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COMMENTARY

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Implementing New Knowledge: The Case of Activity-Based Costing

INTRODUCTION

The implementation of new ideas and practices for managing organizations has long been studied by academic scholars and practitioners.[1] The management of the change process focuses on overcoming barriers to implementation of the new ideas and practices. Typically the barriers that oppose and obstruct change are framed as resistance at individual, group, intergroup, and organizational levels. Strategies for overcoming resistance assume that participants' interests are antagonistic to or, in some way, different from the overall company's interests. Recommended change strategies are designed to reduce these differences in perspective among those participants resisting the change.[2]

Our experiences in introducing technical initiatives into organizations suggest that the traditional explanation of resistance to change is too limited and needs to be extended. In this paper we describe the series of processes required to implement an innovative technical initiative beyond aligning the interests and incentives of participants. First, the technical theory must be demonstrably valid. Its internal consistency and external validity should be established. Then, two additional processes must occur. An "Education and Sponsorship" process enables change advocates to explore and articulate the technical merits of the new proposal, and gain senior management support for acting in accordance with the articulated ideas. If this process is successful:

1. participants learn to understand the new ideas,
2. participants believe that the ideas are valid and useful, and
3. management encourages the implementation of the new ideas.

But a successful education and sponsorship process is only a necessary, not a sufficient, condition for the new ideas to be actually used to influence decisions in the organization. A second process, "Create Internal Commitment," may be required to overcome the barriers to change from the defensive routines that participants trigger to protect themselves from experiencing embarrassment and threat from the new ideas (Argyris 1985,1990a). To overcome the barriers created by defensive routines, the second process must develop motivation for individuals to implement the new ideas and to take effective action based on their implications.

We will illustrate these two implementation processes in the context of activity-based costing. Activity-based costing (ABC) is a technical theory that emerged in the mid-1980s to provide more accurate information to man-

[1] References over the last 25 years include Argyris (1970), Hornstein et al. (1971), Zaltman et al. (1972), Goodman (1982), Huse and Cummings (1985), Porras and Robertson (1987), and Woodman (1989).

[2] For example, much of the work in the agency theory view of organizations has attempted to align incentives of participants more closely with the interests of the organization's owners.

agers about the cost and profitability of their business processes, products, services, and customers. The provision of more accurate ABC information was intended to help managers make better decisions about the use and deployment of their organization's resources. Frequently, however, even after an activity-based cost (ABC) model has revealed new insights about the relative cost and profitability of activities, senior operating managers were reluctant to act upon this information.[3] In this regard, ABC apparently attracts the same organizational resistances experienced by other technical initiatives that have been designed to improve the information available to managers.

In this paper, using the example of the development and implementation of activity-based costing, we describe the necessary requirements that a new technical theory should possess if it is to provide a sound basis for managerial action. We then document the resistances, unrelated to the theory's internal and external validity, that new technical theories encounter. We show how we can make organizational participants aware of the defensive routines that they have skillfully mobilized to block implementation. We indicate strategies that not only create awareness but also lead to overcoming individual and organizational resistance to change.

INTERNAL AND EXTERNAL VALIDITY OF THEORIES: ACTIVITY-BASED COSTING

Activity-based costing, as the provider of new information to aid managerial decision making, is a technical theory designed to stimulate management action. It shares certain features with technical theories of action developed in several other managerial functional disciplines such as finance, strategy, information technology, and human resources. These features (see Argyris 1990b) are:

> Explicit statements exist about the objectives of the new information or management process, including propositions of how to produce the intended consequences.

Statements about action-oriented theories should pass two types of tests. The first test relates to the internal consistency of the technical theory. The theory's statements are tested by specifying what can or cannot be produced by people attempting to apply the theory. To pass this internal consistency test, the ABC theory must be explicated logically and clearly so that well-informed practitioners can apply the theory consistently in a given situation. For example, different individuals should be able to build ABC models based on the same facts (arising from detailed observations or descriptions of the operating environment, including resource spending, activities performed, and demands by products, services and customers) that will produce similar (though not necessarily identical) cost estimates and predictions. To the extent that significant discrepancies between different models arise, they can be resolved through discussion and dialogue within the context, assumptions, and principles of the technical model being used. That ABC problems are now included as standard material in textbooks, and even on professional examinations, such as for the Certified Management Accounting exam, indicates that the internal consistency of ABC is acceptable for defining its internal validity.

The second set of tests about the technical theory relates to the theory's external validity. The statements specify the actions to be taken in order to implement effectively the new ideas and the expected consequences. For example, an action and consequence statement from an ABC model is:

> Activity-based costing, by providing better information about the costs of resources required to produce goods for particular customers, enables managers to achieve more profitable pricing and customer relationships.

The statements about external validity contain explicit or implicit propositions that are both causal and testable. A causal statement predicts that if managers make a particular decision or take a particular action, then particular consequences will follow. Continuing the ABC example:

[3] Examples of managerial resistance to ABC information can be found in several cases such as Cooper (1985), Kaplan (1991), and in Cooper et al. (1992).

> If managers can reduce the number of customer orders, such as by imposing minimum order sizes, the cost of handling and processing customer orders will decline.[4]

Such causal statements render the theory testable against actual events. If the predictions are disconfirmed in a given situation, one can trace backwards to see where the discrepancy began and determine whether the discrepancy arose from an error made by the practitioner or from a gap or error in the theory. Continuing our ABC example, suppose that the following discrepancy from the prediction occurred:

> A minimum order size was imposed, but the cost of resources for processing customer orders was not reduced.

The theory underlying ABC permits analysts to investigate possible explanations for the discrepancy. These explanations could include:

> An increase in the number of orders has occurred, even with the minimum order size, so that the supply of resources for order processing activities could not be decreased; or
>
> Fewer orders are being processed but the quantity of resources supplied to process orders has not been decreased; idle capacity for order processing has been created that will remain until management acts either to reduce the supply of these resources or generate more business that can be handled with resources currently in excess supply; or
>
> An error was made in estimating the cost of resources required for order processing, or in determining the cost driver for order processing activities. The ABC model needs to be revised to correct this error.

In the initial stages of developing new technical theories, such as ABC, much effort is devoted to demonstrating their internal consistency and external validity. These demonstrations are correctly viewed as necessary conditions before managers should contemplate widespread adoption and implementation. But these conditions are merely necessary, not sufficient for managerial acceptance. Even after a technical theory, such as ABC, has demonstrated that it can pass both internal consistency and external validity tests, managers may still be reluctant to adopt the theory and act in accordance with its implications. In this paper we will explore the barriers to action from theories that are not based on the theory's internal consistency or external validity.

PROCESS I: EDUCATION AND SPONSORSHIP

Our analysis starts with the initial process to introduce effectively a new technical approach. This process requires at least three different stages:

1. Education
2. Sponsorship
3. Alignment of Incentives

1. Education: Learning and accepting the logic and validity of the new technical approach

The education stage for a new technical theory follows a logical sequence of three distinct steps.[5] We will illustrate these steps with the process that occurred with activity-based costing, but one can find the identical steps used to promulgate the introduction of other technical theories of management action.[6]

Step One: Identify the gaps in existing theory and practice

For ABC, the critique of existing cost accounting theory and practice for the current technological and competitive environment occurred in the mid-1980s.[7] These critiques

[4] Or, alternatively, if managers improve the efficiency of the customer order handling process, the cost of processing orders will decrease.

[5] The perspective taken in this article is about developing and implementing new theories for managerial action. Therefore, the educational and sponsorship processes are directed at practicing managers, not to academics. Separate processes (not addressed in this paper) are required to communicate and gain sponsorship of the new theories among academic researchers and educators.

[6] For example, Total Quality Management, Cycle-Time Reduction (or, more generally, Time-Based Competition), Theory of Constraints, Competitive Strategy and Value-Chain Analysis, Market Segmentation, and Accelerated New Product Development.

[7] See, for example, Kaplan (1984, 1985); Miller and Vollmann (1985); Cooper and Kaplan (1987); and Johnson and Kaplan (1987).

documented the opportunities for new cost measurement systems in a changed competitive environment characterized by: proliferation of products, services, and customers; escalating indirect and support costs that traditional costing systems could not accurately assign to products, services, or customers; and dramatic improvements in information technology that permitted more accurate and less costly measurement of resource demands.

Step Two: Articulate a new theory that corrects the gaps

Several articles described the emergence of activity-based costing as a new approach for measuring more accurately the cost and profitability of organizational activities.[8] These articles also described the procedures and opportunities for using an activity-based approach for assigning the indirect and support expenses of production, marketing, and selling activities. The theory underlying ABC and the implications of the theory for management action emerged as experience with the approach accumulated.[9]

Step Three: Provide examples of how the new approach benefits organizations

Managers are continuously bombarded with new theories of managerial action. Many of these theories seem plausible, even logical, but the proliferation of new ideas causes experienced managers to be appropriately skeptical about the merits of any new proposal, particularly one that contradicts decades of existing practice and experience. The benefits from ABC were described initially in teaching cases about companies that had voluntarily shifted from traditional cost accounting to an activity-based approach.[10] Numerous well-attended seminars about ABC were organized by consulting firms and professional associations in Europe and North America. These seminars typically included representatives from companies who could describe their experiences (usually successful) with implementing activity-based costing in their organizations. Subsequently, books (Cooper et al. 1992) and many articles in journals such as *Management Accounting, The Journal of Cost Management*, and *FORTUNE* became available to describe ABC implementations and benefits in actual organizations.

This third step in the education process is non-trivial, since it involves overcoming some circularity that can catch emerging theories in a loop that is initially difficult to break out of. Potential adopters of a new idea sensibly want some evidence about its efficacy, payoffs, and efficient implementation procedures. But if all potential adopters demand such evidence before proceeding, the adoption, education, and benefit documentation can not proceed. Therefore, all new theories of management action require a few companies to proceed based on a combination of persuasion from the logic of the advocated theory, anticipated pain from continuing with the status quo, and faith that the new theory will produce the claimed benefits. For several of the recent innovations in operations management (such as Total Quality, Cycle-Time Reduction, and Rapid New Product Development), managers of Western companies could see the new theories in action in Japanese companies. Activity-based costing, in contrast, arose independently in only a few companies in the U.S. and Europe in the mid to late 1980s. More widespread adoption required the active intervention of researchers and consultants to produce a broader population from which implementation experience and success (and failure) stories could be documented.

Education Stage: A Summary

The three steps educated managers about the theory and practice of ABC. The education identified the need for a new costing sys-

[8] See Cooper and Kaplan (1987), Chapter 10 in Johnson and Kaplan (1987), Berliner and Brimson (1988), Cooper (1988-89), Cooper and Kaplan (1988), and Johnson (1988).

[9] The theory was articulated in Cooper (1990), and Cooper and Kaplan (1991a, 1992). Implementation details were described in Brimson (1991).

[10] These cases started to appear in Fall 1986 and were published together in Cooper and Kaplan (1991b).

tem, such as ABC, developed the propositions that underlay ABC, highlighted the decisions and actions that would be better informed with the information produced from an ABC approach, and demonstrated the opportunities for increased profits that were the likely outcomes from making these decisions.

2. Sponsorship: Persuade key individuals to lead the change process

The educational process addresses a general managerial audience. It provides a climate whereby initiatives can be undertaken in individual companies. In order, however, to get educated individuals to translate the technical concepts that have been broadcast to a general managerial audience into a project and eventually into a new way of conducting business in their particular organization, key individuals and authoritative managers in the organization must become persuaded about the value of the proposed approach in their setting. The persuasion is initially accomplished by individuals who recognize how the concepts worked in other organizations or how they might work in their own organization (step three of the educational stage). When persuaded individuals decide to implement ABC, they then become the initial champions or advocates for ABC in their organization. They attempt to recruit more champions, especially within top management and the line managers whose decisions and actions might be affected by the ABC information. The ABC advocates will typically persuade others in the organization using the same educational methods they experienced. The theory of persuasion is an extension of educational activities. In effect, persuasion is a logical, rational activity to show how and why ABC concepts work and provide benefits to the organization.

Many theorists who study organizational change stop at this process. They emphasize the need for a change champion if the technical innovation is to be adopted in the organization. Some urge that the CEO become the change champion. While desirable, the recommendation is naive in that CEOs cannot be champions for all technical innovations in their organization. Also, if only the CEO is persuaded, little effective action will occur in the organization, for reasons to be discussed later in this paper.

A recent field study of eight sites where ABC models had been developed (Cooper et al. 1992) suggested an explicit structure for sponsorship and implementation of an ABC project. The structure assigned individuals in different functional positions to specific roles and responsibilities that were intended to make the implementation of the ABC technical innovation more likely. The structure decomposed an ABC project into two distinct phases. In the first or **Analysis** phase, the ABC project receives sponsorship and an activity-based cost model of organizational expenses and profitability gets estimated. The ABC model typically reveals many unexpectedly higher cost activities, processes, products, and customers. But if the insights from the ABC model are to lead to higher profitability, the project must move forward to a second or **Action** phase in which management acts on the insights revealed from the ABC model to produce improved organizational performance.

Each phase requires people to function in four distinct roles: Advocacy, Sponsorship, Project Support, and Target.[11] The people (or organizations) serving in the first three of these roles can differ substantially between the Analysis and Action phases. The person who first becomes aware of ABC and attempts to launch an ABC project in the organization is referred to as the project's **Advocate**. This person can come from deep within the finance department, such as an assistant controller or cost analyst, or the advocate can be a senior line manager. Approval for the project, however, must come from someone with significant budgetary and organizational authority. Assuming the project was launched from within the finance organization, the person approving the project, referred to as the project **Sponsor**, could be the division or com-

[11] The same person can serve in more than one of these roles.

pany controller or a vice president of finance. After commitments of organizational and financial support from the Sponsor, the site for the pilot ABC project can be chosen, and a project leader selected. The project leader is the **Change Agent** for the project, the person designated to prove the concept and develop more accurate information about the costs of activities, products, and customers. The project Change Agent could be the initial project Advocate but could also be someone at the ABC project site, such as the Assistant or Plant Controller.

In addition to having an advocate, a sponsor, and a change agent, however, an ABC project (indeed, any project intended to produce organizational change) should also have a project **Target**, the person or group whose behavior and actions are expected to change based on the newly revealed information. The Target should not be in the finance organization. The Target could be an individual with line responsibility in operations, marketing, or engineering, who has the authority to make decisions on pricing, product mix, product design, operating improvements, or customer relationships.

In many ABC projects, however, the Target is not clearly identified at the outset of the project. In these projects, the explicit or implicit goal for the ABC project is to produce "more accurate cost information" or to reveal the "hidden profits and the hidden losses." The unstated assumption behind this goal is that once operating managers see the more accurate ABC information, they will be motivated to take prompt and effective action.[12] For many ABC projects, however, operating managers do not take any actions after seeing the ABC information. They stop at the Analysis phase and the project stalls without reaching an Action phase. As specific examples:

In the Schrader Bellows case (Cooper 1985), the marketing director (the implicit but not explicit Target for the project described in the case) rejected acting upon the information about the large number of unprofitable products, claiming:

> I am not comfortable with eliminating products just because they showed negative income. All of the relevant factors were not considered. Basically, you cannot cherry-pick the line without opening yourself up to problems with distributors [who] want to offer a full line.

The Schrader Bellows general manager also rejected any action from the ABC study:

> This is a highly complex business and one that is difficult to understand [especially] to a newcomer. ... The cost data do not tell the whole story. ... When you start talking about dropping products, you are cutting into people's territory... Often when products are dropped, the sales go away but the costs do not. .. It is difficult to eliminate overhead and very hard to believe that costs will go away with selective rationalization.

Line managers at Maxwell Appliance Controls (Kaplan 1991) were similarly skeptical of the value of the ABC information produced by the finance organization and were reluctant to act. The engineering manager stated:

> The existing ABC model is OK but it tells you about the cost of what we are doing now, or last period. The [Design] team wants a model with what-if capabilities. So the Design Team has the tool now, but is not yet using it in its deliberations. .. Right now, we seem to be depending on a diffusion process for the tool to be adopted; waiting for an opinion leader to do it, while others watch and eventually copy if it is successful.

The manufacturing manager at Maxwell felt:

> The [ABC] effort is too new for me to conclude that it has done anything significant for us. .. I'm not convinced yet that the organization is geared to making difficult decisions based on information. It took us five years to drop a product-line that we knew was not making money for us. If we're not prepared to take tough decisions, we don't need a fancy new information system. We get lots of information that is nice to have and see but we don't take real action.

The General Manager of the Farrall Corporation division (Cooper et al. 1992, 91) identi-

[12] This wishful thinking was labeled as the "Field of Dreams" strategy in Cooper et al. (1992): "If I [the ABC project leader] build the model, then they [the action-oriented managers] will come and make decisions based on the newly built model."

fied the resistance from the marketing function to the new ABC information:

> Part of the problem is that Sales and Marketing want better information to pressure Manufacturing into reducing costs. They don't yet see ABC as helping them to understand how customer decisions may drive manufacturing as well as selling and marketing costs.

These reactions clearly show the problems that can arise when newly-created ABC information is dumped onto operating executives who are not strongly committed to change. In examining the few situations where ABC information did not lead to significant organizational resistance,[13] we learned that senior operating executives had sponsored the project and were actively involved in its early stages. Also, the sites where action was taken quickly had identified the Target for the action relatively early in the project: for example, at Hewlett Packard the Target was the product engineering and design groups; at Kanthal, the Target was the sales organization. In these settings, the ABC model was specifically oriented to the information needs of people in the targeted organization. People in the targeted organization understood early in the project the nature of the actions that were expected from them (designing products with fewer unique parts at HP, increasing order sizes and reducing orders for special products at Kanthal).

If, however, the Advocacy and Sponsorship for the Analysis phase was within a staff function, such as finance or planning, and a Target had yet to be explicitly identified, then new Sponsors and Change Agents were required before decisions and actions could occur. Finance people can be advocates, sponsors, and change agents (project leaders) for the Analysis phase. The Analysis phase can also be completed without a Target specifically designated. But since the Finance group is not empowered to make decisions on processes, products and customers, it can be, at best, only the Advocates for the Action phase. The Sponsor for Action process should be an executive who can compel or legitimize a change in decisions.

The skill set, experience, and mode of operation for the Change Agent also differ substantially between the Analysis and the Action phases. The Change Agent in the Analysis phase requires analytic capabilities to develop a model and to integrate information from a wide variety of organizational data bases. The Change Agent for the Action phase must have process skills that help line managers translate the information from an ABC analysis into actual decisions, actions, and implementation.[14]

Finally, a Target who will take action must be selected. The Target should be an operating manager or group in a line organization who has the authority to make decisions and take actions.

This framework for understanding the different roles and responsibilities for managers to sponsor and support the change effort in the Analysis and Action phases of an ABC project assumes, implicitly, that traditional organizational barriers for implementing change can be overcome by getting key managers engaged at appropriate times and in appropriate roles. And, in some cases, persuading the right people at the right time to support the effort can work. But not always. Even when key people can be identified to play appropriate roles, and to sponsor strong action based upon the new ideas, organizational change may still not occur.

3. Align Incentives: Enable the change to occur in the organization

Going beyond education and sponsorship, we see organizations providing systems or structures that facilitate, reward, and reinforce effective change. Examples of such organizational enablers include employees empowered to act at the local level, reduced

[13] See, for example, the Slade and Steward company cases in Cooper et al. (1992); Hewlett-Packard in Cooper and Turney (1989) and Kanthal in Kaplan (1989).

[14] Currently, it would be unusual to find a single individual who would have both the technical skills required to be the Change Agent in the Analysis phase as well as the process skills required for the Action phase. Ideally, future managers should be trained to possess both analytic and process capabilities so that they can serve as Change Agents for both implementation phases.

managerial layering, financial and non-financial rewards for successful implementation, and information systems that produce relevant information in a timely and user friendly manner.

An example of specific organizational enablers can be drawn from the situation described in Maxwell Appliance Controls (Kaplan 1991). The divisional general manager:

- encouraged employees to volunteer for six task forces that would inform managers about how to conduct business differently to solve current operating problems,
- formed the "Gang of 35" consisting of 35 senior operating and financial managers to meet for two days each month to discuss and establish new methods for doing business,
- established more than 100 families of between 5 to 15 people who shared a common work area to do training on the line and cross-training within the family
- derived performance measures from the ABC analysis that would help employees understand actions that would improve production processes and eliminate waste that had been revealed. The measures were designed to communicate to employees the linkages between measures they could influence and the overall company goals for quality, innovation, rapid response time, and cost leadership.

The organizational enablers attempt to provide information and incentives so that large numbers of people in the organization will accept the technical change being encouraged.

Even with the best attempts at education, sponsorship, and incentive alignment, however, new technical solutions may still not be adopted in organizations. For example, in the Schrader Bellows case, the general manager and the senior marketing manager of the division, who likely had explicit incentives relating to the profitability of the division, were not persuaded that actions to rationalize an enormously proliferated product line were worth pursuing, even though the proliferation imposed high demands on the organization's production and engineering resources.

Another example of the failure of formal incentives for introducing new procedures was illustrated by a study of the director-owners of a mid-size managerial consulting firm (Argyris 1993a). The director-owners were concerned about the infighting that had developed among each other and had instituted a fine of several hundred dollars for each incident of bad-mouthing among directors. Over time they more than doubled the fine. But the fine simply drove the bad-mouthing underground. The director-owners also attempted to stop the complaining that some directors were being favored over others in the assignment of consultants, their most valuable resources, to projects. They instituted explicit procedures for assigning consultants. Again, however, the underground attempts by directors to get the best consultants on their own projects continued and again their efforts were driven underground.

External and Internal Commitment

These examples and many others that could be provided are consistent with incentive alignment being important, probably necessary, but not sufficient for constructive action to occur. The limits to incentive alignment can be traced to the distinction between external and internal commitment. Commitment refers to the amount and type of energy that individuals will devote to tasks. Individuals use two types of commitment to action: external and internal. External commitment exists when the individuals assign the causal reasons for their energy and attention primarily to variables other than themselves; e.g. to the urgings and actions of advocates, sponsors, or change agents, and to organizational incentives and rewards. External commitment is important since it establishes the organizational rules of the game for individuals; it articulates what behavior is being encouraged and rewarded. But external commitment is not sufficient if we want individuals to be active and creative problem solvers.

In contrast, internal commitment exists when the individuals assign the causal reasons for their energy and attention to them-

selves. Those with internal commitment will see themselves as personally responsible (Kelman 1989; Lewin 1951) and as initiating behavior (de Charms 1973). In contrast, those with external commitment will tend to see themselves as acting in accordance with rules set by others.

Individuals can act based on both internal and external commitment. Many individuals rely on external commitment because it is forced upon them by organizational norms and incentives. Initially, individuals first exposure to activity-based costing relies on external commitment because others are teaching them the concepts of ABC. But the best implementations will occur when individuals can create the conditions where their commitment is intrinsically satisfying and rewarding. They will seek challenges, take risks, and follow new paths that will enhance their sense of stewardship and their preference for ongoing learning (Deci and Ryan 1985; Amabile 1988).

Individuals who are internally committed tend to feel that their senses of responsibility, justice, and effectiveness are on the line. They are vigilant about detecting and correcting error, especially those that are unforeseen. They also tend to become knowledgeable about the new technical ideas, such as ABC, because they are not willing to act unless they are relatively certain that the ideas are consistent with their underlying values and their beliefs about organizational effectiveness.

One challenge then is how to overcome people's doubts and concerns about a new technical theory so that they can feel more confident that their actions will contribute to overall corporate improvement. The generic strategy outlined above is designed to provide such confidence, and incentive alignment should be appropriate so that the actions are encouraged and sanctioned by formal organizational systems. But other, more subtle forces still exist that inhibit the acceptance of new ideas even after external commitment has been created. These forces are unleashed when new technical theories challenge existing organizational norms and long-established ways of doing business. Such challenges can threaten and embarrass people who have much of their professional and self-feelings identified with decisions, actions, and organizational structures implemented in the past. We turn now to the organizational dilemmas and defenses that arise as individuals attempt to implement new technical theories.

DILEMMAS CREATED BY THE EDUCATION AND SPONSORSHIP PROCESS

In practice, the rational Educational and Sponsorship (E&S) process for implementing activity-based costing can lead to serious organizational problems.[15] These problems arise because the E&S process, when implemented well, can activate consequences that are not foreseen or expected. Because the consequences are unexpected, no plan of action exists to overcome them. For example, the recommendation to select a Target early in the Analysis phase causes the sponsoring Finance group to request the participation of operating managers in a process to which the managers are not strongly committed and about which they have little understanding. This lack of commitment and understanding in the Target group could activate organizational defenses early in the project. But if Finance does not engage operating managers early in the process, then the Finance group may have to define unilaterally the goals for the ABC project. Finance then becomes seen as presumptuous and over-stepping its authority.

An additional dilemma arises if the Finance group, during an ABC project, seizes the opportunity to become a business partner, not just the scorekeeper, in the organization. This shift in roles may be resisted by other functional areas who are not accustomed to and had not requested the Finance group to become a full business partner with them. Anticipating such resistance, the sponsoring Fi-

[15] We are indebted to Robert Putnam (1992) who, in a private memo to us, reviewed several ABC implementation case studies and identified a series of dilemmas that executives encountered in managing the implementation and change process.

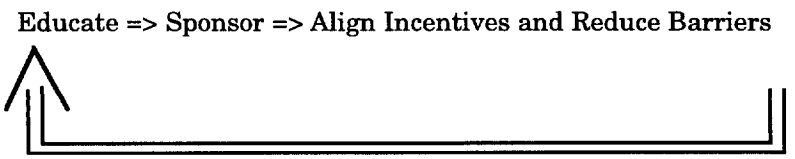
nance group can bypass this early threat to the project by not selecting sponsors and targets for the Action phase. But this bypass will create problems later when a Target individual or group is asked to act based on the ABC information that they did not help to produce or sponsor.

Organizational resistance can even develop within the Finance group itself. Many individuals in a Finance organization place great weight on serving as the neutral and objective keeper, recorder, and publisher of the numbers. People in the Finance group may have developed extensive human capital and professional feelings about serving in such a neutral, objective, and distant scorekeeping function. Such individuals may not wish to have their group's independence potentially compromised by accepting more managerial responsibilities. They may also prefer the clarity and simplicity of maintaining an objective, verifiable system of accounts, that is consistent with their educational and practical experiences. They may feel personally and professionally vulnerable when asked to design a more subjective system that meets strategic and managerial needs, not external regulatory requirements.

A further dilemma emanates from the recommendation that the Target person or representatives from the Target group be part of the Analysis project team. The representatives from the Target's organization are presumed to provide substantive expertise to guide the early design and development stages of the activity-based cost model. The Target's representatives on the ABC project team are also presumed to become the knowledgeable and enthusiastic ABC project advocate within the Target organization. The ABC model that emerges from the Analysis phase, however, will likely be more complex than the existing, traditional cost system and will have required a multitude of judgment calls that are fully understood only by those who participated on the project team. Including diverse functional perspectives on the project team, early in the project's life, can increase conflict, lengthen the Analysis phase, increase the project's cost, and force the project team to "lowest common denominator" compromises in the model's scope and design. Senior line executives, in the subsequent Action phase, will be asked to stake their managerial reputations and their organization's economic health on a model that may still be a "black box" to them, though they will now be aware of controversies and close calls that are still being challenged by those whose interests are threatened by the implications of the ABC model.

In summary, seeking to identify the sponsor and target for the Action phase, when the project is just beginning the Analysis phase and before it has produced any numbers or demonstrated any proof of concepts, may threaten the project before it begins. But not seeking sponsorship early may condemn the project to irrelevance or subsequent organizational resistance to act.

To summarize, the initial process for implementing ABC (and technical innovations arising in other functional disciplines) can be described as:



This process is rational. It assumes that learning the concepts related to ABC and learning where they have worked is adequate to stimulate the choice to implement. Organizational incentives are put in place and sponsorship and involvement of key managers are mobilized to reduce potential barriers to implementation. Effective implementation is assumed to follow from knowledge, enabling, and the

power to legitimize the acquisition of knowledge and to act. But the process can lead to embarrassing or threatening situations that may undermine successful implementation. We turn to these issues for the remainder of the paper.

THE LIMITATIONS OF THE EDUCATION & SPONSORSHIP PROCESS

Let us now assume that an appropriate sponsor has been chosen who has significant budgetary and organizational authority; that a senior financial executive is an enthusiastic advocate; and that a change agent is selected who is capable of developing an acceptable ABC model. How can these individuals act to gain commitment from a Target organization to act upon the newly produced information? The answer depends upon how we wish the target individuals and organizations to react to the implementation of the ABC concepts and practices.

If we desire that the Targets perform the ABC concepts in an acceptable but mechanical way, as they have been instructed, then the generic model described above can be effective. For example, managers may be directed to raise prices or eliminate products and customers that are revealed to be unprofitable by the analysis. If, however, the target, say a senior executive in marketing, based on his experience and judgment, believes that raising prices or dropping products or customers is unwise, he will resist acting and, instead, mobilize defensive routines directed at the ABC effort. These defensive routines, if not overcome, will reduce the effectiveness of the generic model in gaining acceptance for the new approach. If, however, we wish not only to overcome the defensive routines that block action, but want to have the target managers develop a sense of vigilance, to detect and to correct errors in the ABC model and to significantly re-frame the actions that should be taken based on the ABC information, then the generic model is going to be severely limited.

The activation of defensive routines, at any level, indicates that the information and/or the proposed changes in management decisions and actions have triggered embarrassment or threat. We have observed in numerous situations how the information from an ABC analysis can be highly embarrassing or threatening to certain participants by revealing that past and continuing organizational decisions and practices are either contradictory or erroneous. For example, the analysis could reveal that certain favored product lines or customers are highly unprofitable. The product managers responsible for introducing and maintaining these product lines, or the account managers responsible for the highly unprofitable customers, become threatened by the quantitative and defensible evidence of their value-destroying activities. As another example, the revelation of large expenditures on non-value-added and wasteful activities will threaten the reputation and self-image of, say, manufacturing managers who are responsible for improving quality and productivity. Or the ABC analysis could reveal the existence of substantial excess capacity in many organizational activities and processes. Managers could be embarrassed by the explicit recognition of excess capacity in areas under their authority and their inability to either provide the additional production and sales volume for these capacities or to eliminate the unneeded resources. Financial managers become threatened when the distorted and overly aggregate information from their traditional cost and performance measurement systems are revealed to have led to bad decisions on products, customers and services and to a lack of focus on reducing wasteful activities.

Extensive research has shown that managers facing embarrassment and threat from new information, or from a new theory of managerial action, will engage in defensive routines to deny the legitimacy of the analysis (Argyris 1985). The defensive routines are designed (skillfully) to inhibit the discovery of the underlying causes of the embarrassment. These defenses, unfortunately, block learning and over-protect the participants from feeling responsible for the consequences (Argyris 1986, 1990a).

The Schrader Bellows case (Cooper 1985) discussed earlier provides a specific example of this behavior. The ABC project at Schrader Bellows was sponsored and implemented by the Vice President of Strategic Planning of the corporate holding company. Through the authority and resources he had from his corporate position, he by-passed authoritative divisional managers and went directly to the factory to develop the ABC model. As revealed late in the case study, he did not seek approval or pre-commitment from the senior divisional managers to the actions he thought would be required once the large number of unprofitable products were revealed. He avoided an early confrontation with these managers by concentrating on building an analytic and defensible model of operations. We know that he anticipated questions from senior managers about the validity of the analytic model and sought to inoculate himself from such questions by asking the analysis to be confirmed independently by the controller and the data processing manager. Ultimately, however, the analysis was still rejected by the division executives. The V.P. of Strategic Planning had only postponed the confrontation, not eliminated it. Moreover, by postponing the conflict and ultimately raising the debate as a conflict between an analytic, rational approach versus the executives' ignorance and resistance to change, he provided an excuse that absolved himself from blame for the lack of effective action. A more subtle indication of the defensive behavior of the analytic ABC champion is the matter of fact way he accepted the resistance of the senior executives as normal and predictable. Not only was he able to predict their counter-productive behavior, he also predicted that it would persist.

In every change that involves the introduction of a new technical theory of action whose correct implementation could be embarrassing or threatening, the advocates, sponsors, change agents, and targets who use the generic implementation approach will still face the challenge of dealing with the defensive reasoning of organizational participants, including themselves. Thus, along with developing knowledge and acceptance of the technical aspects of ABC concepts and procedures, managers must also learn to deal with the embarrassment or threat created by an ABC implementation.

Individuals differ in how they learn about new technical concepts and in how they learn about and cope with embarrassment or threat. Implementing ABC as a technical theory of action requires that individuals use productive reasoning in which ideas are tested in a way that is independent of the logic used by the participants who are advocating the implementation of the technical theory. Most individuals deal with embarrassment or threat, however, not with productive reasoning but by using defensive reasoning. In defensive reasoning, individuals' primary objectives are to protect themselves from experiencing embarrassment or threats, not to learn. The defensive reasoning is not designed to produce independent rigorous tests of the claims being made. For example, an individual who argues for a position by stating, "Trust me, it will work as I say it does," has crafted a statement that requires the receiver of this message to accept the experience and reasoning of the individual who made the statement.

Why should issues involving embarrassment or threat lead to this different form of reasoning? The answer is because of (1) theories of action individuals learn early in life to deal with embarrassment or threat and (2) organizational defensive routines.

THEORIES OF ACTION: ESPOUSED THEORIES AND THEORIES-IN-USE

Individuals hold human theories of action they use to deal with others. They have two kinds of theories of action: the theories they espouse and the theories they actually use. *Espoused theories* are the values, beliefs, and attitudes individuals express when questioned. Individuals genuinely believe in their espoused theories even when their actions are inconsistent when them. For example, individuals may espouse (claim) that they are open to comments and criticism but then become upset and shut off discussion when others say

things that the individuals did not expect or want to hear.

Theories-in-use contain the rules that individuals actually follow when they design and implement their actions. Human theories-in-use advise individuals to bypass embarrassment or threat (e.g., be diplomatic, sound caring, do not say what you believe will upset others). This advice can only work, however, if individuals cover up that they are acting according to these rules. They cannot say, "I am acting this way in order to save your face," because then they would be violating face saving. These theories-in-use lead to behavior that is undiscussable and to the undiscussability of the undiscussable behavior (Argyris 1982, 1990a).

The behavior associated with the theories-in-use is skillful behavior that has been learned early in life. Because it is skillful, the behavior is activated automatically and spontaneously. It is taken for granted. Thus individuals are often unaware of their actions (while acting). To pay conscious attention could mean that the individuals could not act quickly; the world would pass them by. Their unawareness of their behavior, therefore, is not due to a hole in peoples' heads. It is due to skillfulness. One might say the price of acting skillfully is to be unaware of the consequences of one's actions as the actions are produced (Argyris 1993a).

We can illustrate these claims with a specific example.[16] Recently we taught in a program on strategy, cost and operations management to 36 financial managers.[17] We used a case method designed to get at individuals' theories-in-use as well as the defensive routines found in their organizations. Prior to arriving for the program, we asked the participants to identify a problem that they had sought to solve (or will seek to solve) that was likely to be embarrassing or threatening to the players in their organizations. Not surprisingly, given the context of the course, almost all participants submitted cases where they were trying to change old financial and accounting practices by introducing new concepts and systems.

The participants were asked to describe how they attempted (or would attempt) to overcome the barriers they had identified. They were asked, in the main part of the assignment, to write on two to three double spaced typewritten pages their conversations, thoughts or feelings about overcoming barriers. Each page was to be divided into two columns. In the right-hand column, the participants would describe the conversation that they had (or would have) with the individuals who resisted the new approach. In the left-hand column, we asked the participants to write any thoughts and feelings that they had (or would have) but that they did not (or would not) communicate, for whatever reason, to the individuals with whom they were speaking (see typical such dialogue on next page).

In class, we used a collage or composite of the participants' cases. We first presented them with a list of the statements that had been written in their left-hand columns, statements of thoughts and feelings during the conversations that they did not communicate. Examples of such statements included:

Be careful, don't let these groups get you upset. They are defensive.
Remain calm. Stick to the facts.
Will he *ever* be able to manage?
He hasn't listened to me. Say something positive.
A typical excuse.
Absolutely wrong.
Nonsense.
He is baiting me now.

[16] This example is exploited in detail to explicate the inconsistency between espoused theories and theories-in-use, but the inconsistency is not unique to this example. In fact, the inconsistency is highly consistent. The same outcome has occurred in hundreds if not thousands of experiments, performed in different contexts, among participants from different cultures, and from all types of organizations (private manufacturing, service, and consulting companies as well as not-for-profits, and government agencies).

[17] The individuals included both males and females, whites and minorities, and citizens from North American, European, Asian, and African countries.

Writer's Thoughts and Feelings	Conversation
Say something positive.	Writer: Thank you very much for seeing me. I know how busy you are.
Like heck it is. I know you believe I am a pain to you.	Other: It is always a pleasure to see you.
	W: I would like to talk about a new idea I have on the use of ABC concepts and practices.
Since when have you become so positive. You have been bad-mouthing ABC ever since individuals began to support it.	O: I'm all ears. That is a new, promising view of costing.
Be cautious about ABC and deferential about O in order to reduce his defensiveness.	W: In my opinion, it is time that we re-examine our costs. Maybe ABC is not the best way. If you know of a better one, I should like to hear about it. But I am positive about ABC.

The list contains (1) evaluations (wrong, nonsense), (2) attributions (they are defensive, he does not listen, he is baiting me), and (3) orders to one's self (be careful, remain calm). The individuals who crafted these statements appear sure of their validity. There is no indication of a need to test their validity.

These inferences were supported by the class members. We asked the class members (who had written the cases) what conclusions they would reach about the individuals who had written such statements. They were being asked to judge the lists which contained their own comments. They responded:

They are opinionated.
They act as if they are right.
They are frustrated and angry.
They are entrenched.
They are avoiding conflict.
They are not listening.
They are fearful.
They show lack of empathy.

When the participants read their own comments, they were surprised by how negative they seemed. Most of the participants intended their comments to be positive. Some attempted to deny the inconsistency by saying that they had been tricked. When asked to identify what the faculty member did or said that was a trick, these individuals said that they were unable to remember. But, they certainly felt tricked! When asked if they would like to have the tape (of the class) replayed, they either said that it was not necessary or concluded that they may not have understood the faculty member's actions.

After an extended discussion the faculty made the following summary comments. These comments represented, in effect, the theories-in-use that could be inferred from the participants' cases.

- People carry on private conversations when they think the situation is embarrassing or threatening.
- People censor these conversations and then act as if they are not doing so. In so doing, they make these thoughts undiscussable and their undiscussability also undiscussable.
- People make attributions and evaluations about others that are not tested; indeed in most cases they are not even testable in a relatively objective manner.

- People seem to use a pattern of reasoning that advises them to be rational, be positive, and to suppress negative feelings. They do this in order to appear to be in control; to win and not lose.

Participants unanimously concurred with the diagnosis. What surprised the executives was that these features went contrary to the positions they espoused about themselves when dealing with human beings. Some said that their reaction went beyond surprise: they were feeling embarrassed. Others agreed but added that they felt stuck because they saw no other way to act. If asked to write such a case again, they would produce similar lists.

In this case, the individuals were unaware how defensive they had been while writing their cases. This unawareness is due, as we will show below, to skill and not to ignorance. The good news is that the individuals were able to see their unawareness the moment we showed them the list. This capacity to become aware of one's skilled unawareness is important for designing change programs.

MODEL I BEHAVIOR

The reasoning exhibited in the "left-hand side column" of the participants, which is referred to as Model I behavior (see Argyris and Schön 1974; Argyris 1982, 1985), is consistent with the behavior studied in many different situations involving, to date, over 6,000 individuals ranging in ages from 12-70, male and female, majority or minority, wealthy or poor, well-educated or poorly educated, and from countries and cultures around the world. Model I behavior has four governing values: (1) be in unilateral control, (2) strive to win and not to lose, (3) suppress negative feelings, and (4) strive to be rational. Two of the most prominent action strategies emanating from Model I behavior are: (1) make evaluations (e.g., they're opinionated, he's not listening) and attributions (e.g., he or she is frustrated, entrenched, fearful, avoiding conflict) in ways that are likely to keep you in control and to win, and (2) to suppress negative feelings (e.g., the private orders participants gave themselves to be calm, stay cool).

The intention to be in unilateral control and to suppress negative feelings also was clear from the dialogue in the classroom. When the writers stated their thoughts and feelings in the classroom about the thoughts and feelings in the cases, they did so in ways that were opinionated and did not invite inquiry (in the classroom).

One especially useful and revealing intervention that can be done in real time is for the facilitator not to challenge a speaker after he has made a speech, but to ask others in the class or group how they felt as they heard the speaker express an opinion. The results are invariably educational to the speaker. For example, at one ABC implementation meeting a consultant volunteered how he handles organizational resistance. Included in his speech was, "I tell the people that ABC is a logical rational way for assigning overhead costs to products. It avoids the distortions that arise when using your traditional cost system." The faculty/facilitator immediately asked the audience what they were thinking during this speech. Several hands shot up, one respondent stated, "I felt that I was back in the second grade, being lectured to by my teacher." Others in the audience concurred. The consultant was surprised; he had intended to be helpful.

Using this intervention in the class of financial executives, the faculty member pointed to the list of comments drawn down the left-hand side of their cases and asked the group, "If your were on the receiving end of such comments, how would you feel?" The class members responded that they would feel defensive. But they added immediately that they would not have crafted the comments the way they did if they were dealing openly with someone in a face-to-face encounter. The comments would activate negative feelings which, in turn, could lead to a loss of being in control. They would be more diplomatic. For example, if respondents (R) raised objections, the writers (W) would respond as shown below, keeping private their thoughts and feelings expressed in the left-hand column:

Thoughts and Feelings	Actual Conversation
	R: I am concerned that using ABC may prevent me from introducing new products or carrying existing products that show a loss
W: You guys come up with more excuses that make no sense. You do this all the time.	W: You can still have the ability to do what you want to do. I will show you how to explain these unprofitable products.
	R: If we reduce our product line, we could alienate some of our customers.
W: If we kept every product we ever introduced, we would lose our shirts.	W: Your concerns make good sense. I promise you that your sales will not be harmed.
	R: Perhaps we should wait until we're really sure the organization is ready for this new approach.
W: Delaying again? Can't they see the benefits?	W: I think that we should start to take advantage of the new system, but keep an eye out for any glitches.

It is now possible to see why the consequences of Model I behavior are often the basis for misunderstanding and miscommunication. Important information is withheld; messages are sent that are "positive" but incorrect; and all this misinformation is covered up. The irony is that often the cover-up is transparent. For example, several of the financial executives said that they could recognize when they were receiving such mixed messages from others but (consistent with Model I) they would act as if they did not think there was a cover-up. They covered up the other's cover-up. Thus another consequence of Model I is escalating and self-reinforcing errors.

ORGANIZATIONAL DEFENSIVE ROUTINES

Model I theory-in-use leads directly to the development of the organizational defensive routines described earlier. Organizational defensive routines make defensive reasoning the hallmark of being savvy and of surviving. Those using defensive reasoning assert that their arguments are valid. They craft their arguments in such a way that they can only be tested by using the same defensive logic that they used to create the claims in the first place.

For example consider a statement made by a manager as he resisted an ABC project in his company:

> It is better to fail with existing procedures than to fail trying something new, especially where business is OK and no one is really up against the wall. Believe me, I know.

The manager is exhibiting defensive, anti-learning reasoning in two ways. First, he advises a designed failure rather than a failure that is a consequence of genuine experimentation. Second, he asks the listener to accept his statements as true because he says it is true (a good example of self-referential, self-sealing reasoning).

As another example, a manager declared:

> People are more used to managing expenses than the behavior that drives the expenses. That's the reality of organizational life.

This statement is also anti-learning. While it may be empirically true that most people manage expenses rather than the causes of the expenses, the manager's statement argues against the possibility of such new behavior because he did not have prior experiences with people trying out such learning. Maybe people are quite capable of and interested in examining the causes of expenses, but attitudes, like the one described above held by superiors, will prevent them from doing so.

The class participants' left-hand column cases were replete with examples of such organizational defensive routines. For example:

- Here we go again. Typical of them. It didn't work before so it will not work again.
- That whole department is paranoid.
- Here comes another time consuming meeting. Why do we have them even though no one wants them?
- It's our culture. It says, "If we did not think of the idea first, then it is unlikely to be of any value."
- They see us as outsiders infringing on their turf.
- I am going to scream if I hear one more time, "because that's the way we have always done it."

All these statements illustrate defensive reasoning; they make attributions about reality (the department is paranoid) that are crafted in ways that indicate little interest in learning. Secondly, they indicate activities that no one wants, yet they persist. Thirdly, they indicate we-they relationships that are counterproductive, yet the relationships exist and persist.

These organizational defensive routines act to reinforce the financial executives' Model I theories-in-use. The routines create self-sealing, self-fueling processes that inhibit genuine learning and problem solving. And, all this is typically undiscussable; the undiscussability is taken for granted; and that leads to systematic unawareness.

There is a puzzle embedded in the use of defensive routines. On the one hand they are omnipresent and powerful. On the other hand, they are not, to our knowledge, taught formally. There are no company newspapers describing the organization defensive routines with pride; there are no courses (within companies or universities) explicitly educating individuals in how to produce effective defensive routines. Defensive routines, of course, cannot be taught formally because they violate the precepts of formal managerial theory and stewardship. Their omnipresence is sanctioned by organizational defensive routines and other critical features that have to be kept covert.

OVERCOMING MODEL I BEHAVIOR: LEARNING MODEL II REASONING

We have found that the first step to overcome defensive routines is to help the participants become aware of the degree to which they use Model I reasoning and the degree to which they remain within the constraints of the organizational defenses. As we illustrated in the case studies prepared by the executive program participants, we can create a learning environment that leads to a new level of awareness including how skillfully unaware the participants were in producing the consequences that they did not intend. The next step is to introduce a new model of behavior, Model II, to help participants reduce unintended and adverse consequences.

The governing values for Model II behavior are to (1) produce valid information, (2) encourage informed choice, and (3) monitor vigilantly one's actions to detect and correct errors. The action strategies still include making evaluations and attributions. However, the strategies are crafted to encourage inquiry and testing (consistent with producing valid information and informed choice).

The left-hand/right-hand cases can be used to begin this learning. For example, we can place seven to 12 individuals in a seminar (for

best results, selecting individuals who work together). The seminar is structured around cases prepared by the participants themselves. One individual presents a case. The others act as consultants to examine the effectiveness of the action. In this process we focus on helping the others, in their role as consultants, examine their actions and learn more about their respective theories-in-use, and to develop the skills for Model II reasoning. One important role for the faculty member is to help the participants recognize any unrecognized inconsistencies. For example, one participant advised the writer of the case that the conversation he wrote indicated that he was opinionated and insensitive. The faculty member intervened to examine the degree to which crafting the advice this way was also opinionated and insensitive.

Next, individuals strive to re-craft their conversations consistent with Model II. This leads to a new dilemma. If they craft it consistently with Model II, they will be crafting conversation to promote learning and testing, but such conversations may be viewed as uncomfortable by individuals who live in a Model I world. The conversations could be experienced as uncaring and unsympathetic. For example, a writer's unspoken thought, described earlier, "If we gave you everything you asked for, we would lose our shirts," could be expressed as:

> I am finding it difficult to accept the request you have just made. If I understand you correctly, we have no mechanism for ever eliminating a product or product-line, in which case I think we would eventually incur substantial losses. What is the reasoning behind your request? What ideas do you have that question the validity of my concerns or that deal with them directly?

Or, to the hidden thought that the respondent was "delaying again," the writer could have said:

> I agree that we should be careful about introducing the new system. But I would like to deal with your concerns in ways that do not become barriers to action. How would you react to the two of us developing a joint action plan where we will both be diligent about monitoring and correcting any glitches that arise, but where we can still start to introduce the new system?

These conversations communicate the thoughts that individuals had previously felt but had censored so that they would not be expressed. But the conversations are designed to help the individuals explore the organizational defensive routines that allow the overprotective defensive reasoning of Model I to persist. The individuals are now widening their perspective to include the long-run benefits to the organization from acting using the insights from the new technical theories.

As individuals begin to learn Model II reasoning, they also build a new level of respect for each other. For example, they learn that the attributions they make about the inability of others to listen to difficult feedback is either wrong or, if correct, is correctable. Working through these distortions leads to a new level of trust because the learning requires making one's self vulnerable. Individuals learn how to make themselves vulnerable to facilitate learning without feeling weak.

This, in turn, activates all sorts of mini experiments that enable the undiscussable to be discussed and the unchangeable to be changed. For example, the directors of a management consulting firm initiated a change program by studying their own behavior. They identified several key problems that could prevent them from achieving their aspiration of creating a new type of consulting firm that would add more value to clients than the competition. The problems included counter-productive director politics; the existence of "weak" and "strong" directors (and, especially, the undiscussability of this "fact"); and the undiscussability of ownership issues. All these issues became discussable, were resolved and new relationships and trust created so that new issues, as they arose, would also be resolved. The directors, after five years, continued to strengthen their learning (Argyris 1993a), a process described, in the *Financial Times* (London, June 2, 1993, 12) as unique among change programs because it did not

skirt the difficult issues of organizational defenses and politics.[18]

PROCESS II: CREATE INTERNAL COMMITMENT

Returning to our case study of implementing activity-based costing, if individuals have doubts about ABC, they are encouraged to express them. ABC advocates should not attempt to overcome the doubts of these individuals through persuasion about going along with the new approach or through organizational directives. Such attempts will, at best, produce acquiescence but not full commitment to an ABC implementation. Instead, the doubting individuals can be encouraged to design experiments through which their concerns can be subjected to tests. For example, recall the concerns (quoted earlier) of various executives about following the recommendations from an ABC analysis. One did not want to upset distributors that he felt preferred to have a full line of products to sell. Another expressed his concerns that costs often do not go down as the analysis predicted. Another doubted that the organizational participants could develop a mind set required by ABC (or other new managerial disciplines). Still another expressed mistrust because he felt that ABC was likely to be a subterfuge for dealing with inter-functional warfare.

These doubts are an excellent basis for mini-experiments whether they be thought, paper and pencil, or policy and behavioral experiments. The alternative and unlikely-to-succeed approach is to react by saying "trust us," "you do not really understand; let me explain again the theory of ABC," "that is not the fault of ABC," and "climb aboard and give it a chance." These reactions may eliminate overt resistance and produce external commitment, but will not build an internal commitment in the doubting individual.

The underlying logic for building internal commitment to ABC is to create change situations where data exists or can be created so that statements can be tested. This does not mean that individuals will not become defensive. Defensiveness can be productive. Human beings, whose values and beliefs are being questioned, are being reasonable when they respond defensively. The key is to use the defensive reactions as a basis for learning (Argyris 1982). For example, consider the response that said:

> Often when products are dropped, the sales go away but the costs do not .... It is difficult to eliminate overhead and very hard to believe that costs will go away with selective rationalization.

This reaction is not only normal; it is correct. The costs will remain unless managers take positive actions to eliminate them. Therefore, rather than argue with the managers, the ABC advocate can interpret their reactions through the lens of ABC theory; for example:

> You're exactly right. We should not drop any products unless we can first identify the resources we are presently supplying to support these products (the schedulers, the setup people, the purchasing people, and product managers) that will no longer be needed were these products not to be produced and sold. If we cannot eliminate these resources, and therefore stop spending on them, or, alternatively, and better, replace the sales of the dropped products by substituting more profitable new or existing products, then we should not drop products.
>
> Only when we are sure that we can replace the lost revenues either by larger amounts of lower spending or by increased revenues of other products that do not add to resource demands should we drop the unprofitable products. I believe that the ABC analysis should help us to identify the resources no longer needed for dropped products, or to assure us that increased sales of alternative products will not require supplying more support resources in the future.

To the individual who said:

> I am not comfortable with eliminating products just because they showed negative income. All of the relevant factors were not considered. Basically, you cannot cherry-pick the line without opening yourself up to problems

[18] In a follow-up interview, the CEO of the consulting firm described the new organizational processes that had been implemented in the organization, as well as the new challenges for the future (*Financial Times*, London, July 2, 1993, p. 11).

with distributors [who] want to offer a full line.

a possible response is:

It is reasonable to be concerned about the distributors reactions. I would not want to save money by alienating our key distributors. Why don't we discuss with them whether all of our products are valuable to them. If it is costly for us to produce such a full line, it may be costly to them to sell and support all the products as well. Perhaps they already feel we are offering too many products. We can test whether they would be willing to accept existing products as substitutes for some low-volume products, or institute price surcharges for special orders.

These responses do not require skeptical managers to re-assess their underlying beliefs or values. But the responses engage them by using ABC concepts to address the logic and implications of their concerns. Because the ABC model is designed to be a model of economic reality, managers' concerns can be interpreted and addressed with economic arguments and testable implications about how proposed actions will affect future cost and profitabilities.

These conversations, in fact, illustrate a new approach that had not emerged in previous approaches to create "Model II" reasoning. Previous literature on overcoming defensive routines that arise in response to embarrassment and threat has emphasized the necessity of getting managers out of the rational, technical mode of learning (labeled as "single-loop learning" in previous literature) where change proponents try to educate and persuade resisting managers about the technical virtues of the proposed change. The case studies, where financial managers wrote actual conversations in right-hand columns and thoughts and feelings in left-hand columns, were designed to stimulate a different type of learning (referred to as "double-loop learning") in which individuals learn to question their governing values and beliefs (Argyris 1991). Single loop learning, in contrast, maintains discussion within the status quo of assumed assumptions, beliefs, and values but does not challenge whether these assumptions are being violated by the individuals' behavior or by the organizational defensive routines.

The simulated dialogue to allieviate the concerns of managers who were concerned about the recommendations derived from the ABC information remained within the technical assumptions of the ABC analysis. But in this dialogue, the ABC advocate attempted to avoid activating defensive reasoning by exhibiting a willingness to subject the recommendations from the ABC analysis to jointly designed testing and evaluation. For such a process to be successful, the advocate or inquirer must have considerable knowledge and confidence about the technical theory. The advocate must know the theory well and be able to design and implement suitable tests of the theory. This knowledge includes knowing the circumstances where the technical theory is not appropriate to apply. For example, the advocate can acknowledge that an ABC analysis is not needed to obtain the relevant costs for short-term scheduling of a factory or for making short-run, incremental decisions on pricing and order acceptance. The advocate must, in addition to having mastery over the technical and practical aspects of the theory, be skilled in framing questions and responses that lead questioning managers to productive reasoning about the technical theory, without triggering defensive reactions. The questioning managers, who may still be working within their Model I framework, must themselves be committed to testing the validity of the technical theory. This process of jointly examining assumptions and testing for consequences of a technical theory attempts to generate the same productive reasoning as the reflection and examination of individuals' left and right-hand side case studies. Thus, the emerging experience with implementing an internally consistent and externally testable technical theory is demonstrating how a skilled advocate can generate productive reasoning by working within the theory's framework. The organizational defenses, skilled unawareness, and undiscussability that normally arise with implementing change programs are dealt with effectively through the skilled inquiry process, without requiring the more elaborate processes to learn Model II behavior.

If, however, because of personal defenses triggered by the potential for embarrassment and threat, the questioning managers have no interest in genuine tests of the technical theory, then even this rational process of inquiry and testing will not work. This situation is now outside the ability of the advocates of a technical theory to generate valid tests of the theory. This situation arises from the Model I theory-in-use of the resisting managers and associated organizational defensive routines. Changing such a situation requires double loop learning experiences, like the two-column case studies, described earlier in the paper.

In summary, if managers who feel embarrassed and threatened by the implications of the ABC analysis are willing to temporarily set aside such feelings in order to test the validity of their reasoning that lead to their feeling embarrassed or threatened in the first place (Argyris 1993b), a rational inquiry process may be sufficient to gain internal commitment from them. These managers must feel a genuine commitment to the health of the organization and to the valid testing procedures that can address their resistance, even though they may also feel embarrassed or threatened. The managers must judge that the analytical and testing methods are relatively objective and valid. If, however, the organizational, group, and inter group defenses are extremely powerful, the defenses can still make a "rational" approach appear irrational and ineffective. In such cases, reasoning methods leading to Model II behavior will likely be required if resisting individuals are to become persuaded and internally committed to the merits of the new approach.

SUMMARY AND CONCLUSIONS

We have summarized the necessary preconditions for implementing any technical theory of managerial action. After gaining confidence about the theory's internal consistency and external validity, the initial process requires three interdependent phases: education, sponsorship, and incentive alignment. The outcome from this process may reveal that previous decisions and actions (or inactions) were in error. We have shown, using the example of activity-based costing that revelation of such "error" frequently produces organizational resistance and defensive behavior by individuals and groups who are embarrassed or threatened by the consequences of the new approach.

Actions based on the new approach can be mandated by a senior line manager, so that the manager could claim that the organization is indeed using activity-based costing. But if subordinates are implementing the concepts only because of the mandate from the senior manager, there will be less vigilance, learning, and continuous improvement in implementing the approach. As a consequence, the impact and persistence of the implementation will be lower than hoped for and expected. When managers implement a new approach because of externally-generated incentives and authoritative mandates, they will hold the senior manager responsible for monitoring and maintaining the effectiveness of the change process.

We have suggested two reasons why such discrepancies and self-limiting features have not been dealt with effectively in attempts to implement ABC. First, as with any change process, defensive routines at all levels of the organization become activated, the routines are systematically by-passed by all involved, and their by-pass of the defensive routines is itself systematically covered up. This behavior leads to the undiscussability of important issues with this undiscussability also being undiscussable. Second, human beings appear to be systematically unaware of their own skilled incompetence when dealing with issues that are embarrassing or threatening. This systematic unawareness is protected by socially-sanctioned virtues of being realistic, caring, and acting diplomatically.

The usual approach for dealing with organizational resistance and defensive behavior requires the participants to agree to engage in a complex learning process designed to create awareness of how their "theories-in-use" conflict with their espoused theories. With technical theories, such as activity-based costing, however, an alternative mechanism ex-

ists. The defensive behavior can be used productively as a basis for generating questions and tests about the theory's implications. This alternative mechanism requires advocates to be knowledgeable and skilled so they can pose questions and tests of the theory's assumptions, statements, and prescriptions. Through careful intervention, the advocates can attempt to engage doubting managers in productive discussions designed to generate tests of whether the technical theory can indeed lead to improved performance of the organization. The ability to provide valid and observable tests of the theory reduces the likelihood that defensive routines will be activated to block the theory's implementation.

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