Drive Innovation by Enabling Innersource

Published 29 November 2021 - ID G00728527 - 12 min read

By Analyst(s): Thomas Murphy, Arun Batchu, George Spafford, Manjunath Bhat, Roger Williams

Initiatives: Software Engineering Strategies; Applications and Software Engineering Leaders

Leading organizations drive collaboration and digital innovation by applying open-source practices to internal development, or innersourcing. Software engineering leaders can use these practices to initiate innersource efforts to increase innovation and collaboration, and attract and retain talent.

Overview

Key Findings

- Organizations are looking for ways to keep pace with business demand for rapid innovation, but struggle to apply proven open-source software practices to internal development.

- Innersource efforts are often thwarted by business unit silos that create cultural barriers to innovation, resulting in duplication of work, poor knowledge sharing and a turf mentality.

- Software engineering leaders face a challenging market for hiring and retaining talent, and need compelling initiatives that will motivate engineers to experiment and drive innovation.

Recommendations

Software engineering leaders responsible for development strategy should:

- Initiate innersource efforts by assembling a team to kick-start the effort and selecting the right technology to support collaboration.

- Grow and sustain innersource efforts by establishing and nurturing lightweight governance and communities of practice.
Strategic Planning Assumptions

Through 2025, software projects that adopt innersource patterns for development will reduce defect escape rate by 70%.

By 2024, software engineering leaders who implement innersourcing will complete innovation pilots in half the time of those that do not.

Introduction

Software engineering leaders are under pressure to keep up with the increased business demand for rapid innovation, which requires them to facilitate greater collaboration and knowledge sharing between historically siloed development teams. To compound this cultural barrier to innovation, software engineering leaders are also facing a difficult market for hiring and retaining talented engineers.

Leading digital innovators are tackling these challenges by adopting innersource practices. This approach not only enables improved collaboration, software quality, and productivity, but also helps organizations to attract and retain talent — all of which are key benefits that drive innovation.

Innersource is the use of open-source principles for internal development and sharing of software assets. In most cases, every software engineer in the organization should be able to use, modify and contribute to all internal source code.

Innersource is a robust, growing set of practices (supported by the InnerSource Commons organization) that organizations are using to build a culture based on knowledge sharing. Innersourcing represents a trend toward bottom-up cultural change, but successful efforts also require strong leadership. How should software engineering leaders introduce and support innersource within their organization?
We interviewed several early adopters to understand how they use innersource programs and how their organization has benefited. In this research, we outline key insights from these interviews that will enable software engineering leaders to initiate, scale and sustain innersource efforts (see Figure 1).

Figure 1. Establish and Scale Innersource

Establish and Scale Innersource

Analysis

Initiate Innersource Efforts

While each organization will have a different starting point, software engineering leaders must build common foundational elements to support innersourcing. This will be rooted in first defining goals for innersourcing such as reuse, collaborative performance enhancement, improved software quality. The key management role is to set the vision, recognizing that this is primarily a change management issue, not a tools issue. Start with sponsoring a community of practice and using tech evangelists or influencers. Early adopters use their pilot team to target initial assets to move to innersource and evangelize benefits to business and engineering leaders.

Build a Team and Promote the Initiative
As with any new strategic effort, software engineering leaders need to establish clear objectives for their innersource initiative to gain strong leadership buy-in. Often, innersource efforts will piggyback on the organization’s broader open-source efforts, and may build off the open source program office (OSPO). Other organizations start independently, creating a community of practice or an incubator, and setting up a product team made up of a product owner and a set of cross-functional engineering resources. This team’s job is to:

- Create and deliver workshops/webinars and act as innersource evangelists.
- Build and evolve guidelines and standards (see Figure 2).
- Look at current work and pick targets for movement to innersource/recruit teams.
- Build additional training to help with culture shifts such as effective code reviews.

**Figure 2: Use Community Standards Backed by Tools Automation**

**Community Standards**

<table>
<thead>
<tr>
<th>Common Repository Structure</th>
<th>CI Pipeline Guardrails</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Naming</td>
<td>• PR Checklist</td>
</tr>
<tr>
<td>• Documentation</td>
<td>• Standards for Test and Quality</td>
</tr>
<tr>
<td>• Navigation</td>
<td>• Code Review Assigned — SLA</td>
</tr>
</tbody>
</table>

Don’t overanalyze things at this step; think of your start in innersource as a minimum viable product. You are building a culture, but the members of that culture will be intrinsic to defining it. Gartner’s Culture PRISM — purpose, rules, identity, safety, measures — can aid with this (see Figure 3).
Leaders are key in framing these elements. A fundamental element is building psychological safety. Building code and opening it up from the start, so that anyone — not just your “inner circle” — can see it, is not a comfortable place for many developers. Ensure them based on the purpose, and drive a culture that is positive in its support for each other. Read *The Culture PRISM: 5 Dimensions That Shape Your Culture* for further guidance.

**Use Collaborative Technology**

Innersource initiatives require a single, common repository that can be accessed by every software engineer within the organization. By using Git as a shared, collaborative repository for software assets, software engineering leaders can break down silos of isolated innovation and improve productivity by reducing duplicated effort. Isolated repositories attached to single teams or business units create not only a lack of sharing, they also become bottlenecks of dependency (see Figure 4).
Start **innersource** by establishing an independent repository using a new Git implementation accessible to the entire engineering organization. Organizations will benefit from using one of the primary Git platforms (such as Atlassian Bitbucket, Gitlab, Microsoft GitHub) due to the collaborative work capabilities of these platforms, including support for the code review process. GitHub is the most popular platform for innersource initiatives because of its strong presence in the open-source world. It also hosts Innersource Commons materials to help users outline practices and patterns.  

Utilize a **continuous integration environment** as a foundation for supporting scale and governance. CI does this through creating guardrails that can be built into the pipeline to look at code style, quality, test coverage and other elements via static analysis and testing tools (such as CheckStyle, Snyk, SonarSource, TestLeft). Implementing universal search such as SourceGraph can also aid efforts in identifying existing assets to move into innersource, and to aid with driving the efficiency of refactoring, finding and fixing issues shared across the codebase.
Gather and Promote Value Metrics

Initial innersource efforts start with very minimal budgets. There are costs such as the cost for servers and software as well as the cost to host communities and promotion activities. Utilizing a lean startup mentality, the goal is building proof points that this will work in the organization and provide tangible benefits. These should match the initial established goals. PayPal, has seen and documented how innersource can benefit engineers, management and marketing/PR departments. 5 Common outcomes mentioned by early adopters of innersource include:

- Creation of common services and libraries that reduce delivery time
- Higher reliability/quality
- Positive participant feelings

Even though there are good examples of successful innersource projects at a variety of organizations, some may still be hesitant because it disrupts current practices and culture. Capturing this information will create foundations for growing and sustaining efforts and establishing dedicated budgets.

Grow and Sustain Innersource Efforts

As innersource efforts grow, organizations will apply a growing set of governance to aid in supporting and sustaining the software assets. A key element to note is that innersource projects begin as “nonscheduled” work. As the value of an asset grows (as an asset relied on by many teams), the need for a dedicated product team with a release schedule may increase. However, retaining the open nature, the asset should still be available for extension, contribution and forking by external contributors. With governance we are primarily trying to have enough clarity and consistency in the following areas:

- Accountability: What is the value we want to obtain from innersourcing, how do we coordinate activities enough to get that value and who makes sure those activities happen? This usually entails putting three roles into place — an executive sponsor to define value intended, a program lead to facilitate coordination and stewards to help the work get done in a coordinated fashion.

- Predictability: How will we translate the accountability items into clear expectations for innersourcing, how do we communicate the results of innersourcing activities and how do we handle deviations from what we expected (both positive and negative)? This isn't about punishment, but about avoiding surprises that undermine commitment to innersourcing or even the broader organization.
Establish a strong digital training program. The program should stress the need for better promotion and documentation of processes, goals and objectives for teams and effective marketing for the things you have built. Marketing and product management are essential for breaking down silos and driving reuse between distributed teams. These aspects of the innersource effort also create additional opportunities for team members to develop skills.

Facilitate internal meet-ups and conferences. Software engineering leaders must provide the technology, space and time that their teams need to support content creation and participation. Innersource should not be seen as an extracurricular activity, but rather a valuable endeavor for which time is allocated during normal working hours. Innersource provides significant value to the company, and investing time in the project will pay dividends.

**Budget**

As long as innersource continues as unplanned work it does not have an associated budget — as in, it is not part of the employee's stated objectives or related directly to compensation. This challenges the sustainability of the software as well as predictability of releases as there will be a struggle between completing planned work versus this “extracurricular activity.” Organizations take different approaches to this. Some provide generic allocation of time for working on “side projects.” Others shift so that all software is developed as innersource, which makes “most” work planned. However, if you are on Team A and are scheduled fully, that leaves no room to work on Product B. Thus, unless there is slack time, participants will participate out of interest, on personal time.

**Participation:** Who needs to be involved in innersourcing and key decisions related to it, without burdening people with work that does not provide value to them or to the organization? This is where the RAPID decision-making model and applying the MoSCoW method to who provides input on the decision are effective.

**Transparency:** How do we ensure that stakeholders have enough visibility into intentions, data quality, availability, timing and formats of innersourcing products and supporting materials, as well as into the results and decision making to build trust, without creating unacceptable organizational risks or excessive burden? This is where access controls, just enough record keeping and tooling play a key role.
Sustaining projects is the least developed area of innersource, and the companies with which we spoke generally have not made strides in formal sustaining efforts. This is also an area that has been challenged in OSS leading to the creation of sustaining monetary systems such as GitHub Sponsors or Tidelift. For innersource, different types of “compensation” may be utilized:

- Recognition programs on the innersource website
- Gamification to drive participation providing badges and certifications
- Potential for compensation in either real monetary payments or “company dollars” (see Note 1)

Evolving Governance

Initial innersource efforts, as noted, need a small team or community: the core of owners, committers, users and management support. As innersource efforts expand, the community will need to scale and connect with additional organizations (see Figure 4). This may involve:

- Establishing SLAs for activities such as performing code reviews
- Expanding and evolving CI guardrails as technologies and security threats evolve via DevSecOps
- Participating in the Innersource Commons
- Interacting with the legal team around potential open sourcing of innersource assets to understand various OSS licenses as well as value to the company vs. patenting
- Increasing program management to manage schedules and releases
- Working with HR on training and recognition programs

The pattern for much of this evolution can build on the pattern of an OSPO to create an innersource program office (ISPO). Indeed, if the organization determines to contribute to open source, these two teams will coordinate together.
Attract, Develop and Retain Talent

One of the consistent values organizations have seen through the adoption of Innersource practices is a positive impact on the ability to hire engineering talent. There is currently an acute shortage of technical talent as noted in the 2021 Gartner Software Engineering Leader’s Survey: Hiring, developing and retaining talent is the top challenge faced by software engineering leaders. This shortage is driven by several factors, including:

- The “great resignation” resulting from the disruption caused by COVID-19
- H1B visas and other labor policies
- Shifting employee mindsets that emphasize a desire to give back and to engage in personally meaningful work.
Early adopters of innersource found that an unexpected benefit was developer enthusiasm, especially among new college graduates accustomed to working in a collaborative fashion, who tend to be motivated by a sense of giving back and by purpose-driven jobs.

Innersource emphasizes principles and practices that drive inclusion and diversity which presents an opportunity for reducing the talent pool crunch (see Overcome Talent Shortages by Building Diverse, Equitable and Inclusive Software Engineering Teams).

Software engineering leaders should aim to not only retain talent but also to develop talent. Innersource creates an environment that supports creative projects, learning new things, and taking pride in individual work, as others utilize your contributions.

**Evidence**

1. Innersource Commons

2. Our team of analysts interviewed Autodesk, Comcast and Continental Tire to learn best practices about innersourcing.

3. Open Source Program Office

4. Innersource Fundamentals, GitHub Innersource Course

5. Getting Started with Innersource, PayPal

6. The 2021 Gartner Software Engineering Leaders Survey was conducted to understand the challenges and responsibilities of software engineering leaders. The research was conducted online from April through June 2021 among 314 respondents from North America (49%), Western Europe (33%) and APAC (18%).

**Note 1. Company Dollars**

The concept of company dollars denotes the use of an internal system of credit that can be paid to employees redeemable through the company. This could be via a company store (on-premises or online) for various goods: logo'd merchandise, coffee, etc. Organizations have also allowed them to be banked up for additional days off. This provides the benefit that the participant may be working extra hours for no real wage increase but has a form of compensation.
Recommended by the Authors

Some documents may not be available as part of your current Gartner subscription.

The Art of Culture Hacking
Foster Communities of Practice to Ensure Successful DevOps
How to Build Successful Communities of Practice for Knowledge Management
Hype Cycle for Open-Source Software, 2020
Building a Platform for Product Team Productivity (adidas)