

## \* The Top 10 and Top 100 Corporate R&D and Product Development Metrics \*

by  
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The [July 7, 2014](#) issue of 2PLM introduced the scope and focus of recent Goldense Group Inc. (GGI) research on R&D Operating Environments, Organic Innovation, Open Innovation, Intellectual Property, and "The Top Corporate Metrics used to measure R&D and Product Development".

At GGI, our goal in each primary research effort during the past fifteen years has been to focus four areas of the research effort on emerging new practices, or on rapidly evolving or changing existing practices, to learn rates of change and/or growth.

In our recent research effort, the "2014 Product Development Metrics Survey", the four topics of R&D Operating Environments, Organic R&D Innovation, Open R&D Innovation, and R&D Intellectual Property Practices were chosen as they satisfy those parameters. In addition, they are having an impact on the R&D metrics that corporations use.

The [July 21](#), [August 4](#), [August 25](#) and [September 8](#) issues of 2PLM addressed the research findings regarding these four areas.

In this sixth and final piece of the six part series, the research purpose is more akin to benchmarking than to discovering new and changing industry practices. In each research effort of the past fifteen years, our researchers have presented a list of the "metrics that CXOs are most likely to use to oversee R&D output, productivity, effectiveness, and efficiency." Respondents are asked simply to put a check mark next to any metric that is generally part of management team and corporate reviews. The "Most Frequently Used Corporate R&D Metrics" results from tabulating the responses. The list of metrics is far from static over the past fifteen years.

*Metrics Are More Abundant:* The cost of a metric has been steadily decreasing as computers continue to penetrate every aspect of life. As an information society, people's tolerance for how many numbers cross their path in a day has grown accordingly. There has been an explosion in the daily use of numbers, codes, acronyms; and, there is more to come. R&D and Product Development metrics are no different. In the mid 1990s, there were 30-50 CXO-level R&D metrics that essentially covered all companies. In 2013, a pared-down list of 101 metrics was presented to respondents.

*Innovation Metrics Have Increased:* Aside from computers and the advent of an information society causing a growth in R&D and Product Development metrics, there are a number of other dynamics at play. There has been a growth in the ways corporations innovate. Companies are finally finding a way after decades to develop meaningful CXO-level business metrics for research and advanced development organizations. Open Innovation and Intellectual Property are increasingly becoming ways to generate revenue and profit, and they

need metrics. Functional and technical competencies are becoming more important to meet increasingly refined and specific product needs that must be delivered at minimum cost. The increasingly complex world is affecting measures of corporate risk. Before innovation, measures for lean, six sigma, and flexible/agile took their place this past decade. Today, approximately 200 CXO-level R&D metrics "cover all companies."

*Management Science Failures & Successes:* More experimentation is occurring as the cost of generating a metric continues to decline. Some experimental CXO-level metrics have risen in usage, and then fallen the past decade as corporations found the metric to have low utility. "NPV Efficiency" is perhaps an example. Another experimental metric went the other way, and experienced a meteoric growth in usage rivaling 3M's "Vitality Index" introduced in 1988. "Return On Innovation" evolved in the early 2000s as companies increased their emphasis on innovation. The metric has an acronym problem though. It's shorthand is therefore "ROIInnovation." Without getting into what is a new product and what is not, the metric is "profits from new products divided by R&D spending for the new products." Deciding what spending to include in the denominator, like deciding the numerator, is sufficiently ambiguous. One does need to pay attention when examining reported figures to avoid the glare of overly bright and shiny numbers. Nevertheless, in some fashion of calculation, ROIInnovation has risen from nowhere to now be the tenth most used metric by corporations for R&D. The Vitality Index, also on a meteoric rise since the 1990s, is now the third most used metric and the number one performance metric.

*Monitoring vs. Performance Metrics:* Metrics do not always measure output, productivity, effectiveness, efficiency or related performance parameters. The number one and two most used metrics are "R&D Spending as a % of Sales" and "R&D Headcount." These monitoring, or status metrics, must be present in a CXO metrics portfolio alongside performance metrics. Spending is an input metric. Headcount represents greater than half of R&D Spending at most companies. Status metrics related to capacity regarding people, projects, pipeline, and portfolio are also necessary.

*The Top 10 R&D Metrics:* The following table shows the frequency of use of the ten most frequently used metrics. For perhaps the first time ever, the top dozen metrics are mostly about business input to, and output from, R&D. Traditional R&D measures that focused on internal operations and projects are no longer the central focus of management oversight to attempt to increase understanding. R&D is becoming demystified.

79%	% R&D Spending of Sales
67%	# Total R&D Headcount
62%	Current-Year % Sales Due To New Products Released In The Past "N" Years
61%	# Patents Filed/Pending/Awarded/Rejected
58%	# Of New Products Released
53%	# Of Products/Projects In Active Development [Active Backlog]
41%	% Resources/Investment Dedicated To New Product Development
38%	Current-Year % Profits Due To New Products Released In The Past "N" Years
35%	Value of Product Portfolio [Any Aggregate Measure]
32%	ROI - Return On Innovation [Calculated Using Any Method/Procedure]

Examination of the Top 10 metrics shows that there is little consistency across companies for R&D. The tenth most used metric has not yet achieved penetrating one-third of industry. If one compared operations and other transaction processing function metrics across companies, one would find greater penetration levels and more consistency across companies. R&D, more difficult to measure, is evolving at a much slower pace. Challenges about defining such items as "new products" and "what spending went in to them" are among the reasons.

*The Top 100 R&D Metrics:* The top hundred metrics range from experimental metrics that may or may not become generally used across companies, discussed above, to metrics that are needed to achieve specific R&D strategies. Companies that wish to be known as "innovators" measure items such as "New To The World" and "New To The Industry." Companies having "follower" and "aftermarket" strategies might measure "New To The Company" and "Time To Market After OEM Introduction." Intellectual property metrics for sales and licensing revenues and profits are also increasing in usage. As intellectual property becomes increasingly monetizable and liquid, expect to see some measures hit the mainstream. Research findings indicate significant corporate activity experimenting with the management science of intellectual property. Finally, all measures of portfolio and pipeline value have grown steadily in penetration; as have measures of profit per unit of time and by product category. Revenue is no longer the sole output metric being examined that is expressed in currency terms.

**SUMMARY:** As a whole, since the inception of the Vitality Index in the late 1980s, R&D measurement has generally been increasing in business focus as corporations better grasp how to manage R&D; without their leaders having to necessarily understand the technology within R&D. As a result, CXO-level R&D measurement is becoming mainstream and is increasingly expressed in business terms. R&D has always had a larger share of the CEO's metrics portfolio than any other business function, and this continues to be the case. These past few years, just about all analysts at the London, Euronext, Deutsche Borse, Swiss and other global stock exchanges are inquiring about new product revenues and profits, intellectual property values and rights, and the health of the product pipeline over a number of years. CEOs and CFOs are increasingly pushed to be specific about monetary expectations and the calculations behind their numbers. Market caps are rising and falling depending on the convincingness of their responses. Accordingly, it was observed in 2013, based on fifteen years of research, that business metrics for R&D are rising to overtake technical and operational R&D metrics as the most frequently used corporate-level metrics. R&D is becoming demystified and is more easily discussed by business leaders in financial terms.

*A Note About The Research:* The "2014 Product Development Metrics Survey" study was conducted by sending questionnaires to a wide range of companies developing products throughout North America. Participating companies had headquarters throughout the Americas, Europe, and Asia, but their response was for North American R&D-Product Development operations. Complete data sets were received from 200 companies. Consumer, industrial, medical, chemical, and automotive/vehicular products were the top respondent industries. Participants completed 31 questions across the five primary research subjects. The research period was September 2012 to October 2013. The results were published March 3, 2014 in a 138-page report. This research is statistically valid and provides a Margin Of Error for each research question.

*For more information about Goldense Group Inc.'s (GGI) R&D, Product Development, Innovation, and Metrics research approach and topics, ongoing since 1998, please visit their [research portal](#). Licensed pdfs of the 2014 findings and other research are available in GGI's iStore or through regarded distributors including Baker & Taylor and MarketResearch.com.*

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