Knowing When You've Added

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Level set how to measure value to better understand innovation's full potential | **by Jane Keathley**

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Just the Facts

Measuring value is a key component to understanding innovation potential and effectively managing the innovation process.

There are several value analysis tools—ranging from simple to highly complex—that measure value, including the value matrix, value factor analysis and the innovation ambition matrix.

Understanding how to measure value can increase your value as a quality professional, enabling you to help your organization achieve innovation success and performance excellence.

Creating value is the "golden nugget" of innovation. Without value, there is no innovation. Adding value is what keeps organizations in business, just as quality became a prerequisite for business success in the 1990s. Today, quality is an expectation, not a differentiator. Adding value for customers is what drives sales, employee satisfaction and organizational profitability.

Benefits of measuring value

Given the importance of unlocking value, measuring and assessing value are highly relevant skill sets for organizations. Measuring value is a key component of understanding innovation potential and effectively managing the innovation process. Successful—that is, competitive—organizations must become adept at advancing innovative solutions, and value analyses are key. Knowledge and expertise in performance improvement and problem solving are directly applicable for this, and quality professionals are uniquely poised to take on responsibility for value analysis.

As with any useful metric, collecting and analyzing key data provides an objective basis for decisions, such as when to move forward with a creative solution or when to redesign or revise it. In a broader sense, well-thought-out measurements can play a significant role in managing the high levels of uncertainty inherent in innovation. We must be realistic about the level of uncertainty we're dealing with, and we must understand it in empiric terms if we want to reduce it enough to add real value. A few of the benefits of measuring value are summarized in Table 1.

One of the ways measuring value can help is to objectively understand the user's problem or need and the feasibility of solving it. Measurements of value can help us understand where value is lacking or missing so we can identify pain points and opportunities for innovation.

For example, in a challenging situation such as getting school children from the drop-off point to their classrooms each morning in an orderly fashion, a value assessment of each activity from drop-off to "in their seats" will yield insights into the lowest value activities: Those activities that—if modified—could add the most value to the process. Perhaps it's the way the students are initially greeted, the route taken to their classrooms, or the way their backpacks and coats are handled. Value analysis, perhaps using a value stream or business process map, can help identify the key points at which things break down. These are the best opportunities for innovating and adding value.

When devising innovative solutions, just as with any problem-solving challenge, it's good to have multiple choices. As you gather information and data about these multiple solutions, value analysis can help you compare them and narrow the list to those with the best value proposition, which can be further developed.

As you refine and hone your selected solution, assess the value of each change to ensure you continue to create and enhance value, not detract from it by errantly veering away from or overdeveloping the planned value. Remember: Users like simplicity and dislike complexity.

For higher-level decisions—such as strategic directions, program portfolios and supplier relationships—value analysis helps set direction and align organizational initiatives around those that will provide the greatest innovative benefit.

Value is in the eye of the beholder

One thing to remember is that value will be different for each stakeholder.

In the school example, the principal and parents want to ensure the students are safe and accounted for from the drop-off point to the classroom. The teachers want to start their day off in a calm manner and on time. The students likely want to play or hang out with their friends.

Value analyses must account for these varying perspectives.

> **"Innovation is change that unlocks value."**
>
> **—Jamie Notter, workplace culture expert and author**

Benefits of measuring value

Element of innovation	Benefit of value measures
Understand the problem or need	**+ Identify trends and patterns that indicate opportunities.** **+ Develop clear picture of where the problem lies.**
Identify problem-solving solutions	**+ Uncover the problem areas with biggest impacts.** **+ Evaluate relative benefits of potential solutions.**
Compare and prioritize alternative solutions	**+ Identify solution most likely to succeed.** **+ Understand benefits versus costs of solutions.**
Monitor solution development	**+ Avoid drift away from the optimal solution.** **+ Continue to refine solution for best user experience.**
Deploy the solution	**+ Make additional value-adding refinements.** **+ Identify new opportunities.**
Develop organizational strategies	**+ Evaluate value of strategic initiatives to meet organizational excellence goals.** **+ Identify innovative solutions for key strategic challenges.**

How would you go about measuring value?

How do you measure something as subjective as "value"? Think about some of the things you value in your life: your family and friends, your job, car and house, even your life. Ask yourself: How much—on a scale of one to 100—do you value any one of those things? How do you put a number on value?

Assessments of value involve people, and people are unpredictable. Understanding how people determine what is valuable—that is, the basis of their value decisions—can help put this unpredictability into perspective. If done well, this information becomes incredibly helpful in the search for innovative solutions.

You might be thinking: "It's all subjective," and you're right. Yet, to be effective innovators, we must create value. As the Irish-Scots mathematician and physicist Lord Kelvin said in 1883, "When you can measure what you are speaking about and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind …"[1]

How will we know we've created value if we can't measure it? How can we obtain useful measurements that will help understand and assess value? Several value analysis tools—ranging from simple to highly complex—can be used to capture these insights.

Approaches to measuring value

Measuring the value of innovation involves many intangibles. The most useful information often is found in the more "challenging to measure" continuous variables (as opposed to binary yes/no or even categorical measurements). Here—in order of simple to complex—are several approaches for measuring value.

Value matrix: At its core, value analysis is simply a comparison of benefits to costs (see Figure 1). As benefits go up, value increases. As costs go up, value generally decreases. In this matrix, low benefits/low costs are considered "budget" value; low benefits/high costs are considered "inflated" value; high benefits/high costs are considered "luxury" value; and high benefits/low costs are considered "excellent" value.

"Excellent" is the sweet spot and the most-often desired value point. For example, in Figure 2 (p. 20), the values of different types of juicers are shown on such a matrix, from budget to luxury.

Value factor (VF) analysis: To plot things on the value matrix, you must assign numbers for benefits and costs. The VF analysis does that and expresses the results as a ratio (see Figure 3, p. 20), which can be used to estimate customer value of a product,

Basic value analysis matrix
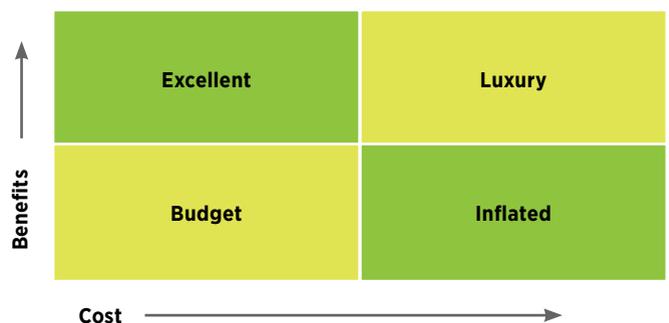
service or other offering, and to compare it to other options.

In this model, the importance to the user and the user's satisfaction with the offering and its costs are considered. This approach is similar to the decision (or Pugh) matrix and quality function deployment.[2]

Figure 4 shows a VF analysis for a car model. Beneficial factors used in this example were anti-pollution, styling, reliability and efficiency. Customers rated each factor based on its importance and their satisfaction with it. A one-to-five scale was used: five being the highest/best. Importance ratings were multiplied by satisfaction ratings, and the results were totaled to obtain the benefits score.

Similarly, cost factors included base price, fuel costs, repairs and insurance, and customers rated the importance of these costs and their view of the actual costs. Responses to costs were multiplied and added to obtain the cost score.[3] In this example, the VF = 3.9, or the benefits score of 74 divided by the cost score of 19.

How can you use the VF number?

+ Compare it with the VF of other car models—for example, competitors or other models in the same line.

+ Compare it with the VF of other versions of the car—for example, last year's model or the same model with additional features.

+ Dig deeper into customer preferences and better understand the features that are most important to them—for example, would improvements in styling add enough benefit to offset the related costs?

Innovation ambition matrix: Developed by Bansi Nagji and Geoff Tuff,[4] this method can be used to evaluate a new offering based on whether it is a new product, enters a new market or both. The model categorizes offerings into core, adjacent and transformational (see Figure 5). Risk increases with each category. The innovation ambition matrix helps you

Value of various juicer models

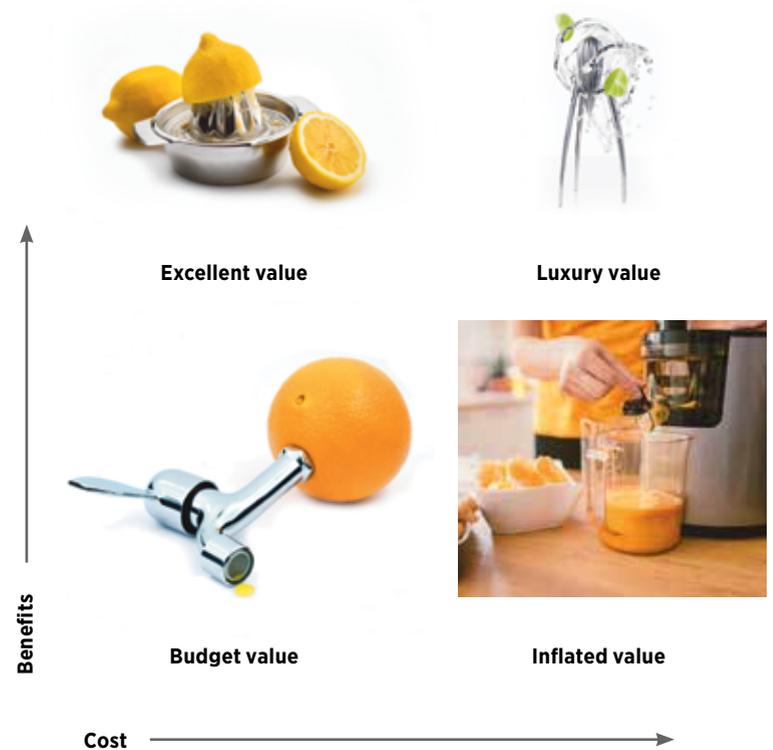Excellent value   Luxury value

Budget value   Inflated value

Benefits

Cost

Value factor ratio

**Value factor =
Customer benefits / Customer costs**

determine your risk tolerance (what is your comfort level for each category), what you want your pipeline of innovative offerings to look like and whether you have the balance you want.

Innovation maturity model: Developed by James M. Utterback and William J. Abernathy,[5] this model evaluates the life cycle of innovation from the early fluid stage, through the transitional phase, to the mature, "specific" phase (see Figure 6, p. 22).

FIGURE 4

Automobile value factor analysis example

Quality	Importance	Satisfaction	Benefit
Anti-pollution	5	5	25
Styling	2	2	4
Reliability	5	4	20
Efficiency	5	5	25
Total benefits			74

Cost factor	Importance	Expense	Cost
Base price	1	4	4
Fuel costs	3	1	3
Repairs	4	2	8
Insurance	2	2	4
Total costs			19

Note: Adapted from Curtis R. Carlson and William W. Wilmot, Innovation: The Five Disciplines for Creating What Customers Want, *Crown Business, 2006. The value factor is 3.9 (74/19).*

+ Early on, the offering will be fluid, with the focus on addressing the pain point and making rapid changes to adapt it to the user's needs and desires. Processes will be chaotic and changing frequently.

+ As the offering matures and settles down, it enters the transitional phase in which the offering stabilizes, while the attention turns to the processes around the offering. This is when innovations to process efficiency and effectiveness are introduced.

+ Eventually, the offering and related processes become standardized, rate of change slows, and changes, if made, are minor. At this point, the offering is ripe for disruption. If the organization hasn't planned for it, this disruption will come from a competitor (for example, Blockbuster and Netflix).

The Utterback and Abernathy model can help keep the innovation pipeline primed, with a fluid balance of offerings in various stages of development progressing forward to replace those mature offerings at the end of their life cycle.

Willingness to pay (WTP): Value also can be assessed by determining an individual's WTP for an offering. Think of art buying. Value generally is determined by how much the piece will bring in at an art auction. WTP may be determined by offering an alternative. For example, you could spend $10,000 for a new deck on your house. Or, you could spend $100,000 for a three-season room with innovative climate control options (for example, dynamic glass windows that automatically control lighting and temperature). What you're willing to pay is a measurement of the value of the options to you. Do you want budget, excellent or luxury value?

A type of WTP, the value of statistical life[6] measures value based on how much an individual is willing to pay for a reduction in the risk of their own death. For example, how much would you pay for certain safety features on your car that will reduce your chance of death by X%? The more you would

FIGURE 5

Innovation ambition matrix
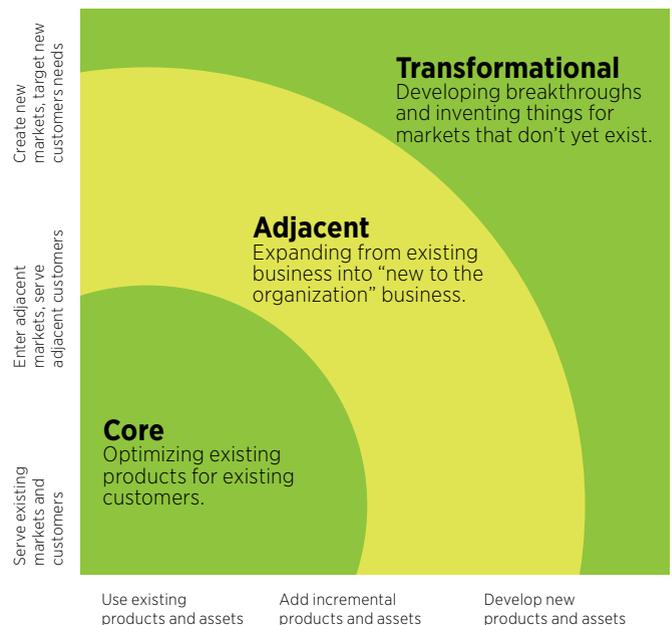
Source: Bansi Nagji and Geoff Tuff, "Managing Your Innovation Portfolio," Harvard Business Review, *May 2012.*

pay, the higher the value. This type of measurement introduces the idea of odds or chances. Value measurements rely on probabilities to improve accuracy.

Value analysis: Value analysis is a field of engineering that identifies and selects the best value alternatives for designs, materials, processes and

FIGURE 6

Utterback-Abernathy dynamic model of innovation
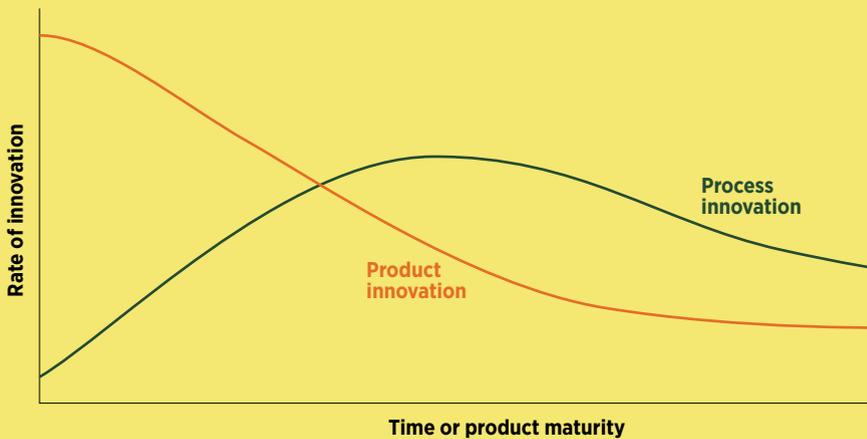
Competitive emphasis on	Fluid pattern Functional product performance	Transitional pattern Product variation	Specific pattern Cost reduction
Innovation stimulated by	Information on users' needs and users' technical inputs	Opportunities created by expanding internal technical capability	Pressure to reduce cost and improve quality
Predominant type of Innovation	Frequent major changes in products	Major process changes required by rising volume	Incremental changes with cumulative improvements in productivity and quality

Adapted from James M. Utterback and William J. Abernathy, "A Dynamic Model of Process and Product Innovation," International Journal of Management Science, Vol. 3, No. 6, 1975, pp. 639-656. The model was further refined in William J. Abernathy and James M. Utterback, "Patterns of Innovation in Technology," Technology Review, Vol. 80, No. 7, 1978, pp. 40–47.
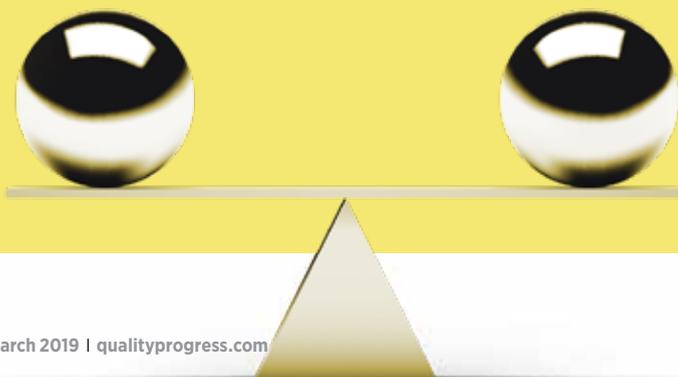
systems. In *How to Measure Anything*,[7] Douglas Hubbard describes value engineering as the science of distinguishing between incurred costs and inherent costs, and minimizing those inherent costs. In other words, increasing the benefits-to-cost ratio.

Engineers ask, "Can the cost of this item or step be reduced or eliminated without diminishing the effectiveness, quality or customer satisfaction?" They ask it repeatedly in iterative cycles, using highly sophisticated algorithms, simulations and statistical analyses to measure and analyze these questions, in pursuit of the greatest value.

Something to keep in mind

There is one rule that is true for all value analysis models: Collect only measurements that will give useful information. Always ask yourself, "What will I do differently based on the possible findings from this measurement of value?"

Hubbard writes the story of when he worked with a financial firm and conducted a value analysis on about 20 of their investment funds.[8] He reviewed 40-80 variables for each fund, first looking at the value of the information gained from each variable. Interestingly, he found that most of them provided zero value. Further, he found that of the variables that would be most helpful in making decisions for innovative changes, few were being measured.

Hubbard has since found similar trends across industries and sectors.

So rule No. 1 is to spend your time and effort on fewer, higher-value measurements that will lead to good decisions for reducing uncertainty and creating value.

How not to analyze value

There are a few things to watch out for in value measurement. First, don't base value assessments on gut feelings. Avoid "vanity metrics," a term from the lean startup method.[9] Vanity metrics are selected because they will likely tell you what you want to hear—a common problem when a passionate entrepreneur or project sponsor wants his or her solution to succeed and only considers supportive data. These metrics are not objective and often will lead away from the hard truths of value assessment. Disciplined and empiric evaluations are necessary to get the most valuable information.

Customer surveys can be helpful, but they must be carefully designed and administered to get actionable information. They should only be used as part of a package of tools to get at and understand customer or user needs. A much better option than surveys is meeting with, working with and walking with customers to understand firsthand the problems they are experiencing.

Longer-term innovations are higher risk, but they also provide higher gains. Corning spent more than 20 years developing its fiber-optics cabling. That long-term investment has paid off in big ways for them, supporting telecommunications across the world. Consider a mix of short and long-term initiatives to set yourself up to capitalize on those long-term gains.

Lastly, a word of caution about big data. These days, data are abundant and easier than ever to amass. Finding trends and patterns in big data can be useful in identifying opportunities in need of innovative solutions. However, effective big data analysis requires specific skills and technology that may be expensive to acquire.[10] The data must be of high quality. The old "garbage in equals garbage out" truism applies here, too. Security management (that is, integrity, availability and confidentiality) of those large data sets must be established and maintained.

All of this can be overwhelming and time consuming. In the end, big data analyses will be useful only when a clear business objective has been defined, and the appropriate and relevant data have been sourced. Pay careful attention to the information that will get the answers you need. Don't go beyond that.

Measuring value: an organizational requirement

It may not always be easy, but there is great benefit in measuring and analyzing value. Many of the concepts and tools of the quality profession apply to innovation measurements and

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analyses—for example, cost/benefit and risk analyses, strategic opportunity and threat research, and problem-solving tools.[11]

Organizations are increasingly reliant on such measurements as they seek to ensure innovative offerings and organizational success. Understanding how to measure value can increase your value as a quality professional, enabling you to help your organization achieve innovation success and performance excellence. **QP**

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