

Driving engineering culture change at Microsoft: An experimental journey



Overview

The Microsoft One Engineering System (1ES) team was formed in 2014, with the goal of gaining efficiencies through a common engineering tool set. Over the next few years, as progress was made, the team found that the needs of the Microsoft engineering organizations were more complex than initially perceived, leading it to broaden its efforts to encompass culture change. Today, alongside its focus on tools, the 1ES team is leading by example in driving culture change, experimenting with different approaches, building on what works, and walking away from what doesn't. It's focusing on areas where it can make substantial impact, engaging with teams who are ready for change, and helping them achieve it through a diversified engagement model.

Table of Contents



Overview

- I. [The Team](#)
- II. [The Challenge](#)
- III. [The Journey](#)
- IV. [The Results](#)
- V. [Resources](#)

[Visit the Webpage](#)

The Team

Part of the Cloud + AI Platform division at Microsoft, the One Engineering System (1ES) team consists of about 200 people, who work in partnership with divisional level engineering system and tools teams to help improve the engineering experience for the people who design and build Microsoft products and services. Areas of focus include tools, processes, program offices (e.g. open source contribution), accessibility, security and compliance, internal consulting, Inner Source (sharing source code within the organization), and finding/amplifying best practices across engineering teams.

The Challenge

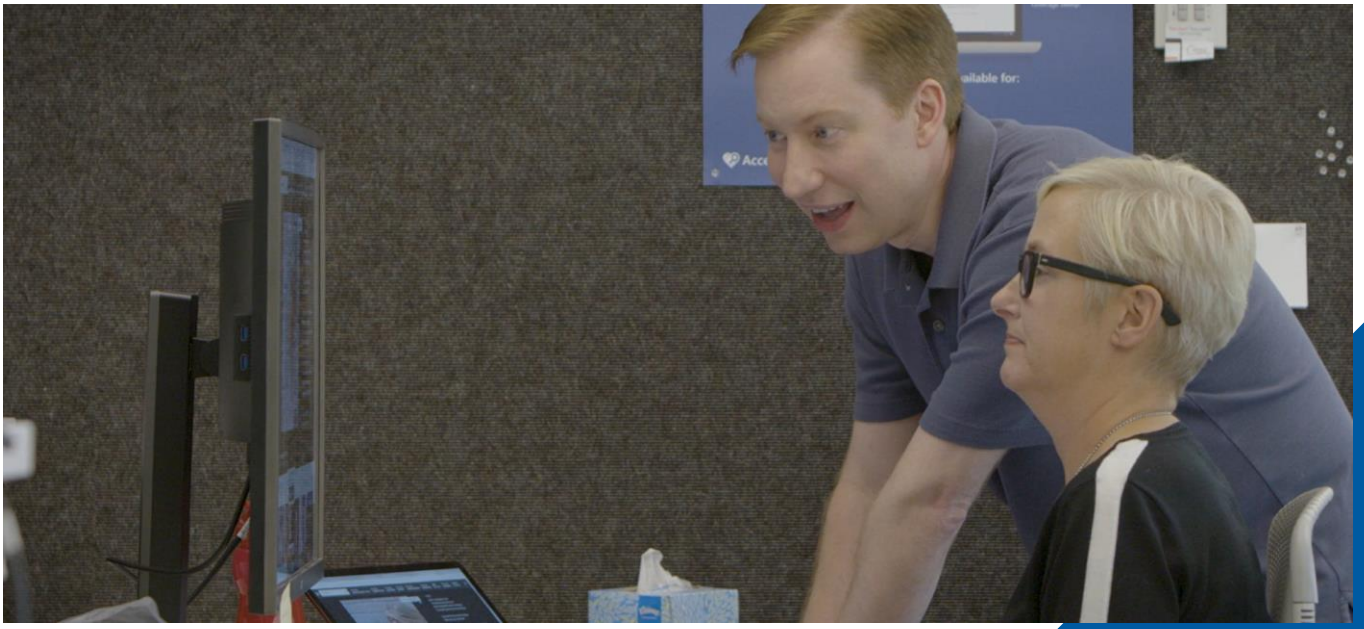
As many successful business leaders know, cultural dynamics within an organization drive business success. But how do you drive culture change, especially in a company as large and diverse as Microsoft? How do you help hundreds of engineering teams, of all shapes and sizes, with varying levels of process maturity, move towards a more DevOps-centric, agile engineering culture? This is one of the questions 1ES team has had to ask itself—and find the answer—since its inception. In the rest of this article, we'll walk you through the team's journey from the start, examine where things stand today, and take a look at where the 1ES team plans to focus its efforts next.

The Journey

The 1ES team's story dates back to 2014, when new Microsoft CEO Satya Nadella defined the need to empower every engineer with the best available tools. Up until then, each division within the company had been free to determine its own engineering tool set, resulting in different tools, processes, and levels of process maturity across the company.

Such diversity led to many drawbacks, including redundant investments in similar tools, few of which had sufficient funding to achieve critical mass. Different tools and processes made it difficult to share code across organizational boundaries and for engineers to move from one team to another. New hires were also disadvantaged, as they were immediately faced with an overabundance of unfamiliar, one-off tools.

The 1ES team initially identified three areas of focus: work planning, source control, and builds. The plan was to identify teams across the company that weren't using the latest and greatest versions of the company's own tools for those functions and drive them to do so, under a top-down "use what we ship, and ship what we use" mindset.



Initial efforts – and results

Over the next few years, in partnership with other teams at Microsoft, the 1ES team drove widespread modernization through adoption of Visual Studio Team Services—now called Azure DevOps—as the standard across Microsoft, with its user base growing from a few thousand to more than 50,000 during that time. Source control issues decreased, build times and build reliability improved, security and compliance efforts were standardized, and the majority of engineering teams were managing their work the same way. Even the vast Windows engineering team, with its thousands of users, millions of work items, and 300 GB of source code, moved from 40+ Source Depot servers to a single Git repo hosted under a single account. And build times for Microsoft Office went from days to hours.

Driving engineering culture change at Microsoft: An experimental journey

However, even with such substantial wins, standardization on a common tool set didn't have all the impact the 1ES team had initially expected. For example, while builds were faster, engineers were actually spending less time coding. The more telling metric, however, was that those same engineers were no happier, with net user satisfaction (NSAT) scores essentially remaining flat over the past four years. That's when the 1ES team realized there was clearly more to it than just a standardized tool set. There were other blockers, including people and processes, which meant that the 1ES team—and the Microsoft engineering organization as a whole--wouldn't be able to achieve their goals without an overall culture change.

A big reason for the 1ES team's need to expand its focus is that, since 2014, when Satya Nadella took over as CEO, the *overall culture across Microsoft* had changed substantially. It began with his initial vision for "One Microsoft", which included the ability for teams to safely depend on each other for the ability of mission-critical components, including the engineering system.

"When Satya became CEO, in one of his first companywide all-hands meetings, he mentioned a competitor that was doing something innovative," recalls Cindy Alvarez, Principal PM Manager on the 1ES team. "I don't even remember what it was; his point was that great ideas can come from outside our walls, and that we needed to become a 'learn-it-all culture instead of a know-it-all culture.' If the old Microsoft way was to dominate, the new one is to empower.

A new philosophy



If you want things to change, you're much better off starting with 'What motivates our internal customers? Why would they want to sign on to this? And how can we best meet them where they're starting from?'

CINDY ALVAREZ

Principal PM Manager, 1ES

In mid-2018, at about the same time as Microsoft acquired GitHub, the 1ES team was reorganized under the Cloud + AI Platform division. Along with a leadership change came a change in philosophy; to drive the desired results, the 1ES team would need to go beyond its focus on tools to encompass all aspects of the Microsoft engineering culture, including people and process. In fact, the scope of the team's efforts would need to expand to encompass all of product development, including program management, UX designers, data scientists, and others—encompassing more than 50,000 employees.

Shortly after the reorganization, the 1ES team's senior managers spent a few days in a room discussing how to drive success. Like all enterprise change initiatives, this one began with a room full of smart, engaged leaders brainstorming goals and approaches.

Driving engineering culture change at Microsoft: An experimental journey

"We all had really good intentions, and our strategy document looked great," recalls Alvarez. "Secure and compliant, high-performance teams, faster deployment... How could anyone argue with wanting to achieve those goals? But we were thinking from the perspective of upper leadership at Microsoft; if you're a Corporate Vice President, you have visibility across organizational boundaries and see where certain practices may block a multi-year goal. However, if you're a small team that's being asked to change what you're doing, what you're mainly seeing is more work landing on your plate—with a really uncertain and ambiguous set of benefits."

According to Alvarez, who regularly speaks on organizational change at conferences, such an approach is all too common. "Getting the leaders together in a room is how every change initiative starts, and it's a fundamentally flawed approach," she says. "If you want things to change, you're much better off starting with 'What motivates our internal customers? Why would *they* want to sign on to this? And how can we best meet them where they're starting from?'"

Lessons learned

To obtain that perspective, the 1ES team had to start with itself—and shift its focus to listening. "Driving the conversation correctly is key," says Alvarez. "To do this, we had to think from the perspective of why our internal customers would *want* to change—and, just as important, believe that change is possible. If we as the 1ES team couldn't model the behaviors we endorsed and show others how to do it, why would anyone believe it's possible for their team? People tend to view such initiatives as 'I've seen this before... If I drag my feet, maybe it'll just go away.' Of course, you'll only hear this in the hallway. Nobody's going to say it to a director in an all-hands meeting."

The 1ES team also learned that it's best to avoid starting with the largest teams, let alone the organization as a whole. "Our original mindset was that, if we got the largest teams doing what we wanted, then the other, smaller teams would follow," says Alvarez. "But those largest teams, like our Windows team, often pose unique challenges and have special needs. You can't 'jump to scale' because it's impossible to stand at one level within the organization and predict what will work for all. It's not about size... It's about focusing on quick wins and substantial impact over rolling out substantial change to as many as possible, all at once. Today, we value continuous learning and steady progress over rushing to scale."



Today, we value continuous learning and steady progress over rushing to scale

CINDY ALVAREZ

Principal PM Manager, 1ES



Explore learnings from the 1ES team: **Five Steps To Culture Change** >

The Results – How the 1ES team drives culture change today

Today, in promoting a cultural shift, the 1ES team's focus is on "being the change we want to see at Microsoft," as Alvarez puts it. To make that happen, the team is leading by example, which has led to its adoption of objectives and key results (OKRs) as a way to work transparently and focus on impact over actions. "We use 1ES Day, speaker series, office hours, newsletters, and other means of communication to talk about what we do and highlight the bright spots," explains Alvarez.



By focusing on midsized teams with a little bit of scale and a modest degree of influence, and helping them do better, we create a viral effect where other teams approach us and ask for our help.

CINDY ALVAREZ

Principal PM Manager, 1ES

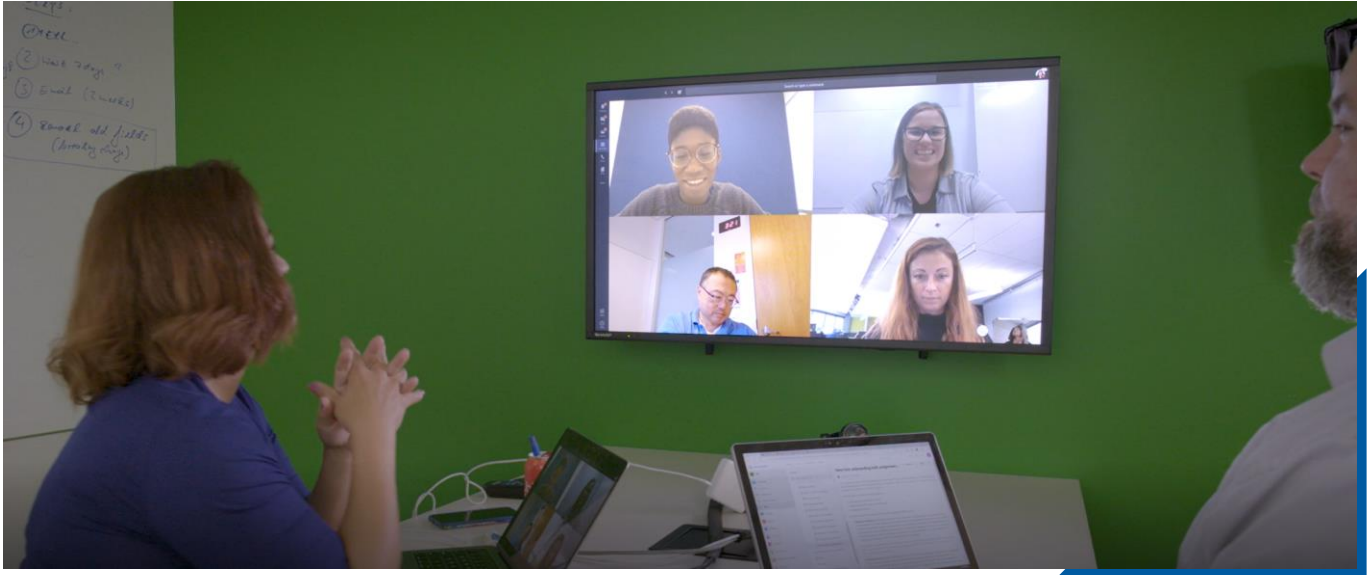
"We also run internal assessments to discover processes and behaviors that aren't serving us well, then invest in fixing them. We're now in the process of creating and tracking metrics to ensure that we're shipping quickly, building what customers need, and evolving to a more collaborative and sustainable engineering culture."

In choosing with which teams to engage, the 1ES team is employing a "middle-out" approach, focusing on midsized teams of 40 to 100 people who *want* their help and are ready for it. "The best way to drive high impact quickly is to find midsized teams where we can quickly assess the situation and gather the necessary info, instead of trying to guess what they need," says Alvarez. "By focusing on midsized teams with a little bit of scale and a modest degree of influence, and helping them do better, we create a viral effect where other teams approach us and ask for our help. We're no longer trying to scale prematurely because don't want to do more harm than good."

Trial and error also plays a large part in the 1ES team's strategy today. "No one has all the answers by default; the way to get to them is to run experiments, which we're running lots and lots of," explains Alvarez. "We form a hypothesis, look for a rigorous way to test it out, establish success criteria, then monitor the results and make the call whether it's worth continuing to invest in that direction or not."

To foster such experimentation, the 1ES team has formed several new initiatives to tackle various areas of culture change:

The vision for the **Lighthouse initiative** is to embed a team of engineers and program managers within one or two strategically chosen product teams each year, as a means of reducing technical blockers to high performance. Currently, the Lighthouse team is engaged with a large team within the Microsoft Office organization as they migrate off a legacy source control system and onto modern tooling. By working side-by-side with that team, and "meeting them where they started," the Lighthouse team has been able to catalyze significant change. Together, the two teams are identifying gaps in tooling and processes, and are creating more modern work management solutions centered around Azure DevOps.



The **Developer Experience initiative** is focused on improving the day-to-day work experience of individual engineers, with the goal of having the tools they use fade into the background. Even though the solutions here are ultimately code and tools, not culture, the approach today is different. The team began by doing extensive research with internal engineers, then decided to focus on a single pilot team—Azure Compute—as a learning exercise instead of rushing to scale. Engagement with Azure Compute uncovered tensions between business objectives (like shipping more often with higher security) and the individual developer experience. Code-to-customer issues were assigned top priority and then the 1ES, Visual Studio, and Azure Engineering Systems teams began partnering on improving the individual developer experience.

“Through listening and observing, we collectively realized how our combined tools negatively impacted the day-to-day development experience,” says Åke Pettersson, Principal PM Lead in 1ES, who heads up the Developer Experience initiative. “We’re learning a lot from helping that team, and now see a clear path toward providing a simpler, more standardized, yet still secure development experience. Efforts with the Azure Compute team to date have allowed us to demonstrate significant improvements in developer satisfaction, which in turn will help drive improvements in the day-to-day engineering experience for other teams as well, both inside and outside of Microsoft.”

The **Inner Source initiative** is working to make internal projects more like open-source, where anyone can discover the project, ask for help, or submit potential fixes—as a means of tapping into the potential of engineering talent across Microsoft as a whole and building better products through shared ownership and purpose. “In a few years, we expect inter-team collaboration to be the new norm,” says Alvarez.

The **Amplify** initiative, which Alvarez herself leads, is helping internal teams ship faster, build what customers need, and collaborate with each other. Her team is doing this through a multifaceted approach that includes creating a framework for how to get better (such as how to start and what questions to ask); establishing baseline metrics so that teams can identify where there’s room to improve;

Driving engineering culture change at Microsoft: An experimental journey

using those metrics to drive discussions with senior managers on prioritization and incentives; and offering coaching, mentoring, and other services designed to show teams what 'good' looks like.

From all indications, the 1ES team's approach to fostering culture change alongside its continued focus on tools is working. A year after the team decided to expand its focus, they've already had some substantial wins, are learning more every day, and the rate of culture change is accelerating. "It's all about listening instead of talking, then having the right conversation," says Alvarez. "Today, we're working with many teams at all levels of maturity, who are coming to us and asking how they can do better. It's hard to quantify all the elements of success when it comes to culture change; our ultimate yardstick is whether the teams we work with are better-off than when they came to us."



Today, we're working with many teams at all levels of maturity... our ultimate yardstick is whether the teams we work with are better-off than when they came to us.

CINDY ALVAREZ

Principal PM Manager, 1ES

For business executives looking to drive culture change within their own organizations, Alvarez offers a few parting words of advice. "Start by understanding your internal customer: What are they doing today, what motivates them, and what are they concerned about or skeptical of? You don't need to have a detailed long-term plan, but you also can't just throw things at the wall and see what sticks. Form your initial hypotheses, run experiments to quickly validate them, invest more in what works, and drop what doesn't. Remember that success builds on success: start with the bright spots and places where you can quickly make a difference instead of trying to fix everything at once."

Resources

Get a guide with learnings from the 1ES team: [Five Steps to Culture Change](#)

Tools and technologies

[DevOps solutions on Azure](#)

[Azure Pipelines](#)

[Azure Boards](#)

Learn More

[Evolve your DevOps practices](#)



Explore more DevOps Stories >

(c) 2019 Microsoft Corporation. All rights reserved. This document is provided "as-is." Information and views expressed in this document, including URL and other Internet Web site references, may change without notice. You bear the risk of using it. This document does not provide you with any legal rights to any intellectual property in any Microsoft product. You may copy and use this document for your internal, reference purposes.

This document is for informational purposes only. MICROSOFT MAKES NO WARRANTIES, EXPRESS OR IMPLIED, IN THIS SUMMARY.