Engineering the next innovation in material science with Microsoft Power BI

"The visualizations tools in Power BI are easier to use, more straightforward, and more accessible to a broader audience. Compared to all of the products we're using, Power BI is just way more fun."

Steven Hanna, Vice President and Chief Information Officer, Kennametal

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Did you know that a six-pound component in landing gear deployed in your last flight started out as a 300-pound slab of titanium? Or that the humble graphite in pencil lead can be transformed into malleable, atom-thick sheets of graphene used in next-generation fuel cells? Welcome to the world of material scientists, the people who design the tools, products, and processes that enable virtually every modern innovation, from space-age energy solutions to cereal box linings.

Microsoft

Tapping intellectual property

Since 1938, Kennametal has created the tools and industrial materials that we rely on daily, serving market segments that include aerospace, automotive, construction, mining, and oil & gas. Today, the company has more than 12,000 employees and customers in more than 60 countries. Kennametal credits its success to a quick, attentive response to customer needs and a problem-solving attitude. And with a worldwide customer base spanning multiple industries, overcoming informational challenges to provide solutions was a top priority. "There are two aspects to what we do," says Christopher Atkinson, Director of Business Partner Marketing at Kennametal. "There's the scientific processes for analyzing materials to identify the elements or compounds and their relationship to various performance attributes we are targeting, and the management of those engineering teams and the work that they do. There's also the process for comparing data sets of products and product characteristics we're creating against thousands of different existing combinations to find something similar and hopefully speed up the development process."

While Kennametal had an abundance of intellectual property, it could be difficult to tap. The company had solved part of the problem when it implemented an SAP ERP system and encouraged scientists to record data in the software instead of in notebooks. However, extracting and working with the data posed another hurdle. Employees tried a variety of analytics tools, from individual spreadsheets to specialized software like Tableau, but nothing was particularly easy to use and results fell short of the company's goals for more detailed analytics. Worse yet, the proliferation of uncontrolled documents and data saved to desktops had become a potential security risk. Instead, Kennametal wanted a business intelligence (BI) solution that would be centralized, powerful, and easy to use.

Data on demand

Kennametal had already decided to transform its IT environment by moving to the cloud, and was an early adopter of Office 365 and an avid user of Microsoft Dynamics CRM. So to improve access to data, it made sense to take a close look at Microsoft's cloud-based BI tools as well. With Power BI's natural-language query, users don't have to learn complex query languages—they can just ask questions. Then, they immediately see results in highly visual formats such as charts and graphs.

Steven Hanna, Vice President and Chief Information Officer at Kennametal, noticed an immediate improvement. "Power BI has natural-language query, which is something you don't get with Tableau. With Tableau, you have to build your own filters for queries," he explains. "And I think the visualization tools in Power BI are easier to use, more straightforward and

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The solution will ultimately provide 12,000 employees working across multiple geographies with cloud-based access to sophisticated analytics and project data. Visualizing information in minutes, business users can explore data and uncover new insights without specialized help. They can also use Power BI to draw insights from their existing Excel notebooks.

Better insight and workflow

Atkinson and Hanna anticipate that Power BI will improve workflow for everyone at all levels of the company. "If I'm in one of our manufacturing plants, and I want to know what the fill rate is for a particular customer, I can just ask," says Hanna.

Or, a scientist involved in product development could quickly find a similar product with the same material composition and characteristics and potentially finish the project faster. "I don't know if there's a way to do that today without taking weeks to manually sift through different sources and hope to find the information," says Atkinson. "It's a matter of getting data into the system, and then having the visualization and natural language tools on top of it so that you can ask those questions and get a fast response."

Kennametal plans to equip employees with Windows 10 tablets for mobile access to Power BI and Cortana. A personal assistant in Windows 10, Cortana integrates with the natural-language-search capabilities in Power BI to visualize data on-demand through voice or typing. The company expects that the R&D team will be one of the groups to benefit most from mobile access to information. "R&D employees spend quite a bit of time in different lab environments doing various experiments," says Atkinson. "And it would be a pretty powerful thing for them if they could use their voice to work with data using a Windows phone or tablet instead of lugging around a laptop or walking back to their desks with handwritten notes."

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The company can connect Power BI with Microsoft Dynamics CRM and looks forward to integrating with other internal applications.

Accelerated innovation

Ultimately, Kennametal will gain a seamless environment that includes data visualization and analytics, productivity software, communication tools, and specialized business applications. "When you pull together Power BI with Cortana, Office 365, Skype for Business, and Microsoft Dynamics CRM you get a holistic business solution that no one even comes close to," says Hanna. "For example, in the future, imagine a sales guy driving down the road who gets alerted by Cortana. He's told that he's driving by a major customer who hasn't placed an order in three weeks. Then he's asked if he wants to place a call through Skype, and meanwhile all the customer's data is displayed on the dashboard of his car as he's driving. Microsoft is the only company in the world that can do that integration."

Kennametal is using Microsoft technology to accelerate progress toward the next innovation in material science. "Power BI reduces the cost to develop products, and it increases our revenue because we can introduce products faster," says Hanna. "We can also leverage intellectual property that used to be spread out in notebooks or in people's heads. And if we can leverage that, and get to market 20 percent faster, that's a pretty great competitive advantage."

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Software

- Microsoft Power BI
- Cortana
- Microsoft Office 365
- Skype for Business

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