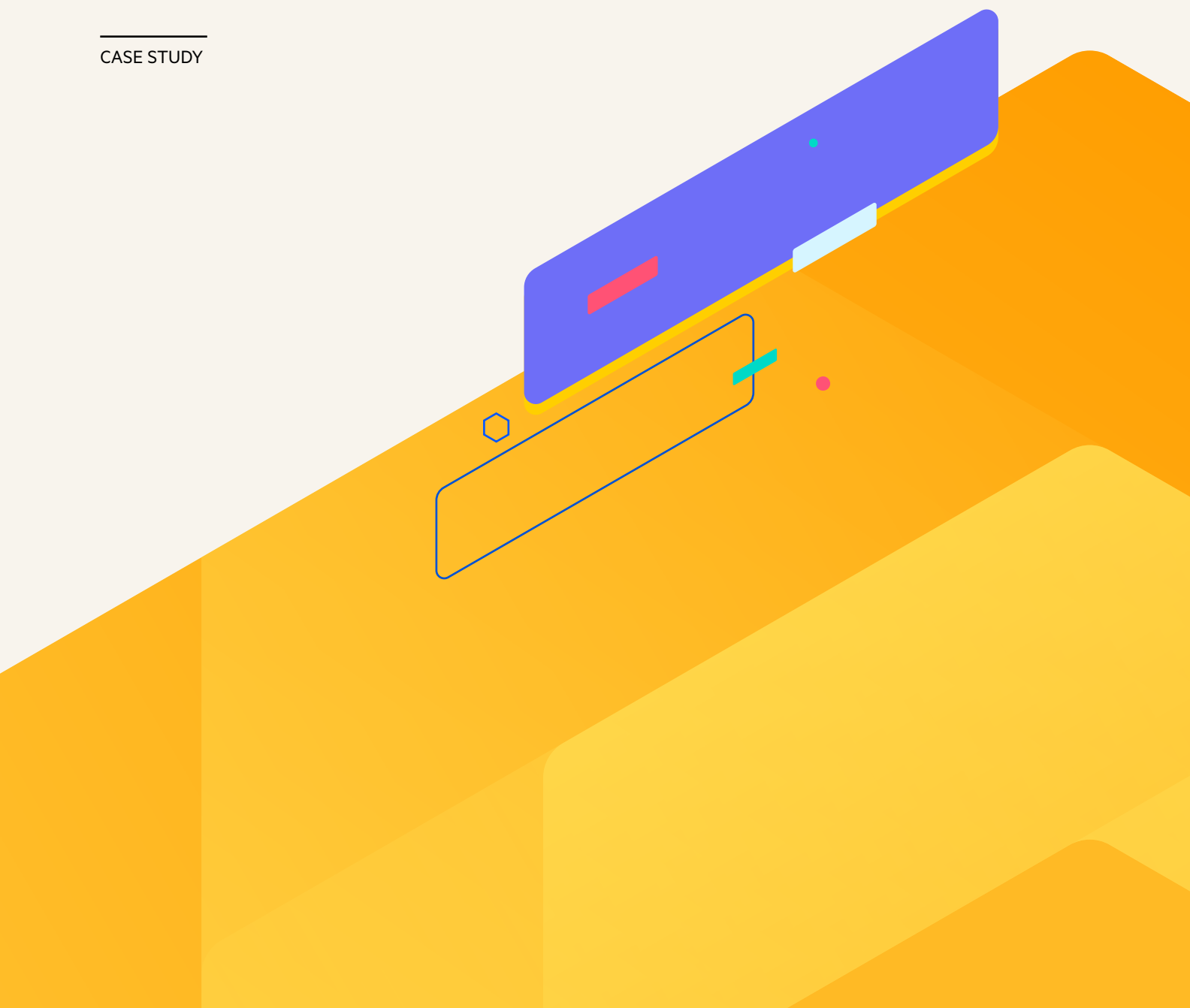


A Lesson in Digital Transformation in the Midst of a Global Pandemic

CASE STUDY



Background

The vision of Edgenuity is to help all learners reach their full potential

[Edgenuity](#) provides online learning and teacher resources and is used by 75% of U.S. school districts. Over the past five years, the company has seen explosive growth both organically and through acquisitions. In addition to mounting capacity challenges, they also faced gaps in the way they built, tested and deployed applications.

In the second half of 2019, Edgenuity selected Amazon Web Services (AWS) as their cloud provider and Chef as their automation partner to help them achieve core business objectives including:

- Availability: Zero downtime for students and teachers.
- Agility and Innovation: Better meet the needs of students and teachers
- Operational Efficiency: Contain costs while providing an exceptional product
- Secure by Design Systems: Ensure student data and scores are secure

At the beginning of 2020, Edgenuity's primary focus was migrating their existing data center to AWS by the end of the year. When the COVID-19 pandemic hit, suddenly the company needed to scale from supporting 500,000 connections to 5 million, making the data center migration critical.



“We’ve gone from zero to 100 in a matter of days and having a tool like Chef has been very useful in helping us be agile and get to the cloud in an efficient manner.”

Corey Johnston, Manager of Cloud Engineering, Edgenuity

A Plan for Change

Moving production applications to the cloud turned out to be more complicated than expected. The applications were complex, built upon legacy technologies and included functionality such as Video Streaming, Adaptive Testing, Grade Books, etc., making a “lift and shift” operation far too risky. As a result, it took four to five days to migrate a single school site. New deployments were just as daunting.

Challenges

Edgenuity faced multiple blockers to overcome:

Complexity—The technology estate was composed of a diverse mix of .NET, .NET Core and Java applications.

Technical Debt—Current applications were monolithic and required a custom version of the application for each school district in order to control content and access. Missing application dependencies were causing applications to fail in production. When moving a couple of servers to the cloud, it turned out that those servers were somehow feeding production and they had an outage. Remediation in-house took hours.



“We had a lot of dependencies and no one person knew all of them.”

Nada Kamis, Senior Cloud Engineer, Edgenuity

Siloed Delivery Teams—Development teams were distributed; work was done in silos and delivery processes were fragmented. Handoffs between engineering and operations when moving code to build and deploy were difficult. Dev, QA and Prod environments were often out of sync. Misunderstandings in configuration and environmental variables frequently caused builds to break.

Security Delays—Security was done after the fact vs. being built into deployments. Security checks were done after development released the application and many times required going back to development to rework non-compliant issues. This caused further delays and slippage or releases into nights and weekends.

Automation for Urgent Needs and Multiple Challenges

Edgenuity recognized that they needed to invest in an automation platform that could help them streamline building, delivering and securing applications. Their vendor requirements included:

1. Accelerate Cloud Migration

- Create a clear path to migrate applications to AWS
- Deliver a tool set versatile in both legacy and modern technologies, such as containerization, Kubernetes and AWS managed services
- Standardize services and APIs to support a hybrid environment

2. Drive Developer Agility and Innovation

- Make deployments transparent to developers regardless of the development application or platform
- Enable developers and QA teams to create clean room environments on demand
- Automate creation of build and deployment pipelines

3. Achieve Operational Efficiency

- Provide the ability to easily reference application dependencies
- Create confidence that deployed apps will work in production
- Limit the time FTEs spent supporting development releases to 5% and evolve FTEs from a team of ops specialists to a team of SREs

4. Implement a DevSecOps Approach

- Keep all infrastructure environments in sync and ensure compliance
- Integrate security tools and policies into all stages of the pipeline



“We wanted to be made of an organization of developers that we taught to do operations. As part of this we wanted to represent everything as code.”

Corey Johnston, Manager of Cloud Engineering, Edgenuity

Chef “Clicks” with Edgenuity

After an extensive vendor search, Edgenuity selected Chef as their automation partner.

Key factors influencing the Chef choice included:

- Integration with existing solutions and ability to provide a clear migration path to AWS
- Ability to enable automation for all parts of their organization by adopting an as code approach
- Chef professional services offerings and their ability to help Edgenuity promote forward thinking in application delivery best practices and decrease their time to market
- Shift-left approach to application packaging and security



“Chef has made our migration to AWS super easy. We were able to take what was built and move it to the cloud. Now we are rearchitecting as we have time and are super happy with the progress we’ve made.”

Corey Johnston, Manager of Cloud Engineering, Edgenuity

One of the core reasons Edgenuity selected Chef Habitat was because it was the only automated application packaging and delivery solution that was technology agnostic. That enabled the operations team to consume an application in its current state and deploy to the cloud regardless of the underlying application language or tools being used by the development team. Chef Habitat let Edgenuity package and deploy their existing applications by making some minor DNS edits and eliminating the need to do any refactoring. What once took four to five days could now be done in three hours—enabling them to migrate schools without disrupting student experiences.

IMPACT

Reduced deployment teams from 4 days to less than 3 hours.

Agility and Innovation

“We needed to set guard rails for our developers without confining their innovation. Chef has really allowed us to do this. Chef enables the art of possible. Developers can build and test in a clean room. Operations then has the confidence to deploy to production without sweat running down their brow.”

Corey Johnston, Manager of Cloud Engineering, Edgenuity.

Chef’s shift-left approach to application delivery played a key role in enabling Edgenuity’s DevOps teams to drive developer productivity and innovation. With Chef, Edgenuity has achieved their goal of making the deployment process transparent to the developers. Once the core automation has been built, developers can just run with it. Environments that used to take days and weeks to set up are now provisioned on-demand in a matter of minutes.

The availability of clean rooms for testing has also enabled Edgenuity to shift testing left and implement a continuous testing strategy, which enables development teams to be more innovative and ship new features faster.

Improved Operational Efficiency

“We wanted to be made of an organization of developers that we taught to do operations. As part of this we wanted to represent everything as code. Chef now sits as our foundational tier that everything else is built upon including our core applications, services, containers, etc.”

Corey Johnston, Manager of Cloud Engineering, Edgenuity.

IMPACT

Impact: Reduced the number of DevOps tools in use by 30%

By implementing a codified and technology-agnostic approach to application delivery, Edgenuity can manage both their on-premises and cloud environments without a lot of pain and effort. Chef is now the cornerstone of the common automation platform at Edgenuity. No matter what area or what version of an application is being worked by the systems team, Chef is used to build and deploy. As a result, Edgenuity reduced the number of DevOps tools in use by 30%.

IMPACT

Impact: Reduced the time ops spent supporting development to less than 5%

Chef’s approach to defining everything an application needs as part of the build process has enabled them to easily reference application dependencies and build common understanding across different versions of apps and integrations with third-party services. By adopting a common packaging methodology across all applications, the customer has been able to scale automated pipelines and progress the roles of FTEs to SREs, on top of reducing the time these individuals spend supporting development to less than 5%.

The operations team now has confidence that what they deploy will work correctly in production. Chef Automate’s dashboards let them visualize where applications are in the CI/CD lifecycle and provide insights.

DevSecOps Approach



“InSpec was a game change for Edgenuity. Before Chef security was an afterthought. Now security is built into the development process and developers know what to expect when they’re building the application, not after the security team does a scan and then comes back to the security team telling them the app is out of compliance and the release is now delayed.”

Corey Johnston, Manager of Cloud Engineering, Edgenuity

The adoption of Chef InSpec for hardening and monitoring has enabled Edgenuity to ensure environments stay in sync and ensure compliance. Security is no longer an afterthought but an integrated part of the pipeline. In addition, using InSpec they can continuously monitor both their cloud and on-prem deployments and ensure they stay in lock step with one another.

Summary

The sudden, COVID-driven expansion of Edgenuity's connection base from 500,000 to 5 million meant they could no longer bring systems down at night to carry on with an accelerated AWS migration. Instead, they needed to migrate live applications with no disruptions to students. Without the work they had already done with Chef, that would have been impossible. But because they had streamlined and standardized their application packaging and delivery processes, they were able to not only migrate the applications to the cloud without disruption but also accelerate the rate in which they were able to release new innovations.



“We’re continuing to evolve our applications to better meet the needs of our students and we’re moving more towards a service-oriented architecture. Because we’ve already had great success with Chef and Chef is technology agnostic, we don’t have to carve out time to learn a whole new tool.”

In addition, Chef has helped Edgenuity continue to modernize and take advantage of new technologies. With Chef they can execute service deployments into new environments like Kubernetes without having to learn another tool. They can accelerate the rate of innovation because there aren't new tools and processes to learn—with Chef, Edgenuity has the reliability and consistency they need to meet customer needs and handle the unexpected.

“We’ve gone from zero to 100 in a matter of days and having a tool like Chef has been very useful in helping us be agile and get to the cloud in an efficient manner.”

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