



# SIX LEVELS OF FINANCIAL KNOWLEDGE

**HERE'S A FRAMEWORK THAT MANAGEMENT ACCOUNTANTS CAN USE TO HELP THEIR ORGANIZATIONS REACH NEW HEIGHTS OF FINANCIAL UNDERSTANDING AND BECOME MORE PROFITABLE.**

BY GEORGE E. MANNERS, J

In the October 2003 issue of Strategic Finance, Paul Sharman made the case for management accounting. This topic couldn't have been more timely then, and it's even more critical now. To the extent that the financial community can engage both itself and line management in a soul searching look at what they really know about their businesses, the case for management accounting can be made emphatically. With the appropriate framework to shape financial knowledge, the management accounting function should become an organization's principal decision support platform.

Few line managers or financial executives are satisfied with the current state of decision support because it's too heavily driven by the financial accounting template and cost systems motivated by overhead allocation. But dissatisfaction usually leads businesses to take a hard look at themselves and set some tough goals relative to acquiring more profound knowledge. What this engagement process requires is a solid but easily communicated framework for self evaluation and planning, which I'll propose. With this self evaluation vehicle, any company can face brutal reality and begin the journey toward reaching new levels of financial understanding.

The framework recognizes that we're on a cusp of decades of development coming together in cost measurement and estimation, data management, business process modeling, enterprise resource modeling and planning, mathematical optimization, raw computing power, electronic visualization, application software development, and more. As they said on *The Six Million Dollar Man*, "We can rebuild him. We have the technology."

I term my proposed framework "the levels of financial knowledge." As you read the description of each level, I expect you to ask, "Where is my business?" Any reasonably sized business may find itself with elements of more than one level operating simultaneously—depending on the function, location, or business unit. Nevertheless, the framework should be quite prescriptive for evaluation and planning.

## LEVELS OF FINANCIAL KNOWLEDGE

The framework consists of six levels of financial knowledge, and the word "financial" is most operative here. I mean dollars and sense; this is much more than data and information—I'm talking about knowledge. First let's take a look at a synopsis of each level (see Figure 1), and then I'll go into more detail about each one.

**Level 1:** The business can count and keep score in the aggregate sense (business unit/corporate) by tracking cash, accounts receivables, payables, etc., and it can generate periodic financial statements.

**Level 2:** The business has a traceable measure of output volume and readily identifies fixed and variable costs. It has internalized the basic vocabulary of cost/volume/profit (CVP).

**Level 3:** The business has a welldefined breakdown of CVP elements and understands how these more detailed

### FIGURE 1: LEVELS OF FINANCIAL KNOWLEDGE

6. OPTIMIZATION ACROSS TIME

5. ENTERPRISE OPTIMIZATION

4. THROUGHPUTBASED UNDERSTANDING

3. SUBSTANTIVE CVP

2. BASIC COST/VOLUME/PROFIT (CVP)

1. FINANCIAL STATEMENTS

elements relate to working capital behavior as well as to both [Level 1](#) and [Level 2](#) templates. It can fundamentally assess the business profitability drivers and can generate appropriate policy statements relative to spending money to make money.

**Level 4:** Throughput, as opposed to output, has become the focus of operational and financial knowledge. The fundamental engineering/economic recipes of input/throughput/output (ITO) are known. The primary transformation constraints are known, and this knowledge is a principal factor in planning and resource allocation.

**Level 5:** At least in a planning sense, but, more importantly, operationally, the business can optimize simultaneously across multiple inputs/costs/recipes/constraints/outputs. Fed by the decisionsupport system, the methodology of marginal economics has moved from the theoretical to the practical.

**Level 6:** The business can optimize simultaneously across multiple inputs/costs/recipes/constraints/outputs and time periods. Managing periodic slack resources, capacity, and inventory across time is accomplished with profound knowledge.

Knowledge acquisition is a journey that requires the appropriate modes of transportation: systems, structures, and processes. It's a journey that an entire business must take, not just certain subsystems of it. Most of us are familiar with businesses that have subsystems that possess significant knowledge, but until that knowledge is integrated into the company's overall financial knowledge, the system's financial knowledge remains at lower levels.

Let's thoroughly investigate the levels by concentrating on the vocabulary and significant knowledge concepts and constructs of each one.

## LEVEL 1 FINANCIAL KNOWLEDGE

Too many users of accounting information think of it as “the incompetent reporting the irrelevant to the indifferent,” but financial accounting is the language of business. If you don’t have the knowledge to understand the language and speak it credibly, then you can’t communicate with those who are the source of capital. Thus, the Level 1 knowledge base connects a business to the outside world.

Since financial accounting constitutes Level 1 knowledge, every business must pass through Level 1 to move through the other levels. This is simply because any level of financial knowledge must possess the systems to tie back to the financial accounting templates—the standard P&L, balance sheet, and cash flow statement.

The principal concepts behind Level 1 knowledge are derived primarily from ratio analysis, which facilitates comparing financial performance and financial potential independently of industry or asset base. The significance of return on equity (ROE), Economic Value Added

(EVA®), and other Level 1 concepts, should never be underestimated. These concepts constitute the basic analysis toolkit for the suppliers of capital and, thus, for the ultimate indices of executive performance and reward.

## LEVEL 2 FINANCIAL KNOWLEDGE

While Level 1 knowledge tells us about a business’s profitability, it tells us very little about the business. In order to move to a more fundamental understanding, a business must establish a traceable measure of output (output unit), a vital stopover on the journey to knowledge acquisition even for the multiproduct business

**Table 1:**

Differences in Level 1 and Level 2

### Profitability Templates

Level 1 P&L Template	Level 2 P&L Template
Sales	Sales
Less: Cost of Sales	Less: Variable Cost
Gross Profit	Contribution Margin
Less: SG&A	Less: Fixed Costs
Operating Profit	Operating Profit

An output unit could be a case, a ton, a foot, an invoice, a gallon, customer count, a transaction—it depends on the business—but each firm building its knowledge base has such a construct. Knowledge really begins to grow when the business can make reliable assessments of how total costs behave as a function of changes in output. To do this, the business must attach variable cost to a single unit of output—a giant step on the journey.

When you have output volume and variable cost per output unit, you have the basis for Level 2 vocabulary. The first important concept is Level 2’s profitability template, which is contrasted with Level 1’s profitability template in Table 1.

Although these profitability templates appear similar, they’re remarkably different because of increased knowledge. As the phrase “contribution margin” replaces the phrase “gross profit” in a business, knowledge has grown considerably.

Additional key concepts at Level 2 flow from the P&L template, variable and fixed costs, and contribution margin. The first is breakeven, the second is operating leverage, and the third is the idea of decreasing unit (average) cost as a function of volume. As the business internalizes these concepts, its knowledge increases enormously. The business prices and sources more intelligently, it makes funding decisions more intelligently, it negotiates more intelligently, and it evaluates opportunities more intelligently. Simply, it’s smarter

## LEVEL 3 FINANCIAL KNOWLEDGE

When a business transitions to Level 3, it has learned that return on assets (ROA) must be employed as the enterprise’s guiding profitability gauge. (And, rest assured, EVA is a form of ROA.) First, business activity and profitability require funding, and a competitive return must be generated on those funds.

Second, the business has learned that it must expand the basic CVP categories to capture more robust activity descriptors. Not only does it require knowledge of variable costs, but the business needs to know how they vary per unit or per dollar and whether or not they are inventoried (manufacturing or SG&A). Not only does it require knowledge of fixed costs, but it also needs to know whether they’re inventoried or not and whether they represent noncash (depreciation) or not. The business also requires knowledge about how many times a cost is inventoried, so categories such as raw materials are imperative for breaking out. Table 2 illustrates the “minimum spec” categories for Level 3 knowledge.

Third, the business ties these more robust CVP categories into elements of assets—particularly current assets—by applying asset turnover constructs. After it does this, it not only can plan an activity but the funding of it as well. Again, see Table 2.

Finally, the business has combined CVP elements and turnovers into an ROA model, which allows it to understand the constructs that truly define Level 3 knowledge:

- It can fundamentally assess its profitability drivers (profitability represented by ROA). It now has a knowledge-driven platform for evaluating profit improvement opportunities, capital spending opportunities, and tradeoffs among drivers. It can track drivers on a continuing basis.
- It can make very definitive policy statements about the limits of spending money to make money. These initiatives could be R&D, promotion, hiring, training, etc.
- It can apply its business modeling at more granular levels such as productline profitability or customer profitability, although Level 4 knowledge can be a much more definitive achievement level for true productline profitability.

Only 10 to 15 years ago, a business that consistently operated at a Level 3 state of knowledge had a distinct competitive advantage. Today, we must raise our sights.

**Table 2:**  
**Level 3 Minimum Spec CVP Categories**

1. Unit volume. The number of units of output produced and sold (as in Level 2).
2. Gross price. The average gross price per unit of volume.
3. Materials cost per unit. For the average manufacturing firm, this might constitute all materials. For firms with one primary material (pulp for paper making, for instance), we might have two materials categories.
4. Variable labor costs per unit. Getting a reliable measure on what portion of direct labor is variable can be challenging but is often critical.
5. Variable processing costs per unit. This could include a variety of dimensions, but energy and water are prime examples.

6. Fixed manufacturing costs. This measure would include all cash expenses that don't generally vary with changes in output.
7. Revenuevariable S&A expenses. This measure includes all expenses that vary with dollars of revenue (as opposed to units). Sales commissions and royalties are examples. It is important to distinguish here how expenses are actually incurred vs. how they are budgeted.
8. Unitvariable S&A expenses. This includes all variable S&A expenses that vary with units sold, such as freight charges. (The reader should grapple with understanding that separating revenuevariable from unitvariable expenses has enormous pricing and other businessknowledge implications.
9. Fixed S&A expenses. This includes all cash S&A expenses that don't vary with unit volume.
10. Manufacturing fixed assets. This is the endofyear book value (net of depreciation) of manufacturing fixed assets.
11. S&A fixed assets. This is the endofyear book value of S&A fixed assets.
12. Depreciation rate on ending fixed assets. Note ending vs. beginning.
13. Receivables turnover. This is the number of times that customer receivables turn over each year, which is defined as sales divided by ending receivables.
14. Materials turnover. This is the number of times that raw materials turn over each year and is defined as total annual materials cost divided by the ending value of materials inventory.
15. Workinprocess and finished goods turnover. This is the number of times WIP and finished goods turn over each year and is defined as cost of goods sold divided by the ending value of this inventory.

# WHILE LEVEL 3 INTRODUCES PROFITABILITY DRIVERS AS A KEY CONSTRUCT, LEVEL 4 DIMENSIONALIZES HOW THOSE DRIVERS REALLY OPERATE.

## LEVEL 4 FINANCIAL KNOWLEDGE

There's a very distinct increment in knowledge when moving to Level 4. This increment recognizes that the business isn't just an output system but a highly interdependent input/throughput/output system. And this ITO system is defined much more effectively by the discipline of process engineering than by the discipline of accounting. Nevertheless, the Level 4 business has married the engineering equations with the accounting equations.

An ITO system possesses known physical recipes (or what older accountants call bills of material) that are defined by their interdependencies as well as their dependencies. If, say, a manufacturing firm is at least partially self-sufficient in its use of energy, it converts fuel and water into steam and then steam into electricity and electricity into machine hours. That's the dependency. But electricity is used to run the steam plant, and manufacturing byproducts may be used as fuel to convert water to steam. The Level 4 business can fundamentally specify and track these interdependencies. It can deploy them to create a credible operating plan and also a reporting and control system tied to the financial reporting and control system.

Level 4 knowledge also introduces profound understanding of the multiple and interdependent constraints that often define the ITO system capabilities. The business recognizes that its system is composed of interconnected resources on which processes are performed. It knows the capacities of those resources and the recipes for performing the processes and the process speeds. The business knows and has documented how costs actually vary as processes are performed on those resources. (It knows how they vary per input and output unit, as well as resource unit, and how they are impacted by process yields.) And, yes, it knows where the defining constraints lie.

While [Level 3](#) introduces profitability drivers as a key construct, Level 4 dimensionalizes how those drivers really operate. At Level 4, the business knows that only three relations are required to understand and account for all operating dependencies:

**Relation 1.** There is stuff in, stuff out, and process yield.

**Relation 2.** A factor cost per output unit is completely defined by resource units per output unit, factor consumption per resource unit, and cost per factor unit.

**Relation 3.** It isn't contribution margin per output unit that drives the system—it's contribution margin per key resource unit. (Thus, Level 4 is a better platform for understanding productline profitability than Level 3.)

That's it. That's all there needs to be. At this point some of you may be asking, "Isn't this activity-based costing (ABC)?" Well, Level 4 is what ABC wanted to be when it grew up and before most businesses turned it into an elaborate overhead-allocation exercise.

Level 4's vocabulary greatly depends on applying contemporary technology. This knowledge must reside on an information and decision-support platform that possesses the following characteristics:

1. An integrated model of the business that can withstand engineering and scientific scrutiny.
2. The ability to credibly reproduce the firm's [Level 1](#) financial reporting through the model (i.e., it can withstand accounting scrutiny).
3. The ability to deploy the model to react rapidly to tactical and environmental changes—not just produce a plan.
4. The capacity to fundamentally deploy the model for strategic analysis and decision making.

Many businesses possess enough integrated Level 4 knowledge to create a very credible annual operating plan, but only a few have truly reached this level on a continuing basis.

# THE CAPACITY TO OPTIMIZE ACROSS TIME IS A HUGE INCREMENT IN AT LEAST THE APPLICATION OF KNOWLEDGE—AND MOST PROBABLY KNOWLEDGE ITSELF.

## LEVEL 5 FINANCIAL KNOWLEDGE

The transition into [Level 5](#) financial knowledge is accomplished only with very contemporary supporting systems, structures, and processes. You'll know it when you see it, but there are three primary ingredients for getting there.

1. Substantive cost/volume/profit knowledge and supporting informationhandling structures (i.e., Level 4).
2. Very contemporary business process modeling that fundamentally maps the input/throughput/output interrelationships and constraints across the entire business.
3. A contemporary optimization platform that accommodates the business model and allows the business to simultaneously optimize its ITO system in terms of all flows through the system (product mix, sourcing, resource utilization, etc.).

Thus, the essence of [Level 5](#) financial knowledge initially is captured by the capability to fundamentally optimize the business—at least in a planning mode.

Although businesslevel financial optimization is only just getting into the knowledgemanagement capability of more sophisticated firms, it will come on quickly. In highvolume process industries it will soon be required to continue participating in the industry. Other industry categories may move more slowly, but the following new best practice is now observable. To enter [Level 5](#), a company has already taken the following steps:

1. The business has mastered Level 4.
2. The whole business, not just part of it, has been fundamentally mapped and modeled at a substance level where modern optimization solvers are imbedded in the model.
3. The business has thoroughly validated the model. It has selected real historical time periods and recreated actual flow volumes and financial reports throughout.

4. The business has “deconstrained” the validated model and begun to fundamentally learn the optimization relationships across its systems. A validated optimization model always creates significant new knowledge.

5. The business has acted on the more tacticallevel profitenhancing opportunities the model offers. The outcomes of these tactical actions are further reinforced and refined in the model, which is a principal tool for all continuousimprovement project selection and justification.

6. The business has internalized the model's use as a condition for all capital justification and strategic analyses.

Again, you'll know it when you see it.

The [Level 5](#) vocabulary of optimality includes two other constructs that greatly facilitate knowledge building. The first is opportunity cost. In an interdependent, multiconstraint ITO system, the opportunity cost of another resource unit, another labor hour, another source of materials, another unit of saleable product—and so on—greases the whole decisionmaking process. To return to our steam, electricity, and operating machine example, if each is constrained, which has the highest opportunity cost? Which one should receive the infusion of capital first? On which can we go outside for added capacity

(OK, outsource), and which must be internally upgraded?

Knowledge of opportunity cost greatly enhances pricing decisions and negotiations, and it provides the platform to vastly improve priority setting and to allocate scarce resources. Since the marketplace is often a highly binding constraint in an optimized system, opportunity cost constitutes an ultimate measure of customer profitability (e.g., the next customer).

A byproduct of opportunity cost is [Level 5](#)'s second key construct—decision making at the margin. Although marginal analysis is done at any level of financial knowledge, at [Level 5](#) it almost defines the way the system works. For example, unless a business has reached this level, a decision to outsource a key process lacks sufficient knowledge for dealing effectively

with all the interdependencies. Or, for instance, a decision to bring in semifinished units and avoid the capital necessary for expanding a constrained resource has a huge number of impacts across the system. It can radically impact the optimal product mix, the energy balance, and optimal sourcing. And it can literally change the whole face of the business when, at the margin, you move from one optimum to another optimum. Even a Level 4 business has trouble coping with these interdependencies because it lacks the capacity to specify what is best in an absolute sense.

You can't overestimate the importance of enterprisewide enhancements available to a Level 5 business. Whether it concerns resource allocation to competing remote sites, decisions to open/close, intrasystem transfers, inventory swings, etc., the enterprise has more profound knowledge. And this knowledge allows it to move faster and more intelligently with the best interests of the entire system in mind.

I once worked for a CEO who excelled at what he termed backoftheenvelope economics. Of course, you can't put Level 5 knowledge on an envelope. It takes contemporary technologies supporting the company's desire to get there. Yet the prize is worth the chase.

## **LEVEL 6 FINANCIAL KNOWLEDGE**

At Level 6, a business not only exhibits Level 5 knowledge, but it can apply it across multiple time periods. Is reaching this level really that big of a jump from the previous level? The contention here is that the capacity to optimize across time is a huge increment in at least the application of knowledge—and most probably knowledge itself.

There are several driving constructs behind the financial advantages of optimizing across time. The first driving force is simply the ability to plan through seasonality in a profitoptimizing fashion. Whether this seasonality is in demand, factor prices, or resource productivity, the capability to deal optimally with the seasonality is Level 6's principal defining characteristic.

A second driver, which is highly interdependent with seasonality, manages periodically slack or constrained resources. As a highly interdependent ITO system faces seasonality, it may use its knowledge to optimally deploy periodic slack resources to buffer the flows through the system via buildups and drawdowns in various inventories. For instance, suppose we have a highly seasonal business, we

possess several similar machines with different run speeds/yields across product lines, we can deploy some workinprocess and finished inventory, and we must take down each machine for preventive maintenance at least twice each year. A Level 6 firm would know exactly how to simultaneously optimize production (and mix), inventory buildups/drawdowns, and machine takedowns each time period across the planning cycle. Businesses have always had to do this, of course, but at Level 6 they do so with profound enterprisewide knowledge rather than within subsystems. Multivendor, multisite, multigeography, logistically complicated businesses will be hugely impacted when they can approach Level 6 capability across multiple time periods.

Another driving concept is the capability to manage the uptime/downtime sequencing of key resources across multiple time periods with the optimality of the enterprise governing the decisionmaking process. The interdependent complexities across a business that has a tricky need for preemptive maintenance can singlehandedly justify the pain of moving to this knowledge level. I'll even go so far as to say that to avoid capital spending by more profoundly managing uptime and downtime across time periods will in itself pay back the investment in gaining Level 6 knowledge.

A further driving concept behind moving to this level is the more fundamental ability to manage the complexity of multiresource, multiproduct/service setup times, run lengths, and run speeds across time periods—especially in justintime (JIT) environments.

A final driver is that it doesn't take a business leader long to tune in to an absolutely basic principle of financial knowledge: Profit flows don't equal cash flows. Yet this basic principle needs Level 6 businesswide modeling to receive optimal treatment. Inventory buildups and drawdowns and the behavior of receivables in a seasonal environment highly impact the profit flow vs. cash flow principle. It takes very sophisticated business models that optimize the enterprise to truly deal with these complexities.

The Level 6 fraternity contains very few members. Those who have moved past Level 5 into an optimality model with many time periods have done so primarily within a planning framework. But Level 6 comes with dramatic, enterpriselevel payoffs to those willing to take the journey.

## COLLECTIVE MASTERY

Management accounting can provide a business with the decision support environment in which it can evaluate its financial knowledge level and establish a target setting vehicle for continuous improvement. Knowledge, though, is only the beginning. At each level, we seek to achieve a greater sense of mastery, which implies that we not only possess knowledge but have the understanding and confidence to act on that knowledge in a way that leads to superior financial outcomes. Knowledge is an absolute prerequisite, but collective mastery is the ultimate objective. By “collective mastery” I imply that knowledge is broadly and deeply shared within the business and that individuals possess the knowledge, resources, and skills to master the operating requirements of the interconnected processes. Moving up the levels of knowledge is well worth it. ☐

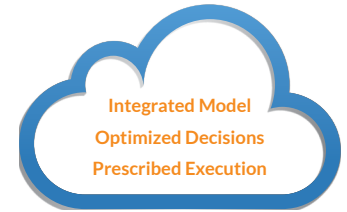
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## ABOUT RIVER LOGIC

Founded in 2000, River Logic is a privately held technology firm with a mission to establish prescriptive analytics (optimization) as the leading scientific approach to business planning and decision support. Its focus is on helping customers and business partners increase their performance, decision making agility and ability to predict business outcomes.

River Logic provides a prescriptive analytics platform, Enterprise Optimizer®, on a service oriented architecture that supports SaaS and onpremise deployments. This is complemented by an Integrated Business Planning application that simplifies customer adoption of the solution and platform into their business. This solution enables the ability to create an integrated model of an enterprise (including multienterprise), optimize decision points associated with an Integrated Business Planning process and prescribe a set of play books for execution.

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