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The Sum of the Parts

by Michael Cooke, Richard Turner, and Stephen Chen

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The Sum of the Parts

Effective product innovation depends on fast access to critical design and engineering data. At Whirlpool, the challenge turns out to be as much human as it is technological.

by Michael Cooke, Richard Turner, and Stephen Chen

In 2006, when Dana Nickerson arrived at Whirlpool Corporation, the US$18 billion home appliance maker, he found its product development system hampered by an engineering problem that plagues many large corporations: the inability to find comprehensive data on the parts that go into the company's thousands of products. That deficiency, in turn, affected the company's ability to develop new products and get them to market quickly. Nickerson, whose job as Whirlpool's director of global business process management for corporate technology was to rationalize the management of parts data, compares the situation to having a version of Google Earth that zooms down only as far as the country level. "We had no more visibility into our product information than that," he says.

In a typical product development project, parts searches by Whirlpool engineers would turn up as many as 2,000 hits, requiring them to check drawings of each one to determine whether an existing the part met the specs. Pressed for time, engineers often found it faster simply to design a new part. And that, says Nickerson, increased development costs significantly. "Every activity that involves parts — supplier rationalization, strategic sourcing, part recycling — requires detailed knowledge about all the parts and components you use," he says. "What we realized was that we couldn't use what we couldn't find."

Most manufacturers have the same problem. Data on the parts and components they use is buried in complex, discrete databases connected to any number of legacy systems and outdated proprietary applications. Without structured, easily accessible data models that can integrate information from disparate sources, there is no opportunity to reuse parts or to gain insight from design or test data. Those drawbacks can cripple the design process, especially as it becomes more globally distributed and outsourced.

So Nickerson set out to rethink Whirlpool's parts-management technology, to make it easier to find the information needed to foster good design decisions. He envisioned a muscular content-management system that would capture, store, and integrate design and materials data as well as functional, quality, and environmental compliance information, from systems throughout the corporation, including design drawings and complex relational databases.

The first step, in Nickerson's view, was the toughest: defining exactly how to describe thousands of parts and components across the company. The language that Whirlpool engineers used differed from region to region. "Whirlpool's European operations, for example, use different ways to describe a product or a part than its U.S.

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organization does, and if you don't resolve those terminology differences in some structured way, then you will never be able to agree on common ways of describing the various elements," Nickerson explains. "Without common ways of describing items, people in different regions will not be able to find the same thing."

The solution to the Tower of Babel problem was not a rigid system. Unless the data model is flexible and adaptive enough that users can mold it to their liking, they won't use it. At the same time, it's dangerous to make it too adaptable, because that can lead to managing too many criteria. The system will work only if it gives all the potential users a say in how to describe each part. Typically, a team of approvers will come to a consensus on what kind of and how many criteria are needed to describe each part — a process that is ongoing as engineering and business needs change. "The development of the hierarchy is really key, because if the organization doesn't participate in that process, then you will never get the buy-in you need," says Nickerson. "And without that, people won't use the end result or see its value, and they'll just keep on doing things the way they always have."

As portions of the data model are completed, Whirlpool populates the database with information. That, says Nickerson, is relatively straightforward. Not so straightforward is deploying the search tool for finding the parts data. It all depends on the definition of search, which Nickerson continues to mold to make the system as easy to use as possible. "We don't need the ability to search for something," he says. "We need the ability to *find* something. We don't want people to get 'no results found' when they over-constrain a search, and we don't want them to get thousands of results, either."

That's why Nickerson believes familiar search tools don't work well enough. *Navigating* a database — a term frequently applied to explorations conducted on Google or Yahoo — can involve long, circuitous routes that are too time-consuming and not rewarding enough for corporate design and engineering. Instead, because engineers are searching through structured databases, Whirlpool's search engines can pinpoint specific design criteria more accurately and efficiently. Moreover, in the business world, the search interface has to interact constantly with the user, anticipating the user's needs — especially when the user isn't sure what he or she is looking for. That type of technology, says Nickerson, "allows you to find what you are looking for much more quickly" — although at Whirlpool, as with all search engine development projects, a perfect system is still a work in progress.

Whirlpool's data management project is too new for Nickerson to be able to quantify the benefits. But he is convinced that his user-generated taxonomy, with a find tool that works the way those same users think, will eventually result in a system that can further the innovation process. Considering how few manufacturing data systems actually support product development, if Nickerson accomplishes just a portion of his goals, it will be a breakthrough in content sharing. For Whirlpool, that will surely be worth the effort. +

Resources

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