MANAGEMENT ACCOUNTING PHILOSOPHY II: THE CORNERSTONES OF RESTORATION

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This article establishes principles to serve as the cornerstones for the restoration of management accounting.

The first article in this series questioned the view that a number of different management accounting (MA) approaches can all simultaneously be valid and correct, particularly if they contradict each other on a number of fronts. Deductive logic was used to show that the existence of absolutes is undeniable—also in MA—and that absurdity, conflict, and dissatisfaction on the part of managers is the inevitable consequence of this (the relativist) view. Moreover, it was shown that the correspondence definition of truth (i.e., corresponding to the facts) is wholly applicable to MA. [1]

Working from that foundation, the objective of this article is to establish principles to serve as cornerstones for the restoration of MA. This will be achieved by showing how the correspondence requirement on MA is to be fulfilled while simultaneously identifying MA cornerstones that all in the profession can and should subscribe to. Philosophy will again be called on to help, in particular the principles of inductive logic and the law of rational inference will prove indispensable.

The two proposed cornerstones are intended to be both manager (i.e., MA customer) and enterprise optimization centric. [2] The question naturally arises how these cornerstones fit into the existing body of MA knowledge. The answer to the question lies in demonstrating the cornerstones' integration into an existing MA framework. This integration into a framework also serves two other purposes: (1) to highlight adjustments to the framework to accommodate MA's new manager and enterprise optimization focus; and (2) to validate the cornerstones' implementation feasibility.

Cornerstones

The quest for a set of principles capable of serving as cornerstones to restore MA deductive logic has brought us part way toward reaching a solution, but it is limited in the specificity it can provide. [3] The second branch of logic, inductive logic, can take us the rest of the way. Inductive logic forms the basis of the scientific method and as such comes with significant clout. It uses observed characteristics (effects) to arrive at a conclusion (a cause). [4] To illustrate, consider the following scenario: Management accountants are leaving the profession; exit interviews reveal that many are dissatisfied with the inconsistencies in the profession. In instances like this example, where the entire population is not observed, the conclusion is not as ironclad as that of deductive logic—some people obviously left the profession for other reasons. In MA, modeling the use of inductive logic favors conclusive outcomes because the

population is finite and known, i.e., companies deploy limited resources to provide a discrete number of products and services.

Francis Bacon is credited with penning the basic rules of inductive logic in the 17th century.[5] These rules for *searching for causes* have since crystallized into two branches: (1) empirical or operations science, which deals with current observable events through experimentation, observation, and hypotheses; and (2) historical or origin science, which deals with unobservable events through inductive principles (e.g., forensic science dealing with a homicide—an unrepeatable event).[6] Historical science bases its assertions on a known relation between a cause and its effect in that the relationship can be expected to be similar in other times—the past or the future.[7]

MA is a blend of both these branches of inductive logic in that: (1) empirical science for the most part governs the construction of its cost model; and (2) the application of cost model outputs aligns with inductive principles in historical science. An example of the first is measuring a flight simulator's electricity consumption while it is running to quantify the causal relationship and construct the cost model. An example of the second is to use the insight into the simulator's operating cause and effect information and related costs-at a later point in time—to evaluate the margin in a decision to sell ten additional simulator training hours per week.

Once operational, an MA system fits almost exclusively in the historical science branch of inductive logic.[8] The reasons for this are twofold. First, the volume and perpetuity of commercial activities in the typical enterprise makes a pure empirical approach—that must perpetually observe every occurrence of every activity—cost prohibitive and impractical. Second, modeling in MA is intended to enable enterprise optimization by supporting a whole range of managerial activities that are dependent on insights into enterprise cause and effect relationships. These activities are concerned with outcomes at different times such as planning and decision making with outcomes in the future and control and performance measurement with what transpired in the past.

The principles of inductive logic relevant to historical science therefore prevail in MA. Historical science recognizes two principles that govern the drawing of cause and effect inferences, namely: causality and analogy.[9] These two principles are intended to serve as cornerstones of MA, and each is discussed in more detail in the next two sections.

Cornerstone one: Causality—preeminence in MA

Philosophy recognizes first principles—principles for which no proof is necessary because they are self-evident.[10] Causality, the recognition of the relation between a cause and its effect, is such a principle—it embodies the law of rational inference.[11] There is a second reason to afford causality a position of preeminence in MA; causality is a universal principle in the realm of inductive logic as it is the basis for all conclusions drawn in both empirical and historical science.[12] It is therefore relevant whether one holds that MA is subject to the empirical rules or the historical rules of inductive logic or both. For these reasons, causality serves as the cornerstone to anchor the correspondence requirement on MA identified in the first article.

A definition for causality that appropriately embodies “corresponding to the facts” in MA needs some elaboration. The traditional MA definition of causality is decidedly value (money) centric and suffices when MA's primary purpose is cost accounting for external reporting.[13] However, when the objective is enterprise optimization and the facilitation of decision making for managers who must hold sway over the quantitative flow of goods and services in an enterprise, the traditional view comes up short. This is because in enterprise optimization money is not the whole thing—not the real facts; money is the meta-language of quantitative economic activity and merely expresses the quantitative flow of goods and services.[14] Managers will be most effective when MA information provides insight directly into the real thing—the quantities of goods and services consumed and produced by the enterprise. Forcing the traditional value centric view of causality on managers is like mandating that make-up be applied to the clown's image in the mirror as opposed to the clown's person.

Therefore, in MA “correspondence to the facts” with an optimization focus is first and foremost concerned with the quantitative flow of goods and services. With this as the prerequisite, the correspondence definition of causality in MA can be formulated as:

> *The relation between a cost objective's quantitative output and the input quantities that in us be, or must have been, consumed if the output is to be achieved.*[15]

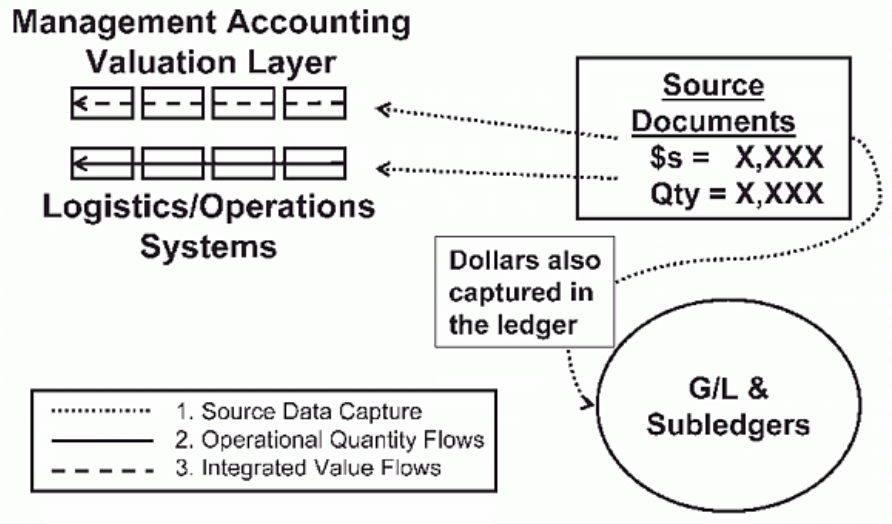
The following example illustrates such a quantity-based causal relationship: a flight simulator has been determined to consume 150 kWhs of electricity for every hour of operation. The objective is to sell 200 simulator training hours per month. The causal relationship is defined as: Output = 200 simulator hours; Inputs required = 30,000 (200 × 150) kWhs.

Although the correspondence definition of causality is devoid of any reference to value/cost, the recognition of money as the meta-language of economic activity implies a duality in the information MA must provide. Currency serves as a common denominator in weighing otherwise incomparable alternatives in a decision, and its use in optimization decisions is vital. Manager information need is therefore of a dual nature: (1) a quantitative model of operations cause and effect relationships; and (2) a corresponding value representation of those relations. To illustrate: If electricity costs $0.10/kWh, the example above is expanded to reflect this duality as follows: Output = 200 simulator hours; Inputs required = 30,000 kWhs resulting in Input Costs of $3,000.

It is important to note that the correspondence definition of causality does away with the traditional view of MA as predominantly a financial undertaking—parsing general ledger (G/L) dollars into some semblance of operational metrics. Instead, when applying the correspondence definition of causality, MA is decentralized—embedded in the logistics/operations systems of an enterprise—all the while maintaining the integrity of quantities and their values (from source documents, e.g., goods receipts) throughout the value chain. [16] Exhibit 1 illustrates this practice of value chain integration graphically. Quantities and their values are never separated, as is the practice in traditional systems. Instead, the MA system comprises a value layer that is embedded in the operational systems. With value chain integration the integrity of quantity-value is maintained in all operational transactions and MA is no longer dependent on the G/L for any information.

Exhibit 1.

Value Chain Integration



The correspondent definition of causality and value chain integration that follows from it holds a number of advantages for MA:

- It radically enhances MA's usefulness in supporting enterprise optimization as managers gain insight directly into the quantities they strive to influence/adjust.
- MA is able to shake off the shackles of imprisonment to external reporting structures and dictates.
- It lowers the cost of sound MA information by leveraging of operational data and data maintenance.
- Method-centric approaches to MA become obsolete. [17]

In MA's quest for principles that can serve as cornerstones to restore the profession, causality is the chief cornerstone. It anchors the correspondence definition of truth and as such serves as the basis for transforming MA into a manager and enterprise optimization-centric discipline.

Cornerstone two: Analogy

The other principle of inductive logic relevant to historical science and MA's second cornerstone is analogy; it is concerned with inferences of known cause and effect relationships at different times. [18] Whereas causality is concerned with understanding and

capturing enterprise cause and effect relationships, analogy deals with the application of causal information. For example, if a particular flight simulator is operated for an hour it consumes 150 kWhs of electricity. Based on the principle of analogy, a manager can infer that for that particular simulator this would have been the case a month ago and will be the case a month hence.

In MA, the analogy principle finds application in two ways. First, it uses the relationships defined in the cost model to reflect repeat occurrences of events (operating the simulator for 200 hours in the last period). This is useful for understanding and analyzing financial results and for performance measurement. Second, the principle of analogy finds application when inferring the outcome of a future event such as the avoidable costs in an investment decision to replace the current simulator with a new, more efficient one.

Going beyond analogy's application in MA, its use is pervasive in decision making in general because it applies even if managers base their decisions on insights into other cause and effect relationships. For example, the last time a complimentary product was cut, the company lost a key client. Moreover, analogy also finds application in other managerial activities that depend on cause and effect insights such as planning and control. The principle of analogy is therefore ubiquitous in management, measurement and decision making.

Analogy serves as the second cornerstone for MA because it: (1) is the predominant way in which MA information is used: (2) it lies at the core of an enterprise's optimization efforts: and (3) it is the essence of the vast majority of managerial activities. Analogy also serves to unequivocally focus MA on its customers-managers and their optimization endeavor.

Validity of the cornerstones

But how robust are the proposed cornerstones? Do arguments exist that can topple them? The position of causality in MA is unassailable. It is based on the law of rational inference, which is a first principle, undeniable, and irrefutable. The naysayer must rely on the very principle he is trying to deny; it requires rational inference to deny the relation between a cause and its effect. To deny the relevance of the principle of causality in MA would be absurd.

The principle of analogy in turn is indispensable in management, measurement, and decision making. There are two potential arguments against its use: (1) managerial actions based on random outcomes (e.g., flipping a coin), something no manager is likely to subscribe to and no stakeholder can be expected to approve; and (2) that MA need not or should not be manager-centric, in other words, MA should not place its customer front and center—a self defeating argument if ever there was one.

In conclusion, regarding the validity of the proposed cornerstones, some pointers are provided on their practical application, which also goes toward clearing up some of the current confusion in MA. [19] As indicated above, the primary application of causality in MA occurs in understanding and modeling enterprise operations. In contrast, the principle of analogy finds application in managerial processes, and in particular, in drawing inferences during, for example, decision making. This distinction in the application of the cornerstones must also be maintained with regard to the MA concepts appropriate to each. For example, the operational cost concepts (fixed and variable) find application in the domain of causality and hence operations modeling. On the other hand, the decision support cost concepts of avoidable and unavoidable find application in an analogous world—that of decision support. Therefore, there is no legitimate basis in MA for the current exclusive use of operational cost concepts (fixed and variable) in decision support.

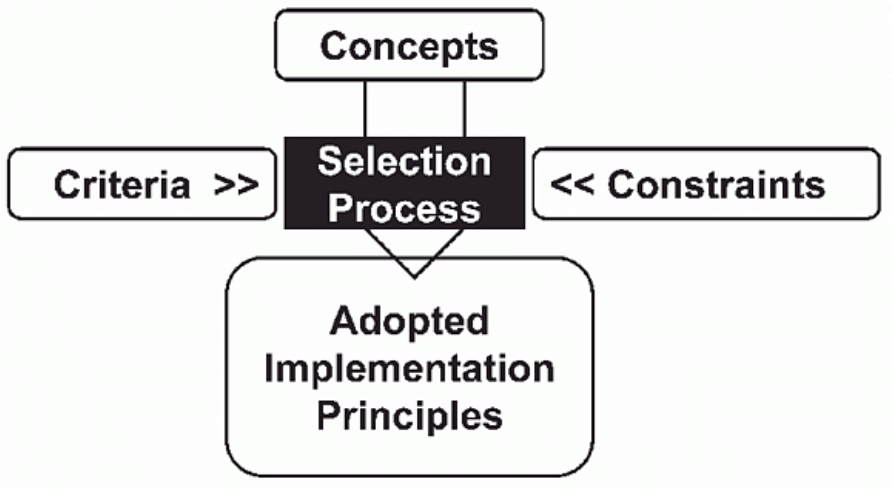
The cornerstones and the existing MA body of knowledge

The cornerstones might stand up to logical scrutiny, but how do they fit into the current MA body of knowledge? Moreover, what implementation considerations should be noted if the cornerstones are adopted? For the cornerstones to serve as the basis for MA's recovery, they must effectively integrate into the existing body of MA knowledge. [20] Demonstrating their integration requires a closer look at the proposed cornerstones' place in and influence on a larger MA framework.

An MA framework to guide the selection of concepts, methods, and principles in establishing an MA system was introduced by Gordon Shillinglaw in 1979. [21] It comprises at least three groups of elements, namely concepts, criteria, and constraints for which the relationships are illustrated in Exhibit 2 . [22] *Concepts* are any of a very large number of elements that make up the current body of knowledge in MA. Examples of concepts are cost, cost objective, and variability. *Criteria* are the acid test for the incorporation of concepts, methods, and practices into the MA system. The two cornerstones proposed above are examples of criteria in the framework and are intended to serve as the gatekeepers for MA. *Constraints* serve as filters in the selection process and are intended to contribute to the checks and balances in the overall framework. Examples of constraints are objectivity, accuracy, and materiality.

Exhibit 2.

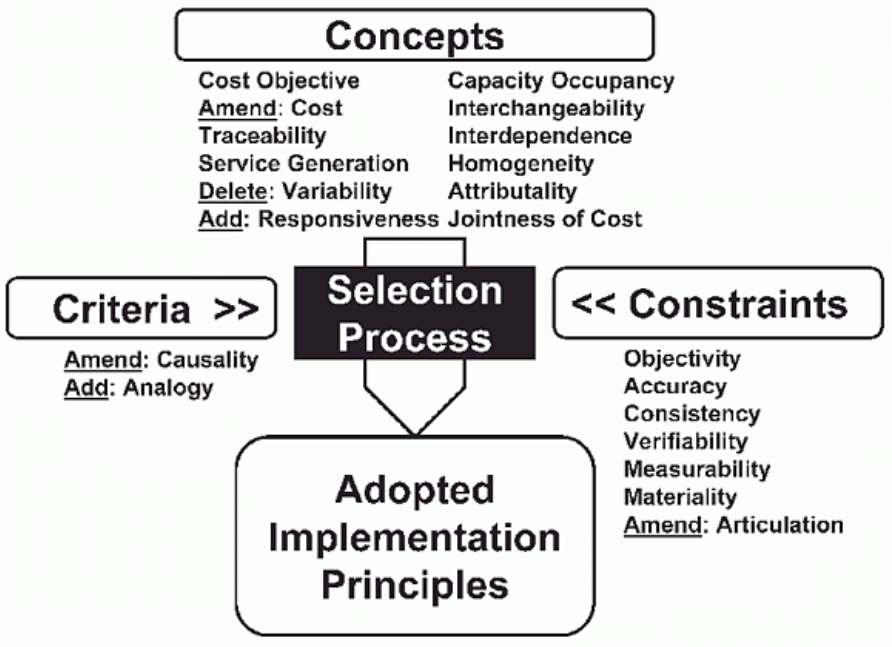
Groups of Elements in An Existing MA Framework



The Shillinglaw framework contains extensive references to decision support, which makes it useful for putting the proposed cornerstones with their manager and optimization focus into perspective. The elements that make up the Shillinglaw framework, with suggested amendments, additions, and deletions, are graphically depicted in Exhibit 3 . The refinements that result from the integration of the proposed cornerstones into the framework and the shift to an enterprise optimization emphasis in MA are discussed below under subheadings for each of the three groups of elements.

Exhibit 3.

An MA Framework for Enterprise Optimization



Criteria. Causality was the only criterion proposed by Shillinglaw, but only after a process of elimination, which sought to nullify other candidates for the coveted spot (i.e., relevance, benefit, and equity/fairness). He accomplished this, but his initial list would always remain open to questioning—was the list complete? This discussion seeks to establish a more concrete foundation using the laws and principles of logic and should settle any doubts as to causality's preeminent position in MA.

The revised causality criterion with its enterprise optimization focus widens the sphere of influence of the framework beyond just product costing for external reporting. The correspondence definition of causality—grounding the principle of causality in the bricks and mortar of enterprise operations—opens the door to potentially unrestrained levels of detail. Moreover, managers have a desire for more information in their back pocket rather than less. It falls to the second criterion, the principle of analogy, to limit the detail and reach of MA.

Analogy is one of two additions to the original framework. The analogy criterion dictates that MA caters to the range of decisions and areas of optimization for which managers are held accountable—for which they require analogous information. There are no hard and fast rules in this regard, and there should not be. A large number of factors influence the extent to which managers in a particular enterprise consider decision support and optimization information to be sufficient. It could be as loosely summarized as the five or six critical success factors for running the business to support the management and decision support requirements of individual managers. The objective of the cost model based on the analogy criterion is clear-support enterprise optimization; how this is applied in practice when implementing the MA system is a choice specific to each company.

Concepts. The concepts of cost and variability in the Shillinglaw framework are impacted by the revised criteria (the proposed cornerstones). The impact on variability will require the introduction of a new concept—responsiveness.

As far as the concept of *cost* is concerned, it has to be aligned with the correspondence definition of causality—in line with the understanding that money is the meta-language of economic activity, cost is considered a function of input quantities consumed. The traditional view of cost as a relation between money and a cost objective must therefore be subjected to the relationship between a cost objective's output and its inputs as in the earlier example under the section for causality as cornerstone.

Variability in the original framework reflects the traditional view of the relation between total volume and total cost. [23] Product customization and complexity in the conversion process have shown that this view of cost behavior no longer holds true in all instances (e.g., when producing fewer more complex products result in a higher total cost). Moreover, the correspondence definition of causality requires more specificity in its definition of relationships than is possible with the concept of variability. The concept is therefore replaced.

Enter *responsiveness*, which describes the relation between an output quantity and the input quantities required to produce that output. A distinction is made between those input quantities that are consumed regardless of changes in the output level (i.e., fixed input quantities) and those consumed in a manner proportionate to the level of output. Moreover, in keeping with the recognition that value (money) is the meta-language of economic activity, the valuation of a consumed input quantity is subjected to the quantity's responsiveness characteristics. For example, a flight simulator with an output of 200 hours consumes 30,000 kWhs proportionate to output. The associated cost of $3,000 will be classified as a proportional cost. Conversely, the cost of an input quantity consumed in a fixed manner becomes a fixed cost; even when idle, the simulator consumes 1,000 kWh per month to keep hydraulics primed and key components and instruments heated. This 1,000 kWhs is a fixed quantity consumption and the related input costs of $100 (1,000 × $0.10) are fixed costs.

The relation between total cost and total output is the result of individual responsiveness relations of inputs (and hence their costs) to cost objectives' output levels. In this way responsiveness allows for the relationship between total cost and total volume to have a potentially inverse relationship, as pointed out above.

Constraints. *Articulation* is the only constraint in the Shillinglaw framework affected by the revised criteria. This constraint requires that financial statements articulate, i.e., the total cost in MA for a period should not be different from that in financial accounting. [24] In the revised framework articulation applies only to the extent that MA is required to maintain integrity for the purposes of external reporting—as a separate valuation layer (a financial accounting meta-layer on top of the causally constructed quantities—see Exhibit 1), which allows for the fulfillment of MA and financial accounting requirements in different valuation layers without any compromises. In the MA valuation layer, information relevant to enterprise optimization can be used such as cost depreciation as opposed to financial or book depreciation.

As is evident from the revised MA framework, the proposed cornerstones integrate into the existing MA body of knowledge without compromising any requirements on MA. Moreover, the cornerstones bring the required philosophical soundness and rigor to serve as gatekeepers for a robust and customer-focused MA system. As criteria in the framework, the cornerstones govern the selection of concepts, methods, and practices to ensure MA's manager and enterprise optimization-centric focus because they serve as principle-based standards for MA.

Conclusion

The first article demonstrated the need for the correspondence definition of truth as the foundation for MA. This article showed how this is realized using the principles of inductive logic to serve as cornerstones for MA. First, the principle of causality fulfils the requirement to "correspond to the facts." The principle of analogy on the other hand serves to confine MA's detail and reach to an enterprise's optimization needs. These proposed cornerstones integrate into an existing framework for MA and the current MA body of knowledge highlighting the refinements to the MA framework and the implementation feasibility of the cornerstones with their manager and enterprise optimization focus. The proposed cornerstones—philosophically sound, MA customer-centric, seamless integration into the discipline, and complementary to the existing body of MA knowledge—are all essential criteria to restore MA.

The proposed cornerstones and the MA framework are firmly grounded in traditional MA thinking, which has been a popular target for criticisms over the last number of decades. [25] For example, the issue of complexity surfaces with regularity in contemporary MA discourse in the form of a pervasive chant for simplicity in MA, and the structure proposed in this article will likely face the same protest. If the proposed cornerstones are to become viable, they must address such known criticisms at the very least. Thus, pre-emptive responses to this and other assertions—to shore up the proposed structure—will be the subject of the final paper in this series.

1

Angeles, PA.1992. *Harper Collins Dictionary of Philosophy*. Second Edition. (Harper-Collins Publishers, Inc.: New York) 316-317. Truth: A statement or proposition that corresponds to the facts.

2

Enterprise optimization refers to those managerial, entrepreneurial and execution activities that strive to do more with less—use resources effectively and efficiently to achieve enterprise objectives.

3

Van der Merwe, A. 2007. "Management Accounting Philosophy: Gaping Holes in Our Foundation," *Cost Management*. May/June 2007 Issue. Thomson/TTA. New York, NY.

4

Morris, T. 1999. *Philosophy for Dummies*. Hungry Minds Inc.: New York, NY. p. 52.

5

Bacon, F. Circa. 1620. *The New Organon*, Book 2. Cambridge Texts in History of Philosophy edited by L. Jardine and M. Silverthrorne. (Cambridge University Press. Cambridge, UK. 2000).

6

Geisler, N. & Brooks, R. 1990. "*Come, Let Us Reason: An Introduction to Logical Thinking.*" (Baker Book House: Grand Rapids, MI) 149. "As Francis Bacon noted, science is the search for causes. The scientific search for causes can be divided into two broad categories: empirical and historical."

7

See Note 6 above, page 133.

8

The term "MA system" as used in this series of articles refers to the complete MA solution comprising the conceptual model of enterprise operations based on an MA approach and the processes and technology required to maintain and operate it.

9

See Note 6 above, page 158.

10

See Note 6 above, page 16.

11

See Note 4 above, page 69.

12

See Note 6 above, page 149.

[13]

Horngren, C. & Foster, G. 1987. *Cost Accounting: A Managerial Emphasis*, 6th Edition. (Prentice-Hall International: Englewood Cliffs, NJ) 448, "A cause and effect relationship between changes in total cost and changes in the allocation base," and Hansen, D. & Mowen, M. 2003. *Cost Management: Accounting and Control*, 41h Edition, (South-Western: Mason, OH, 2003) 213. "Causal factors are variables or activities within a producing department that provoke the incurrence of support costs."

[14]

The ascendancy of quantities in business is underscored by the fact that illegal and criminal activities almost always entail value/dollar flows not representative of corresponding quantitative goods and service exchanges (bribes, fraud, and money laundering).

[15]

Adapted from Shillinglaw, G., *Cost Accounting Principles for External Reporting: A Conceptual Framework*. Essays to William A. Paton: Pioneer Accounting Theorist. Edited by Zeff, S; Demski, J. & Dopuch, N, (Division of Research, Graduate School of Business Administration. University of Michigan, 1979) 162. Note: In MA there is a need to distinguish between the strong form of causality (as defined here) and the weak form (the relation between a machine's excess/idle capacity and the products produced on it). The vast majority of causal relationships, however, will be of the strong form.

[16]

Clinton, B. D. &Van der Merwe, A. 2006. "Management Accounting—Approaches, Techniques, and Management Processes." *Cost Management*, May/June 2006, Vol. 20 No. 3, Thomson/TTA: New York, NY. See pages 14-22 for a discussion on the concept of MA value chain integration in ERP systems.

[17]

Note that all prevailing MA approaches differ (and fight) over the most appropriate way to parse G/L dollars. Standard costing parses the G/L primarily to satisfy external reporting, the Theory of Constraints with a throughput objective, Activity-based Costing with a focus on activities and their consumers, and Lean Accounting based on operations flow principles.

[18]

See Note 6 above, page 161. This principle is also called the principle of uniformity.

[19]

See Note 3 above. Refer to the section on incongruent use of MA concepts and in particular the blended cost concept error.

[20]

The complete restoration of the profession is obviously dependent on acceptance by managers of MA as a valuable contributor to enterprise success. MA getting its own house in order-the objective here—is considered a necessary precondition to the larger restoration process. See the first article in this series for the reasons why the profession is in its current predicament.

[21]

See Note 15 above, pages 157-183.

[22]

The original Shillinglaw framework goes beyond what is necessary to induce structure into MA today. It proposed six groups of elements, only the three primary groups of elements essential to the selection process will be used here.

[23]

See Note 15 above, page 162.

[24]

See note 15 above, page 167.

[25]

MA tradition or traditional MA thinking as used in this series of articles refers to the body of MA knowledge accumulated over more than a century prior to the explosion in tools, methods, approaches and "new" thinking that transpired in the 1980s and beyond.