InnerSource Commons

State of
InnerSource
2021

Contents

Executive Summary

We have seen a huge increase in the adoption of InnerSource in the past two years, as more and more organizations recognize the potential for InnerSource to break down silos, enable code re-use and accelerate innovation. Of course, InnerSource is also seen to be a great step on the path to open source readiness.

The InnerSource Commons is the world's largest community of InnerSource practitioners. Its goal is to create and share knowledge about InnerSource: the use of open source best practices for software development within the confines of an organization. Founded in 2015, the InnerSource Commons is now supporting and connecting over 1,500 individuals from over 500 companies, academic institutions, and government agencies. Research into the State of InnerSource in the marketplace is regularly conducted as part of our Working Group activity.

This research represents a snapshot of how the InnerSource Commons community is approaching InnerSource as a strategy, and where they are on their InnerSource journey in terms of adoption status and team readiness. InnerSource culture and an overview of potential blockers and obstacles are examined. It also covers the InnerSource practices in most common use, benefits experienced, success measures and metrics, and the motivations of those involved. It represents a diverse set of experiences across multiple roles and organizational profiles from across the globe and we hope it provides some inspiration and context to those of you on your own InnerSource journey.

A huge thank you goes to all those who responded to the survey. We encourage all who read this report and to gain insights into what other organizations are doing on their journey to InnerSource adoption. If you want to discuss the findings further, do come join us in the InnerSource Commons (www.innersourcecommons.org); it's the perfect place to share and learn from others who are leading InnerSource practices worldwide.

We hope to welcome you soon to the InnerSource Commons!

Clare Dillon
Executive Director InnerSource Commons

Matt Cobby

Director of Engineering at Deloitte

When most companies are in the process of transforming into technology companies or pivoting their business model to create new markets, InnerSource is becoming increasingly important as a way to create the vibrant engineering cultures that drive software delivery performance.

"This year's report shows a watershed moment where InnerSource is maturing in companies with the leaders now creating teams and roles to grow their InnerSource programs"

This year's report shows a watershed moment where InnerSource is maturing in companies with the leaders now creating teams and roles to grow their InnerSource programs. This is critical to the success in changing the engineering practices in a company and executing on technology strategy. The survey also highlights that one of the most significant challenges to a successful InnerSource culture is that developers don't feel supported to make changes to shared code bases. This may be because they are too busy to uplift shared code, they are not rewarded for their work, or the work is not valued by senior management. A dedicated InnerSource team can remove these blockers and unlock productivity gains across the organisation.

I am also seeing InnerSource quickly gaining traction in financial services where it can bridge the gaps between the silos, helping to spread innovations from cutting edge teams to more traditional legacy teams.
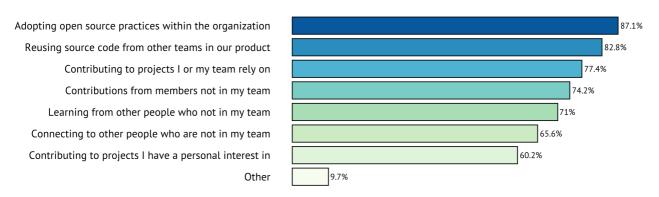
InnerSource brings a safe, simple way for engineering teams to collaborate on shared components to speed up delivery, reduce the costs and risks of development and improve quality of code and drive better customer outcomes.

InnerSource Practices

InnerSource means different things to different people within different organizations. When asked what InnerSource meant to them, respondents could select any number of the options presented below (see figure on the next page). Our analysis shows that "adopting open source practices" is the primary association with InnerSource (over 87% of respondents). Previous research has suggested that open source practices observed in InnerSource settings are:[1]

- Universal access to development artifacts
- A transparent development environment
- Peer-review of contributions
- Informal communication channels, such as mailing lists and Internet Relay Chat (IRC) channels (IRC being very popular before the rise of modern reincarnations such as Slack and Discord)
- Self-selection of motivated contributors
- Frequent releases and early feedback (Eric Raymond's principles of "release early, release often".
- 'Around the clock' development.

When I think of InnerSource, I think of the following

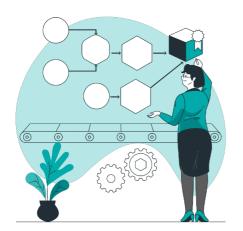|	
Adopting open source practices within the organization	87.1%
Reusing source code from other teams in our product	82.8%
Contributing to projects I or my team rely on	77.4%
Contributions from members not in my team	74.2%
Learning from other people who not in my team	71%
Connecting to other people who are not in my team	65.6%
Contributing to projects I have a personal interest in	60.2%
Other	9.7%

In the 2021 report, which practices are adopted varies by organization, as each organization tends to have a different approach to adopting InnerSource.[2] And yet, we can identify a number of common practices, and indeed distil patterns (see the sidebar "InnerSource Practices as Patterns"). The results of this question suggest that code dependencies play a major factor in the daily practice of InnerSource: almost 83% of respondents associated reusing of code from other teams in

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[1] K. Stol et al. (2014) Key Factors for Adopting InnerSource, ACM Transactions on Software Engineering and Methodology volume 23, number 2

[2] D. Cooper and K. Stol (2018) *Adopting InnerSource: Principles and Case Studies*. O'Reilly Media.

a product as a practice. Being able to reuse code in a way that removes barriers and reduces friction between teams has traditionally been a major driver for the emergence of InnerSource.[3]

InnerSource is not only about 'read-only' of code, it is also about "scratching an itch": users of software who identify issues, and fix those themselves. Over 77% of respondents associated InnerSource with an ability to contribute to projects upon which they are dependent, and 74% associated it with receiving contributions from people who are not part of the team. These last few items suggest that InnerSource is an important way to overcome common problems and reduce friction in the (re)use of components that are developed by other teams. Even within a single organization, teams may experience the "Not-Invented-Here" syndrome. InnerSource can help to strengthen relationships between teams and build trust, by having explicit agreements on how to work together, including providing support and reviewing each other's contributions.

InnerSource Practices as Patterns
Sebastian Spier

The InnerSource Commons has created a community of InnerSource practitioners from all over the software industry. It provides a safe space for sharing stories about what has worked, and what hasn't, in terms of InnerSource collaboration. However, when hearing such stories, how does one know whether a solution applies to your organization or not?

This is where patterns are helpful. Patterns follow a simple format to describe a repeatable, proven solution to a problem within a context. When reading a pattern, practitioners can compare the pattern to the context in their organizations, to assess whether the situation is similar enough to make the solution applicable to them.

Once you decide that you want to apply a pattern in your organization, the pattern format assists you during the implementation of a solution to understand the constraints of the problem, the forces you need to balance, and the resulting context—the situation created by applying the solution.

A pattern isn't something that you can just copy and apply as is, but rather a starting point for adapting a proposed solution to the context of your organization.[1]

[1] InnerSource Patterns: Best Practices in pattern format – Easy to understand, evaluate, and apply, Available at: innersourcecommons.org/learn/books

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[3] C. Melian (2007) Progressive Open Source: The Construction of a Development Project at Hewlett-Packard, PhD dissertation, Stockholm School of Economics.

A few other practices are noteworthy as well. By receiving contributions from 'outsiders', i.e. people not on the team that owns the software, developers are able to learn from others. 71% of respondents associated InnerSource with such type of learning. The ability to connect to other people within the organization, which makes InnerSource effectively a socialization process, was selected by over 65% of respondents. Finally, over 60% selected the ability to contribute to projects that they had a personal interest in, suggesting that intrinsic motivations to contribute, which are commonly found in Open Source development, are also relevant to InnerSource.

How are InnerSource Patterns Created?

Sebastian Spier

Patterns are a way for InnerSource Commons participants to concisely share information, improving the practice of InnerSource. Patterns are documented using a fixed template, with the following main sections: Title, Problem Statement, Context, Forces, and Solutions.

But how are new patterns created?

In an open process, patterns are proposed, reviewed, and improved collaboratively by InnerSource practitioners. The most mature patterns are published in an online book at patterns.innersourcecommons.org.

Even after a pattern has been published, they are improved and refined further over time, as multiple organizations use and extend the pattern. One way to improve a pattern is for organizations to describe their way of applying the pattern. In pattern lingo we call that "an organization becomes a known instance" of the given pattern.

A pattern isn't something that one can just copy and apply. The solutions proposed in a pattern are meant to be a starting point, which practitioners then must adapt to the way that their organization works. By way of doing that, new experiences are made with the way that InnerSource may work in an organization, which can then be contributed back to the respective pattern and the InnerSource Commons as a whole.
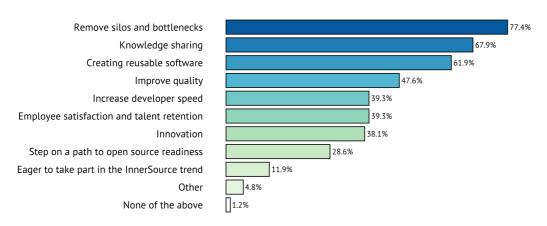
Further Reading

E Bank, G Grütter and R Hanmer, KJ Stol, P Sudarsan, C Williams, T Yao, and Nick Yeates (2017) Innersource patterns for collaboration. In: *Proceedings of the 24th Conference on Pattern Languages of Programs*, 2017, Vancouver, British Columbia, Canada, ACM.

Benefits and Motivating Factors

There's a range of motivating factors that has led organizations to embark upon their InnerSource journey. Top motivating factors are the reduction of friction by means of removing development silos and bottlenecks, and knowledge sharing, and creating reusable software.

Which factors motivated your organization to adopt InnerSource?

Factor	Percentage
Remove silos and bottlenecks	77.4%
Knowledge sharing	67.9%
Creating reusable software	61.9%
Improve quality	47.6%
Increase developer speed	39.3%
Employee satisfaction and talent retention	39.3%
Innovation	38.1%
Step on a path to open source readiness	28.6%
Eager to take part in the InnerSource trend	11.9%
Other	4.8%
None of the above	1.2%

These are the same key factors that drive InnerSource adoption. All three are related to the way that most organizations are structured. Large organizations tend to be divided into a number of business units, and within those, different teams, to make them more manageable. That is, each unit is managed by a person who is responsible for making that unit effective. As soon as you create such organizational boundaries, there will be an 'in-group' and an 'out-group': those within a team versus those not in the team. This can create all sorts of issues. For starters, different teams and divisions may have different policies and priorities in place. Teams each have a delivery cycle or "cadence" and those are often not aligned, causing trouble when code needs to be integrated from different teams. Code dependencies cause issues when a bug in one team's code is blocking another team's progress.

InnerSource seeks to overcome those intra-organizational boundaries. It emphasizes transparency so that others outside a team can investigate issues and propose solutions, depending on their own needs. By opening up, InnerSource helps to remove 'silo thinking' and development bottlenecks. It also helps to facilitate knowledge sharing: simply opening up discussion boards and forums allows anybody to consume, but also share knowledge. By sharing experiences and identifying common problems, the InnerSource paradigm can help facilitate the creation of reusable software.

Benefits of InnerSource
Maximilian Capraro

The results of our survey indicate that most organizations are motivated to adopt InnerSource because they expect specific benefits from it. What are some benefits of InnerSource?

Efficiency – cost & time reduction
InnerSource allows developers to permeate and break up silos within their organization.[1] Where a component already exists, InnerSource makes it easier to reuse for all teams. Where a bottleneck exists, InnerSource empowers teams to contribute changes themselves instead of escalating or building own workarounds. In doing so, InnerSource leads to cheaper, faster, more efficient development as well as more reuse.[2] The survey respondents observed measurable success in removing silos and bottlenecks and creating more reusable software.

Quality of code & product
The source code of InnerSource components is readable for all employees of an organization. Consequently, all can chip in and help detect and resolve bugs or bring in fresh and innovative ideas. This increases the quality of the source code and the resulting products. In addition, this visibility motivates developers demonstrate their expertise and deliver their best.[3] For our survey respondents, improving quality was among the top motivators as well as experienced and measured benefits of InnerSource adoption.

Knowledge sharing & networking
InnerSource can lead to contribution across team and business unit boundaries that might not have happened otherwise.[4] Each of these contributions is a chance for knowledge sharing – for example in form of the feedback trusted committers give to contributors. Asynchronous and written communication persists that knowledge and builds "passive documentation." [5] Improved knowledge sharing was the second most important motivation to InnerSource adoption for our survey respondents.

Endnotes

[1]Vitharana, P., King, J., & Chapman, H. S. (2010) Impact of internal open source development on reuse: Participatory reuse in action. Journal of Management Information Systems, 27(2), 277-304.

[2]Capraro, M., & Riehle, D. (2016) Inner source definition, benefits, and challenges. ACM Computing Surveys (CSUR), 49(4), 1-36.

[3]Dinkelacker, J., Garg, P. K., Miller, R., & Nelson, D. (2002, May). Progressive open source. In Proceedings of the 24th International Conference on Software Engineering (pp. 177-184).

[4]Capraro, M., Dorner, M., & Riehle, D. (2018) The patch-flow method for measuring inner source collaboration. In Proceedings of the IEEE/ACM 15th International Conference on Mining Software Repositories (MSR) (pp. 515-525). IEEE.
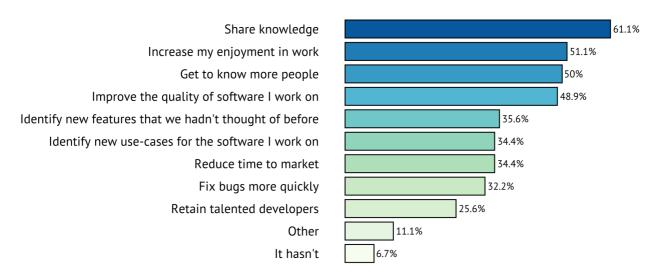
[5]Bonewald, S. (2017) Understanding the InnerSource Checklist. O'Reilly Media, Inc.

Other common motivating factors include improving software quality and increasing developer speed, as well as employee satisfaction and talent retention. All of these motivations are related, of course: developers who feel they are not blocked by red tape, who can get on with a job, creating high quality software, are likely to enjoy a higher level of job satisfaction, which has been linked to higher levels of employee retention.

Perceived Benefits of InnerSource

We also asked respondents to select in which ways InnerSource has helped them and their team. Obviously, these answers are *perceived* benefits, rather than measured benefits—we discuss measurement in the next section.

InnerSource has helped me and my team in the following ways

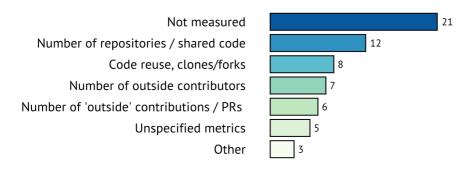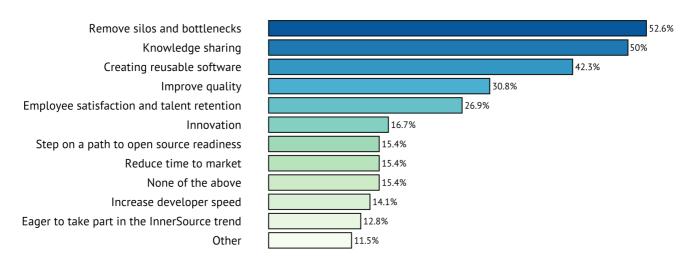| Benefit	Percentage
Share knowledge	61.1%
Increase my enjoyment in work	51.1%
Get to know more people	50%
Improve the quality of software I work on	48.9%
Identify new features that we hadn't thought of before	35.6%
Identify new use-cases for the software I work on	34.4%
Reduce time to market	34.4%
Fix bugs more quickly	32.2%
Retain talented developers	25.6%
Other	11.1%
It hasn't	6.7%

Measuring InnerSource

Most respondents indicated that InnerSource was not measured. The most common way to measure InnerSource activity is by counting the number of InnerSource repositories and the amount of shared code (20%). The second most used measure keeps track of the amount of code reuse, including counting clones and forks. Number of contributions and pull requests from 'outside' team members was also mentioned by several respondents (ca. 12%).

How is InnerSource measured?
Numbers indicate number of responses

Category	Responses
Not measured	21
Number of repositories / shared code	12
Code reuse, clones/forks	8
Number of outside contributors	7
Number of 'outside' contributions / PRs	6
Unspecified metrics	5
Other	3

Have you observed any measurable progress since adopting InnerSource

Category	Percentage
Remove silos and bottlenecks	52.6%
Knowledge sharing	50%
Creating reusable software	42.3%
Improve quality	30.8%
Employee satisfaction and talent retention	26.9%
Innovation	16.7%
Step on a path to open source readiness	15.4%
Reduce time to market	15.4%
None of the above	15.4%
Increase developer speed	14.1%
Eager to take part in the InnerSource trend	12.8%
Other	11.5%

We are happy to see that the top three goals that companies had mentioned in our State of InnerSource 2020 report, when adopting InnerSource, are also the top three indicators of progress in this year's survey. This demonstrates the power of InnerSource in Removing silos and bottlenecks, Knowledge sharing and Creating reusable software.

Several respondents indicated, in addition, that it was too early to tell, but also that measuring progress is difficult. Nevertheless, as shown in the first graph In this section, respondents indicated several metrics that were in use to measure InnerSource activity within their organizations.

Measuring Success on InnerSource
Daniel Izquierdo

It is worth highlighting that survey respondents claim that measuring progress is difficult, but at the same time, they have observed measurable progress since adopting InnerSource. And indeed, the four top benefits to adopting InnerSource are where they have specifically seen progress as well as in silos removal, knowledge sharing, reusing code, and improving quality.

Measuring success and metrics in general are a hot topic at the InnerSource Commons as we can see given the number of talks and attendees during recent Summits and Community Calls.

Community respondents and community members are right. If we are willing to understand and make informed decisions, metrics should be somehow related to the business and cultural goals we're trying to achieve in this journey.

Structure the Information
Thinking of metrics, we all have one metric that could cover our existing pain point nowadays. However, if we extend and aggregate all of our thoughts, these will bring a myriad of metrics for different reasons. Even when discussing metrics, the key part of the conversation is not about them, it is not even about the technology or the tool, it is about how to effectively consume them and how everyone else in the company can integrate them into their daily work.

How can we discover them? In the first place, start with the business goals, what are you trying to achieve? What are your cultural goals? What are your business goals? These first questions on the table will help you determine the rest of the steps as the questions that matter and the metrics that relate to them. There are several methods you could look at as the Goal-Question-Metrics approach.

People, Processes, and Tools
If metrics are a key part of the discussion, technology is another essential piece of the puzzle. No matter how you are measuring this, if you are making decisions on the data, if you are putting metrics in action, there is a need to be able to track the metric algorithm currently in use. Using open source tools to analyze software development metrics is a good starting point, another good starting point is to try the technology internally or even start from scratch a new project on the topic.

Although technology is important, this is not everything and not enough to move forward. There should be a process in place to effectively adopt metrics within the organization and be able to share them in a transparent and collaborative way to the rest of the organization. This should be seen as another tool for everyone's InnerSource journey, and not as a goal itself (e.g., metrics or tools shouldn't be seen as the solution, but as a tool that facilitates the transition into a more InnerSource way of working).
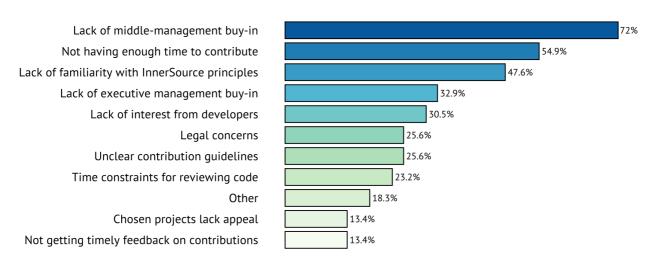
And finally people: the consumers, developers, managers, and other stakeholders. It is important that everyone takes ownership of the metrics that are part of the initiative, with clear expectations and educating everyone into the adoption and understanding of those metrics.

Obstacles to InnerSource Success

While the 'soundbite' definition of InnerSource, "the adoption of Open Source development practices," suggests merely a change in process, InnerSource represents in fact an organizational transformation whose scope is much wider than just the software development process.

Getting buy-in and commitment from middle-management is now seen as the biggest obstacle to InnerSource success. This comes ahead of the lack of time that people can dedicate to contributions, which was the main obstacle identified in our 2020 State of InnerSource Survey. Lack of familiarity with InnerSource principles is still quite high in the list of blockers, together with the lack of executive management buy-in and the lack of interest from developers.

Blockers and obstacles to InnerSource Success

Obstacle	Percentage
Lack of middle-management buy-in	72%
Not having enough time to contribute	54.9%
Lack of familiarity with InnerSource principles	47.6%
Lack of executive management buy-in	32.9%
Lack of interest from developers	30.5%
Legal concerns	25.6%
Unclear contribution guidelines	25.6%
Time constraints for reviewing code	23.2%
Other	18.3%
Chosen projects lack appeal	13.4%
Not getting timely feedback on contributions	13.4%

One of the biggest perceived obstacles to InnerSource success is a lack of middle-management buy-in. This is easy to explain as a result of the 'natural' division of most organizations, whereby mid-level managers seek to optimize their slice of the pie, resulting in local rather than organization-wide optimization of processes. A lack of time to contribute to InnerSource was seen as the second biggest obstacle, and that is simply a side-effect, as developers are struggling with too big a workload assigned to them. We also found that a lack of familiarity with InnerSource principles was seen as an obstacle, and while it is unclear from the survey whether respondents

felt they themselves lacked in their understanding, it is likely that respondents believe that their organization "doesn't quite get it." That is, if organizations don't have a clear InnerSource strategy, then any attempt on the ground to initiate InnerSource projects may be dead in the water. This suggests that there is a need to educate organizations, and in particular managers and executive managers what is needed to set up successful InnerSource initiatives. And therein lies the rub: there is not a "one-size fits all" approach to adopting InnerSource. The InnerSource Commons is actively producing a variety of materials that can help organizations to understand the key principles of InnerSource, and demonstrate how these principles can be applied.

There is a variety of other blockers and obstacles that deserve attention as well. There could be legal concerns, and these usually relate to how code is shared across countries. While the answer to this issue will depend on the context of each organization, a recent event on this topic provides practical advice.[4]

A lack of interests of developers also certainly doesn't help, but we believe that such developers can be inspired once they have experienced the benefits of InnerSource.
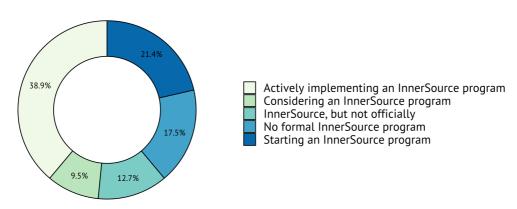
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[4] Transfer Pricing for InnerSource Projects featuring Gijs Meijer (ING Bank), Wolf Salden (ING Bank), and Jesus Alonso Gutierrez (Santander). InnerSource Commons Community Call, 16 March 2022.

InnerSource Adoption

Adoption Status

We see considerable variation in the adoption status of InnerSource across organizations. Roughly 60% of respondents indicated their organization was either actively implementing an InnerSource program, or starting a program. Close to 10% indicated they were considering it, and almost 13% specified that they were doing InnerSource informally. Over 17% indicated that no formal program was in place.
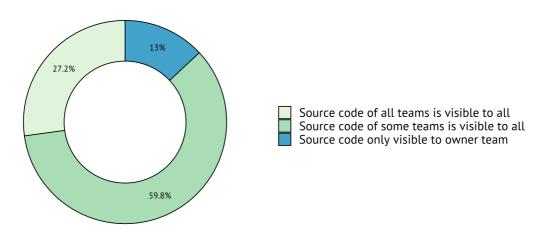
InnerSource adoption status

Legend:
- Actively implementing an InnerSource program
- Considering an InnerSource program
- InnerSource, but not officially
- No formal InnerSource program
- Starting an InnerSource program

Code Visibility

The extent to which source code is made visible throughout organizations also varies across InnerSource programs. Almost 60% of respondents indicated that the source code of some (but not all) teams is visible throughout the organization. Twenty-seven percent responded that all source code is visible to all engineering teams, and 13% responded that there was no visibility of code beyond the team that owned it. One concern expressed in making source code available to all is the issue of export control.
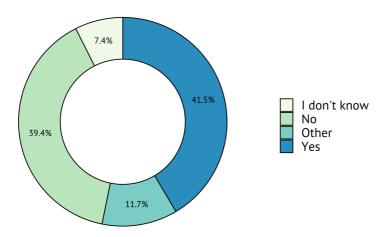
Source code visibility

Legend:
- Source code of all teams is visible to all
- Source code of some teams is visible to all
- Source code only visible to owner team

Dedicated Staff

We also investigated whether organizations hired dedicated people for rolling out InnerSource. Over 41% of respondents indicated their organization did have dedicated roles, such as "Director of InnerSource" or "InnerSource Coach." An almost equal number (over 39%), on the other hand, indicated that no such dedicated staff were in place, and a small number (7.4%) did not know. Numerous respondents indicated other arrangements, including voluntary teams or communities of practice who advocate for InnerSource, part-time dedicated people, and that such roles fall under the organization's Open Source Program Office (OSPO).
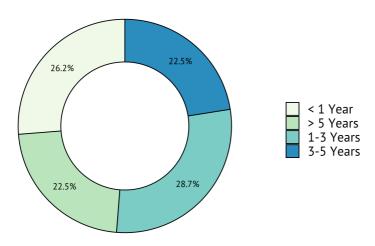
Dedicated people for rolling out InnerSource

History of Adoption

We asked for how long organizations have adopted InnerSource, providing 4 categories. We found an almost even spread across these categories. Over 26% indicated less than one year; almost 29% indicated between one and three years; 22.5% between three and five years, and the remaining 22.5% longer than five years. This indicates that our sample of respondents represents an even mix of organizations in terms of their InnerSource experience.
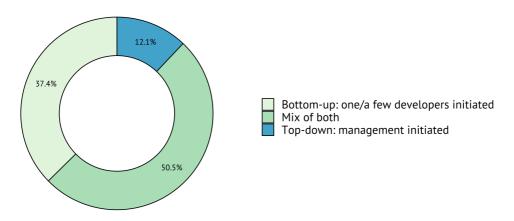
How long ago was InnerSource first adopted?

Top-Down vs. Bottom-Up

Adoption of InnerSource is done in different ways; many of the early initiatives in the late nineties and early noughties started as bottom-up, grassroots initiatives. This is still the case for many organizations today, as indicated by over 37% of respondents. Only 12% of respondents indicated that it was done in a purely top-down fashion, but most respondents, over 50%, indicated a mix of both.
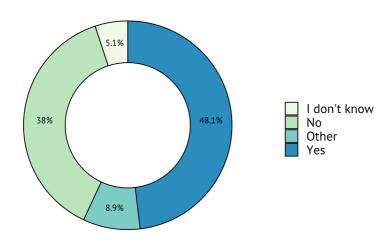
Adoption: bottom-up or top-down

- Bottom-up: one/a few developers initiated
- Mix of both
- Top-down: management initiated

Advertising InnerSource Projects

We asked respondents how projects are "advertised" as InnerSource projects; that is, projects that are explicitly earmarked as projects that are "open" for contributions by others. Almost half (48.1%) indicated that there is a standardized way of doing this, whereas 38% indicated there is not. A small number of respondents didn't know, and about 9% indicated other arrangements. Several people commented "not yet," or that they have but that it's still in an early stage. Some people responded in the confirmative but indicated it wasn't effective, or that it wasn't used by everyone.
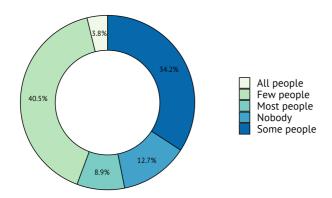
Advertising projects as InnerSource projects

- I don't know
- No
- Other
- Yes

Time to InnerSource

The success of InnerSource projects relies on people from other teams being able to spend time on those projects. We asked respondents to which extent people in their organizations are afforded time to contribute to InnerSource projects. Only a small percentage (3.8%) responded that all people in their organization are afforded such 'self-directed' time; over 40% indicated "few" people"; 34% indicated "some people"; and about 9% indicated "most people" were afforded such time. Almost 13% indicated that nobody in their organization was given time to work on InnerSource projects. Clearly, this represents a huge blocker to make InnerSource a success in those organizations.
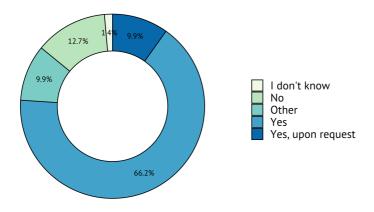
People in my organization are afforded time to contribute to InnerSource

Legend:
- All people
- Few people
- Most people
- Nobody
- Some people

Project Visibility

We asked respondents whether the project that they worked on was visible to others within the organization. Roughly two-third of respondents indicated in the confirmative, and another 10% indicated that source code was made accessible if people would request this. Almost 13% however indicated that this was not the case. About 10% indicated other arrangements, including availability of "parts of the code."

The source code of my project is visible to everybody within the organization

Legend:
- I don't know
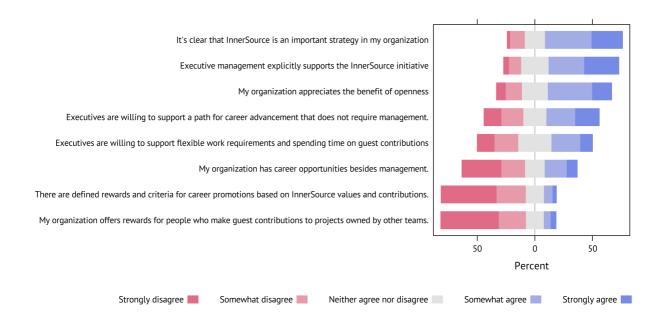- No
- Other
- Yes
- Yes, upon request

InnerSource Strategy

The earliest instances of InnerSource can be traced back to the late nineties, and these were primarily bottom-up, grassroots initiatives by developers and architects who saw an opportunity to leverage the "internal" workforce of their organization. Developers at Philips and Bell Labs (now part of Nokia) were amongst the first to create InnerSource initiatives—and all of them large organizations. While several companies expressed interest in InnerSource and experimented with these ideas, InnerSource as a trend didn't gain much traction in general in the software industry at the time.

That changed in 2015, when Danese Cooper founded the InnerSource Commons, which brought together a community of like-minded people who believe in the strength of open source, and "openness" in a more general sense. Today, the InnerSource Commons community counts hundreds of likeminded engineers, developers, architects, and managers. InnerSource is gaining considerable traction, and many organizations have started InnerSource initiatives.

One aspect that we wanted to focus on in this year's survey was to get a sense of organizations' strategies around InnerSource. We posed a series of statements that respondents were asked to rate in terms of their agreement. These responses reflect participants' perceptions of their organizations' attitude towards InnerSource.

We wanted to understand the extent to which organizations advertise their initiative internally, and whether they are putting their money where their mouth is. Most respondents indicated that their organizations make clear that InnerSource is an important strategy, and that executive management expresses explicit support. Respondents also indicated that they believed their organizations appreciate the benefit of "openness." These are all good signs.
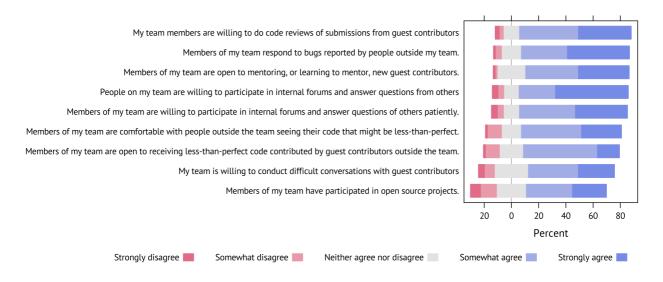
While organizations support InnerSource as an important strategy, many respondents indicated that executives were not willing to support flexible work requirements or spending time on making guest contributions.

We also note that just over half of respondents felt that executives support a path for career advancement that does not require management; this sounds positive, but we also note that most respondents indicated that their organization does *not have* career opportunities besides management. This may be a barrier to InnerSource success at these organizations, because many organizations are managed using hierarchical structures, a "divide and conquer" approach, whereby managers are responsible for their "part of the shop," which leads to local optimization at the cost of global optimization.

More disconcerting is that, while organizations support InnerSource as an important strategy, many respondents indicated that executives were not willing to support flexible work requirements or spending time on making guest contributions. This will be a major barrier for InnerSource success at those organizations, which relies on such arrangements. Further, most respondents indicated that their organizations haven't defined any rewards and criteria for career promotion in relation to InnerSource contributions. Organizations tend not to reward such guest contributions. While explicit rewards in the form of monetary remuneration may not be necessary, if guest contributions are not recognized as having value to the organization, then this will be a major obstacle in making InnerSource a successful strategy for those organizations.
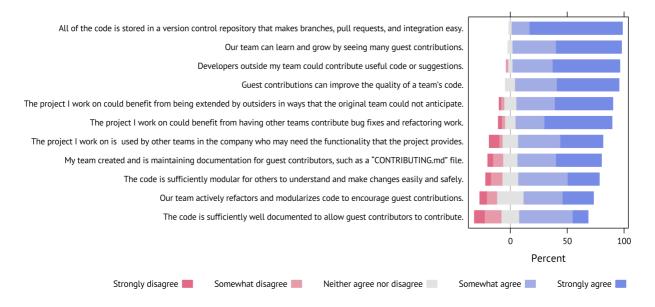
Team Readiness

It's not only important that organizations recognize InnerSource to be a valuable strategy, but also, it is equally important that the people who make things happen on the ground are prepared, and "ready." We asked respondents to indicate their agreement on a series of questions in relation to this. These questions all probe respondents' team members' willingness to partake in activities that are typical in InnerSource projects. The results in the graph below suggest that most respondents felt that their teams are 'ready.'
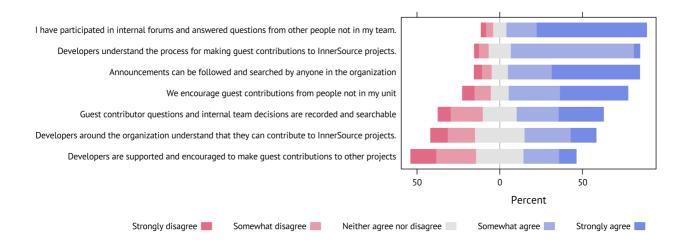

Project Readiness

Whereas team readiness is an assessment of how-well prepared people on a team are, project readiness is a measure of how suitable a project is for an InnerSource approach. As before, respondents rated a series of statements, shown in the figure below.

InnerSource Culture

InnerSource also implies a cultural shift, and this touches upon almost every aspect of developers and teams. The extent to which developers and teams are "prepared" for an InnerSource culture will affect the success rate of InnerSource at an organization. We posed a number of statements around culture to assess this. Helping others in a "community" is clearly a major aspect of building any type of community. Most respondents have participated in internal forums and Q&A platforms to answer questions of people not on their teams.

Isabel Drost-Fromm

President of the InnerSource Commons

Looking at the findings of this report I believe InnerSource really has gained a footing in the industry as a way of growing development, increasing collaboration, and successfully dealing with inevitable dependencies. I hope that for many organizations InnerSource paves the way towards easy and friction-less participation in upstream open source projects for mutual benefit of both the projects and the participating corporation.

Who took the survey?

This year, 125 people participated in the survey, which is considerably more than in previous years. While not all respondents completed all questions of the survey, this sample offers one snapshot of the current state of InnerSource. The response rate is still relatively low; one potential explanation is that InnerSource is still an emerging trend.
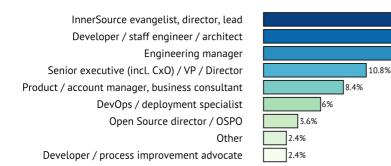
Demographics

Roles

Respondents had a range of roles. Slightly more than a quarter of respondents who specified their role indicated to have a specialized InnerSource role, such as InnerSource Evangelist, Director, or Lead. Another quarter identified as developer, staff engineer or architect. Other roles included engineering manager (ca. 16%), senior executive (ca. 10%), and a product/account managers and business consultant (ca. 8%).
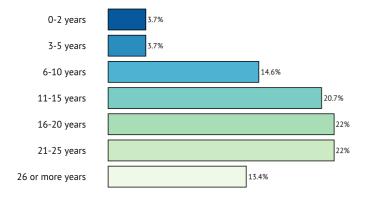
Gender

This year's sample consists of 83% men and 11% women as self-reported by respondents. Six percent preferred not to answer this question. This distribution is similar to the previous State of InnerSource Survey, as well as other surveys in the IT industry.

Role	Percentage
InnerSource evangelist, director, lead	25.3%
Developer / staff engineer / architect	25.3%
Engineering manager	15.7%
Senior executive (incl. CxO) / VP / Director	10.8%
Product / account manager, business consultant	8.4%
DevOps / deployment specialist	6%
Open Source director / OSPO	3.6%
Other	2.4%
Developer / process improvement advocate	2.4%

Years of Experience

Years of experience followed a Gaussian distribution (also known as Normal distribution). Note that the first two groups together cover up to 5 years' experience, whereas all other categories cover 5 years. Most respondents had at least 10 years' experience.
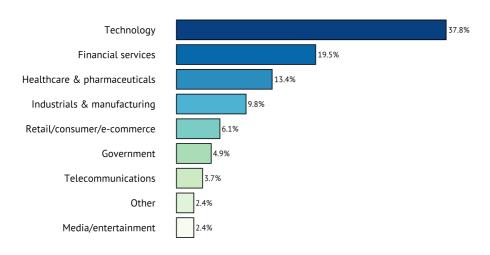
0-2 years	3.7%
3-5 years	3.7%
6-10 years	14.6%
11-15 years	20.7%
16-20 years	22%
21-25 years	22%
26 or more years	13.4%

Firmographics

Industry

As in previous years, respondents are working in a wide range of domains, with technology being the largest. The category technology obviously comprises a wide range of companies offering many different types of services and products. As in previous surveys, several respondents work in the financial services domain.

Industry sectors

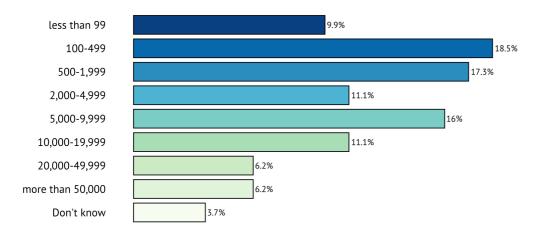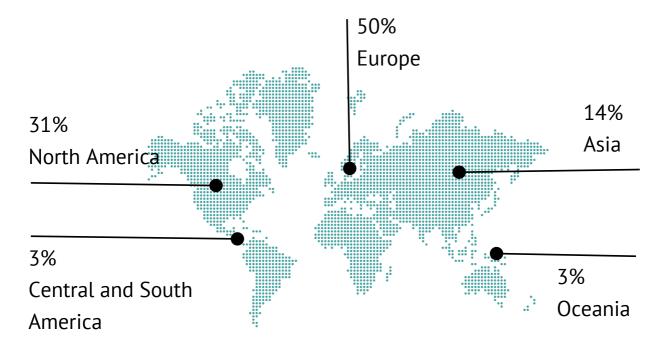|	
Technology	37.8%
Financial services	19.5%
Healthcare & pharmaceuticals	13.4%
Industrials & manufacturing	9.8%
Retail/consumer/e-commerce	6.1%
Government	4.9%
Telecommunications	3.7%
Other	2.4%
Media/entertainment	2.4%

Employees

Respondents came from a variety of industry sectors, and the number of software engineers working with these organizations varies from less than 99 (ca. 10%) to over 50,000 (ca. 6.2%). Roughly 50% of respondents worked in organizations with up to 5,000 software engineers.

How many software developers work in your organization?

Category	Percentage
less than 99	9.9%
100-499	18.5%
500-1,999	17.3%
2,000-4,999	11.1%
5,000-9,999	16%
10,000-19,999	11.1%
20,000-49,999	6.2%
more than 50,000	6.2%
Don't know	3.7%

Regions

Half of the respondents who indicated their location are based in Europe. In second place is North America, with 31% of respondents. Fourteen percent indicated Asia. Participation from Central and South America was limited at 3%, as was participation in Oceania, also 3%.

50%
Europe

31%
North America

14%
Asia

3%
Central and South America

3%
Oceania

Methodology

We designed an online questionnaire based on Silona Bonewald's book Understanding the InnerSource Checklist (see also the section Further Reading) Silona's checklist is an excellent starting point for any organization to understand whether they are 'ready' for InnerSource. The book goes into great detail to explain and justify each checklist item. We took this list and amended these items as questions; some items were dropped, others were combined or rephrased. The questionnaire was administered using SurveyMonkey, and was open for 6 weeks in November-January 2021/2022. We received 125 respondents, but not all respondents completed all questions.

Acknowledgments

We thank all respondents for their time in filling out the survey. We are grateful to Georg Grütter and Lawrence Hecht for their valuable feedback during the survey design and Lawrence Hecht for his keen eye during the write-up.

About the InnerSource Commons

The InnerSource Commons was founded in 2015 and is currently the world's largest community of InnerSource practitioners advocating open development practices within organizations. The InnerSource Commons community interacts through an archived Slack channel, a dedicated mailing list, and organizes several events per year (see below). Further information on the InnerSource Commons can be found on its website: www.innersourcecommons.org.

InnerSource Commons is a 501(c)(3) non-profit organization governed by a set of corporate bylaws. The Board of Directors sets the policy and appoints officers that set and execute policy. The Board is elected by the Membership on a yearly basis. InnerSource Commons initially is incorporated in the US. As the community grows, we anticipate to find sister organizations in the European Union, Latin America, and other parts of the world.

The InnerSource Commons community actively shared knowledge and experiences through a variety of channels, including articles, books, and events. The table below shows the Community Calls and Summits that were organized in the past year.

Date	Event Name	Speakers
Apr 2021	InnerSource Metrics, Value & ROI	Joe Patrao (Bloomberg), Daniel Izquierdo (Bitergia)
May 2021	InnerSource in Government	Zack Koppert (GitHub)
Jun 2021	InnerSource & DevOps	Fei Wan (Comcast), Steph Egan (BBC), Tom Sadler (BBC)
Jul 2021	InnerSource & Discoverability	Michael Graf (SAP), Guilherme Dellagustin (SAP)
Sep 2021	InnerSource in Action	Georg Grütter (Bosch), Isabel Drost-Fromm (Europace)
Sep 2021	InnerSource in the Enterprise	Matt Cobby (National Australia Bank), Willem Jiang (Huawei)
Oct 2021	InnerSource Patterns	Gil Yehuda (US Bank), Fei Wan (Comcast), Sebastian Spier (Meltwater)
Oct 2021	Strategies for Kick-starting InnerSource	Jesús Alonso Gutierrez (Santander), Shishir Saxena (Fidelity)
Nov 2021	InnerSource Summit	With 25+ speakers from global companies.
Jan 2022	InnerSource Programs & People Strategies	Brittany Istenes (Fannie Mae), Danese Cooper (InnerSource Commons)

Feb 2022	InnerSource ROI & Convincing Leaders	Matt Cobby (Deloitte), Daniel Izquierdo (Bitergia), Swapnil Kulkarni (Nuance)
Feb 2022	InnerSource Security	Vishal Kulshrestha (Verizon), Elspeth Minty (Morgan Stanley), Conley Rogers (GitLab)
Mar 22	Transfer Pricing for InnerSource Projects	Gijs Meijer (ING Bank), Wolf Salden (ING Bank), Jesus Alonso Gutierrez (Grupo Santander)

Authors

Klaas-Jan Stol

Klaas-Jan Stol is a faculty member with the School of Computer Science and IT at University College Cork, a Funded Investigator with Lero, the Science Foundation Ireland Research Centre for Software, and a Scientific Advisor with SINTEF, Norway. He has conducted research on InnerSource since 2010. His research focuses on human aspects of software development processes. He's a Member of the InnerSource Commons. Klaas received a PhD from the University of Limerick, Ireland.

Cristina Coffey

Cristina Coffey is an entrepreneur, strategy consultant, start-up mentor and investor. She is an InnerSource enthusiast and passionately believes in the benefits of InnerSource to organisations. Before her involvement with InnerSource Commons through NuaWorks, Cristina held roles such as Head of Innovation, Strategic Director and Strategic Partnerships Manager, as well as founded EuropeanPioneers, a virtual accelerator that invested €4.5M in 25 SMEs across Europe.

Clare Dillon

Clare Dillon has over 25 years experience working with developers and developer communities. In 2020, she was appointed the Executive Director of InnerSource Commons. Clare has been involved with the InnerSource community since early 2019, when she helped set up NearForm's InnerSource practice. Before that, Clare was a member of the Microsoft Ireland Leadership Team, heading up their Developer Evangelism and Experience Group. Clare also works with the OSPO++ Network to support the establishment of University and Government Open Source Program Offices globally, that can collaborate to implement public policy and trustworthy public services.

Sebastian Spier

Sebastian Spier is Director of Engineering Programs at Meltwater. He is working on tools and methods to improve the daily work of 500+ colleagues in Meltwater's Engineering team, removing frictions wherever possible. He sees InnerSource as a central building block to support successful collaboration in distributed teams. As a member of the InnerSource Commons Foundation, he is maintaining the collection of InnerSource Patterns. He is always looking to help others to use and improve these patterns.

Maximilian Capraro

Maximilian Capraro is a software engineer at DATEV where he advocates for InnerSource and is a maintainer in one of the firm's largest InnerSource projects. He is a member of the InnerSource Commons foundation and serves on its board of directors. Before joining DATEV, Max performed research on InnerSource practices and developed the contribution-flow method for evaluating and auditing InnerSource success in large organizations. He holds a doctoral degree from FAU Erlangen, Germany.

Daniel Izquierdo Cortázar

Daniel Izquierdo Cortázar is co-founder and current CEO of Bitergia, a company helping organizations build and accelerate their Open Source Program Office or InnerSource Program Office as well as empower them in the use of software development metrics. He is currently a Member of the Board of Directors at the InnerSource Commons Foundation, and part of the Governing Board of CHAOSS — Community Health Analytics for Open Source Software — a Linux Foundation Project. His main interests are mining software repositories to produce community and process insights, fostering the adoption of open source and InnerSource, and optimizing development teams through transparency and collaboration.
Daniel received a PhD from the Universidad Rey Juan Carlos, Spain.

Further Reading

For many further resources please visit innersourcecommons.org, which includes the following:

InnerSource, the powerful movement for developing open source software within the walls of a single organization, where the "openness" of a project extends across teams inside the company. Author Andy Oram takes you inside InnerSource, first by reviewing the principles that make open source development successful.

Danese Cooper and Klaas-Jan Stol present a series of case studies at a range of companies to show when and why InnerSource may be useful to your organization. The case studies candidly discuss the difficulties of getting InnerSource projects started, along with the progress so far and the benefits or negative fallout.

A Pattern — That's what we call InnerSource best practices codified in a specific format to make it easy to understand, evaluate, and apply them in your context. This book contains the most mature patterns, collected by the InnerSource Commons Community.

Author Silona Bonewald explains how the InnerSource initiative can help your company develop software internally by applying lessons from the open source movement. A checklist guides you through various steps needed to produce software using the InnerSource approach, whether it's company wide or just for one team.

How to manage InnerSource projects? In this book Daniel Izquierdo & José Manrique López explain basic infrastructure as well as metrics that are helpful when introducing InnerSource methodologies into an enterprise.