

Metrics for innovation: guidelines for developing a customized suite of innovation metrics

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Today more than ever before, companies must exploit their innovative capabilities to develop new businesses if they are to successfully confront the disruptive effects of emerging technologies, empowered customers, new market entrants, shorter product life cycles, geopolitical instability, and market globalization. Indeed, the development of innovative capabilities is the only means by which companies can sustain a competitive advantage.

In every industry, the leading companies are the innovators. Yet the cadre of innovators keeps changing. For example, in 1982, Tom Peters and Robert Waterman cited Amdahl, Texas Instruments, Eastman Kodak, and Maytag as exemplars in their business classic, *In Search of Excellence*. Twelve years later, *Built to Last* by James Collins and Jerry Porras found the elixir of success in a predominantly new cast of visionaries. Meanwhile, today's innovators such as Wal-Mart, Southwest Airlines, eBay, and the University of Phoenix are themselves relative newcomers.

Such high turnover at the top suggests that the real problem isn't a lack of innovation—it's sustained innovation. Companies may seize upon a good idea that gives them an advantage for a while, but sooner or later, they cede this advantage to a competitor who has found an even better idea. In recent years, companies have tried to address this problem by introducing innovation programs, typically in the form of new business development incubators. However, such programs rarely endure for more than two or three years and their budgets are usually among the first casualties in a drive to cut costs.

Until now, innovation has been somewhat of a black art. Managers currently lack the requisite metrics to make informed decisions about their innovation programs.¹ Admittedly, some metrics have been developed for new product development.² However, such metrics are very limited. Managers have only a vague sense of their company's overall innovativeness; they have little or no means to assess the effectiveness and efficacy of a particular innovation program. They need tools with which to diagnose impediments—for example, fear of cannibalization within the existing business³ or a corporate culture that's excessively risk averse—to their innovation processes and to evaluate the innovative capacity of potential acquisition targets.

This article offers managers both general principles in the development of innovation metrics as well as sample specific metrics that they can begin to use immediately. Our recommendations derive from our experience with Strategos, an innovation and strategy consulting firm, and the Woodside Institute, a management research laboratory whose purpose is to promote organizational resilience and renewal.

State of the art

Given the importance of innovation as an engine of growth,⁴ it is surprising that many companies don't measure their innovativeness. Yet innovation metrics are important for at least two reasons. First, metrics help managers make informed decisions based on objective data, which is especially valuable given the long-term nature and risk associated with certain innovation projects. Second, metrics affect behavior by helping align goals and actions with the best interests of the company.⁵

Among those companies that do measure their innovativeness, most use R&D and product-development metrics only, such as annual R&D budget as a percentage of annual sales, number of patents filed in the past year, percentage of sales from products introduced in the past year, and number of ideas submitted by employees. A number of academic articles address the issue of developing metrics for this kind of innovation.⁶

Though somewhat useful, these metrics offer a limited view of a company's innovativeness. They don't measure the company's overall innovation capability. In emphasizing technology development, they neglect business-concept innovation. And their focus on R&D and products makes them less suitable for service companies and companies outside the high-tech sector.

During the past year, we have built a framework for the selection of metrics that managers can customize to track innovation success in their companies. These metrics can help senior executives assess their company's innovativeness and hence combat the insidious strategy decay that often afflicts a company's business. Strategies decay for four reasons. Over time they get replicated--they lose their distinctiveness and, therefore, their power to produce above-average returns—or better strategies supplant them. Strategies also get exhausted as markets become saturated, customers get bored, or optimization programs reach the point of diminishing returns. Finally, strategies get eviscerated. Customers or suppliers become so powerful that they can dictate much lower prices than before.⁷ The only way to combat strategy decay is to keep innovating.

Innovation: fundamental driver of wealth creation

Innovation may be particularly in vogue today. However, the most successful companies have long since known its value. Southwest Airlines—one of the few profitable players in a beleaguered industry—innovated by renegotiating the customer interface, offering a no-frills service in exchange for lower fares. Wal-Mart innovated by reconfiguring its supply chain. Other companies have succeeded by devising entirely new business concepts—for instance, eBay's

online auctions, University of Phoenix's degree programs for working adults, and NetJets's fractional ownership service to meet executives' occasional needs for private jet travel.

In an effort to maintain a leadership position, companies that can't innovate must buy innovation off the shelf. For example, as the fizz went out of the carbonated drinks market in recent years, Coca-Cola acquired Mad River Traders and PepsiCo bought South Beach Beverage Company—both makers of alternative beverages such as bottled waters, juices, and teas laced with ginseng. Though sometimes effective in the short term, this strategy of innovation through acquisition usually fails because the acquiring corporation overestimates the value of synergies and underestimates the post-merger integration difficulties. In any case, innovation by acquisition is always at enormous cost, either in cash or stock, to the shareholders of the acquiring corporation. Shareholders see far higher returns when companies successfully innovate organically.

Innovation framework

The framework (Exhibit 1) combines three views on innovation. It provides the perspective for a suite of metrics that help assess and develop a company's capacity for innovation.

- **Resource view.** Companies must balance optimization (tactical investment in the existing business) and innovation (strategic investment in new businesses). The resource view addresses the allocation of resources to effect this balance. The resource inputs are capital, labor, and time. Output is the return on investment in strategic innovation.⁸
- **Capability view.** The capability view assesses the extent to which the company's competencies, culture, and conditions support the conversion of innovation resources (see resource view) into opportunities for business renewal. The inputs of this capability view are the preconditions for innovation, i.e. the extent to which a company's skills, tools, culture, and values are adapted to innovation. For example, does the company consider past demonstrations of innovativeness when selecting new recruits? Outputs include the development of new skills and knowledge domains that spawn innovation as well as the number of strategic options (i.e. opportunities to significantly advance an existing business or invest in a new business).
- **Leadership view.** The leadership view assesses the degree to which a company's leadership supports innovation. As such, it evaluates leaders' involvement in innovation activities, the establishment of formal processes to promote innovation, and dissemination of innovation goals.

Innovation processes are an additional element of the framework. They comprise organizational structures such as incubators, innovation markets, venture funds, and innovation incentives. As Exhibit 1 suggests, innovation processes interlink the resource view and the capability view.

Exhibit 1—Innovation Framework

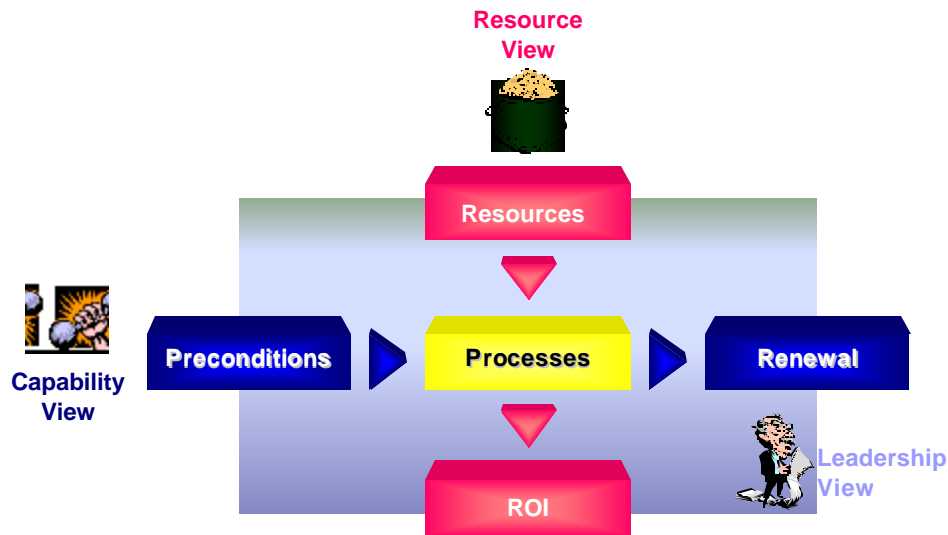


Exhibit 2: Sample Metrics

Resource View

Inputs: Capital, Talent, Time

- Percentage of capital that is invested in innovation activities such as submitting and reviewing ideas for new products and services and developing ideas through an innovation pipeline
- Number of entrepreneurs in the company, i.e. individuals who have previously started a business, either within the company or before joining the company
- Percentage of workforce time that is currently dedicated to innovation projects

Output: Return on investment

- Number of new products, services, and businesses launched in the past year
- Percentage of revenue from products or services introduced in the past three years
- Share of wealth, i.e., the change in the company's market value during the past year divided by the change in the total industry's market value during the same period

Capability View

Inputs: Preconditions

- Percentage of employees for whom innovation is a key performance goal
- Percentage of employees who have received training in innovation—for example, instruction in estimating market potential of an idea
- Number of innovation tools and methodologies available to employees

Output: Renewal

- Number of new competencies (i.e. distinctive skills and knowledge domains that spawn innovation) measured as a simple count among a threshold proportion of employees
- Number of strategic options (i.e. newly created opportunities to significantly advance an existing business)
- Number of new markets entered in past year

Leadership View

- Percentage of executives' time spent on strategic innovation rather than day-to-day operations
- Percentage of managers with training in the concepts and tools of innovation
- Number of times during the past 5, 10, and 20 years in which senior management has redefined the company's core business.

Processes

- Number of ideas submitted by employees in the past three, six, and twelve months
- Ratio of successful ideas to ideas submitted
- Number of ongoing experiments and ventures
- Average time from idea submission to commercial launch

General guidelines for selecting metrics

Exhibit 2 presents some sample metrics for the resource, capability, and leadership views in the innovation framework as well as for innovation processes. Metrics for the resource and capability view subdivide into inputs and outputs. Resource view inputs measure the resources that the company is allocating to innovation. Resource view outputs measure the company's success at innovation. Managers need to measure both inputs and outputs. Measurement of just resource inputs might lull the company into believing that trying harder and continuous improvement deserve validation. Likewise, measurement of just resource outputs doesn't give a company a true picture of the cost of the investment that has produced an improvement in innovativeness. The ratio of resource outputs to resource inputs, of course, provides a measure of return on innovation investment.

The inputs in the capability view attempt to quantify the extent to which the company has created conditions that are conducive to innovation. In this way, capability view inputs measure the company's culture and innovation competence, typically in terms of employee access to innovation training, tools, and methodologies. The outputs of the capability view measure the company's

success at providing renewal options. For example, it might measure new competencies (i.e. distinctive skills and knowledge domains that spawn innovation) or newly created strategic options (opportunities to significantly advance an existing business). As with the resource view, measurement of both inputs and outputs is necessary to monitor the extent to which capability view inputs seem to drive capability view outputs.

The optimal selection of metrics and the optimal value or “sweet spot” of any particular metric will vary from company to company. Clearly, one size does not fit all. For example, innovation for a cement producer will require different skills, resources, and competences and will be manifest in different ways than, say, innovation for a fashion retailer. The goals or targets of the innovation will thus vary from industry to industry. However, the generic variables that are measured by the innovation metrics will be quite similar across most industries. Likewise, no single metric can convey full meaning in isolation. Just as with the analysis of a company’s financials, the analyst must look at several metrics in order to develop a comprehensive view of the company’s innovation capability.

Moreover, managers need to be mindful of unintended consequences that can result from over-emphasizing the importance of any one metric. For example, a metric that rewards individuals or groups for successfully developing an innovation project can lead to “not-invented-here” attitudes, resulting in innovation empires whereby individuals or groups become overly invested in the success of their project at the expense of innovation projects elsewhere in the company.⁹ With these caveats in mind, consider the following general guidelines:

1. Build a comprehensive set of metrics. Include at least one metric for each of the six elements in the framework, i.e. inputs (resource view), preconditions (capability view), wealth (resource view), renewal (capability view), leadership, and processes. With such a comprehensive set, you’ll be more likely to detect problems (for example, a lack of leadership involvement or a bottleneck in the innovation process) before they become too serious.

2. Assess existing metrics. If your company is a veteran of innovation, other managers are probably already using innovation metrics. Assess whether these metrics suit your needs. In the interests of standardization, seek consensus on a set of metrics with other managers.

3. Avoid complex metrics. Ensure that the metrics are simple, meaningful, and intuitive. They will have greatest impact if they become common currency throughout the company, from the boardroom to the shop floor.

4. Resist the temptation to track every conceivable parameter. Select a manageable set of metrics (no more than 8 to 10) and measure them diligently, disseminating the values as widely as possible.

5. Include at least one or two customer-driven metrics. Measure customer-driven metrics such as sales from new products to complement the internally focused metrics such as the number of new competencies under development or

the percentage of workforce time dedicated to innovation projects. But avoid undue emphasis on customer-driven metrics, otherwise these metrics will stifle innovation projects with a longer-term return on investment¹⁰.

6. Reconcile metrics with existing methodologies. If your company uses a methodology such as value-based management or the Balanced Scorecard, reconcile your innovation metrics with that methodology. Even in the absence of such a methodology, ensure that your metrics encourage individual behaviors that aggregate to accomplish company-wide goals.

Specific guidelines for selecting metrics

For companies that are just beginning to develop an innovation capability, we offer the following recommendations:

- **Inputs:** Focus on recruitment and training.
- **Processes:** Focus on creating an innovation pipeline process that attracts a large number of ideas and systematically selects the most promising ideas for further development. Also, concentrate on minimizing the development time of those few projects selected for further development.
- **Outputs:** Focus on defining and communicating quantitative innovation targets to be achieved within specific time frames—such as, revenues and ROI.

Innovation veterans might direct their efforts as follows:

- **Inputs:** Focus on incentives, team formation, staffing, and sustaining existing innovation processes.
- **Processes:** Focus on increasing the size and speed of the innovation pipeline and markets subject to budget constraints.
- **Outputs:** Focus on meeting innovation goals.

Metrics for beginners and veterans

Managers should compile their own suite of innovation metrics with reference to the above guidelines. However, to help promote speedy implementation, we've compiled, as two examples, suites for use by beginner and veteran companies (Exhibits 3A and 3B, respectively).

Exhibit 3A—Metrics for beginners in innovation

	Inputs	Processes	Outputs
Resource View <i>How much?</i>	What is the number of in-company entrepreneurs (people who have started a business in the company or before joining the company)?	Is there a process to generate and renew external and internal insights?	What is the “innovation revenue” per employee? (revenue from businesses that were created in the past 3 years)?
Capability View <i>How effectively?</i>	What percentage of employees have been trained in innovation?	How many different funding sources exist for innovation?	How many new competencies are being deliberately developed?
Leadership View	What percentage of employees recognize a strategic focus on innovation?	Is senior leadership directly accountable for the company’s innovation processes?	What percentage of employees can identify the innovation targets?

Exhibit 3B—Metrics for veterans of innovation

	Inputs	Processes	Outputs
Resource View <i>How much?</i>	How many “innovation mentors” are in your organization?	What is the average time from idea generation to venture launch?	What is the ratio of revenue from new businesses to revenue from established businesses?
Capability View <i>How effectively?</i>	How many incentive schemes are in place to support innovation?	How many new ideas enter the pipeline each month?	How many strategic options are being pursued today?
Leadership View	How often does the current business definition undergo reevaluation?	How much time is necessary for funding innovation decisions?	What is the dollar value of new opportunity domains relative to existing business revenue?

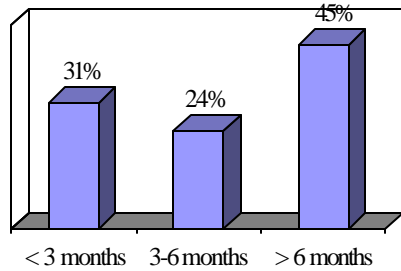
Benchmarks

The following benchmarks draw from the results of a questionnaire that some 50 companies answered during the past year. Approximately half the companies had more than 10,000 employees and revenues of more than \$1 billion. 26 percent of the companies had more than 50,000 employees, and 32 percent of the companies had revenues in excess of \$50 billion.

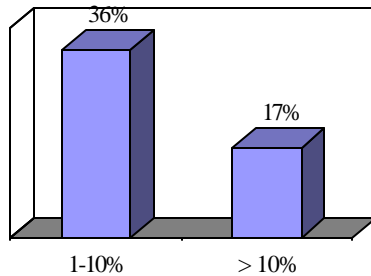
We find that most companies we work with are anxious to know how well they

are innovating. We present these benchmarks to address this need—and to give companies a starting point in developing targets. In each case, the percentages refer to the percentage of companies responding.

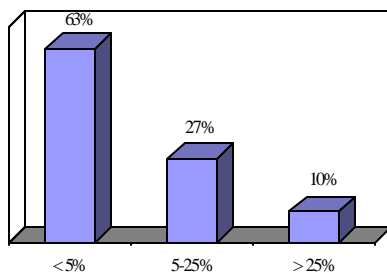
Time required from idea conceptualization to go-forward decision:



Percentage of management that is accountable for innovation in terms of allocated time (note that less than half of all managers feel responsible for innovation at all):

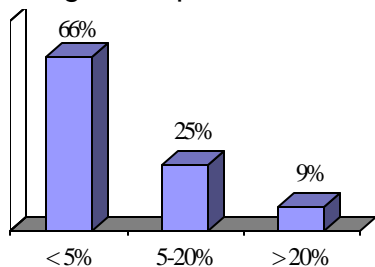


Percentage of employees that are currently involved (i.e. more than 50 percent of employee's time) in an innovation project:



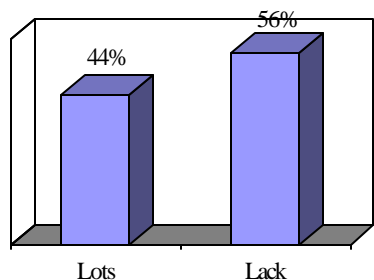
Benchmarks (continued)

Percentage of capital that is invested in radical innovation projects:

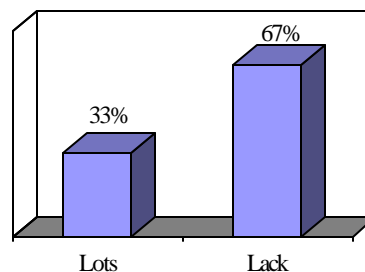


Characteristics of company's innovation pipeline today:

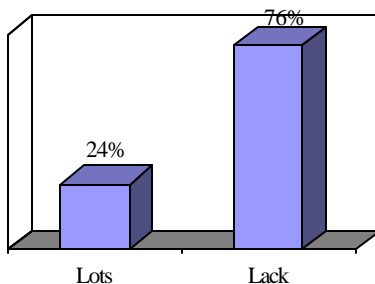
New ideas:



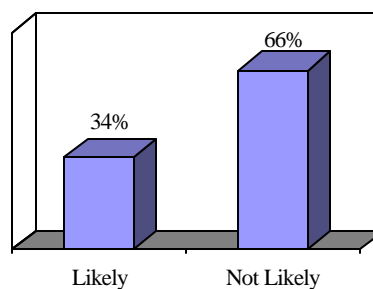
Innovative business concepts:



Promising new ventures:



Likelihood of meeting growth needs in next five years:



Source: Strategos questionnaire

Future of innovation metrics

As more firms develop innovation metrics and a database that validates their relevance, managers, analysts, and investors will eventually be able to assess a company's innovation capability with as much facility as they can currently assess concepts such as market share, leverage, and economic value added.

Endnotes

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- ¹ See Turrell, Mark, "Show me the numbers: A look at innovation metrics," Imaginatik working paper, 2004 [www.innovationtools.com/Articles/EnterpriseDetails.asp?a=146].
 - ² For example, Cooper, Robert G.; Edgett, Scott J.; Kleinschmidt, Elko J. "Benchmarking best NPD practices II";. *Research Technology Management*, May/Jun2004, Vol. 47 Issue 3, p. 50.
 - ³ See Christensen, Clayton M., *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*, Harvard Business School Press, 1997.
 - ⁴ Cooper, Robert G.; Kleinschmidt, Elko J., "Benchmarking the Firm's Critical Success Factors in New Product Development," *Journal of Product Innovation Management*, December 1995, pp 374–391.
 - ⁵ Hauser, John R.; Zettelmeyer, Florian, "Metrics to Evaluate R,D&E". *Research Technology Management*, July/August 1997, 40(4), p 32.
 - ⁶ Chiesa, Vittorio; Coughlan, Paul; Voss, Chris A., "Development of a Technical Innovation Audit," *Journal of Product and Innovation Management*. March 1996, 13(2) pp 105–136; Hughes, G. David; Chafin, Don C., "Turning New Product Development into a Continuous Learning Process," *Journal of Product Innovation Management*, March 1996, 13(2), pp 89–104; Demirag, Istemi S., "The Impact of Managers' Short-Term Perceptions on Technology Management and R&D in UK Companies" *Technology Analysis & Strategic Management*, March 1996, 8(1), pp 21–32.
 - ⁷ See Hamel and Valikangas: *The Quest for Resilience*, Harvard Business Review, September 2003.
 - ⁸ Booz Allen Hamilton has also developed a resource-based perspective on innovation metrics, ROF²: see www.leading-innovations.com.
 - ⁹ Hauser, John R.; Zettelmeyer, Florian, "Metrics to Evaluate R,D&E". *Research Technology Management*, July/August 1997, 40(4), p 32.
 - ¹⁰ Hauser, John R.; Zettelmeyer, Florian, "Metrics to Evaluate R,D&E". *Research Technology Management*, July/August 1997, 40(4), p 32.

(abstract)

key words: innovation metrics, sustaining innovation, impediments, innovation framework, resource view, capability view, leadership view, benchmarks, Gary Hamel.

Quotes:

"We have built a framework that...can help senior executives assess their company's innovativeness and hence combat the insidious strategy decay that often afflicts a company's business."

“The optimal selection of metrics and the optimal value or “sweet spot” of any particular metric will vary from company to company.”

“To help promote speedy implementation, we’ve compiled, as two examples, suites for use by beginner and veteran companies.”

Conceptual article

<i>Purpose of this paper</i>	During the past year, the authors have built a framework for a suite of metrics that senior managers can customize to track and promote innovation success in their companies.
<i>Design/methodology/approach</i>	Senior executives can use the suite of metrics to assess their company’s innovativeness over time and hence combat the insidious strategy decay that often afflicts a company’s business.
<i>Findings</i>	The framework combines three views on innovation—resource, capability, and leadership—providing the perspective to develop a suite of metrics for assessing and developing a company’s capacity for innovation.
<i>Research limitations/implications (if applicable)</i>	The optimal selection of metrics and the optimal value or “sweet spot” of any particular metric will vary from company to company.
<i>Practical implications (if applicable)</i>	As more firms develop strategic innovation metrics and a database that validates their relevance, top managers will learn to assess and guide a company’s innovation capability more effectively.
<i>What is original/value of paper</i>	This is the first strategic guideline for building a customizable system of innovation metrics.