A KEY TO SUCCESS IN MANAGING PRECIOUS RE-
search and development resources, mostly tech-
nical people, is the ability to estimate how
many resources are required to take on poten-
tial projects. It has been well established that core mem-
bers 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 fu-
ture 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 es-
timate of how many engineering
staff-months will be needed to com-
plete 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 an-
ticipated engineering effort for the
new product could be extrapolated,
based on similar experience.

An alternative is the size model, in which past expe-
rience 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 ar-
chitecture or features, a bottom-up estimate is very cost-
ly to produce, and perhaps impossible. Having some rea-
sonable handle on the resource demand allows the
manager to respond with hiring, work prioritization,
and so on.

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

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

With so many companies not having any quick and rea-
sonably reliable way of projecting the resource needs of
proposed new product development projects, is it surpris-
ing 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 ca-
pacity management could make a competitive difference.

In general, two simple activities to gauge capacity load-
ing early in project portfolio planning will yield high-
value information. The more obvi-
ous 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 in-
tervals. Whether or not an abstrac-
tion 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 under-
standing 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 techni-
cians, 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 prod-
uct development projects, released to market on time, at
the originally approved parameters.

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