

UPenn Builds Custom App in a Week to Support Research Lab's Unique Business Functions

When the University of Pennsylvania's Quattrone Nanofabrication lab needed to improve its archaic scheduling, billing and analytical processes, it threw out several old programs and built a new, versatile business application using the Mendix platform. The lab's engineers created a customized application from scratch that delivers the precise capabilities they need – including a unique new way to measure the health of each piece of equipment. They built the program in less than a week, and met a tight internal deadline for deployment.



Challenge

The new state-of-the-art “nanotechnology” laboratory complex the University of Pennsylvania is opening this year will rival any research facility in the world. But some of the IT applications supporting the venture are years, if not decades, behind what peers are using. Scheduling for the systems is done using an old conference room calendaring application. Billing was done using Excel, some records were still entered on paper logs, and changes in user authorizations had to be done manually.

This posed multiple challenges for the University. If a research institution wanted a progress report on charges its researchers had incurred half-way through the month, it would take three days to tabulate. If the director wanted to decertify a user's privileges, he'd have to do it one machine at a time. And if he wanted analytics on which groups were undertaking different kinds of projects, he simply couldn't produce them.

“Penn has built a top 10 facility in the US, but these older systems just weren't professional and they weren't serving our needs,” said Noah Clay, director of the Quattrone Nanofabrication facility inside Penn's Singh Center for Nanotechnology. “I couldn't fathom moving forward, facing this new group of faculty and researchers with what we had in place.”

Solution

Clay, a former lab leader at Cornell and Harvard, had had experience working with more advanced billing, calendaring and analytics functions – and he set out to upgrade the applications at Penn. He looked into off-the-shelf software, but the customization needed would have been cost prohibitive and time-consuming. Internal IT developers at Penn could have created applications that performed the functions, but it would have taken several years. And, since his staff of 15 – five researchers, five grad students and five contractors – included no advanced coders, he couldn't do the work in house. Clay needed another solution.

Clay turned to the Mendix platform, to create one omnibus application that would run all billing, equipment reservation and analytics for the lab. The application would replace all the legacy systems that handled these functions. He needed to move quickly, to get the new system up and running when his lab moved into a new central location in the spring. The team built the application in February, ran tests in March and had it deployed by early April. He also needed to have it fit into a tight budget.

“We wanted to merge all our operations seamlessly, and we knew we didn't have time to shop around,” Clay said. “Mendix stepped forward with a solution that fit our needs to a ‘T.’”

Results

A team of three non-technical laboratory pros on Clay's staff conducted all of the development of the new application using the Mendix platform.

"They've really taken to it," Clay said. "The platform is intuitive, easy to use and chockfull of features they can use to create the application that suits our needs. They're easily adding in all the customization in the system that they've ever wanted. I have three scientists acting like kids in a candy store, building exactly what they have wanted for years."

One new feature they've created is a way to easily analyze the ongoing condition of the equipment in the lab. For example, Clay said, the team may want to keep a close eye on a critical temperature or level of vacuum in an electron microscope.

Other solutions typically require a database querying program, rigid internal coding or software for this added functionality. Clay's team is planning to set up unique dashboards that they can review each morning, allowing them to be more proactive in addressing process problems areas as well as equipment maintenance.

The biggest benefit the department will realize, Clay said, is saving at least a week of one professional's labor costs every month. Instead of taking a week to reconcile invoices, the new automated application can churn out an invoice with a push of a button. Clay added that the analytics he can produce for deans inside the college and leaders of sponsored research projects outside the college will help Penn generate more grants and more work for the lab.

"It was essential that we delivered this app quickly and cost effectively, to get our outdated systems up to speed. Traditional development and integration times would have been anywhere from six to 12 months. Mendix fit within our budget and we were able to get our application up and running in just a few weeks."

Noah Clay

Director, Nanofabrication
University of Pennsylvania

Clay said he plans to work with other departments inside the university to explore other projects that can be facilitated by the Mendix platform.

"I could see many other ways that Mendix could be a benefit to Penn," he said. "We're hoping the university can build a number of great Mendix apps over the coming years."

About UPenn

The Krishna P. Singh Center for Nanotechnology is a premier facility that integrates state-of-the-art nanotechnology equipment. Researchers use its equipment in the manipulation of matter on an atomic and molecular scale. The building merges the operations of three interdisciplinary laboratories. Facilities serve research and educational programs at Penn and are leveraged by partner institutions and local industry within the greater Philadelphia area.



Mendix helps enterprises achieve their digital goals. Our digital innovation platform empowers customers to bring new products to market, digitize customer engagement, and automate unique business processes. Facilitating an iterative, collaborative approach, the platform brings business and IT together to build and deploy innovative applications at the speed of ideas.

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