Pearson uses cloud platform to bring digital textbooks to life and to analyze how kids learn

"The Microsoft technologies and Fino engagement help us to enhance the ways that teachers teach and students learn."

Leigh Garcia, Vice President of Product Management, Pearson

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In the fast-changing education market, even digital content is no longer enough. That content also has to be part of a highly interactive, collaborative, and analytical solution that meets new standards and supports new ways of learning. Pearson is at the forefront of this market with its Pearson System of Courses, based on Microsoft Azure and development technologies.

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Business Needs

Printed textbooks are so 20th century. Even digital content can look quaint. How does a textbook publisher deliver what's needed now?

If that publisher is Pearson, then the answer requires innovation on a variety of fronts and at a velocity previously unconsidered, let alone achieved. New standards—such as Common Core—need to be accommodated. So do new ways of teaching that are personalized in response to students' interests. Innovation also has to include unprecedented levels of engagement to attract and retain the attention of students who face more distractions than students of any previous generation. Finally, teachers and administrators need a fuller, faster understanding of how, and how well, their students are learning, so that they can optimize learning for everyone. For Pearson, these ambitious goals all figure into the company's new Pearson System of Courses (PSOC), a tablet-based curriculum for K–12 English language arts and K–11 mathematics. Introduced in 2014, PSOC was immediately used by eight school districts and 85,000 students throughout the US. For 2015, Pearson expects that number to increase by a factor of about 50 percent.

Creating PSOC was not only an educational challenge; it was a technology challenge, too. Pearson and its technology partner Fino Consulting needed to support an agile software development process that would enable a large and complex project to move forward quickly and flexibly, while maintaining high quality. And they needed PSOC to support massive amounts of data—about 40 petabytes in its first year—and to incorporate high levels of social collaboration. They also needed it to support the rapid analyses of student learning to help teachers adopt the most appropriate pedagogical model for working with each student.

Solution

Pearson and Fino sought to address both the educational and technological requirements for PSOC by using a range of Microsoft technologies, especially the Microsoft Visual Studio 2013 development system and the Microsoft Azure cloud computing platform.

The PSOC team of more than 50 developers and 50 project managers, UI designers, and quality-assurance personnel used Visual Studio for everything from design through test. "Fino uses Visual Studio, because of its unmatched support for

Overview
Customer: Pearson
Customer Website: www.pearson.com
Customer Size: 42,000 employees
Country or Region: United Kingdom
Industry: Education
Partner: Fino Consulting
Website: www.finoconsulting.com

Customer Profile
Pearson, based in London, is an international media and education company that engages in the education, business information, and consumer publishing markets.

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C#, XAML, and the Microsoft platform," says Christian Jungers, Chief Technology Officer at Fino and Lead Architect on PSOC. He also cites features such as its Server Explorer server management console, which the development team used to quickly explore and iterate the various PSOC databases and system services.

PSOC also required a computing platform to meet the heavy demands of content hosting, social collaboration, and data analysis. While Pearson had experience with Amazon Web Services and external hosters, Pearson and Fino chose Microsoft Azure. "Azure was the best choice for PSOC because of all the platform components it exposes," says Jungers.

PSOC uses Azure Websites and Azure Blob and Table Storage to author and host Pearson-generated content. It uses Azure Cloud Services to process interactions with users that came to tens of millions of events in PSOC's first four-month period. And it uses Azure HDInsight and Azure SQL Database to provide educators with analyses of student performance. The events of PSOC use—for example, when students download, create, or share content—are analyzed in HDInsight so teachers can track and understand how students are working with the content, which concepts they've grasped, and which ones they need help with.

PSOC also uses these Azure services so the product team can analyze the solution's own performance, for use in formulating a continual stream of enhancements.

The Azure portion of the solution feeds cross-platform tablet interfaces on iOS, Windows 8.1, and, soon, Android. To create those front ends, Fino and Pearson used

a combination of native development and Xamarin development tools.

When students log into PSOC, the action automatically triggers the download of relevant course material, including interactive content such as assignments and class activities. PSOC also includes a digital notebook that stores user-created content, including class notes, homework assignments, and class projects that are shared, through Azure, with peers and teachers

Benefits

Pearson and Fino used Microsoft technologies to deliver a high-quality and highly innovative solution for the education market, and did so relatively quickly and cost-effectively.

Delivers 10x speed improvement
Using Visual Studio made the development process for PSOC more efficient in several ways, according to Jungers. "Visual Studio gave us one place to make data connections, investigate code, iterate features, debug, and manage unit testing," he says. "We saved the time we'd have otherwise spent on managing multiple tools and switching among them. For a project of the size and complexity of PSOC, that was essential. "

The developers also used Visual Studio to deliver the level of quality that Pearson required—and to do so quickly and cost-effectively. "Best practices don't matter much if every member of the team doesn't follow them consistently—and quality will suffer," says Jungers. "We used Visual Studio to make it faster and easier for developers to deliver consistent, high-quality code. We met our quality goals while saving an

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Scott Ziolko,
Director of Data Science, Fino

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order of magnitude over the time and cost of traditional methods."

Supports highly scalable, cost-effective cloud analytics
By using Azure HDInsight and Azure SQL Database for the all-important analysis capabilities of PSOC, Pearson gained the scalability of the cloud without the costs and complexity associated with developing and maintaining its own analysis solution.

"With HDInsight and Azure SQL Database, we activated the system, integrated our data components, and started processing information on day one—without needing a specialist or DevOps engineer," says Scott Ziolko, Director of Data Science for Fino. "We wouldn't have been able to do that with a do-it-yourself solution. That's what sets HDInsight apart from other computing clusters."

Contributes to pedagogical goals
Ultimately, the technological benefits of PSOC serve the latest pedagogical needs of educators.

"PSOC helps students to learn because it teaches them how to think about learning," says Leigh Garcia, Vice President of Product Management at Pearson. "That requires students to work interactively with teachers and peers in ways that weren't possible before. It requires teachers to understand how their students are succeeding and how to help them continue to succeed. All the content hosting, interactivity, social collaboration, and analytics—that's what it's for. The Microsoft technologies and Fino engagement help us to

enhance the ways that teachers teach and students learn."

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