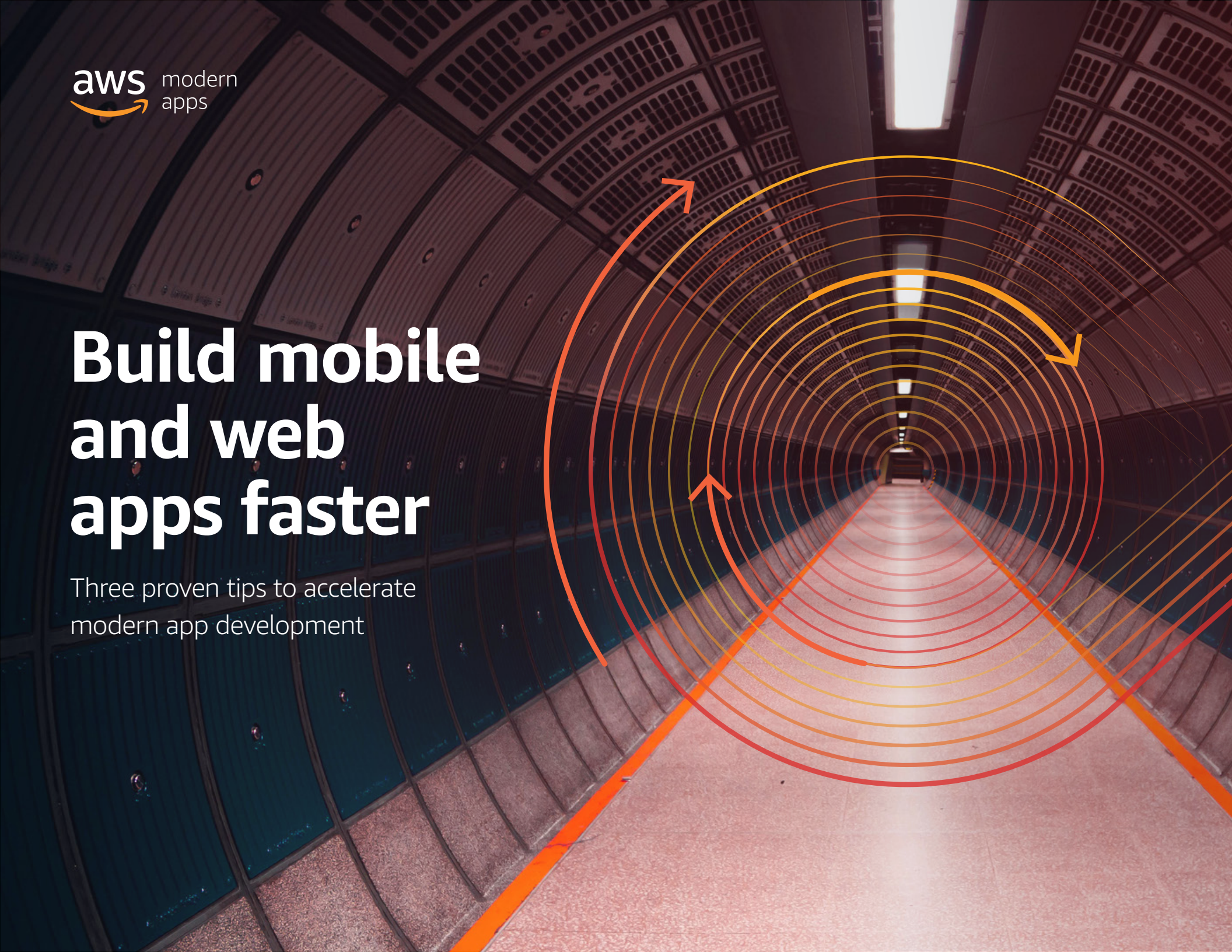
aws modern apps

Build mobile and web apps faster

Three proven tips to accelerate modern app development



Organizations want to innovate faster with modern mobile and web applications that delight customers and support employees. Development teams must meet the ever-rising bar for user experience and complex cloud features—while delivering a scalable, secure, high-performance app at low cost—which is no easy feat.

When building modern mobile and web applications, ensure your teams are set up for success to deliver scalable apps quickly. Look for developer tools that close the gap between new and experienced developers to launch apps quickly and balance this with extensible options that can integrate with internal processes.

To accelerate development further, search for solutions to streamline access to dispersed, distributed data across teams to enable front-end teams to build data-driven features more quickly and efficiently. Make architectural choices to support your app today and throughout the peaks and valleys of demand that will come tomorrow. Whatever you decide, ensuring app performance and security remains your number one job.

In this guide, we share three tips to accelerate the development of modern mobile and web apps:

1. Modern Tools and Frameworks – empower your front-end teams with flexible, purpose-built tools and frameworks
2. Modern APIs – simplify access to distributed data sources with a unified GraphQL API
3. Modern Compute – operate less with managed and serverless services

Tip #1
Empower your front-end teams with flexible, purpose-built tools and frameworks

The situation

Front-end developers create a differentiating user experience for their apps using front-end programming languages like JavaScript, Swift, or Kotlin, popular frameworks like React, React Native, Flutter, or Angular, and tools such as integrated development environments (IDEs). They code the presentation layer of apps, access and integrate data through APIs, and build cloud-powered features such as video or chat with real-time and offline capabilities for their web or mobile application.

While front-end developers may be experts in building user interfaces, they are typically not cloud experts. **Building and connecting cloud functionality into a mobile or web application can be complex and time-consuming,** reducing the time front-end teams have to focus on developing the user experience.

The solution

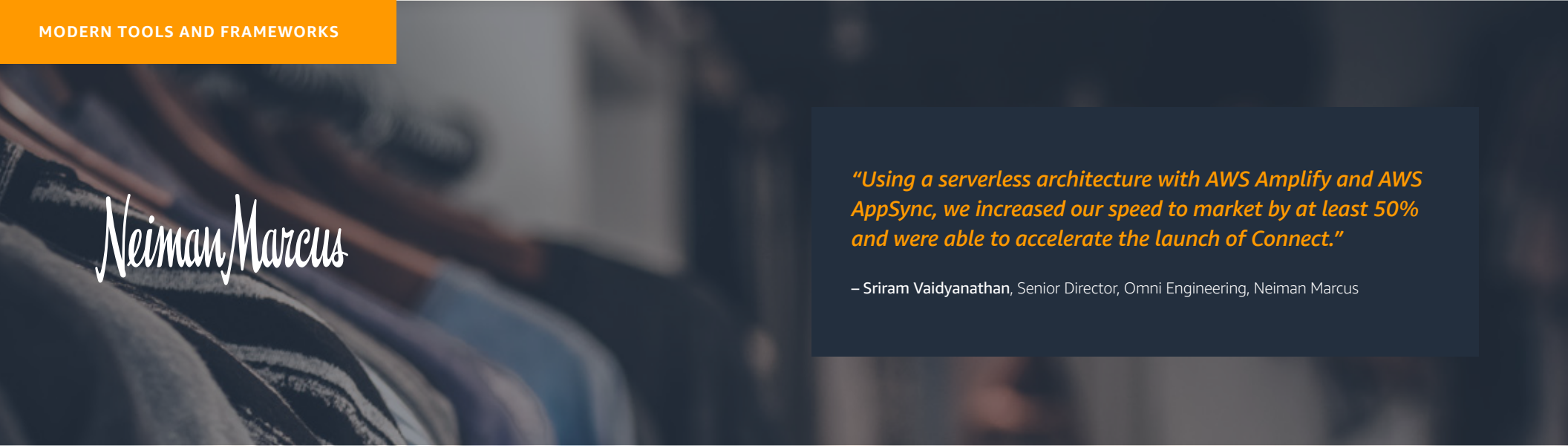
Help your front-end teams be more productive with **development tools and frameworks that reduce the amount of code needed to accomplish key use cases.** Leverage frameworks with deep capabilities for the most complicated tasks like authentication and data access, and look for advanced features to handle caching, reconnection, data synchronization, and conflict resolution. Select tools that simplify development—without sacrificing the flexibility to customize or extend app features with code. Choosing tools that reduce the cloud learning curve results in quicker setups, faster workflows, and automated security—giving front-end teams the freedom to focus on the problems they're solving for your customer.

How AWS can help

AWS Amplify offers tools and services to help front-end developers quickly build web and native mobile apps that share a common AWS-powered backend. Amplify libraries simplify the integration of common use cases, like storing images and video in the cloud, into your app and integrate deeply with popular front-end frameworks, languages, and mobile platforms. Additionally, the Amplify CLI and Admin UI can help developers quickly create a new AWS backend if needed.

Unlike backend-as-a-service offerings, AWS Amplify allows developers to leverage the breadth of AWS services and tools as their apps evolve. When you build your app backend using the Amplify CLI or Admin UI, AWS Amplify automatically generates the underlying business logic and deployment code so that developers can extend their app with custom business logic code in their preferred programming language. Developers building web apps can also use the AWS Amplify fully managed static web hosting service to deploy apps in minutes simply by connecting their code repository.

AWS Amplify is helping front-end developers build mobile and web apps faster. By encoding best practices for common scenarios and delivering them in an opinionated way, AWS Amplify reduces the overall steps and lines of code required to build full-stack apps on AWS—while still providing them with the flexibility to customize apps as business requirements evolve.



"Using a serverless architecture with AWS Amplify and AWS AppSync, we increased our speed to market by at least 50% and were able to accelerate the launch of Connect."

– **Sriram Vaidyanathan**, Senior Director, Omni Engineering, Neiman Marcus

Neiman Marcus increases application speed to market by 50 percent on AWS

Challenge:

A luxury household name, Neiman Marcus has a reputation for delivering a first-class, personalized customer service experience. To modernize and enhance that experience, the company wanted to develop Connect—an omnichannel digital selling application that would empower associates to view rich, personalized customer information. The goal: Make each customer interaction unforgettable.

When the COVID-19 pandemic forced many retail stores to close, the company's sales moved exclusively online. Neiman Marcus needed to launch Connect quickly to continue providing the hallmark experience that had always attracted customers and enable its associates to perform digital selling.

Tools and services used:

- AWS Amplify
- AWS AppSync
- AWS Lambda

Results:

- Speed to market for Connect increased by 50 percent
- Using a serverless architecture costs 90 percent less than traditional methods

Read the full case study »

Tip #2
Simplify access to distributed data sources with a unified GraphQL API

The situation

Organizations continue to transition from monolithic applications to more modular architectures in the cloud. When applications are built with modular independent components, called microservices, release velocity can increase because developers can easily make changes to any component.

Microservices make applications easier to scale and faster to develop, enabling innovation and accelerating time to market. However, this also means that **front-end teams may need to connect to hundreds of distributed microservices and data sources,** making it more difficult for them to access the data they need for their user-facing application. By streamlining data access in a way that makes it easier for front-end teams to consume in the application, backend teams play an important role in accelerating web and mobile development.

The solution

Technologies like GraphQL can increase the speed and efficiency of data access and integration across multiple backend data sources. GraphQL is a query language for APIs and a runtime for fulfilling those queries with your existing data. GraphQL provides a complete and understandable description of the data in your API, giving front-end developers the ability to query exactly the data that's needed on each API call from multiple backend databases and microservices.

Backend development teams can use GraphQL to abstract existing data sources into a single endpoint and provide easier data access to front-end teams. For a set of existing APIs, abstracting a number of endpoints into a single GraphQL API delivers GraphQL advantages—without the work of migrating APIs or rewriting the application from scratch. Creating a unified API layer with GraphQL can complement an existing REST API strategy to help front-end developers move faster by simplifying their interaction with distributed service architectures.

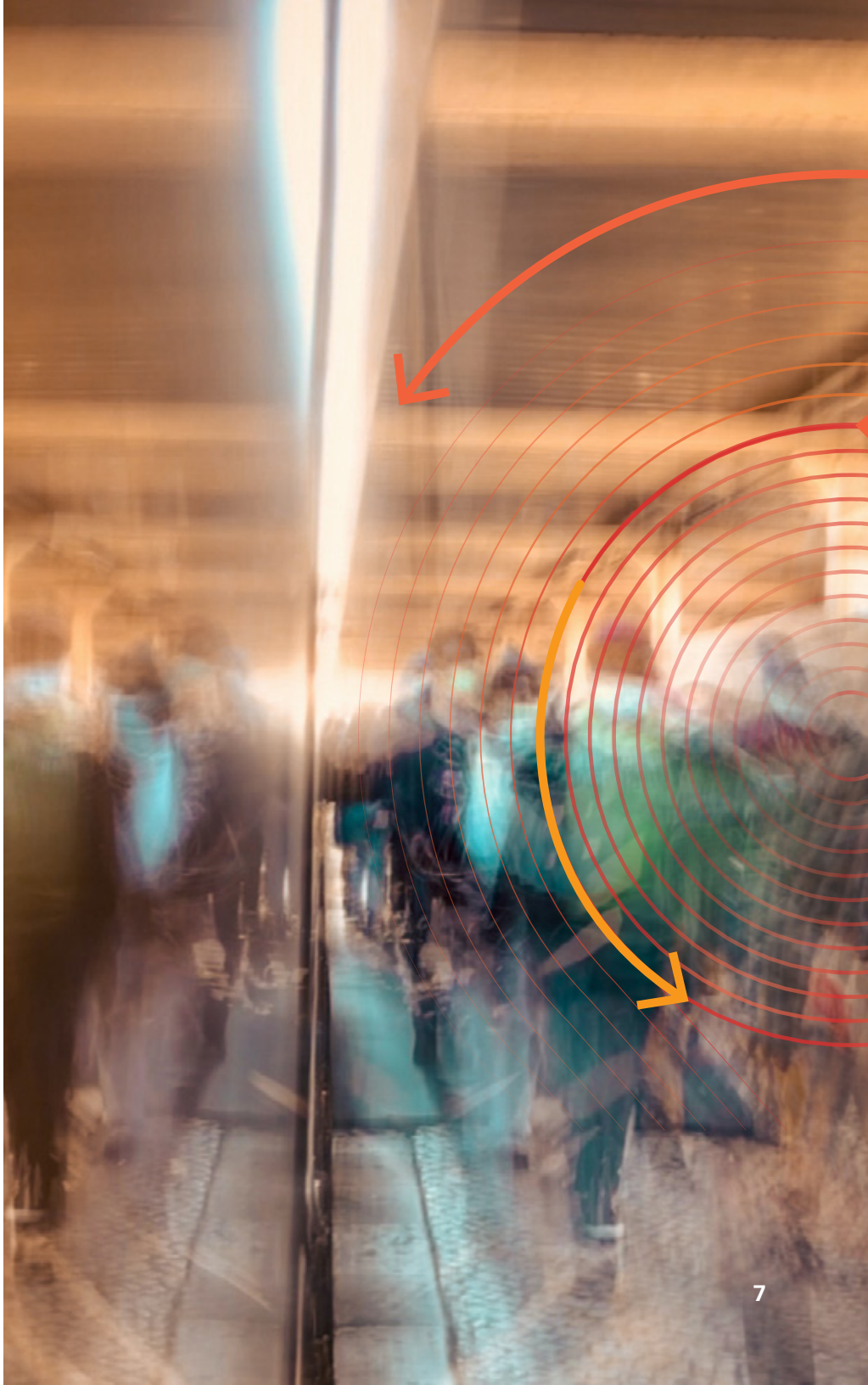
How AWS can help

AWS AppSync is a fully managed service that makes it easy to develop GraphQL APIs by handling the heavy lifting of securely connecting to data sources like Amazon DynamoDB, AWS Lambda, and more. Adding caches to improve performance, subscriptions to support real-time updates, and client-side data stores that keep offline clients in sync is just as easy. Once deployed, AWS AppSync automatically scales your GraphQL API execution engine up and down to meet API request volumes.

With a GraphQL API powered by AWS AppSync, organizations can develop applications faster by giving front-end developers the ability to query multiple databases, microservices, and APIs from a single GraphQL endpoint. AWS AppSync also makes it easy to develop and scale GraphQL APIs. And AWS AppSync automatically adjusts throughput capacity in response to actual traffic patterns.

AWS AppSync offers integrations with other AWS services, making it easy to secure, monitor, and troubleshoot APIs. These services include:

1. AWS WAF to protect APIs from common web exploits
2. Amazon CloudWatch for metrics and logs
3. AWS X-Ray for tracing
4. AWS CloudTrail for audit logs



"We went from concept to production in less than a month with a single engineer working on the AWS AppSync service."

– **Michael Manley,** Chief Technology Officer, Public Good Software

Public Good goes from concept to production in less than one month and with one engineer

Challenge:

Public Good Software is a leading cause-marketing platform with a goal of making news actionable by matching journalistic articles to relevant charitable causes. AWS AppSync allowed the organization to go from concept to production in less than a month with a single engineer working on the API backend. Because fewer calls were required from the client to the backend, the use of AWS AppSync lowered the latency in delivering actionable content. The combination of AWS AppSync and GraphQL meant data could be fetched and aggregated across multiple microservices in a single network request.

Tools and services used:

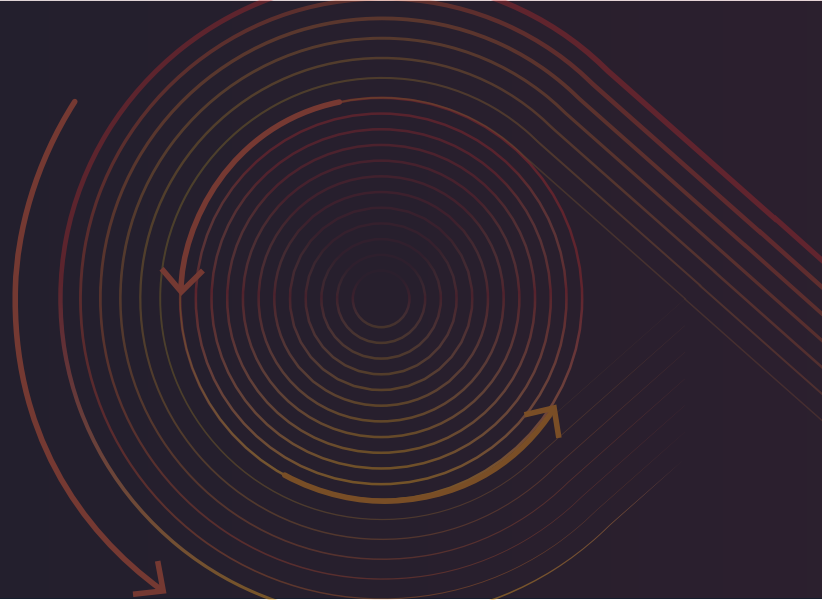
- AWS AppSync
- Amazon SageMaker

Results:

- Executed API improvement and moved to production in less than one month
- Updated API has improved customer experience and sped up page load times
- Application scales seamlessly to match variable site traffic

Read the full case study »

Tip #3
Operate less with managed and serverless services



The situation

Deloitte reports that 80 percent of IT resources are focused on running the business, while 20 percent are focused on innovation.[1] The fastest way to improve that ratio and bias it toward innovation is to reduce time spent on activities that aren't core to your business—like managing infrastructure. **Managing servers, storage, networking, and operating systems is time-consuming, expensive, and not very agile due to procurement cycles.** Managing infrastructure consumes more and more of your teams' time and offers a big opportunity to optimize and reinvest in innovation.

The solution

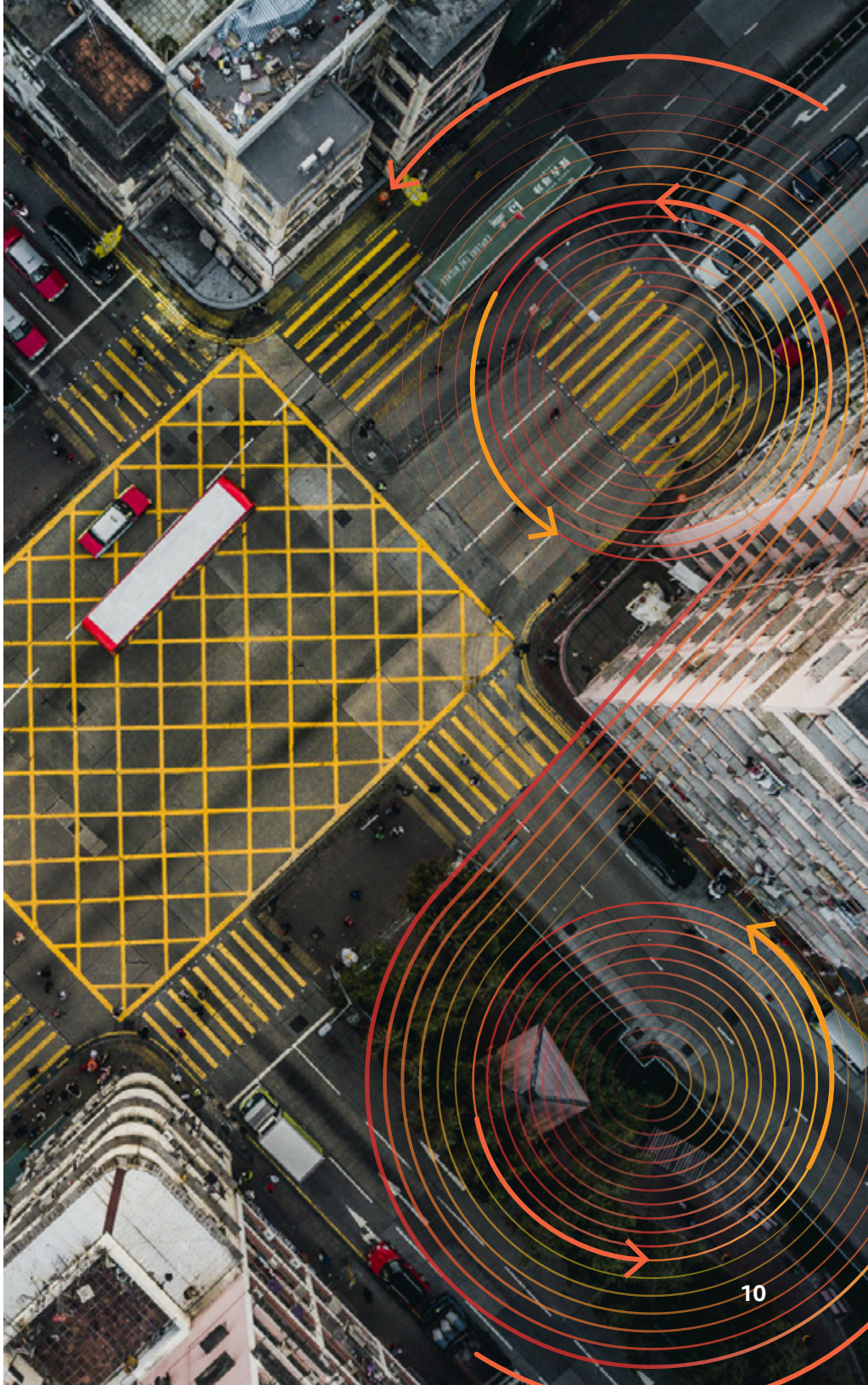
One of the easiest ways to operate less is by offloading the operational burden to a cloud provider by adopting managed or serverless services for your infrastructure. Reducing time spent provisioning, managing, and patching servers enables your developers to spend more time innovating—writing and iterating code for the products that delight your customers. **With serverless computing, there's no infrastructure to provision or manage.** Your infrastructure scales automatically by unit of consumption—rather than server unit. Pay only for the compute you consume; availability and fault tolerance are built in. Serverless computing removes the burden of server operations so you can focus on building the application rather than managing and scaling the infrastructure to support the application.

1 https://www2.deloitte.com/us/en/insights/focus/cio-insider-business-insights/tech-finance-technology-investment-budgeting-processes.html

How AWS can help

A great place to start is with AWS Lambda, a serverless, event-driven compute service.

With AWS Lambda, you only need to write code for business logic. AWS Lambda is event-oriented, which means that it sits idle until an event is triggered and the system has to jump into action. In fact, you can automatically trigger AWS Lambda functions from over 200 AWS services and SaaS apps—without writing integration code. Once the event is triggered, resources are spun up and down to meet the need of the task—at millisecond speed. There is no need to worry about infrastructure provisioning or configuration, and you pay only for what you use. This means faster time to production with the lowest possible TCO. AWS Lambda offers maximum agility with minimal operations, but sometimes you may find that finely tuning infrastructure adds value to your business—at AWS, you can always complement AWS Lambda with container services on AWS, like Amazon ECS or Amazon EKS, to meet that need.



"What would normally be a complex architecture—with the amount of security, precision, and latency required—is simplified by using services like AWS Lambda to create a magical experience for the user."

– **Michael Connor,** Chief Architect, Coca-Cola Freestyle

Coca-Cola builds new touchless drink dispensing application in just 100 days

Challenge:

When the COVID-19 pandemic hit, Coca-Cola was presented with an opportunity to innovate. The company wanted to provide a touchless experience for its Freestyle drink dispensers by building a new smartphone app that would allow customers to order and pay for drinks without physically touching a vending machine.

Coca-Cola chose to take advantage of the built-in security, latency, and scalability features of AWS Lambda, allowing its developers to focus on the application itself. As a result, Coca-Cola completed the application build in just 100 days. Today, over 30,000 machines feature this touchless capability.

Tools and services used:

- AWS Lambda
- Amazon API Gateway
- Amazon CloudFront

Results:

- Launched mobile app prototype in one week
- Scaled to 10,000 machines in 150 days
- Enabled mobile devices to connect to dispenser in milliseconds

Read the full case study »

Getting started

Now that you've explored our three tips for accelerating the development of modern mobile and web applications, you're probably anxious to get started. We advise teams to begin with one or more of these tips to complement their current approach to building modern applications.

Empower your front-end teams with AWS Amplify—reducing the overall steps and lines of code required to build full-stack apps can help developers launch faster. Simplify access to distributed data sources with AWS AppSync—abstracting existing data sources into a unified GraphQL API endpoint provides easier data access to front-end teams to build data-driven features. And operate less infrastructure using services like AWS Lambda—adopting managed or serverless services for your modern infrastructure lets your teams focus on building the application.

Whichever path you choose, AWS will help you meet the ever-rising bar for user experience and cloud services—allowing your teams to deliver a scalable, high-performance app at low cost. Discover how you can quickly and easily build feature-rich mobile and web applications. Or jump right in and get started with one or more of our tools or services today.

Start your application modernization journey »

Connect with an AWS expert »

Additional Resources

Start building mobile and web apps with AWS Amplify »

Dive into API modernization with GraphQL »

Read the 2021 Deloitte TCO report on serverless »

Gain practical tips in the AWS AppSync GraphQL Blog »

Explore articles on the Front-End Web & Mobile Blog »