

Cypress uses Numetrics to Benchmark Product Development and Improve Productivity on Important New Product Family

In Brief...

Challenge

Cypress wanted to benchmark its new product development capability against the industry to ensure its rapidly expanding PSoC product line would consistently achieve on-time market delivery and development budget targets.

Solution

Cypress used Numetrics benchmarking software and industry database to perform root cause analysis and benchmark key performance indicators including productivity, cycle time, schedule performance and spin count.

Impact

Cypress executives and R&D managers gained valuable, fact-based insight into R&D performance and drive systematic changes in product development processes.

Value

Cypress made significant improvements in product development execution that directly translated to improved financial performance.

Cypress Semiconductor Corp. was founded in 1982 by T.J. Rodgers, a charismatic leader whose trademark management style is to create a high-performance culture rooted in metrics. Everyone at Cypress, including R&D, manufacturing and marketing, is expected to demonstrate success and progress based on facts and data. Cypress firmly advocates rigorous measurement and metrics to ensure continuous improvement in productivity, quality and, ultimately, sales and profits.

Across the company, Cypress employees understand that data-driven decisions strengthen business processes and execution. So how does a 28-year-old metrics-driven, quality-oriented company ensure that it stays on the leading edge? By benchmarking its R&D capability against the industry at large and performing root cause analyses.

The Challenge

Cypress was expanding its new-product strategy and driving into new markets with its PSoC® Programmable System-on-Chip™ platform, which was targeting the embedded systems market. These products were strategically important to the company and more technically complex than many devices it had previously developed. They required more integration than previous products and had varying levels of programmability and analog/mixed-signal capability built in. Some of the development projects were managed across as many as eight sites, with teams of more than 100 engineers. The result was a quantum leap in design and project complexity.

Cypress had to ensure that its development execution was exceptionally competitive. For example, one key leverage point for the PSoC platform was the intellectual property (IP) at its core. By leveraging the IP blocks comprising the base PSoC architecture, Cypress could create and deliver different products to new markets. Cypress was adept at reusing IP, but managers wanted to understand how their IP reuse compared with the industry and how it affected their schedule assumptions.

“We knew we were designing to a level of complexity that would result in higher revenue and margins,” said Paul Keswick, executive vice president of new product development, engineering and information technology, “but achieving our financial performance targets hinged on sound R&D execution.”

Cypress Improves Productivity on New Product Family

The Solution

Key in the drive to optimize its PSoC development execution was to understand how Cypress's new product development capability compared to the industry at large. Cypress applied Numetrics' benchmarking tools to a handful of PSoC products.

"The data required for the Numetrics tools included both chip complexity information and project information, which was easy to gather. Analyzing the results generated by the Numetrics tools was intuitive," Keswick said.

Cypress adopted Numetrics' performance benchmarking solution, which included Numetrics' IC Industry Database™ and IC Metrics Tracker™ products, to understand how a number of PSoC designs and derivatives compared against similar projects in relevant industry categories.

"We were able to get a wealth of knowledge on how we were doing relative to the industry," Keswick said. (Note: Industry performance metrics are presented in a blinded fashion, thereby ensuring confidentiality.)

The implications from the data were immediately obvious to Keswick and team. Cypress found differences between its performance and the industry, such as:

- Number of resources used up front in the more costly portions of the design
- Number of tapeouts
- Time from project start to first tape out
- Time to volume production.

What that meant to Cypress management was clear: With larger teams, they may be getting to market faster but each project was less productive than the industry average because of the overhead associated with large teams. Generally, the more design sites that were involved in a project, the more chance there was that that communications

would become a bottleneck. In addition, some of the productivity result was attributed to the new and sophisticated architecture of PSoC: With programmable mixed-signal functionality, the devices were more complex than devices Cypress had previously made, requiring more verification. Further, Cypress discovered that while it did reuse IP blocks two to three times as part of its product positioning strategy, it didn't re-use IP at best-in-class levels.

"We rolled up the data and took a hard look at where we were relative to the industry. We cut the data several ways to not miss anything," Keswick said.

Impact and Value

Armed with this fact-based insight, Cypress executives began to revise their design methodology.

"We affected change based on the feedback from the data," Keswick said. *"The ROI is getting our products to market faster or with fewer resources or both." In addition, management sees a "soft ROI" from knowing how its teams stack up against competing teams.*

"Using Numetrics, we get a valid set of benchmarks and we can get it refreshed as often as we want because the database is continuous," Keswick added. *"Quite frankly, Numetrics is a large part of keeping us honest with ourselves, and there's a lot of value in that."*