

NXP Consumer Division Tackles Inter-project Resource Conflicts and Increases Design Efficiency

In Brief...

The Challenge

Managing a pipeline of dozens of active projects for six different business lines within NXP with limited resources.

The Solution

Calimez used NMX Planner™, a rigorous and scientific approach to measuring design complexity, to provide accurate estimates of scheduling and staffing requirements on design projects. In addition, using Pipeliner™ helped determine whether total resource demand from projects in the execution pipeline exceeded availability during the target time horizon.

The Impact

Business line managers and development organizations worked tighter and reduced the development portfolio by 20%. Instituting aggressive but achievable targets, they motivated teams and increased productivity and throughput.

The Value

Projects finish on time and within budget which positively impacts NXP's business.

As a Development Manager at NXP's Innovation Center in Hamburg, Germany, Benoît Calimez was responsible for helping a group of 18 project managers increase their ability to manage and execute their IC design projects. These project managers and their development teams served up to six different business lines within NXP, including automotive and consumer products.

Managing a pipeline of dozens of active projects with limited resources, poses a very complex challenge. Calimez led the initiative to improve the organization's estimation of project complexity and resource requirements, as well as analyze the execution pipeline to ensure that adequate resources were available to finish all projects on schedule.

The first step was to accurately define the complexity of each IC project and determine its schedule and resource requirements, which has been more of an art than science for many organizations.

"We relied upon experts within the project or sometimes brought in experts from other projects at NXP who were regarded for their competence," says Calimez. *"In the best-case scenario, we ran Wideband Delphi sessions."*

When estimating project complexity, however, one thing was clear. Everyone involved in these projects—from engineers to architects to the business line's management—often had different views about the complexity. Their initial assumptions about such factors as the reuse and product scope also varied. This led to conflicting views about the required effort. Calimez realized that building a reliable project plan required everyone involved to align on the same assumptions and the same view of the effort needed.

The Solution

Calimez initially created an spreadsheet-based tool internally, providing a checklist to both force a quantitative discussion among team members, and lead them to a common qualitative understanding—and most importantly a consensus—of a project's complexity. When the

stakeholders were unable to reach agreement, he knew that a more rigorous and scientific approach was needed. This is when Calimez considered introducing Numetrics. *"Some other groups within NXP were already using Numetrics for project planning,"* says Calimez. *"I introduced it to our organi-*

zation, and I was very quickly convinced that Numetrics IC Project Planner™ and Schedule Risk Analyzer™ could significantly improve our ability to estimate projects.”

IC Project Planner combines Numetrics’ patented IC design complexity calculation engine with its project plan synthesis technology, providing accurate, fact-based estimates of schedule and staffing requirements early in the chip planning process. Schedule Risk Analyzer measures development schedule risk by calculating the IC design’s complexity and then benchmarking the project plan’s schedule and staffing assumptions against industry norms and past performance.

Planner bases schedule estimates on the chip’s complexity and the manager’s staffing plan. Conversely, it bases staffing estimates on chip complexity and schedule constraints the manager imposes, calculating required team size and the corresponding productivity requirement. In addition to generating estimates of cycle time and staffing, the tool enables users to rapidly perform tradeoffs among the critical constraints on the project: schedule vs. staffing-level vs. chip complexity. In this way, the tool supports “what-if” project plan simulation.

Numetrics became an invaluable tool for Calimez to accurately determine complexity and effort. *“We would not pass any project concept approval (PCA) gates without first benchmarking our initial plans with an early project estimate from Numetrics.”* As business line managers and architects became more familiar with the Numetrics, their confidence in the tool grew.

Calimez used the Numetrics results to analyze risk and determine whether project plans were realistic. *“The business managers were always pushing us for tighter deadlines with fewer resources. Numetrics helped us show them that the estimates were either conservative, or too optimistic. If you can’t get management to*

agree on complexity, then you have no chance to convince them that your effort estimate is correct. To convince them of the complexity, you have to be able to accurately compare this new project with known projects. We use Numetrics’ complexity calculation engine to benchmark internally.”

At a higher level, Calimez made use of Numetrics MultiProject Pipeliner™, a multiproject pipelining software tool, to evaluate the feasibility of the entire portfolio of projects and optimize the execution pipeline. Pipeliner reveals whether total resource demand from projects in the execution pipeline exceeds availability during the target time horizon. Because it uses staffing estimates that IC Project Planner generates, it alerts managers in the early stages of project planning as to whether enough staffing of each role is available to finish all projects on time. *“After running Pipeliner, we realized that completing all of the projects proposed was simply not realistic,”* says Calimez. The business line managers and development organization worked together and reduced the development portfolio by approximately 20%. Schedule targets were still aggressive, but nonetheless realistically achievable, which motivated the teams to work hard to ensure that they were met. The benefit was an increase in development productivity and throughput.

The discipline introduced by using the Numetrics solution and taking an objective and quantitative approach has helped Calimez achieve his goals of managing a pipeline of projects well. Today, projects finish on time and within budget, which is having a significant financial impact on NXP’s business.