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IMPROVING SEMICONDUCTOR R&D

Using data-driven insights speeds up delivery time, helps change mind-sets, and allows companies to tackle more complex projects.

by Gaurav Batra, Zach Jacobson, and Nick Santhanam

R&D projects often miss their deadlines and exceed budgets. But by replacing instinct and guesswork with advanced analytics, companies should be able to better direct scarce resources, as well as speed up cycle times.

A case in point is the semiconductor industry, where we have found that some 80 percent of R&D projects need this kind of help. Our study of more than 2,000 integrated-circuit projects showed that companies often drastically underestimate staffing requirements and have to play catch-up later in the life of a project.[1]

One company we know applied advanced analytics to 80 of the 209 projects in its R&D pipeline, statistically modeling their complexity to gain insights into optimizing staffing levels and speeding up completion across stages of the work. It found that by doing so, it significantly improved project delivery times over a five-year period. As the exhibit shows, the most dramatic result was achieved in year five, when schedule slippage dropped to near zero after management used the insights to change employee mind-sets. As the data on the right-hand side demonstrate, launching projects with more realistic schedules and resources—the result of data-driven insights—also reduced overall project duration compared with past practice. The company found that projects with similar levels of complexity were completed up to 10 percent faster when using advanced analytics. And analytics made more complex projects possible. Of the projects that didn't use advanced analytics, none had more than about 3.5 complexity units.[2]

[1] See Aaron Aboagye, Dorian Pyle, and Alexander Silbey, "By the numbers: R&D productivity in the semiconductor industry," *McKinsey on Semiconductors*, Autumn 2014, McKinsey.com.

[2] A complexity unit is a benchmark that accounts for the differing technical characteristics across projects.

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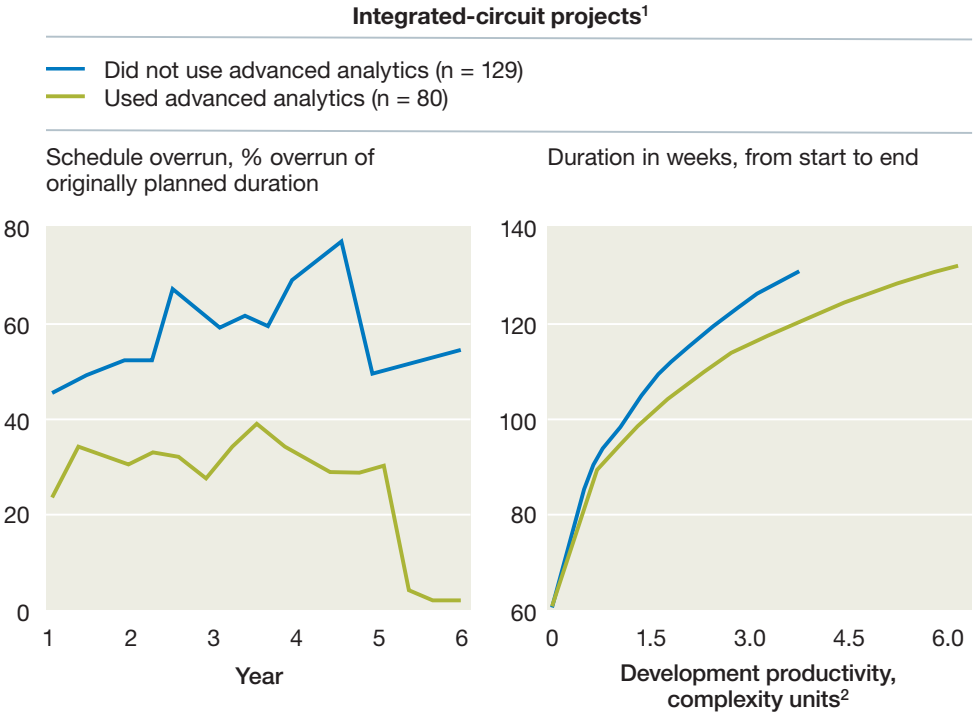
Using advanced analytics in R&D decision making can lead to many improvements.



[1]All 209 projects were finished and released to volume production.
[2]A complexity unit is a benchmark that accounts for the differing technical characteristics across projects.

For more, see Gaurav Batra, Zach Jacobson, and Nick Santhanam, "Improving the semiconductor industry through advanced analytics," *McKinsey on Semiconductors*, Winter 2015, McKinsey.com.