

# NXP Manages Time to Market and Schedule Risk for Important New AMS Device Using NMX IC Project Planner™

## In Brief...

### Challenge

NXP was developing an analog- and mixed-signal-packed (AMS) switched mode power supply (SMPS) controller IC for applications including chargers and adapters, set-top boxes and PC peripherals. Management had significant revenue expectations for the device in a hyper-competitive market. Time to market was vital. The company needed to quantify its schedule risk on the IC development project.

### Solution

Used Numetrics NMX IC Project Planner™ to perform a schedule risk analysis on the project by benchmarking the project's execution assumptions, particularly the impact of IP reuse.

### Impact

NXP was able to quantify the complexity of this very important AMS project and perform various what-if simulations using Planner, trading off staffing, duration and complexity. In the end, the team decided to increase staffing and throughput so that a reliable—but aggressive—schedule could be achieved.

### Value

NXP was able to start a project with full control of the project variables (duration, staffing, complexity), and the project lead had facts and data to show management the reasons behind the proposed staffing and duration.

In an era in which semiconductor design teams are being asked to do more with less, building predictable schedules is crucial to market success. Part of that exercise is being able to accurately quantify the complexity of an IC project, taking into consideration the impact of the type and content of analog and mixed-signal blocks, their design parameters, as well as the effect of design reuse.

### The Challenge

Many design managers use their years of experience to make educated guesses about the impact of these factors. Frank van de Schuur didn't want to guess. For him and his company, NXP, the stakes were too high. Van de Schuur is the project lead on an analog- and mixed-signal-packed (AMS) NXP power adapter, a switched mode power supply (SMPS) controller IC that operates directly from the rectified universal mains. Typical applications for this device include:

- Chargers, adapters
- Set-top box (STB), DVD, CD(R), TV/monitor standby supplies
- PC peripherals
- Small portable equipment
- And more.

NXP had significant revenue expectations for the device in a hyper-competitive market. Time to market was vital.

Their initial development plan, including staffing assumptions, was based on previous, similar internal projects, and the schedule was set according to required market introduction.

## The Opportunity

At the same time, van de Schuur was leading an internal NXP productivity-improvement team that was evaluating how Numetrics enterprise resource planning software could be used in engineering process improvement.

*“There was a strong wish to measure ourselves against the competition and to try to improve on schedule predictability. We wanted to avoid having to pull resources from one project to finish another on time,”* van de Schuur said.

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The Productivity Improvement Team's task was to explore Numetrics using analog and mixed-signal projects. Specifically, the team was to:

- Benchmark several representative projects in each product line to establish a performance baseline using NMX Project Planner™
- Evaluate how Numetrics could satisfy the project-planning needs of several High Performance Mixed-Signal (HPMS) business lines
- Run several representative project estimation pilots in each product line using Numetrics.

The goal was to enable each product line to:

- Benchmark their projects against the industry using Numetrics
- Forecast schedule, resource and needs for projects on the roadmap.

## The Solution

Numetrics engaged with NXP to perform a schedule risk analysis on the power adapter project by benchmarking the project's execution assumptions.

The initial project plan was analyzed in the following way: The forecasted staffing was entered into the Numetrics tool, and this project effort was used with two design-complexity scenarios calculated by Numetrics. The first had high block reuse, the other low block reuse.

*"In the concept sketch, there was the idea that we could re-use blocks from a previous device, make some modification and go to market as soon as possible,"* van de Schuur said.

This min-max complexity analysis was done to see the impact on expected productivity and compare it with past IC developments projects. The low-reuse scenario assumed development throughput that was nearly double that of the performance baseline and productivity that was 62 percent higher.

The low-reuse scenario also showed that staffing was low and that the project would take six months longer than anticipated. These were clear warning signals that, in the event that the reuse level actually was that low, significant changes were needed.

But in examining the high-reuse scenario, the Numetrics-generated fact-based plan estimated staffing levels and duration that were more in line with the initial plan (only a 6-week gap). The required productivity turned out to be a challenging target, but a realistic one—one that was among the best-in-class in the industry.

A few months later, it became evident that the level of reuse was actually lower than initially expected, and Numetrics was used again to fine-tune the additional staffing required, in order to achieve the first tape-out in time and contain the increase in the project duration.

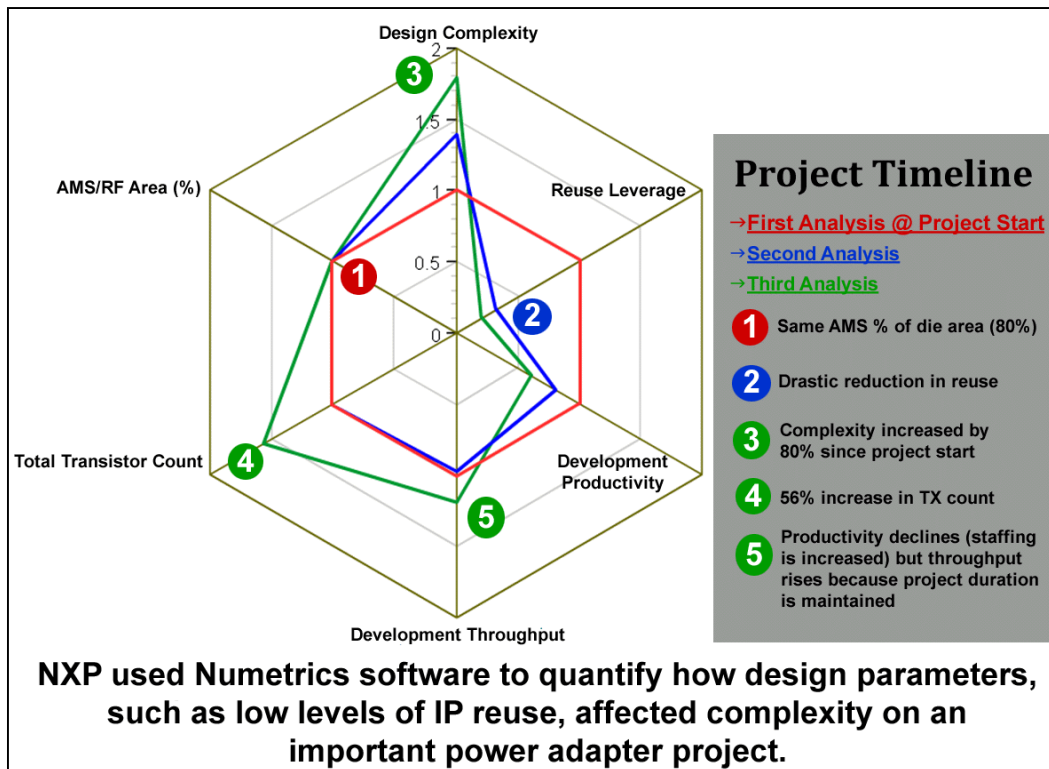
Finally, specification changes called for additional functional blocks to be included in the IC core. Given these changes, a third analysis was made to evaluate the optimal resource profile that would avoid a significant schedule slip for the final milestone.

## The Conclusion

By using Numetrics' IC Project Planner, NXP was able to quantify the complexity of a very important AMS project using facts and data. Armed with this data, van de Schuur and his team performed various what-if simulations using Planner, trading off staffing, duration and complexity. In the end, the team decided to increase staffing and throughput so a reliable—but very aggressive—schedule could be achieved.

In using Numetrics, there were two key beneficiaries: The business line and van de Schuur. The business line was able to start a project with full control of the project variables (duration, staffing, complexity), having knowledge of the im-

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impact on each of them upon any change in the others, avoiding unrealistic schedule and staffing and measuring the impact of 'optimism' in the block reuse. And van de Schuur had facts and data to show his management the reasons behind the proposed staffing and duration.

*"Especially in beginning of the project, when we examined different scenarios, we could see that the 'wish' schedule was unrealistic," van de Schuur said. "That helped me to go convince management that we should change the target."*

Based on the positive experience with Numetrics software, NXP plans to undertake a program to benchmark more completed projects to keep the performance baseline up to date and to perform schedule risk analysis on newer projects by benchmarking their execution assumptions.

*"Our goal is to do more internal benchmarking and external benchmarking against the competition," van de Schuur said.*