

Good Decisions Require Good Models

Causality-Based Concepts and Decision Making

Douglas T. Hicks, CPA

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Executive Summary

- In order to understand the real world phenomena around us we create models that make complex realities understandable. This is as true in business as in any other part of life. To make good decisions, our models must be valid; they must be an accurate representation of the world around us. It is our models that determine our behavior, not the phenomena themselves.
- In business, one model that has proven to be invalid at most twenty-first century organizations is its cost model. By using this invalid model, decision makers are led to make inappropriate decisions and take ineffective actions.
- Autopsies on failed businesses indicate that blame can usually be placed on one or two basic flaws in management's understanding of their business' economics.
- Causality-based concepts have been developed to correct the deficiencies in invalid cost models. Unfortunately, most businesses have assumed that these concepts can only be adopted through the implementation of a complex and costly new "ABC system." Fortunately, nothing could be further from the truth.
- Causality-based concepts can be economically incorporated into the decision making processes of any organization. What is required is the development of a valid intellectual model – one that provides an accurate version of the organization's economic realities – and decision makers who know how to use that model to their advantage.
- There are many ways of incorporating a valid cost model into an organization's decision support system – implementing a new "ABC system" is only one option. The method used is dependent on the individual circumstances of each organization.
- Invalid models lead to inappropriate decisions and inappropriate decisions lead to poor results. Armed with a valid cost model that provides them with accurate product, service, process, and incremental cost information, decision makers can improve the quality of their decisions and lead their organizations into a more successful future.

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*“The validity of our decisions depends upon our perception and understanding of reality. Good decisions require good models, and the caliber of our decisions reflects the quality and validity of our models”*¹

– Alfred Oxenfeldt

Individuals use models to understand the phenomena around them. The late Dr. Alfred Oxenfeldt, a long-time authority on decision economics, put it this way, “The brain works by constructing an internal version of the outside world. Its conclusions reflect that internal version rather than the actual outside world; *the validity of its conclusions depends largely upon whether these internal representations accurately mirror the outside world*” (italics mine).²

Most phenomena encountered by human beings are far too complex for them to completely comprehend. Whether it is the way a computer works, the way family relationships work, or the way the economy works, we cannot completely comprehend all of the complexities involved. Yet we must still function in a world where these phenomena exist. To do so we create “models” of those phenomena that incorporate what we perceive to be its most important parts and the relationships between those parts. **It is our models of phenomena that determine our behavior, not the phenomena themselves.**

As the 1980s unfolded, corporate executives began to recognize major shortcomings in one of the models they used to support business decisions; specifically, their cost model. The concepts underlying their cost models were developed at a time when labor was the most important factor in production, and product and service variety was very limited. As time passed, businesses became more complex and product and service customization grew. Unfortunately, the continued use of these obsolete, long-standing cost models went unquestioned since the assumptions behind them had long been forgotten.

Finally, in the mid-1980s, authoritative voices from prestigious institutions began to warn against the dangers of cost information based on the “traditional” cost models. They clearly demonstrated how the use of traditional cost information as a decision support tool distorts economic facts and leads to inappropriate decisions and ineffective actions. Thought leaders, such as Robert Kaplan at Harvard University, began developing an alternative view of costing that was christened Activity-Based Costing, or simply ABC, and later expanded to Activity-Based Management, or ABM.

The concept of ABC/M is based on the principle of *causality*; that the products and/or services provided by an organization cause it to perform activities and the performance of those activities cause it to incur costs. Following the principle of causality, the cost of individual products or services can be determined by first assigning costs to the activities that made the costs necessary and then assigning the cost of each activity to the products or services that made each activity necessary. Conversely, the cost of operating an organization can be determined by first establishing the volume and mix of products or services provided by the company, establishing the level of each activity that is needed to support that volume and mix of business, and then calculating the cost of providing the required portfolio of activities. This new concept provided a solid intellectual basis for correcting the long-obsolete cost models still in use at most of today’s businesses.

Unfortunately, the first individuals to recognize the potential of ABC/M were not decision makers – the executives and other managers whose decisions depend on accurate and relevant cost information. Instead, accountants and information technology professionals took the initiative and, as might have been expected, they developed new general ledger-based, software-driven systems that could replace or supplement traditional cost accounting systems. By 1991, at least ten ABC/M software packages were available.

As a consequence, the conventional method that evolved to adopt this new concept was the implementation of an ABC/M system using one of the available software packages. Hundreds of companies recognized the need for more accurate cost information and proceeded to improve their cost models by implementing such a system. Unfortunately, the financial and manpower resources required to implement and maintain such a system were considerable and only available at the largest organizations. This severely limited the concept's success.

The Results of the ABC “Revolution”

In 2003, the Institute of Management Accountants / Ernst & Young Survey of Management Accounting indicated that 98% of the 2,000 plus senior financial executives surveyed believed the cost information available to their managers was inaccurate with nearly 38% believing that those distortions were significant.³ Even without a base from 1983 to match the results against, it would be hard to believe that 2003's results suggest much of an improvement in the past twenty years.

Another 2003 survey, this one performed by Narcyz Roztocni and Sally M. Schultz of the State University of New York at New Paltz and published on Dr. Roztocni's website (www2.newpaltz.edu/~roztockn/portland03.pdf), showed that ABC had been “implemented” by only about 21% of responding organizations. From my personal observations, I would suggest that the implementation may actually be lower than the 21% reported. In my experience, many organizations that have made some simple changes to their cost systems, such as switching from a plant-wide, labor-based overhead rate to multiple-department, labor-based rates, define their change as “implementing ABC.”

A review of other surveys shows similar results. In the May 2000 issue of *Management Accounting (UK)*, Thomas Kennedy states “Worldwide adoption rates of ABC have peaked at 20 per cent and a declining number of firms are giving it further consideration. This situation must be particularly disappointing for its advocates, despite the extensive, high-profile marketing and consultancy services that have been developed. Anecdotal experience of problems associated with ABC implementation is supported by research documenting a high number of IT projects falling well short of their stated objectives.”⁴

One of the key reasons for ABC/M's limited success is suggested in Dr. Kennedy's final sentence; specifically, ABC/M implementations are viewed as IT projects. Although a major IT project may be the appropriate method of adopting causality-based concepts at most large organizations, it is seldom a practical solution at small, mid-sized, or even some large companies. These firms simply do not have the resources required to undertake such a project. As a result, the executives and managers at these organizations continue to base their decisions and actions on cost information generated by a flawed “internal version” of their organization. The resulting poor decisions and misguided actions cause a tremendous waste of resources and undermine the organization's ability to fulfill its mission or enhance value for its owners.

The Causality Principle and Decision Making

Managerial economics is the science of providing decision makers with accurate and relevant economic information on which they can base their decisions and guiding those decision makers in using that information appropriately. Much of the economic information needed by decision makers relates to costs. **The value of the causality principle is the structure it provides for developing cost models – “internal versions” of the outside world – that reflect an organization’s economic realities.** Armed with a causality-based cost model, decision makers: 1) have a valid economic model with which they can process information and 2) can obtain the accurate and relevant cost information they need make economically sound decisions and take appropriate actions.

For causality-based concepts to be successful, they must first be used to change the intellectual model – the “internal version of the outside world” – used by executives and managers. This may be the most difficult task in the entire process. Executive effectiveness is not only enhanced by an executive’s experience and education, it is also diminished by the “baggage” of that experience and education. After decades of using cost information based on a traditional model, experienced decision makers have become comfortable using it. In some cases they know the information is questionable, but have used their experience and intuition to devise mental “tricks” for modifying the numbers before making decisions. Too often, however, an “internal version” based on traditional cost models is hard wired into their brains.

The first and greatest challenge, then, is to undo this hard wiring in the minds of *decision makers* and replace it with an intellectual model based on causality-based concepts. If those individuals who actually make pricing, outsourcing, and capital expenditure decisions, who execute lean and mass customization initiatives, and who devise company strategies do not *demand* information based on an accurate cost model, even the best implementation will soon fall into disuse and either be abandoned or ignored.

Of the approximately two hundred organizations I have assisted in adopting causality-based concepts, the ones that have gained the greatest financial benefits are those whose decision makers became the prime movers behind the initiative – not just through “lip service” or as interested parties, but through their active involvement and understanding of how an effective cost model can be used to enhance their organization’s performance. At these most successful clients, the accountants and IT professionals were facilitators, but decision makers were “the champions.”

To get decision makers to demand information based on an accurate cost model their decision making processes need to be updated – better data supports better processes. They must become more cognizant of the principles of managerial economics. As my friend and successful turnaround consultant, Steven Martin of BKD, LLP., has observed, “When doing business autopsies on failed businesses, the death can usually be blamed on one or two basic flaws in management’s understanding of their business’ economics. Most managers (and particularly senior managers) cannot relate basic economics to their current business model and current business strategy.” Although a recent internet search on the topic of “managerial economics” shows it to be an important element in the curricula of most major business schools, I have encountered its use in “the real world” about as often as I encounter a New York Yankee fan in Boston.

Executives who have devised decision making processes that seem to work in the absence of good cost information may not perceive a need for an accurate cost model. Their lack

of exposure to good cost models has made good cost information superfluous. Their decision making models do not require it. Such an environment will never be conducive for a successful and sustainable causality-based initiative. These decision makers will continue to be led into inappropriate decisions and ineffective actions by the absence of a valid cost model.

But without an effective cost model, how will decision makers learn to use the precepts of management economics to their advantage? This is a classic “chicken and egg” problem. Which comes first? Do improved cost models lead to improved decision making processes or do improvements in decision making processes need to occur before resources are provided to improve cost models? The answer is simple, both must take place concurrently. Executing the answer is not so simple.

A concerted effort must be made to convince an organization’s decision makers that the principles of managerial economics supported by effective models will ultimately lead to a more prosperous future. This may seem like an easy task – after all, shouldn’t better decisions lead to better results? But old habits and old mindsets are hard to change. The effort required to accomplish this should not be underestimated. Only when decision makers perceive the need for a valid cost model will the environment be right for a successful and sustainable adoption of causality-based concepts.

Accurate Costs and Model Design

Once decision makers recognize the need for a cost model that reflects the economic realities of their organization; the next order of business is to create one – not a physical model, but an “internal version” or intellectual model of the organization’s economic realities. In designing such a model, it is important to keep in mind that the model’s purpose is insight, not computational virtuosity.

In his 1979 book *Cost-Benefit Analysis for Executive Decision-Making*, Alfred Oxenfeldt provides some characteristics of a good model: ⁵

- A model is a simplified version of a more complex reality; the degree of simplification varies according to the use for which it is intended.
- A model’s purpose is to illuminate real-life phenomenon; some simplification is required for ease and clarity of understanding.
- The model depicts reality for a particular purpose and a particular audience.
- Although simplified, the view of reality presented by a model does include its main elements and their relationships; simplification occurs by omitting nonessentials.
- A model is an intellectual tool, a device that assists in the thought process. Its value therefore is to be assessed primarily by the validity of the conclusion or decisions to which it leads.
- A model can be expressed in a wide variety of media.

In developing a cost model to support management’s decisions and actions, its purpose and audience must always be kept in mind. It should include the main elements of the organization’s operation while omitting the nonessentials. It should not attempt to include everything, only those elements that will make a difference to the decision maker. It must be kept simple enough to be easily understood and used, but complex enough to cover all of the essentials. Finally, do not confuse the model with the media. The method of adopting the model – special software, computer spreadsheet, paper and pencil – is not an issue in the model’s design. That is an issue to be addressed only after the model is created.

Obviously, creating a good model requires a lot of tradeoffs. Theoretical correctness must be balanced by practical considerations. Completeness is important, but so is simplicity. As Dr. Oxenfeldt stated it, “An error in estimating the magnitude of an effect usually is far less serious than mistakes due to wholly overlooked consequences.”⁶ In other words, it is more important to take a critical element into account than to measure that element precisely. This leads to a point that clearly states the critical nature of a model’s design; *the design of a cost model is more important to the model’s accuracy than the precision of data processed by that model.*

This point has been stated many ways. A good model with poor data will lead to more valid conclusions than a poor model with good data. It is better to be approximately correct than precisely wrong. It is better to estimate the right things than to precisely measure the wrong things. Any way you look at it, the design of a causality-based model is more critical to its success than the accuracy of its data or its method of implementation.

There are a variety of techniques for designing a model that will be both comprehensive and simple. One technique that has proven successful in my practice is described in Chapter Five of my 1999 book, *Activity-Based Costing: Making it Work at Small and Mid-Sized Businesses.*⁷ You may want to explore others.

Designing a causality-based cost model is not a science, it is a craft. It requires a mastery of causality-based concepts, not just sophomoric knowledge. It requires the ability to surface the issues that are important to an organization; whether or not that organization’s management knows those issues are important. It requires the ability to effectively evaluate the significance of each activity in light of the organization’s information needs. It requires the ability to make a lot of trade-offs between what is theoretically correct and what is practical and maintainable. As a result, it should not be taken lightly.

Before moving on to methods of converting a valid “internal version” into tools that support the decision making process, two more issues must be addressed: 1) what costs will be relevant for the decision makers and 2) the difference between accounting costs and economic costs.

Relevant Costs

A model that closely mirrors reality and generates reasonably accurate cost information is great, but it will not effectively support management decisions if the cost information it generates is not relevant. There are three basic types of “relevant” costs that executives need if they are to make sound decisions:

- *Fully-absorbed product or service cost information* is needed to support core business pricing decisions. Well-designed cost accounting systems come close to providing these costs at a *fixed* volume and mix of business. Decision makers must, however, be able to measure these costs at *varying* volumes and mixes of business activity.
- *Incremental cost information* is needed for the myriad of business decisions that require the “net change” in overall business costs resulting from proposed courses of action.
- *Activity or process cost information* is needed to help the business isolate the cost of critical business processes that can be used to direct and measure its continuous

improvement, mass customization, supply chain management, and lean thinking initiatives.

The cost information required to support a specific decision is unique to that decision. An opportunity that would have been attractive on Tuesday might not be so attractive on Wednesday due to a change in the company's circumstances. The method by which the cost model is adopted must enable executives and managers to use that model to measure all three types of cost information if the model is to meet their decision making needs.

Economic Costs vs. Accounting Costs

Decision makers must also be able to break with the practice of starting their cost calculations with costs measured by following generally accepted accounting principles (GAAP). Cost accounting systems must calculate costs using the conventions of GAAP if they are to be used for financial reporting. But accounting costs are not the same as economic costs and *economic costs are the only relevant costs for business decisions*. As a consequence, any system that can only use general ledger costs is deficient from the very start. Although this is an extremely important issue in decision making, it goes beyond the scope of this paper and will not be discussed further in this context.⁸

Tools to Support the Cost Model

The adoption of a causality-based cost model by implementing an integrated system using specialized ABC software is valid option for some, but not most organizations. An operation with less than 500 employees seldom needs a "system." An operation with more than 2,000 employees usually needs one. A lot of factors (complexity, variability, automation, etc.) determine the appropriateness of a "system" for those in between.

To provide management with the accurate and relevant cost information it needs to support decisions, however, the manner of adopting a cost model needs to provide all three types of decision costing information (fully-absorbed, incremental, and activity/process) and provide them at varying volumes and mixes of business. A system that takes actual costs (representing a fixed volume and mix of business) and processes them in a theoretically correct manner provides only a small fraction of cost information needed. It provides no incremental cost information and fully-absorbed and activity/process cost information at only one volume and mix of business (the current one).

To be effective, the tools for incorporating a cost model into an organization's decision support system must:

1. be able to begin with any assumed volume and mix of business,
2. project the activities that are required to support that volume and mix of business,
3. project the cost of providing all of those activities,
4. assign the projected costs to the appropriate activities,
5. develop rates for assigning the cost of activities to products and services, and
6. use those rates to assign costs to the products and services.

Steps 1 through 3 make it possible to project total costs under a variety of volume and mix assumptions, step 4 makes it possible to determine activity costs, and steps 5 through 6 make it

possible to cost individual products and services. Comparing “before” and “after” total costs makes the measurement of incremental costs possible.

Summary

Real world phenomena do not guide decision makers in evaluating their options. The models they use to understand those phenomena guide them. When those models are invalid, their decisions tend to be inappropriate and their actions ineffective.

Causality-based costing is a simple, but powerful tool that has been developed to correct one of decision makers’ most flawed models; the model that provides the cost information they need to make sound, fact-based business decisions. Unfortunately, the adoption of new costing practices has most often been championed by accountants and information technology professionals who promote specific methods – like ABC/M or Lean Accounting – and not by decision makers – the individuals whose success depends on its output. As a result, it has most often been adopted in the form of general ledger-based, software-driven systems by large and complex organizations.

Decision makers do not need more accurate *cost accounting* information; they need better *economic* information – information that supports the decision making process. Before causality-based concepts can be successfully applied, however, a significant obstacle must be removed. Executives whose decision making practices have been molded by the inaccurate and often irrelevant cost information available in the past, must adopt practices more in line with managerial economics – a more effective process that thrives on the availability of the accurate and relevant cost information an effective cost model provides. Only then will decision makers demand an effective cost model.

Once decision makers demand good cost information, an organization must construct an intellectual cost model that incorporates all of its *important* economic features and behaviors. This model will serve as management’s “internal version” of the organization and help decision makers better understand how to determine the cost consequences of their proposed actions and decisions.

The final step is to develop physical calculation tools that will enable management to *accurately* quantify the *relevant* cost measurements required for any decision situation. This may take the form of specialized software, computer spreadsheet-based models, or simple pencil and paper models. The most effective method will depend on each organization’s specific circumstances.

Executives need accurate and relevant cost information to support the myriad of decisions they must make every day – data that has seldom been available to them. When they obtain information from an effective cost model and learn how to use it effectively, the quality of their decisions will improve as will the financial performance of their organization. Unless it is championed by decision makers and turned into practical decision support tools, however, the powerful concept of Activity-Based Costing will end up as just a more accurate way to record history – not a very glorious end for a concept with so much potential.

Footnotes:

- 1 Oxenfledt, Alfred R., *Cost-Benefit Analysis for Executive Decision Making*, New York: AMACOM, 1979, p. 67.
- 2 Oxenfledt, Alfred R., p. 67.
- 3 *2003 Survey of Management Accounting*, Ernst & Young LLP / Institute of Management Accountants, Ernst & Young LLP, 2003.
- 4 Kennedy, Thomas, "The great debate: ABC has been hailed as the answer to our prayers but things are never that simple," *Management Accounting (UK)*, May, 2000.
- 5 Oxenfledt, pp. 55-56.
- 6 Oxenfledt, p. 223
- 7 Hicks, Douglas T., *Activity-Based Costing: Making it Work for Small and Mid-Sized Companies*, New York, John Wiley & Sons, 1999.
- 8 For more information see Chapter Four of my book, *Activity-Based Costing: Making it Work for Small and Mid-Sized Companies* which is dedicated to this subject. The chapter is titled "The Deadly Virus of GAAP."