Measuring product development

A survey reveals what companies measure to characterize and benchmark product-development projects.

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Product development is key to business success. It determines every new product's final cost, what features it will have, and whether the company will make money selling it. And many companies track a variety of metrics or variables in the process so that management can measure and manage development.

But what gets measured and when? Are these measurements consistently updated throughout a project's lifetime, or are they perfunctorily checked off a list and then forgotten? And when a project is completed and the new product launched, does the development team track the product into the marketplace and bring back information that may benefit future endeavors?

These were some of the questions posed by a recent industry survey conducted by our company. Our initial goal was to determine the degree of standardization that exists in project metrics in individual companies, across industries, and across all companies.

Survey findings

Most respondents (66%) claim that some standard measures are taken for all their company's development projects. Of these companies, 93% say their standards have changed over the past 10 years; 89% say standards have changed in the past five years. The vast majority of these companies (94%) also predict their standards will change within the next five years. This suggests that the trend of companies to standardize project measurement is strong and increasing, and that it is an area receiving continual management attention. However, the survey also shows that project standards still vary a great deal.

Not only do the metrics vary, so do the times at which they are taken. The largest group of respondents (45%) claim their companies review projects at both predetermined milestones, such as after product definition or prior to approving development, and on a periodic (monthly or weekly) calendar basis. Almost a third (30%) measure projects at specific Stage-Gate milestones. (These milestones occur after specific, well-defined phases in product development. They were first defined by Robert Cooper during the mid-1980s at McMaster University in Canada). A quarter of the companies say they
measure development projects, like their final status, by the calendar.

This shows that too many companies still rely on outdated calendar reporting, apparently disinterested their employees to make sure projects are on track. As a result, Cooper, management should not call in anyone for period-

Cooper, management

The idea of project milestones misled and met with the entire team, it lets them calibrate what teams had prom-

Trend in project management

Then management can add their way to specific insights and help the project along.

The team sometimes hard to explain to nonengineers and management that project reviews do not follow a calendar. This makes it hard for accountants to manage financial resources people to get a good understanding of the process and how to control it. Instead, they try to track mistakes (R&D) into a square hole (accounting metrics). So it's no surprise that most metrics focus on dollars spent and target prices. And there has been no change in these metrics in this decade. All this highlights the fact that managers need a new calendar for tracking R&D.

Another business practice tracked by the survey is postlaunch reviews. Respondents are asked to rate their review processes. A little more than half (32%) say they use postlaunch reviews, but only a little over half (57%) say they use them well. While a little under half (47%) say they don't use them at all. It seems odd and unproductive that so many com-

The survey also detected differences between high and low-tech industries in how they measure project development.

Design Management

Design Management: Project Stage

Design Management: Postlaunch

Design Management: Average of checks

Survey stats

The 2019 survey was conducted by Gold

Goldman Group Inc., Cambridge, MA. The 13-page survey questionnaire was ad-

The results were analyzed and presented at The Management Roundtable's 32nd Annual Conference on Metrics for Managing Projects, Products, and Processes in Chicago. Subsequently, 21st published three reports within the next few weeks with more than 10 companies, with under 1,000 employees, and with companies with over 1,000 employees, with outliers, all of which were leveraged to provide the data for this study.

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The R&D projects have development schedules that typically don't show very many fully measurable changes on a weekly or even a monthly basis. Development schedules are measured anywhere from three months (software and computer) to five months (more or less). Tying R&D projects to an optimized measurement process such as Stage-Gate ensures consistency and standardization because it was designed for product development. However, managers still feel they manage processes harmonizing with a company's changing R&D into using accounting's periodic reviews.

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multiproject management systems available. Such systems would track projects and customer orders, then assign resources, so company's could better use their capacity. The next step toward such software is establishing centralized, standardized multiproject metrics.

Metrics are typically estimated in the early planning stages of product development, but tracking seems to break down in the latter stages. For example, more than two-thirds of those who use Target Cost and Target Price calculated them during the first two development phases, Definition Approved and Development Approved. But less than one-half of them continue to track those metrics through subsequent phases. This means that opportunities to be proactive or predictive were lost.

Measurements that can give managers better insight on product strategy or profitability, such as Time-to-Profit or Break-even Time, rank low in both the use and frequency. Project metrics are, on average, still divorced from the larger strategic and profitability concerns of business. So management methods of measuring business performance are still largely reactive, rather than proactive or predictive. Once a business decides to proceed with a development project, measurements become more tactical and infrequent.

We are still a long way from having the necessary levels of control over R&D projects. But it appears industry is ready for multiproject management and control systems that will push their practices to the next level of excellence.

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## A different way to look at project metrics

This graph divides metrics up into four categories and then charts them according to use. It shows that at least one process measurement is used by more than 50% of the survey's respondents. (Process metrics measure the way people are doing the work. Product metrics measure product specifications.) Of that 50%, two-thirds track a total of three or more process measures, along with one metric from resource capacity, resource cost and sales/profit/contribution.

Traditional basic metrics, those in the middle circle, are tracked by just more than half of respondents. These metrics include marketing/promotion costs and ROI or payback, the financial measures vital to corporate success, and product development accountability. A significant number of other sales/profit/contribution metrics and process metrics are in use, but they're not as widespread.

The most commonly employed measures such as target product cost, target product price, time to market, and capital, are reactive metrics. They help management look at what has already happened. More sophisticated planning and predictive metrics, such as those measuring planned capacity utilization and schedule slip rate, can help predict outcomes, thus giving management a chance to rectify the situation. These metrics are better at matching product development to the business goals it is supposed to support. Predictive metrics also help management identify past mistakes and avoid them in the future projects.

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### Respondents that use project metrics

<table>
<thead>
<tr>
<th>100%</th>
<th>Target cost</th>
<th>Project schedule or Time to market</th>
</tr>
</thead>
<tbody>
<tr>
<td>80%</td>
<td>Target price</td>
<td>Target gross margin</td>
</tr>
<tr>
<td>Capital</td>
<td>First-year sales volumes</td>
<td></td>
</tr>
<tr>
<td>60%</td>
<td>Specification changes</td>
<td>Development</td>
</tr>
<tr>
<td>% Reuse of design</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40%</td>
<td>Schedule slip rate / % milestones on time</td>
<td>Break-even time</td>
</tr>
<tr>
<td>Five-year sales volumes</td>
<td>% of phases on time</td>
<td></td>
</tr>
<tr>
<td>ROI or payback</td>
<td>Time to profit</td>
<td></td>
</tr>
<tr>
<td>Three-years sales volumes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Outsource design</td>
<td>% of design reviews of time</td>
<td></td>
</tr>
<tr>
<td>Lifetime sales volumes</td>
<td>Marketing and promotion</td>
<td></td>
</tr>
<tr>
<td>% Outsource manufacturing</td>
<td>% documents on time</td>
<td></td>
</tr>
<tr>
<td>Total product contribution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Outsource manufacturing</td>
<td>% concurrency of team</td>
<td></td>
</tr>
<tr>
<td>RONA or other asset</td>
<td>Digital design/simulation</td>
<td></td>
</tr>
<tr>
<td>% Outsource manufacturing</td>
<td>Resource cost</td>
<td></td>
</tr>
</tbody>
</table>

Metrics like Target Product Cost, Project Schedule/Time to Market, Target Product Price, Target Gross Margin %, and Capital were used by the largest percentages of survey respondents.

Break-even Time, Total Product Contribution, Lifetime Sales Volumes, Time to Profit, and RONA (return on net asset) or Other Asset, were the least-tracked metrics out of those provided.

Project Schedule/Time to Market, Schedule Slip Rate, Target Product Cost, Development, and Product Requirement Changes were the five metrics tracked most consistently through all phases of a typical R&D project.

Each of these metrics was tracked, on average, three or more times during the product development cycle. (Margin of error is 11%)