

Practical Issues in Avoiding Pitfalls in Managerial Costing Implementation

**The fifth and last in a series of articles exploring
cost measurement issues.**

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Introduction

This series of articles has addressed a number of key practical issues in the formulation of managerial costing systems in government organizations. The first considered government's increasing needs for cost management and differentiated the cost measurement process of managerial costing from the external reporting of cost. The second offered guidance on management's role in selecting from alternative measurement methodologies and in choosing cost objects: the view of cost to be measured.

The third article discussed practical issues in defining and selecting cost drivers along three dimensions: managerial impact and usefulness, measurement credibility, and measurement cost. The fourth showed that measurement limitations and measurement costs restrict the level of precision possible in managerial costing systems. Fortunately, management's need for precision is also considerably lower than that typically expected in bookkeeping or accounting systems driven by external reporting requirements.

Recent experience suggests a somewhat naïve expectation that simply hiring a good contractor and using good activity based cost accounting software automatically results in better cost management. Unfortunately, success is *not* guaranteed. This final installment in the series will build a general theory of managerial costing by considering pitfalls in the three dimensions of usefulness, truthfulness, and affordability.

Managerial Costing Requirements

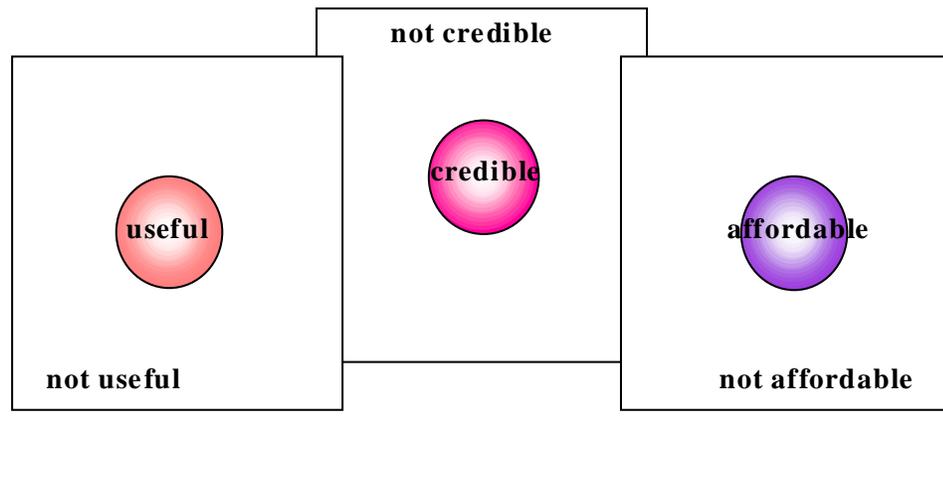


Figure 1 Useful managerial costing efforts are a small subset of all possible systems. The same is true for credible and affordable systems.

A General Theory of Convergent Requirements

Government organizations have long met their *external* accounting requirements without cost accounting systems. This situation can undoubtedly continue. Current motivation for cost information is coming from inside the organization as managers are more interested in productivity increases to accomplish organizational missions in an era of reduced resources. Reprogrammed cost efficiencies provide new budget resources for unfunded mission priorities. Enhancing the mission is the goal of “managerial costing.”

Managerial costing systems can be evaluated in three fundamental dimensions. Managerial costing is either useful to managers or it is not. Managerial costing is either credible in providing a reasonable view of the true cost of resources consumed or it is not. Managerial costing is either affordable or it is not.

It is undoubtedly easier to miss the target for any of these dimensions than to hit it. Furthermore, it is proposed here that satisfying one or two of these dimensions is insufficient. The goal of mission enhancement will be met by the managerial costing effort only where there is a convergence of all three dimensions.

Much of the existing accounting in government is of limited usefulness to managers seeking continuous improvement in the productivity of their operations. Cost managers must find managerial costing information useful. If managers don't use the system, the effort dies from *lack of interest*.

Costing inevitably requires the making of assumptions as to what cost elements to include and how to include them. It is relatively easy to make assumptions that fail to reasonably represent the "true" cost of resources consumed. Bad assumptions will do more harm than good by undercosting or overcosting cost objects with resultant undesired economic behavior. Cost measurements must credibly represent the true consumption of resources by cost object. If cost measurements do not reasonably represent underlying physical and economic realities, the system will die *from lack of trust*.

Finally, it should be recognized that the upper limit for the cost of cost measurement is infinity. Cost measurement can always be done in greater detail and more frequently. Even if we had a cost accountant for every employee we could still think of ways to measure cost that would cost more. If the cost of cost measurement is too high, the system will die *from lack of affordability*.

Each of these requirements dimensions represents a necessary condition for success. Each is also insufficient, on its own, to guarantee success. Truly successful managerial costing efforts must find a point of convergence in all three dimensions, while avoiding pitfalls. See Figure 2.

Designing a managerial costing system that meets one of the requirements is difficult. Meeting the usefulness requirement, for example, demands a good understanding of how cost measurement will be used in the cost management process. The probability of a randomly developed system hitting this target is small. The same difficulty exists in meeting the credibility and affordability requirements.

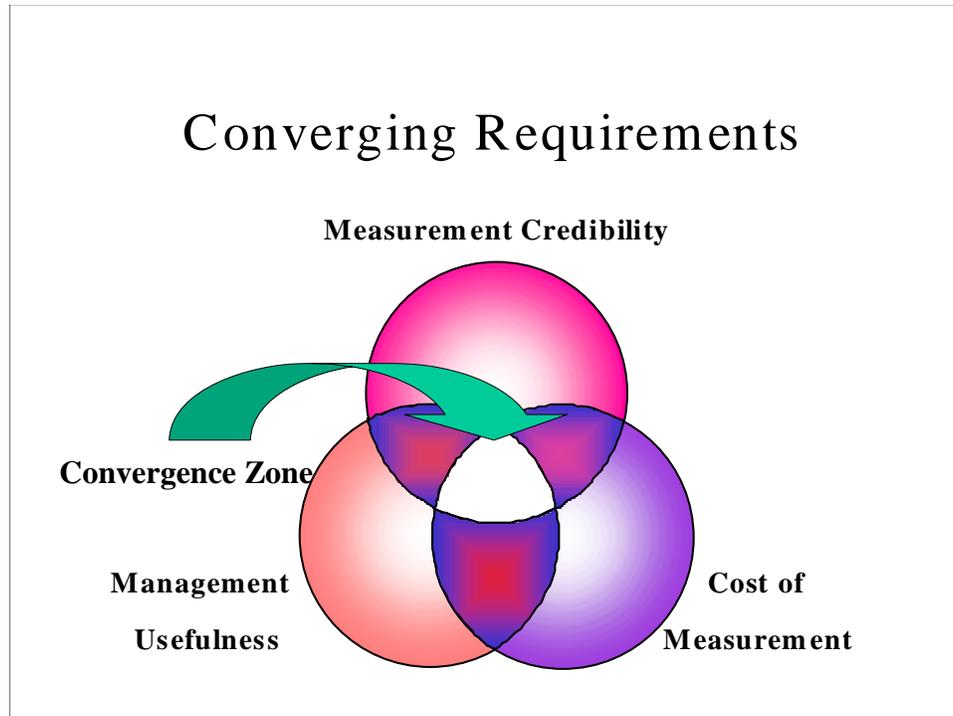


Figure 2. Systems that meet all three requirements represent a small subspace of those that meet one or two requirements. The space that fills all requirement is the convergence zone.

The convergency requirement that all three be simultaneously satisfied further drastically limits the space available for a truly successful system. System designers should carefully consider these requirements and the common pitfalls that threaten successful applications.

Usefulness Requirement and Standardization Pitfall



Managerial costing information must help managers manage cost. We covered the difference between managerial costing and external reporting in the first article in this series. The second further developed management’s essential role in the specification of cost objects. These articles emphasized the need for management to actively “pull” managerial costing information rather than be the passive recipient of cost data. Here we will further explore the usefulness requirement by considering the “standardization” pitfall.

Some seem to think that simply installing a cost accounting system automatically creates a cost management process. If this were true, it would make great sense to standardize governmental cost accounting systems on some commercial off-the-shelf accounting package. However, this approach misses the point that the cost management process must drive or “pull” cost measurement. Standardized approaches often fail because they do not respond to the situation specific needs that exist in organizations with diverse missions, environments, personalities, and structures. If all situations, organizations, and managers were identical, perhaps standardization would work. Unfortunately, they are not and no one size is likely to “fit all.”

Standardization Pitfall Illustration

The Federal Accounting Standards Advisory Board’s “Statement #4/ Managerial Cost Accounting Concepts and Standards for the Federal Government,” offers federal departments great flexibility in developing cost measurement approaches. Footnote number 24 states:

“Costing Methodology - The costing methodology used (e.g., activity-based costing, job order costing, standard costing, etc.) should be appropriate for management's needs and the operating environment.”

Yet, initial discussion by the Board considered a wide range of approaches. Some suggested that all federal agencies should use the same cost measurement system. Some even suggested using the same Cost Accounting Standards developed for defense contractors.

My testimony to the Board asked them to consider the implications of standardizing all combat ships in the Navy on a single design. Take a moment to think about the advantages and disadvantages of such standardization. Would there be advantages?

Of course there would be advantages. There are always advantages of standardization. Efficiencies would be found in the training and staffing of sailors. Repair part inventories would be dramatically reduced. Purchases of ammunition and stores could probably be done at lower cost due to great quantities of fewer part numbers. Unit costs of building ships would probably improve as shipbuilders experienced greater learning curve effects

through larger quantities. Perhaps most importantly, force deployment and evaluation of battle results could be done much more precisely: leading to increased effectiveness.

While it is true that there would be advantages, there would also be disadvantages. Ultimately, the decision maker must weigh the advantages and disadvantages in making a decision. To illustrate disadvantages, I offered the graphic shown in Figure 3. (Geiger, 1994)

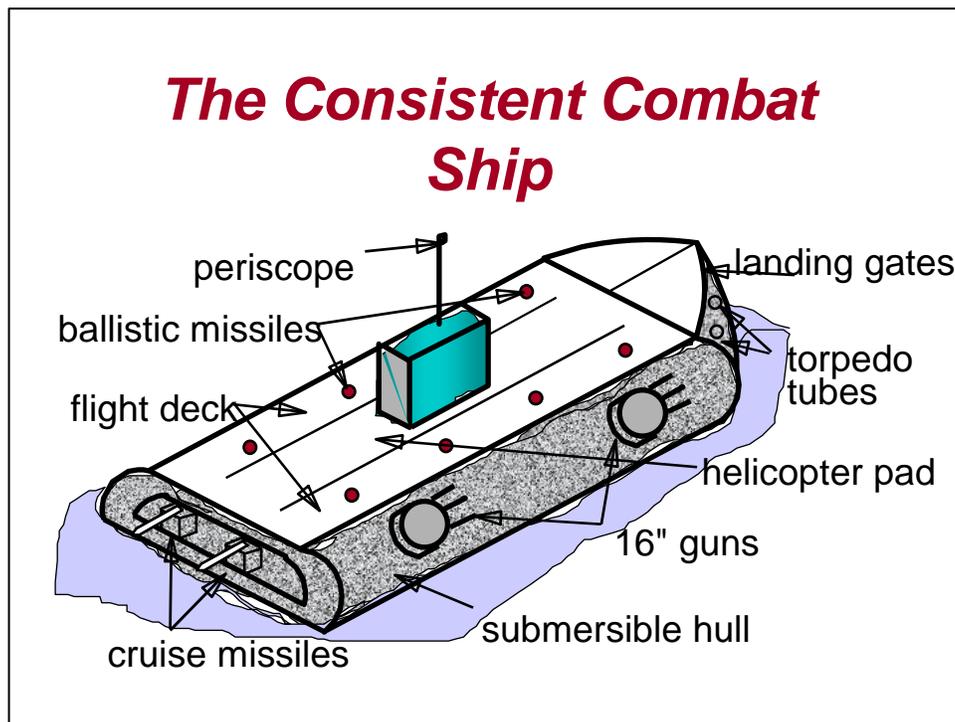


Figure 3 Standardizing all missions into a single system results in a solution focused on none.

Some combat missions include the need for air operations, so every ship must meet this requirement and have a flight deck. All ships must be double hulled and have a conning tower since some of the user community needs to work underwater. Yes, this does interfere sometimes with flight operations, but the problem is consistent.

Other underwater missions require ballistic missiles and torpedoes. The submitted design suggests ballistic missiles in the middle of the flight

deck (with the stipulation that only very careful landings will be permitted). Torpedo tubes in the bow conflict with the need for the ship to land on the beaches and disembark marines, but this could probably be worked out technically.

Edwin Land once said that any problem could be solved: “if you can define a problem and have enough resources.” This ship could undoubtedly be built. However, it would be expensive and, worse, it would not be a very good aircraft carrier, submarine, or landing craft. Trying to be all things results in being good at none. So it is with managerial costing.

Credibility Requirement and Mis-Costing Pitfall



As we have implied throughout this series, cost measurement is not simple. In fact, it is quite easy to do wrong. Let’s consider the pitfall of mis-measurement and the consequential resource consumption implications.

Economic theory has long recognized the relationship between cost of goods and the consumption of goods. The “demand curve” relates the two. Lower cost means higher demand and higher cost means lower demand. Economists, however, assume away the cost measurement issues that may be particularly important within government organizations new to cost measurement.

An earlier article in this series already discussed the potential for “infinite demand” of apparently “free goods” in organizations that do not measure cost. Here we will consider the impact of mis-measured cost. Consider Figure 4. Cost X elicits consumption Y while similar rational economic response to cost X_1 generates demand of Y_1 . If X represents the “true cost” and X_1 the “as measured cost,” it should be apparent that the undercosting error in measurement will rationally stimulate greater consumption by the increment of Y_1 less Y . Similarly it can be illustrated that overcosting will stimulate underconsumption.

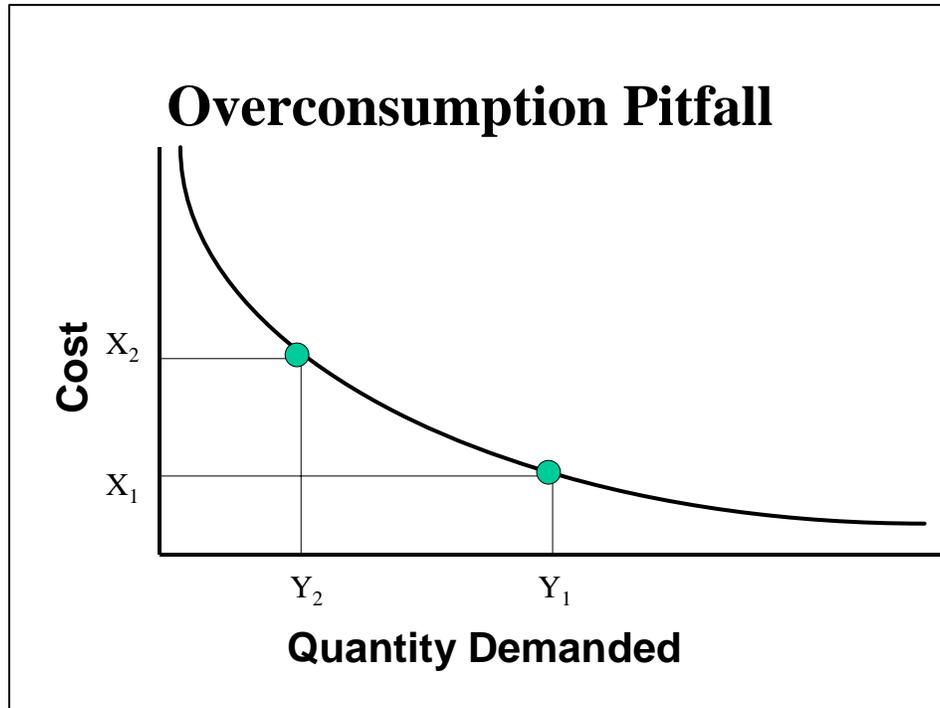


Figure 4 uses the demand curve to show that undercosted goods or services (represented by X_1) will result in overconsumption

Cost measurement literature (Johnson and Kaplan, 1987) has recognized this phenomenon. They describe the common scenario of an organization that allocates large overhead pools on a direct labor cost driver. The fully burdened labor rate appears to be very expensive. Economic alternatives such as outsourcing, automation, or privatization look relatively more attractive. This overcosting phenomenon logically leads to underconsumption by encouraging excessive outsourcing, overautomation, and inappropriate privatization.

FASAB Standard #4 recognizes the importance of credibility by preferring direct measurement where practical and emphasizing cause and effect relationships and reasonability when allocating:

“The cost assignments should be performed by the following methods listed in the order of preference: (a) directly tracing costs wherever feasible and economically practicable, (b) assigning costs on a cause-and-effect basis, or (c) allocating costs on a reasonable and consistent basis.”

Mis-Costing Pitfall Illustration

Let's consider a case to illustrate a managerial costing application where the management seeks to evaluate outsourcing against in house operation. Consider a situation where the Navy wishes to "compete" nuclear and non-nuclear ship refurbishment between its own shipyards and private sector shipyards.

Let's inject a common flaw into the measurement process. Let's assume that the Navy shipyards aggregate overhead for all refurbishment into a single pool and then allocates the pool to refurbishments based on the direct labor used.

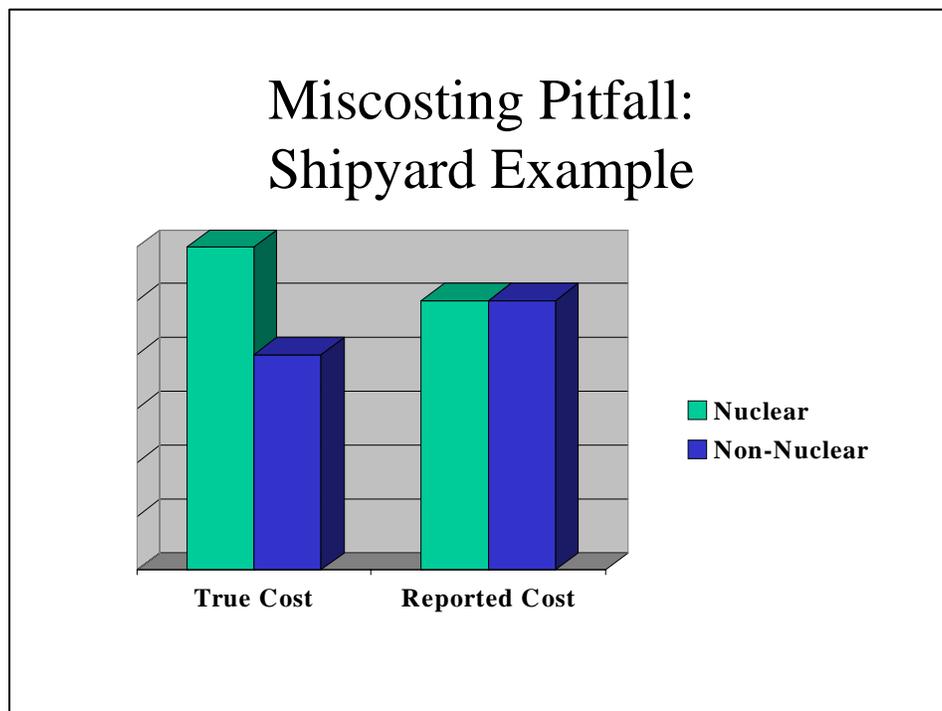


Figure 5 illustrates the difference between "true cost" and "measured cost" on a per labor hour basis. The overcosted non-nuclear refurbishment is likely to be outsourced since any vendor quote will be compared to an inflated estimate of internal cost.

Now, it would seem reasonable to assume that nuclear refurbishment overhead is actually higher than non-nuclear. Nuclear materials demand

greater levels of security and safety. Nuclear reactors required greater technical sophistication than gas turbine engines. Therefore, it is likely that allocating the single overhead pool on the basis of direct labor will overcost non-nuclear refurbishment and undercost nuclear.

Figure 5 illustrates the difference between “true cost” and “measured cost” on a per labor hour basis. It should be clear that the Navy’s “as measured” cost for nuclear refurbishment was lower than the “true cost.” This process has been undercosted.

The consequences of undercosting can be illustrated with one additional, but likely, assumption: that the private shipyards know the “true cost” for their processes. It should then be obvious that private shipyards are likely to win the non-nuclear refurbishment business: perhaps at greater cost than what the Navy was actually incurring. Furthermore, it should be clear that the Navy will never realize projected savings based on the overcosted non-nuclear outsourcing.

Let’s use some hypothetical numbers to illustrate what is likely to happen. See Table 1. If the contractor adds 15% to true cost in making a bid, he will still show an apparent 10% savings on non nuclear refurbishment since the Navy will compare the bid of 46 to the reported cost of 50. Accepting this bids wins somebody a purchasing award but in reality increases total cost for the government.

	True Cost	Reported Cost	Contractor Bid Cost	Post Outsourcing True Cost
Nuclear	60	50	69	60
Non-Nuclear	40	50	46	46
Total	100	100	115	106

Table 1. Comparing contractor bid to Navy reported cost shows that the Navy is apparently proficient at nuclear work, but that the non nuclear should be outsourced.

In this case the extra measurement cost incurred by having a two pool overhead system would be justified by the improved credibility or truthfulness in the measured cost per hour of the two refurbishment processes. The consequences of not improving measurement credibility far outweigh the increased costs of measurement.

Affordability Requirement and Excessive Complexity Pitfall



No organization exists for the sole purpose of measuring itself. The managerial costing process is therefore subject to affordability constraints. The pitfall, of course, is a measurement process that is excessively complex and overly detailed.

Unfortunately, when fiscal resources are readily available cost measurement and cost management are less important, and management attention seems to go elsewhere. When fiscal resources are constrained, management is more interested in cost management, but the fiscal resources available for cost measurement are constrained. The cost of the cost measurement process inevitably assumes the most importance when the measurement need is greatest.

FASAB Standard #4 on Managerial Costing recognizes the pitfall of excessive complexity and explicitly avoids its requirement:

“While each entity's managerial cost accounting should meet the basics discussed above, this standard does not specify the degree of complexity or sophistication of any managerial cost accounting process. Each reporting identity should determine the appropriate detail for its cost accounting processes and procedures based on several factors. These include the:

- nature of the entity's operations;
- precision desired and needed in cost information;
- practicality of data collection and processing;
- availability of electronic data handling facilities;
- cost of installing, operating, and maintaining the cost accounting processes; and
- any specific information needs of management.”

Excessive Complexity Pitfall Illustration

Perhaps in response to a natural instinct for self-preservation, it seems that initial attempts at cost measurement tend towards excessive complexity. Imagine that, due to resource constraints or budget cuts, you are asked to

develop an activity based cost accounting initiative in your own organization.

You recognize the threat to your interests, but certainly want to cooperate with the effort. Your major concern is that something may be left out. Besides wanting everyone to see how complex your operation is, you suffer from “budget mentality.” If you leave something out in the budget process, it doesn’t get funded and it disappears. You certainly don’t want this to happen during the managerial costing process.

Therefore it seems that there is a natural bias in government organizations towards excessive complexity when they start a managerial costing effort. This tendency seems to occur so often that the fourth article in this series was addressed to the issue in its entirety. Let’s consider a short, but real, example to illustrate what can easily happen.

The Maintenance Department at the United States Army Installation at Fort Knox seemed to experience this phenomenon. An activity based costing system was developed to measure some 1700 activities to the penny once per year. Contractor charges totaled roughly \$100K, and the effort probably required an equal expenditure of government employee cost.

However, Maintenance Department management was not satisfied with the system. Development of an even more complex system was briefly considered but rejected. The system died. It was not even “populated” a second time. The Garrison Commander said "the system just didn't provide enough new information to justify the time and effort it took."

Discussion

The failure at Fort Knox was attributed to excessive complexity. The managerial costing effort also could have failed on the basis of usefulness due to the infrequency of the data and its potential delay in availability. Infrequent, annual cost information is unlikely to be extremely useful in cost management applications. Imagine if we sent the tanks at Fort Knox to the target range every day, but we didn’t tell them their score until the end of the year. Such a long feedback process is unlikely to produce the kind of armored force that won the Gulf War in 100 hours.

The usefulness of data will suffer if it is not fresh: available soon after the period being measured. Providing monthly data at yearend is probably little better than providing annual data once per year. Long lag time diminishes the effectiveness of a managerial costing process. In general, frequent data inherently offers greater relevance for cost management. Fresh, frequent data is better yet.

However, increasing usefulness by providing monthly data will increase the cost of the cost measurement by an order of magnitude and threaten failure on the affordability requirement. Attempts to improve affordability by reducing system complexity may impact on credibility or usefulness.

Consider, for example, the complexity pitfalls exposed in answering the apparently simple request to measure the cost of the Blackhawk Helicopter.¹ There are so many permutations of assumptions possible that an initial effort is almost doomed to excessive complexity.

Does cost of a helicopter include pilots and crew? Does it include their training? If so, does it include just flight training or does it include basic training? What about their quarters? What about the cost of meals and the cost of buying meals? The list of cost issues goes on and on as we consider R&D, ammunition, maintenance, higher headquarters, airfields, etc, etc, etc. Assumptions must be made in measuring cost and the credibility of the measurement rests on the reasonableness of those assumptions in light of the measurement's intended use.

Perhaps it is simply too difficult for organizations, like many in government that have never measured cost, to initially determine a managerial costing specification in the convergence zone that balances usefulness, credibility, and affordability. It is more likely that good managerial costing systems will move towards this zone as they learn from experience and evolve towards increased usefulness and credibility at less cost as shown in Figure 6.

¹ See **FINANCIAL MANAGEMENT: Reliability of Weapon System Cost Reports Is Highly Questionable** (GAO/AIMD-94-10, released October 28, 1993 for an idea of how the Army was called to task on this issue.

This is what happened in at Fort Huachuca in an area similar to the one that failed at Fort Knox. The initial activity based cost system for the Directorate of Logistics measured 350 activities annually. However, the Garrison Commander felt that this effort provided less benefit than the labor required. But unlike Fort Knox, Fort Huachuca evolved their managerial costing effort. The second activity based model had 125 activities. Two years later the third model tracked 35 activities quarterly and had helped management achieve significant levels of cost reduction.

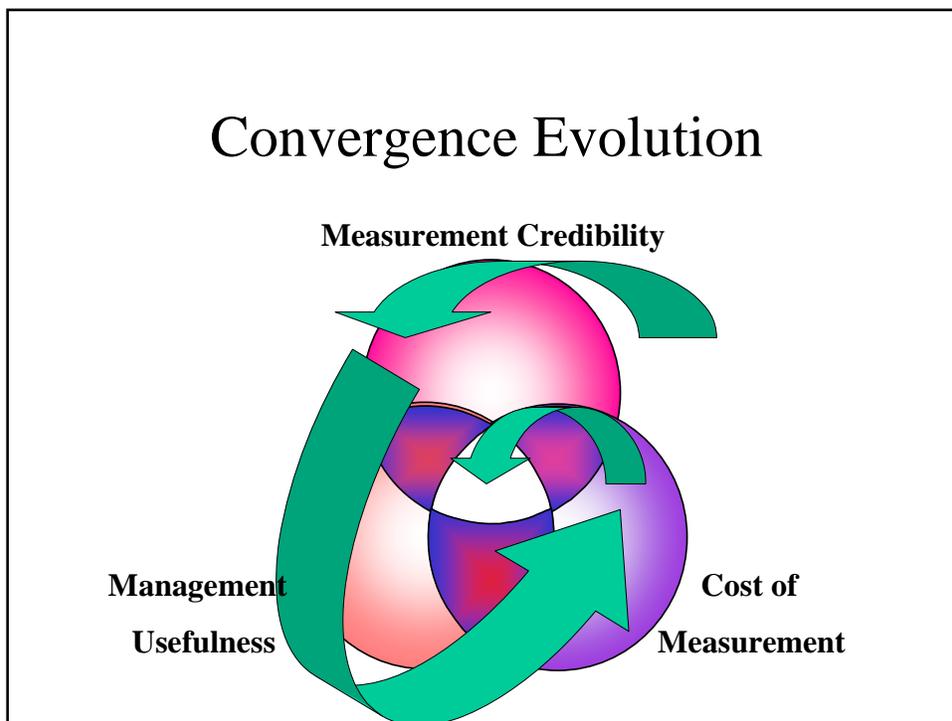


Figure 6 Instead of trying to design the perfect managerial costing system, it is perhaps more likely that organizations will learn from initial attempts and evolve their systems towards the convergence zone over time.

Summary and Conclusions

There are three conflicting forces that shape managerial costing system design. These are usability, measurability, and affordability. Each of these forces places demands on the system that compromise the other two. Development of a system that doesn't meet all three constraints is unlikely to be fully successful. Each is a necessary, but insufficient, consideration for

success of a managerial costing system. Unless all three requirements are met, the system is likely to fail and the system development is best avoided.

Relevancy requirements demand that management's intended use of cost information drive the cost measurement process. Ignoring this requirement results in the production of "gee whiz" numbers that have no practical use other than the knowledge of perhaps interesting, but useless, numbers. Systems that fail to address the usefulness requirement could be labeled as ***pointless managerial costing***.

Credibility requirements demand that the measurement process determine the "true" cost specified by management. This can best be thought of as a range of reasonably accurate measurements where that accuracy is determined in the context of management's intended use for the measurement. The greatest danger here is in systematically over or under-costing the measurement. Measurement processes that misstate costs systematically or imply great, but practically speaking, impossible levels of precision could be labeled as ***fraudulent managerial costing***.

Affordability requirements require an equal or greater value than the cost of developing and maintaining a managerial costing process. The law of diminishing returns generally results in a cost-effective limit to system detail and attempted precision. Systems that cost more than their benefit will not survive in fiscally constrained organizations and could be labeled as ***consumptive managerial costing***.

It is thus the case that managerial costing design must balance the effect of the three conflicting forces: usability, measurability, and affordability. If sensible compromises are made a convergence of conflicting constraints is possible. Within this intersection we can affordably measure true cost in ways useful to management.

In closing we must recognize that as difficult as managerial costing seems, it is the easy part in changing the way government organizations operate. Managing cost demands cultural and behavioral change and is difficult enough even when the pitfalls in managerial costing are avoided.

Geiger, Dale R.; "Tradeoffs Between Comparable Consistency and Relevant Customization in Federal Management Accounting," The Government Accountants Journal, Summer 1994, Volume XLIII, No. 2.

Johnson, Thomas and Kaplan, Robert; Relevance Lost, 1987, Harvard Business School Press, Boston, Massachusetts.