

A Forrester Total Economic Impact™
Study Commissioned By IBM
August 2018

The Total Economic Impact™ Of IBM UrbanCode

Scale, Velocity, and Efficiency Enabled By
IBM UrbanCode

Table Of Contents

Executive Summary	1
Key Findings	2
TEI Framework And Methodology	4
The IBM UrbanCode Customer Journey	5
Interviewed Organizations	5
Key Challenges	5
Solution Requirements	6
Key Results	6
Composite Organization	7
Analysis Of Benefits	8
IT Operations (Release Engineering) Savings	8
Faster Time-To-Market With Improved Application Development Productivity	9
Reduced Risk Of Failed Deployments	10
Unquantified Benefits	12
Flexibility	14
Analysis Of Costs	15
IBM UrbanCode License Fees	15
Hardware Fees	16
Professional Services Fees	16
Internal Implementation Costs	16
Ongoing Administration Costs	17
Financial Summary	18
IBM UrbanCode: Overview	19
Appendix A: Total Economic Impact	21
Appendix B: Supplemental Material	22
Appendix C: Endnotes	22

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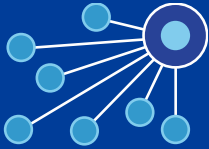
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Executive Summary

Key Benefits



IT operations resource savings
\$463K



Faster time-to-deploy:
90% reduction



Application development
productivity savings
\$3.6 million



Reduction in risk of failed
deployments
\$221K

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

To better understand the benefits, costs, and risks associated with an IBM UrbanCode implementation, Forrester interviewed six customers with several years of experience using IBM UrbanCode to support their DevOps approaches.

IBM UrbanCode includes Deploy, Velocity, Build and Release. IBM UrbanCode Deploy is a tool for automating deployments of both traditional and microservices-based applications to hybrid cloud and on-premises environments. It is designed to support Agile developers moving toward continuous delivery by facilitating rapid feedback and satisfying the compliance requirements of production support teams. Audit trails, versioned configuration, and approvals contribute to that governance. IBM UrbanCode Velocity provides tools to help organizations understand their DevOps practices, implement changes, review change impact, and automate release processes. IBM UrbanCode Release is a collaborative release management tool that helps organizations plan, execute and track a release through every stage of the delivery cycle. IBM UrbanCode Build is a continuous integration and build management server optimized for the enterprise that works in a continuous framework.

Modern digital enterprises use applications to reach and serve customers in ways that would be impossible otherwise — and application development and delivery leaders and their teams are at the center of this effort. Modern applications are critical enablers of new channels and business models, and the speed at which companies deliver new capabilities to customers has become a crucial competitive differentiator.¹

Prior to implementing IBM UrbanCode, the customers interviewed were facing scalability, delivery speed, and application stability issues. These organizations wanted to drive scale and velocity by implementing standardized, repeatable processes to significantly decrease the effort required to deploy an application. With IBM UrbanCode, customers accelerated time-to-market for new features and services, improved deployment times, reduced deployment complexity, increased transparency into the release process, reduced the risk of failed deployments, implemented DevOps on an enterprise scale, and reduced the cost to deploy.

Based on the interviews, Forrester constructed a TEI framework, a composite company, and an associated ROI analysis that illustrates the areas financially affected. The composite organization is representative of the six companies that Forrester interviewed.



ROI
522%



Benefits PV
\$4.3 million



NPV
\$3.6 million



Payback
Less than 6 months

Key Findings

Quantified benefits. The following risk-adjusted present value (PV) quantified benefits are representative of those experienced by the companies interviewed:

- › **IT operations resource savings.** With the improved efficiency enabled by deployment automation and audit resource savings through IBM UrbanCode, IT DevOps automation teams saved at least one-third of their allocated resource headcount. The composite organization realized \$463,366 in IT operations engineering savings due to IBM UrbanCode over the three-year analysis.
- › **Faster time-to-market with improved application development productivity.** Organizations also increased speed-to-market for new features, products, and services as their teams reduced development cycle times with reported reductions ranging from 15% to 90%. The composite organization's application developers saved 8 hours a week or saw at least a 20% improvement due to deployment automation and faster time-to-deploy with IBM UrbanCode. These faster time-to-market savings with improved application development team productivity represent approximately \$3.6 million in savings over three years.
- › **Reduction in risk of failed deployments.** With the increased consistency and transparency in the release deployment process enabled by IBM UrbanCode, interviewed organizations reported a significant decrease in their number of failed deployments. One organization's 80% successful deployment rate increased to at least 96% with IBM UrbanCode. The three-year cost savings from reducing failed deployments was quantified as \$221,059 for the composite organization.

Unquantified benefits. The interviewed organizations experienced the following benefits, which are not quantified for this study:

- › Improved ability to scale.
- › Increased speed of deployment, leading to faster time-to-market for new features and services.
- › Reduced cost of a release by 97%.
- › Improved stability via repeatability and standardization of the deployment process.
- › Increased visibility into the release process.
- › Improved employee satisfaction.

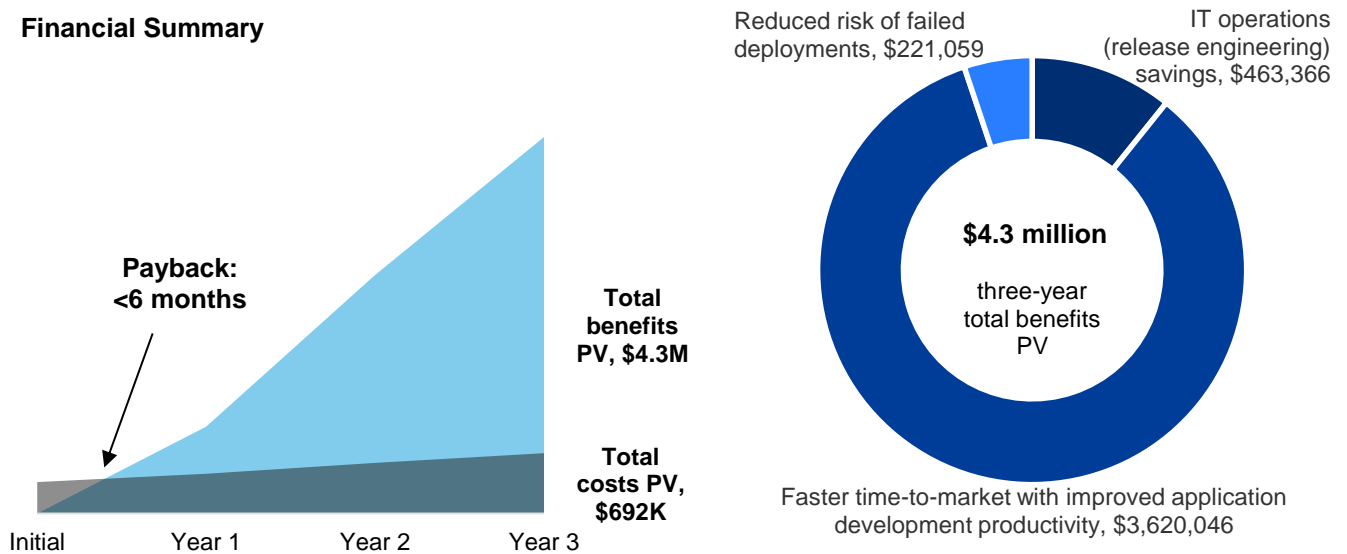
Costs. The interviewed organizations experienced the following risk-adjusted PV costs:

- › **IBM UrbanCode software license fees and maintenance.** The composite organization paid a total of \$298,367 in software license and annual maintenance fees over the three-year analysis.
- › **Hardware costs.** The composite organization maintained four servers for IBM UrbanCode at a cost of \$12,534 over the three-year analysis.
- › **Professional fees.** The composite organization used 200 hours of IBM professional services that was part of its enterprise license agreement (ELA) for its UrbanCode deployment.

- › **Implementation costs.** The composite organization had four internal IT operations resources working at 30% over eight months for its IBM UrbanCode implementation at a cost of \$110,400.
- › **Administrative costs.** The composite organization allocated one build coordinator at \$99,750 per year as part of its IBM UrbanCode deployment.

Forrester's interviews with six existing customers and subsequent financial analysis found that an organization based on these interviewed organizations experienced benefits of \$4,304,471 over three years versus costs of \$692,364 adding up to a net present value (NPV) of \$3,612,107 and an ROI of 522%.

Financial Summary



The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

TEI Framework And Methodology

From the information provided in the interviews, Forrester has constructed a Total Economic Impact™ (TEI) framework for those organizations considering implementing IBM UrbanCode.

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 IBM UrbanCode can have on an organization:



DUE DILIGENCE

Interviewed IBM stakeholders and Forrester analysts to gather data relative to IBM UrbanCode.



CUSTOMER INTERVIEWS

Interviewed six organizations using IBM UrbanCode to obtain data with respect to costs, benefits, and risks.



COMPOSITE ORGANIZATION

Designed a composite organization based on characteristics of the interviewed 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 interviewed organizations.



CASE STUDY

Employed four fundamental elements of TEI in modeling IBM UrbanCode's impact: benefits, costs, flexibility, and risks. Given the increasing sophistication that enterprises have regarding ROI analyses related to IT investments, Forrester's TEI methodology serves to provide 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 IBM 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 report to determine the appropriateness of an investment in IBM UrbanCode.

IBM 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.

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

The IBM UrbanCode Customer Journey

BEFORE AND AFTER THE IBM URBANCODE INVESTMENT

Interviewed Organizations

For this study, Forrester conducted six interviews with IBM UrbanCode customers. Interviewed customers include the following:

INDUSTRY	REGION	NUMBER OF EMPLOYEES	ADDITIONAL INFORMATION
Telecommunications	South America	6,000	172 applications supported by IBM UrbanCode
Insurance	North America	5,000	\$1.4 billion in annual revenue
Financial services	Global	200,000	350 customer banking apps supported by IBM UrbanCode
Insurance	Global	3,000	\$2.5 billion in annual revenue
Enterprise marketing	North America	1,500	Over \$650 million in annual revenue
Financial services	Global	40,000	300 IT employees and uses IBM UrbanCode Deploy as center of DevOps stack

Key Challenges

Most of the organizations interviewed were on multiyear iterative journeys. They were struggling to scale releases to match the growth in code deployment driven by their implementations of Agile development practices. They needed to:

- › **Gain visibility into the deployment process.** Organizations did not have enough visibility into application release processes. One IT manager noted: “We needed to create more visibility into configuration and management for the application release processes. This increased visibility opens up more self-service capability for our dev teams as well.” For other organizations interviewed, alleviating audit concerns with increased traceability was another driver to deploy UrbanCode.
- › **Standardize code deployment across multiple systems.** One organization’s director for platform services noted: “We wanted to put everyone on the same page. IBM UrbanCode helped us and drove a lot of standardization on the operations side, from the configuration layout to the bare metal up.”
- › **Reduce effort expended on manual code deployments to gain scalability.** Another main driver of the move to IBM UrbanCode was to reduce the “crazy amount of effort” these organizations were expending on their manual code deployments. One organization noted that its IBM UrbanCode implementation included changing portions of its release deployment process to ensure that “we didn’t just automate a bad process.”

“We added a lot of apps and infrastructure over the last year and a half — more code builds, more parallel branches, etc. All that’s driven an increase in components that the teams are managing — an increase in units of work from build to deployment. We needed to drive scale and velocity by putting solutions [like IBM UrbanCode] in place.”

IT manager, leading insurance organization



Solution Requirements

The interviewed organizations searched for a solution that could:

- › Automate the application release process.
- › Consistently manage planning of releases across all application platforms.
- › Increase visibility into how processes are configured and managed.
- › Open up self-service capability for dev teams.

After an extensive request for proposal (RFP) and business case process evaluating multiple vendors, the interviewed organizations chose UrbanCode and began deployment:

- › Three out of six interviewees took a phased approach to deployment; the rest implemented immediately.
- › UrbanCode was deployed to between 20% and 50% of application teams within the organizations.

Key Results

The interviews revealed that key results from the UrbanCode investment include:

- › **Improved ability to automate deployments in complex environments (or reduced complexity of deployment), leading to productivity and resource savings.** With the deployment automation enabled by IBM UrbanCode, organizations could save the time and effort spent by their IT operations and application development teams on their manual deployment processes. The application development team saw productivity gains, and the IT operations team saved additional resources as a result.
- › **Reduced risk of failed deployments, leading to cost savings.** Using IBM UrbanCode, organizations could implement repeatable, reliable processes and reduce the likelihood of error in a release. As the number of failed deployments decreased, organizations saved on the cost of fixing these failed releases.
- › **Increased speed of deployment, leading to faster time-to-market for new features and services.** Interviewees consistently reported that IBM UrbanCode increased the speed of deployment for their organizations. Organizations saw an exponential increase in deployments, with one organization reporting growth from one deployment a week to 50, and another reporting a jump from 30 deployments a week to 815. One insurance organization noted that on a per platform basis, it gathered enough data to report an average 50% reduction in cycle time after implementing IBM UrbanCode. Another organization reported a 75% decrease in deployment time, with formerly 1-hour deployments completed in 15 minutes. Because of this faster deployment, companies could now deliver new features and services earlier than before.

Quantifiable benefits are discussed in more detail starting in the Analysis of Benefits section. The interviews also revealed several significant but qualitative results, which are detailed in the Unquantified Benefits section.

“IBM UrbanCode brings us enterprise scale — their products do flow together; any plug-in is vendor-supported. They have over 400 plug-ins for all different products. It allows us to be flexible and extensible. It allows us to focus on service. We’re not doing integration work.”

*SVP of DevOps services,
financial services*



“When you have a tightly coupled, complex architecture with all these dependencies built into it, that’s where UrbanCode plays well.”

*Head of infrastructure
engineering, global provider of
loyalty and marketing programs*



“UrbanCode’s template-based approach has given us significant efficiencies. For example, in the past, our speed of deployment for our UAT environment with multiple servers was 45 minutes. We’ve doubled the number of servers, and deployment happens in a matter of minutes.”

*IT manager, leading insurance
company*



Composite Organization

Based on the interviews, Forrester constructed a TEI framework, a composite company, and an associated ROI analysis that illustrates the areas financially affected. The composite organization is representative of the six companies that Forrester interviewed and is used to present the aggregate financial analysis in the next section. The composite organization that Forrester synthesized from the customer interviews has the following characteristics:

Description of composite. A leading financial services corporation with 6,000 employees. This organization has a 250-person IT group; six of those IT employees are operations engineers (release engineers) allocated to the DevOps automation team.

Deployment characteristics. Prior to its IBM implementation, the composite organization had moved to an Agile application delivery model. After its move to Agile, the organization built multiple homegrown tools, for example an automation tool for release management using functionality from its legacy data center automation software solution, an open source continuous integration tool, and several layers of internally developed scripts. These multiple tools were not consolidated into a single solution or developed in a consistent manner across all application platforms. This inconsistent approach presented challenges with stability and scalability. As part of its DevOps initiative and to fully implement continuous delivery, the composite implemented IBM UrbanCode Deploy, IBM UrbanCode Release, and IBM UrbanCode Build.



Key assumptions

250 IT employees

Six IT operations release engineers

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	IT operations (release engineering) savings	\$114,000	\$228,000	\$228,000	\$570,000	\$463,366
Btr	Faster time-to-market with improved application development productivity	\$890,625	\$1,781,250	\$1,781,250	\$4,453,125	\$3,620,046
Ctr	Reduced risk of failed deployments	\$88,891	\$88,891	\$88,891	\$266,674	\$221,059
Total benefits (risk-adjusted)		\$1,093,516	\$2,098,141	\$2,098,141	\$5,289,799	\$4,304,471

IT Operations (Release Engineering) Savings

By reducing the complexity of deployments through IBM UrbanCode, organizations saved significant time and effort spent by their DevOps automation resources on releases. Factors that contributed to these time savings included the creation of standardized, repeatable processes; the increased transparency of the release process; and the faster time-to-deployment enabled by IBM UrbanCode. An executive at one organization also noted the significant value of IBM UrbanCode’s visual process designer and templates feature by remarking, “I don’t need 100 engineers, I have 50,” to illustrate the resources saved because of this feature. This financial services organization decreased its average 4-hour turnaround time for a release to 5 minutes as it deployed builds instantaneously through IBM UrbanCode. It moved from two builds a day to 20 or 30 builds a day.

Another organization replaced its four enterprise architects working on deployment support with two DevOps engineers who spent 70% of their time supporting IBM UrbanCode. One enterprise reported that when it implemented deployment automation with IBM UrbanCode, it could do the same amount of work with one-third of the staff. This organization estimated that it saved 10 to 12 full-time equivalents (FTEs) out of a team of 30 as majority of the manual responsibilities for build creation completely disappeared.

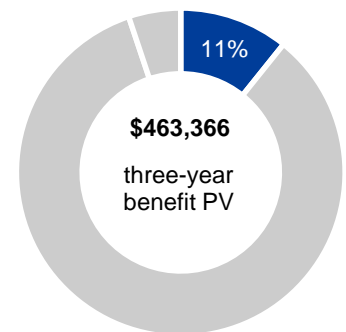
Forrester assumes that:

- › By implementing deployment automation with IBM UrbanCode, the composite realized IT operations savings as it reallocated 30% of its six-person DevOps automation team. In the first year of using IBM UrbanCode, the composite organization saved one IT operations resource. As UrbanCode was used to support more applications in years 2 and 3, these IT operations engineering savings increased to two FTEs.

Forrester also considered several impact risks that could potentially reduce anticipated IT operations savings:

- › Variability in an organization’s pre-IBM UrbanCode environment and how operations and release teams were structured.

The table above shows the total of all benefits across the areas listed below, as well as present values (PVs) discounted at 10%. Over three years, the composite organization expects risk-adjusted total benefits to be a PV of more than \$4.3 million.



IT operations (release engineering) savings: 11% of total benefits

Impact risk is the risk that the business or technology needs of the organization may not be met by the investment, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for benefit estimates.

- › Variability in size and scope of IBM UrbanCode deployment.
- › Variability in maturity level of each organization in its Agile and DevOps journey.

To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a three-year risk-adjusted total PV of \$463,366.

IT Operations (Release Engineering) Savings: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
A1	Number of operations headcount saved		1	2	2
A2	Annual rate per person		\$120,000	\$120,000	\$120,000
At	IT operations (release engineering) savings	A1*A2	\$120,000	\$240,000	\$240,000
	Risk adjustment	↓5%			
Atr	IT operations (release engineering) savings (risk-adjusted)		\$114,000	\$228,000	\$228,000

Faster Time-To-Market With Improved Application Development Productivity

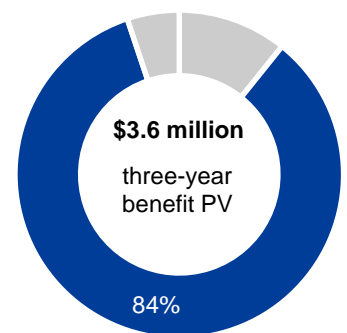
The increased speed of deployment and operational efficiency from moving to IBM UrbanCode also drove time savings for the application development teams of the interviewed organizations. Developers were exerting less effort on a release. They also spent less time waiting for DevOps automation engineers to complete their tasks, as developers could initiate code deployments.

One organization decreased deployment times by 75% and observed that the time saved by its development team was reinvested in quality and speed of feature delivery. One interviewee noted, “Our developers now put out more product in the same amount of time.” This organization noted that the success of its enterprise deployment was a result of approaching those developers. They were typically Java development teams and represented 10% of the organization’s target population, and they were willing to adopt a DevOps approach. The success stories from these early adopters then drove adoption throughout the organization, as it grew to 2,500 users of the IBM UrbanCode solution.

One telecommunications company noted that its developers used to have a service-level agreement (SLA) of 3 hours per installation and now this SLA was at 30 minutes with the efficiencies gained due to IBM UrbanCode. A DevOps team leader remarked, “There was a 90% diminution of time for deployment in production.” This company estimated that its developers gained 8 hours per week in improved productivity because of IBM UrbanCode.

Forrester assumes that:

- › Following the IBM UrbanCode implementation, the composite organization saw an average productivity improvement of 10% in the first year for 150 people in its application development team. As the organization’s IBM UrbanCode deployment matured, this productivity improvement increased to 20% in years 2 and 3.



Application development productivity savings: **84%** of total benefits

- › Only 50% of this productivity benefit was captured for productive work. At an average fully loaded compensation of \$125,000 per full-time equivalent, the benefit of improved developer productivity is quantified at \$937,500 in Year 1.

Application development productivity savings will vary with:

- › The pre-IBM UrbanCode environment and how development and release teams are structured.
- › The number of application development resources and number of teams adapting IBM UrbanCode.
- › The fully loaded compensation of application developers.

To account for these risks, Forrester adjusted this benefit downward by 5%, yielding a risk-adjusted application development productivity benefit of \$890,625 in Year 1 and a three-year risk-adjusted total PV of \$3,620,046.

“We’ve removed an enormous bottleneck and reduced our time-to-market. Our business partners are happy to see functionality quicker, now that we’ve moved to 20 deploys a week through [UrbanCode] Deploy.”

VP of architecture and data services, leading mutual fund and financial services firm



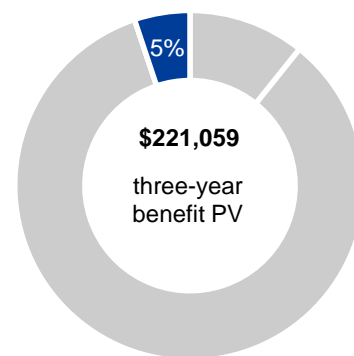
Faster Time-To-Market With Improved Application Development Productivity: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
B1	Number of developers		150	150	150
B2	Annual fully loaded compensation (average)		\$125,000	\$125,000	\$125,000
B3	Percentage improved productivity		10%	20%	20%
B4	Percent captured		50%	50%	50%
Bt	Improved developer productivity	$B1 * B2 * B3 * B4$	\$937,500	\$1,875,000	\$1,875,000
	Risk adjustment	↓5%			
Btr	Improved developer productivity (risk-adjusted)		\$890,625	\$1,781,250	\$1,781,250

Reduced Risk Of Failed Deployments

Organizations also reported increased release stability with their IBM UrbanCode implementations and a reduction in risk of failed deployments. One build and release management team member noted: “Pre-IBM, people were going in and manually changing environments, creating directories, for example, which introduced inconsistencies. Now we’ve standardized the release process with UrbanCode, and the main benefit has been stability. Our releases go much more smoothly.” This organization realized time savings for issue resolution, as it saw a 97% drop in failed deployments because of IBM UrbanCode.

Another interviewed organization noted that moving to IBM UrbanCode eliminated the possibility of human error in its deployment process, with one interviewee remarking, “Now there is no fat-fingering of the build; nobody picked up the wrong build. We’ve eliminated the human error component and reduced risk.”



Reduction in failed deployments: 5% of total benefits

- › One financial services organization reported that it went from an 80% successful deployment rate in its old system to at least a 96% successful deployment rate with its IBM UrbanCode implementation. This organization had approximately a quarter million deploys and 2 million builds a year.
- › One telecommunications company reported that it went from two incidents of failed deployment in production per month to zero after its IBM UrbanCode deployment.

Forrester assumes that:

- › The composite organization reduced its number of failed deployments in production by 24 a year with its implementation of deployment automation through IBM UrbanCode. For these production incidents, the composite organization typically had an average of eight resources working on an incident for 3.5 hours. At an average fully loaded compensation per IT resource of \$120,000 a year, or \$57.69 per hour, the cost of a failed deployment to the composite organization was \$1,615. In addition, the composite organization saved 20 man-hours a week on issue resolution for nonproduction releases, representing savings of \$1,154 per week.
- › The total cost savings to the composite organization due to a reduction in failed deployments with IBM UrbanCode is quantified at \$98,768 per year in the table below. The organizations interviewed had varying ranges for percentage reduction in failed deployments because of improved stability and release quality with IBM UrbanCode.

The reduction in risk of failed deployments will vary with:

- › An organization’s pre-IBM UrbanCode environment; organizations with more mature deployment processes with partial automation and scripts see less of a reduction in failed deployments compared to those with more manual processes.
- › The size and scope of the IBM UrbanCode deployment.
- › The methodology for valuing the cost of failed deployment as some organizations might quantify the cost of a failed deployment in terms of revenue loss, depending on the applications affected.

To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year risk-adjusted total PV of \$221,059.

“A critical benefit of UrbanCode is that deployment is always perfect. The tool means you can avoid human effort and human error. It brings consistency of deployment.”

*DevOps team leader,
telecommunications company*



“We showed our team that in [UrbanCode] Deploy, you can see error codes and steps in the process. For example, in the middle of a production release, something failed. That release manager went into the web UI, drilled down, took a screenshot, and sent it to the WebSphere team. They got the problem resolved before they could even open up a ticket. Overall, we now get issues resolved in a tenth of a time.”

*SVP of DevOps services,
Fortune 500 banking and
financial services corporation*



Risk Reduction Of Failed Deployments: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
C1	Cost of failed deployment in production		\$1,615	\$1,615	\$1,615
C2	Number of failed deployments reduced post-IBM UrbanCode		24	24	24
C3	Weekly cost of nonproduction failed deployment		\$1,154	\$1,154	\$1,154
C4	Number of weeks		52	52	52
Ct	Reduced risk of failed deployments	$C1 * C2 + C3 * C4$	\$98,768	\$98,768	\$98,768
	Risk adjustment	↓10%			
Ctr	Reduced risk of failed deployments (risk-adjusted)		\$88,891	\$88,891	\$88,891

Unquantified Benefits

- › **Increased speed of deployment, leading to faster time-to-market for new features and services.** As discussed in the key results section, interviewees consistently reported that IBM UrbanCode increased the speed of deployment for their organizations. Organizations reported as much as a 10x faster deployment time in production with IBM UrbanCode. With faster deployment cycles, organizations delivered new features and services at a faster pace.
- › **Improved mean-time-to-recovery (MTTR) from failed deployments by 90%.** Organizations found that the consistency and increased visibility enabled by IBM UrbanCode resulted in shorter issue resolution times. One executive noted that issue resolution time for the organization was reduced by 90% after implementing IBM UrbanCode.
- › **Reduced cost of a release by 97%.** One interviewed organization reported that with its move to IBM UrbanCode, each release took up fewer resources, from an average cost of GBP £3,300 per release to an average of GBP £99 per release today. This represents a reduced cost per release of 97%.
- › **Improved stability via repeatability and standardization of the deployment process.** With their IBM UrbanCode implementations, organizations could establish standard, repeatable processes for deployment. This repeatability was one of the top benefits cited by the interviewees, as it enabled them to be more confident in the stability of their releases when they went to production. These organizations also noted how easy it was in IBM UrbanCode to define operations, such as how to restart a server and develop processes in a standard way. One global specialist insurer's enterprise architect remarked: "We did 700 deployments over all environments in the course of a month, and it was always the same. That repeatability and reliability of deployment — our production deployment worked the first time because we did it so many times."
- › **Improved ability to scale.** One organization, which was using IBM UrbanCode to support deployment automation for 350 applications with a target to support 800 applications companywide, stated that one of the main benefits of working with IBM UrbanCode was the ability of the solution to support enterprise-scale deployments. UrbanCode could support multiple technologies such as web, mainframe, and other platforms. The organization noted that other solutions would have required integration resources, whereas IBM UrbanCode, with its plug-in offerings, could support different products. The ease of data flow throughout the solution meant that DevOps could focus on service and system maintenance instead of working on code. One SVP noted: "These products were meant to work together to pass metadata. You can run certain tests at build time, and Build makes sure that information is available as part of the artifact set that flows through the system."



10x faster deployment time

"The cost benefit to us of implementing UrbanCode was a reduction of 97% in the cost of a release. From an average of eight people working for 3 hours for every release, it's now one person working 10 to 15 minutes."

Enterprise architect, global specialist insurer



"IBM UrbanCode's out-of-the-box integration with RTC (Rational Team Concert) was huge. Because of the flexibility of the architecture, IBM was able to provide the plug-in very quickly. That is the competitive advantage of IBM UrbanCode — all those plug-ins. No environment is going to be homogeneous."

VP architecture and data services, leading mutual fund and financial services firm



- › **Increased visibility into the release process.** Interviewed organizations consistently cited transparency as a benefit. One enterprise remarked that instead of a release snapshot like other build tools, “Build is aware of what’s going on, it labels it, and before we go into production, it checks the label.” With UrbanCode, this organization could now ensure quality and integrity further down in the system. For another organization, the DevOps team’s principal engineer noted: “Now that we have all that information readily available with UrbanCode, we can produce reports and link that to our management system. We have system-generated reports. That has also helped us in our compliance and audit processes, with our system-generated audit logs.”

Another organization noted that using Deploy significantly improved its configuration management process. By removing the manual setting of configuration parameters, this organization increased transparency of the configuration management process and reduced the effort spent on analyzing dev scripts whenever an error occurred.

One organization noted that IBM UrbanCode’s documentation was a critical component in achieving certification under ISO-2000. With UrbanCode, the organization could prove that it had documented and certified implemented process with continuous deployment for automation. The organization also noted that it is the only telecommunication company in its country of operation certified ISO-2000.

- › **Improved employee satisfaction.** By eliminating repetitive manual processes and easing the workload on IT operations and developers through UrbanCode, several organizations reported increased employee satisfaction, as their teams could now work on “high-value” tasks. One company said that with its UrbanCode deployment, it eliminated weekend releases that were building into Monday and Tuesday. One manager noted: “Doing the same deployment over and over again is soul destroying. I had people up for 3 hours through the night doing the same thing again and again. Now their job is more about optimizing applications and establishing metrics to show value to the business.”

“UrbanCode Deploy can get the configuration [of the production environment], and make sure the testing environment is configured exactly the same way. Deploy removed our blind spots; it broke all that up and made the steps discernable. Now anybody can work on any app versus just the subject matter experts.”

VP architecture and data services, leading mutual fund and financial services firm



“With UrbanCode, it’s really cool that I can spend time on things that really make sense rather than re-executing a thing 10 times. It feels really good to shift my focus from more repetitive operations work to more proactive, creative work.”

IT operations engineer, leading telecommunications company



Flexibility

The value of flexibility is clearly unique to each customer, and the measure of its value varies from organization to organization. There are multiple scenarios in which a customer might choose to implement UrbanCode and later realize additional uses and business opportunities, including:

- › **Improving the ability to deliver microservices.** With the creation of standardized and repeatable processes, increased governance and visibility, and the ability to automate application deployments throughout cloud environments with IBM UrbanCode, organizations now have the improved capability to deliver microservices that was not possible prior to their UrbanCode implementations. A principal engineer noted, “We now have the ability to take app components and move them together from one environment to the next in one snapshot.” Organizations that are considering implementing a microservices architecture in the future may realize additional productivity and efficiency savings and faster time-to-market with the capability that IBM UrbanCode provides.
- › **Increasing IT resource savings with wide-scale deployment.** For organizations that only deployed UrbanCode to select divisions, expansion to other groups would result in additional IT resource savings, productivity benefits, and deployment cost savings. One of the organizations interviewed was currently supporting 2,500 users on IBM UrbanCode and had achieved a 25% penetration rate in its target population pool of 800 applications for automation. As it scaled deployment of UrbanCode, it would also receive commensurate benefits in the future. This organization did note that while it has approximately 2,500 applications in its consumer bank, it did not expect to deploy IBM UrbanCode to all these applications.
- › **Gaining efficiency by utilizing the full capabilities of IBM UrbanCode.** Some of the organizations interviewed had only implemented the Deploy portion of the IBM UrbanCode solution. These organizations have the potential to gain efficiency benefits as they implement additional UrbanCode Deploy cloud blueprint functionality, IBM UrbanCode Build, and IBM UrbanCode Release. The value of flexibility is unique to each organization, and the willingness to measure its value varies from company to company.

Flexibility, as defined by TEI, represents an investment in additional capacity or capability that could be turned into business benefit for a future additional investment. This provides an organization with the "right" or the ability to engage in future initiatives but not the obligation to do so.

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
Dtr	IBM UrbanCode license fees	\$226,800	\$0	\$45,360	\$45,360	\$317,520	\$298,367
Etr	Hardware fees	\$0	\$5,040	\$5,040	\$5,040	\$15,120	\$12,534
Ftr	Professional services fees	\$23,000	\$0	\$0	\$0	\$23,000	\$23,000
Gtr	Internal implementation costs	\$110,400	\$0	\$0	\$0	\$110,400	\$110,400
Htr	Ongoing administration costs	\$0	\$99,750	\$99,750	\$99,750	\$299,250	\$248,063
	Total costs (risk-adjusted)	\$360,200	\$104,790	\$150,150	\$150,150	\$765,290	\$692,364

IBM UrbanCode License Fees

The composite organization purchased \$200,000 of IBM UrbanCode licenses, with an additional maintenance cost of \$40,000 per year. Licensing fees may depend on the number of agents, the components of the IBM UrbanCode solution implemented, and other enterprise agreements. Because of this complexity, readers should work with their IBM account manager to understand the specific license costs.

Risks that may affect this cost include:

- › Variability in the scope of deployment, number of agents, and number of servers.
- › Variability in number of IBM UrbanCode components used.
- › Variability in volume licensing and other enterprise agreements.

To account for these risks, Forrester adjusted this cost upward by 5% yielding a three-year present value total cost of IBM UrbanCode software fees of \$298,367.

The table above shows the total of all costs across the areas listed below, as well as present values (PVs) discounted at 10%. Over three years, the composite organization expects risk-adjusted total costs to be a PV of \$692,364.

Implementation risk is the risk that a proposed investment may deviate from the original or expected requirements, resulting in higher costs than anticipated. The greater the uncertainty, the wider the potential range of outcomes for cost estimates.

IBM UrbanCode Fees: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
D1	License fees		\$216,000			
D2	Maintenance				\$43,200	\$43,200
Dt	IBM UrbanCode license fees	D1+D2	\$216,000	\$0	\$43,200	\$43,200
	Risk adjustment	↑5%				
Dtr	IBM UrbanCode license fees (risk-adjusted)		\$226,800	\$0	\$45,360	\$45,360

Hardware Fees

The composite organization also maintained four virtual machines (VMs) for its IBM UrbanCode solution at an annual cost of \$1,200 a year per VM. The annual hardware cost to the composite organization for IBM UrbanCode was \$4,800 per year. This cost was risk-adjusted up by 5% to account for variability, yielding a total annual hardware cost of \$5,040 per year.

Professional Services Fees

The composite organization used 200 hours of IBM professional services fees from its overall IBM ELA. Assuming a professional services cost of \$100 per hour, this is equivalent to \$20,000 in professional services fees for initial deployment and training on IBM UrbanCode. To account for the variability in the pre-UrbanCode and DevOps environment for different organizations and subsequent level of additional deployment services and training required, this cost was risk-adjusted up by 15% to \$23,000.

Internal Implementation Costs

Interviewees offered a wide range of IBM UrbanCode implementation cost estimates, as each organization had different implementation approaches, environment complexity, and pre-UrbanCode deployment processes. One organization had four resources allocating 30% of their time over eight months. Another had two resources allocating 50% of their time over 18 months.

For the composite organization, Forrester estimates that:

- › Planning and deployment took eight months.
- › Four resources from IT operations spent an average of 30% of their time on the IBM UrbanCode implementation.
- › Employees earn an average fully burdened salary of \$120,000 per year.
- › No additional costs for training (such as developer training on the platform) were added.

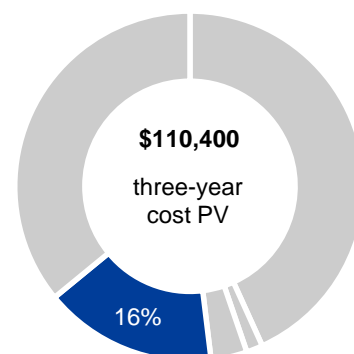
Risks that may affect this cost include:

- › Variability in requirements for professional services and internal labor at implementation depending on size and complexity of deployment.
- › Variability in level of training required to fully adopt Agile and DevOps.

To account for this, Forrester adjusted the internal implementation costs upward by 15%, yielding a one-time initial cost of \$110,400.



Eight months
Total implementation
and deployment time



Internal implementation labor: 16% of total costs

Internal Implementation Costs: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
E1	Number of people		4			
E2	Percentage of time		30%			
E3	Length of time (years)	8 months	8/12			
E4	Average annual compensation		\$120,000			
Et	Internal implementation costs	$E1 * E2 * E3 * E4$	\$96,000			
	Risk adjustment	↑15%				
Etr	Internal implementation costs (risk-adjusted)		\$110,400			

Ongoing Administration Costs

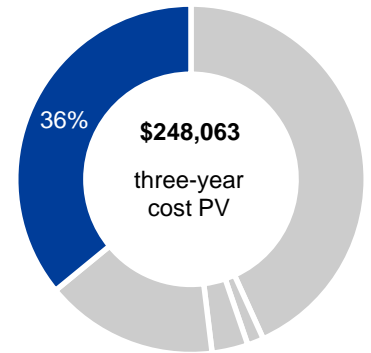
Forrester also includes the ongoing cost of administration of IBM UrbanCode in the financial model. The composite organization allocated one IT operations resource for build engineering to ongoing administrative costs for IBM UrbanCode.

For the composite organization, Forrester estimates that:

- › The organization hired one build engineer.
- › The average fully loaded compensation of this build engineer was \$95,000 per year.

Ongoing administration costs may vary depending on a company's pre-IBM UrbanCode deployment environment.

To account for these risks, Forrester adjusted this cost upward by 5%, yielding a three-year risk-adjusted total PV of \$248,063.



Ongoing administration:
36% of total costs

Ongoing Administration Costs: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
F1	Number of build coordinators			1	1	1
F2	Annual compensation			\$95,000	\$95,000	\$95,000
Ft	Ongoing administration costs	$H1 * H2$	\$0	\$95,000	\$95,000	\$95,000
	Risk adjustment	↑5%				
Ftr	Ongoing administration costs (risk-adjusted)		\$0	\$99,750	\$99,750	\$99,750

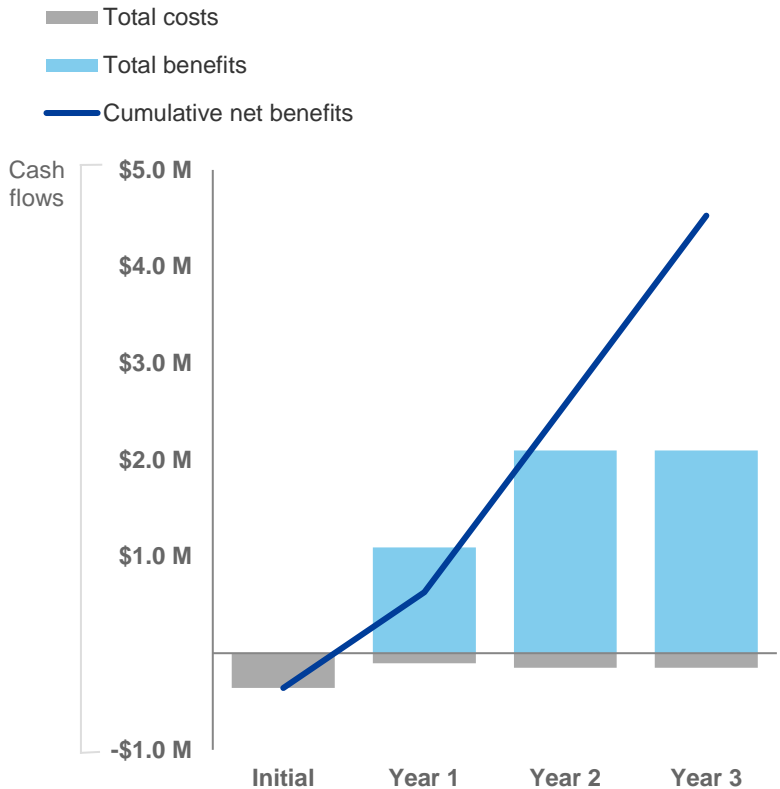


One FTE
build engineer

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.



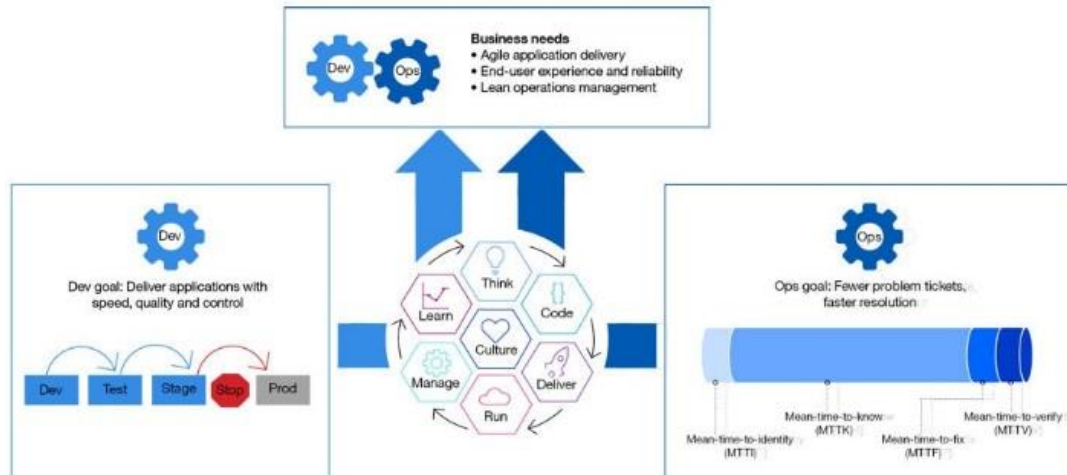
These risk-adjusted ROI, NPV, and payback period values are determined by applying risk-adjustment factors to the unadjusted results in each Benefit and Cost section.

Cash Flow Table (Risk-Adjusted)

	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Total costs	(\$360,200)	(\$104,790)	(\$150,150)	(\$150,150)	(\$765,290)	(\$692,364)
Total benefits	\$0	\$1,093,516	\$2,098,141	\$2,098,141	\$5,289,799	\$4,304,471
Net benefits	(\$360,200)	\$988,726	\$1,947,991	\$1,947,991	\$4,524,509	\$3,612,107
ROI						522%
Payback period						Less than 6 months

IBM UrbanCode: Overview

The following information is provided by IBM. Forrester has not validated any claims and does not endorse IBM or its offerings.



IBM UrbanCode Deploy is an application release automation solution that combines robust visibility, traceability, and auditing capabilities.

- › It allows you to deploy applications to distributed data centers, cloud, and virtualized environments.
- › The plug-in ecosystem eliminates scripting and helps build DevOps toolchains for complex applications.
- › The UrbanCode Deploy server can be run on your premises, on an IBM Cloud with expert services, or on IBM Cloud Private or your own Kubernetes-based platform. You can purchase UrbanCode Deploy on its own or as part of a bundle that allows you to pool the licenses for a range of IBM DevOps products.

UrbanCode Deploy Key Features:

- Multitier application models
- Easy process designer
- Deploy to public, private, and hybrid cloud
- Track what is where: inventory
- Integrations replace custom scripting
- Scalable distributed automation
- Quality gates and approval

IBM UrbanCode Release manages the release of complex interdependent applications, infrastructure changes, and simultaneous deployments of multiple applications. This software enables you to plan, execute, and track a release through every stage of the life cycle model. IBM UrbanCode Release helps to reduce errors while making large releases faster and more agile.

UrbanCode Release Key Features:

- Allocate environments
- Integrate with other software
- Create a life cycle template
- Define a release

- Use the reusable deployment plan to gain visibility

IBM UrbanCode Build is a continuous integration and build management server optimized for the enterprise that easily works within a customized framework. It provides scalable configuration and management of build infrastructures with integration into development, testing, and release tooling and a wide range of plug-ins for most tools.

UrbanCode Build Key Features:

- Capture common elements of configuration
- Understand application dependencies
- Take advantage of data warehouse-like structure
- Central teams set up security rules and build templates
- Flexible pricing and deployment

IBM also provides a new bundled offering under a new consumption model that changes the way you can use and deploy DevOps software. The new offering helps simplify your planning for adoption and growth of critical IBM DevOps products.

IBM UrbanCode Velocity manages your value stream. It provides extensive metrics and visibility into continuous delivery performance and helps teams identify delivery bottlenecks. Delivery of multiple applications is streamlined with a shared “pipeline of pipelines” providing a consistent view across related services.

UrbanCode Velocity Key Features:

- Real-time delivery performance reports for transformation leaders
- Pipeline management for team leads
- Orchestrate pipelines across multiple tools including UrbanCode Deploy and Jenkins

Appendix A: Total Economic Impact

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

Total Economic Impact Approach



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



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



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



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

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



Present value (PV)

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



Net present value (NPV)

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



Return on investment (ROI)

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



Discount rate

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



Payback period

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

Appendix B: Supplemental Material

Related Forrester Research

“Make The Case For Agile And DevOps-Driven Digital Transformation,” Forrester Research, Inc., May 29, 2018

“The Quest For Speed-Plus-Quality Drives Agile And DevOps Tool Selection,” Forrester Research, Inc., April 27, 2017

Appendix C: Endnotes

¹ Source: “Make The Case For Agile And DevOps-Driven Digital Transformation,” Forrester Research, Inc., May 29, 2018.