



R&D PRODUCTIVITY: CAPACITY MANAGEMENT IS PARAMOUNT

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A recent Management Roundtable Conference on R&D Productivity was especially telling on the subject of capacity management. We have all been to many conferences and we are all aware that the range of interpretations of a conference title result in many different types of presentations. It was especially telling that just about every speaker, when asked to speak on the subject of R&D Productivity, chose to speak on "capacity management of the pipeline." Through the lens of that conference, one might assume that R&D Productivity was synonymous with Capacity Management.

Don't Overload The Pipeline At The Onset

How do you make an assessment of commitment vs. capacity? At a high level, it is fairly easy but too few companies routinely perform even this highest-level calculation. Actual workloads scheduling 200%-300% of capacity are not uncommon. Be sure to run the highest-level calculation first. Simply add the required effort for all the design projects in the company for a given period, based on the project schedule. Total all of the needs for all of the projects, add in the real time requirements for customer support and sustaining engineering, and compare them to the engineering headcount for a given time period. This will show how much the staff is over-extended at the highest level. Try real hard not to schedule more than 85% of capacity at any given time. Do not load the pipeline to exceed 110-125% of capacity!

Create A System That Addresses The Real Issues

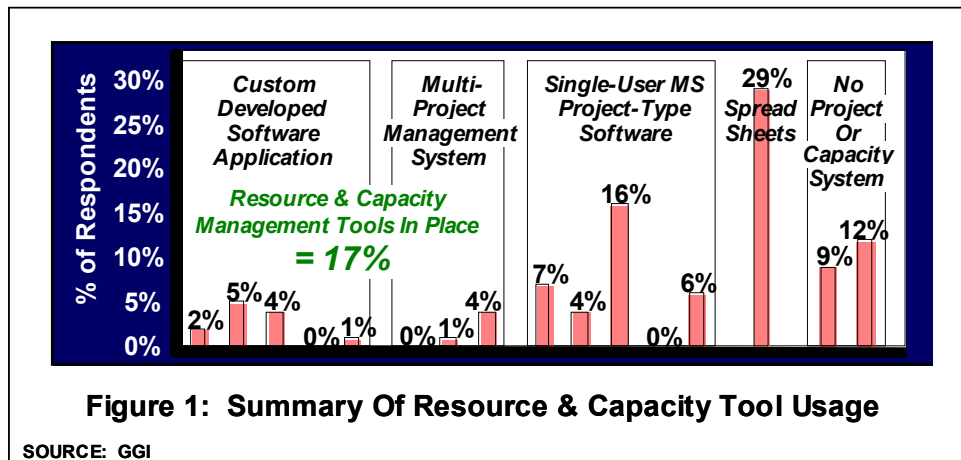
The real challenges do not lie at the highest level of estimating. The real issues arise at the level of allocating scarce functional resources across projects. Unless there is a consistent process with common milestones that are used across all projects for estimating and tracking, it will be difficult to attain better estimates for functional disciplines. The second key piece is to have common definitions of functional resource categories that everyone uses for planning and estimating. While both of these actions seem easy, even trivial, most companies cannot achieve them.

The central issue lies in commonly held corporate values and beliefs that R&D and Product Development should not be organized for execution. This means that, in general, process discipline is not enforced. It also means that most companies do not have a commonly held and defined set of personnel categories. Phased and gated product development processes – now used by over 80% of companies across industry – are positioned as mere "guidelines" and many teams deviate significantly from common process templates.

At the same time, personnel categories vary widely within site departments and across multiple-site companies. Without a common template for planning and estimating, and without a common set of resource categories, resource and/or capacity planning cannot be driven to the level required to manage functional resource allocations without a great deal of manual work and numerous “judgment calls.”

Goldense Group Inc. (GGI), in its 2002 R&D Metrics Survey, investigated the tools that companies are using to manage capacity [Figure 1]. Without the tools, or a great deal of sweat equity,

capacity management cannot be realized at the appropriate level of detail. About 17% of companies have put



tools or combinations of tools in place to address resource and capacity management at the functional discipline allocation level. The rest of industry does not.

Given the importance that industry leaders are placing on Capacity Management, as evidenced by Management Roundtable’s recent conference, and contrasting that with the current state of tools and practices identified in GGI’s survey, it seems clear that the vendor community will be working to develop tools in the next few years to provide improved capabilities for industry.

Go In Search Of The Holy Grail

Once a company has achieved resource and capacity planning at a function or discipline level, the only practical level of detail that remains is planning at the individual level. It is currently beyond the patience of most companies to develop a system that performs to this lowest level of detail. And, as of today, a system cannot be purchased from a third party that achieves this third level.

Yet, the need is quite real. It is well documented that the productivity ranges of individuals within a given functional discipline differ by a factor of ten or more. This means that top performers in a given discipline will produce ten times as much output as the low performers in the same discipline. This is why team leaders and project managers always want a specific person from a department on their project and not just any person from the department. If a company has achieved planning to the functional discipline level, make sure capacity

requirements estimates for disciplines are based on the average output across the individuals in the department and not based on the output of the top performers.

On this front, there will be much discussion in the years to come. The state of practice of Human Resources will be pushed forward as productivity standards begin to emerge in R&D and Product Development as they have in Manufacturing and Quality. Industry will eventually reach the point where each person in each department will be able to be assessed against an expected and/or standardized productivity rate. Exactness of R&D Productivity rates will never be able to reach the level of precision of manufacturing time/output standards, but they will become much more quantified than is current industry practice.^{K_R}