The Ultimate, Real-World Guide to Digital Transformation
Introduction

Your company has problems. Digital transformation is the answer.

Let’s be a little more specific. If you’re like most companies today, you struggle to engage with and retain customers, due in no small part to antiquated technology and processes. Without a fast and efficient way to deliver software to consumers, it is hard to stay ahead of competitors, meet customer expectations and provide an optimal experience at all stages of the customer journey.

Digital transformation solves these problems by empowering your company to take advantage of the tools, techniques, and philosophies necessary to give your customers what they want and create business value.

That’s easy enough to understand. What can be harder, however, is making a plan for actually achieving digital transformation.

That’s why we at Raygun created this guide to digital transformation. Drawing on our experiences helping customers to improve their business operations using Crash and Performance Monitoring tools, this guide explains what digital transformation means, and which real-world benefits it can deliver to your business (for example—helping you to deliver application updates faster, and fix application errors more quickly).

This guide also reflects the Raygun team’s own experience with digital transformation. Raygun is a company that is digital-first. We’ve evolved
our application delivery operation into one that releases updates multiple times a day, and we employ modern development practices daily.

We believe that both of these qualities—our work in helping customers achieve digital transformation, and our experience in maintaining digital first in our own business operations—situate us uniquely to help guide other companies toward digital innovation.

In short, if you're looking for a grounded, results-oriented guide to digital transformation (DX) that is tethered to actual business challenges, you've come to the right place.
Table of Contents

Introduction 2

Overview: What is digital transformation, and why does it matter? 5
   The challenge: Optimizing the customer experience 5
   The solution is digital transformation 7
   Achieving digital transformation: A real-world approach 8
   Reaping the benefits of digital transformation 9
   Digital transformation in practice 9

Chapter 1: Why digital transformation is hard 10
   Challenge 1: Budgeting 11
   Challenge 2: Regulations and Auditing 12
   Challenge 3: Achieving backwards-compatibility 12
   Challenge 4: The growing pains of new processes 13

Chapter 2: To embrace digital transformation, embrace DevOps 14
   What is DevOps? 14
   DevOps means putting people first 15
   DevOps perfection doesn’t exist 17
   DevOps methodologies 18
   Measuring the success of DevOps-driven digital transformation 20

Chapter 3: What to expect during digital transformation, and what comes next 22
   How long will digital transformation take? 22
   Expert’s contribution: DX for teams 23
   Your people need to be transformed 24
   Your organization needs to laser-focused on customer value 24
   Move from ‘Delivery’ mindset to ‘Customer Value Creation’ mindset 25
   Continuing the digital transformation journey 25

Resources and further reading 27
Overview: What is digital transformation, and why does it matter?

Let’s start with the basics: A definition of digital transformation and an explanation of why it matters in the real world.

The challenge: Optimizing the customer experience

To understand the meaning and importance of digital transformation, you first have to recognize how software has transformed companies large and small, across all industries, and what that means for the ways in which customers engage with companies.

As Forbes famously put it back in 2011, “every company is a software company” in the modern world. In other words, it’s not just companies whose main product is software that are invested in and dependent on applications to drive their business.

Virtually every company now writes and uses software for its day-to-day operations. Whether you’re a bank, an insurance company, or even a hot dog vendor (yes, they have apps, too), your business very likely depends centrally on software.

In this software-centric world, one of the key factors that separates successful businesses from the crowd is the ability to leverage software to maximum effect. Simply having applications is not enough to remain competitive. Your business also needs to ensure that those applications meet and exceed user expectations by delivering the features users demand, providing flawless stability, and receiving updates constantly.
Indeed, data shows that a quarter of consumers open the mobile apps that they download just one time, then never use them again. Mobile app retention rates—defined as launching an app at least eleven times after installing it—hovered under 40 percent as of 2018, despite incremental improvements in recent years. And nearly half of users will wait only three seconds for a website to load before abandoning it. Statistics like these highlight how difficult it is to build software that consumers actually want to use—and that, by extension, drives business success.

Keep in mind, too, that the challenge facing businesses in today's software-centric world is not just the difficulty of achieving user engagement.

It's also about building loyalty and trust.

Applications that fail to load quickly, that churn out archaic user-facing error messages due to poor error handling or testing, or that behave
erratically can also lead consumers to assume that the company designing the app is not serious about quality—or, worse, that the company’s software is subject to security problems.

Both assumptions seriously undercut user trust and engagement. Conversely, websites that are optimized for user experience generate 30 percent more sales and experience a 50 percent decrease in bounce rate.

The solution is digital transformation

What does all of the above have to do with digital transformation? Digital transformation is what helps businesses succeed in the face of these daunting odds. Companies that leverage new technologies effectively (that “rethink everything they know,” as Capgemini puts it) are the ones that rise above the noise by releasing reliable, user-friendly applications, and updating them on a continuous basis.

The exact approach that different companies take to digital transformation will vary; there is no single path or “one weird trick” for achieving digital transformation. But at the end of the day, all successful digital transformations lead to the same result: They improve the customer experience, help to build customer loyalty, and ultimately, create business value.
Achieving digital transformation: A real-world approach

By now, many companies are aware of the importance of digital transformation. They also understand, at a high level, what digital transformation entails: leveraging new technological tools and processes to improve their software.

Yet, recognizing the importance of digital transformation is one thing. Actually achieving digital transformation is another. Even if your company is familiar with the various digital transformation frameworks out there, and is committed to digital transformation in theory, implementing digital transformation in a real-world way can be quite challenging—not to mention intimidating.

We’re here to tell you, however, that digital transformation is possible, provided you take a healthy and realistic approach to it. Your company almost certainly will not achieve digital transformation overnight. Indeed, you’re likely to stumble in your first efforts at digital transformation, no matter how familiar you are with digital transformation theory or how closely you’ve studied digital transformation examples from other companies.

Nonetheless, digital transformation is within your reach. No matter how many employees you have, the size of your budget, or the current state of your software delivery operations, you can achieve digital transformation by starting small and iterating what works. Digital transformation begins by recognizing what you’re doing right, then continuously expanding upon it. It’s a slow and committed process, not a revolutionary rupture.
Reaping the benefits of digital transformation

You'll know when your digital transformation efforts have bore fruit by the money they save you. Data suggests that the optimizations enabled by enterprise digital transformation can reduce costs by as much as 36 percent. That adds up to tens of billions of dollars saved in industries like healthcare and government.

Realizing cost-savings thanks to digital transformation doesn't mean, of course, that your digital transformation is complete. As we've noted above, it's best to think of digital transformation as a process of continuous improvement and iteration, not a one-and-done affair. You can save even more (and provide even greater customer experiences) by continually expanding upon your digital transformation successes.

Digital transformation in practice

So far, we've explained at a high level what digital transformation means and why it's valuable. Now, it's time to take a closer, more specific look at digital transformation. The remainder of our guide will walk through the challenges of digital transformation and the main solution to them—embracing DevOps.
Chapter 1: Why digital transformation is hard

Before departing on your digital transformation journey, it’s important to recognize why digital transformation can be so hard.

There are a number of factors at play. Perhaps the biggest is a reliance on legacy technology that lacks full compatibility with modern tools and processes. Banks and insurance companies often still use mainframe computer infrastructure in which they invested decades ago, long before anyone was thinking about the challenges of rapid software delivery and continuous application improvement. Even if you help manage a younger company that was born in just the past decade, you are likely to have an infrastructure built with technologies that are now considered old-generation, like bare-metal servers and simple cloud-based virtual servers, as opposed to next-generation environments such as containers and serverless functions.

At the same time, the software and hardware infrastructure on which companies depend tends to be complex and composed of multiple layers. Simply mapping and taking stock of your infrastructure (let alone determining which components can benefit the most from digital transformation) is no mean feat.

The third challenge to digital transformation centers not on technology, but on methodology. At an organization of any significant size, different teams tend to operate in different ways, and using different tools. Finding a way to transform methodologies across an entire organization is a real challenge.
The list goes on. Challenges to digital transformation come in many forms.

In this chapter of our guide to digital transformation, we take a look at the most common pain points that afflict companies across different industries as they pursue digital transformation. Keep reading for common problems that companies face when pursuing digital transformation, based on our experience working with clients.

**Challenge 1: Budgeting**

Perhaps the most obvious challenge to digital transformation is budgeting. Not only does the limited size of budgets make it difficult to invest in the technologies that help to enable digital transformation, but slow budget cycles (which can take weeks or months to complete) make it difficult to acquire new tools quickly. In addition, companies that fall into the trap of failing to link their budgets to progress run the risk of overspending on failed initiatives while underfunding projects that lead to real success.

In addition, the goal of many companies’ budgetary processes is to focus on the here-and-now, not the future. This makes it hard to invest in technologies that increase costs in the short term, even if, by speeding
digital transformation, they save money in the long run.

**Challenge 2: Regulations and Auditing**

Even if you successfully clear the budgetary hurdles to digital transformation, you may run into regulatory obstacles that make it difficult to adopt new technology.

Those obstacles could be handed down by regulators who are external to your company. If you operate in an industry like healthcare or banking, for example, HIPAA or PCI DSS requirements may limit your ability to adopt new tools until they have been thoroughly vetted by auditors.

Even if you are not subject to strict third-party regulations, your company's internal IT governance policies may get in the way of technological innovation. The adoption of new tools or processes may require lengthy security audits, for instance.

**Challenge 3: Achieving backwards-compatibility**

A successful digital transformation must improve software delivery practices, while at the same time allowing your organization to continue using many of the tools and processes on which it already relies.

This means that you can't, for example, simply abandon your mainframe and build a new infrastructure from scratch in the name of digital transformation. (Well, maybe you could if you had an unlimited budget, but you almost certainly don't.) Nor are you likely to have the luxury of
being able to rewrite all of your applications from scratch.

As a result, you must find ways to improve your existing software without replacing it (or the infrastructure on which it runs) entirely. This is a tough strait to navigate.

**Challenge 4: The growing pains of new processes**

Adopting new software delivery processes is a core part of digital transformation, and process changes are difficult by nature.

It takes time for developers to become accustomed to a new process that requires them to check in code on a daily or hourly basis when they were previously accustomed to committing new changes weekly or monthly. It takes time and some adjustment for IT operations teams to learn to address problems with production software instantaneously, while also communicating information about the problems back to developers so that they can be fixed permanently.
Chapter 2: To embrace digital transformation, embrace DevOps

Now that we've discussed why digital transformation is difficult, we're going to discuss how, if digital transformation is your goal, DevOps is the vehicle that gets you there.

That's a critical lesson that many companies still overlook. Although DevOps has been a keyword for technical teams for nearly a decade, and some folks mention DevOps within the context of digital transformation, DevOps is not always an important part of the digital transformation conversation. Instead, you tend to see digital transformation described in high-level terms, with little attention to how you actually operationalize it.

But as we promised at the beginning of this guide, our goal is to explain digital transformation for the real world. And we firmly believe, based on our experience building a DevOps tool that speeds digital transformation for our customers, that you can't achieve digital transformation if you don't do DevOps.

Let us explain, starting with a basic definition of DevOps.

What is DevOps?

When we talk about DevOps, we're referring to an approach to software production that emphasizes two key themes. The first is a focus on making processes continuous by performing them on a routine, recurring basis. The second is constant collaboration between different teams (including
but not limited to developer IT operations, or IT Ops) in order to maximize everyone's visibility into the software delivery pipeline.

There’s a lot more to say about DevOps, to be sure. But an all-around discussion of DevOps itself is beyond the scope of this guide. (If you want a longer but not-too-long overview of DevOps, we recommend TechTarget’s guide.) Let's instead turn to the key points you need to understand in order to leverage DevOps as the pathway to digital transformation.

**Keys to DevOps**

- Collaboration
- Put people first
- Ask for feedback
- Let go of perfection
- Continuous improvement

**DevOps means putting people first**

DevOps is not a technology or tool. Nor is it a specific type of process. It's instead a mindset that you implant in the minds of your team members to help them deliver software more effectively.

That’s why, when you want to do DevOps (and digital transformation), you should start with your people. Once your team has embraced DevOps
principles, the tools and processes that they need to support DevOps will fall into place. So will the technologies that enable digital transformation, by extension.

How do you get buy-in from your team for DevOps?

Consider the following best practices.

**Bring development, IT Ops and other teams together**

As we noted above, collaboration between teams is a core element of DevOps. Achieving collaboration means not only providing physical and virtual channels for different teams to communicate—though that is part of it—it also means enabling different teams to speak a common language. You want your developers to understand what your IT Ops engineers spend their days doing, and vice versa.

This doesn’t mean that everyone has to learn to do everyone else’s job fully, but all team members should have a basic understanding of what others do, and the pain points they commonly face in ensuring that software is delivered quickly and reliably.

Keep in mind, too, that in a broad sense, DevOps is not just about the development and IT Ops teams. That’s where the concept started, but it has now expanded to include groups like the security team and the software testing team. They should all be able to communicate with each other freely and effectively.
**Hire the right talent**

At most companies, there is no reason why the existing IT team cannot learn to do DevOps. Again, DevOps is at its core a state of mind, and anyone can adopt that state of mind.

That said, some strategic hires can advance your DevOps strategy. DevOps engineer is now a widespread job title, and hiring some key personnel who specialize in DevOps can help to jump-start your digital transformation. DevOps engineers can also provide bridges between different teams because their skill sets span multiple areas of specialty.

**Ask for feedback**

When encouraging your team to adopt DevOps, keep in mind that DevOps (and digital transformation) should not be a top-down process. Continuous feedback is an important feature of DevOps, and that is true not only when delivering and monitoring software, but also when it comes to your team. Be sure to provide employees opportunities to explain what is working for them and what is not as you proceed on your DevOps journey.

**DevOps perfection doesn’t exist**

The first thing to understand about DevOps in the context of digital transformation is that there is no such thing as perfect DevOps.

On the contrary, given that the idea of continuous improvement is baked into DevOps, you could say that DevOps by definition precludes the possibility of ever reaching perfection.
As long as you strive continuously to do better, you’re doing DevOps (as well as digital transformation) right.

**DevOps methodologies**

Once your team has adopted a DevOps mindset, you’re ready to begin implementing DevOps methodologies. At this juncture, you have several options. As we said, there is no single way to do DevOps.

Following are the main methodologies associated with DevOps. It’s important to note that these are not mutually exclusive; on the contrary, they overlap and build off of each other. We list them starting with the most basic—an Agile methodology—and continuing through to CI/CD, the most advanced type of DevOps methodology. Most organizations will start with Agile and work forward from there (again, DevOps is about continuous improvement, not changing the world in a day).

**Agile**

The Agile approach to software development, which was popularized by the introduction nearly two decades ago of the “Agile Manifesto,” emphasizes flexibility within the context of software production and maintenance.

The Agile concept was born as a response to so-called “waterfall” software production strategies that were rigid, difficult to scale, and difficult to adapt. Recent ‘Modern Agile’ thinking has moved beyond the original Agile Manifesto by introducing more generic principles. [Modernagile.org](http://Modernagile.org) is framework/methodology free and is principle driven, it is focused on delivering customer outcomes and growing team culture.
Mature agile teams are most likely already embracing DevOps CI/CD methods, or at least working towards formalizing them.

If your company struggles at a basic level to modify the way it produces software in response to changes in user demand or lacks the ability to scale in order to support more users or deliver more applications, your first step toward digital transformation will be to adopt Agile practices and develop an agile mindset. The specific Agile practices that you embrace will vary depending on your particular needs, but as long as you approach software delivery from an Agile perspective, you will set yourself on the right path. Trello offers useful pointers for getting started with Agile as a way to improve software delivery and more.

**Continuous integration**

Continuous integration, or CI, is the practice of merging code into an application’s codebase on a continuous (or near-continuous) basis. It takes the Agile methodology to the next step by enabling developers to make changes faster—and, by extension, to react more quickly to shifts in customer demand.

CI can be achieved in part by adopting a specific type of tool: continuous integration servers, which automate most of the steps required to check in new code. However, CI also requires a commitment and process for enabling rapid code commits and updates.

We should also note that the word continuous in this context should not be taken literally. No DevOps organization commits new code every second or every minute; that is unrealistic. Instead, think of regular,
recurring code commits as the goal of CI. Even if you only commit new code every 24 hours, that still qualifies as CI (although, again, your goal should also be to consistently strive to do better by increasing the pace of commits).

**Continuous delivery**

Continuous delivery, or CD, builds upon CI by making application deployment continuous as well. In other words, when you do CD, you deploy new application code to end-users on a frequent, routine basis, rather than waiting weeks or months between application updates.

An Agile methodology and CI are prerequisites for CD, but CD also requires a well-organized software testing, build and deployment process, as well as strong communication between different teams.

**Measuring the success of DevOps-driven digital transformation**

How do you know when you’re leveraging DevOps effectively for driving digital transformation? Consider the following metrics:

- How long it takes to turn an idea (such as a new application feature) into code that reaches end-users. The faster you can complete this journey, the closer you are to achieving full digital transformation.

- How much time it takes to correct errors or bugs in your applications, whether you discover them prior to deployment or once your software has reached production. A healthy DevOps organization (and one that is best positioned to power digital transformation) is one that can react to problems quickly, even
when the reaction requires coordinating information between different teams.

• Your levels of user engagement and retention: How many users you have and how frequently they use your software. This is the ultimate measure of digital transformation success.
Chapter 3: What to expect during digital transformation, and what comes next

Once your company has set foot on the path to DevOps and digital transformation, and you are measuring your progress using the metrics described above, what should you expect as the journey continues?

Let’s answer that question by first assessing how long you can expect digital transformation to take, as well as how to know when you’ve started realizing true benefits from it.

How long will digital transformation take?

The amount of time required to complete a digital transformation will obviously vary from company to company. And in fact, in one sense, the timeframe for digital transformation is indefinite because, as we’ve noted many times at this point, digital transformation should be about always striving to do better—which means that successful digital transformations never truly end.

That said, one important point to understand about digital transformation is that it will take time (typically, many months or two or three years) before you begin to see true results in the form of better business productivity. Don’t expect digital transformation to happen in the span of a few months, and don’t consider your effort a failure when it doesn’t.

Part of the reason why digital transformation takes time to bear fruit is that it’s not just internal changes to your company, tools, and processes that are required, but also an adjustment to end-user expectations. When
you start delivering software faster and more reliably thanks to digital transformation, it will take some time for users to catch on and begin increasing their engagement.

A second factor worth bearing in mind is that although digital transformation can speed your software production process, it won't eliminate all of the other obstacles to quick progress in your company. Budgeting, billing, marketing and so on will continue to take time, and you won't begin capitalizing on digital transformation until these processes move forward.

**Expert’s contribution: DX for teams**

Tony Dale-Low is experienced in coaching project managers, scrum masters, product owners and teams in successful Agile project delivery. Experienced in designing project structure using Agile methods, Tony also specializes in transitioning existing projects to Agile.

“In my experience, Digital Transformation (DX) is about transforming your people and your teams.

**DX can for many organization be a multi-year journey, and unfortunately, you are not going to get there just by implementing new technology, or by adopting Agile and DevOps methods, without the significant mindset shift required in your people.**

*In my opinion, the first steps in DX should be firstly a massive re-focus on your people, and secondly on your customer.”*
Your people need to be transformed

Organizations need to become much more people-centric. Management needs to become servant-leaders, trusting their people more at all levels, and working hard to removing the impediments that prevent their teams from doing their best work. In my experience, to meet the demands Digital Transformation places on a team, people must continually learn how to work more effectively together and individuals need to develop an agile mindset.

Your organization needs to laser-focused on customer value

The easiest way to focus your team on customer value is to align team members with customer journeys so that their experience can be improved end-end. Teams need to have customer centricity at the core and will need new skills that help them understand customer pain.
points, and measure the effectiveness of changes made to the customer experience.

**Move from ‘Delivery’ mindset to ‘Customer Value Creation’ mindset**

In so many organizations I have worked, the focus is simply on maximizing delivery, where developers and teams are just treated as a ‘resource’ to get the next widget built (which generally is never fast enough).

Ideation and ‘good ideas’ are often siloed and left to the product managers and experience designers. Features are built and shipped, and in the rush and aftermath of go-live, there is generally never enough focus given on the effectiveness of the items shipped.

Customer Value Creation is different because it turns the focus to the user. Questions to ask to incorporate this mindset are:

1. Is the feature being used in the way we expected?
2. What have we learned?
3. Is the customer getting value out of the new feature?
4. What tweaks and changes can be made to increase the value further?

**Continuing the digital transformation journey**

If you’ve read our guide to this point, you know that we’re really keen on continuous improvement as the core of digital transformation.

So let us wrap things up by noting for a final time that, ideally, digital transformation will never truly end. There will always be new tools,
processes, methodologies, and philosophies that you can adopt to make application delivery even faster and make software even more stable.

Think about it—Ten years ago, if we were explaining how to do digital transformation, we'd probably recommend moving to the cloud. Today, however, the cloud seems so basic and obvious that it's no longer a key factor in discussing digital transformation. That's part of the reason why we have instead focused on adopting DevOps methodologies as the key to digital transformation.

The other factor—and the most important one—is our own experience. At Raygun, we build a DevOps tool that provides software delivery teams with visibility into software quality and performance in order to enable faster, more effective software delivery, improve collaboration between teams and, ultimately, optimize the end-user experience. We've witnessed the real-world impact that DevOps tools have on enabling digital transformation, and we want to help more companies proceed along that path.

Finally, let us close by emphasizing the “people” component of digital transformation once last time. While tools and methodologies will do much to help your company achieve digital transformation, delivering the best customer experience is another critical ingredient.

Achieving this goal requires not just the right tools and processes, but also a cultural shift that places the end-user experience first. It can easy to ignore the people who will ultimately use your software while you are busy writing and testing it, but without keeping user experience front-and-center, you'll never fully achieve digital transformation.
Resources and further reading


Ready to discover how error and performance monitoring can help to mitigate risks during your digital transformation process?

See how the Raygun platform helps you find and solve issues in your codebase before they reach customers.

With smart pricing, detailed visual flame charts, and automatic issue detection, no other tool gives you the level of visibility into performance issues affecting your customers.

Learn more

Thousands of customers build better software using Raygun