

A Forrester Total Economic Impact™
Study Commissioned By Stack Overflow
November 2019

The Total Economic Impact™ Of Stack Overflow For Teams

Cost Savings And Business Benefits
Enabled By Stack Overflow For Teams

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Benefits Overview



Question-asking benefits, in the first year:

1,275 questions avoided
3,825 hours saved



Question-answering benefits, in the first year:

1,913 answers avoided
13,388 hours saved



Additional benefits:

**Improved developer
“flow”**

Improved recruiting

**Faster application time-
to-market**

Executive Summary

Stack Overflow is a public platform, ubiquitous to most developers, where developers can find answers to coding questions quickly — or ask a new question. Stack Overflow for Teams concentrates the use of Stack Overflow for the development team within a single company. Developers with questions, often involving unique internal processes and proprietary information can find answers from colleagues, or ask a new question and expect an answer in a reasonable time on a secure, private platform.

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

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed several customers with years of experience using Stack Overflow for Teams. These organizations have seen significant time savings by avoiding having to ask someone to answer a question that has already been answered. With Stack Overflow for Teams, developers can find answers, answer questions, provide new and updated answers, and find information to collaborate with subject matter experts. Leveraging Stack Overflow for Teams has also helped organizations improve application quality and even developer recruiting.

As summarized by Forrester’s research, “Asking for help is a logical response, but the ability to quickly solve problems during the doing activity can make or break a developer-engagement strategy.”¹ Interviewed organizations saw how the existing methods of asking questions and providing answers took time and caused interruptions. Prior to using Stack Overflow for Teams, most employees used existing communication channels to ask questions — email, individual or team chat, and in-person requests. While this usually delivered an answer for the developer making a query, there was no useful way to capture this information for future discovery so the group of experts answering questions was interrupted more often than they needed to be, resulting in lost developer productivity.

Forrester interviewed four developer managers at enterprise organizations that develop and support custom applications — two financial services and two communication organizations. They have all reported significant developer and developer support time savings. Results are summarized as a single composite organization for this study: an enterprise with 2,200 developers using Stack Overflow for Teams on a regular basis.

Key Findings

Quantified benefits. The following risk-adjusted present value (PV) quantified benefits are representative of the composite organization, based on the experiences reported by interviewed companies:

- › **Question-asking time savings.** At the composite organization, employees in development-related roles asked about 1,500 questions each month, and as many as 85% of those were duplicates that required extra time to type up, send, and manage follow-ups. With Stack Overflow for Teams, employees only ask 225 new questions each month. Developers can search the Stack Overflow for Teams platform to find the right answers based on search relevancy and leverage



ROI
179%



Benefits PV
\$3.5 million



NPV
\$2.2 million

colleague recommendations with votes and answer confirmation flags. Seeing who asked and answered the original discussion also helps foster collaboration and further discussion. The savings in the first year add up to 3,825 hours and nearly \$224,000.

- › **Question-answering time savings.** The significant reduction in questions asked means experienced developers — often the ones most senior and working on business-critical modules — are interrupted less often with questions they would either prefer to deal with later or that they or a colleague have already answered at least once, if not many times. Since it can take longer to craft a complete answer, and some questions have multiple answers provided, savings add up to more than 13,388 hours and more than \$1.1 million in the first year.

Unquantified benefits. The interviewed organizations have experienced additional improvements enabled by Stack Overflow for Teams, though these are not quantified for this study:

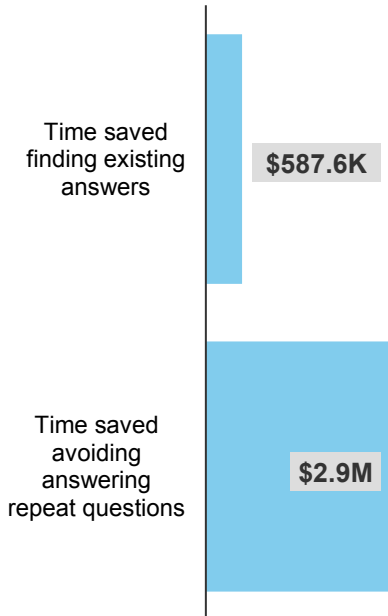
- › **Avoided developer “flow” interruptions.** In addition to time spent actually answering questions, an interruption may impact a developer more significantly if they require extra time to remember what they were doing. In addition, instead of responding to an email or chat interruption, senior developers can plan and schedule Stack Overflow for Teams time to review and answer questions.
- › **Improved recruiting.** With Stack Overflow’s ubiquity, potential developer new hires see the platform as one indication of a more mature development process using modern development tools. While not measured as of yet, organizations attribute some improvement in hiring, training, and retention to Stack Overflow for Teams.
- › **Improved development quality and application time-to-market.** With fewer interruptions, developers can stay focused on work, conveniently find information or coding standards, and share best practices. All of these can contribute to fewer coding errors, faster QC and test phases, and faster application delivery.
- › **Adoption beyond DevOps.** Organizations are planning for future Stack Overflow for Teams expansion as a platform to help other roles and groups. Departments such as finance and human resources have to adhere to very specific guidelines, and the platform can help them collaborate and share up-to-date information to meet these guidelines — for example, a finance colleague looking for the correct accounting standard or an employee with a benefits question for HR.

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

- › **Stack Overflow for Teams subscription costs.** Subscription costs for the composite organization are estimated to be a risk-adjusted present value of \$1.2 million for the three-year period.
- › **Management and moderation resource costs.** Resource requirements are minimal, but the organization scheduled some upfront question-and-answer seeding and has some ongoing moderation and management.

Forrester’s interviews with four existing customers and subsequent financial analysis found that a composite organization based on these companies experiences benefits of nearly \$3.5 million over three years versus costs of \$1.3 million, adding up to a net present value (NPV) of \$2.2 million and an ROI of 179%.

Benefits (Three-Year)



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 Stack Overflow for Teams.

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 Stack Overflow for Teams can have on an organization:



DUE DILIGENCE

Interviewed Stack Overflow stakeholders and Forrester analysts to gather data relative to Stack Overflow for Teams.



CUSTOMER INTERVIEWS

Interviewed four organizations using Stack Overflow for Teams Enterprise tier 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 Stack Overflow for Teams' 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 Stack Overflow 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 Stack Overflow for Teams.

Stack Overflow 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.

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

Stack Overflow For Teams Customer Journey

BEFORE AND AFTER STACK OVERFLOW INVESTMENT

Interviewed Organizations

For this study, Forrester conducted four interviews with Stack Overflow for Teams Enterprise tier customers, three based in the US and one in Europe, and all with a global presence. Interviewed customers include the following:

INDUSTRY	INTERVIEWEE	STACK OVERFLOW FOR TEAMS ENVIRONMENT
Finance	Developer services manager	1,850 questions per month before 1,300 active users of Stack Overflow for Teams
Finance	Division CTO	2,000 questions per month before 1,800 active users of Stack Overflow for Teams
Communication	DevOps manager	1,800 questions per month before 3,900 active users of Stack Overflow for Teams
Communication	Director of data science; technical product manager	950 questions per month before 1,750 active users of Stack Overflow for Teams, extension of support resources

Key Challenges

Customers invested in Stack Overflow for Teams to resolve issues and improve developer productivity. Issues and challenges included:

- › **Developer inefficiencies.** Developers needed to ask and answer questions. This not only took a lot of time, but it also impacted employee morale, especially for developers answering the same question for the second, fifth, tenth time — or even more. Some answers were collected in email, or in a wiki, but these solutions were either not centralized or not scalable to the amount of questions and answers that needed to be collected and shared.
- › **Developer interruption amplification.** Developers spent time answering questions — but the impact was amplified beyond just the time to write their answers. The interruption from their primary work often required extra time to restart and get back to full productivity.
- › **Difficulty collecting, updating, and sharing developer standards.** Every new question and answer could mean an update or clarification of a development standard — the correct format for a variable, the use of a standard module a colleague had developed, and a variety of other important details. These regular updates were difficult to collect and share; even if published, the variety of locations still made it challenging to find. The DevOps manager for a communication company said: “The expectation that we had for our software engineers to know where to look for documentation was a bad assumption. And it created a really messy experience.”
- › **Missed recruiting opportunities.** Organizations hoped modernizing their technology and best practices would improve recruiting and hiring success. They were starting to see some added difficulty bringing in young, qualified candidates who were not “wowed” by the development technologies, processes, and best practices currently in place.

“The expectation that we had for our software engineers to know where to look for documentation was really a bad assumption. And it created a really messy experience.”

DevOps manager, communication



- › **Developer morale.** Developers wanted to see their organizations better take advantage of modern technologies. The director of data science for a communication company highlighted how developers felt before, based on their feedback since Stack Overflow for Teams, “I have heard from multiple people in the user community that they are so happy and so pleased that we are using this.”

Solution Requirements

The interviewed organizations searched for a solution that could provide:

- › An easy-to-navigate question-and-answer platform that employees would use.
- › Tools for users to approve answers, as well as vote on the usefulness of answers and add their own comments.

Organizations reviewed alternatives, but all chose Stack Overflow for Teams because it met their needs and all their developers were already using the public platform on a daily basis.

Key Results

Interviewed organizations shared several key benefits enabled by Stack Overflow for Teams, including:

- › **Developer time savings.** Developers save time avoiding asking and answering questions. Those asking questions can now quickly find relevant information by searching the Stack Overflow for Teams portal. The developer services manager at a finance organization said, “It’s like ‘1-800 database team’ and poof, I get an answer right away.” Developers can review answers based on search relevancy and colleague recommendations. The director of data science at a communication organization added, “We can make a lot of progress by drawing upon our community knowledge.”
- › **Reduced developer interruptions.** In addition, those asking questions are no longer interrupted mid-thought with a chat or email alert with group questions that have often been asked before. They can schedule time to help colleagues with questions and remain focused on their primary work. The developer services manager at a finance company said: “We reached out to ask, ‘Raise your hand if you are answering questions every time we have a new hire training class.’ We wanted to know how often they have to keep getting everybody up to speed, and everyone was nodding their heads like crazy.”
- › **Improved recruiting.** Developer candidates interviewing at organizations have shown increased interest when Stack Overflow for Teams is mentioned. The CTO at a finance organization said, “Stack Overflow is one of the elements to develop our ecosystem to meet the expectations of the kind of people that we would want to have as engineers here.”
- › **Improved morale.** Employee morale and engagement have seen improvement, as developers can avoid extra interruptions and focus on their work.

Composite Organization

Based on the interviews, Forrester constructed a TEI framework, a

“I have heard from multiple people in the user community that they are so happy and so pleased that we are using this.”

*Director of data science,
communication*



“We wanted to know how often they have to keep getting everybody up to speed, and everyone was nodding their heads like crazy.”

*Developer services manager,
finance*



“We can make a lot of progress by drawing upon our community knowledge.”

*Director of data science,
communication*



composite company, and an associated ROI analysis that illustrates the areas financially affected. The composite organization is representative of the four 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:

- › The composite is a communication technology firm with 2,200 developers, including a subset of senior developers who were more often looked to for help.
- › Developers were asking an average of 1,500 total questions per month.
- › Of those questions, 85% were redundant.
- › Each question took 20 minutes to prepare and ask, and each answer took 35 minutes to respond.

Deployment characteristics. The composite organization started its Stack Overflow for Teams subscription, worked with a core group to seed the platform with a useful starting set of questions and answers, and then opened the platform up to everyone. No training was required as virtually everyone was already familiar with the public portal.

“Stack Overflow is one the elements to develop our ecosystem to meet the expectations of the kind of people that we would want to have as engineers here.”

CTO, finance



Key assumptions

- 1,500 questions were asked each month before Stack Overflow.
- 85% of those questions were redundant.

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	Time saved finding existing answers	\$223,763	\$236,925	\$250,746	\$711,433	\$587,615
Btr	Time saved avoiding answering repeat questions	\$1,106,477	\$1,171,564	\$1,239,905	\$3,517,946	\$2,905,682
Total benefits (risk-adjusted)		\$1,330,239	\$1,408,489	\$1,490,651	\$4,229,379	\$3,493,297

Time Saved Finding Existing Answers

Across all interviewed organizations, employees save time by avoiding having to explain an issue in person or type a query in email or chat — which often requires writing up more than just a quick question, including reproduction steps, code snippets, and other details. This can be time-consuming and even a little draining, especially when asking a question that a developer is sure has been answered before, but probably doesn't remember where the answer is found.

With Stack Overflow for Teams, developers can access the company-specific portal, search for the answer to a question, or ask a new question. Interviewed organizations highlighted time savings and developer productivity as key benefits and listed some of the issues they faced before:

- › A communication firm using Stack Overflow for Teams for developer support highlighted how repetitive questions wasted time. The director of data science said, "Opening up a ticket . . . could take several minutes and takes a week to close." The director added how difficult other solutions could be to manage, "There's a whole level of effort just maintaining an FAQ."
- › A finance organization had collaboration tools, but they were siloed and difficult to search. The CTO said: "Teams would come up with some useful information and put it in their wiki, but it would be very unlikely that it would be found. It's unlikely one team would go and hunt around in another team's wiki, and there wasn't a very sophisticated horizontal search capability."

With Stack Overflow for Teams, developers are more productive and can stay focused on their work. The developer services manager for a finance organization said, "We know developers are important, they're expensive, and we want to make sure we're maximizing their value."

For the composite organization, Forrester assumes:

- › Asking a question takes an average of 20 minutes. (This does not include the cycle time of waiting for an answer; while that can impact productivity, Forrester assumes developers had enough to work on while waiting for a response.)
- › Finding an answer on Stack Overflow for Teams takes around 5 minutes.

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 nearly \$3.5 million.

"We know developers are important, they're expensive, and we want to make sure we're maximizing their value."

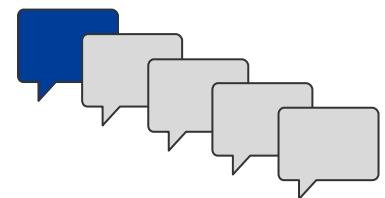
Developer services manager, finance



- › Developers previously had an average of 1,500 questions each month. Before Stack Overflow for Teams, all of these required some method of asking someone else to provide an answer.
- › Eighty-five percent of those questions were redundant — questions that had been asked and answered, but only available for that individual or a small group. The CTO of a finance organization said that with Stack Overflow for Teams, “We’ve had some questions with 800 hits; so, the time it took to write a question is scaled across 800 people that have looked at it.”
- › Today, an average of 225 questions are posted to the Stack Overflow for Teams platform each month. The CTO at a finance organization said, “There is very low friction to asking questions and sharing information.”
- › That means the organization avoids 1,275 repetitive questions per month in the first year, now that someone has already provided answers to many questions in the past, and a developer can find the answer to their question with a quick search or two. The DevOps manager for a communication company said: “It can help people help themselves, to not only be able to ask questions of experts but to collaborate with each other. They can collaborate with each other, they can communicate with comments, and they can figure it out together.”
- › The number of avoided questions grows at a 5% rate year over year, in part due to new complexities as well as increased use across the development group.
- › The number of questions added to Stack Overflow for Teams remains steady; even though developers may use the platform more over time, more questions (and answers) are also added, thus avoiding more questions in the future.

“We’ve had some questions with 800 hits; so, the time it took to write a question is scaled across 800 people that have looked at it.”

CTO, finance



Before Stack Overflow for Teams, 85% of questions were redundant.

Time Saved Finding Existing Answers: Calculation Table

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
A1	Number of questions asked per month before Stack Overflow for Teams	Composite	1,500	1,575	1,654
A2	Number of questions asked per month since Stack Overflow for Teams	Composite	225	225	225
A3	Percentage reduction in questions asked	$1-(A2/A1)$	85.0%	85.7%	86.4%
A4	Total questions avoided per month	$A1-A2$	1,275	1,350	1,429
A5	Work time it takes to ask a question (minutes)	Composite	20	20	20
A6	Work time it takes to find an answer for a question already asked on Stack Overflow for Teams (minutes)	Composite	5	5	5
A7	Total time saved (hours) per year	$A4*(A5-A6)/60*12$	3,825	4,050	4,286
A8	Average hourly salary for employees with questions	Assumption	\$65	\$65	\$65
At	Time saved finding existing answers	$A7*A8$	\$248,625	\$263,250	\$278,606
	Risk adjustment	↓10%			
Atr	Time saved finding existing answers (risk-adjusted)		\$223,763	\$236,925	\$250,746

With 15 minutes of time saved for every avoided question, this adds up to between 3,825 and 4,286 hours saved each year. At an average fully

burdened rate of \$65 per hour, that totals \$223,763 saved in Year 1, \$236,925 in Year 2, and \$250,746 in Year 3.

With a broad group of developers with different questions leveraging Stack Overflow for Teams at different adoption rates, Forrester applies a 10% risk adjustment to allow for any overestimates in the percentage of questions already asked and the time saved per question now found on Stack Overflow for Teams. The result is a three-year risk-adjusted total PV of nearly \$588,000.

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.

Time Saved Avoiding Answering Repeat Questions

Stack Overflow for Teams helps avoid spending time asking questions that have already been asked. But asking a question isn't the biggest part of the problem: It's the person on the other side of the conversation, the answerer, who is impacted the most. Answering questions not only takes time and thought to write up and confirm an answer; it may also require extra research and definitely interrupts from regular ongoing work. Developers have email and chat applications running — as colleagues or managers may have questions or updates — so they typically saw message alerts for all questions, and it's natural to see a question and try to help out if possible. While some efficiencies may be possible by cutting and pasting repeatable answers, that practice varied greatly from person to person, and that information was never effectively centralized for sharing and collaboration.

Interviewed organizations described the time it took to answer a question — and often these were more senior employees working on business-critical applications. Organizations reported that:

- › It's difficult to avoid interruptions. The CTO of a finance organization said: "Folks tend to have email open and when a notification pops up, it is distracting. If you're receiving a dozen emails a day that require some amount of attention, that is disruptive."
- › Stack Overflow for Teams has helped developers budget their time better. The developer services manager at the other finance organization said, "Instead of being nearly continuously interrupted while trying to be productive, we can budget time for this collaboration and stay productive the rest of the time."
- › The technical product manager for a communication company said: "How many questions were we answering on a regular basis? That's hard to measure exactly, but definitely enough to keep three people busy full time."

For the composite organization, Forrester assumes that:

- › The same 1,500 questions would have been asked without Stack Overflow for Teams.
- › On average, any question asked (whether before or today) has an average of 1.5 answers, as someone might jump in with more updated or corrected information, provide a different option, or simply add to and validate a previous answer.
- › That adds up to 338 answers per month provided today on the Stack Overflow for Teams platform and 1,913 avoided answers per month for questions that are no longer asked multiple times. The DevOps manager for a communication company said, "Other employees can

"How many questions were we answering on a regular basis? That's hard to measure exactly, but definitely enough to keep three people busy full-time."

*Technical product manager,
communication*



learn from it and would decrease that team's need to answer that same question over and over and over again."

- › New answers add to the many other answered questions in Stack Overflow for Teams, continually adding value to the platform. The CTO of a finance organization said: "An email will end up as a lost thread; with Stack Overflow we see lots of refinement with edits, comments, and answers. The value of an answer goes up because it becomes more broadly applicable and even more accurate over time."
- › An answer takes 35 minute to prepare (whether before or since Stack Overflow for Teams).

That adds up to 13,388 hours saved in Year 1, 14,175 in Year 2, and 15,002 in Year 3.

While a smaller group, these senior developers spending time answering questions have different habits and adoption rates. To account for any overestimation and variability, Forrester has applied a 5% risk adjustment. The result is a three-year risk-adjusted total PV of more than \$2.9 million.

"Other employees can learn from it and would decrease that team's need to answer that same question over and over and over again."

DevOps manager, communication



Time Saved Avoiding Answering Repeat Questions: Calculation Table

Ref.	Metric	Calculation	Year 1	Year 2	Year 3
B1	Number of questions per month asked before Stack Overflow for Teams	A1	1,500	1,575	1,654
B2	Average number of answers provided per question	Composite	1.5	1.5	1.5
B3	Total number of answers provided per month before Stack Overflow for Teams	B1*B2	2,250	2,363	2,481
B4	Number of questions asked per month since Stack Overflow for Teams	A2	225	225	225
B5	Number of answers provided per month with Stack Overflow	B4*B2	338	338	338
B6	Total number of answers avoided per month	B1*B2-B5	1,913	2,025	2,143
B7	Time it takes to answer a question (minutes)	Composite	35	35	35
B8	Total time saved (hours) per year	B6*B7/60*12	13,388	14,175	15,002
B9	Average hourly salary for employees answering questions	Assumption	\$87	\$87	\$87
Bt	Time saved avoiding answering repeat questions	B8*B9	\$1,164,713	\$1,233,225	\$1,305,163
	Risk adjustment	↓5%			
Btr	Time saved avoiding answering repeat questions (risk-adjusted)		\$1,106,477	\$1,171,564	\$1,239,905

Improved Employee Morale And Recruiting

Stack Overflow for Teams can be a part of an organization's broader technology modernization efforts. Investment in new and helpful solutions can automate common tasks, improve collaboration, and improve efficiency. This leads to an environment where employees can enjoy their work more, more employees may provide more references, and interviewed candidates see more commitment to modernization when they hear about investment in Stack Overflow for Teams and other solutions. The developer services manager at a finance organization said: "People are enthusiastic about the experience. We are collecting knowledge, so we don't have to be answering repeat questions. That

improves productivity; that also improves morale.”

Avoided Developer “Flow” Interruptions

Flow is a state of cognitive performance that can lead to increased performance, especially for complex work. Developers achieving flow can be 52% to 127% more productive, depending on the complexity of their task, than average workers. And every time they stop to answer a question — or even consider answering a question — flow is broken. Forrester’s report, “Engineer Your Technology Environment To Improve Employee Productivity And Flow” summarizes the impact of flow on business: “Interruption-driven work environments lead to lower-quality decisions and reduce speed on complex tasks. . . . Distracted workers tend to skip or put off tasks with high value, like planning and problem solving.”²

Helping employees achieve flow more often, such as helping avoid repetitive and distracting questions, can significantly improve productivity. Stack Overflow for Teams helps avoid those questions — and also moves questions that still need to be asked to a central, collaborative portal, where developers can go at set times to review material or help answer questions.

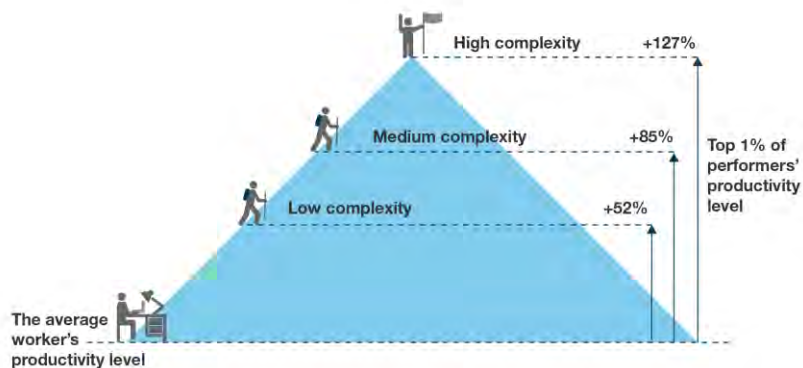


“Interruption-driven work environments lead to lower-quality decisions and reduce speed on complex tasks.”

FORRESTER RESEARCH

The Higher The Complexity Of Work, The More Flow Matters

Engineer Your Technology Environment To Improve Employee Productivity And Flow



Source: John E. Hunter, Frank L. Schmidt, and Michael K. Judiesch, “Individual differences in output variability as a function of job complexity,” *Journal of Applied Psychology*, February 1990

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Source: Forrester Research, Inc. Unauthorized reproduction, citation, or distribution prohibited.

Flexibility

The value of flexibility is focused on the future opportunities in which organizations may invest to broaden or deepen their Stack Overflow for Teams deployments and enable future benefits. Several interviewed organizations highlighted how they want to expand Stack Overflow for Teams adoption to other groups in the business, such as human resources and finance departments. This could enable use and benefits in two ways:

- › **Developer-like collaborative teams.** Departments such as finance have their own set of standards and best practices, and employees

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.

often need to check with a colleague to remember the exact rule — as a developer might have a question about a section of code. Stack Overflow for Teams can provide that focused environment where they can ask questions, provide answers, and update those answers as rules change.

- › **Top-down information and support.** Stack Overflow for Teams can also help organizations looking to store common employee questions that are often relevant to many others in the organization. The platform can serve as a central repository for this information, where a smaller group serves as the experts and virtually all other employees can ask questions such as: “How do I set up email?” or “Where can I find the list of corporate holidays?” Questions that are often repeated, but also require occasional review and updating, can be inconvenient to update in other collaboration platforms but can be updated in Stack Overflow for Teams by simply adding a new answer to an existing question.

The value of these flexibility opportunities could be measured in a similar way for the developer teams, looking at time saved asking and answering questions, or could be based on how that information might impact business metrics or results.

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

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
Ctr	Stack Overflow license costs	\$0	\$448,800	\$489,600	\$534,480	\$1,472,880	\$1,214,191
Dtr	Resource costs	\$8,800	\$11,440	\$11,440	\$11,440	\$43,120	\$37,250
	Total costs (risk-adjusted)	\$8,800	\$460,240	\$501,040	\$545,920	\$1,516,000	\$1,251,441

Stack Overflow License Costs

The primary investment cost is the subscription for the Stack Overflow for Teams platform. Forrester has used Stack Overflow for Teams Enterprise tier public pricing of \$17 per user per month for the composite organization, with the number of licenses increasing slightly each year from Year 1 through Year 3 to allow for growth in the development team.

For the composite organization, Forrester estimates \$448,800 in Year 1, \$489,600 in Year 2, and \$534,480 in Year 3. Since Forrester has referenced public pricing, we do not apply a risk adjustment. The three-year present value adds up to \$1.2 million.

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 less than \$1.3 million.

Stack Overflow License Costs: Calculation Table

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
C1	Stack Overflow license costs			448,800	489,600	534,480
Ct	Stack Overflow license costs	C1	\$0	\$448,800	\$489,600	\$534,480
	Risk adjustment	0%				
Ctr	Stack Overflow license costs (risk-adjusted)		\$0	\$448,800	\$489,600	\$534,480

Resource Costs

For the interviewed organizations, setup was minimal, no training was required (as everyone who would be using Stack Overflow for Teams was already a Stack Overflow user), and the only upfront cost included some time — about 100 hours spread across a number of senior developers — to prepare a starting volume of questions and answers. The DevOps manager for a communication firm said: “We basically just set it up and let it roll. We did some internal marketing in the beginning to let people know it was there and the benefits it could provide.”

“We basically just set it up and let it roll.”

DevOps manager, communication



Resource Costs: Calculation Table

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3
D1	Question seeding time (hours)		100			
D2	SME rate (during seeding)	B8	\$80			
D3	Hours per week for ongoing management			5	5	5
D4	Ongoing management FTE hourly rate			\$40	\$40	\$40
Dt	Resource costs	D1*D2+D3*D4*52	\$8,000	\$10,400	\$10,400	\$10,400
	Risk adjustment	↑10%				
Dtr	Resource costs (risk-adjusted)		\$8,800	\$11,440	\$11,440	\$11,440

Ongoing, Forrester estimates that the composite organization needs about 5 hours of week to moderate the site — such as finding and handling questions without answers.

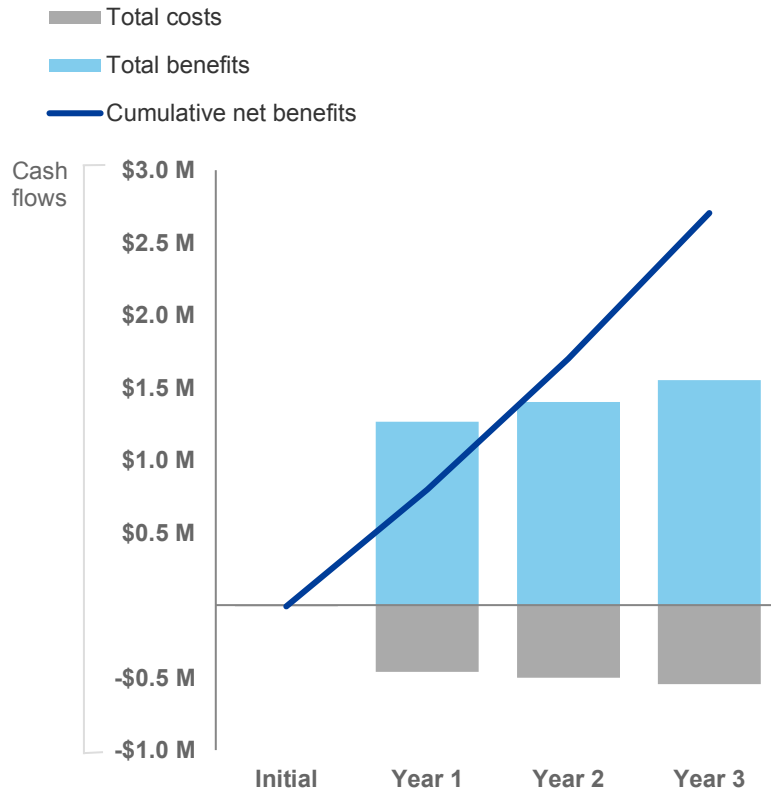
The totals are \$8,800 during implementation and \$11,440 per year, with a 10% a risk adjustment applied. This adds up to a three-year present value of \$37,250.

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.

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 and NPV for the composite organization's investment. Forrester assumes a yearly discount rate of 10% for this analysis.



These risk-adjusted ROI, and NPV 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	(\$8,800)	(\$460,240)	(\$501,040)	(\$545,920)	(\$1,516,000)	(\$1,251,441)
Total benefits	\$0	\$1,330,239	\$1,408,489	\$1,490,651	\$4,229,379	\$3,493,297
Net benefits	(\$8,800)	\$869,999	\$907,449	\$944,731	\$2,713,379	\$2,241,856
ROI						179%

Stack Overflow for Teams: Overview

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

ABOUT STACK OVERFLOW FOR TEAMS

The Stack Overflow for Teams solution offers a singular place for all team members to find and share information in a completely private and secure environment. Stack Overflow for Teams empowers knowledge workers to find answers to big questions in the moments when it matters the most.

The Enterprise solution is a powerful collaboration tool where organizations can share proprietary information and achieve business goals faster. By enabling knowledge workers with tools that they need to solve problems, companies are able to increase the speed of development cycles and produce features, products, and services faster than ever before.

Stack Overflow for Teams drives in-the-moment knowledge for team members, reducing the time spent searching for answers. With companies implementing several tools and services, Stack Overflow for Teams serves as the central point of information.

For more information, visit <https://stackoverflow.com/enterprise>.

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 Source: “Developer Engagement Best Practices,” Forrester Research, Inc., September 13, 2019.

<https://www.forrester.com/report/Developer+Engagement+Best+Practices/-/E-RES155337>

² Source: “Engineer Your Technology Environment To Improve Employee Productivity And Flow,” Forrester Research, Inc., December 15, 2017.

<https://www.forrester.com/report/Engineer+Your+Technology+Environment+To+Improve+Employee+Productivity+And+Flow/-/E-RES113826#dialog-1573174355745-dialog>