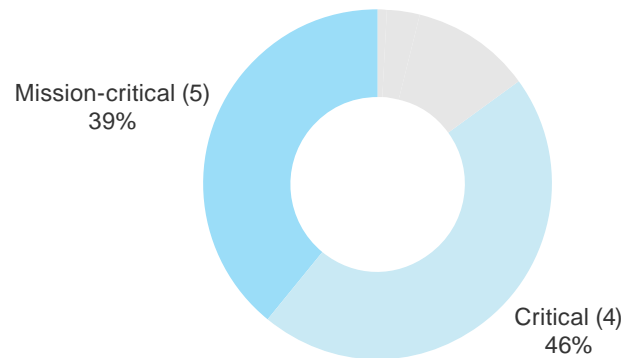
Mission-critical (5) 39%

Critical (4) 46%

Base: 150 professionals responsible for open source software development life-cycle tools purchasing/support/administration in the US

Source: A commissioned study conducted by Forrester Consulting on behalf of CloudBees, June 2016

FIGURE 2
Open Source Tools Have A Significant Role In App Delivery

"How prevalent are open source software development tools in your delivery pipeline?"

Major role — almost all or all of our tools in the delivery pipeline — 16%

Significant role — over half the tools in our delivery pipeline — 42%

Medium role — less than half the tools in our delivery pipeline — 37%

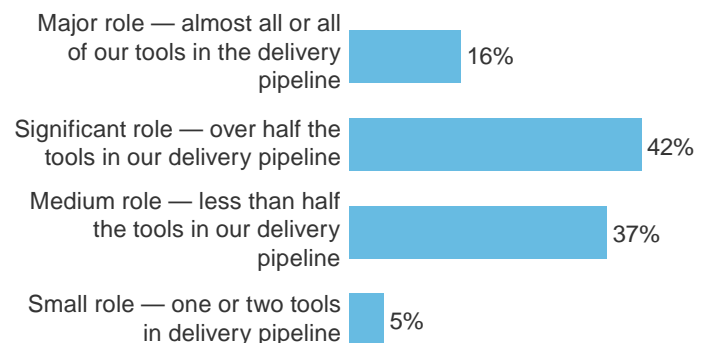Small role — one or two tools in delivery pipeline — 5%

Base: 150 professionals responsible for open source software development life-cycle tools purchasing/support/administration in the US

Source: A commissioned study conducted by Forrester Consulting on behalf of CloudBees, June 2016

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FIGURE 3

Open Source Dev Tools Deliver New Capabilities On Par With Or Better Than Commercial Tools
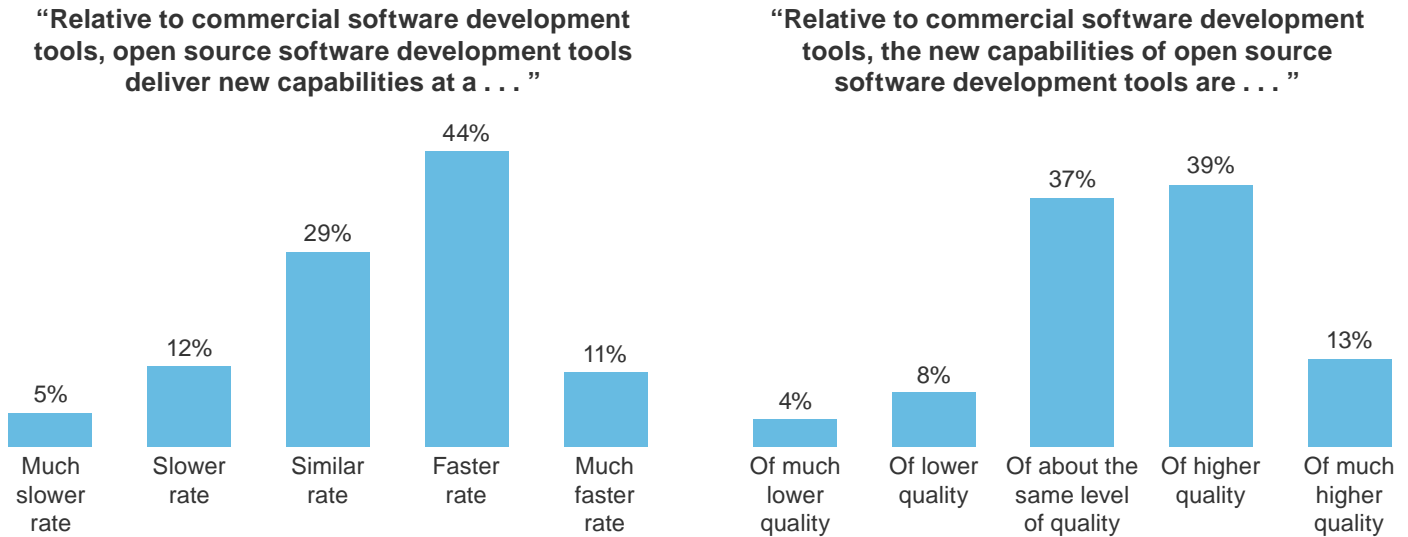
"Relative to commercial software development tools, open source software development tools deliver new capabilities at a . . . "

5%	12%	29%	44%	11%
Much slower rate	Slower rate	Similar rate	Faster rate	Much faster rate

"Relative to commercial software development tools, the new capabilities of open source software development tools are . . . "

4%	8%	37%	39%	13%
Of much lower quality	Of lower quality	Of about the same level of quality	Of higher quality	Of much higher quality

Base: 150 professionals responsible for open source software development life-cycle tools purchasing/support/administration in the US
(percentages may not total 100 because of rounding)

Source: A commissioned study conducted by Forrester Consulting on behalf of CloudBees, June 2016

Open Source Tools Are Far From Free

Open source development tools are perceived as delivering features with similar or better quality than existing commercial offerings, and at a lower cost. However, this does not mean that open source tools are without their flaws and challenges, or that every open source tool will have a low total cost of ownership (TCO) just because there is no upfront cost. While risks and costs will vary from tool to tool, organizations looking to adopt open source tools into their software delivery pipeline should be wary of the following potential pitfalls:

› **Open source security vulnerabilities.** According to our survey, security is by far the most important capability for open source software tools — 63% of survey respondents ranked it as the most important (see Figure 4). However, recent research shows that open source components are rife with vulnerabilities, many of which do not get fixed in a timely manner. There are an average of 50 security vulnerabilities found in open source software components every day, and vulnerable component dependencies are only remediated 41% of the time.[2] Because of this, respondents rated security as the open source

development software capability with which they are least satisfied. Even further, 26% of respondents feel that open source software is actually less secure than non-open source commercial development tools.[3] Organizations looking to utilize open source tools in their delivery pipeline must be aware of these potential vulnerabilities and carefully select open source software that offers the best security capabilities.

› **Required customization that can drive up TCO.** While the level of customization required varies greatly from tool to tool, 82% of our respondents indicated that at least some customization is necessary to adopt open source tooling (see Figure 5). The application delivery pipeline today is fragmented, with many different tools required as companies strive for faster delivery of high-quality software. This fragmentation means that many tool capabilities overlap, and that time and money are required to make the tools work together. This is especially true of open source tools, where it is on the tool owner to make sure the tool is customized and integrated into the software delivery pipeline. This can lead to unseen and escalating costs, and lower overall satisfaction when commercial support is not available.

› **Scaling concerns.** Many open source tools are designed for small-scale usage. As organizations grow, tool standardization and the ability to support many teams or projects become important to reduce cost and optimize efficiencies. Our survey shows that most open source software development tools are designed to improve intra-team collaboration or individual developer productivity (see Figure 6), but only 30% of tools are used to enable collaboration across multiple development teams. The No. 1 cause of latency in the app delivery pipeline is handoffs between teams, making tools that enable cross-team collaboration essential for on-time, on-budget delivery.

FIGURE 5

Customization Is Required For Most Open Source Development Tools

"What level of effort is required to adopt an open source software development tool as part of your software delivery tool set?"
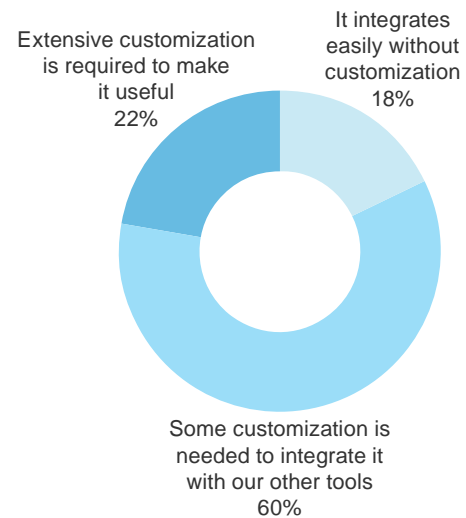
Extensive customization is required to make it useful
22%

It integrates easily without customization
18%

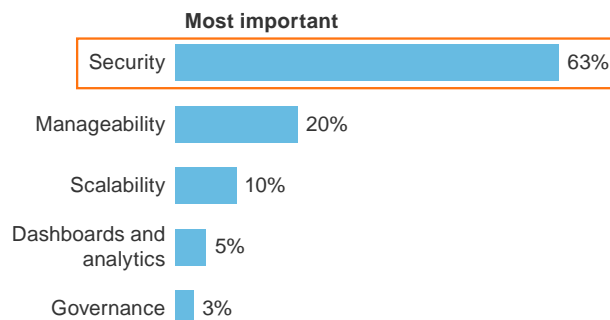Some customization is needed to integrate it with our other tools
60%

Base: 150 professionals responsible for open source software development life-cycle tools purchasing/support/administration in the US
Source: A commissioned study conducted by Forrester Consulting on behalf of CloudBees, June 2016

FIGURE 4

Organizations Are Concerned With The Security Of Open Source Development Tools — For Good Reasons

"Please rank each capability in order of importance for your open source software development tool(s)."

Most important

Security	63%
Manageability	20%
Scalability	10%
Dashboards and analytics	5%
Governance	3%

"How satisfied are you with the degree to which the open source software development tool(s) you use supports the following capabilities?"

Very satisfied

Scalability	45%
Dashboards and analytics	45%
Manageability	37%
Governance	27%
Security	19%

Base: 150 professionals responsible for open source software development life-cycle tools purchasing/support/administration in the US

(percentages may not total 100 because of rounding)

Source: A commissioned study conducted by Forrester Consulting on behalf of CloudBees, June 2016

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FIGURE 6

Most Open Source Tools Are Scaled To Improve Team Collaboration And Developer Productivity

"Please select the response that best completes the following statement: 'The value of our open source software development tool(s) improves . . .'"

The ability of delivery teams to collaborate with other teams	30%
The ability of delivery team members to collaborate with one another	56%
Individual developers' personal productivity	14%

Base: 150 professionals responsible for open source software development life-cycle tools purchasing/support/administration in the US

Source: A commissioned study conducted by Forrester Consulting on behalf of CloudBees, June 2016
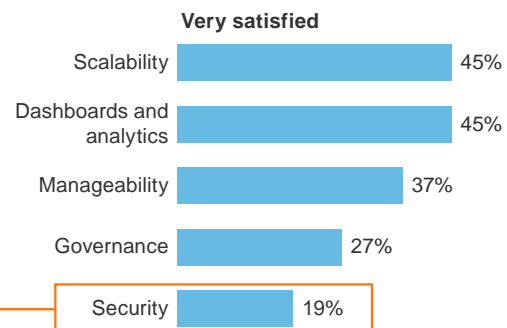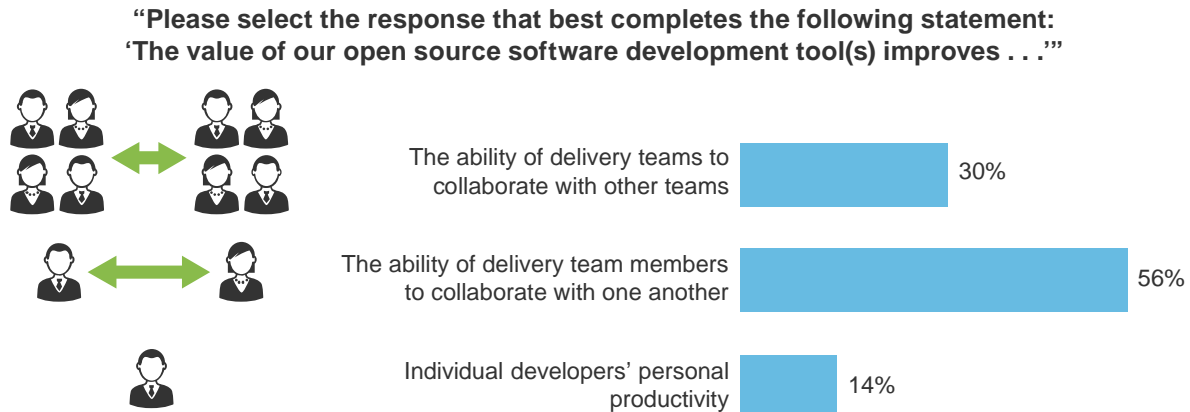
Commercial Support Helps Close Open Source Development Tool Gaps

Open source development tools play a central role in many organizations' software delivery pipelines. To close functionality and security gaps in these tools, savvy buyers leverage commercial offerings built on top of open source development tools that improve the quality and supportability of the tool. Our survey shows that a majority of respondents think that commercial offerings built on top of open source software development tools add significant value to the open source tool (see Figure 7). Commercial offerings add value for open source software development tools through:

› **Improving the quality of open source tools.** Seventy-five percent of respondents who think commercial add-ons provide value said that the commercial offering improves the quality of the open source tool, while 47% reported that commercial add-ons provide more frequent releases or patches. More frequent patching also helps to eliminate security vulnerabilities faster than the open source project can respond.

› **Providing a richer set of capabilities.** A further 59% said the commercial offering adds new features to the open source tool. Open source projects provide a great foundation, but they sometimes lack the rich features that
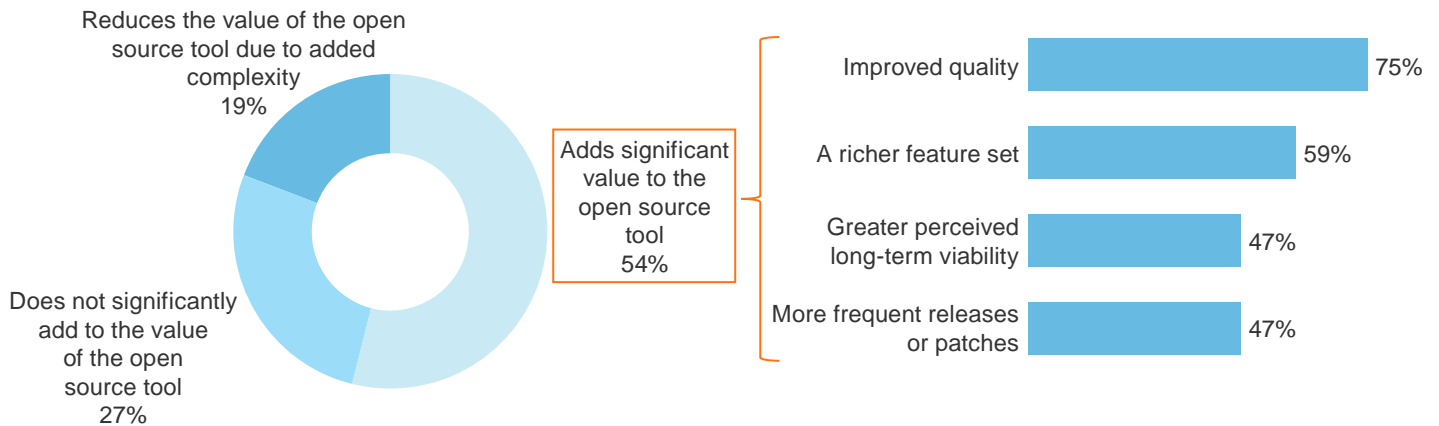
enterprises demand; commercial extensions to open source close this gap.

› **Offering additional support and training.** While most organizations are satisfied with the basic support they get from open source communities, many use professional third-party support for tough-to-answer questions or problems that require complex solutions. Seventy percent of survey respondents leverage professional support from third-party organizations, and 89% are satisfied with the support they receive.[4] Most organizations also leverage commercial offerings for open source tool training. Seventy-three percent of our respondents use training from commercial organizations; it is their No. 1 resource.

› **Providing visibility and control.** In addition to helping close the gaps that exist with the security and scalability of open source tools, commercial add-ons on top of open source solutions are helpful or very helpful for dashboards and analytics, according to 79% of survey respondents (see Figure 8). Additionally, extensions that improve manageability and governance were helpful for 69% and 70% of respondents, respectively. However, buyers need to be sure that the commercial offerings they choose address areas of concern for the open source tools they support. By doing so, organizations will maximize the value they get from their open source development tools.

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FIGURE 7

Commercial Offerings Can Add Significant Value To Open Source Development Tools

"When there is a commercial offering built on top of an open source software development tool, the commercial offering . . . "

Reduces the value of the open source tool due to added complexity
19%

Does not significantly add to the value of the open source tool
27%

Adds significant value to the open source tool
54%

"When you purchase a commercial extension to an open source tool, what value does the commercial offering add?"*

Improved quality — 75%

A richer feature set — 59%

Greater perceived long-term viability — 47%
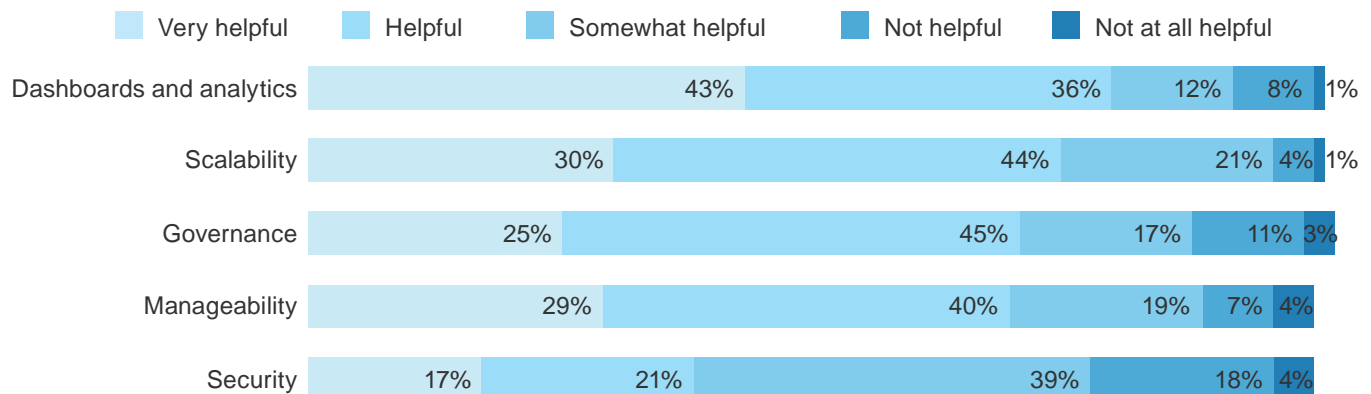
More frequent releases or patches — 47%

Base: 150 professionals responsible for open source software development life-cycle tools purchasing/support/administration in the US

*Base: 81 professionals responsible for open source software development life-cycle tools purchasing/support/administration in the US

Source: A commissioned study conducted by Forrester Consulting on behalf of CloudBees, June 2016

FIGURE 8

Commercial Offerings Address Open Source Capability Gaps With Varying Degrees Of Success

"Where there are commercial extensions for your open source software development tool(s) available, how much does that commercial extension help your enterprise requirements for each capability?"

	Very helpful	Helpful	Somewhat helpful	Not helpful	Not at all helpful
Dashboards and analytics	43%		36%	12%	8% / 1%
Scalability	30%		44%	21%	4% / 1%
Governance	25%		45%	17%	11% / 3%
Manageability	29%		40%	19%	7% / 4%
Security	17%	21%	39%	18%	4%

Base: 150 professionals responsible for open source software development life-cycle tools purchasing/support/administration in the US

(percentages may not total 100 because of rounding)

Source: A commissioned study conducted by Forrester Consulting on behalf of CloudBees, June 2016

Key Recommendations

Open source application delivery tools are popular because they meet needs unfulfilled by commercial offerings. Developers contributing to open source projects build tools that they want to use and that solve problems they uniquely understand. Despite the value they provide, the tools are often not sufficient to meet the needs of large enterprises that value security, stability, scalability, and low overall support cost. Commercial support offerings and product extensions fill these gaps. Enterprises that want to blend the best aspects of open source and commercial software should augment their application delivery tools portfolios by considering the following:

> **Ensure that your open source tools are adequately supported.** Open source projects are supported by their communities, but the responsiveness of these communities to fixing defects and security vulnerabilities can vary widely. Choosing a commercial partner for open source product support can help close the response-time gap.

> **Ensure that your open source tools provide the features that you need.** Open source tools often have a single-developer or small-team focus; they work fine in smaller contexts but can lack the features that large enterprises need to support a rollout at scale. Commercial offerings can ease administrative burdens and provide multiproject and large program support that the base open source software lacks.

> **Ensure that your open source tools integrate well with the rest of your tool chain.** No single tool in a modern application delivery organization's pipeline can do it all, so solid, stable integrations between tools are essential for success. Commercial offerings can fill this gap by delivering reliable integrations between tools that are up to date with the latest versions.
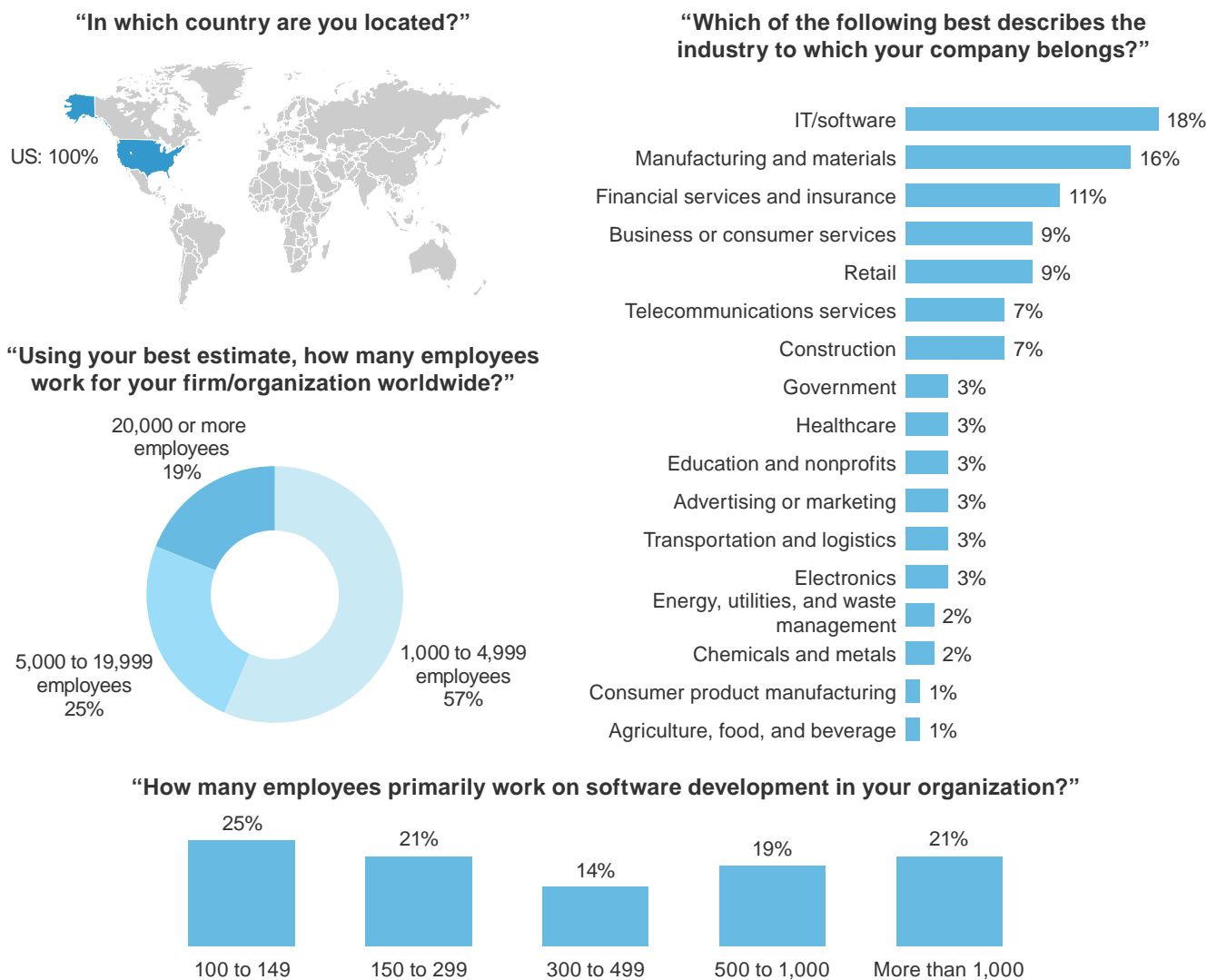
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Appendix A: Methodology

In this study, Forrester conducted an online survey of 150 organizations using open source software development life-cycle tools in the US to evaluate the current state, benefits, and challenges of using open source tools in the software delivery pipeline. Survey participants included application development and IT decision-makers responsible for software development life-cycle tools purchasing, support, or administration. The study began in May 2016 and was completed in June 2016.

Appendix B: Demographics/Data

FIGURE 9

Survey Firmographics

"In which country are you located?"

US: 100%

"Which of the following best describes the industry to which your company belongs?"

Industry	%
IT/software	18%
Manufacturing and materials	16%
Financial services and insurance	11%
Business or consumer services	9%
Retail	9%
Telecommunications services	7%
Construction	7%
Government	3%
Healthcare	3%
Education and nonprofits	3%
Advertising or marketing	3%
Transportation and logistics	3%
Electronics	3%
Energy, utilities, and waste management	2%
Chemicals and metals	2%
Consumer product manufacturing	1%
Agriculture, food, and beverage	1%

"Using your best estimate, how many employees work for your firm/organization worldwide?"

- 20,000 or more employees: 19%
- 5,000 to 19,999 employees: 25%
- 1,000 to 4,999 employees: 57%

"How many employees primarily work on software development in your organization?"

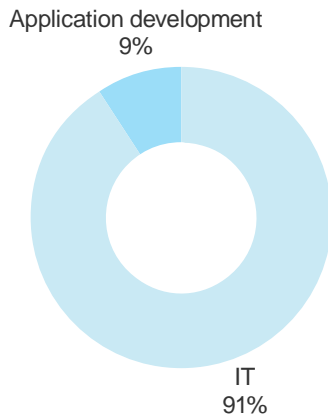| 100 to 149	150 to 299	300 to 499	500 to 1,000	More than 1,000
25%	21%	14%	19%	21%

Base: 150 professionals responsible for open source software development life-cycle tools purchasing/support/administration in the US

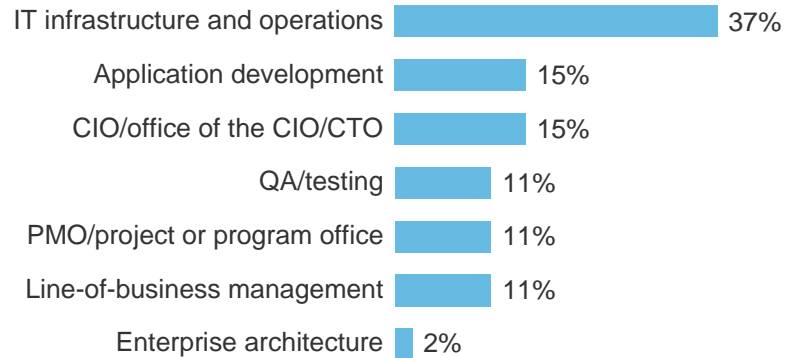(percentages may not total 100 because of rounding)

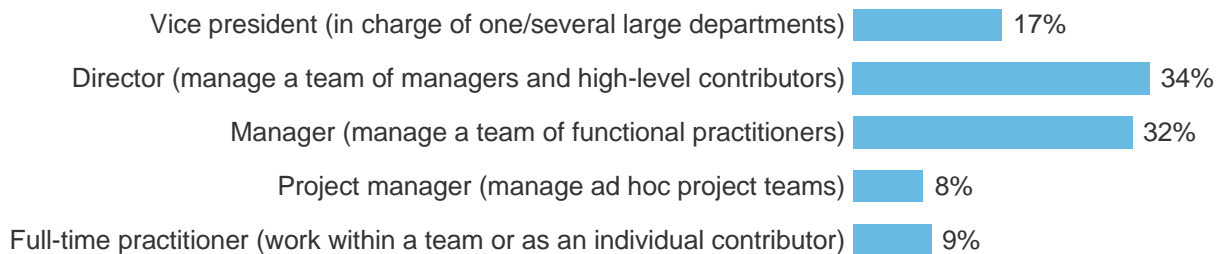Source: A commissioned study conducted by Forrester Consulting on behalf of CloudBees, June 2016

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FIGURE 10
Survey Demographics

"Which of the following best describes your current position/department?"

Application development
9%

IT
91%

"Which of the following most closely describes your job function?"

IT infrastructure and operations	37%
Application development	15%
CIO/office of the CIO/CTO	15%
QA/testing	11%
PMO/project or program office	11%
Line-of-business management	11%
Enterprise architecture	2%

"Which title best describes your position at your organization?"

Vice president (in charge of one/several large departments)	17%
Director (manage a team of managers and high-level contributors)	34%
Manager (manage a team of functional practitioners)	32%
Project manager (manage ad hoc project teams)	8%
Full-time practitioner (work within a team or as an individual contributor)	9%

"What is your level of responsibility when it comes to selecting software development tools?"

I am the final decision-maker
27%

I have influence in the decision-making
73%
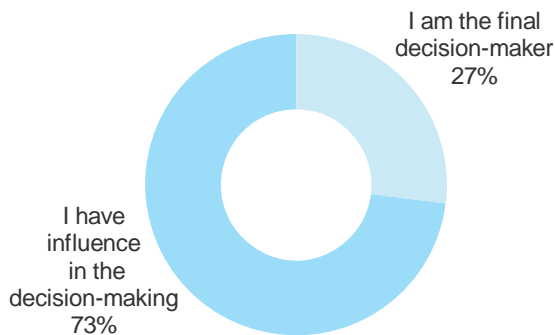
"What is your level of responsibility for supporting and/or administering tools for software development?"
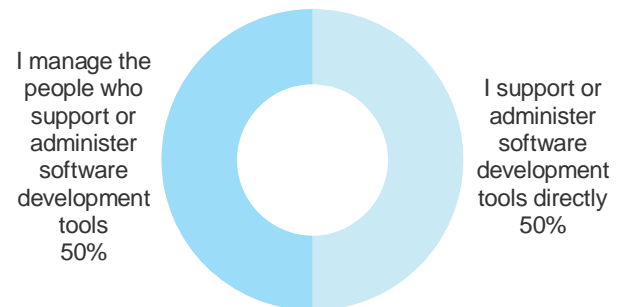
I manage the people who support or administer software development tools
50%

I support or administer software development tools directly
50%

Base: 150 professionals responsible for open source software development life-cycle tools purchasing/support/administration in the US
(percentages may not total 100 because of rounding)
Source: A commissioned study conducted by Forrester Consulting on behalf of CloudBees, June 2016

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Appendix C: Endnotes

[1] Source: A commissioned study conducted by Forrester Consulting on behalf of CloudBees, June 2016.

[2] Source: "2015 State of the Software Supply Chain Report," Sonatype, June 16, 2015

[3] Source: A commissioned study conducted by Forrester Consulting on behalf of CloudBees, June 2016.

[4] Source: A commissioned study conducted by Forrester Consulting on behalf of CloudBees, June 2016.