

August 26, 2008

# TCO Is Overrated

by Andrew Reichman and James Staten  
for IT Infrastructure & Operations Professionals

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Use Relative Cost Of Operations For Most Infrastructure Investment Justifications

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## EXECUTIVE SUMMARY

Total cost of operations (TCO)-based financial analysis is held up as the gold standard for technology investment justification, but most firms don't have the rigor to apply the discipline to their environment. To really implement TCO-based analysis it takes a comprehensive and continuously updated catalog of asset inventory, in-service dates, agreed-upon operating cost rates for activities, and a scheme to divide shared costs among the constituent business processes that use them. For most firms, this is a pipe dream viewed either as a waste of resources in a futile quest for achievement or too intimidating to even begin. Forrester recommends a more expedient and realistic financial approach that can be just as effective but much simpler to calculate — relative cost of operations (RCO). RCO can be a middle-ground solution, moving far beyond acquisition-cost-only analysis, while being more achievable than a full-blown TCO.

## TABLE OF CONTENTS

### 2 Most Cost Analysis Is Fraught With Inaccuracies

- It's The Tools, Not The Leaders
- Sophisticated TCO Analysis Is Lacking
- This Causes Spend-Control Thinking — Not Operations Cost Savings

### 5 To Truly Understand Financial Impact, Measure Only What Changes

- Use Relative Cost Of Operations Instead
- Simplify The Business Case By Separating Out Cost Categories
- But Don't Forget The Periodic Full Cost Analysis

## RECOMMENDATIONS

### 9 You Need Three Tools In Your Cost Analysis Arsenal

### 10 Supplemental Material

## NOTES & RESOURCES

Forrester's research was based on lessons learned from end user client advisory sessions and inquiries.

### Related Research Documents

- ["Justifying And Funding Infrastructure Investments"](#)  
February 6, 2008
- ["Measuring The Cost Of IT Consolidation"](#)  
November 12, 2007

## MOST COST ANALYSIS IS FRAUGHT WITH INACCURACIES

After reviewing hundreds of inquiries from enterprise clients, Forrester has concluded that few firms ever attempt to use TCO analysis as a basis for IT decision-making, and the small number that do attempt it don't have the ability to perform accurate analysis. Instead, most firms rely on guesswork to estimate the impact of decisions on the bottom line and focus too much on upfront acquisition cost.

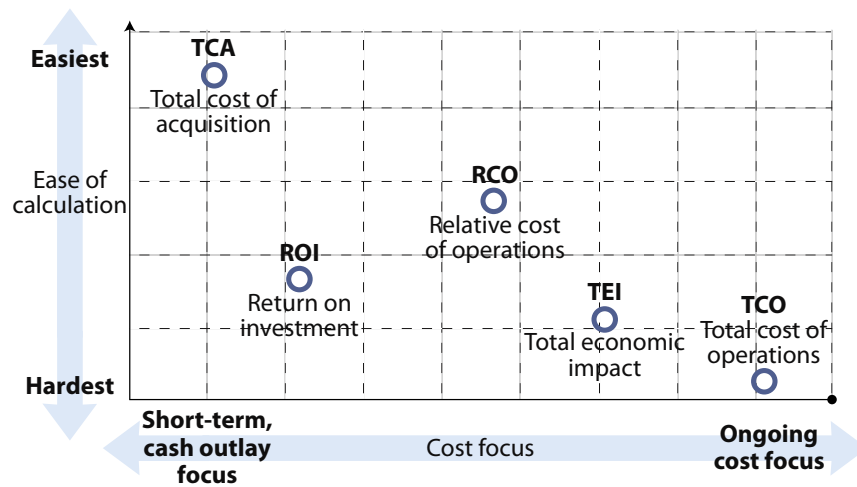
### It's The Tools, Not The Leaders

This isn't the fault of IT leaders as much as it is the tools they employ for this purpose. Upfront acquisition cost is measurable and visible, while less direct costs of operation are harder to identify and harder still to apportion among many shared purposes. Despite frequent use of the term TCO, many firms use it fairly interchangeably with other financial measurement approaches, often implying anything other than simple acquisition cost. The spectrum of approaches is broad, but most are problematic (see Figure 1):

- **Cost of acquisition ignores ongoing operational costs.** For a multitude of purchases — mostly products considered either commodity or with “well-understood” costs — organizations fight tooth and nail for minor price reductions even when closely priced products can have very different long-term operational cost implications. For example, in the server arena we often see clients pit two to three server vendors against each other for the lowest possible price, without considering the different management, support, and lights-out aspects of the products, which can be vastly different.
- **Return on investment (ROI) assumes productivity gains in isolation.** It also relies heavily on assumptions that can introduce significant variability of analysis. ROI analyses are usually too sharply focused on one particular solution to a given problem, striving to justify a particular approach rather than considering the whole context of the decision. For example, if a key database is running out of storage capacity, it's easy to rationalize the purchase of a new direct-attached storage array for this device because of its ability to expand the database and run the business. Yes, expanding capacity is key to growth, but such an analysis doesn't compare options such as networking the database server to a consolidated storage area network (SAN). And since IT investments don't generate profits, it's hard to know what benefits to attribute to a specific investment; many times the ROI relies heavily on assumptions that may or may not be valid.
- **TCO requires significant investments in time and rigor.** TCO is without a doubt the most thorough and potentially accurate cost-analysis method available to an IT organization. Unfortunately though, successful application requires precise knowledge of all aspects of the ongoing operational costs of the baseline environment in which the investment will be made. It also requires a thorough understanding of the operational cost ramifications of this investment on all aspects of the environment affected by this change. Most firms don't have current or accurate inventories of their hardware, much less the ability to assign portions of shared

resources to projects and initiatives. It may be a great idea to have a system that’s constantly updated and that can provide a cost impact for any change, but the reality is that this is too complex and out of reach for most firms.

**Figure 1** The Enterprise Cost Modeling Spectrum — Where Do You Fall?



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Source: Forrester Research, Inc.

### Sophisticated TCO Analysis Is Lacking

In talking with enterprises through inquiries and other engagements, Forrester found that although many companies talk about doing TCO analysis, they don’t really consider all costs, and thus make so-called TCO decisions based on incomplete data. This can result in the selection of unfavorable investments and excessive cost, despite best intentions. We found several key shortcomings with TCO analysis, in that most IT organizations have:

- **Poor understanding of TCO measurement.** Companies often refer to any analysis more complicated than just considering the sticker on the hardware as TCO. This is not enough to put the “T” in TCO. Real TCO means that everything is considered, even the stuff that’s hard to measure, like power, facilities, staff, real estate, efficiency, and opportunity costs.
- **Weak data.** Most firms don’t truly know what it costs them to run their IT systems, partly because they don’t have thorough and up-to-date inventories and partly because many different teams make the decisions and pay the bills. Each team usually has a reasonably good subset of information, but it needs to fit together consistently to enable true TCO analysis. For example, the finance team might know how much they paid for all the servers on a purchase order and when it was cut, but they might not itemize it by each machine, which is critical to decisions

about consolidating specific servers. Conversely, the server team most likely knows each machine and its technical specifications but not when it was purchased and for how much. Bringing together all the bits and pieces of information to a useful whole is a huge puzzle, but one that must be solved if TCO is the goal.

- **Little systematic, ongoing measurement of costs.** Most firms gear up for analysis when it's time to make a big purchase but don't keep the mechanisms running when they're not in acquisition mode. As a result, the data they rely on must be refreshed each time they go to make a new investment decision. For TCO to work, there needs to be a team and a toolset in place all the time, working to keep the data current and the apportionment models for shared resources accurate, so the information is right and ready each time a purchase is being considered.
- **Insufficient tools for measuring these costs.** There are few software products on the market for TCO measurement. Instead, companies rely on disparate tools from each technology domain and struggle to pull it all together. This often means custom consulting projects that are complicated and not easily adapted for ongoing use. Too often these fall into disrepair when the project is completed and don't provide a solid foundation for effective TCO measurement.

### This Causes Spend-Control Thinking — Not Operations Cost Savings

Without a good understanding of the overall operations costs of IT, companies view with some skepticism any analysis of long-term cost savings or ROI for a new purchase. The champions of the desired technology shift from wanting to prove the hypothesis of financial value delivered to simply wanting to “make the model work.” This quickly devolves into a “trust me” buying pattern that becomes a dangerous situation for IT leadership. If ongoing costs start to escalate, it may be time to look for a new job. The most common traps are:

- **Investing the least.** Although IT investments are critical to running the business, most companies can't make a credible direct link to revenue generation. Thus, the readily measurable impact of IT investment decisions is spending. For this reason, the ROI of any given investment option will generally be negative — money outgoing. This means the investment that requires the lowest cost outlay will be deemed the one with the highest ROI.
- **Investing in a vacuum.** Since overall cost measurement is time-consuming, firms often split their spending budget into categories, such as storage, servers, networking, and client PCs, then empower architects in these areas to simply stay within the budget. These well-intentioned individuals do exactly as they are told and spend every cent of the budget assigned, as best as they can, interdependencies be damned.
- **Ignoring time.** In any purchase, a dollar spent today is more costly than a dollar spent tomorrow, due to both the cost of capital faced by the firm and the relentless pace of innovation that reduces the cost of equal technology over time. A PC may only last three years, a server or

storage array a minimum of five, and facilities infrastructure 15. Yet we often see companies accelerate purchases through a questionable ROI analysis. In some cases, doing nothing for a year or more may have been the best option.

- **Trying to quantify soft costs to make the case.** Many a business case attempts to justify an investment by showing improvement in a soft cost that doesn't produce a change in operational expense. For example, making the administrative staff more productive doesn't mean you can now pay them less. Common sense is critical in these situations to ensure that the benefits are real and should be counted as hard benefits. If they can't be measured properly, they should be mentioned in the text of the case but not included in the quantitative analysis.

**TO TRULY UNDERSTAND FINANCIAL IMPACT, MEASURE ONLY WHAT CHANGES**

Rather than shortchange your analysis with TCA (total cost of acquisition) or ROI measures or struggle in vain with full-blown TCO, simplify your analysis by looking at what will change with a new investment — not every moving part in the data center. Take a page from the video industry, which figured out how to speed up the delivery of rich media content. Rather than render each and every frame of video, which was too costly and complicated, the industry figured out that if it captured periodic fully rendered frames (key frames), it could save time and capacity by simply calculating and rendering only what part of the next frame was different from the previous. The industry found it could do this repeatedly for several frames before a new key frame needed to be rendered to keep the picture quality from degrading. The same concept can be applied to infrastructure investment justification by focusing your analysis on only what cost categories will change (see Figure 2).

**Figure 2** An RCO Analysis Example: Server Refresh

Cost category	Option A: Vendor A (incumbent)	Option B: Vendor B
Management software licenses	\$0	+\$1,500
Remote management licenses	\$0	+\$750
Training	\$0	+\$250
Implementation costs	N/A	N/A
Availability software licenses	N/A	N/A
Support cost	-\$150/yr	-\$250/yr
Power and cooling costs	-\$375/yr	-\$425/yr

### Use Relative Cost Of Operations Instead

In terms of technology financial analysis, this entails doing periodic analysis of overall operations costs, then with each subsequent purchase, identifying only the cost categories that will be affected by the purchase and calculating the relative differences they will yield. Forrester calls this relative cost of operations (RCO) analysis. This much simpler and more actionable approach yields the following benefits:

- **Fewer metrics to calculate.** The addition of a new product or refresh of an in-place resource typically doesn't cause sweeping changes in your IT processes or the broad-scale operational costs of your shop. (Impacts of that sort are hard to quantify anyway.) In most cases you can quickly identify the most relevant cost categories a given purchase will affect. For example, a server refresh may replace two or more existing servers with a portion of a consolidated or virtualized infrastructure. This materially impacts software licensing costs, power consumption, and support contract costs, while other cost categories will be mostly unchanged.
- **Less guesswork.** Once the primary cost categories have been identified, measuring the baseline costs and the relative costs of the options being considered is fairly straightforward. You avoid the need to demystify the vendor-provided cost-benefit analyses and the need to develop soft-cost justifications for tangential impacts of the project.
- **More credible justification.** Since the costs compared are simple to describe and easy to accurately quantify, the whole business case is less subject to dismissal by executives as being vendor-biased or too reliant on benefits that are vague and unlikely to be realized. Cost justification becomes much easier for everyone to understand and accept.
- **Faster, better decision-making.** If you don't have to hunt for extraneous numbers to make up a complete TCO analysis, the process can go faster. At the same time, since the process takes ongoing spend into account and doesn't stop at upfront acquisition cost, the results are more based in reality than a basic analysis is.
- **Simpler case validation.** Since the analysis is simplified, the valuable process of revisiting the portfolio of investments two to three years postimplementation becomes easier. Because there was a smaller number of variables and benefit categories, postmortem evaluation becomes much more viable and more productive with a simpler RCO approach to business cases.

### Simplify The Business Case By Separating Out Cost Categories

An RCO analysis is a tool for financial justification and part of a business case for technology investment — not a replacement for the business case. However, RCO makes the business case easier, as it provides a means for a simpler structure. After explaining the need for the product or technology investment, split the cost categories into segments that require different types of treatment. Treat the following segments this way:

- **Explain away unaffected cost categories.** Many cost buckets simply aren't affected by the new technology — even if they are large cost points — so rather than calculate them anyway because management will expect to see them, explain why they are unaffected by the purchase. This also sets the expectations for the RCO analysis, which specifically identifies the cost categories where you expect to see the biggest deltas.
- **Quantify the relevant cost categories.** These are the categories upon which you conduct RCO analysis. Be as specific and objective as you can in these categories as the scrutiny of your analysis will happen here. Be reasonable when ascribing benefits — only include the elements that change when implementing this particular project rather than things that would change anyway.
- **Discuss impacts on soft-cost categories.** You won't be able to financially justify these costs, as cash flows won't be changed; however, productivity improvements, simplification of administration, and better availability are justifications that you should explain. Identifying in which direction the overall number is expected to move as a result of an initiative, along with a qualitative assessment of impact (such as small, medium, or large) is a better way to treat hard-to-quantify results than trying to quantify beyond realistic capabilities.

### But Don't Forget The Periodic Full Cost Analysis

While RCO may be significantly simpler and more cost-effective, you still need credible baseline costs. This requires periodic full cost analysis of your maintenance and ongoing operations of services and equipment (MOOSE).<sup>1</sup> The timetable for this analysis depends on the rate of change in your infrastructure. A schedule of every two to three years should be sufficient for most companies, but major events like a merger or acquisition, a significant IT transformation or consolidation, or other major changes should be a catalyst for a refresh (see Figure 3).

**Figure 3** Model: Periodic Full Cost Analysis Of MOOSE

10% weighted average cost of capital

**Scenario 1: Storage virtualization adoption**

Category	Subcategory	Year 1	Year 2	Year 3	Year 4	Year 5	Total
<b>Hardware</b>		<b>\$100,000</b>	<b>\$250,000</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$350,000</b>
	Storage acquisition	\$	\$250,000	\$	\$	\$	\$250,000
	Virtualization appliance	\$100,000	\$	\$	\$	\$	\$
	Storage maintenance	\$	\$	\$	\$	\$	\$
<b>Software</b>		<b>\$50,000</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$50,000</b>
	Storage virtual. licenses	\$50,000	\$	\$	\$	\$	\$50,000
<b>Staff</b>		<b>\$50,000</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$50,000</b>
	Salaries	\$50,000	\$	\$	\$	\$	\$50,000
	Training	\$10,000	\$5,000	\$	\$	\$	\$
<b>Facilities</b>		<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
	Power and cooling	\$	\$	\$	\$	\$	\$
<b>Total</b>		<b>\$200,000</b>	<b>\$250,000</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$450,000</b>

**Scenario 2: Business as usual**

Category	Subcategory	Year 1	Year 2	Year 3	Year 4	Year 5	Total
<b>Hardware</b>		<b>\$40,000</b>	<b>\$350,000</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$390,000</b>
	Storage acquisition	\$	\$350,000	\$	\$	\$	\$350,000
	Virtualization appliance	\$	\$	\$	\$	\$	\$
	Storage maintenance	\$40,000	\$	\$	\$	\$	\$
<b>Software</b>		<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
	Storage virtual. licenses	\$	\$	\$	\$	\$	\$
<b>Staff</b>		<b>\$</b>	<b>\$120,000</b>	<b>\$123,600</b>	<b>\$127,308</b>	<b>\$131,127</b>	<b>\$502,035</b>
	Salaries	\$	\$120,000	\$123,600	\$127,308	\$131,127	\$502,035
	Training	\$	\$	\$	\$	\$	\$
<b>Facilities</b>		<b>\$10,000</b>	<b>\$10,500</b>	<b>\$11,025</b>	<b>\$11,576</b>	<b>\$12,155</b>	<b>\$55,256</b>
	Power and cooling	\$10,000	\$10,500	\$11,025	\$11,576	\$12,155	\$55,256
<b>Total</b>		<b>\$50,000</b>	<b>\$480,500</b>	<b>\$134,625</b>	<b>\$138,884</b>	<b>\$143,282</b>	<b>\$947,291</b>

**Figure 3 Model: Periodic Full Cost Analysis Of MOOSE (Cont.)**

Relative cost comparison		Year 1	Year 2	Year 3	Year 4	Year 5	Total
Category	Subcategory						
<b>Hardware</b>		<b>\$(60,000)</b>	<b>\$100,00</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$40,000</b>
	Storage acquisition	\$	\$100,00	\$	\$	\$	\$100,000
	Virtualization appliance	\$(100,000)	\$	\$	\$	\$	\$
	Storage maintenance	\$40,000	\$	\$	\$	\$	\$
<b>Software</b>		<b>\$(50,000)</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$(50,000)</b>
	Storage virtual. licenses	\$(50,000)	\$	\$	\$	\$	\$(50,000)
<b>Staff</b>		<b>\$(50,000)</b>	<b>\$120,000</b>	<b>\$123,600</b>	<b>\$127,308</b>	<b>\$131,127</b>	<b>\$452,035</b>
	Salaries	\$(50,000)	\$120,000	\$123,600	\$127,308	\$131,127	\$452,035
	Training	\$(10,000)	\$(5,000)	\$	\$	\$	\$
<b>Facilities</b>		<b>\$10,000</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$10,000</b>
	Power and cooling	\$	\$	\$	\$	\$	\$
<b>Total</b>		<b>\$(150,000)</b>	<b>\$220,000</b>	<b>\$123,600</b>	<b>\$127,308</b>	<b>\$131,127</b>	<b>\$452,035</b>

**NPV \$306,689.83**  
**Payback Year 2**

44545

Source: Forrester Research, Inc.

## RECOMMENDATIONS

### YOU NEED THREE TOOLS IN YOUR COST ANALYSIS ARSENAL

No single cost analysis tool fits every situation. Keep the goal in mind, which is to provide reasonably effective tools to make better decisions, not to measure everything for its own sake. To enable this goal, every IT leader should have experience with and a plan to implement three key tools that together yield a solid foundation for ongoing financial management:

- **TCO, for creating a baseline of overall operations.** The proper use of TCO is to quantify your MOOSE, which serves as your map of overall IT spend from which you can plot your course for improvement. It's valuable to measure spending by category and to determine simple yet effective ways to allocate shared costs among many users. Agonizing over a complex system that measures every possible cost has diminishing returns when it comes to producing better analysis, so don't try to go too far with TCO.
- **RCO, for evaluating incremental changes.** Quick financial analysis that is credible, consistent, and easily shows impact against MOOSE lets you support transformation goals with each purchase. There should be no need to redo TCO to determine impact on overall

spending, nor should spending be justified purely as a one-time outlay when the new investment will be with you for the next three years at least. So toss out your ROI and TCA calculators.

- **TEI, for understanding risk-optimized transformations.** When a major transformation of a service, category of infrastructure, or key process is being contemplated, neither TCO nor RCO will shed the proper light on the overall impact of the choices before you. And neither tool accounts for the risk associated with each option. For this, a Total Economic Impact™ (TEI) analysis is warranted.<sup>2</sup>

## SUPPLEMENTAL MATERIAL

### Online Resource

The online version of Figure 3 is an interactive tool to calculate the cost impacts of a new technology investment, process change, or project.

## ENDNOTES

- <sup>1</sup> Every year, CIOs and their finance people get prepared for this question from their CEOs: “How does our IT spending compare with our competitors?” To help them respond, Forrester annually provides IT spending benchmarks, including our recommended IT spending benchmark: spending to maintain and operate the IT organization, systems, and equipment (MOOSE) as a percentage of revenues. Our 2007 estimates for this benchmark metric by industry and size of company are included in this report, along with the source data by industry from Forrester’s Business Data Services, InformationWeek 500 (IW 500), and other benchmarks. Once a CIO has compared his or her company’s IT MOOSE metric with our benchmark data, the real fun begins — understanding and explaining the differences. Whether a company’s IT MOOSE is higher or lower than our benchmark, a CIO should take advantage of our guidance and tools to determine the cause of the discrepancy and whether being high (or low) is good or bad. See the November 13, 2007, “[US IT Spending Benchmarks For 2007](#)” report.
- <sup>2</sup> Data protection and data privacy have become a board-level issue as regulators impose fines and requirements and customers react to the publicity of data breaches. Some organizations have implemented an effective data privacy program to keep data private, but they are unsure of what investment is appropriate and how to measure their results. A Total Economic Impact™ (TEI) analysis of privacy programs indicates that an organization will likely see the benefits of a reduced probability of a data breach and greater employee and process efficiency, providing gains of more than \$400,000 a year in our example scenario. These benefits need to be balanced against the costs of privacy training and assessment provided by your internal privacy team and external service providers. Our analysis of a typical organization considering privacy programs shows an annual positive return after the first year of 38% with a net positive return occurring within two to three years. Using Forrester’s TEI methodology, organizations can model their specific characteristics using our values as a starting point for a customized analysis. See the April 14, 2008, “[The ROI Of A Privacy Program](#)” report.

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