

CASE STUDY

Empowering Future Nurses: A Case Study on YBG and NUS Technology's Long-Term Partnership

Client: Patrick A.



Overview

With a 15-year history, YBG established itself as a critical resource for nursing students across the United States. The platform provides a comprehensive suite of tools to help students prepare for the high-stakes exams required for their careers, from the HESI A2 entrance exam to the final HESI NCLEX certification. Their vision was to be the most robust and flexible practice platform, enabling students to target their weaknesses and practice with exam formats that mirror the real test.

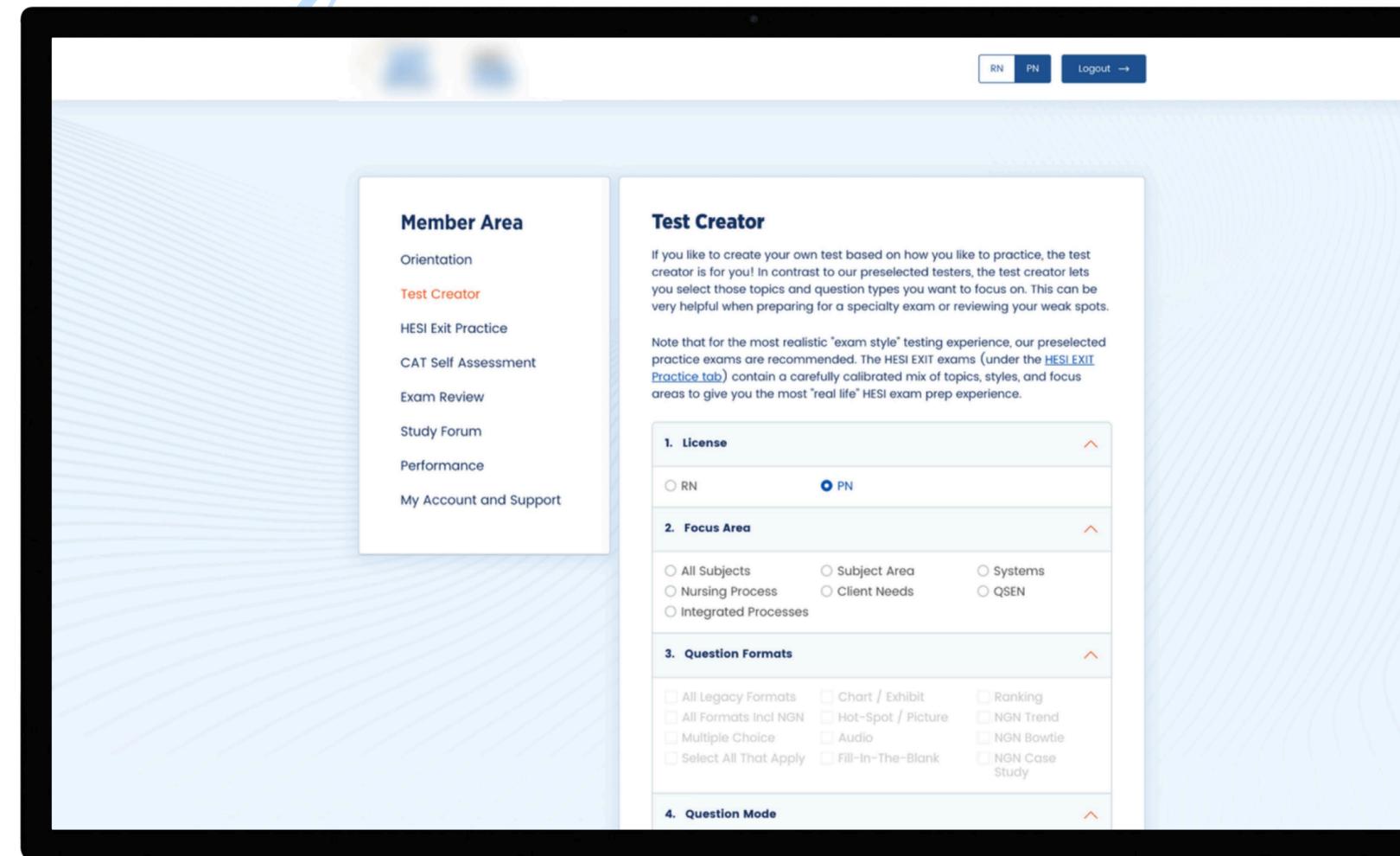
- Industry
EdTech (Nursing Education & Exam Preparation)
- Market
United States
- Frontend
Ruby on Rails, react-rails, Next.js, Tailwind CSS
- Backend
Ruby on Rails
- Database
PostgreSQL
- Infrastructure
AWS (EC2, RDS, S3, ElastiCache), Google Cloud (Backup)
- Integrations
Aweber, BugSnag, VWO, VdoCipher



THE CHALLENGE

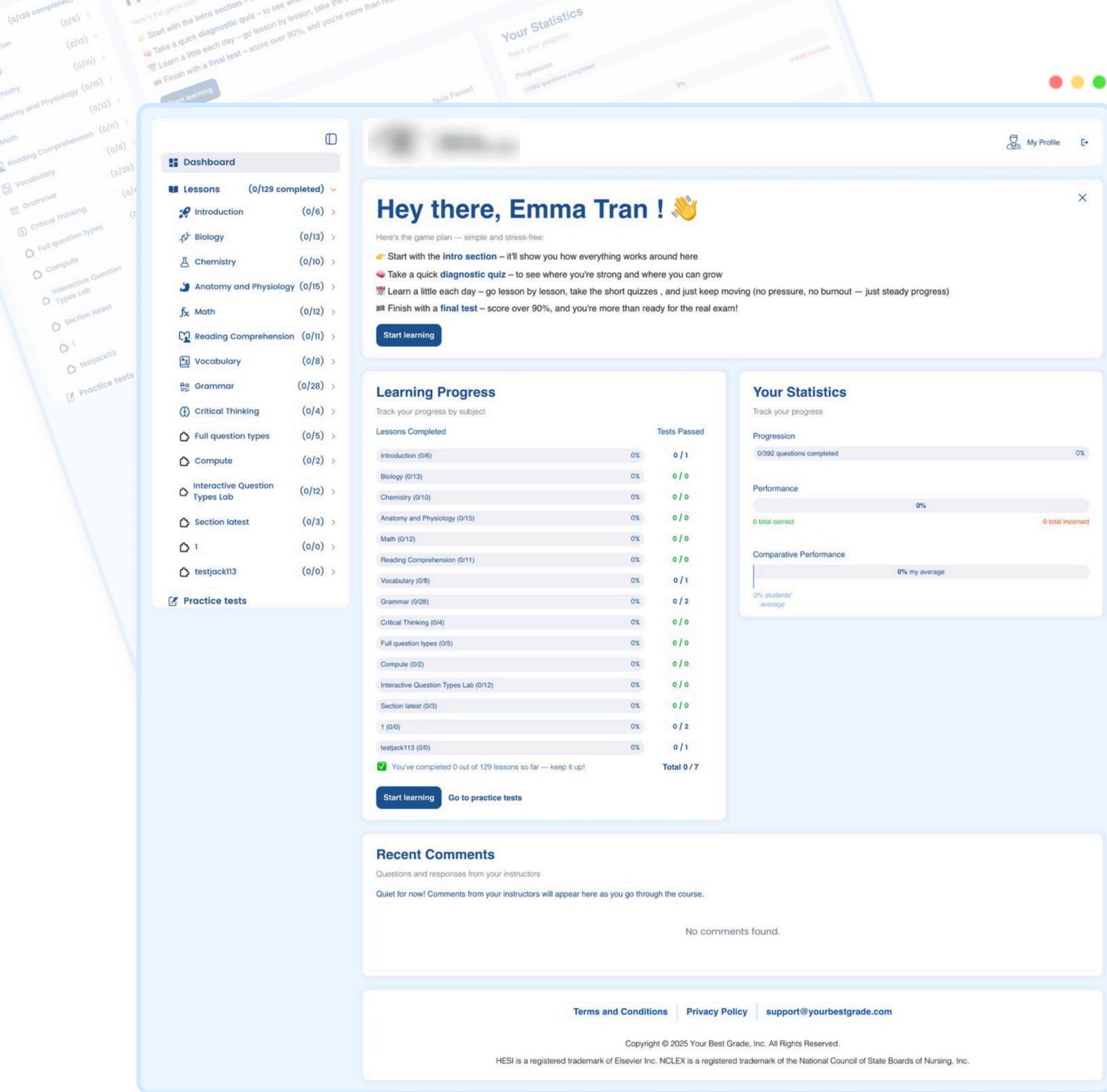
A Mission-Critical Platform Weighed Down by Legacy Code

NUS Technology began its partnership with YBG eight years ago, inheriting an 11-year-old legacy codebase. While the platform was feature-rich, it was suffering from significant technical debt and performance issues that threatened user experience and future growth.



The client's primary challenges were:

- **Crippling Performance:** The platform's most valuable feature, the "Test Creator," was frequently timing out, taking one to two minutes (or longer) to generate an exam. This created immense user frustration. Similarly, loading test questions placed a heavy, direct load on the database, causing system-wide slowdowns.
- **Extreme Feature Complexity:** The platform supports 18 different question types—including complex drag-and-drop interactions on images—which were difficult to implement and maintain in the legacy Rails and Bootstrap frontend.
- **Complex Business Logic:** The site's revenue model depended on a complex web of payment methods (Credit Card, PayPal, Cash App, BNPL) and diverse subscription plans (monthly, yearly, add-on days, installments, refunds), making testing and new feature development incredibly time-consuming.
- **Lack of Automated Testing:** The original codebase had virtually no unit tests. Every change, no matter how small, required extensive manual regression testing, dramatically slowing down development velocity.



■ THE SOLUTION

A Strategic Partnership for Modernization and Performance

NUS Technology took on the role of a long-term strategic partner, focusing on stabilizing, optimizing, and incrementally modernizing the platform. The goal was not to rewrite from scratch, but to surgically improve the existing system while building new capabilities.

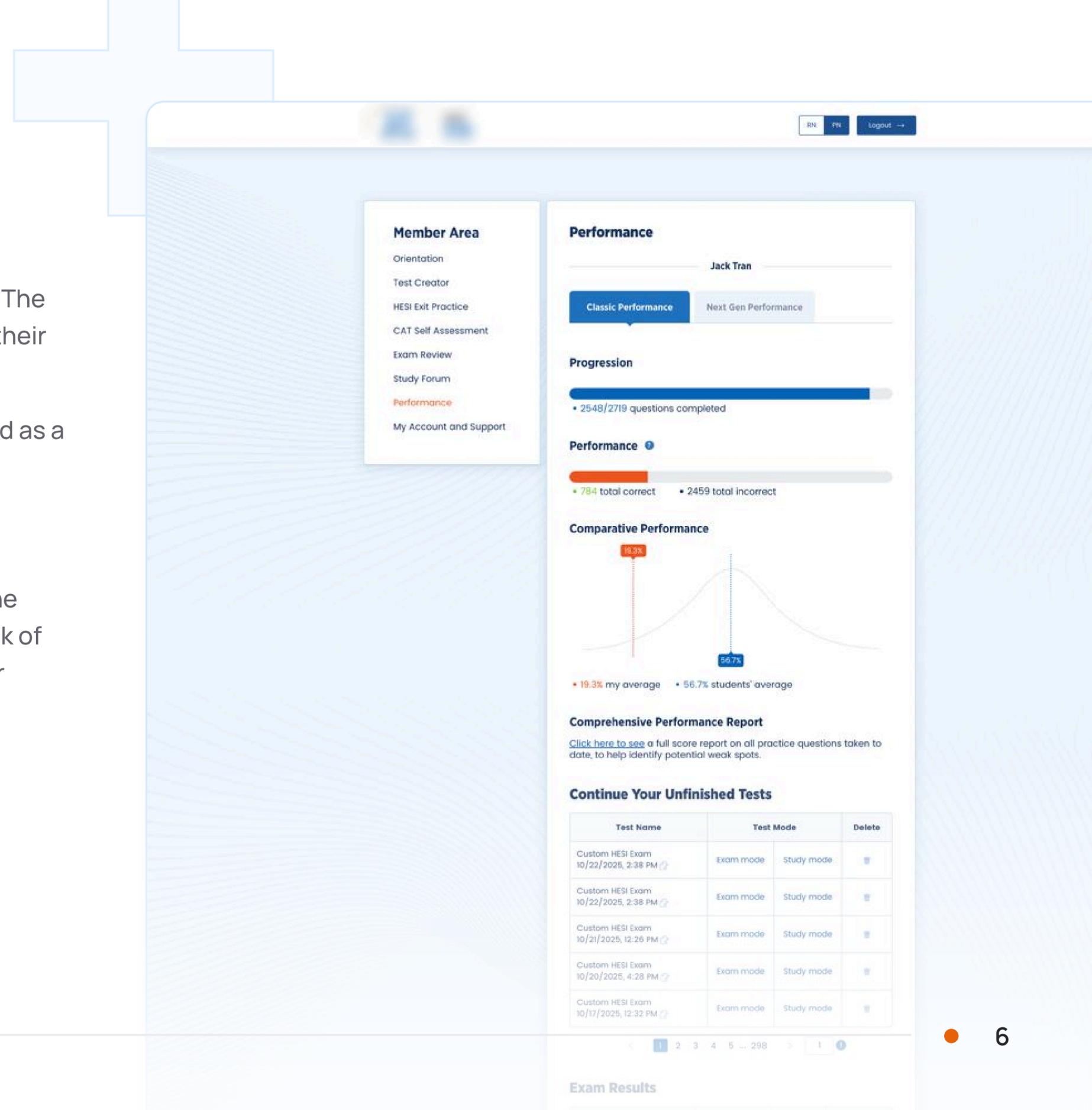


Technology Stack & Architecture

The team's strategy involved a careful evolution of the tech stack. The core backend remains **Ruby on Rails** and **PostgreSQL**, leveraging their power and stability.

To address performance, **AWS ElastiCache (Redis)** was introduced as a critical architectural component to cache test and question data, decoupling the application from the database.

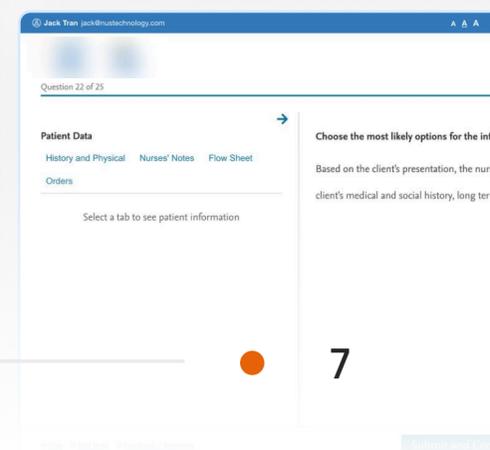
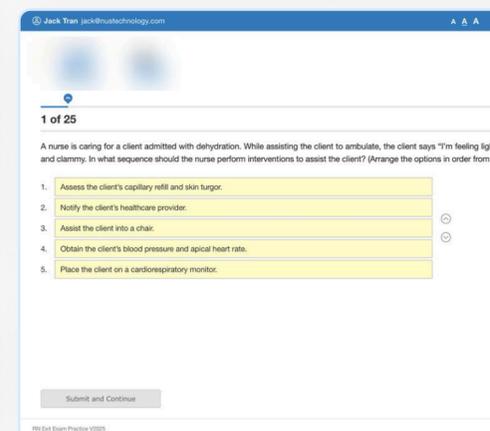
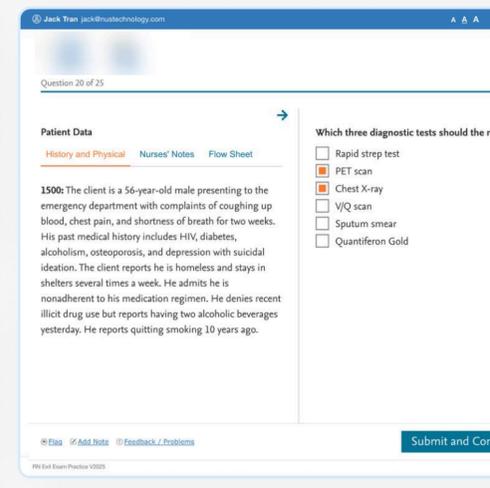
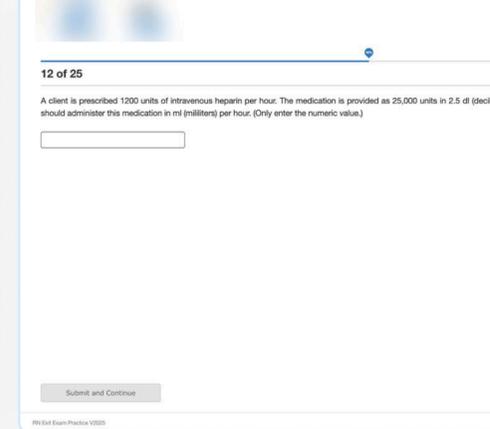
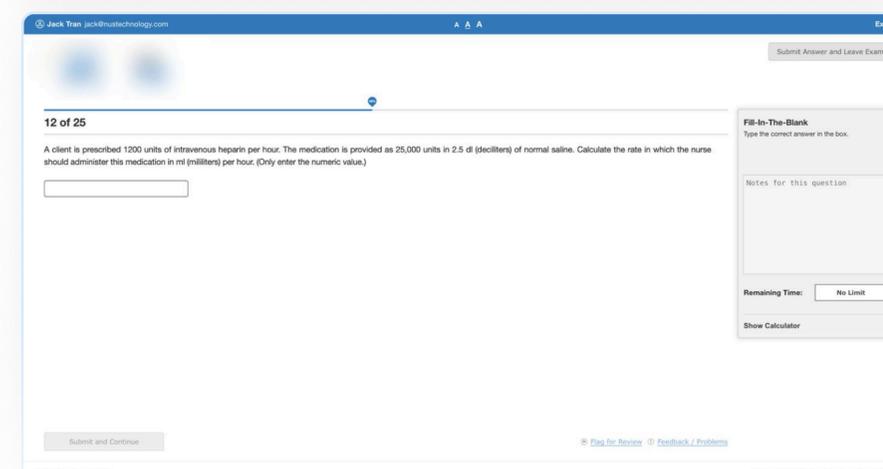
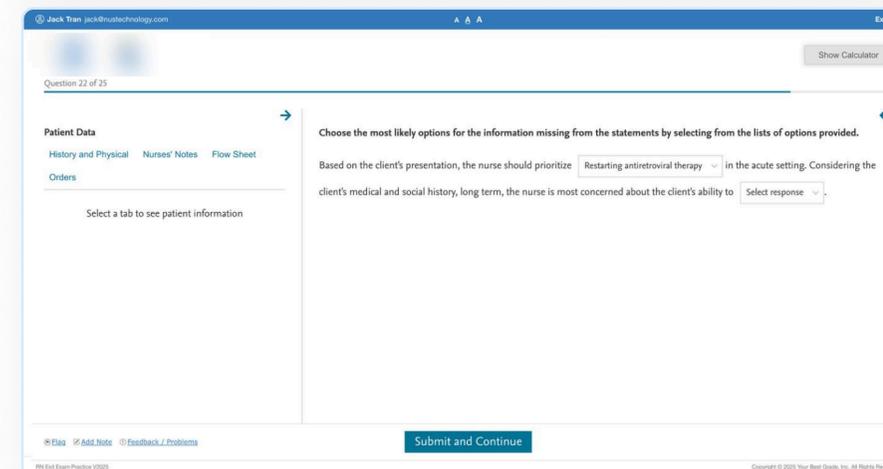
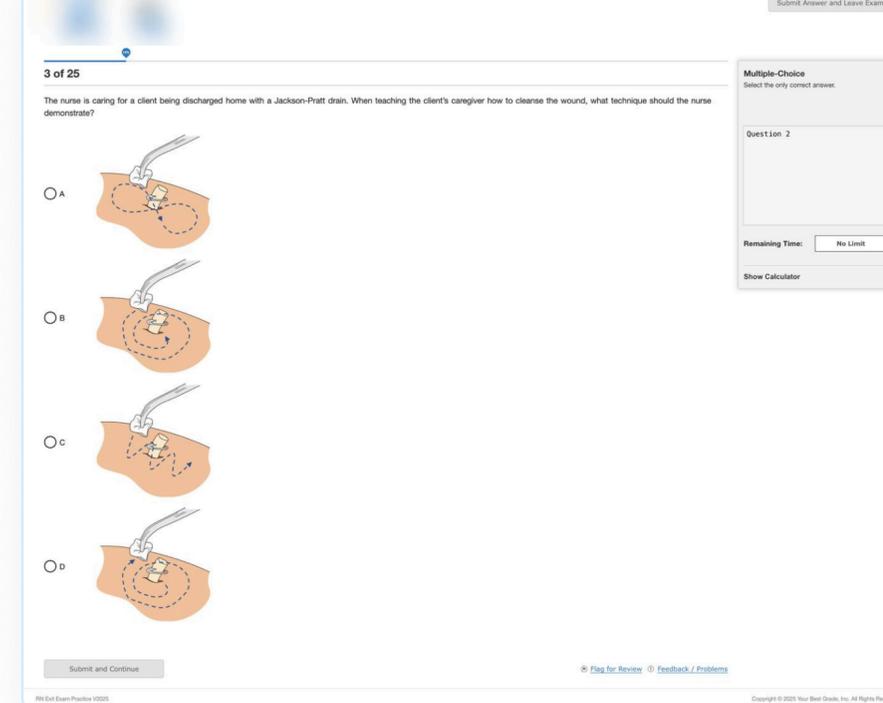
On the frontend, **react-rails** was used to build modern, interactive components within the existing Rails monolith. For new, standalone features like the HESI A2 module, the team adopted a modern stack of **Next.js** and **Tailwind CSS** to ensure high performance and a better developer experience.



Overcoming Technical Hurdles

The team's expertise was immediately put to the test to solve the platform's most pressing issues:

- **Optimizing the "Test Creator":** The 2-minute timeout was unacceptable. By performing a deep analysis and optimizing the underlying database queries and application logic, the NUS team reduced the test generation time from **70-120 seconds to an average of 3-7 seconds**, a performance increase of over 95%.
- **Eliminating Database Overload:** To solve the test loading bottleneck, the team implemented a **Redis caching layer**. Instead of hitting the database for every request, frequently accessed questions and tests are served from memory. This change dramatically improved page load speeds and stabilized the entire platform, allowing it to "run smoothly to this day."
- **Mastering Complex Interactions:** To support all 18 question types, especially image-based drag-and-drop, the team engineered custom JavaScript solutions. This included handling image scaling on different screen sizes and creating a "click-and-drop" alternative for mobile devices, ensuring the complex functionality worked reliably everywhere.



THE RESULT

A Revitalized, High-Performance E-learning Leader

The 8-year partnership between NUS Technology and YBG has transformed a struggling legacy platform into a stable, scalable, and highly profitable business. The technical achievements translated directly into business value:



Drastic Performance Gains

The Test Creator timeout issue was eliminated, with generation speeds improving by over 95% (from 120+ seconds to <7 seconds).



Enhanced Platform Stability

The implementation of Redis caching solved critical performance bottlenecks, leading to a faster, more reliable user experience and a significant reduction in database load.



Sustained, Long-Term Partnership

The greatest achievement is the 8-year (and counting) collaboration, demonstrating a deep level of trust and NUS Technology's ability to consistently deliver value and manage a highly complex system.

Achievement	Before	After
Test Creator Speed	1-2+ Minutes (or Timeout)	3-7 Seconds
Test Loading	High Database Load	Served from Cache (Redis)
Development	Slow, High-Risk (No Tests)	Ongoing Modernization & Test Coverage

Conclusion

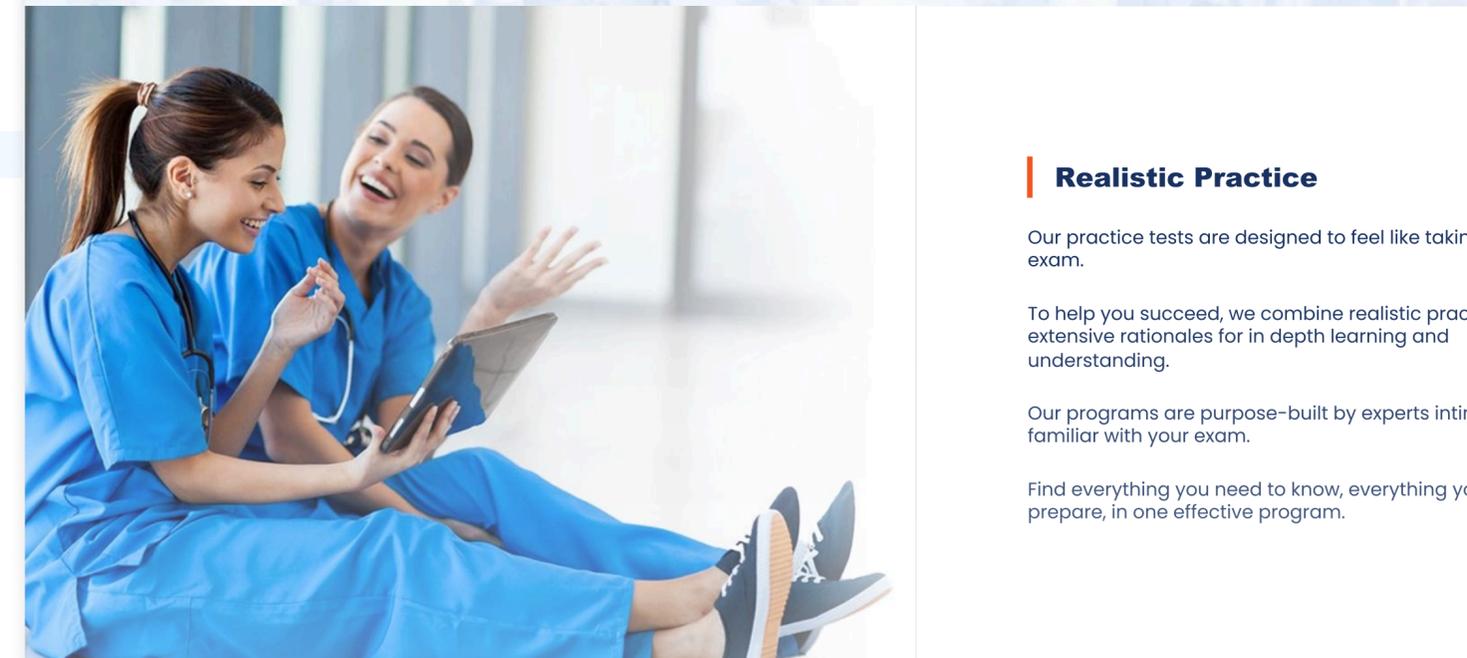
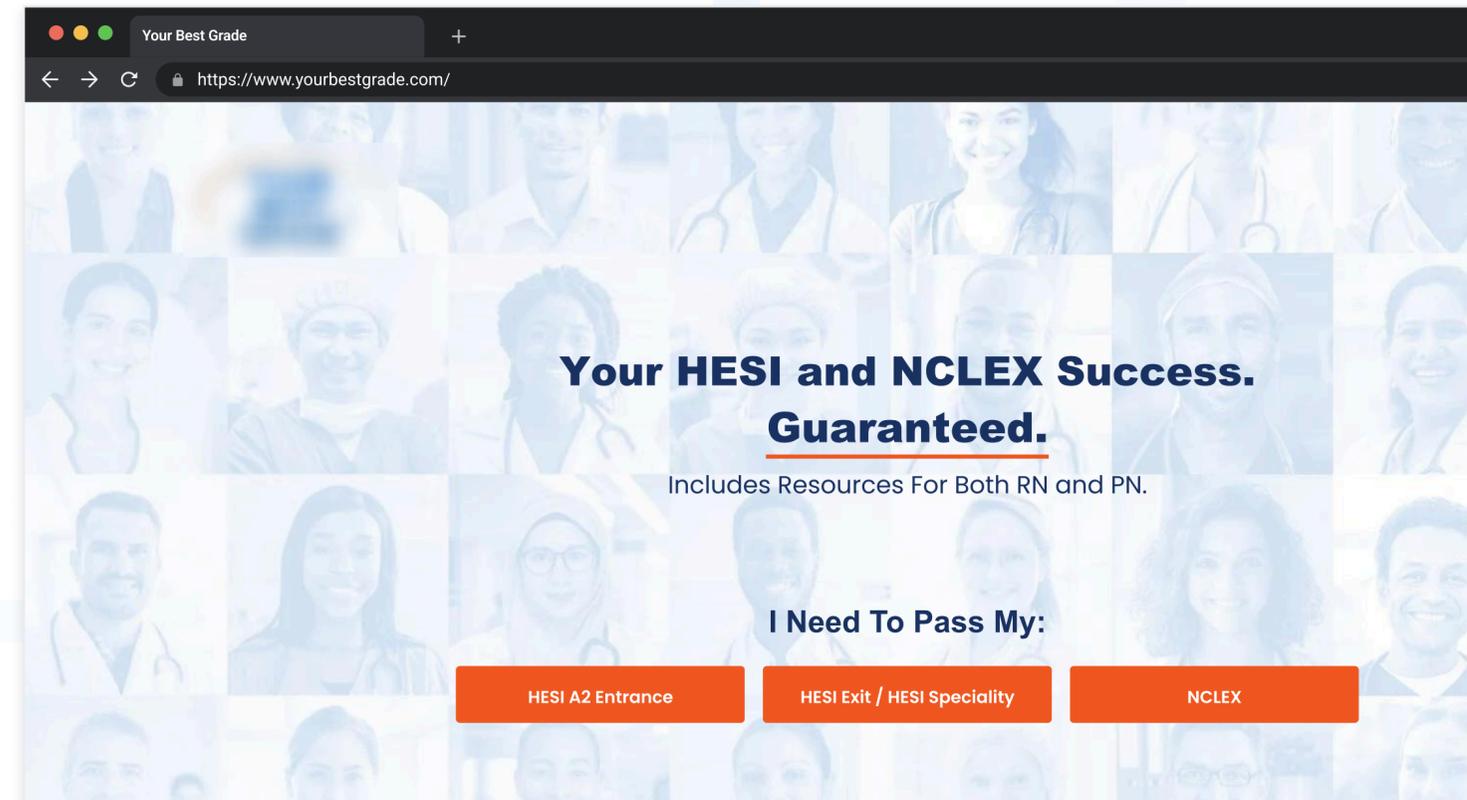
This partnership showcases NUS Technology's ability to do more than just build new products. It highlights our expertise in managing, optimizing, and modernizing complex, mission-critical legacy systems. By solving deep performance issues and skillfully handling intricate business logic, NUS has helped YBG solidify its position as a "money maker" and a leading resource for nursing students in the US. The 8-year relationship stands as a testament to our role as a reliable, long-term technology partner invested in our client's success.

Links



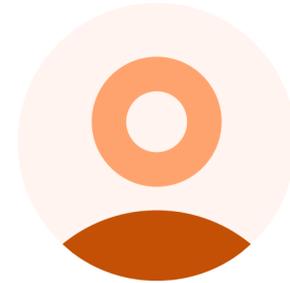
Website

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TESTIMONIAL

What Our Client Says



Patrick A.
Director

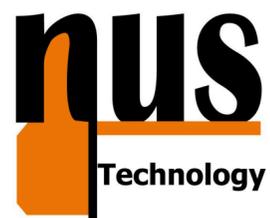
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Reliable. Skilled. A Partner You Can Count On

We've partnered with NUS Technology for 8 years. Their team skillfully optimized our legacy platform, significantly improving performance on key features like the test creator. Their reliable, long-term support has been invaluable to maintaining our system's stability.

THANK YOU

For Reading Our Case Study



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