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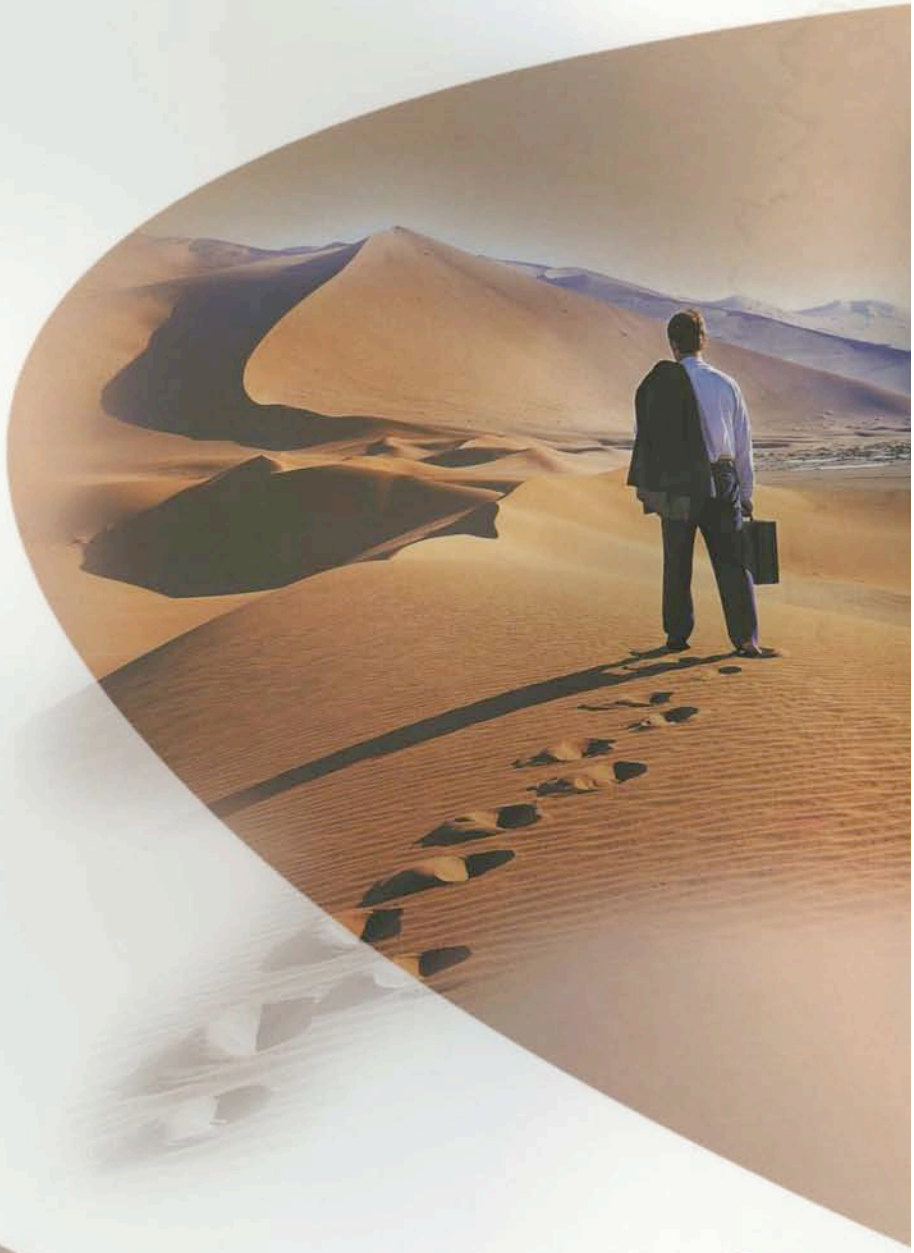
management first

Strategic Direction



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Managing and measuring for R&D success

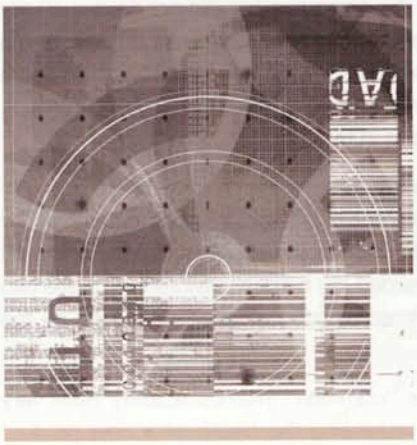
Could do R&D (much) better

Most companies now openly accept the importance of innovation and new products to business success. As a result, the assumption would be that organizations are now actively implementing the deliberate management and measurement of the R&D processes that deliver these new products. However, it seems that such practices are still nowhere near as common as they should be, and most companies have a huge gap to fill that could markedly improve their R&D performance.

The latest bi-annual Product Development Metrics Survey by the Needham, USA based management-consulting firm Goldense Group, Inc. (GGI) collected data on the management approaches and metrics used by product research and development (R&D) centers throughout North America with some input from Europe. It found that while there is a growing move towards structured and formalized management practices and increasing cross functional participation, the vast majority of companies have yet to establish and coherently tie together the metrics, capacity management and project management systems that are essential for effectively managing a resource and process that is vital to business prosperity.

Survey shows process progress

One of the main issues investigated in this survey was the loading of the R&D pipeline, and in particular how companies decide which ideas to follow. The survey found that a significant majority of the respondents (80 percent) use a disciplined 2-Step (or 2.5 Step) process to decide which projects the advance along the path to full product development. With this approach there is a formal review of projects before they enter detailed definition and planning, then another similar decision process before they enter full development. With the typical alternative – the 1-Step approach – the decision about which projects proceed is made only once, at the full development gate. According to GGI, the fact that the percentage using the 2-Step method was up from the 63 percent found in the 2000 survey, strongly indicates that the philosophy is taking hold in leading product development companies.



Even more interesting, was the finding that 79 percent of the firms indicated that the Milestone 2 meeting in a 2-Step process was a formal review and more than 50 percent had that same formality at the 1st Milestone. In the 2-Step companies there were, on average, five decision-makers in the milestone meetings. Whereas, only 38 percent of 1-Step companies, which is an "all the eggs in one basket" approach, had a formal meeting, and also only averaged three decision-makers at the meeting.

Does this difference in formality translate into a difference in the R&D pipeline? Goldense Group thinks it does. The survey found that when all 2+ Step company

projects are cumulated, 53 percent were rejected at Milestone 1. This is a significant improvement over 2000 when only 12 percent were rejected at the first gate. By dramatically reducing the number of projects moving into the detailed concept maturation and planning stage, the quality coming out of that stage improves and fewer resources are required. Overall, the R&D load for all the 2+ step companies moves from over 500 ideas, to 239 projects going through refinement and detailed planning, to only 146 actually being developed into products. In contrast, the 1-Step companies brought 590 projects to the single Milestone decision point and then allocated resources to develop 432 of the projects (78 percent).

According to GGI, the companies that apply a disciplined approach to deciding on which projects should enter development make better use of their resources. Those that follow that discipline get more products out of their R&D process quicker, and avoid the choking 150-300 percent overloads that many firms experience.

Outsourcing – all buzz and little action

In looking at the key issues involved with providing capacity for RD&E activities, the survey investigated outsourcing. Given the general "buzz" about outsourcing, an answer that 90 percent of the companies do outsource work was expected. But, what was also found was that more than half the companies outsource less than 10 percent of their engineering effort! Because so few companies do significantly more, the average outsourcing is only 10.47 percent.

As regards cross-functional participation in new product development (NPD), the survey found that this has improved significantly. Disciplines such as purchasing, manufacturing engineering, quality and production now report spending upwards of one-third of their time on NPD. This is higher than ever reported and GGI believes that this indicates a new recognition of the importance of moving smoothly and quickly from engineering design to efficient and profitable production.

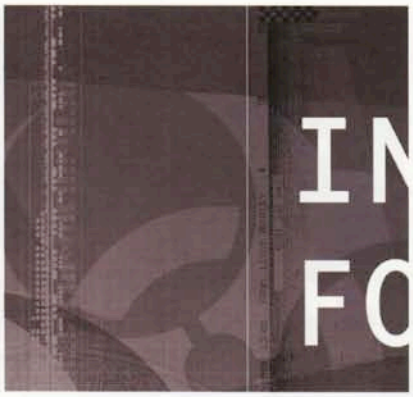
Major weaknesses still apparent

The development and evolution of the tools and measures needed to best manage R&D was another area where the survey strove, in part, to refresh and update research. The results are revealing in that they indicate how difficult the task is, how much work there is still to do, and how slow real progress has been.

For instance, it is apparent that many companies lack a well-defined and understood set of R&D metrics. The survey discovered that just over one-third of the respondents had a clearly defined set of metrics. About the same number did not have a clearly defined set, but could piece together the metrics used by experience and measures shared in company decision meetings, presentations and the like. Also the mean number of metrics reported in firms that have a clearly defined set is only 6.4 metrics. These are essentially the same result found in 2000.

Similarly, there has been little movement toward any standardization or commonality in the use of metrics. From a list of 60 R&D metrics only two were used in common by more than half of the companies surveyed (R&D spending as percentage of sales (68 percent), and total patents filed/pending/awarded (50 percent)). Moreover, these two are not really "owned" by the R&D departments, but are measures driven by the finance or legal departments.

In fact, as GGI report, most of the top six "common" metrics actually have very little value in managing the R&D function, assessing the health of a new product



development process, or measuring the true contribution of new products to corporate profitability. Only "Number of approved projects – ongoing" might be a measure of work loading of the R&D function, but it reveals little standing on its own. Therefore, while all companies prepare financial statements that show standardized measures of sales, profits and financial position, they still do not view NPD and R&D with any sense of standardization.

Finally, despite the overloading of R&D being an often noted issue, the survey found, not surprisingly, that when it comes to managing capacity, predicting needs and tracking the loading and workflow most firms do not use a very robust way of measuring; with 68 percent of the respondents using two or fewer metrics to address capacity and 26 percent using no metric regarding capacity! As regards applying technology for managing R&D capacity planning and analysis, the simple spreadsheet, not integrated with any other system, is still the most common tool in use. As GGI notes, despite advances in enterprise resource planning systems that have improved manufacturing management tremendously, no such initiative has begun to take hold for R&D management. The result of this absence is a seriously reduced ability to use an extremely valuable resource, engineers and key product developers, in an efficient way.

In conclusion, there is obviously a major opportunity for companies to develop a well understood portfolio of metrics for R&D that are self-contained, balanced and strongly correlated to show the cause and effect relationship between R&D activities and profitability. Such a metrics suite is very achievable and would result in the more effective management of the R&D function, as well as a better return for the dollars expended on this vital part of a company's future.

The 2002 Product Development Metrics Survey is the third bi-annual industry study by the consulting and educational firm Goldense Group, Inc. (GGI) http://www.goldensegroupinc.com, which have a focus on measuring the processes of R&D and product development. The survey involved participation of 83 companies that produce products ranging from defense systems to industrial components to medical devices to consumer goods.