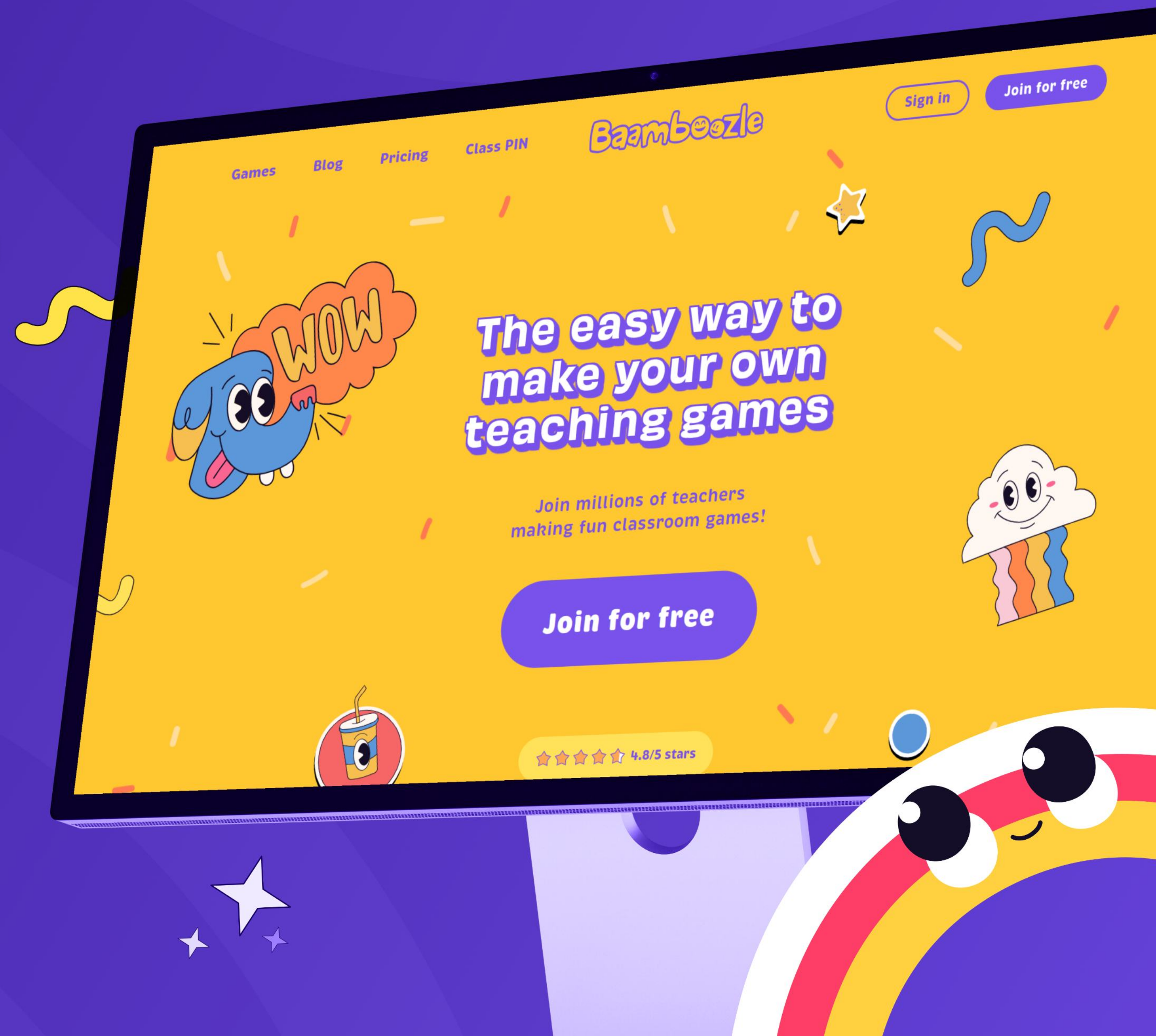


CASE STUDY

Building an AI-Ready Platform for Classroom Learning

Client: Baamboozle / Ronan Casey



Since December 2023, NUS Technology has worked with Baamboozle to extend and strengthen its game-based learning platform as customer demand and product requirements have continued to grow.

Baamboozle serves a global market of teachers and students, helping educators turn classroom review sessions into interactive, multiplayer games. Teachers can create quiz-style activities, display them on a shared television or projector, and invite students to participate through a classroom PIN without requiring them to install an application.

As adoption and product ambitions increased, Baamboozle’s existing development capacity was no longer sufficient to deliver new functionality at the required pace. NUS joined the project to expand the engineering team, continue development of the established platform, resolve operational issues, and support the development of a new generation of AI-assisted authoring tools.

■ Industry
EdTech / Game-Based Learning

■ Market
Global

■ Partnership
December 2023–Present

■ Frontend
Next.js, React, TypeScript

■ Backend
Laravel, PHP

■ Infrastructure
AWS

■ AWS
Stripe, AWS S3, CloudFront, Google Cloud Translate, OpenAI, Google Gemini, OpenRouter, Langfuse, Giphy, Bing Image Search, Meilisearch / Elasticsearch, Sentry



THE CHALLENGE

Scaling a Growing Product Ecosystem

Baamboozle had evolved beyond a standalone classroom game application. Its Laravel platform managed teacher accounts, educational games, subscriptions, content discovery, administration, advertising, authentication, media services, email communications, and numerous external integrations. At the same time, a newer Next.js application was being developed to support Baamboozle Studio, AI-assisted content creation, and emerging experiences such as the Baamboard interactive game board.

Supporting both environments created several interconnected challenges.





Complex Subscription Operations

Baamboozle monetizes its platform through paid subscriptions for teachers and schools that need access to advanced functionality. Subscription management therefore needed to handle paused plans, resumed subscriptions, trial extensions, cancellations, free-plan expiration dates, and customers resubscribing while an existing subscription remained paused.

Problems within these workflows could produce incorrect account access, inaccurate expiration dates, or inconsistent information between Stripe, the application database, and Baamboozle's administration panel.

An Outdated Search Foundation

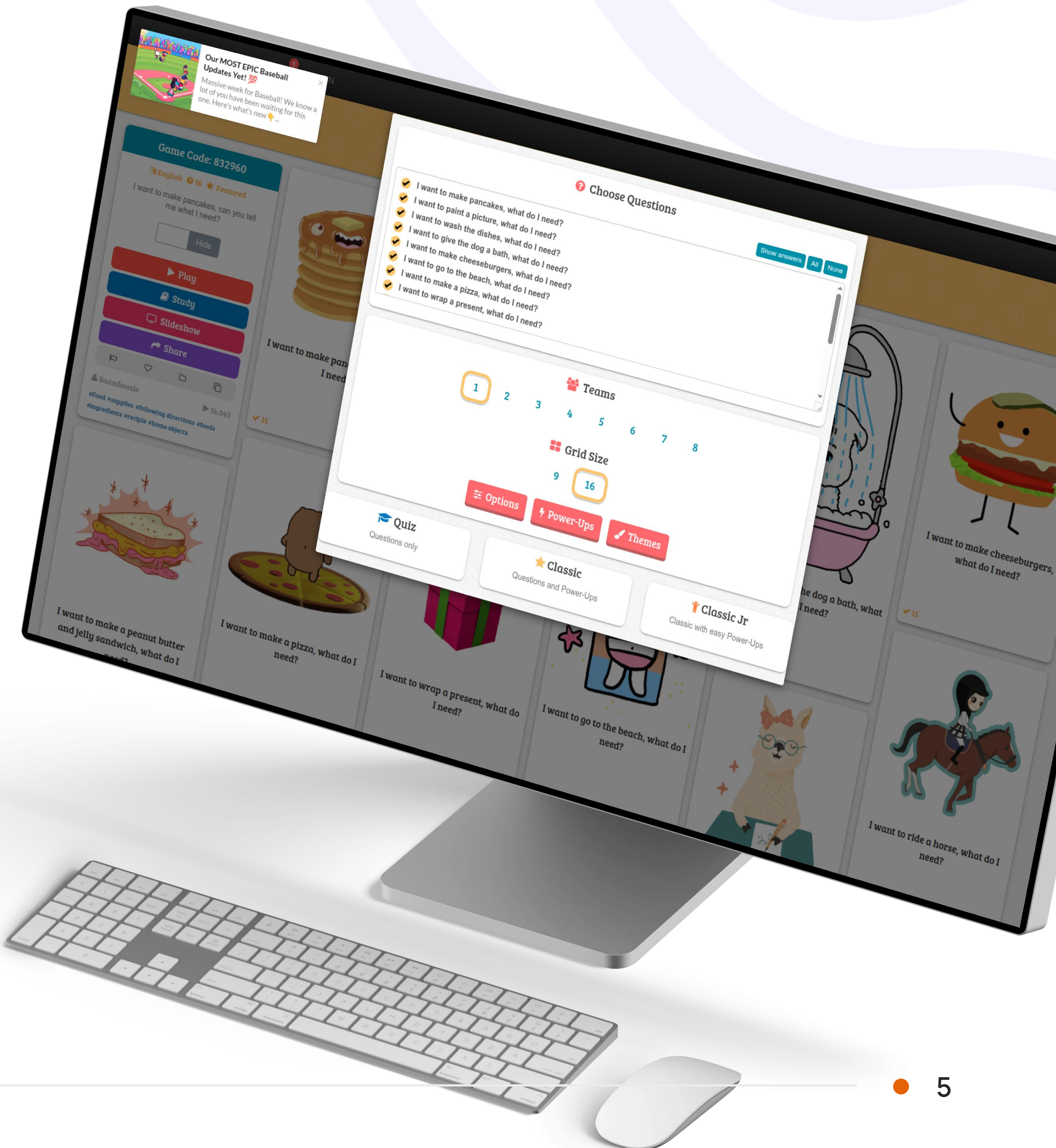
Baamboozle's growing content library contained games, questions, tags, hashtags, and other searchable information. Its existing Elasticsearch integration relied on a driver that was no longer actively maintained.

Replacing the driver required more than a basic technical migration. Search needed to account for the structure and language of educational content, including English stemming, hashtags written in camelCase, questions nested within games, tag-based discovery, and separate indexes for development, staging, and production.

Unreliable External Content Imports

Teachers frequently wanted to reuse educational material created on other platforms. Baamboozle therefore needed to support imports from services such as Kahoot and Quizlet.

Each external platform used different data structures and introduced its own parsing errors and edge cases. Imported content could also contain inappropriate language that needed to be identified before being used in a classroom. Without reliable import workflows, teachers could spend substantial time manually rebuilding or correcting content they had already created elsewhere.

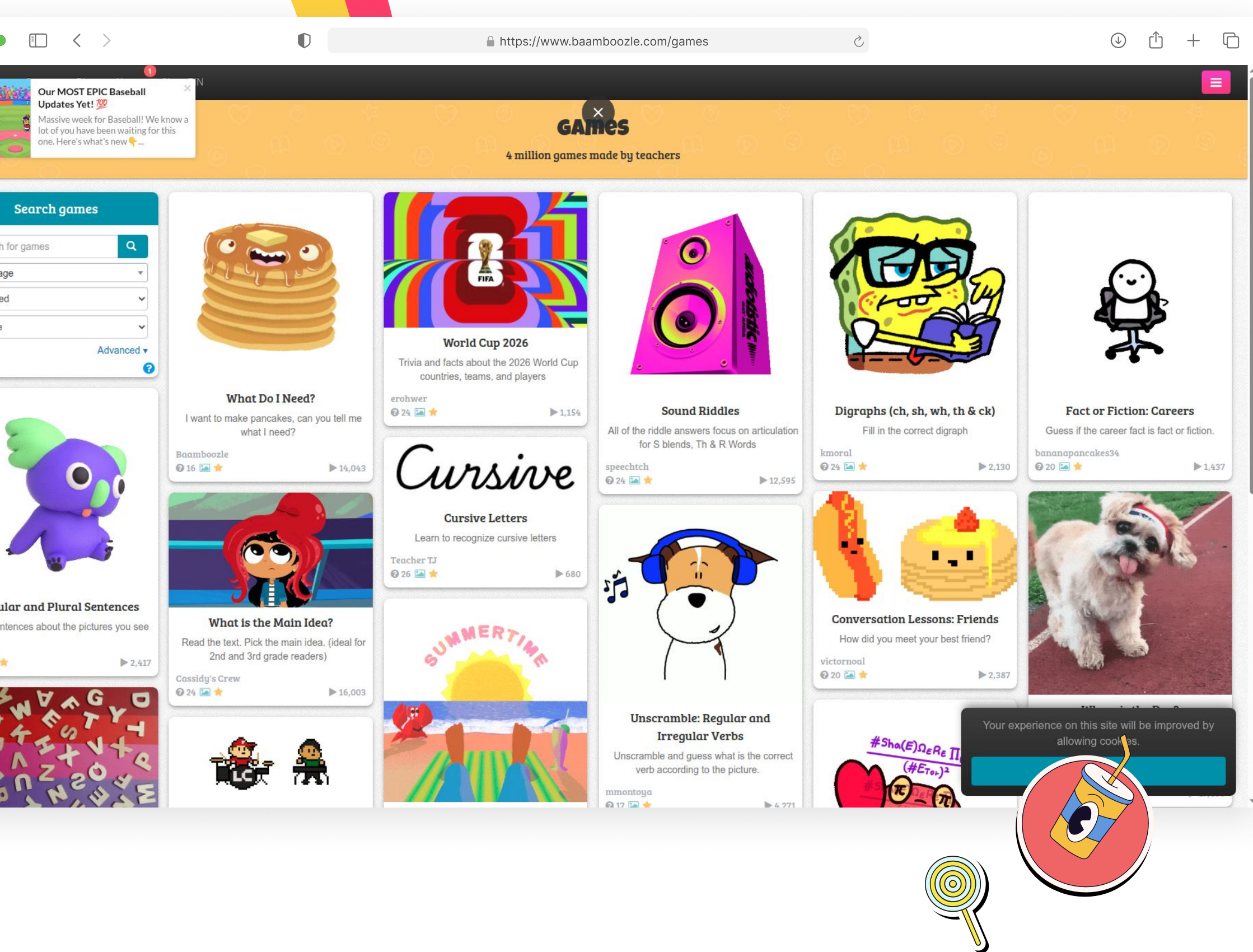


Continuous Platform Modernization

The newer client application was progressing through major upgrades to Node.js, React, and Next.js. Each upgrade created a risk of regressions in styling, responsive layouts, and established user journeys.

At the same time, Baamboozle was introducing AI functionality dependent on multiple language-model providers, streaming responses, caching infrastructure, language services, web-content tools, and model observability platforms. The challenge was to modernize and extend the product without destabilizing the classroom experience that existing users depended on.





THE SOLUTION

Strengthening the Platform and Extending It with AI

NUS worked across Baamboozle’s Laravel backend and Next.js client, addressing immediate operational issues while creating a stronger foundation for new product development.

Stabilizing Core Operations

NUS strengthened subscription workflows across Stripe, Laravel Cashier, the application database, and Baamboozle’s administration tools. The team resolved edge cases involving paused and resumed subscriptions, trial extensions, cancellations, free-plan expiry dates, and customers resubscribing while an existing plan remained paused.

The team also improved third-party integrations, including handling Giphy rate limits more gracefully, and introduced feature flags so selected functionality could be activated or disabled safely in production. Automated browser testing with Laravel Dusk was expanded to reduce regressions as the platform continued to evolve.

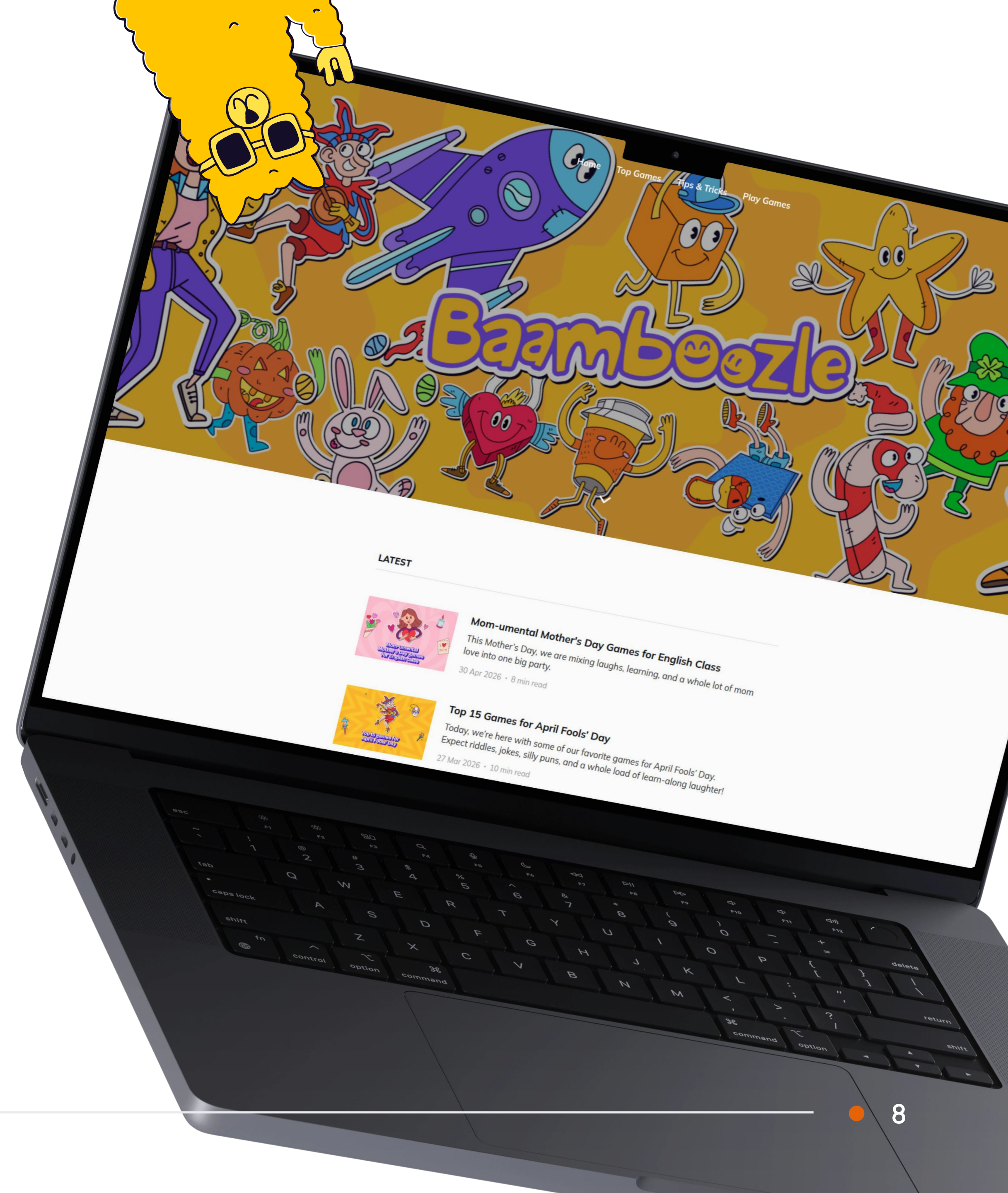
Modernizing Search and Content Workflows

NUS replaced Baamboozle's outdated Elasticsearch driver and rebuilt search around the structure of its educational content. The new implementation supports English stemming, camelCase hashtags, nested questions, tag-based discovery, advanced search, and separate indexes for local, staging, and production environments.

Search and administrative queries were also optimized, while import workflows for Kahoot and Quizlet were strengthened with source-specific parsing, error handling, and profanity filtering. These improvements made it easier for teachers to reuse existing material and for Baamboozle's team to manage a growing content library.

Supporting Continuous Platform Development

NUS supported major upgrades across Node.js, React, and Next.js, resolving styling, responsive-design, and end-to-end regressions after each upgrade. This allowed Baamboozle to continue modernizing its technology stack without interrupting the development of new functionality.



Building AI-Assisted Authoring

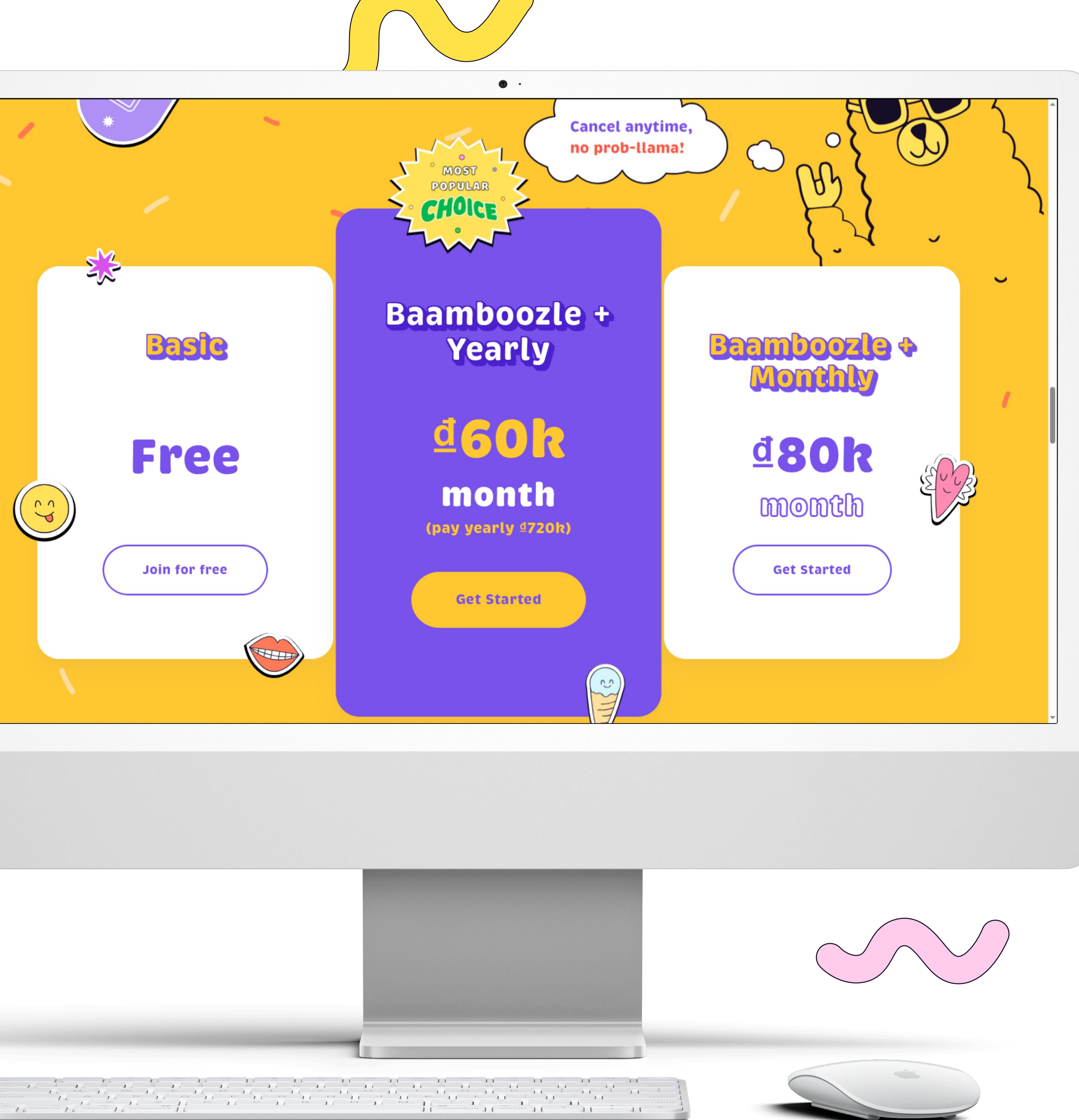
For Baamboozle Studio, NUS developed an extensible AI Toolbar that allows teachers to translate games and questions directly within the editor. Teachers can review, edit, approve, or reject individual translations before applying them, keeping control of the final educational content.

A resilient batch translation pipeline processes up to 100 items per request, caches individual results, isolates failed batches, and applies timeouts to prevent stalled jobs. The surrounding architecture was designed to support future tools such as content improvement, simplification, and hint generation.

NUS also introduced a multi-provider AI routing layer supporting models from OpenAI, Google Gemini, Claude through OpenRouter, Kimi, and other providers available through the Vercel AI SDK. Model-specific settings can be changed without modifying the surrounding product logic.

Redis-based caching supports both streaming and non-streaming AI responses and follows a fail-open design, allowing AI features to continue operating if the cache becomes unavailable. Langfuse tracing and LLM-as-judge scoring provide Baamboozle with a foundation for comparing model outputs and improving AI quality over time.



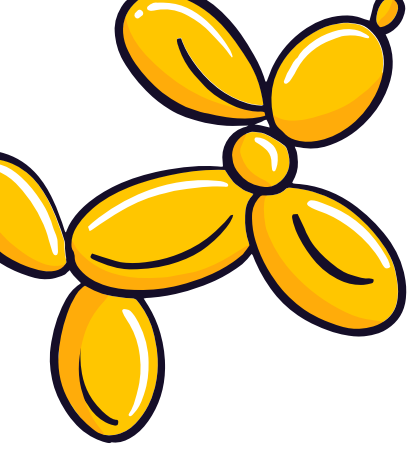


■ THE RESULT

A Stronger Foundation for Continued Growth

Since NUS joined the project, Baamboozle has increased its effective development capacity by approximately **35%**, enabling the team to maintain the established platform while progressing new initiatives such as Baamboozle Studio and AI-assisted authoring.

Improvements to subscription lifecycle handling reduced recurring billing and account-access issues by an estimated **30%**, particularly across pause, resume, cancellation, trial-extension, and resubscription scenarios. This gave Baamboozle's team a more consistent view of customer status and reduced the need for manual intervention.



Search migration and query optimization shortened loading times across key administrative and team-management pages by approximately **25%**. The new search foundation also expanded support for tags, hashtags, nested questions, and environment-specific indexes without relying on the previous unmaintained driver.

The improved Kahoot and Quizlet import workflows, combined with batch AI translation, reduced the time required to prepare or migrate a typical classroom game by an estimated **40%**. Teachers can reuse existing content, process larger translation workloads, and review AI-generated changes directly within the authoring workflow

Product Links



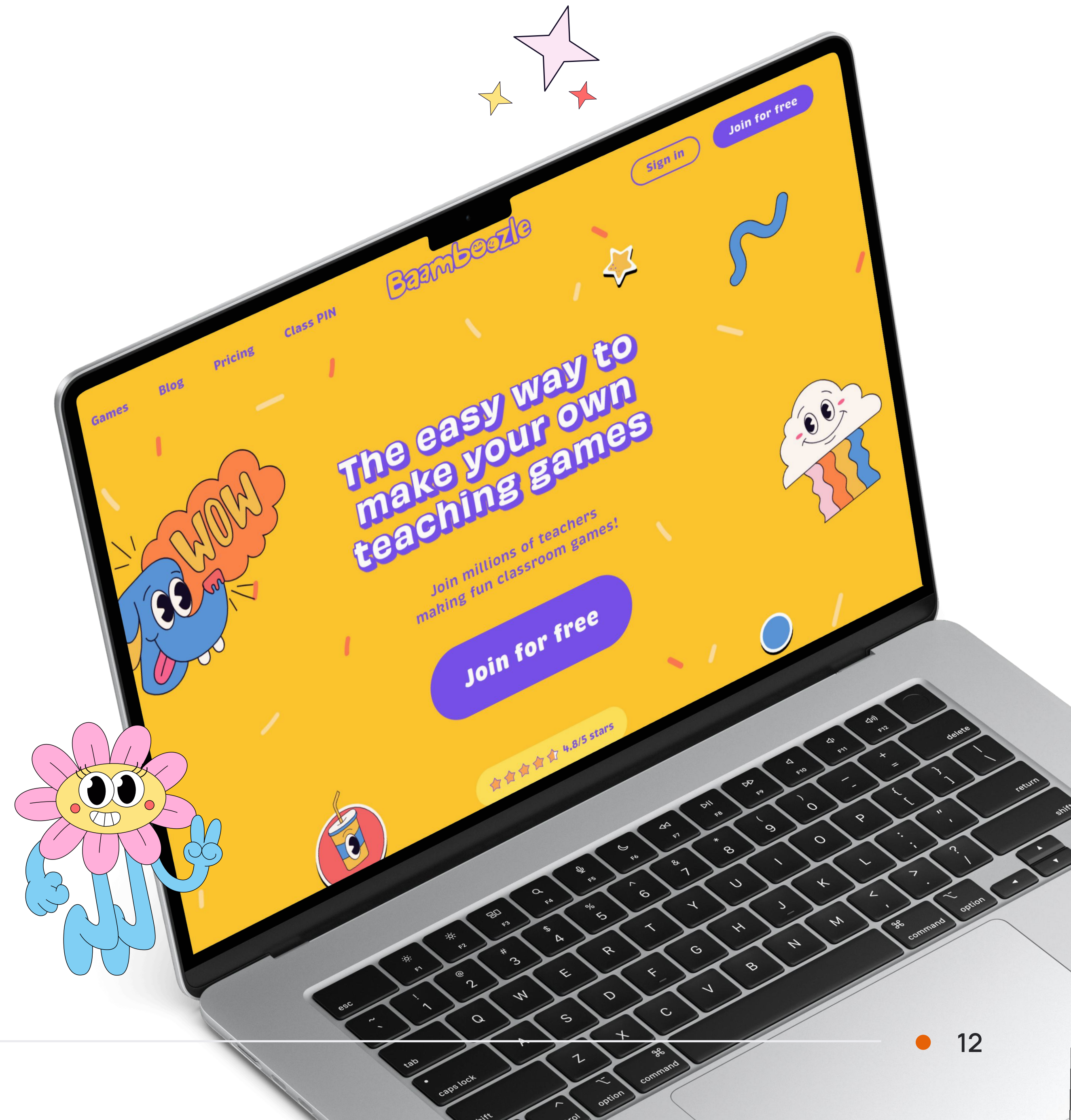
Website

[Visit the Website](#) ↗

From Classroom Games to an Extensible Learning Platform

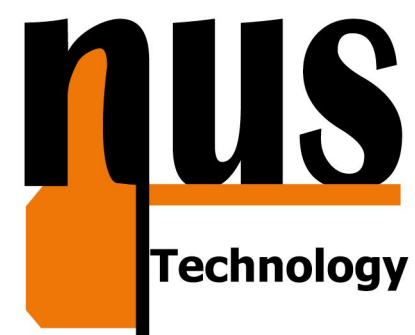
Baamboozle's continued growth has expanded the product far beyond its original classroom game experience. Subscriptions, educational content, search, external imports, advertising, media services, AI providers, analytics, and teacher-facing authoring tools now operate as components of one connected global platform hosted on AWS.

Since joining the project in December 2023, NUS has helped Baamboozle strengthen these connections while continuing to build new functionality. By resolving operational edge cases, modernizing foundational systems, supporting major framework upgrades, and introducing a flexible AI architecture, NUS has enabled Baamboozle to respond to growing product demand without neglecting the reliability of the platform teachers already use.



THANK YOU

For Reading Our Case Study



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