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**DETERMINING THE STRUCTURE OF AN OPTIMAL
PERSONNEL PROFILE FOR A TRANSFORMED COMMISSION**

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PREFACE

This report is one of a series of reports on the transformation of public utility commissions. Previous reports in the series have focused on the transformation of a commission's culture, roles, and activities. This report focuses on the staffing dimension of the personnel mix needed to support these changes.

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INTRODUCTION

In the classic sociological sense, an organization such as a public utility commission is a social unit consisting of specific groupings constructed and reconstructed deliberately and with forethought to achieve specific goals.¹ These organizational groupings determined on the basis of rational divisions of labor, power, and communication are designed with the objective of placing individuals into positions where they are expected to make the largest contribution towards achieving the organization's goals. It is reasonable then to conclude that proponents of the classical view had in mind a readily identifiable common ground among the organization's members that the organization exploits as it selects its goals. Recently, it has been argued that metaphors are an acceptable shorthand for this common ground that provides an insight into the types of personnel an organization would find most suitable for assisting its efforts to reach its goals.² Consequently, with respect to uncovering the optimal personal profile for an organization, it would indeed be analytically convenient if we can go backwards from the organization's metaphor to its specific goals, and from its goals to the common ground supporting these goals.

Before we can use the concept of a metaphor to deduce an optimal personnel profile for an organization, we must ask the question. What are the primitive elements of the metaphor that enable us to deduce the types of personnel required to efficiently achieve the organization's specific goals? In preparing to answer this question, we interpret an organizational metaphor as describing a "pattern of shared meaning,"

¹See Talcott Parsons, *Structure and Process in Modern Societies* (Glencoe, IL: The Free Press, 1960), 17; and Amitai Etzioni, *Modern Organizations* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1964), 3-4.

²David W. Wirick, Robert E. Burns, Vivian Witkind Davis, Douglas N. Jones, and Francine Sevel, *Organizational Transformation: Ensuring the Relevance of Public Utility Commissions* (Columbus, OH: The National Regulatory Research Institute, 1998), 10-15.

which in turn, is represented by a *single* set of understandings and conventions that are routinely grasped by the members within the organization.³ Then it follows immediately that the pertinent common ground within the organization is the conventions and understandings commonly understood by the organization's members.

Typically, a decision by an organization to restructure the current set of conventions and understandings is motivated by a strongly held belief among the organization's members that this set is not ideal. So armed, the organization collectively searches for a better set of common conventions and understandings that is suitable *and* implementable given the social and economic environments it faces. Wirick et al. propose that a public utility commission could do worse than adopting a set of conventions and understandings that is consistent with the "living organism" and "brain" metaphors.⁴ This paper has two purposes. The first is to detail the anatomy of the set of common conventions and understandings necessary for supporting the new metaphors. The second is to deduce an optimal distribution of personnel types for supporting this dual metaphor.

The basic argument underlying this analysis is that the commission uses its organizational metaphor as a signal that conveys private information pertaining to its goals to the remaining participants in the regulatory process. In particular, the metaphor announces how the commission intends to achieve its specific goals, which are assumed to be common knowledge to all regulatory participants. This signal is necessary because a complete history of the commission's practices and procedures is never available to any of the other regulatory participants. Therefore, at any time, their only recourse is to respond to a commission decision on the basis of an incompletely understood set of prior commission decisions. The rational course of action in such a situation is to form a *belief* over a set of feasible histories, where a belief is a probability

³See Ken Binmore, *Game Theory and the Social Contract Volume I: Playing Fair* (Cambridge, MA.: The MIT Press, 1994), 3; and Hal G. Rainey, "Building an Effective Organizational Culture," in *Handbook of Public Administration*, James L. Perry, ed. (San Francisco: Jossey-Bass, 1996), 153.

⁴Wirick et al., *Organizational Transformation*, 15, 27.

distribution over the meanings of past commission decisions. The commission's organizational metaphor is the signal that assists the other regulatory participants as they form their beliefs.

Section 1 describes the commission's starting point for changing from the machine metaphor to the dual metaphor of the living organism and the brain. Section 2 characterizes the organizational profile associated with this dual metaphor. Section 3 presents the structure of the optimal personnel profile consistent with this metaphor.

COMMISSION'S STARTING POINT

What is it that causes a commission to change its metaphor? The answer is that the commission is unhappy with the metaphor's results. That is, as far as the commission is concerned, its current metaphor is no longer capable of conveying its private information to the other regulatory participants. How might this happen? The commission could have decided unilaterally to change the methods used to achieve its goals. For example, in the past a commission tended to achieve its goals by acting noncollaboratively and using efficient and integrated decision procedures. The machine metaphor is an effective signal in this regard. If, however, the commission now intends to achieve its goals through more cooperative procedures, then the machine metaphor is no longer effective as a signal because it does not convey the commission's private information as it now exists. But then, the question arises: How does the commission adopt a new metaphor? This question is not so simple because we must first trace out the change in the commission's circumstances in order to answer it.

Let's begin by noting that an organizational metaphor is an effective signal when it fulfills two functions. First, it must accurately reflect the organization's culture, which we alternatively denote as the organization's pattern of shared meaning. Second, it must be consistent with the environment within which the organization is embedded.

Therefore, changes in the organization's culture or to its environment will precipitate a change of organizational metaphor. So, let's assume that there is a change to the organization's environment. Then the organization's current circumstance is that it is confronted with an existing culture that may no longer be compatible with its new environment. The organization's task is then to bring its culture back into synchronization with its environment. How might the organization go about doing this?

The methods the organization selects to change its culture depend on the hierarchical structure of the organization. If the organization has a rigid hierarchy with dictatorial powers at the top levels, then changing the organization's culture is a problem in rational decisionmaking by a single decisionmaker under conditions of uncertainty.⁵ If the organization has a distributed hierarchy with nondictatorial powers across organizational power centers, then changing the organization's culture involves solving the more difficult problem of rational decisionmaking by teams under conditions of uncertainty.⁶ If the organization is nonhierarchical, then changing the organization's culture can be accomplished by finding an equilibrium to a bargaining game.⁷ In this report, we assume that a state public utility commission is organized to facilitate participatory decisionmaking. That is, there are no dictators in any segment of commission decisionmaking. For example, the staff dictators are not allowed to make decisions without consulting with other staff dictators and commissioners. Commissioners have to consult with each other, either formally or informally, before they make and implement a decision pertaining to the regulation of companies. In other words, there is hierarchical power at the class level but no individual possesses any dictatorial power.

⁵Kenneth Arrow, *Social Choice and Individual Values* (New Haven, CT: Yale University Press, 1963); Leonard J. Savage, *The Foundations of Statistics* 2nd rev. ed. (New York: Dover Publications, Inc., 1972).

⁶Roy Radner, "Hierarchy: The Economics of Managing," *Journal of Economic Literature* Vol XXX, No. 3 (Summer 1992): 1382-1415.

⁷Robert J. Graniere, "Commission Transformation and the Legislative Model of Regulation," *The NRRRI Quarterly Bulletin* (forthcoming).

Regardless of the commission's hierarchical structure, the commissioners and each member of the commission staff are free to perceive the changes to the commission's environment differently. Therefore, it is possible that there may be as many perceived realities within the commission as there are commissioners and commission staff. Because the commission's structure is nonhierarchical by assumption, each of the different perceived realities may point to a different culture. Therefore, the immediate problem is the reconciliation of the different perceived realities so that the commission-as-an-organization may ease into a new culture.

This problem is not as difficult to solve as it may at first seem, if we are willing to stipulate that the commissioners and commission staff members are prepared to find a way to reconcile their differences in perceived realities.⁸ We offer as support for this stipulation an idealized state public utility commission with only one commissioner and one commission staff member, where each one perceives the changes to the commission's environment differently. Their differing perceptions ensure that the commissioner's and the commission staff member's best response to the changes in the commission's environment will be different when they are isolated from each other. As a result, the idealized decisionmaking environment for this idealized commission must be fraught with some form of conflict because the commission's structure ensures that they are not isolated from each other. Consequently, this two-class commission must find some means to deal with the competing aims and aspirations of the commissioner and the staff member.

Essentially, what we have here is a bargaining game between the commissioner and the staff member. What is not clear are the informational characteristics of this game. The game has complete information, if the timing, feasible moves, and payoffs of the game are common knowledge for the commissioner and commission staff

⁸There is a tendency when doing a qualitative analysis to weaken the definition of culture to allow for some flexibility in the areas of conventions and understandings. It might be argued for example that each member of an organization has the same understandings to a greater or lesser degree and generally abides by the same conventions. But clearly, this representation of organizational culture suggests a continuous threat to the organization's stability as a result of potential defections.

member. The game is finite, if the commissioner and staff member have a limited number of moves. When the bargaining game between the commissioner and commission staff member is a finite game with complete information, it has a Nash bargaining equilibrium.⁹ For those unfamiliar with a Nash bargaining equilibrium, it is generally speaking a vector of payoffs associated with a feasible agreement between the commissioner and commission staff member satisfying the condition so that neither the commissioner nor the staff member has reason to argue for another feasible agreement because both has made a best reply to the other's bargaining strategy. Obviously, a Nash bargaining equilibrium is the realization of a mutually agreeable outcome for both the commissioner and the commission staff member.

If this idealized bargaining game is finite and has incomplete information, then it has a perfect Bayesian Nash equilibrium and a sequential equilibrium, which also indicate that the commissioner and staff member have found a mutually agreeable outcome.¹⁰ However, as noted above, both of these more complicated equilibria would require the commissioner to form a belief about the feasible histories that could have been created by the commission staff member, and *vice versa*. But what is more important than the technical conditions of these three equilibria is that they exist under reasonable circumstances, and hence, it is reasonable to expect that a commission, organized nonhierarchically, could reach them, if given the opportunity to do so. Therefore, we are comfortable in asserting that one of these three equilibrium concepts is the conflict-resolution mechanism underlying the reconciliation of the commissioner's and commission staff member's perceived realities in our idealized example.

So, let's assume that the commissioner and the commission staff member have found one of these equilibria through their rational strategic interaction with each other. Then, we may note that our idealized example has solved the social-contract problem

⁹John Nash, "The Bargaining Problem," *Econometrica* 18 (1950): 155-162.

¹⁰David Kreps and Robert Wilson, "Sequential Equilibrium," *Econometrica* 50 (July 1982): 863-894; Robert Gibbons, "An Introduction to Applicable Game Theory," *Journal of Economic Perspectives* Vol. 11, No. 1 (Winter 1997):127-149.

introduced by Binmore.¹¹ The distinguishing characteristic of this problem is that the divergent aims and aspirations among the members of society make conflict inevitable, but a healthy society can find a cultural transformation that balances these aims and aspirations such that the benefits of the transformed society are not entirely lost to internecine strife among the society's members. Binmore's solution to this social-contract problem, as it would apply to our idealized state public utility commission, is for the commissioner and commission staff member to construct a new set of common understandings and common conventions that coordinates their behavior within the commission in a manner that is consistent with the commission's changed environment. In effect then, the equilibrium of a bargaining game among the commissioner and the staff member induces the metaphor that the commission uses as a signal in its game with the remaining participants in the regulatory process.

ORGANIZATIONAL PROFILE FOR THE DUAL METAPHOR

In this section, we derive the organizational profile associated with the dual metaphor proposed by Wirick et al. Their dual metaphor consists of the living organism and brain metaphors. In our analytical context, the living organism metaphor is a signal to the other participants in the regulatory process that the commission intends to survive as its environment changes.¹² We interpret survival as the commissioners and staff members recognizing the linkages among themselves and their environments, and then everyone mutually agreeing as a result of a bargaining game to a set of common understandings and conventions that is consistent with these linkages and the changes to their environment. On the other hand, the brain metaphor is a signal that the

¹¹Wirick et al., *Organizational Transformation*, 6.

¹²Tom Peters, *Liberation Management* (New York: Random House, 1992); Gareth Morgan, *Images of Organizations* (Thousand Oaks, CA: Sage Publications, 1996).

commission intends to stake-out a position for itself in its new environment. We interpret "staking-out a position" as a process involving the extensive collection and use of information to facilitate organizational learning meant to bring the commission into equilibrium with its environment.

Following Wirick et al., we assume the commission ensures its survival by using teams to identify the commission's fit with its changed environment.¹³ The teams are to find this fit by collaborating with other organizations using flexible project-oriented modes of operation, and then measuring how satisfied the remaining regulatory participants are with the commission. Also following Wirick et al., we assume that the commission stakes-out its position by exchanging information with the regulatory participants designing its organizational structure around this information flow.¹⁴

Now, let's look at the organizational profile most congenial to these two metaphors. To do this, we look at the focal points of each metaphor. The focal point of the brain metaphor is staking out a commission position, which is equivalent to promoting the primacy of the commission's role as a decisionmaker. The focal point of the living organism metaphor is the commission's survival. If these focal points are to characterize the commission's role in its environment, then it must be the case that the commission survival is ensured by a role that emphasizes the primacy of its decisionmaking. Consequently, the point of interest is what is the organizational profile that allows the commission to effectively collaborate with other regulatory participants in the area of defining its mission, while simultaneously assuring the primacy of its decisions when handed down to these same regulatory participants.

Wirick et al. propose that self-organizing work groups form as teams in order to create a mission for the commission.¹⁵ These teams are structured to work collaboratively outside of the commission because the commission's mission is set with

¹³Wirick et al., *Organizational Transformation*, Table 2-2, 14.

¹⁴Ibid., Tables 2-1 and 2-2, 13-14.

¹⁵Ibid., Table 2-2, 14.

input from the other regulatory participants. But then, it is absolutely necessary that the commission realizes its cultural equilibrium before it sends its teams out to create a mission for itself, otherwise the teams will find it impossible to effectively work independently of each other. Without the organizing effect of a culture, they will spin off in multiple directions in their interactions with other participants in the regulatory process. This lack of direction will significantly increase the degree of difficulty when it comes to assembling the teams' output to create a mission for the commission.

In addition to being in place before the commission's teams begin collaborating with the other regulatory participants, it is essential that the cultural equilibrium not be sensitive to the configuration of these teams. To show why this is so, assume to the contrary that the commission cultural equilibrium is sensitive to team configuration. Then changes in these configurations will require that the commissioners and commission staff members realize a new cultural equilibrium, which imposes very high transactions costs on the collaborative process. These transactions costs, in turn, reduce the teams' ability to use flexible, project-oriented modes of operation within the commission because fewer teams form, and they subsequently get set in their ways. However, as Wirick et al. point out, these modes of operation are necessary to the commission's survival.¹⁶ Therefore, a cultural equilibrium that is sensitive to the configuration of the teams within the commission can only make the commission's teams less effective as they strategically interact with the rest of the regulatory community.

So, what does it mean for the commission to realize its cultural equilibrium before it collaborates with other regulatory participants to create a mission for itself? This requirement implies at the very least that the commission teams enter the collaborative process armed with a common set of understandings and conventions. But, what if, at the end of the collaborative effort with the other regulatory participants, some of these teams find out that they have to realize a *new* cultural equilibrium, if they

¹⁶Ibid., Table 2-2, 14.

are to reach a consensus with the other regulatory participants concerning the commission's mission. In other words, what if parts of the commission find that the single cultural equilibrium sufficient for coordinating behavior within the commission is not sufficient for coordinating their behavior outside of the commission. The ramification of such a revelation is not pretty. Essentially, the commission must accept the reality that the strategic interactions of these particular teams with other regulatory participants will yield below-average payoffs for the commission. However, although unsightly, this ramification is not fatal for the commission as long as there are not too many commission teams with this characteristic, which we assume in this analysis. We are now in the position to deduce the structure of the optimal personnel mix consistent with the dual metaphor of the living organism and the brain.

PERSONNEL PROFILE FOR THE DUAL METAPHOR

What is the structure of the personnel profile that simultaneously allows the commission to realize a cultural equilibrium and to collaborate effectively with other regulatory participants? This question has been addressed by Wirick et al. using an organizational typology created by Quinn and a distribution of innovation adopters proposed by Rogers.¹⁷ In their work, they overlay Rogers' distribution on a schematic of Quinn's typology to get a broad sense of the types of personnel required to effectively support a particular metaphor or mixture of metaphors.¹⁸ Quinn's typology consists of four models of organizational behavior. In no particular order of importance, he proposes that every organization is a mixture of the open system, competition, internal process, and human resources models. In the course of distilling this typology for

¹⁷Everett Rogers, *Communication of Innovations* (New York: Free Press, 1971), 182; Robert E. Quinn, *Beyond Rational Management: Mastering the Paradoxes and Competing Demands of High Performance* (San Francisco: Jossey-Bass, Inc., 1989).

¹⁸Wirick et al., *Organizational Transformation*, 41.

decisionmaking purposes, Quinn and DeGraff interpret the implications of each model for organizational transformation.¹⁹ As they see it, the *open systems model* rewards experimentation, risk-taking, innovation, and flexibility. The *competition model* rewards productivity, reputation, results, and achievement of goals. The *internal process model* rewards efficiency, stability, and predictability. Finally, the *human resources model* rewards team work, consensus building, and interpersonal relations. Thus, in the context of Quinn's typology, the structure of the optimal personnel profile in our case is discovered by deducing the mix of the four organizational behaviors that is best suited for sustaining cultural equilibrium within the organization and collaboration outside of the organization. It is to this task that we now turn.

On the one hand, the need for collaboration embedded in the dual metaphor of the living organism and the brain suggests that the competitive model is one of the two main girders supporting the structure of the optimal personnel profile. If the outcome of the commission's collaborative effort conducted through its teams is to be a mission that emphasizes the commission's role as a decisionmaker in the regulatory environment, then commission teams and their members must be able to build superior reputations, produce acceptable results, and achieve their goals. As a result, the commission's cultural equilibrium, which represents the common understandings and conventions within the commission, must include rewards for productivity. On the other hand, the nature of the cultural equilibrium supporting the external collaboration suggests that the human relations model is the other supporting girder. If the commission is to effectively present its teams to the other regulatory participants, then interpersonal relations and consensus building must be on the minds of commissioners and the staff of the commission. After all, both of the behavioral characteristics are hallmarks of successful team work.

¹⁹Robert E. Quinn and Jeff DeGraff, "Leading Change: Creating Transformational Competencies," presentation materials, University of Michigan Business School, November 1997.

The other girders completing the infrastructure for the optimal personnel profile are the internal process and open systems models. The decision to include the internal process model as part of the infrastructure rests on the observation that good interpersonal relations and effective consensus building cannot be supported by an illusion. Good interpersonal relations and good reputations require significant measures of stability and predictability. In fact, a basic tenet of management is that most individuals and groups of individuals dislike change and uncertainty, which stated alternatively indicates that change and uncertainty put strains on interpersonal relations. Additionally, effective consensus building requires efficient procedures and practices to manage the internal and external strategic interactions among the teams. In other words, rationality is part and parcel of an effective consensus.²⁰

The inclusion of the open systems model captures the reality that risk-taking and innovation are essential elements of the successful transmission of the commission's metaphor and hence the commission. However, risk-taking in the sense of pursuing the higher expected payoff, which is associated with more risks, and shunning the lower expected payoff, which is associated with fewer risks, can strain efforts to build a consensus because it tends to separate teams from each other. Consider that while one or more teams within a consensus-building commission may agree to take risks in the above sense, it would be difficult for a majority of the teams to take these risks because the strengthening of the "winning" teams' reputations and rewards would weaken the good interpersonal relations that are necessary for consensus building within the commission and external to the commission.

Consequently, on the purely qualitative level, it would appear that a suitable mix of organizational behaviors for the commission's transformation of its metaphor from the machine to the living organism and brain dual metaphor would include high measures

²⁰The role of the internal process model in discerning the structure of the optimal personnel profile for the dual metaphor is not necessarily inconsistent with the following conclusion reached by Wirick et al. See Wirick et al., *Organizational Transformation*, 36. "For today's commissions, it appears there is too much emphasis on internal process and not enough on open systems." It may be that the current mix of personnel types within the commission overrepresents internal process control.

of the human resources and competition models, a medium measure of internal process model, and a low measure of open systems model, which, for the following reasons, we restrict disproportionately to the experimentation task of the open systems model. It is improbable that a cultural equilibrium emphasizing consensus building, team work, and reputation will also support a significant proclivity for the majority of the commission's teams to take risks and innovate. By definition, teams with these traits are not particularly good at reaching compromises. However, the open system model does more than encourage risk-taking and innovation. It supports experimentation for the purpose of being on the leading edge. As a result, experimenters may be highly valued during the transformation from the machine metaphor to the dual metaphor being considered here because they are individuals who are willing to use an innovation that is just beginning its life cycle without certain knowledge as to how long the innovation will survive in the commission.

Each of the other three organizational models also can be associated with specific personnel types that appear to be most suitable for a commission using the dual metaphor of the living organism and brain to signal its intentions to the remainder of the regulatory community. In fact, Wirick et al. have completed such an exercise in their work on organizational transformation.²¹ They populate the open-system model with innovators and brokers. An innovator's primary characteristics are optimism and creativity, and the broker's primary characteristic is expansion of the enterprise.²² Their subpopulations for the competition model consist of producers and soldiers. Producers focus on tasks and rational persuasion to reach goals, while soldiers need clear goals and formal expectations. The internal process model is populated by monitors and conservers. Monitors want information and like to communicate and measure, while

²¹Ibid., Table 3-1, 35.

²²Wirick et al.'s description of a broker is consistent with our description of an experimenter. Elsewhere, see *ibid.*, Table 3-1, 35. Wirick et al. characterize a broker as an individual that is well focused on forces external to the commission. This characterization is not accepted in this analysis because it places a broker in the human relations model.

conservers seek dependability and reliability. Finally, the human relation model contains motivators and facilitators. A motivator is described as being caring, understanding, and tolerant. The facilitator is open and accessible.

How do these personnel types mesh with a cultural equilibrium supporting collaborative efforts among the commission's teams and other remaining regulatory participants for the purpose of assisting the commission in setting its mission. It would seem that such a cultural equilibrium would not require a lot of experimenters in their role of expansion and innovators in their roles of creativity and doing entirely new things. As noted previously, these roles make consensus building and external collaboration that much more difficult. Meanwhile, it is likely that the cultural equilibrium support of team work, consensus building, and collaboration would require a significant number of motivators and facilitators, as these individuals perform roles that are very conducive to effective team work and consensus building. However, the cultural equilibrium supporting the dual metaphor of a living organism and the brain also has to support the commission's role as a decisionmaker in the regulatory environment. It would seem that an appreciable number of producers and soldiers would be required to meet this objective. The producers are adept at the completion of tasks and rational persuasion, and the soldiers are expected to react favorably to the tasks set by producers. Lastly, a visible presence of conservers and monitors seems to be necessary to complete the maintenance of our cultural equilibrium. The ability of producers to rationally persuade is contingent on the dependability and reliability that the conserver brings to the completion of tasks. Similarly, the credibility of the motivators relies on the communications and measurement skills of the monitor. In short, Wirick et al.'s typology of personnel types conforms more than reasonably well with the suggested mix of organizational behaviors that we think are required to complete the commission's transformation from the machine metaphor to the dual metaphor.

However, there is a difference in emphasis between the structure of Wirick et al.'s personnel profile and the structure of the personnel profile that we will suggest

later in this report. Wirick et al. emphasize innovation and the speed at which innovations are adopted by an organization in their work on organizational transformation.²³ Unfortunately, there is not any explicit discussion or analysis in their work that ties innovation and its speed of adoption to the maintenance of their dual metaphor. For example, there is no direct statement to the effect that successful innovation and its rapid adoption are crucial for the continued survival of the commission in the role of regulatory decisionmaker. There is just a strong sense that true innovators are hard to find, and therefore, it might be necessary to keep them around even if they are nonproductive for a while.

In any event, they use Rogers' empirical distribution of the dissemination of an innovation to say what they do have to say about the relationship between innovators and the structure of the personnel profile for the transformed commission. This distribution is replicated from Wirick et al. as Figure 1.²⁴ Rogers segments the dissemination of innovation within an organization in five dominating personnel types. In order for the dissemination of an innovation to occur, there must be innovators. However, innovators are not particularly well integrated into an organization, and sometimes, they are prone to take on more risk than is good for them.²⁵ As a result, there may be a need to hold them in check.²⁶ Still, an unused innovation is useless in terms of enhancing the organization's reputation and ensuring its survival, and hence, there are early adopters who behave much as our experimenters. Early adopters are the innovators' point men and the key force in the adoption of an innovation because

²³Wirick et al. state that "... movement from a culture suited to machine-like organization to one appropriate to an open system is an important component of change." See *ibid.*, 29.

²⁴*Ibid.*, 40.

²⁵*Ibid.*, 39.

²⁶"The innovators at a commission, as in other organizations, may be the earliest and most enthusiastic to adopt change, but as noted by both Quinn and Rogers may also be too far out in front of their peers." See *ibid.*, 42.

they are well integrated into the organization and opinion leaders.²⁷ But, the successful dissemination of an innovation requires more than early adoption. It also requires acceptance within the organization.²⁸ This is a role that is performed by the early majority adopters and late majority adopters. They tend to be “deliberative and even skeptical” in their approach to innovation.²⁹ Finally, complete dissemination occurs when the laggards embrace the innovation.

What can we infer about the structure of the optimal personnel profile for a public utility commission from a perspective that innovation is important because it assists the commission in its efforts to work collaboratively with other regulatory participants to ensure its survival as a primary decisionmaker in the regulatory environment? That is, how many risk-taking innovators need to be around in relation to early adopters (a.k.a. experimenters) in order to maintain a cultural equilibrium that emphasizes team work, consensus building, reputation, interpersonal relations, results over efficiency, stability, and predictability? From this vantage point, it would seem a personnel profile containing more early adopters and fewer innovators would be preferred over a personnel profile with fewer early adopters and more innovators.

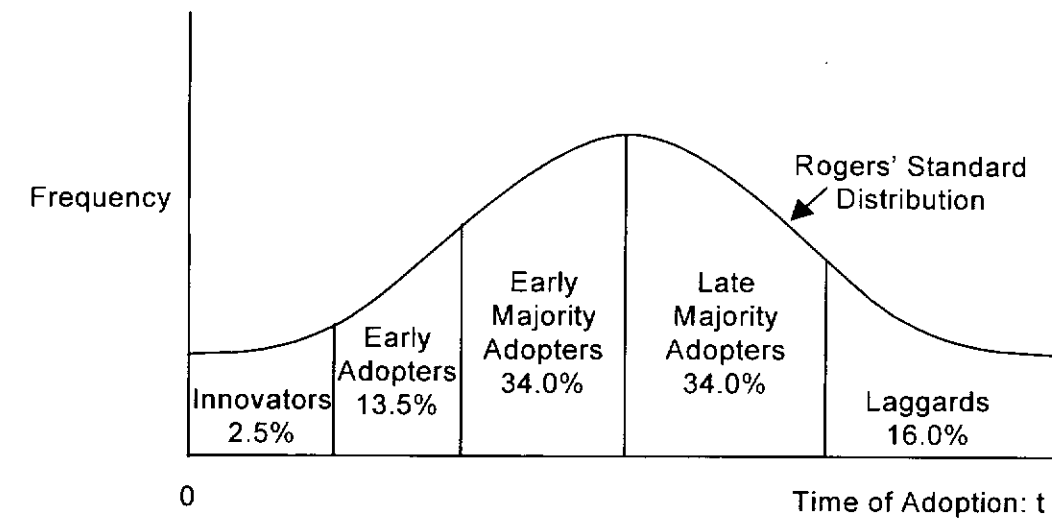


Fig. 1. Timing of the Adoption of an Innovation: Empirical Distribution.

Although innovators are essential for the transformation from the machine metaphor to the dual metaphor of the living organism and the brain, they have to be held in check, which suggests that they are not particularly good team players outside of their own team. They are prone to taking too many risks, and as a result, they may not be very well integrated into the risk-neutral and risk-averse portions of the transforming commission. They tend to be out ahead of their peers, which suggests that they also would find it difficult to collaborate with the risk-neutral and risk-averse segments of the other regulatory participants. Meanwhile, the characteristics of the early adopters are all “good” in the context of the dual metaphor of the brain and living organism. They are the key force in the adoption and expansion of an innovation, which leads to the growth, enhancement, and survival of the organization. They are well-integrated with the early and late majority adopters within the commission, which makes it easier for them to experiment with innovations. They are opinion leaders within the commission, which makes it easier for them to defend their experimentations.

²⁷“Early adopters rather than innovators are likely to be the key force in initiating cultural change at commissions. . . . In Quinn’s model, these are people who score high on facilitator, motivator, broker and producer roles as well as the innovator role, and see opportunities for the commission to move forward on all fronts.” See *ibid.*, 42. The conclusion that early adopters score high as facilitators, motivators, and innovators is not accepted in this report. It does not appear that the skills attributed to motivators and facilitators are suited for the expansion of the enterprise or experimentation with the innovation. Additionally, it is incongruent to let an early adopter’s traits be sufficiently broad to encompass the innovator’s traits. Therefore in this analysis, the early adopter is interpreted as an experimenter.

²⁸“In Roger’s model, early adopters are people to check with before others will use a new idea.” See *ibid.*, 42. It is tempting to equate leadership for innovation as equivalent to leadership for the organization, but this perspective is not adopted in this report for the following reason. It would not seem reasonable that an experimenter in terms of the use of innovation, who is our early adopter, could effectively lead an organization with a cultural equilibrium that emphasizes consensus building, team work, and productivity.

²⁹*ibid.*, 39.

Figures 2 through 4 are constructed with these thoughts in mind. However, it also needs to be kept in mind that these figures are illustrative, which in reality means that we have not yet developed an analytical or empirical way to determine the actual numbers of innovators, experimenters, facilitators, motivators, producers, soldiers, monitors, and conservers that are needed to transform a commission from one described by the machine metaphor into one that is described by the dual metaphor of the brain and living organism. Perhaps, this is an avenue for future research at the National Regulatory Research Institute or elsewhere. But despite this caveat, these figures are instructive in terms of demonstrating how a quantitative analysis that determines the optimal personnel profile for a transformed commission might be carried out. In this vein, we interpret each vector, V_i , in the i^{th} quadrant of Figure 2, as a "bundle" representing the number of units of the commission personnel that ought to be devoted to innovation, experimentation, facilitation, motivation, production and its support, and monitoring and its support, if the commission is to successfully transform from the machine metaphor to the dual metaphor. As usual, the V_i should be interpreted as pointing to coordinates in a Cartesian plane, which means that a vector, V_i , of length 4, which is denoted by $V_i(4)$, represents all positive combinations of Cartesian coordinates that satisfy the equation $x^2 + y^2 = 4^2$. In other words, V_{IV} , the bundle for the human relations quadrant, cannot contain four facilitators and no motivators, or four motivators and no facilitators. But, whatever the combination of facilitators and motivators selected by the commission, it must satisfy the Pythagorean theorem.

If we choose to go no farther than our analytical and empirical evidence allows us to, then all we can show graphically in Figure 2 is vectors of different lengths that tie to our earlier analytical conclusions. In this regard, we can show the vectors shown in the second and fourth quadrants to be longer than the vectors in the first and third quadrants. This first sizing graphically represents our conclusion that the structure of the optimal personnel profile for the dual metaphor of the living organism and brain should be weighted in favor of the characteristics associated with the human relations

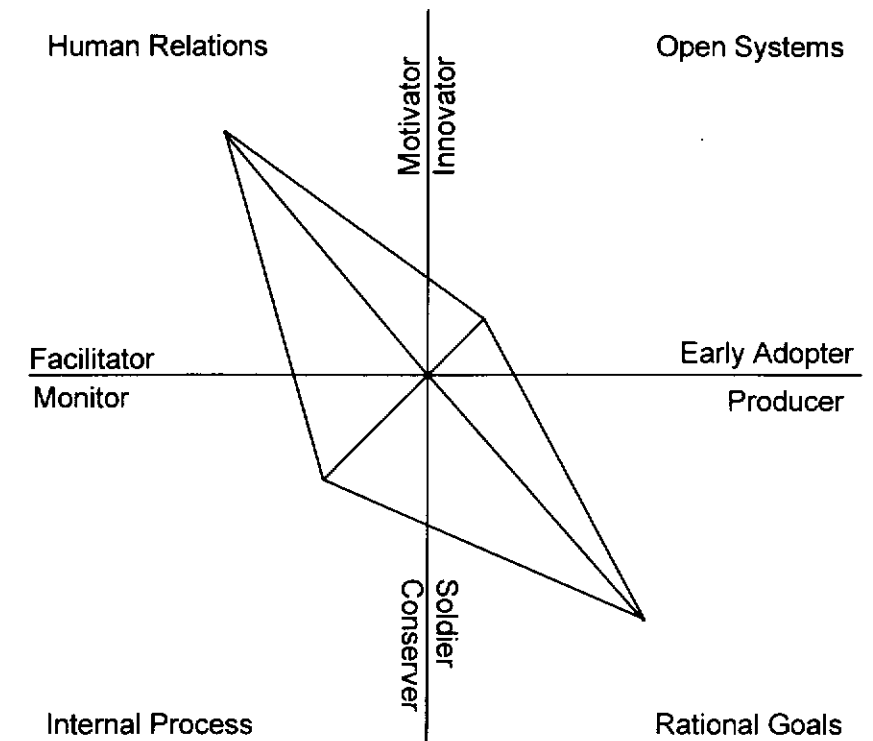


Fig. 2. Optimal Mix of Personnel Characteristics: An Illustration.

and competition models of organizational behavior. Next, we can draw the vector in the third quadrant that is longer in length than the vector in the first quadrant. This second sizing graphically describes the conclusion that characteristics associated with the internal process control model are more numerous in the optimal personnel profile than the characteristics associated with the open system model. However, we do choose to go farther through the use of an illustrative example describing what we could accomplish in the real world graphically, if we had a way to quantify the analytical conclusions that we reached earlier. Therefore, without the benefit of any additional analytical or empirical evidence, we assert in Figure 2 for purely illustrative purposes that a V_I of length 1, a V_{II} of length 4, a V_{III} of length 2, and a V_{IV} of length 4 are needed

to successfully transform a public utility commission from the machine metaphor to the dual metaphor of the living organism and the brain.

These bundles of different lengths are then summed and restated in Figure 3 as the percentages of commission personnel that ought to be working at the tasks denoted in each of the four quadrants. In our illustrative example, the open-systems tasks of experimentation and innovation consume 9.1 percent of the commission's personnel, with the organizational activity in this cell being heavily weighted toward experimenters. Meanwhile, the commission in our illustrative example commits 18.2 percent of its personnel to internal process tasks with more weight being given to the monitoring activity than the conserving activity. Competition tasks occupy 36.3 percent of the commission personnel in this example with more emphasis being placed on the

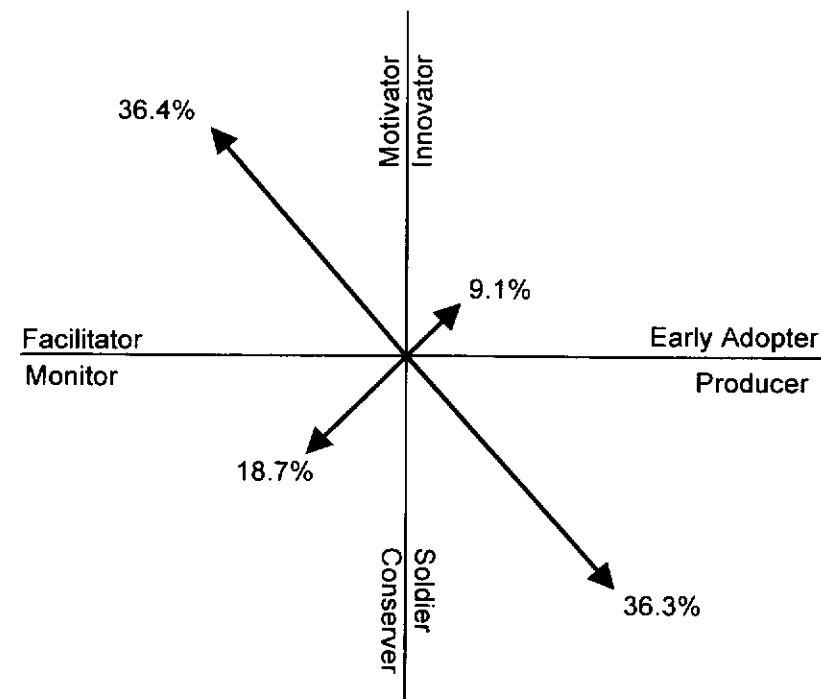


Fig. 3. Optimal Percentages of Personnel Characteristics: An Illustration.

producing activity than the soldiering activity. Lastly, the commission commits 36.4 percent of its members to human relations tasks in this example with the motivating activity having a slight edge over facilitating activity.

Is there any way to compare our illustrative distribution of personnel types to a benchmark distribution of personnel types in order to estimate how much deviation from the benchmark distribution is necessary? The approach taken here is a variant of the approach taken in Wirick et al. In Figure 4, we overlay in vector from the Rogers' distribution pertaining to the dissemination of an innovation onto our illustrative

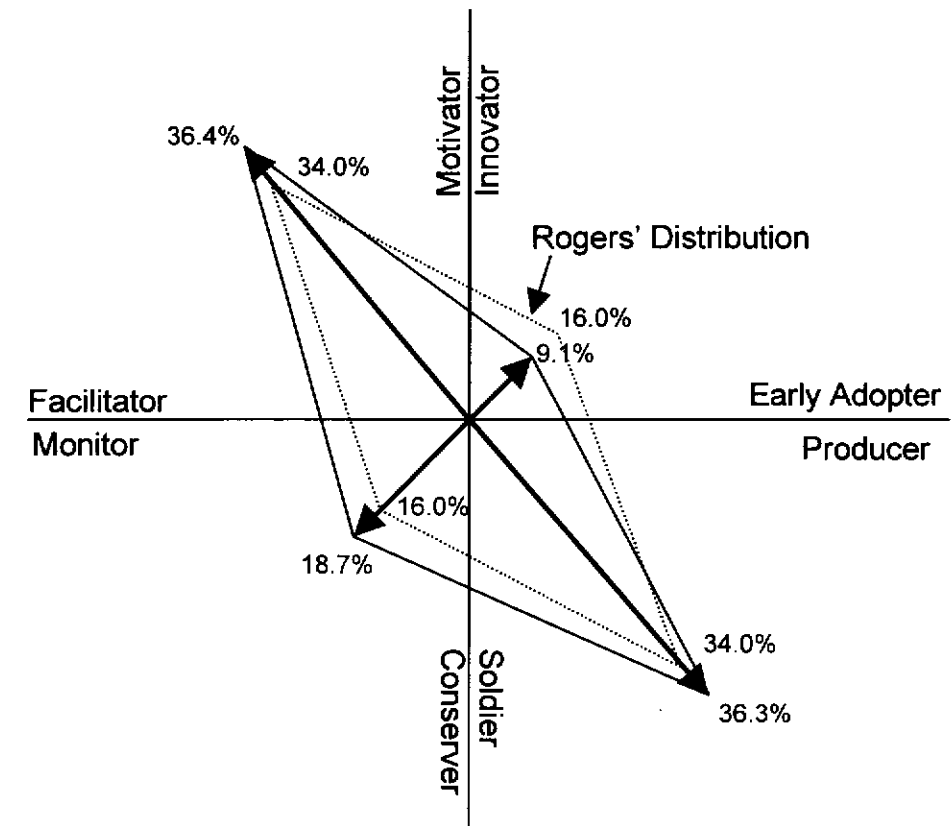


Fig. 4. Comparison of Optimal Percentages of Personnel Characteristics to Benchmark Percentage of Personnel Characteristics: An Illustration.

distribution of the personnel types required to successfully transform the commission from a machine metaphor to the dual metaphor of the living organism and the brain. But before we extract any conclusions from this figure, we need to comment on the matching of the personnel types in our illustrative personnel profile with the personnel types characterizing the Rogers' distribution.

It is reasonably clear that individuals lagging with respect to the acceptance of an innovation are behaviorally related to the monitoring and conserving functions that dominate the internal process model of organizational activity. The members of both groups value stability and predictability, and hence, they cast a skeptical eye on anything new. However, it could be argued that monitoring and conserving activities associated with the internal process model are more attuned to improving organizational efficiency than the basic cautiousness associated with the lagged adoption of an innovation. It is even more clear that innovation and the early adoption of the innovation are behaviorally related to the innovation and experimentation activities that dominate the open systems model. Innovation is innovation notwithstanding the modeling framework, and procedurally speaking, the early adoption of an innovation is equivalently experimentation with the features and functions of the innovation. It can be argued less assertively that the individuals in the first wave of the general acceptance of an innovation (i.e., the early majority adopters) are behaviorally related to the motivation and facilitation activities that dominate the human relations model. Motivation is the act of providing a rational framework for the widespread adoption of the innovation. This function is performed by the early majority adopters. Facilitation is the act of pushing the innovation into the mainstream of organizational activity. This function also is performed by the early majority adopters. Lastly, it can be argued that the individuals in the second wave of the general acceptance of an innovation (i.e., the late majority adopters) are behaviorally related to the producing and soldiering activities that characterize the competition model. Production is creating the organization's output, and the late majority adopters use an innovation in this fashion because it has become part of the organization's mainstream activities. Soldiering is a

metaphor for following orders, and this is generally why late majority adopters begin to use an innovation.

On the basis of the preceding analogies, there are more than enough innovators in the Rogers' distribution of the dissemination of innovation to successfully navigate the transition from the machine metaphor to the dual metaphor of the brain and the living organism. Figure 4 also indicates that the Rogers' distribution slightly underrepresents the percentages of laggards, early majority adopters, and late majority adopters in relation to what is needed in the areas of facilitation, motivation, production, soldiering, monitoring, and conservation to successfully complete the commission's transformation to the dual metaphor. Consequently, the Rogers' distribution contains too many early adopters (a.k.a. experimenters) as compared to what is needed on the basis of our illustrative example of the structure of the optimal personnel profile for the particular commission transformation under consideration.

The excess of early adopters in relation to the Rogers' distribution is anticipated by Wirick et al. when they offer the advice that individuals with skills in dispute resolution, collaboration, and information processing are best suited for staffing a commission that has been transformed to mimic the behavioral characteristics of a dual metaphor consisting of the living organism and brain metaphors.³⁰ Each of these tasks is performed most effectively when the decisionmaking environment is well-behaved and populated with people who want to reach a consensus. Early adopters, by definition, are seeking to alter the *status quo*, thereby throwing up for grabs a current consensus or collaboration based on a particular dispute resolution process. Furthermore, they are looking for new landmarks rather than relying on the direction provided by the old ones. Therefore, early adopters are questioning the old ways in a very significant manner. Finally, early adopters do not seem to be particularly well-equipped to form a clear vision of the commission's mission, which is so important to successfully performing the

³⁰Ibid., 28.

facilitation and motivation activities that are critical functions of the human relations model of organizational behavior.

We are now positioned to analyze Wirick et al.'s vision of the operation of a transformed commission.³¹ They propose the commission should use its teams in collaboration with other regulatory participants to create a mission for itself that is general enough to never falter as things change and then to cautiously implement this mission. These instructions clearly elevate the importance of innovation and experimentation when the regulatory environment is changing rapidly. However, innovation and experimentation are organizational activities at odds with consensus building, team work, and interpersonal relations, unless the consensus being built is to use teams to innovate and experiment. However, if the consensus is to innovate and experiment, then the commission's mission has to be centered around these activities, which, in turn, would suggest a mission that is difficult to implement cautiously. That is, cautious innovation and cautious experimentation do not present themselves as concepts that can be defined easily. Moreover, a mission centered around innovation and experimentation substantially decreases the relative importance of facilitation, motivation, and production, which are the organizational activities, according to our analysis, that comprise the core of a dual metaphor consisting of the brain and the living organism. In short, Wirick et al.'s vision of the commission's mission, while consistent with the open systems model of organizational behavior, is at odds with their selection of the living organism and brain metaphors to describe the proper transformation of public utility commissions.

Of course, the preceding analysis of Wirick et al.'s visions of a commission's mission should not be interpreted as suggesting that a commission should suppress its innovation and experimentation activities. Because there is no convincing data on the amounts of innovation and experimentation currently being done within an untransformed commission and the amounts of these activities that are required in the

³¹Ibid., 24-25.

transformed commission, it may very well be the case that there currently is too little innovation and experimentation at a commission. But, it also is important to note that a finding of too little innovation and experimentation does not mean *ipso facto* that it is proper for this commission to radically restructure its work force as decreasing the relative importance of the monitoring and conserving activities. The overall theme of the analysis presented in this report is that a commission transformation in accord with the brain and living organism metaphors, although dependent on successful innovation and experimentation during the transition period, is not consistent in the long run with a personnel profile that overrepresents these two activities.

CONCLUSIONS

With respect to methodology, the analysis indicates that Wirick et al. have introduced tools that are sufficient for predicting the structure of the optimal personnel profile for a completed transformation of a public utility commission. Their reinterpretation of Quinn's organizational profile is a good tool for discovering the organizational skills that are required for the successful completion of a proposed commission transformation. This tool also is a reasonably effective means for deducing an appropriate metaphorical transformation for the commission from observed changes in the commissioners' and the commission staff's perceptions of their regulatory environment.

Furthermore, Roger's distribution of the dissemination of an innovation within an organization has been shown to conform reasonably well with Quinn's typology of organizational models. However, it also has been shown that the Roger's distribution can provide misleading results when it is used as a benchmark for the transformed commission's staffing policies. The problem is that the Roger's distribution may differ from the typical distribution of innovators, early adopters, early majority adopters, late majority adopters, and laggards for untransformed public utility commissions. As shown

in this report, the Roger's distribution contains too much innovation and experimentation in relation to what is required in these areas after a commission has been transformed consistently with the dual metaphor of the brain and living organism. But, the reality might be that the pretransformation commission did not do enough innovation and experimentation in relation to what is required of the transformed commission. Therefore, the proper staffing policy would be to increase the individuals adept at innovation and experimentation, even though the staffing policy derived from the Roger's distribution would reduce the number of such individuals. Consequently, a pertinent research topic in the area of transformation is how innovations are currently disseminated throughout a traditionally structured public utility commission.

Notwithstanding the problems created by using the Roger's distribution as the benchmark for an optimal personnel profile of a transformed commission, our analysis indicates that innovation and experimentation are weak focal points for the staffing of a commission that is described by the dual metaphor of the living organism and the brain. Without regard to existing excesses or deficiencies of innovation and experimentation within the commission prior to its transformation, the success of the transformed commission relies on effective collaboration, consensus building, team work, reputation, incentives, and interpersonal relations throughout its organizational structure and with the other participants in the regulatory process. These organizational activities, whether done in teams or otherwise, are not particularly compatible with innovation and experimentation because the latter two activities promote change, and change always threatens an existing consensus, reputation, team, incentive, and interpersonal relationship. In fact, innovation and experimentation are strong focal points for a commission described by the dual metaphor only when the collaboration and consensus building outside of the commission result in the commission's mission being innovation and experimentation. Then it would be the case that the commission's cultural equilibrium would emphasize these two organizational activities.

The prior conclusions do not take away from the fact that innovation and experimentation are required if a commission is to be successfully transformed from

one metaphor to another. However, these two activities are always required during the transition period, notwithstanding the nature of the commission's transformation. There must be one or more organizational catalysts to push a commission from one cultural equilibrium to another. Innovation and experimentation, by definition, are these catalysts. Therefore, these activities are necessarily dominant during the actual transformation of a public utility commission, but as shown in this report, they can be counterproductive once the transformation is complete.