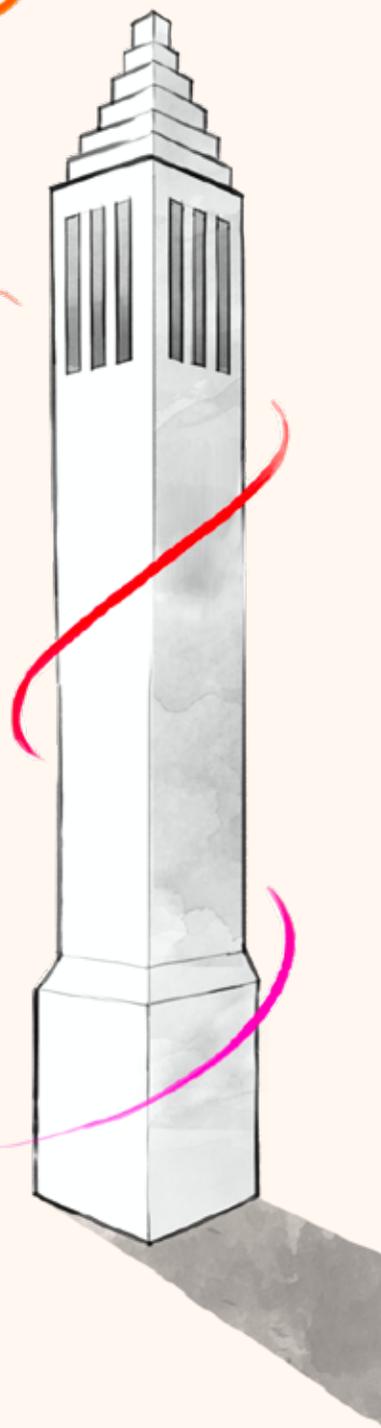THE UNIVERSITY OF
ALABAMA®

Building powerful data visualization at the University of Alabama

Teams and enterprises collect and use data in real-time, but putting this data to work in custom reports, apps, and visualizations can be a lot of work. Here's how the University of Alabama's Office of Institutional Research and Assessment (OIRA) uses npm to do that work in record time and with added flexibility.

OIRA has the monumental task of collecting, storing, and managing data for organizations across the University of Alabama, as well as producing analysis and metrics for both internal and external consumers. Serving as a neutral, data-driven part of the University, the OIRA's most important function is to provide accurate data to decision makers and mandatory regulatory groups.

The OIRA provides extensive decision-support information for University units, including the central administration, colleges and schools, departments, programs, and committees, as well as administrational and operational support. Additionally, the team provides mandatory reporting to external regulatory bodies along with media and ranking agencies that have bearing on the University's image and reputation. Data requests can be submitted to the OIRA office by anyone inside or outside The University of Alabama.

To manage this stream of requests and support these diverse constituencies, the OIRA builds web tools and applications with npm.

Why they use npm

Some of OIRA's web applications are used daily by students and faculty, such as the University's online syllabus, syllabi.ua.edu. Other applications have narrower audiences or are meant for short-term use, requiring the small OIRA team to build unique applications to suit each use case. This makes npm, which provides many thousands of modules worth of functionality and tools, invaluable.

As with many organizations, the University of Alabama has a mix of enterprise business intelligence (BI) and visualization applications in their portfolio. This provides the OIRA team with an opportunity to compare those enterprise tools with what they've been able to build using npm.

"With enterprise visual analytics dashboards, you have to work with their complicated tools and there are a lot of features that you don't need," said Coston Perkins, web resources integration analyst at OIRA at the University of Alabama in Tuscaloosa, Alabama. "With web technology, there are already so many libraries built around what we need to do. We can generally build visualizations faster and better than they can with enterprise software. The open source world is far ahead of the enterprise software out there. And that's why it's winning in our office."

Developers typically face three options for tools they can use for data-intensive projects. The first option is to buy enterprise software, which leads to fewer customization options, higher costs, unintended data silos, and headaches from integration issues. The second option is to use open source software and create everything themselves. While more secure, this work is more involved than using something off the shelf. The third option is a hybrid: combining enterprise products with open source components and flexibility.

Increasingly, organizations like the OIRA have opted for this third approach, relying on npm's public Registry and secure code hosting through npm Enterprise to rapidly develop powerful new applications using modular, reusable packages of JavaScript.

"With web technology, there are already so many libraries built around what we need to do. We can generally build visualizations faster and better than they can with enterprise software. The open source world is far ahead of the enterprise software out there. And that's why it's winning in our office."

—Coston Perkins

Web Resources Integration Analyst at IORA, University of Alabama

npm

From vision to completed project

The OIRA team determined that web applications were the easiest way to build out reports and visualizations and deliver data to both external and internal users. A web build enables anyone to access information anytime from any device.

"We chose to do it all ourselves. We like to write our own software. We like to build websites," said Perkins.

"We like having the power to build very dynamic and accessible reports through the web that are interactive and use modern data visualization approaches."

Using npm, the OIRA team can build new applications on top of open-source technologies like Node.js and React combined with specialty tools available from the world's largest software Registry.

"I'm looking for whatever's the best tool for the job. And I might need something like a Likert component to build a Likert chart on the page. The best way to find that, find a complete project that's very accessible, is to just search on npmjs. com," said Perkins.

npm is a distinct advantage, he says, over GitHub, where he is likely to find a long list of incomplete projects and reports of other projects that might be incomplete as well. Instead, "with npm, I can regularly expect a complete project, and a nice documentation of that project," he said. A quick import into his software or project, and he's done.
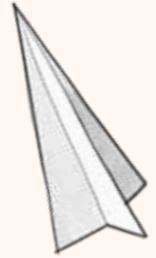
" *If you want quick and easily accessible software, and to be able to find libraries and use them quickly, npm is the way to do that. There's not really a competitor in my eyes."*

—Coston Perkins

Web Resources Integration Analyst at OIRA, University of Alabama

---

"There's no other option besides npm," says Perkins. "If you want quick and easily accessible software, and to be able to find libraries and use them quickly, npm is the way to do that. There's not really a competitor in my eyes."

In a recent example, an academic department at the University had a spreadsheet of enrollment statistics but wanted something more interactive for a presentation.

"In no time, I was able to quickly build them a static website with interactive data visualizations and breakdowns for their meeting. npm makes it simpler than ever to find and install libraries that you trust to get the job done. We're able to service all of campus much better with this efficiency," said Perkins.

npm

"Open source is winning."

Much of the OIRA team's work is invisible—anyone who requests data from them only sees reports and dashboards populated with visualizations that make data easy to consume. But those visualizations are more than pretty graphs and charts—they are sophisticated tools designed to concisely convey specific types of information to the human mind. That means a great deal of thought goes into which type of visualization to use and which tools they use to build them.

Perkins says that the increased security, the large numbers of libraries, and the ease in writing code means open source code from npm wins in any competition. For the OIRA, this flexibility equates to a huge business advantage.

"Typically, you get better results because they're more up to date. You're not dealing with a big monolithic enterprise software that was designed seven years ago. You're working with something modern. This library was just updated a week ago. And it's using the latest and greatest technologies that you want to use. That's the advantage of open source," said Perkins.
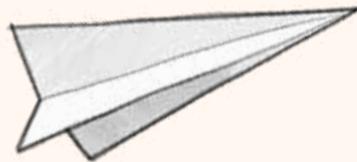
"npm makes it simpler than ever to find and install libraries that you trust to get the job done. We're able to service all of campus much better with this efficiency."

—Coston Perkins

Web Resources Integration Analyst at IORA, University of Alabama

npm

To learn more, visit www.npmjs.com/enterprise