

Innovasic Maximizes Design Throughput by Benchmarking Microcontroller Development Team Productivity



In Brief...

The Challenge

Determine Innovasic's productivity compared to other companies in the industry and learn what they could do to improve their processes on their new flagship microcontroller project FIDO.

The Solution

Numetrics' Design Complexity Calculation Engine and Industry Database gave Innovasic the ability to compare their microcontroller product to other similar projects in the industry and normalize designs to enable an "apples to apples" comparison.

The Impact

The Numetrics tools also allowed Innovasic to understand their team's productivity and to make informed management decisions based on the amount of risk involved in a particular design project.

The Value

The most valuable thing gained was insight into where Innovasic could improve, as well as knowing whether they were approaching a project with adequate resources and with realistic expectations.

Founded in 1992, Innovasic is a fabless semiconductor manufacturer providing pin-compatible replacement ICs and embedded real-time microcontrollers for long life-cycle applications in industries such as automotive, aerospace, and medical instruments.

The Albuquerque, New Mexico, company can rapidly develop fully compatible replacements for digital, analog, or mixed signal products that have been discontinued by the original manufacturer.

In 2007, the company shipped its one-millionth microcontroller.

Jordon Woods, Founder and Chief Technical Officer for Innovasic, saw an opportunity to expand the company's offerings by introducing its own standard line of microcontrollers, and a new flagship project was launched.

Innovasic developed the FIDO (Flexible Input Deterministic Output) family of deterministic microcontrollers that provides unique features to meet the requirements of embedded control and communications applications.

"While we had designed a lot of microcontrollers, this was a different approach," says Woods. "We really wanted to assess the productivity of the team on this type of project. We wanted to determine how productive we were relative to other companies

The Solution

Woods searched extensively on the Web for insight into measuring productivity. *"I thought I could do it myself, but it turned out I couldn't,"* says Woods. *"Numetrics had come up many times in my search. Our CEO had experience with Numetrics in the past so we soon began working together."*

Numetrics gave Woods precisely the tools he was looking for. To benchmark the first FIDO design Woods entered the staffing and milestone timeline achieved by the team. He then captured

the technical details of the design, which the Numetrics complexity calculation engine uses to quantify design complexity. Numetrics' tools use a unique solution to model and compute the normalized design complexity which is expressed as the industry-norm effort required to implement that particular chip spec.

Once the project was captured, Woods was ready to perform in-depth analysis, comparing the FIDO team's achievement to other similar

projects in the industry. The Numetrics tool generated a diagnostic summary report of key performance indicators and a number of standard charts, providing a clear picture of the project's metrics relative to industry norms and trends.

"The Industry Database is invaluable," says Woods. "It gives you a means to compare apples to apples. I could do a linear regression on past projects and figure out what our productivity had been with respect to where it is now," says Woods. "But that's only useful to the extent that all projects are the same. The secret sauce that Numetrics brought was its ability to normalize all designs to a central database."

Numetrics also used IC Project Planner™ to illustrate to Woods how FIDO's outcome could have been predicted early in the planning phase. Planner calculates schedule risk by normalizing the design's complexity and then benchmarking the manager's schedule and staffing assumptions against industry norms and past performance. Alternatively, it can generate staffing estimates based on chip complexity and the schedule constraints the manager imposes, calculating required team size and the corresponding productivity requirement needed to meet schedule.

The Benefits

Numetrics gave Woods the answers he needed. *"But the most important thing we gained from Numetrics was insight into where we can improve,"* he said. Numetrics also gave him an invaluable tool for measuring schedule risk. *"Numetrics lets you make an informed management decision, as opposed to putting your thumb in the wind and saying this design is not that risky, or I'm afraid of this design because it requires something I don't know how to do. You can really get a feel for how much risk you are taking on a schedule,"* Woods added.

Best of all, the path to knowledge was neither difficult nor time consuming. *"Numetrics was extremely easy to use. We had good data on what manpower worked on the project, and the chip description data was readily available. It was just a matter of gathering that data. I spent perhaps a man-day or two doing that. Once I had the data entered, it was very easy to generate reports,"* Woods concluded.