What's On at Your Shop?

TO KEEP YOUR R&D FACTORY RUNNING SMOOTHLY, YOU NEED TO KNOW THAT IT'S CARRYING THE RIGHT LOAD.

BY BRADFORD L. GOLDENSE AND JOHN R. POWER

A KEY TO SUCCESS IN MANAGING PRECIOUS research and development resources, mostly technical people, is the ability to estimate how many resources are required to take on potential projects. It has been well established that core members of R&D teams are most productive when they are dedicated to a particular project or two. When they have too much work, they will be running between projects like proverbial chickens with their heads cut off. So you must bring in the right number of people or restrict the work coming in. Neither choice is possible, however, if no one has confidence in your estimates of workload.

How can R&D officers manage capacity and predict future needs? First, they must account for resources early in the process of approving projects, and second, they must track actual performance as work progresses.

So a manager must start with an estimate of how many engineering staff-months will be needed to complete a project. A useful tool for that task would be a model, rule of thumb, or some other guide.

For instance, there is what we call an architectural model, which uses a product of similar architecture as a reference point. From there the anticipated engineering effort for the new product could be extrapolated, based on similar experience.

A company's got to know its limitations, in time and resources, before attempting any heavy lifting.

An alternative is the size model, in which past experience would also provide a reference.

One of these guides would at least frame the workload in terms of capacity and begin to set expectations about timing and sequencing. Early in the product cycle, when not a great deal is known about the specific product architecture or features, a bottom-up estimate is very costly to produce, and perhaps impossible. Having some reasonable handle on the resource demand allows the manager to respond with hiring, work prioritization, and so on.

Goldense Group Inc. surveys industry biennially regarding product development practices. Its 2002 survey asked how companies made their capacity-loading estimates.

Of the 82 companies that responded to our survey, surprisingly, half of them used no abstraction, relying only on judgment.

With so many companies not having any quick and reasonably reliable way of projecting the resource needs of proposed new product development projects, is it surprising that capacity is stretched more often than not?

Our research also indicates that most firms don't use a very robust way of measuring. A simple analysis for capacity management could make a competitive difference.

In general, two simple activities to gauge capacity loading early in project portfolio planning will yield high-value information. The more obvious activity is to tabulate the number of active and backlogged R&D projects, and list them on a spreadsheet. Each project must have an estimate of staff hours needed to accomplish the work.

Separately, make an estimate of available capacity at quarterly intervals. Whether or not an abstraction model is used, some estimate should be made for all backlogged projects. A comparison of total staff needs to current head count will provide an aggregate understanding of workload. The ideal percentage is to be loaded to 85 percent of capacity; the maximum should be 125 percent.

The less obvious analysis is to compare the number of projects to the head count to show the average number of projects per core team member—that is, the engineer or product developer. The ideal ratio is two; fewer than two is almost always better than more.

Support team members, such as engineering technicians, sales staff, or finance representatives, depending on the limitations and timing of their role on projects, can carry four to 15 projects each.

With aggregate early information, the R&D manager can better add staff, outsource some work, or take other steps to align resources to meet demands. Staying within capacity will result in a higher percentage of new product development projects, released to market on time, at the originally approved parameters. ■

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