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ABSTRACT

Cost analysis for internal management of higher education institutions is of interest because of the steady state of higher education, concern over management practices, and the expectation that higher education institutions should be more responsive to social planning and public policy concerns and objectives. The nature of the institutions that administrators manage is examined briefly in terms of structure and function. A survey is made of decision-making and the relationship between the ends desired and the means chosen for getting there. Several situations in which cost analysis can be useful are described followed by some technical and intellectual problems. Finally, two models are presented for putting all these considerations together and for using cost analysis in internal management. (JMF)

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Using Cost Analysis In Internal Management In Higher Education

by Raymond F. Bacchetti

Analytically derived cost information is the most underestimated and therefore underused tool available to college and university administrators today. As a consequence, much of the information on which decisions are based is fuzzy and impressionistic, comparisons with other institutions are impossible to make, and there is no way of knowing whether the decisions which drive higher education are economic and sound. Knowing what things cost —whether the subject is maintaining buildings, processing library books, or providing an hour of classroom instruction—and then basing decisions on that cost information says more about the caliber of an institution's administration than practically anything else.

On the other hand, analytically derived cost information is today the most overrated item on the agenda of those who seek to improve the administration of higher education. Animated by the belief that an alternative reduced to a number is somehow more reliably evaluated, advocates of cost analysis are prepared to overlook the intangible nature of education, the subtle side of its achievements, and the values that can only be realized by teachers and students who operate outside the growing shadow of those who want to quantify the educationally important events, squeeze them into simplified formats, and see reflected on computer print-outs information which proves that they have a management information system which leaves nothing to chance. This substitution of numbers for judgment is wrong in principle and wrong in application wherever it may be found.

Thus, two views are given that have one thing in common: they both overstate and misstate a position. And that introduces the text of this paper, a splendid quotation of general value to administrators and of special pertinence to any discussion of cost analysis.

> The worst, the most corrupting lies [are] problems poorly stated.
>
> George Bernanos (1946)

Cost Analysis in Internal Management

The topic of cost analysis for internal management is old (and new), straightforward (and controversial), drearily dull (and utterly fascinating), simple and clear as a crystal bell (and cobwebbed and as fearsome as things that go bump in the night). Which one of each pair one chooses depends upon whose hands cost analysis is in and whose purposes are being pursued.

For "cost," this paper uses the financial accounting definition: information about what is paid to secure or accomplish something of value. By "analysis," is meant developing and using that information in ways that increase its meaning. By "internal management" is meant the decisions that administrators make in the processes of operating, evaluating performance, and planning for their colleges and universities. The goal of this paper is to say something about the interrelationships among these three terms that will be useful to the dialogue on cost analysis. (One of the best contributions has already been made in the form of the NACUBO Administrative Service Chapter 4:5, on "Fundamental Considerations for Determining Cost Information in Higher Education."

There are three principal reasons why the topic of cost analysis is of interest. Each of them is well known, so they will simply be noted here.

1. *Economic reasons.* Not so long ago the term "steady state" referred to a condition into which higher education had fallen; now it is the name of an objective administrators are working very hard to achieve. It is unmistakably clear that these are the early years of what is sure to be a long financial drought. The management of drought and scarcity is different from the management of abundance; therefore, the analytical tools that will serve administrators well in the future won't always be the same ones that were so serviceable in the past.

2. *Management reasons.* The belief prevails in some quarters that higher education is poorly managed; that

performance expectations on faculty, other professionals, and administrators are lax; and that educational institutions tend to use the intangible qualities of their mission to hide inefficiency and amateurishness in their operations.

3. *Social reasons.* Now as never before, all institutions of higher education—public and private, large and small, established and new—are expected to be accountable to others than simply trustees or regents; and they are expected to be responsive to social planning and public policy concerns and objectives.

In the acknowledgment and response to all three of these reasons, cost analyses and the use made of them will play a role and will be seen to play a role. While it has always been timely or appropriate to talk about ways to manage institutions better, it's particularly timely and important now.

The approach that was chosen for this paper involves a look from the writer's particular perspective at why or how administrators do or might do certain things, the connection between which accomplishments are desired and how one goes about achieving them, and the nature of the tools that exist or can be developed. The approach reflects the writer's education, which has been mainly in philosophy and very little in management or administration—and the writer's experience, which includes a variety of roles in university administration.

The paper will follow the scenic route, beginning with a look at the nature of the institution that college and university administrators help to manage. Then a survey will be made of decision making and the relationship between the ends desired and the means chosen for getting there. After that, there will be a section on several kinds of situations in which cost analysis can be useful, followed by comments on some technical and intellectual problems. Finally, two models will be presented for putting all these considerations together and for using cost analysis in internal management.

What is the Nature of the Institution Being Managed?

To boil this supermarket-sized question down to a couple of digestible answers, just two aspects will be considered: functions and structure. They will be observed through a pair of glasses designed to select the features that will be relevant to focusing later on cost analysis and internal management.

The standard and still serviceable functional description of higher education has three elements: teaching, research, and public service. There are four combinations of these functions: all of our institutions provide for teaching, some add research, some add public service, and some add both. These three basic functions are much easier to talk about in terms of input than output: innumerable hours have been spent—and will continue to be spent—in the attempt to discover or invent measures of output.

What has been accomplished when a course has been taught, an experiment concluded, a concert presented? How can those outcomes be calibrated in order to establish relationships with the resources directly and indirectly marshalled in their behalf to see if they were done economically or to judge whether they're worth doing at all? These may not be right or necessary questions, or even answerable ones. Administrators cannot get away with shifting responsibility for deciding what they want or ought to do to cost analysis. Cost information and analysis is simply one among many types of evidence that can aid in the solution of problems or the laying of plans.

What are some of the elements—and their functions—that are typical of the structure of educational institutions? First, they are value- rather than product-centered. That useful economic concept of "value added" may better reflect what takes place in higher education than it does when applied to manufacturing. Students are taken from wherever they are and value is added—personal and social value—through the opportunities provided for them to learn, to grow, and to develop skills and attitudes useful in making the world work. The pay-off occurs over a lifetime (sometimes longer), in direct, indirect, and often unbelievably subtle and powerful ways, and graduates of colleges and universities are a joint product of so many experiences that there is no way to assess cause and effect relationships, to relate input to output in a rigorous and scientifically satisfying way.

Second, the central responsibilities of higher education are practically all fiduciary. Colleges and universities, whether public or private, are founded on trust. This is a familiar concept in relation to money. But it goes way beyond that. Society trusts higher education institutions with a major portion of its youth; it is willing to allow academic freedom to prevail; it allows a class of professionals called professors to be employed under conditions that do not require licensing nor provide any public means for revoking the right to practice their profession. Along with this trust goes a tremendous responsibility to behave accordingly.

Third, intellectual authority—that is, the final say in what goes on in the classroom, study, and laboratory—is decentralized. Central academic or administrative leadership in this area is exercised chiefly by persuasion, and institutional control is more often negative (the power to say no) than positive (the power to initiate).

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Finally, practical power is as often distributed as it is centralized. Opportunities to stimulate or to resist, to flatten or erect barriers, to give or withhold support are *by design* woven throughout the entire institutional tapestry. That design both reflects and reinforces the value-centered and fiduciary nature of colleges and universities. They are as much *settings* within which teaching and learning go on as they are *organizations* responsible for doing teaching and research and certifying learning. They have as much stake in the intellectual independence of faculty and students as they do in cultural transmission, curricular coherence, and the advancement of knowledge.

The implications for cost analysis of these institutional characteristics are not obvious and they're not trivial. At the very least, one is made wary of industrial models and "bottom-line" thinking. Beyond that, the horizon is relatively uncluttered by dogma and convention. The way is relatively free to think through the concepts and problems of cost analysis in ways that will reinforce the strengths of one of mankind's more interesting organizations and help in managing them in ways that take due and proper account of resource scarcity, social needs, public judgments, and above all, the intellectual trust that colleges and universities hold.

From this lofty discussion of the nature of institutions, it is necessary to drop down and narrow the focus, first to decision making and second to cost analysis as a means to the end of good decisions.

Decision Making and Inertial Force

The major force that drives an existing institution from one day to the next, one year to the next, is inertia: that is, the tendency of a body (or organization) once in motion to stay in motion. "Inertia" is often used in a derogatory way, referring to a plodding, unresponsive march from past to present to future. It's this view that leads people to suggest that the last opportunity to change a college is the day before the first faculty member is hired; or that causes some to say that reforming an educational institution is slightly more difficult than moving a cemetery.

Here "inertia" is used with a different intent. The *fact* of inertia can surely have negative connotations, but assured continuity and relatively smooth continuation—synonyms for inertia in this metaphor—are extremely precious characteristics. They are the necessary conditions of the educational events, of the flow within which the moments of intellectual impact occur; they provide the stable base upon which other things are built. It is not surprising, therefore, that most decision making concerns inertial motion and its maintenance—student admissions; faculty and staff salary policy; recruiting, development, and promotion of faculty and staff; library acquisitions; budgeting; accounting; physical plant operations and maintenance; student counseling; the seeking of public and private funds; and scheduling of classes, rooms, meetings, etc.

Decisions about these matters can be made well or poorly, and cost analysis can be a useful character in a supporting role in the drama of recreating each day or semester or year the kind and quality of institution desired. Whether in looking at cost relationships across the institution and over time or in discovering facts about costs which were not before a part of decisions (such as how much the institution spends on photocopying), the effective management of inertia can be handsomely assisted by intelligent cost analysis.

Analytically derived cost information is the most underestimated and therefore underused tool available to college and university administrators today. . . . On the other hand, [it] is today the most overrated item on the agenda of those who seek to improve the administration of higher education.

As in the physical world, counter-inertial forces are also a part of the natural dynamics in colleges and universities. In the best institutions, there is a readiness to acknowledge these forces, often to search them out, and to complete the decision cycles they set in motion. These institutions have fewer skeletons in closets, lumps under rugs, and ragged pieces of unfinished business. As a result, they're more dynamic and have more energy to expend on their basic purposes. The three counter-inertial forces that upset the smooth flow of the organization can be called (as in nature) collision, friction, and gravity.

By collision is meant the new ideas, new needs, and new requirements that disrupt the inertial flow. A good idea for a new program, for example, can generate not merely the scramble for the resources it would require but, more likely in today's (and tomorrow's) economic climate, the examination of priorities, of economic relationships (cost analysis?), and of other considerations. Since the doing of new things in the future will be much more a matter of reallocation than of allocation, one can with certainty predict increasing need and—if developments keep pace with that need—desirability of using cost analysis in appraising the alternatives produced by collisions between old and new ideas and ways of doing the institution's work.

By friction, the second counter-inertial force, is meant disagreements, either of the confronting kind (much like collisions) or of the kind manifested in great or growing unenthusiasm, where constant struggle is required to move an activity through a desert of indifference or covert hostility. Friction often generates a kind of administrative problem in which a cost analyst runs the risk of being used. If someone wants to "prove," for example, that program x (the cause of the friction) is costly, or costs more than program y, or costs more per unit than other programs, he can probably do it by some careful numerator and denominator management. Under most such circum-

stances, cost information becomes a political rather than an analytical instrument. That danger should be worried about but not allowed to overshadow the value of devising ways to measure the cost of overcoming this friction or the savings to be made from eliminating its source.

By the third force, gravity, is meant the tendency for an idea to run down, to spend its energy, to come to rest. Some programs, some skills, some clusters of concepts, some services and activities become obsolete. When something bright pales or something active becomes inert, a drag on institutional momentum sets in. In the last stages of decline, one doesn't need cost analysis to point to the problem. But when the trend is setting in, cost data may serve a useful diagnostic role.

Cost information and analysis is simply one among many types of evidence that can aid in the solution of problems or the laying of plans.

Keeping an institution going and handling the opportunities and problems that originate from initiative, conflict, indifference, and fatigue usually provide enough decision-making opportunities to make room for the intelligent use of cost analysis. The next necessary question, then, concerns the fit of cost analysis with the process it facilitates. "How decisions get made" is, of course, the pivotal question. After a brief look at it directly, this paper will discuss the importance of conceptual underpinnings in determining which uses fit which kinds of decisions.

The first thing to be said about how decisions are made in colleges and universities is that very little is known systematically about that subject. Still less is known about how decisions *ought* to be made. This is not to say that educational institutions are managed poorly or well; it's a comment less on institutional management than on existing knowledge of institutional management. The topic at hand doesn't require the development of a theory of decision making in higher education. This theme requires only a sketch of ideas about decision making that will provide some grounding for other ideas about cost analysis. There are three that weigh in heavily on this matter.

First, consensus about both procedures and objectives is crucial. Unlike other kinds of social organizations, educational institutions depend for their continuity and vitality on agreement about both means and ends, instruments and goals, practices and purposes. The old philosophical argument about whether the ends justify the means is virtually irrelevant in the running of a college or university. Both means and ends must be justified.

Because authority and responsibility are dispersed and relate predominantly to a trust, the ground of the institution's existence lies as much in consensus about the way decisions get made as it does in the decisions themselves. Executive power is a necessary but residual power; it is self-limiting in that the executive who overuses it will shortly get his vote cancelled by the community he serves. Even negotiation, necessary to be sure in some situations, gives way to consensus as the instrument most congruent with the basic nature of the institution.

Second, evidence provides a push to decisions and goals provide a pull. No goal or set of goals generates automatically or unambiguously the policies and practices necessary for their realization. No set of evidence leads clearly to one course of action and no others. An administrator loaded with evidence—especially cost analytic evidence—who is vague about goals is playing a randomized version of William Tell, careless about whether he hits the apple but sure about his ability to release a powerful arrow. No wonder those on whose heads the apples rest are made nervous by such archers. The same individual focused on purposes and neglectful of evidence—especially cost analytic evidence—is doing the reverse: aiming carefully at a target with no string in his bow. In the first instance, he is dangerous; in the second, merely ineffectual. Aim, skill, and the proper equipment are inseparable companions.

The final notion about decision making is that any organization whose product is a qualitative change in people and ideas must leave ample room for judgment in any and all decision making. Judgment—the power of arriving at wise decisions on the basis of indications and probabilities—provides for uniqueness, adventure, risk, and superior achievement better than any model that relies only on formulas or tested and reliable relationships (which, of course, can only reflect *past* achievements).

No analytical instrument is anything more than a tool, and a hand tool at that; to invest more authority in it is about as risky a letting a car steer itself, expecting a medical technician to diagnose an illness correctly, or allowing a computer programmed with all the evidence on your side represent you in court. Moreover, judgment must have room to override even the best-supported recommendation when it appears to be wrong.

Role of Conceptual Structure

With these notions of what decision making entails in mind, the focus on cost analysis can be further sharpened by taking a look at the role of conceptual structure. A conceptual structure is a framework within which terms and facts have meaning. North and south, left and right, mind and body, culture and individuals: these terms and the larger intellectual apparatus of which they are parts are conceptual structures. Many such structures are used by everyone virtually all the time, and they have become so much second nature to us that the tendency is to believe that they reflect reality. The reverse is more nearly true: our reality is a reflection of the conceptual structures employed to understand our experience.

Accounting principles and terms, for example, are ways of intellectually holding and arranging certain economic information, events, and relationships so that they have

meaning in the management of an organization's financial affairs. These principles and terms change in various ways over time depending on how well or poorly they function to help make sense out of experience. But we put the cart before the horse if we believe that this or any conceptual structure is thought of as something other than a way of ordering or securing meaning from individual or collective experience.

Society trusts higher education institutions with a major portion of its youth. . . . Along with this trust goes a tremendous responsibility to behave accordingly.

This heavy-duty philosophical point is made to underscore the view that cost analysis is at this stage in its development a particularly fragile piece of intellectual architecture in college and university management. Unlike familiar conceptual structures such as the principles of accounting, cost analysis is relatively unformed and untested in higher education. With appropriate caution lights then, the following example demonstrates why conceptual structure is a condition of meaning in cost analysis.

Suppose a shoe manufacturer found he had belt-length strips of leather left over from the shoe-making process. What do they cost him? Part of the answer is given because part of the conceptual structure is given: he's a shoe, not a belt, manufacturer. So he can justifiably think of the belt leather as more marginal than main and apply marginal cost rather than average cost principles. If he wants to avoid the cost question altogether, he may decide the marginal cost of materials is zero and set a low price. Thus the buyer of his belts is being subsidized by the buyer of his shoes. This situation is hardly one of earth-shaking importance.

But suppose the attempt is being made to assess the cost per degree in a college or university, and suppose that teaching isn't the sole purpose at that institution. Which costs are attributable to the degree-getting process? The cost of fund raising or time involved in preparing or presenting budgets to the state legislature? The cost of heating a research laboratory in which a student is doing course-related work? The cost of studying how to do cost analysis in such situations? The answers to these and the legion other questions anyone close to the subject could dream up clearly depend on what information is desired and why; in short, on the meanings sought.

Costs per degree or per any other unit are, without clear conceptual underpinnings, quite literally meaningless. By the same token, a conceptual structure untested by fact gathering and analysis is empty. The two-way interaction between facts and concepts, or data and objectives, is a necessary condition of making headway.

To use costing as a means in decision making, then, one has to develop agreement on terms, methods, and the force and function of results. Except at fairly high levels of aggregation, these agreements won't be precisely the same for different institutions. That's not a fact necessarily to be lamented; it's just a fact. For two or more institutions to get together on a single conceptual structure for cost analysis, they must together resolve the same issues related to terms, methods, and the use of results as does one of them alone.

The possibilities of standardized cost information in higher education are, in this writer's judgment, vanishingly small. Costing encompasses a set of tailor-made tools, not interchangeable parts in an information network. Indeed, the two purposes—aiding a single institution or small group of like institutions to operate more economically and producing comparative information about a large class of institutions—are fundamentally different; that is, they call for different conceptual structures.

Examining institutional information exchange possibilities isn't the purpose of this paper. Examining cost analysis for internal use is, and it is such uses of costing that are discussed next.

Uses of Cost Analysis

There's a continuum that underlies any discussion of using cost analysis. It runs from hard management at one end to soft management at the other. Knowing where on this continuum one is operating will go a long way to assuring effective results.

By "hard management" is meant the area of plans and operations where cost information can be developed with a high degree of clarity and have considerable influence in the choice of a best course of action. Examples are lease/buy or make/buy analyses, the setting of prices which are closely related to costs (as in overhead reimbursement formulas and auxiliary enterprise charges), and mathematical models which relate rates of change and give valid and reliable information on the effects of certain actions and trade-offs.

By "soft management" is meant areas where cost information is diagnostic or indicative rather than definitive, where approximations will reveal as much as is necessary to know in order to focus on a course of action. This is the area in which cost information can reveal *that* something is happening but not *what* it is. Examples are charting the relative costs of instruction over time, the setting of prices which are not closely related to costs (such as tuition), and assessing the marginal costs of new students or programs.

These terms "hard" and "soft" are purely descriptive as intended here. Soft management can be just as good as hard. Each is a proper tool for the situation that has the characteristics just described. There's no suggestion that higher education will become better managed as soft management gives way to hard management. Indeed, synonyms for soft management are words like these: sensi-

tive, forward-looking, cautious, risk-taking, shrewd, wise, inspired. Not bad company to be in.

Keeping this continuum in mind, then, there are a half dozen or so situations in which cost analysis has a likely role to play in decision making. These can run from "back-of-the-envelope" calculations to approaches impossible before the age of the computer. In thinking about them, one forgets at his or her peril that the computer analysis can be just as wrong as the back-of-the-envelope one, and the costs plotted out on a restaurant napkin just as right as the figure obtained by wading through three miles of print-out. What distinguishes right from wrong or adequate from inadequate is the appropriateness of the means to the end in view.

Trend and comparative analysis in instruction. All the ways to look at the cost of instruction are variations on the theme of dividing some measure of instruction (such as contact hours, course enrollments, or degrees) into some measure of costs (such as direct salary costs, total department costs, or one of these with indirect costs added to it). The possibility of achieving great accuracy in such calculations is increased with a comprehensive system of faculty activity analysis, but it will always be far from perfect. At the extreme, an uncertainty principle will surely begin to operate at some level, and probings for ever more accurate measurements will affect the behavior one is trying to measure. (That's an elaborate way of saying it will generate faculty resistance or revolt.)

The *fact* of inertia can surely have negative connotations; but assured continuity and relatively smooth continuation [here used as synonyms for inertia] are extremely precious characteristics.

Even before that level is reached, one has to make so many compromises and accommodations that the validity of the data seriously diminishes: weighing class size differences, taking account of teaching assistants, accounting for independent study students, judging the equivalent value of course preparation, paper reading and exam grading, and office hours; all these factors don't easily yield to a neat and tidy framework. There are similar problems with the numerator. But the problem should not be over-estimated. This kind of measurement is front-end loaded. Most of what is to be learned is learned quickly and with gross numbers. The payoff from seeking greater precision is very low.

What one learns is here more than elsewhere a function of the skill and judgment of the individual who interprets the data. This is soft management in its most appropriate exercise: sifting cost analytical evidence, integrating it with other information, making focused inquiries, and finally concluding whether congratulations, suggestions, promptings, or some drastic changes are in order.

Actuarial analysis. Any organization of any size has slack in it. Clerks leave and aren't immediately replaced; reserves aren't fully used; the cancellation of activities is more likely than the unplanned initiation of them; faculty members take sabbaticals and replacement teaching can often be foregone. In times of retrenchment, the reliable assessment of the probability of such slack may serve to identify deliberate underfunding as a budget-cutting alternative. Whether it turns out to be a desirable one or not depends on a good deal more than its actuarial identification. Nevertheless, cost analysis can provide the basis for some calculated risks.

Estimating marginal cost-benefit relationships. Most college and university activities are subject to the rule of diminishing marginal utility, and cost analysis can often help determine the rate at which this occurs—the rate at which benefits decrease in relation to costs. Examples of such relationships are financial aid to admit/enroll ratios, loan collection effort to loan repayment, fundraising effort to funds raised, and student counseling to drop-out figures.

Each of these pairs has a family of subtle relationships associated with it, and one cannot push this sort of analysis too far. Its direct results can be useful, however, and so can the indirect benefits that follow from trying to wrestle with the nature of the relationships. It has been the experience at Stanford that the sharpening of understanding of issues has often been an even more valuable outcome of analytical work than the numerical results.

Projecting alternative costs. As the pressure mounts for colleges and universities to become more productive in the usual sense—that is, to reduce unit costs by substituting less expensive for more expensive ways of accomplishing objectives—the ability to assess current and projected costs will be a valuable aid to judgment. This will be particularly true in the case of alternatives with high capital and developmental costs, such as computer systems. These are often advertised not as producing savings initially but as providing a more economical means of handling growing requirements and future needs. The truth of that claim is, therefore, a crucial part of the decision to make the initial investment.

Cost projections and simulations of costs under various scenarios move in the direction of hard management. The causal, back-of-the-envelope estimate is too likely to be insufficient and therefore wrong. In fact, the value of the analysis is likely to be proportional to the depth to which it goes. Whether one is thinking about automating a registration system, opening a print shop, or buying rather than leasing vehicles, thorough cost analytic information can be valuable; though here, too, it won't make the decision for you.

. . . handling the opportunities and problems that originate from initiative, conflict, indifference, and fatigue usually provide enough decision-making opportunities to make room for the intelligent use of cost analysis.

Relationship and trade-off analyses. Many trade-off situations clearly require cost analysis to determine the better course of action. The question of whether to buy more expensive, longer-lasting bulbs and relamp less frequently or buy cheaper ones and replace them more often is one example of a class of questions that has long occupied plant managers, purchasing agents, and many other administrators.

A new class of questions deals with situations at a more global level and is the product of the steady state. University finances have become something of a zero-sum game, where real growth in one area means a real decline elsewhere; thus, the sum of the changes is zero.

Fairly often such changes are subtle and interactive. An increase in faculty or student numbers may, for example, generate proportionate increases in support services. A decrease of the same amount is likely, however, to generate only marginal savings in those same services. Variable costs on the way up become semi-variable on the way down. Cost analysis, often incorporated into sophisticated mathematical models, can be a great resource in this class of administrative decisions—often the only resource powerful enough to analyze the complex relationships involved. Leaving such subtleties aside, the ability to project costs and savings into a fairly long future can in these close-to-the-bone days be a precondition of wisdom.

. . . consensus about both procedures and objectives is crucial . . . educational institutions depend for their continuity and vitality on agreement about both means and ends, instruments and goals, practices and purposes.

Institutional self-education. Learning more about what things cost can be an education in itself. The value of that education won't be immediately realized, however, for both the wisdom of a decision *and* the accuracy of the information on which it was based are only known over time. To get the most out of cost analysis, then, an institution has to develop some memory cells that allow it to check the past against the present. Were projections correct? If not, why not? When past cost analyses aren't validated by present ones, what can be learned from that experience? And how can those learnings be put to use in improving the analyses and projections now being made for the future?

The answer to these questions will be different in different institutions. The chief inhibition to this kind of self-education—besides the time it takes—is likely to be similar, however. Will a finding of past inaccuracies put the learner's career in a shadow? The answer, of course, depends upon institutional attitudes about professional growth and responsible management. If it follows a model that seeks to trace errors back to their source only in order to place blame, then not many cost analysts are going to be anxious to retrace their steps periodically to check out their past judgments. If, on the other hand, the institution follows a model built on the proposition that the purpose of checking past judgments is to improve present and future ones, then both the analyst and the institution are learning and improving, and that's a wholly admirable policy to follow.

Technical and Intellectual Problems

Cost analysis has warts, shortcomings, and unsuitabilities. In this section comments are made on five technical and intellectual problems with costing in order to acknowledge them so that they can be kept in mind and set aside at the same time. Unacknowledged or vaguely acknowledged problems are like intellectual smog. They're everywhere, making situations murky and clouding results. When they're identified, they tend to lose their ubiquitous smoggy status and become instead pitfalls which the wary can avoid.

Jointness. To develop unit cost data, one must apportion to units the costs they entail. Easier said than done. The principal difficulty has its roots in the jointness or commonness of certain behaviors. If I'm talking to my wife about one of our children, am I being a husband or father? If I got paid for this activity, how would you decide how to apportion my time, or cost, between the practices of husbanding and parenting? Take, for another example, a professor working in a lab with a graduate student by his or her side. Is the professor's time going to research or to the teaching of the graduate student? If to both, in what proportions? The fact of the matter is that both activities are going on at the same time, in the same process, in an undifferentiated way. The time, effort, and cost of the faculty member in this situation is indivisible.

The very nature of most of what goes on in educational institutions is like this. Single, unified individuals simultaneously serve a multitude of purposes. To allocate their effort to different purposes can be done only arbitrarily, and "arbitrary" is a word that must necessarily strike fear into the heart of any cost analyst. Its dictionary meanings are pretty clear: "depending on will; decisive but unreasoned." Its antonyms are "fair" and "just." "Arbitrary" is so thoroughly a villain that it completely undoes NACUBO's costing standard #10: "Common cost incurred to provide two or more services should be allocated in an equitable manner."[1] That's a directive that no one can discharge. The "two or more services" are each sovereign. The choice between them is up to will, not to reason. Anything built on that choice, therefore, inherits its same qualities. Unit costs that have jointness anywhere in their family tree are seriously flawed by arbitrariness, and the flaw cannot be repaired.

Consistency versus flexibility. In any system on which one comes to rely there is the tendency to stick with it

[1] Administrative Service, Chapter 4:5 "Fundamental Considerations for Determining Cost Information in Higher Education," (Washington, D.C.: NACUBO, 1975).

rather than lose its comfortable, dependable features, and the ability to trace and compare over time. A cost analysis system that becomes elaborated and used in an institution is subject to this tendency. As it becomes used to measure performance, particularly improving performance, and as it becomes identified with a management approach, a shift away from it looks suspicious. Did the administration shift in order to hide something? Is there a bit of razzle-dazzle going on? The administration made a lot of the results before; if that method of cost analysis is no good now, maybe it was no good then?

. . . any organization whose product is a qualitative change in people and ideas must leave ample room for judgment in any and all decision making.

It takes a fair amount of effort and courage, therefore, to change one's cost analysis system. The path of least resistance is clearly to continue to operate in such a way that definitions and methods stay the same over time. If someone demonstrates that contact hours would be better than credit hours for certain purposes, or that three old categories of activity can be collapsed into two, the choice between consistency with past analyses or flexibility to experiment becomes a major factor in the decision.

This dilemma isn't news to anyone. The power of continuity always exists and is in most respects a positive force. One must take care, however, where he or she makes continuity investments. Some aspects of institutional life are more worthy of conservation than others. To prevent a cost analysis system from becoming one of the conservative themes in an institution's structuring and functioning, care must be taken that it doesn't come to have a life of its own. It's clear that that's happened when program decisions get made mainly because they'll look good in the statistics of classroom utilization, or class size, or cost. It's not likely to happen when decisions get made primarily for good educational reasons *and* according to the most economical arrangements that the cost analyses can point toward.

Measuring outcomes. At the beginning of this paper, the financial accounting definition of cost was given as the amount or equivalent paid for something of value. Moving from that definition into cost analysis, one quickly runs into the problem of the role played by the word "value" in the definition. To compare costs in terms of the outputs or products in whose behalf those costs are incurred, one has to make some sort of judgment about those outputs. The easy way out is to withhold judgment, to stipulate that one contact hour or course or degree is as good as another. Thus the burden of analytical utility is carried by the numerator—the cost data; and the denominator—the output data—makes no evaluative contribution. As a result, cost-benefit analysis becomes cost-cost analysis. Instead of comparing the cost of a Volkswagen with the cost of a Cadillac, we find we're comparing the cost of a car with the cost of a car. The danger, of course, is that some cost-cutting chauvinist becomes convinced that the lower cost unit is the model of efficiency and the higher one an example of waste or extravagance.

What happens in practice, of course, is that the denominator analysis is done after the fact. Administrators find that different courses or contact hours or degrees cost different amounts and then—stimulated by the cost-cost analysis—they engage in the intellectual task of seeing whether the cost differentials are justified. This is a very useful role for cost analysis. It is diagnostic, provocative, handy. It fits well with practical notions of accountability as well as with practical management needs. Care must be taken, however, to keep the cost analysis separate from the benefit analysis. They cannot be merged into one until the demoninators can be divided into units of value just as the numerators are divided into units of cost.

The day of the great denominator breakthrough is a long way off. However, the task of creating units of value for education is likely to be intellectually very dull and the result uninteresting, much like the medieval speculations about the number of angels who could crowd onto the head of a pin. Much more exciting is the task administrators are already well into: deciding what their purposes are, pursuing them with vigor and commitment, doing cost comparisons in order to monitor the economics of their activity, and acting to alter either the purposes or the manner in which they are pursued if economic or value judgments generate a serious challenge to the *status quo*.

The cost of costing. The cost of doing cost analysis is not trivial in at least two ways. First, it is nontrivial because it requires the development and maintenance of data bases which probably go beyond the data maintained for other reasons. Second, it is not trivial because it can generate a cost-accounting style or institutional mentality that may be as destructive in some areas as it is instructive in others.

To use costing as a means in decision making, then, one has to develop agreement on terms, methods, and the force and function of results.

Far too much has been made in higher education of data collecting and manipulating *capacity* and far too little of justification and utility. The view of "the more information, the better" has been first cousin to the growth of computer technology; the question of whether data ought to be collected and reported has often yielded the stage to the question of whether it could be done. If the answer came back yes, it was done, without the "ought" question being given the thought it deserved.

This phenomenon, often referred to as "technology-push," is like a tomcat in a bird sanctuary. Unless he is belled, he's going to become a very expensive pet to keep fed. Much of the problem has been too much feed and not enough feedback; too great a readiness to count, to

divide, to take ratios, and too great a reluctance to sit down beforehand and determine why it was desired to know certain things and what would be done with the data when it was obtained.

Detailed cost information is enormously expensive to acquire and use. Before an institution goes beyond what is already easily available, its officers should be able to describe the expected benefit to that institution's decision-making processes.

Maintaining perspective. In philosophy there's a fallacy to which students and teachers have long been sensitized called the fallacy of misplaced concreteness. It refers to an old and familiar tendency to take things that are abstract and intangible and convert them into things that can be grasped, handled, and held on to. It's easy to get caught in this fallacy, to confuse churches with man's religious impulse, courts with justice, a person's possessions with his or her worth as a human being. If this fallacy hadn't been identified before, the pressures of cost analysis would have forced somebody to invent it.

Some things simply are abstract and intangible and cannot be reduced to measurable units. Educational institutions abound in examples. A flash of insight by a scholar or student; the mastery of an idea or a method; the creation of a painting, short story, essay, or musical composition; penetration of a puzzle in nature; the discovery that an old notion has new applications; an act of self-discovery—the list is endless.

Not only is it endless, but it contains in it those episodes, events, and achievements in which colleges and universities are centered. One needs, therefore, to be alert to the all-too-human tendency to wish upon these central events more concreteness than they contain and to force them into measurable forms in order to provide the appearance of tangibility.

Pains also must be taken, after this immeasurability is recognized, not to let that which can be measured overwhelm that which cannot. A desire to believe that the information which can be obtained and quantified is therefore the information that ought to be used is a seductive one. If cost analysis is to remain a useful tool, it must be kept in its proper domain.

Models for Developing Cost Analysis

The use of costing for internal management purposes is in many respects in its infancy or at most early adolescence. The financially robust period of the fifties and sixties did not require elaborate cost justifications or audits, and management energies went primarily into building, expanding, and innovating rather than into developing the skills required now for living with and making the best out of no growth, uncertainty, and what amounts to a national pause to reappraise higher education planning.

Such times are marvelous ones to live in because of the chance they provide to influence the course of events. The opportunities for improving higher education management through the development and use of cost analysis are ripening. Taking advantage of those opportunities will require approaches that are consistent with the state of the art. Below are two models that seem promising.

The feedback model. In this approach, an institution takes a self-consciously experimental stance. Its objective is to develop, use, and evaluate costing information and then to alter and improve its approach on the basis of feedback. Building on what was said earlier about the central role played by judgments about the purposes for which cost information is collected, this model would produce some intellectually lively times for administrators as they moved into this developmental mode of operation. The questions to be asked and answered along the way should bring into sharp focus matters of administrative style and responsiveness to current issues such as accountability, steady-state administrative techniques, and professional growth.

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Such an approach steers a middle course between the twin shoals of (1) designing an information system to answer the questions that will be asked and (2) designing a set of questions to fit the information routinely produced now. It brings together in a common enterprise those who have questions and those who can provide answers, allowing needs and possibilities to influence the development of a system that is both useful and economical.

The feedback model is most appropriate in institutions with a great deal of centralized responsibility. Where the expectation falls upon the central administration aggressively to seek resources, to plan and pattern institutions to meet certain public or social needs, and to be accountable for a significant degree of programmatic flexibility, that administration is likely to participate actively in the day-to-day life of the institution. The determination of which measures will be useful is one that will involve both central and school and departmental representatives, for unless those measures can command consensus, their utility will be compromised. Feedback and cooperation are therefore vital.

The screening model. In an institution where responsibility is decentralized, where the central administration uses its authority to monitor and correct more than to initiate, where activity is distributed and central control is more a residual than active power, a screening model may be more useful in developing cost analysis into a management tool. By screening model is meant using simple and easily available cost information in diagnostic or soft-

management ways to ascertain whether and when one ought to probe further.

Consider an analogy to a medical test panel. From a sample of the patient's blood, this piece of machinery runs a series of tests that show where certain of the patient's characteristics fall in relation to norms. When some abnormal result occurs, the physician determines which analytical tool to apply next in order to learn, with sharp focus and economy, the next level of diagnostic facts. From these, he or she can assess a course of action which may oblige still more analysis or some other alternatives.

In this model, the patient is spared the expense of having the maximum tests run at each monitoring. The physician does not subscribe to the rule "the more information the better" but to a more economical version, "the less information I need to identify problems, the more attention I can give to the problems I discover."

Probably the most encouraging developments in using cost information to improve management decisions in higher education are growing out of management science, operations research, and similar perspectives.

The comparison to a college or university is easily made. An elaborate information system is likely to pay poor dividends if it is geared up to screen against narrow standards. The more sensible system senses where some unit or program is showing some nonstandard, abnormal, or otherwise peculiar results on a basic measure, say majors or enrollments per faculty member. It allows the central administration to focus there and to research in a deliberate way to get quickly in touch with whatever problems may exist. All the departments or programs that are "normal" no longer consume administrative resources, at least not until the next monitoring.

The screening model keeps administrative intervention on a human scale. No sense of decisions being made "by the numbers" develops because the diagnostic signals are very general and they trigger discussions rather than computer print-out. This model also keeps the administration in touch with institutional activities and people and inhibits the likelihood that a staff of technical analysts will come to wield power because they possess large amounts of detailed information.

Conclusion

Having followed the scenic route, it's fair to ask whether the paper has arrived anywhere. The answer is, of course, yes. We've arrived right back where we started. Whether the trip had any value depends on where we go from here.

There's a good deal of work underway in the area of cost analysis, much of it in individual institutions and designed to improve those institutions. Most of the public attention has fallen on efforts to develop interinstitutional cost analysis, and the National Center for Higher Education Management Systems (NCHEMS) has undertaken the largest role in this regard. The record of all these interinstitutional efforts is mixed; their future uncertain.

The American Council on Education has, with the Ford Foundation, sponsored a Study of Cost Analysis in Higher Education. Professor Carl Adams and his colleagues at the University of Minnesota are conducting this study, and they have been looking at past, present, and future uses in a comprehensive and promising way.

Probably the most encouraging developments in using cost information to improve management decisions in higher education are growing out of management science, operations research, and similar perspectives. Mathematical models conceived and developed in partnerships between working administrators and expert professionals are yielding practical tools for decision making and planning. These models often build on cost analysis and go beyond it. They interrelate variables in projections of the hypothetical future states that present choices would produce. The result is an extraordinarily powerful method for informing decision making in narrow and specific areas as well as in institutional planning overall.

It's far too early to predict the future place of cost analysis in higher education. One can say without fear of contradiction that its utility is limited and that those limitations have yet to be fully explored. Cost analysis is probably not as important as cost analysts think it is and more important than most others think it is. That leaves everyone plenty of room to maneuver, to experiment, to change, and to improve. This writer estimates that cost analysis will become a friendly companion to judgment, playing a backstage role: not influencing the script, the direction, or the actors, but giving clues to the producer about staging, ticket prices, and what kinds of plays he can afford to have in the repertory.

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