THE ALIGNMENT PUZZLE WHITE PAPER

Deep dive:

The history and development of Management Accounting and Cost Accounting

1 What does management accounting have to do with alignment?

Is it worthwhile to immerse yourself in the background of management accounting when you are working on alignment issues? Absolutely, because the management accounting system largely determines how managers are assessed—and therefore how they behave. In addition, it supplies information to support decision-making. A management accounting system that is set up incorrectly, or used incorrectly, can lead to wrong decisions and dysfunctional behavior. If the information leads to local optimization that is not aligned with the organization's goal, there is an alignment problem.

Even more strongly: we believe a management accounting system can be one of the most important sources of misalignment within an organization. If there is no clear strategy for sales and operations, people will quickly fall back on steering the organization based on a bookkeeping model.

2 Information that is useful for management

Management accounting is the discipline of providing information that is used to plan, monitor, direct and reward people and to evaluate performance (Garrison, Noreen, & Brewer, 1976–2010, 13th edition). Put more simply: helping managers make decisions (Datar & Rajan, 2018, 16th edition).

Management accounting emerged during the Industrial Revolution as a spin-off from financial accounting, particularly from the system of cost allocation.

2.1 Management Accounting versus Financial Accounting

For external reporting, Brother Pacioli taught us centuries ago that regular reporting helps maintain long friendships—and he meant friendships with people outside the organization[1]. Management accounting is very different from financial accounting because it delivers information intended for internal use only. Whereas financial accounting is subject to legislation and rules laid down by official bodies such as the U.S. Securities and Exchange Commission (SEC) and must follow GAAP (Generally Accepted Accounting Principles), management accounting is not. In principle, companies are completely free to design and implement their own MA system (Management Accounting).

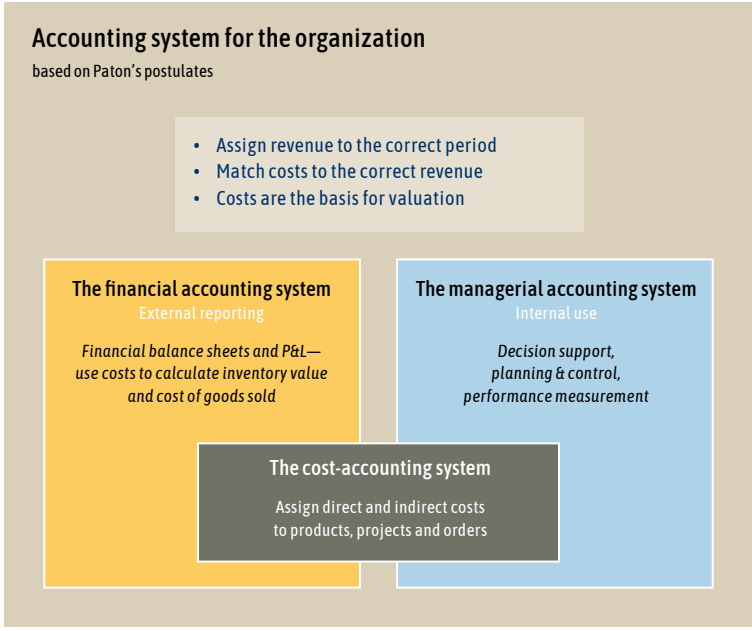
1 Also read our white paper *The history and development of Financial Accounting*.

To be able to present an annual income statement and balance sheet, William Andrew Paton's hypotheses are essential building blocks. Revenues must be assigned to the correct periods, and the correct costs must be matched to the correct revenues. And to draw up the balance sheet you have to determine the value of inventories and machines on the last day of the period.

But bear in mind that these are artificial tools and solutions devised to report on time periods of an expedition that is still ongoing. They are based on assumptions and simplifications of the real world. Yet the principles that are necessary for financial accounting are very often also applied in MA for a much broader range of uses. In our view this is inappropriate and incorrect.

One of the most important activities within management accounting is cost accounting—that is, assigning the right costs to the right products.

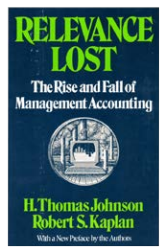
Many management accounting systems are in fact extensions of the allocation system built into the FA (Financial Accounting) system. This activity is sometimes placed so centrally that some authors use management accounting and cost accounting as synonyms. It should be clear that we strongly reject this. Much more relevant information is necessary to help managers make the best decisions.



2.2 Does classical management accounting still provide useful information?

In 1987 H. Thomas Johnson and Robert Kaplan, American professors of management accounting, published the famous book *Relevance Lost: The Rise and Fall of Management Accounting* (Johnson & Kaplan, 1987). In that book they concluded that the state of management accounting was dismal:

- "Corporate management accounting systems are inadequate for today's environment."
- "Management accounting systems are not providing useful, timely information for process control, product costing and performance evaluation activities of managers."



Johnson and Kaplan demonstrated that virtually all procedures around management accounting that were known in 1987 were already in use by industrial companies in 1925. They found that astonishing because the world had changed drastically since then. We would add, in turn, that now—more than thirty years later—still nothing fundamental has changed in management accounting.

2.3 Times change

In 1985 Vollmann and Miller showed that the ratio between direct labor costs and overhead within companies changed over time from 50–50 in 1850, via 40–60 in 1950, to 25–75 in 1980 (Vollmann & Miller, 1985). That means that by 1980 the overhead costs were three times as high as direct labor costs. As product life cycles become shorter and more investments must be made before the start of production—on R&D and process design—direct product costs constitute an ever smaller fraction of total costs.

Topic	1950s	2020s
Share of direct material and labor in total costs	High	Low
Share of overhead in total cost structure	Low	High
Time horizon for changing the wage-cost level	Short	Long
Time horizon for changing overhead costs	Short	Long
Speed at which markets change	Slow	Fast

Another important difference between 1950 and 2020 is how dynamic the market is. When the first cost-accounting methods were developed, the market—compared with now—was predictable and stable.

A third important difference is the average employee's level of education. It is now considerably higher than in the 1950s. Knowledge workers are more expensive and less easily replaced than unskilled workers.

All these factors have made the classical methods of management accounting less relevant and potentially even misleading.

Before we continue with the question of what constitutes meaningful management information, we must understand how the classical systems of management accounting work. To do so, we zoom in on the heart of the system: the cost-accounting system.

3 The central role of cost accounting

According to most of the literature on cost accounting, its purpose is fourfold:

1. inventory valuation;
2. setting the sales price;
3. other decision support;
4. evaluating managers' performance.

However, we are convinced that cost accounting is suitable only for the first two purposes—and of the second only partially, because nowadays the market largely dictates the sales price.

In most management accounting literature, decision support is treated as a sort of by-product of cost accounting. In our view this is incorrect, because decision support and product cost assignment are, by their nature, different.

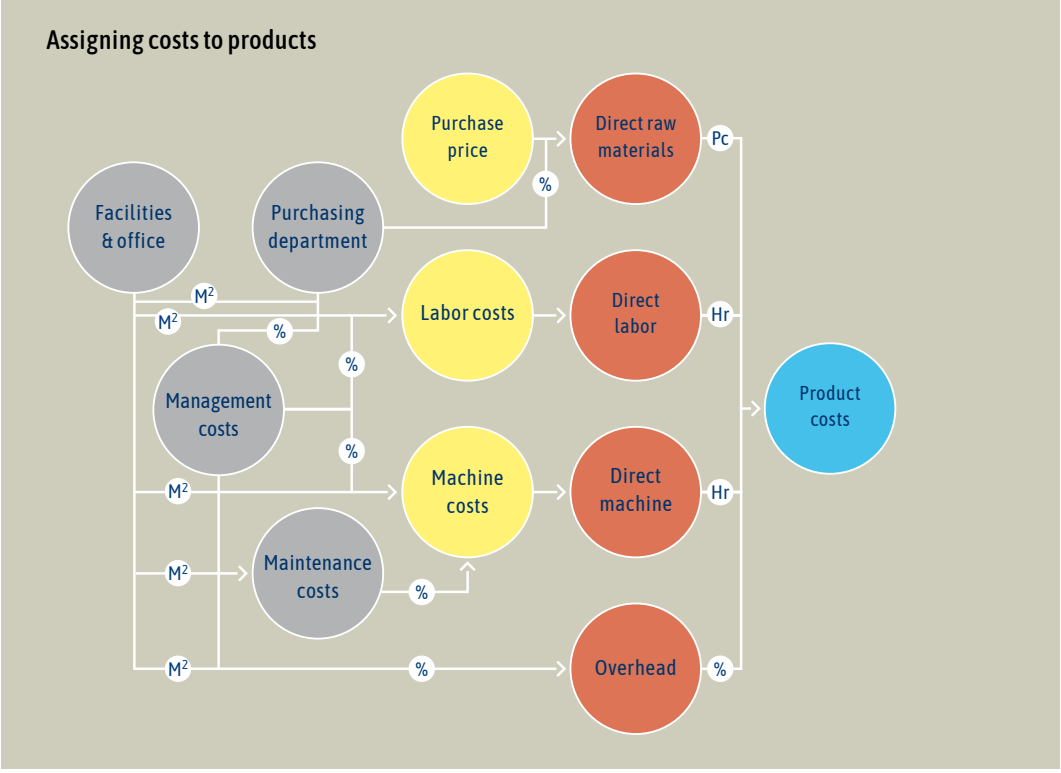
4 Cost-accounting methods

Cost-accounting methods revolve around a central question: how should costs be assigned to products or to other cost objects, such as projects or orders?

In this section we briefly outline three different ways to tackle that task. We start with the classical absorption-costing approach and then discuss two alternative methods that were developed specifically with better support for management accounting in mind.

4.1 Classical absorption costing

Absorption-costing methods aim to assign the costs of direct materials, direct labor, and indirect costs (such as facilities and overhead) to the relevant cost objects. A wide range of calculation techniques exists. Some methods use primary and secondary cost centers; others use mark-ups or overhead rates—and many combine these in various ways. Numerous methods contain multiple layers, which can make the calculations rather complex. But in the end, they all come down to allocating indirect costs to products, orders, or projects to arrive at a unit cost.



Criticism of absorption-costing methods

Absorption-costing methods have come under heavy criticism, especially regarding the relevance of the resulting information for different purposes. What exactly is the information used for? Inventory valuation? Setting the selling price or deciding on product promotion? Or for decisions about production volumes, product mix, batch sizes, or inventory policy?

Because these methods do not distinguish between controllable and non-controllable expenditures, the information is, in principle, not suitable for decision support. This criticism weighs more heavily today than it used to. In the past, fixed costs and overhead rates were relatively low. In addition, the relationship between the time horizon over which fixed costs could be adjusted and the speed at which markets change was more favorable than it is now.

Over the second half of the last century, the weaknesses of the absorption-costing system became increasingly clear. As a result, the need grew for other systems that produce better and more relevant information for decision-making and performance measurement.

4.2 Variable Costing

The premise of variable costing is that only those costs are included that vary directly with production volume—for example, the costs of materials and energy. Items such as administrative expenses and facilities costs are excluded. Depending on the labor arrangement, direct labor may sometimes be included; in some cases even a portion of overhead is included as variable manufacturing overhead.

Variable costing is used as a tool to support decisions, but its weakness is that it is useful for only one type of decision: how much to produce. It is not very helpful for other decisions such as setting a selling price, making investment choices, planning, or deciding whether to make in-house or buy externally. Nor does the method provide a basis for performance measurement. Its scope of application has therefore remained limited.

4.3 Activity-Based Costing

The concepts behind Activity-Based Costing (ABC) were developed in the United States in the second half of the twentieth century. They became widely known in 1988 through Robin Cooper and Harvard professor Robert Kaplan—the same Kaplan of the book "Relevance Lost" (Cooper & Kaplan, 1988).

ABC uses the activities performed within the organization as the basis for assigning costs. To do that, consultants must analyze what all indirect employees do and assign their activities to the appropriate products. This requires extensive investigation inside the organization, but according to Kaplan and Cooper it is much better and fairer than other methods.

In practice, however, the use of ABC often disappointed. Most organizations that implemented ABC ended up with two costing systems: the official costing system for financial accounting and a separate ABC system for management accounting. Implementing and maintaining an ABC system proved neither easy nor cheap. Moreover, its usefulness was questioned: if overhead costs are assigned to products more precisely, how exactly does that help managers make better decisions? Which decisions are we talking about? Does ABC provide the right information about how cash flows will change under the different decision alternatives?

ABC is a cost-assignment system: it calculates costs and assigns them to cost objects, but it says nothing about how those costs change as a result of alternative decisions.

Initially, Kaplan and Cooper presented ABC as the solution to the problems of traditional costing systems—especially in the area of decision support—as their publication title made clear. Later, Robert Kaplan became more critical of ABC and acknowledged the system's limitations when it comes to decision-making.

5. Forget sunk costs

When you evaluate decisions economically, one rule always applies: **look at the effect on cash flows over the entire decision horizon**. Cash flows that are not affected by the decision must not be taken into account—also not via indirect overhead rates or allocations.

In investment analysis, the golden rule for decades has been: forget sunk costs. In this book we argue that this rule applies not only to investment decisions, but to all types of decisions. Sunk costs are expenditures that have already been incurred and cannot be reversed, regardless of future decisions.

A well-known (fictional) example concerns a man from one city—say, Washington D.C.—who wins a cash prize in the lottery and may collect it in another city—such as New York.

> The prize is $100. He sets off and first buys a bus ticket to the train station for $5. That amount is less than the prize, so he buys the ticket. At the station he must buy a train ticket to New York for $75. The two tickets together cost $80. That is still less than the $100 prize, so he buys the train ticket. Upon arrival in New York, it turns out he needs a taxi costing $25. He calculates that the total costs would come to $105. Because that exceeds the prize, he decides not to take the taxi and returns to Washington without the prize.

Everyone can see the absurdity of this last decision. He should not have taken the sunk costs of the bus and the train into account, and should have weighed only the cash flows he could still influence at that moment. Those are just the $25 taxi fare and the $100 prize. On that basis, at the moment of deciding about the taxi, he would correctly maximize the long-term net cash flow. Even better would have been not to set out at all—to realize in advance that the total travel costs exceed the prize—but that's a different story.

Sometimes the rule to forget sunk costs is misinterpreted as a license to sell products at far too low a price. People suggest that the logic implies excluding fixed costs from the cost price and therefore selling products or services below full cost. That is absolutely incorrect. On the contrary: optimizing long-term net cash flow means trying to sell as many products as possible at

the highest possible price. The full cost price indicates what expenditures will look like in the long run—when everything is adjustable, including the purchase of new machines and other investments. But nothing is certain: a completely new technology may emerge that makes it possible to deliver products or services much cheaper and better.

A variant of the lottery-prize story that leads to the opposite decision—based on psychological or emotional arguments—is the following.

> Another man also won a prize to be collected, but upon arrival in New York he discovers he is mistaken: the prize is not $100 but only $10. Still, he reasons: "I've already spent so much money; I'm going to pick up the prize anyway!" He takes the taxi, spending an additional $25 in order to collect $10. At that point he decides to spend a further net $15—on top of the $80 he had already spent.

Something similar can happen with long-running projects whose original purpose has been overtaken by changing reality. It takes courage to stop such a project. Sometimes people continue far too long with a pointless undertaking—behavior that may be explained psychologically, but not economically.

In both stories the men wrongly include the expenditures already made in their decision. The first fails to recognize that the past spending cannot be reversed; the second refuses to accept the loss. Both violate the rule: forget sunk costs!

6 Examples of wrong decisions caused by cost information

In this section we discuss two examples of how information about costs—or cost-based information such as margin and inventory costs—can prompt management to make poor decisions.

Examples in this area often involve (rare) bottleneck situations, as introduced by Eli Goldratt. We also included a numerical example of that in the cash-flows chapter (see V1.7). But in this chapter on management accounting we deliberately choose two different examples to show that the problem also occurs in many other situations.

The first example concerns a decision to increase marketing expenditures in order to use idle production capacity. If the marketing costs exceed the sales margin, is that still sensible? The second example concerns an unfortunate attempt to reduce working capital in a tomato-ketchup factory, which failed because information about inventory value was used incorrectly.

The conclusion from both examples is that when making decisions, you must always look at cash flows. If you let yourself be guided by cost information, you can very easily make the wrong decision.

6.1 Example 1: extra marketing expenditures for a soccer-ball factory

A soccer-ball producer has 25% overcapacity in its production process. The question is whether it is advisable to spend additional marketing money to boost sales.

Suppose it is possible to run a marketing campaign costing $50 per month that will raise sales from 100 to 125 balls per month. This means we spend $2 in marketing money per extra ball sold. However, the sales margin is only $1 per ball. Is that extra marketing effort sensible?

If you look at the data only through a cost lens, you immediately conclude it is unwise. After all, the additional margin on the revenue of $25 per month (25 balls times a margin of $1) is lower than the marketing outlay of $50 per month. But that is the wrong conclusion. Look at the following calculation of monthly profit.

Example: a soccer ball factory

Soccer ball factory	
Sales & production	
Monthly sales (balls)	100
Max. capacity per month (balls)	150
Costs	
Fixed costs per month	$ 300
Allocated fixed costs per ball	$ 3
Variable costs per ball	$ 1 +
Cost price per ball	$ 4
Selling price per ball	$ 5 -
Margin per ball	**$ 1**

Scenarios	Baseline (no extra marketing)	Extra marketing (extra spend and sales)
Production & sales volume	100	125
Results		
Revenue per month	$ 500	$ 625
Fixed costs per month	- $ 300	- $ 300
Variable costs per month	- $ 100	- $ 125
Extra marketing per month	0	- $ 50
Profit per month	**$ 100**	**$ 150**

Why is this? Cost information does not provide insight into the controllability of costs—only into their allocation. The unit cost of the soccer balls largely consists of fixed-cost allocations. Those do not increase with higher production and are already fully covered at 100 balls per month. All extra balls therefore provide, in addition to the margin, an extra contribution of $3 per additional ball sold. So instead of losing $25 per month, we actually gain $50.

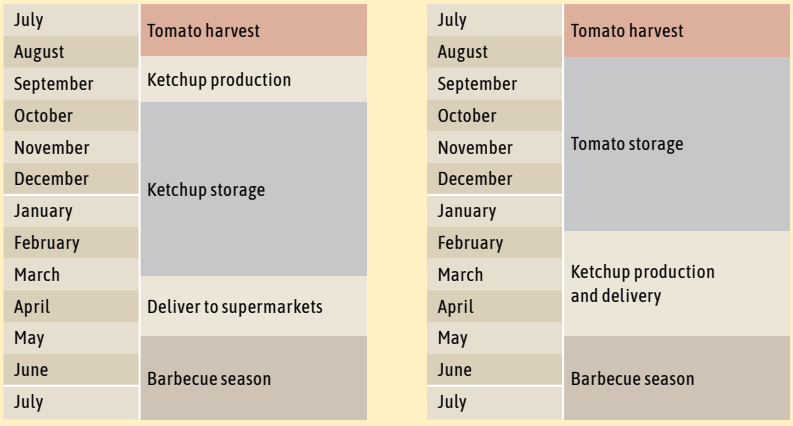
6.2 Example 2: inventory valuation in a tomato ketchup factory

A small Italian family business producing a particularly tasty tomato sauce was acquired by a large American corporation. When the American manager visited the company and took in how things were organized, he shook his head in pity. The old Italian owner took off his cap and looked at him questioningly. "You've never heard of RoI and RoCE, have you?" said the American, referring to Return on Investment and Return on Capital Employed.

One of the most important issues was the choice of the time of year in which to produce the ketchup. Is that at the end of the summer, immediately after the tomato harvest? Or in the spring, just before the barbecue season begins and market demand rises sharply?
Traditionally, the tomatoes were processed into ketchup as soon as possible after the harvest. The bottles of finished product then sat in inventory from September until March to be delivered to supermarkets around April.

The American calculated that this was a poor tactic. The inventory value of the bottles of finished product was one dollar per bottle, while only half a dollar of that was the value of the tomatoes. There were more than a million bottles. If you take 25% inventory costs over half a year, you can calculate that this inventory costs $125,000, whereas if you were to stock only the tomatoes, this amount would be only half.

Tomato ketchup factory calendar



The old Italian countered that storing tomatoes in a refrigerated facility is much more expensive than storing bottles of ketchup that contain a lot of preservatives. And that it is easier to find seasonal workers in September than in spring because of the tourist season.

But according to the new manager, those extra costs could easily be paid out of the inventory savings. He calculated that overall it would yield a saving of $ 38,000. He was convinced that, during the six-month storage period between harvest and the sale of bottled tomato sauce, it was better to keep the goods refrigerated in tomato form rather than store them as finished product.

Cost of one bottle of tomato ketchup

Tomatoes	$ 0,50
Other ingredients	$ 0,05
Packaging	$ 0,05
Labor hours	$ 0,10
Machine hours	$ 0,10
Overhead	$ 0,20
Cost per bottle	**$ 1,00**

Inventory-cost percentages

WACC[1]	10%
Storage	1%
Insurance	1%
Handling	3%
Aging / obsolescence	8%
Ordering costs	2%
Total	**25%**

Cost approach (amounts x $1,000, rounded)

Costs	Old	New	Difference
Inventory value	$ 1,000	$ 500	$ 500
Inventory costs (25%, 6 months)	$ 125	$ 63	$ 63
Storage site expenses	$ 15	$ 30	-$ 15
Seasonal-labor expenses	$ 60	$ 70	-$ 10
Totaal	$ 200	$ 163	**$ 38**

Common sense and the cash-flow approach

Intuitively, the old Italian felt that something was off. Had his family been doing it wrong for generations? We would love to write here that he gave the American the appropriate reply. For example, that he would say: "My dear sir from America, you have understood nothing of Brother Pacioli's principles, and your way of thinking is at odds with Paton's assumptions and postulates. All those calculations about inventory value and inventory costs are nonsense. This is about decision support, and then you must look only at cash flows."

But although these arguments are correct, that did not happen and the old Italian unfortunately remained silent. And that is precisely the problem that many production leaders and supply-chain managers face: they do not have the right answer to financial fallacies. As soon as someone starts talking about RoI or RoCE, they allow themselves to be sidelined.

1 Weighted Average Cost of Capital. the weighted average of the required returns on debt and equity, i.e., interest and dividends.

The correct analysis is as follows. Instead of ending up $38,000 better off, you actually end up $21,000 worse off. The value of inventory at any given moment is not relevant to the decision.

Cash-flow approach (amounts × $1,000, rounded)

Outgoing cash	Old	New	Difference
Inventory value	*irrelevant*	*irrelevant*	—
Interest on paying 6 months earlier for bottles and ingredients ($100 at 4%)	$4	$0	$4
Storage site expenses	$15	$30	-$15
Seasonal-labor expenses	$60	$70	-$10
Interest on paying seasonal labor 6 months earlier ($60 at 4%)	$0	$2	-$2
Insurance for 6 months of inventory (0.5%)	$5	$3	$2
Total	$84	$105	**-$21**

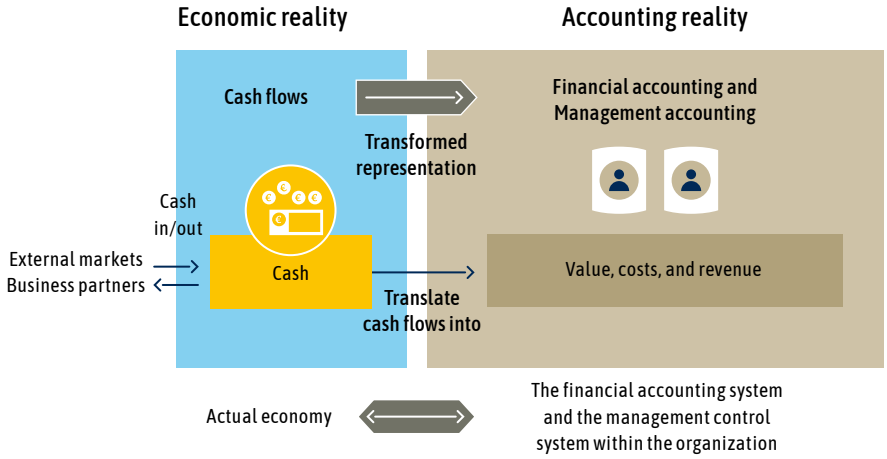
The timing of expenditures is relevant to the extent that we can assume we have to borrow the money from the bank and pay interest—or that we reduce our savings earlier and thus receive less interest. Let us assume this is 10%. That is fairly high, but we prefer to be on the safe side. That amounts to roughly 5% over the six months between the harvest and the barbecue season.

Here we calculate only the difference between the two alternatives, without needing to know the exact value of each alternative individually. Only the difference matters. The insurance premium will probably also be higher for storing filled bottles than for tomatoes. The rest of the items and numbers speak for themselves.

In short, by unthinkingly using terms such as “inventory value” and “inventory costs,” and undoubtedly a strong desire for high RoI and RoCE, the wrong decision was made.

7 The economic reality is hidden behind the wall of financial accounting

Organizations create internal control systems that are based on the principles of financial accounting. Cash flows are translated into revenue, value, and costs, and these are the concepts that people inside the organization are required to work with. The "real economy" of actual cash flows ends up hidden behind a wall.



Internal systems for management and control can create their own (local) reality—one that for the people who must deal with it becomes more important than the "real" economy. These systems can become quite complex. That makes it very difficult for managers to see the true impact of their decisions on the real economy.

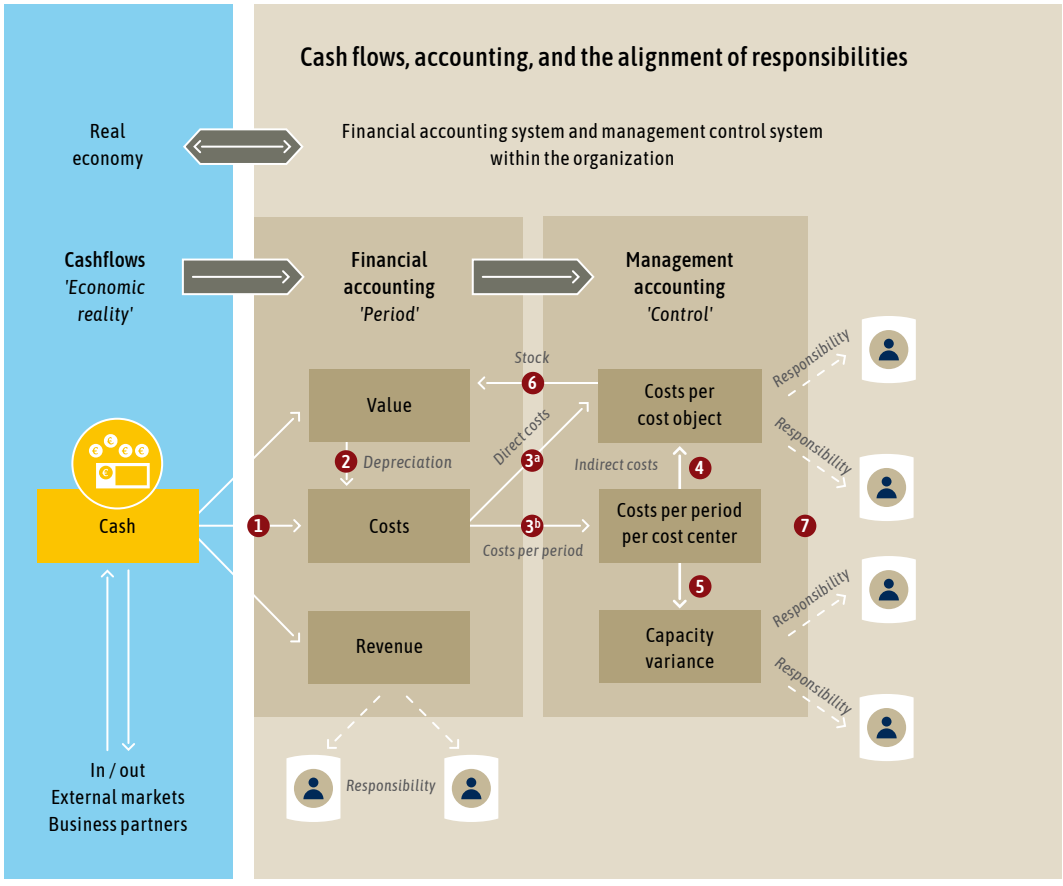
7.1 Translating cash flows into value, costs, and profit

In the translation from cash flows to internal financial magnitudes, we can distinguish seven main steps (see also the figure):

1. First, cash flows are translated into costs, revenue, and value. These are time-dependent magnitudes: either they cover a period (such as revenue or costs in a given month) or they apply at a specific moment in time (for example, book value on December 31).
2. Periodically, parts of value are converted into costs through depreciation. These are period costs that result from the decline in value of an asset such as a machine.
3. Costs are assigned:
   - as direct costs to cost objects (for example products, projects, or orders) based on consumption (e.g., raw-material usage).
   - as period costs to cost centers (for example the monthly building expenses of the purchasing department).

4. The costs assigned to cost centers are then allocated to cost objects using allocation keys—for example, machine hours and labor hours to products or projects, burden rates, and overhead costs.
5. The costs that by the end of a period have been over- or under-applied from cost centers to cost objects constitute the capacity variances for that period.
6. Through the cost allocation in steps 3 and 4 to the cost objects, those objects increase in value. Consequently, the value of inventory and work in process (WIP) rises.
7. The computational steps listed above produce a palette of magnitudes—such as product unit cost, order result, inventory value, capacity variance, period result, and cost-center variances—that can be assigned to individuals as responsibilities.

Geen rechtstreekse vertaling in document. Dingen op goede plaats geplakt?

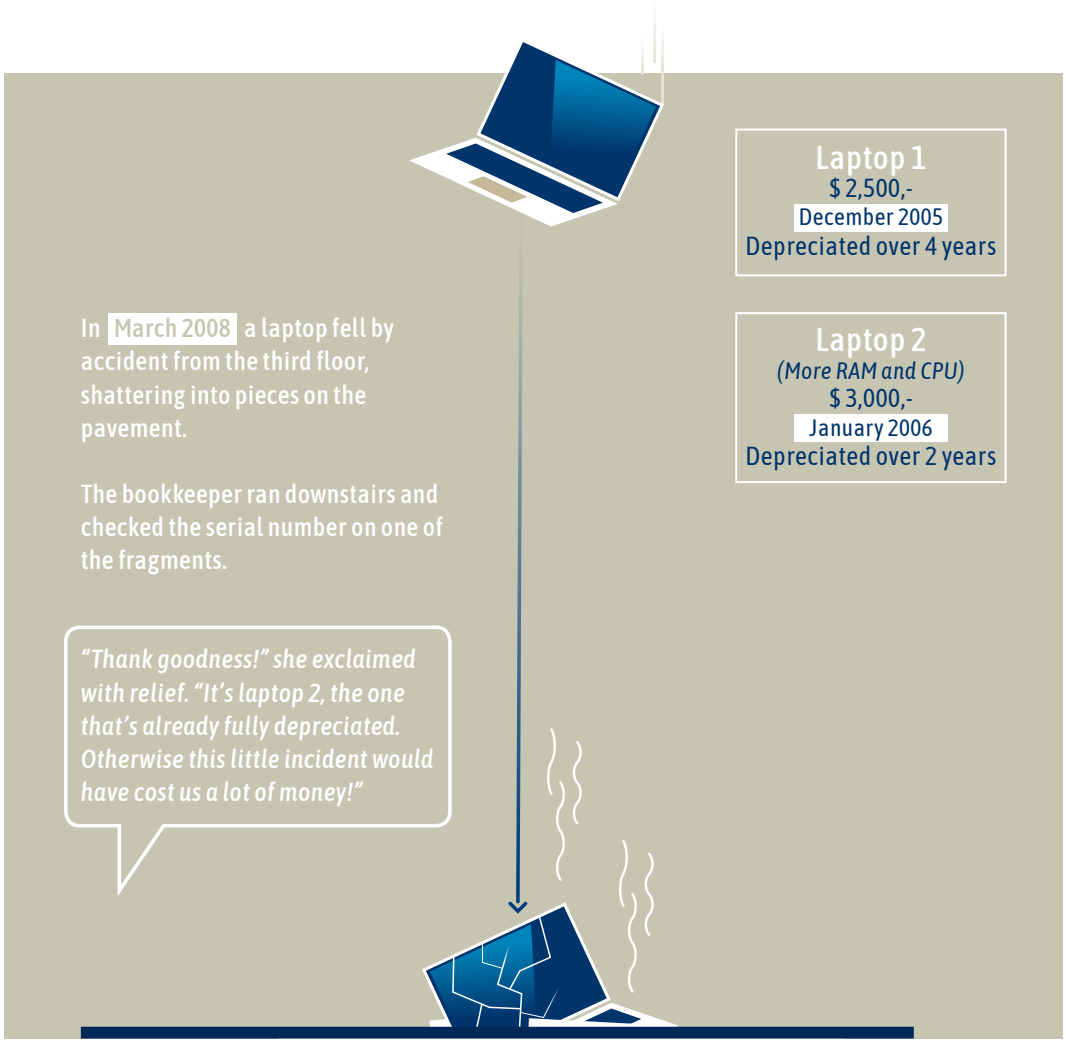


7.2 Who is responsible for what?

From this complex mechanism of assignments, calculations, and splits come the figures used to run the organization. All these internal numbers have been artificially decoupled from the real economy—and from one another—and tend to take on a life of their own. The relationships between the numbers have disappeared, and responsibilities are deliberately separated. Some employees are responsible for revenue, others for product costs, and still others for inventory levels, capacity utilization, project costs, or the expenses of a cost center.

The entire system contains no information about the controllability of cash flows and is not geared toward achieving a common outcome. Everyone has their own little domain. In short, it creates fertile ground for local optimization and—in alignment terms—misalignment.

7.3 The joke about the two laptops (…that turned out not to be a joke)



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