

Winter 1997

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Recommended Citation

Veliyath, Raj, Heather M. Hermanson, and Dana R. Hermanson. "Organizational Control Systems: Matching Controls with Organizational Levels." *Review of Business* 18.2 (1997): 20,20-24.

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Organizational Control Systems: Matching Controls with Organizational Levels

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Companies today face a number of risks, such as environmental liabilities, losses from misuse of derivatives or harassment suits, which underscore the need for better control systems. However, increasing control in an organization can stifle creativity and entrepreneurship. Clearly, there is a tradeoff between having too much versus too little control. However, in addition to the amount of control, the mix of controls is important in maintaining the right balance within an organization. We propose a framework that should help managers determine the appropriate matching of control types and control levels in their organizations. The matching is discussed for both "traditional" companies and "modern, information-age" companies.

Introduction

The process of control traditionally involves four steps: (1) goals or objectives, (2) implementation programs and policies, (3) measurement and comparison of outcomes against targets, and (4) corrective action [11]. In other words, a system is out of control when the actual outcome does not match the standard. In this case, the system is brought under control either by changing the actual performance or by revising the standard.

From an organizational standpoint, control promotes coordination across departments as well as among hierarchy levels. The control process helps to align individuals' incentives with those of the company. In addition, control reduces risk by offering early warning of potential problems and providing a larger window of opportunity for corrective action.

The absence of adequate controls can have serious organizational consequences. Problems such as defective products or poor coordination within the company often can be partially blamed on weak control systems. Some problems, like IBM's failure to see the shift away from mainframes in the computer market, can occur over a period of several years in the form of a series of small missteps [5]. Even minor control lapses, such as a lack of foresight, can do a great deal of damage over time.

Undoubtedly, inadequate controls are an organizational weakness that can allow many problems to occur. Conversely, too much control also can be counterproductive. First, there is the up-front expense of installing control systems. Control is a support activity which does not directly contribute to value added or the organization's bottom line. Second, there is the added cost of reducing the organization's flexibility and innovation. These qualities are especially crucial in more dynamic and volatile industries.

Maintaining an optimal balance between stability and flexibility is a major challenge for managers [6]. While some control is necessary for efficiency and cost effectiveness, too much may restrict flexibility. Therefore, an appropriate amount of control is important for maintaining the balance, and a proper mix of controls is crucial.

Types of Control

Every company takes an input and transforms it into an output, a "transformation process." One distinction is whether the control is "ex-ante" and happens before the transformation process is completed or whether it is "ex-post" and occurs after the outcomes are produced.

Process/Preventive Controls, also labeled ex-ante or feed-forward controls, typically involve tracking certain variables and taking corrective action whenever there is any deviation beyond specified parameters in the variables being tracked. The control action takes place *before* the transformation process is completed and the output is produced.

For example, under a feed-forward system of inventory control, the factors that affect finished goods inventory levels, such as the rate of sales or dispatch delays, are tracked. When the sales rate begins to decline or there is a dispatch bottleneck, the information is fed forward and the level of finished goods inventory is controlled by reducing production. Thus, the inventory levels are prevented from exceeding established levels. Alternatively, the managers may realize that the original standards for sales or dispatch delays no longer are appropriate and must be revised. In this way, actual results may lead to the inventory objectives or plans being updated.

The primary disadvantage of process/preventive controls is that they require a great deal of planning. Such controls do not handle unusual situations well, and it may be somewhat difficult to update a feed-forward control model in a timely fashion.

Output/Detective Controls, labeled remedial or ex-post controls, are after-the-fact. The transformation process is complete, the outcome has been produced, and the control activity is based on the comparison of actual with planned outcomes. Such control is applicable when it is easy and inexpensive to measure the output and when the risks associated with waiting for the end of the transformation process are not too great.

Using the same inventory control example and a feedback control system, the level of inventory is checked periodically against an established standard. Corrective action is taken only when the check reveals that inventory levels are exceeding or dropping below the preset benchmarks. An inventory buildup is stopped, but any excess inventory remains, leading to added carrying and storage costs. Likewise, a shortfall in inventory can result in lost sales. Alternatively, the managers may revise the inventory targets due to changes in the company's environment. Inventory standards are not fixed. Rather, they are updated continually based on new information.

The main disadvantage of output/detective controls is that they require an exception in order for action to occur. In addition, actual performance tends to fluctuate around the standard, so some non-errors may be perceived as errors.

Socialization/Adaptive Controls. The two previous control types, process/preventive and output/detective controls, are usually based on traditional models of control. These models rely on the setting of well defined benchmarks and relatively easy measurability of outcomes. However, in many situations, the transformation process is not well known and the outcomes are not as measurable. This is true in accounting firms, research labs, physicians' practices, legal firms, and many other professional or white-collar situations where the employer's primary asset is the employees' intellectual capital. In such companies, the complexity of the work and the knowledge required make it difficult to monitor the process or the outcomes.

An absence of adequate controls can have serious organizational consequences.

In this setting, the socialization/adaptive model is a common method of control. Here the control mechanism is more implicit. The professional body with which the individual is affiliated (e.g. the American Institute of Certified Public Accountants) prescribes norms and codes of conduct, censuring the individual in cases of deviation from accepted behavior. The company's training or socialization process instills the organization's own values in the individual who assimilates them and carries them into the work setting.

In nonprofessional organizations, such a socialization model can be instituted through an extensive acculturation, socialization, and training program. This is traditionally practiced in Japanese firms. The reward and censure are administered by the individual's work group. By virtue of being implicit and based on broadly defined norms or values, this control mechanism is also more *adaptive* than process/preventive or output/detective controls in that the individual or group can more rapidly adjust the parameters to accommodate changes in the environment. Therefore, this type of control is more appropriate in situations where the control parameters need to be adjusted frequently.

Returning to the inventory control example, suppose that the company sells high-tech products in a market with very unstable demand. The company cannot establish rigid inventory targets, but instead must rely on the judgment of its managers to determine appropriate inventory and production levels. The company may use a socialization/adaptive control process to govern the managers' behavior. Each new manager is socialized in the "way of thinking" that the group uses to manage inventory and production. This way of thinking may include rules of thumb or other intuitive processes.

The main disadvantage of socialization/adaptive controls is that they require high levels of awareness, skill, and integrity within the work group. Given the high degree of employee

empowerment today, even one poorly trained or disruptive employee can cause significant damage. The effectiveness of these controls also may be limited by the subjectivity of the control measures used or by workplace politics.

Levels of Control

Early literature categorized the control process into strategic, management, and operational levels, with each category of control occurring primarily at one of the three distinct levels of the organizational hierarchy [1,9]. Strategic control deals primarily with the broad questions of domain definition, direction setting, expression of the organization's purpose, and other issues that impact the organization's long-term survival [3]. Strategic control overlaps to some extent with the process of strategy formulation. Strategic control also deals with issues relating to headquarters' control over subsidiaries and the implementation and monitoring of progress along strategic programs.

Management control, which primarily occurs at the intermediate business unit level, deals with questions of effective resource utilization, state of competitiveness of the unit, and translation of corporate goals into business unit objectives [10]. Management control concerns traditionally are near-to-medium term.

Operational control primarily is concerned with efficiency issues. Occurring at very specific functional or sub-departmental levels of the organizational hierarchy, this mode of control generally conforms to traditional control models. The time horizon of control is very short term, the benchmarks are known and well defined, and the outcomes are tangible and easily measurable.

It is important to recognize that the three levels of control are not mutually exclusive. In reality, they represent a nested arrangement. If the control process does not identify and deal appropriately with a problem occurring at a lower level, the problem worsens. The problem then gets kicked up to a higher level of control. Thus, what might have originated as an operational control problem could become a management control problem to be dealt with at a higher level of the organizational control hierarchy. In extreme cases, when the issue balloons into a crisis that threatens organizational survival, the problem can only be handled in the strategic control mode. At this level, the organization's goals, plans, and even mission may be reassessed when dealing with a problem. Thus, there is an inherently dynamic aspect to the way control problems are transferred from one organizational level to another.

Kimberly-Clark is an example of a company that allowed operational and management control issues to interact and multiply into a threatening strategic situation. The company has a pristine reputation as a maker of household and health products. However, since the 1950s, it has also been selling cigarette paper and sheets of pressed, reconstituted tobacco to tobacco companies for use in cigarettes. The tobacco reconstitution process used by Kimberly-Clark enabled tobacco companies to manipulate nicotine levels in cigarettes.

Recently, the state of West Virginia named Kimberly-Clark as a co-defendant in a lawsuit aimed at recovering taxpayer money spent on treating smoking-related illnesses [4]. The charge was that Kimberly-Clark conspired with cigarette companies to deceive the public about the hazards of smoking. Faced with the prospect of its profitable sideline becoming a legal and financial liability, Kimberly-Clark belatedly decided to spin off its tobacco unit [14].

It appears that the operational control failure at Kimberly-Clark was that management did not ascertain whether the advertised claim that the tobacco reconstitution process allows nicotine levels to be adjusted to a smoker's individual requirement was indeed misleading. If it was, the company should have withdrawn or modified the message. At the management control level, the failure was not instituting an audit of its tobacco-related business once smoking-related illnesses became commonplace and legal challenges initially began to sprout. The strategic control failure was not making a conscious determination whether the tobacco business was consistent with the company's mission and values. If the tobacco business was consistent with the mission and values, the company then needed to follow up by instituting proper operational and management control systems that protected the organization against legal liability.

Matching Type of Control and Level

Now we turn our attention to the match between control types and levels of control. The relation between the two factors is illustrated in a table suggested by Ouchi and shown in Exhibit 1 [12]. The measurability of output is for a process which is to be controlled, the transformation process. The knowledge of the transformation process refers to the extent to which the input-output process is understood and decipherable.

In output/detective types of control, the traditional models of control assume the measurability of a known, definite output and a clear knowledge of the transformation process [7].

Exhibit 1. Selecting the Right Type of Control

Measurability of Output	Knowledge of Transformation Process	
	High	Low
High	#1 Output/Detective Process/Preventive	#2 Output/Detective
Low	#3 Process/Preventive	#4 Socialization/Adaptive
OTHER FACTORS TO CONSIDER		
Size of potential loss	Larger downside risk makes process/preventive controls more attractive.	
Nature of work force	An educated, professional workforce makes socialization/adaptive controls more appropriate.	
Economic and technical change	Rapid change makes socialization/adaptive controls more appropriate.	

Situation 1 in Exhibit 1 resembles most operational control conditions and a variety of management control conditions, and output control is the preferred mode. For example, many factory workers are controlled through the use of piece counts and defect rates after the product has been produced. Process/preventive control also may be applicable, provided the process has clear control parameters that can be tracked before the outcomes are produced.

In Situation 2, the knowledge of the transformation process is low and the measurability of output is high. This resembles some operational control situations, such as for a traveling salesperson, and many higher level management control situations. Because the transformation process model is unknown, process/preventive control becomes inapplicable, leaving output/detective control as the logical choice. For example, many companies monitor their sales force by measuring the traveling salespersons' sales volume.

In Situation 3, measurability of output is low, but the knowledge of the transformation process is high. This is the predominant situation in many management control situations, and the process/preventive model is the best choice. Many operational control situations, such as handling hazardous waste material, also may fit here. It is better to prevent an environmental problem than to try to detect the problem later.

Finally, Situation 4 is where both output measurability and transformation-process knowledge are low. Most strategic control contexts fall here. The traditional control models become inappropriate. Socialization/adaptive control, which depends on training, socialization, and rituals, replaces explicit outside control.

Other factors mentioned at the bottom of Exhibit 1 affect the matching of control type with organizational level. If the potential loss from inadequate control is great, process/preventive controls are preferable. Socialization/adaptive controls that rely on implicit regulating mechanisms are more appropriate with an educated, professional work force. Finally, as the rate of economic and technological change increases, socialization/adaptive controls become more appropriate for they allow for rapidly changing benchmarks.

Controls in a Traditional Company

The characteristics of each control level make them more amenable to one of the three control types. Strategic control would be better accomplished using the socialization/adaptive mode, management control could employ a combination of the process/preventive and output/detective modes, and operational control could primarily employ the output/detective mode of control.

This mix of controls is depicted for a "traditional" company in Exhibit 2. A traditional company is one with relatively few knowledge workers, a stable management hierarchy, reasonable levels of competition, and a fairly stable market environment.

Exhibit 2. Mix of Controls in a Traditional Company

Organizational Level	Type of Control		
	Process/ Preventive	Output/ Detective	Socialization/ Adaptive
Strategic	2nd	3rd	1st
Management	2nd	1st	3rd
Operational	2nd	1st	3rd

Note: The rankings reflect the appropriateness of each type of control in managing risks faced at each organizational level.

Most strategic control is best accomplished using the socialization/adaptive mode of control. An example is the strategic control exercised by a multinational company's headquarters over subsidiary country business units. Control is ensured by setting the context and socializing individual country business managers in the norms of the global organization [13]. For example, Unilever periodically brings its managers to its Four Acres facilities for training, in addition to rotating them through the corporate headquarters offices [2]. This identifies the high-potential individuals and initiates them into the Unilever Club. Such socialization aids strategic control by defining a context. It also enables international managers to develop a network of contacts and mentors within the global organization.

Alternatively, monitoring global trends and open-ended environmental scanning, as practiced by Royal Dutch Shell, constitute strategic control of the process/preventive type. War gaming exercises that Shell practiced in advance helped it deal with the supply disruptions caused by the 1991 Gulf War. They also study and debate detailed "what if" scenarios [8]. This type of control would be second in order of importance for strategic control purposes. Finally, tracking progress on the implementation of strategic programs is an output/detective type of strategic control activity.

Under management control, the implementation of business strategies and tracking progress on strategic programs at the functional level are output/detective control types. Tracking the business environment as well as the actions of key competitors, customers, and other important segments of the environment is a process/preventive type of control. There is relatively less of the direction-setting type of activity, which necessitates socialization/adaptive control involved in management control.

Operational control is comprised primarily of the output/detective type and conforms to traditional models. Considerations of efficiency are paramount. To a limited extent, the tracking of the implementation of action plans may be process/preventive in nature. Process innovations such preventive category. Socialization/adaptive control is largely irrelevant for operational control except for specialized knowledge segments or professionals such as accountants, physicians, and researchers.

Exhibit 3. Mix of Controls in a Modern, Information-Age Company

Organizational Level	Type of Control		
	Process/ Preventive	Output/ Detective	Socialization/ Adaptive
Strategic	2nd	3rd	1st
Management	2nd	3rd	1st
Operational	1st	3rd	2nd

Note: The rankings reflect the appropriateness of each type of control in managing risks faced at each organizational level.

Controls in a Modern, Information-Age Company

Today more organizations are knowledge based and information driven. Modern, information-age companies are those with many knowledge workers, a flatter organizational structure, intense global competition, and rapidly-changing market conditions. Companies operating in such an environment have different control needs than do traditional companies, for (1) their technology is changing rapidly, (2) the actions of important competitors and customers are unpredictable, and (3) the bases of sustainable competitive advantage are few. The mix of controls for such a modern, information-age company is represented in Exhibit 3.

The configuration for strategic control is unchanged from Exhibit 2. In management control however, socialization/adaptive control replaces the output/detective type as the most important type of control. More management-control activity will occur in situations where both the measurability of outputs and the knowledge of the transformation process are low. Process/preventive controls will also gain relatively in importance because control failures are becoming so expensive. Even with operational control activities, the importance of socialization/adaptive modes of control will become more pronounced, reflecting the increasing proportion of skilled knowledge professionals at the lower rungs of the organizational hierarchy. Process/preventive control will become the most important type at the operational control level, reflecting the increasing use of process teams consisting of multi-functional specialists. The use of output/detective controls will diminish. Output control activates the corrective action only after the damage has occurred, which is no longer acceptable.

Finally, in keeping with the trend toward flatter organizations, the role of management control will progressively shrink, until at some stage it may overlap and merge with operational control. Thus, the control hierarchy might become flattened to include merely two levels, strategic and operational control.

Conclusion

Organizations have to exercise the appropriate amount of control, balancing the need for stability against the flexibility required for adapting to changing environmental circum-

stances. This tradeoff has to be assessed in light of the organization's industry and type of activity. Cost is another important determinant of the control mix. While socialization and process controls are more expensive than output controls, they help companies to avoid major losses by virtue of their preventive nature.

While our views of the future of organizational control systems have not yet been tested empirically, we hope that the framework proposed will be useful to managers seeking to determine the right amount and mix of controls in their organizations. If nothing else, the ideas expressed should promote thoughtful discussion among managers. ■

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