

# Innovation Metrics: A Framework to Accelerate Growth

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More than 70 percent of Wall Street analysts consider a company's ability to innovate consistently a key determinant of its value. However, only one in three of these analysts claims confidence in measuring innovation.<sup>1</sup>

Chief executives, similarly, realize that to maintain competitive advantage, their organizations need to be able to innovate—not just occasionally, but consistently. They know that to be good at anything—and to improve at it—an organization needs to measure it. But how do you measure the ability to innovate?

In the past, competitive advantage rested on factors such as quality, productivity, access to low-cost resources, and customer service. Today, these factors have become threshold competencies—keenly important, but unlikely by themselves to provide sustainable competitive advantage. Yet many organizations still gauge overall performance by measuring these threshold factors.

Organizations that continue to rely on such traditional measures are locked into the old—and dangerous—paradigm that past success is the best indicator of future success. Today, of course, past success can actually be a hindrance to future success. Companies that focus exclusively on improving the things that made them successful in the past, rather than on developing the things that will make them successful in the future, will likely fall victim to obsolescence and commoditization. Examples abound in which industry leaders, trapped in the „mental models“ created as a result of past successes, became complacent and then noncompetitive. Some, such as British Air, Chrysler, and IBM, were able to react, survive, and thrive. Others, such as Digital, Schlitz, and Wang, stumbled and vanished.

Organizations can avoid this trap by including metrics specifically designed to gauge innovation performance as part of an overall suite of corporate performance indicators. Industry leaders such as 3M and Hewlett-Packard have demonstrated that innovation metrics enable past success to provide a solid foundation for future success. The premise underlying the power of metrics in driving innovation success is simple: you cannot improve what you do not measure.

Simply defining, let alone measuring, systemic innovation across an organization is not easy. An innovation is only recognized per se in terms of the value it creates in the real world. But systemic innovation is fundamentally a „rate“ game; companies that innovate too slowly will still lose ground to their competitors. So measuring innovation performance after the fact is not a sufficient control strategy. It is therefore critical to create methods to gauge innovation performance—while also providing live guidance to help the organization build its capacity to innovate systemically.

## **Metrics as an Agent for Change**

Metrics can drive change throughout an organization—and specifically boost innovation capability—by:

- Signaling strategic intent and providing incentives to align activity with the organization's goals
- Monitoring progress and guiding corrective action
- Allowing the evaluation of people, objectives, programs, and projects to optimize resource allocation

Innovation today is inherently complex and dynamic, requiring alignment across the organization. Efforts to implement a systemic innovative capability must compete for „share of mind“ with continuing pressures for lower costs, higher quality, and improved customer service. More than any other single tool available to managers, well-applied metrics can cut through the fog and very clearly signal to the organization a desired direction and strategic priorities.

Ultimately, innovation is created by teams and the individuals within those teams. Linking individual and team performance goals to innovation metrics is often an important step in creating sustainable change toward systemic innovation.

## **The Arthur D. Little Innovation Metrics Framework**

Although the dynamics of systemic innovation across an organization are inherently complex, its effective measurement can be relatively straightforward. In our experience working with leading organizations around the world, we have developed a simple framework distinguished by two features: a holistic view of innovation, and a time perspective that balances predictive and historic measurements.

Arthur D Little's High Performance Business Model provides the needed holistic view of innovation (Exhibit 1). Metrics can be designed to measure performance in each of the model's four interdependent elements:

**Stakeholder Strategies.** How well are we achieving the strategies designed to address the needs of each group of stakeholders? *Are we doing the right things?*

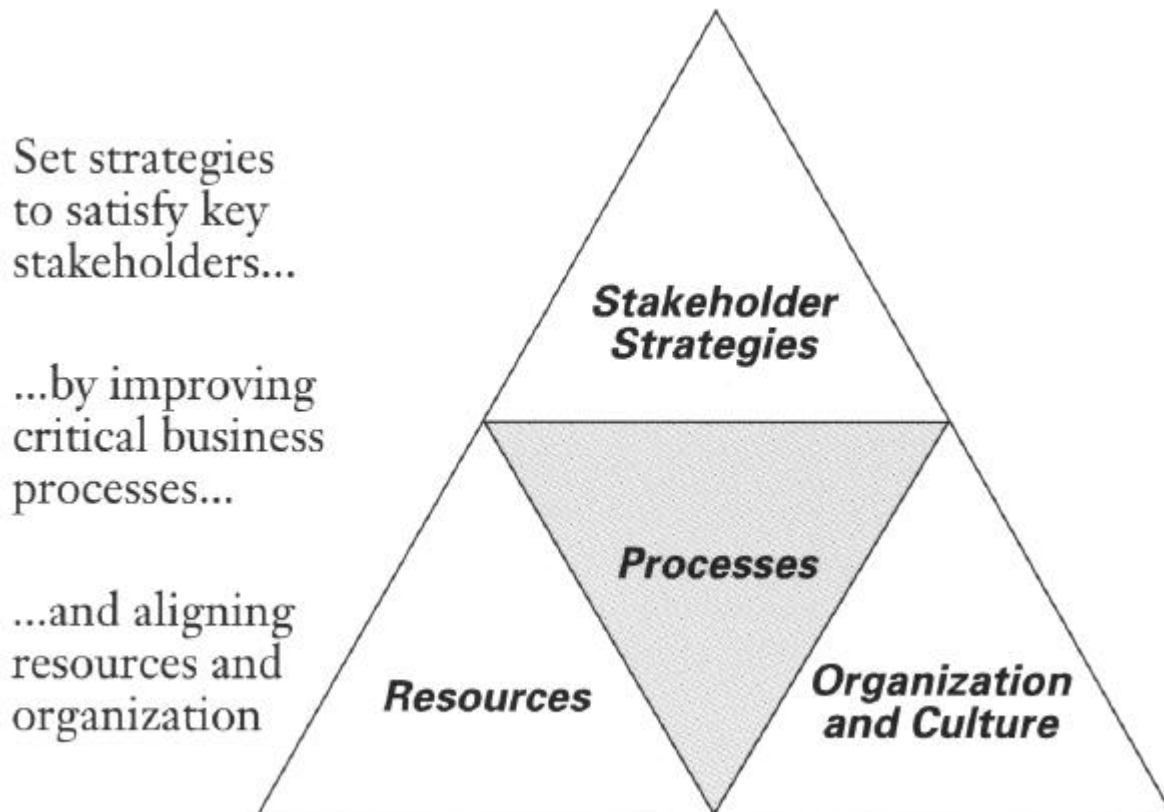
**Process.** How good are our critical innovation processes? *Are we doing things right?*

**Resources.** How appropriate are our internal resources and how effectively have we tapped external resources? *Do we have access to the right resources?*

**Organization and Culture.** Do we have the appropriate organizational structures, culture, and reward systems to drive innovation? *Are we getting the best from our resources?*

#### Exhibit 1

#### The High Performance Business Model



Answering these four questions at any given moment will provide a comprehensive snapshot of innovation, but it won't provide any early warning of emerging problems within the innovation system. To get a complete picture, you need to understand the innovation trajectory, or rate, by adding a time dimension within a continuum represented by four phases:

*Lagging indicators* provide information on past performance, answering the question, „HOW well did we do yesterday“

*Real-time indicators* provide information on current performance, answering the question, „How well are we doing today?“

*Leading indicators* provide information on likely future performance, answering the question, „How well are we likely to do tomorrow?“

*Learning indicators* provide information on the rate at which the organization is improving its performance, answering the question, „How well will we do in the longer term?“

By combining the performance and time dimensions, we have created the Arthur D. Little Innovation Metrics Framework (Exhibit 2). Over the years, we have experimented with numerous metrics within each cell of the matrix, including input, efficiency, and output measures addressing strategic, operational, and tactical issues. We have found that all these measures work sometimes, but none do so all the time.

Most companies that use metrics make the mistake of choosing metrics that span only a fraction of the potential suite. For example, while companies often measure how well they meet stakeholder needs, they tend to focus primarily on only one kind of need: financial. Furthermore, they typically use only „hard“ lagging data, such as „revenues from new products.“ While important, such metrics provide only a narrow „rear-view mirror“ perspective on innovation. The failure to use elements across the innovation system, and to include real-time, leading, and learning indicators, means that managers can identify innovation system problems only after substantial potential value has already been lost.

## Exhibit 2

### The Arthur D. Little Innovation Metrics Framework and Representative Metrics

	Lagging	Real Time	Leading	Learning
Stakeholder Strategies	Gross Contribution of New Products	NPV of Idea Portfolio		
Processes		Milestones Completed on Time		Take-up Rate of New Processes
Resources			External Alliances Being Pursued	
Culture/Organization	Staff Turnover Rate		Innovation Climate	Level of Inquiry

**What makes a good suite of metrics?** Two principles guide the design of a good suite of metrics:

- Adopt a portfolio approach, selecting just a few cross-supporting metrics
- Balance the metrics portfolio across the axes of the Innovation Metrics Framework

Only a few metrics are necessary to provide the sharp focus required to effectively align the organization around—and drive change toward—key innovation imperatives. Using a suite of metrics that range across the Innovation Metrics Framework ensures that key elements of the delivery system—not just the desired stakeholder outcomes—are targeted and tracked. Keeping the perspective across the framework both increases the probability of meeting strategic goals and builds capability for greater achievement in the future.

The array of possible measures for each cell of the matrix ranges from quantitative/objective (such as „new sales ratio“) to quantitative/subjective (such as „net present value of development portfolio,“ where a forecast is required), or qualitative/subjective (such as „innovation climate“), although quantitative measures are most often used. It’s helpful to choose metrics that meet the following criteria:

- Supportive of the strategic priorities of the business
- Supportive of the highest-leverage elements of the innovation system
- Aligned with obvious and controllable drivers of value
- Easily measured consistently over an extended period
- Consistent with the current level of sophistication and role of innovation in the organization
- Universally applicable, both internally (to support internal benchmarking) and externally (to support external benchmarking)

The highest-leverage parts of the innovation system that require support will vary greatly from organization to organization. The execution of strategy and the delivery on key stakeholder goals is always an important business system imperative that requires support by metrics. Beyond this, high leverage may be found either through focusing on weak elements of the system that may be bottlenecks to success or on valuable strengths that can be further leveraged.

For example, a large New Zealand organization recently adopted a real-time resource metric—percentage of non-R&D staff billed on development teams—in response to ongoing frustration over the lack of true cross-functional teamwork in innovation activities. Its target was to have full-time R&D staff make up no more than 30 percent of innovation resources in the future, to ensure that marketing, operations, distribution, and financial issues were

identified and addressed early in the innovation process by members of these functional teams. A European food company saw little value in such a metric, since the use of effective cross-functional teams was already strongly ingrained in its culture. Instead it focused on „milestones on time“ and other process metrics, believing that its new commercialization processes and inexperienced product development project managers were likely to be a major bottleneck that would require monitoring and support.

To be relevant, the chosen metrics must be consistent with the current organization’s level of innovation sophistication. For example, in an organization in which innovation is a defining feature of business strategy and competitive success, sophisticated metrics, such as the rate of improvement in networking, may be a very valuable learning indicator. In an organization relatively new to significant networking, this metric would have far less relevance and might actually detract from the organization’s effort to learn how to deliver value from innovation. In these circumstances, a measure such as the contribution derived from new products would be more useful.

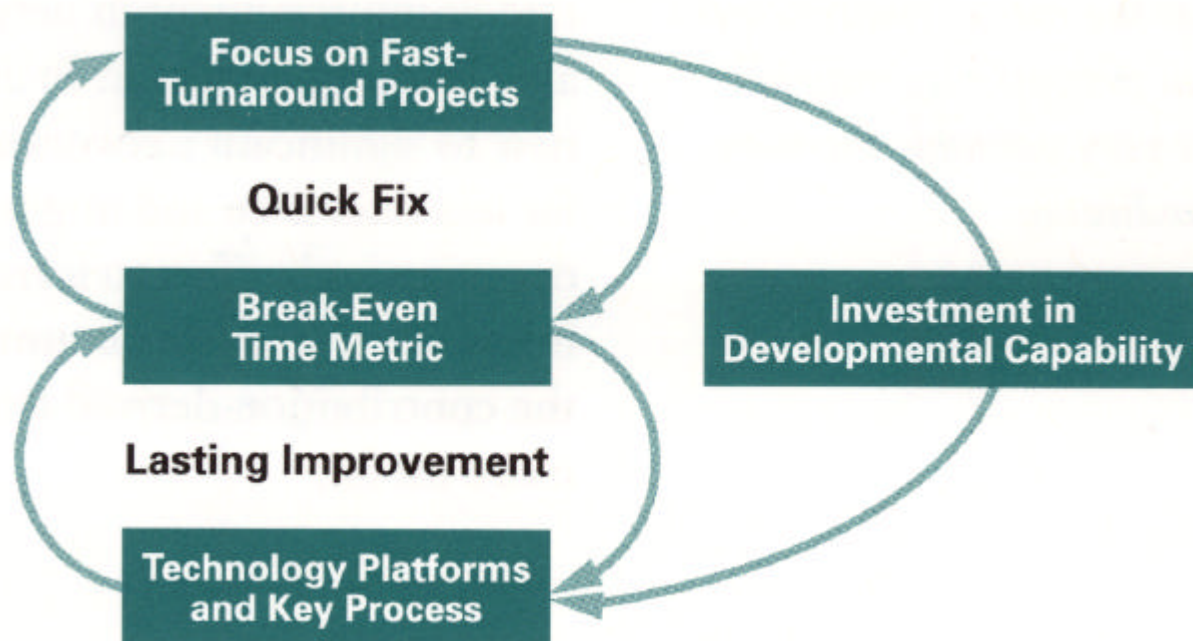
### Balancing the Consequences

Metrics are powerful motivators. Designed to create positive changes, they can also generate unintended negative consequences that may actually hurt a company’s performance.

Consider the popular metric of break-even time (BET), a lagging process metric. It measures the time from the beginning of product development work until the product has generated enough profit to pay back the development investment.<sup>2</sup> The intent of the metric is twofold: to improve the efficiency of the new-product development process (reducing costs and product development cycle times), and to increase process effectiveness (increasing the revenues from each new product). However, a BET metric can also have a negative impact on new-product development over the long term (see Exhibit 3). Institutionalizing the metric may lead to a focus on quick-payback projects that rely on existing intellectual property. If these projects are allowed to dominate a company’s portfolio, investment will decline in projects that build the organization’s capability to innovate effectively in the future, such as technology platforms and new-product commercialization capabilities. The latter typically provide a foundation to improve BET, but only in the longer term. If the cycle is managed in a positive direction, it becomes reinforcing: the improvement in BET brings more dollars that can be invested in improved capabilities, which drive further improvement in BET.

### Exhibit 3

#### Break-Even Time as an Example of an Addiction Loop



The danger is that if these capabilities decline in the short-to-medium term, so too may BET performance. A reduction in BET performance further increases the pressure to concentrate on short-payback projects. The archetypal pattern it creates is an „addiction loop“ that is hard to break.

This potential „addiction loop“ does not mean that BET is a poor metric. Rather, it clarifies the need to have in place either additional metrics or some counterbalancing force, such as a strong culture or processes that drive continual improvement in commercialization capability. As the organization builds a portfolio of metrics, management must understand its intended and unintended consequences simply as different facets of a complex system that can and must be managed. For example, the inclusion of „net present value of development portfolio“ or „percent coverage of three-year growth gap from innovation,“ along with appropriate targets, in a suite with BET would counterbalance the temptation to rely on short-term, lower-value projects to meet BET targets.

To drive the intended innovation performance while minimizing the impact of unintended negative consequences, the whole suite of metrics must be based on an understanding of the systemic structure on which each metric is acting. Systems thinking, as described in *The Fifth Discipline*, is an ideal tool for such an analysis.<sup>3</sup>

A recent case highlighted the value of adopting a systems perspective in identifying the unintended consequences arising from unbalanced metrics portfolios. A large university was experiencing a great deal of frustration and tension within its organization over the failure of new or historically weak areas of research to achieve success.

Current R&D metrics, and subsequent resource allocations, were based on the number of peer-reviewed papers published or external peer-review grants secured by the research teams. The resulting „success to the successful“ archetype made it almost impossible for new or under-performing research disciplines to get sufficient resources to achieve a breakthrough. As a result, the university’s R&D portfolio was dominated by projects focused on past glories rather than on possible breakthrough approaches to tomorrow’s problems. The solution was to break the direct coupling between R&D metrics and R&D resource allocation and to adopt a metrics suite that included some leading measures across the innovation system. This allowed resource allocation and other management initiatives to be conducted strategically.

### **Cascading Metrics Throughout the Organization**

For metrics to be most effective, the organization must choose a common suite of metrics and cascade them through all levels of the organization, from the corporate center to each business unit and on to the various functional groups and departments. If a given metric reaches a level at which it is no longer useful or meaningful, the group in question needs to develop a new metric that acts as an agreed-upon surrogate. But care must be taken to avoid multiplying unnecessarily the number of metrics any group uses.

### **Defining Metrics and Targets**

Carefully defining each metric prior to its final selection increases the probability that you will end up with a well-balanced metric suite. It also ensures consistency over time and discourages negative behavior in the form of „metrics gaming,“ or exploiting ambiguities in what qualifies as a contribution to an established target.

An example of metrics gaming took place at a large Australian industrial products company, which recently established „number of ideas captured“ and „financial contribution from new ideas“ metrics and targets, with the objective of driving increased levels of innovation and product development. An unintended consequence was that managers began crediting „suggestion box“ ideas and TQM program outcomes arising from previously established programs. While these incremental improvements were valuable, they were not the quantum leaps forward management sought.

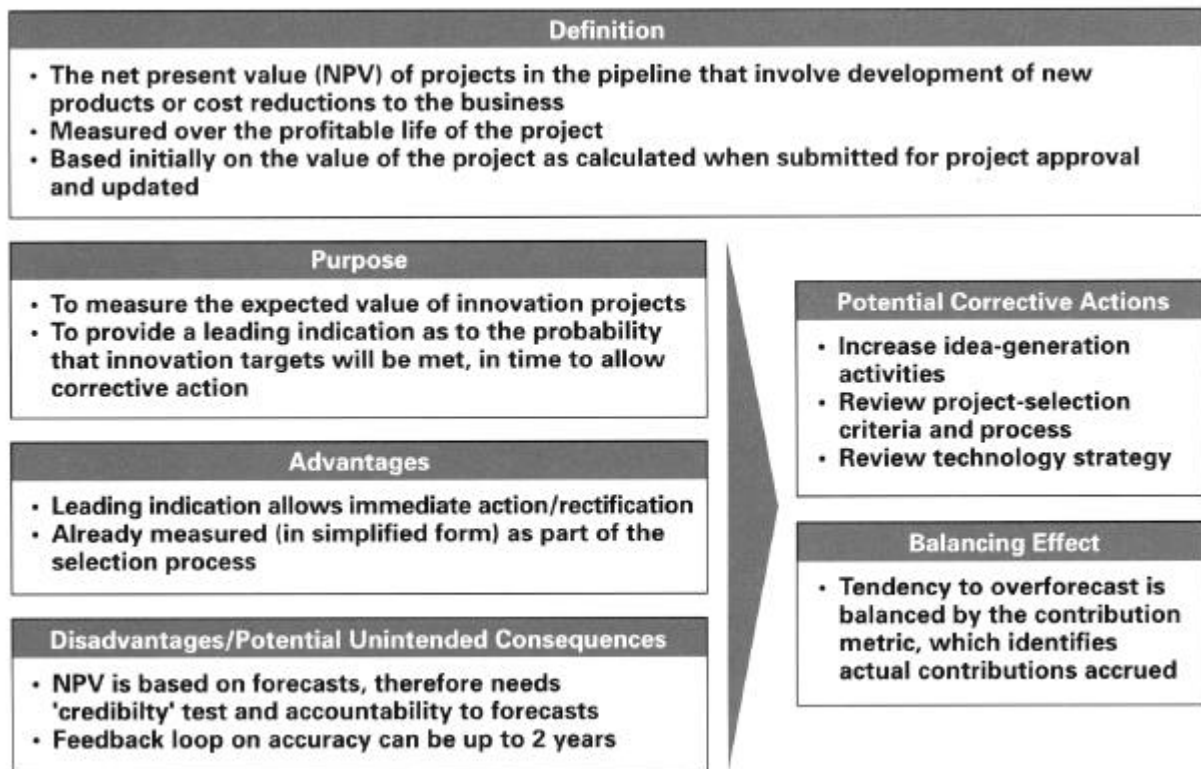
For each metric it employs, an organization should define very clearly the metric itself, the primary objective of the measurement, and any foreseeable unintended consequences (Exhibit 4). We have also found it very useful to think about what actions would be taken in the event of an outcome or trend that falls short of targeted performance. Identifying the possible intervention actions helps confirm the extent to which a metric aims at controllable drivers.

To be effective, innovation metrics must have assigned targets against which progress is measured. Targets establish the „creative tension“ or motivation that drives teams and individuals to rethink traditional approaches and practices, creating real and sustainable change.

Certainly one can simply measure the rate of change in the selected metric and gain some information about the health of the innovation system. But tracking metrics without targets is like measuring future success on the basis of past success; it tells you that you are better than you were, not whether you are as good as you need to be.

## Exhibit 4

### Definition of a Net Present Value Metric



Generating creative tension demands aggressive „stretch“ targets that resist solutions based on incremental changes to current practice. Creative tension also requires real commitment to the targets being set. This commitment is most sustainable when the people involved are truly enrolled in the vision represented by the target, rather than pressured into compliance or conscripted to the cause. Leadership has an important role to play in gaining enrolled commitment to targets, but so does reason. Targets should be chosen on the basis of credible and visible rationale. The trick is to maintain a difficult balance between stretch targets and targets that may be perceived as arbitrary.

Maintaining commitment to change against the inevitable forces of inertia requires setting both short- and long-term targets and managing them over time. Short-term targets create early wins and provide early feedback on progress. Long-term targets create sustained creative tension and consistent development toward goals requiring substantial change.

The European food industrialist mentioned earlier considered that achieving a „milestone on time“ target of 70 percent within one year would be a good outcome, given its inexperience with a new process. A goal of 90 percent in two years was considered as stretch but realistic.

Setting targets is often the most painful part of establishing metrics to drive innovation and should not be considered a trivial exercise. However, if done well, the investment in developing, communicating, and demonstrating commitment to these targets will pay large dividends, generating a positive creative tension that will sustain lasting change toward high-performance innovation.

### Implementing a Metrics Suite

We have found that a simple six-step process can quickly create a powerful and well-balanced innovation metrics suite. The process focuses on generating the top-level metrics from which supporting metrics cascade. As always, the 80/20 rule needs to be followed; this is a tool, not a science!

**Step 1:** Identify the strategic imperatives that innovation will affect and the high-leverage elements of the innovation system (bottlenecks or leveragable strengths). These are the outputs of a classic innovation audit.

**Step 2:** Generate a list of potential metrics that link to the high-leverage innovation elements in Step 1. Use brainstorming, or draw on existing metrics, to identify metrics for each cell of the Innovation Metrics Framework, to ensure that you start with a balanced portfolio.

**Step 3:** Rate metric candidates against weighted selection criteria and rank them within each of the innovation system elements (strategy, process, resources, and organization/culture). Create a short list of the top candidates in each category.

**Step 4:** Define each short-listed metric, taking care to identify potential unintended consequences and balancing forces.

**Step 5:** Select three to five metrics to form a balanced portfolio across the Innovation Metrics Framework.

Take care to select cross-supporting metrics that will ensure that the most severe unintended consequences are balanced by the impact of other metrics, either within the suite or elsewhere in the organization.

**Step 6:** Define targets against each metric that will maximize creative tension. Targets should be set in both the short term (less than 12 months) and long term (3 years or more).

## **Conclusion**

A balanced suite of innovation metrics is critical to driving systemic innovation across an organization. Without such metrics, innovation will remain reactive, sporadic, and haphazard. Care must be exercised to anticipate and manage the consequences of metrics through the proper design and selection of just a few self-supporting metrics within a structured portfolio.

Building a credible track record with a suite of innovation metrics takes years. To meet the increasing expectations of your organization's stakeholders, you would do well to address this priority now.

<sup>1</sup> Source: *Findings of the Arthur D. Little Global Survey on Innovation, 1998.*

<sup>2</sup> See: Charles H. House and Raymond L. Price, „*The Return Map: Tracking Product Teams*,“ Harvard Business Review, January-February 1991.

<sup>3</sup> For information on systems thinking, see *The Fifth Discipline*, Peter Senge, Currency/Doubleday, 1994; *The Fifth Discipline Fieldbook*, Peter Senge, Art Kleiner, Charlotte Roberts, Richard Ross, George Roth, Bryan Smith, Currency/Doubleday, 1996.

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