

An Integrative Study of Organizational Structure Influences on Information Utilization

Dr. Patricia M. Fandt, Management, University of Central Florida
Dr. Pamela S. Lewis, Management, University of Central Florida

Abstract

The present study integrates organizational structure influences on managers' use of information for decision making. While previous research supports the notion that managers use accessible rather quality information, the present study indicates that quality, more often than accessibility, determines the information used. Organizations that exhibit characteristics of an organic system appear to provide the rewards and motivation for using accurate and timely information sources. Implications for future research and managerial applications are provided.

Introduction

Decision making is a ubiquitous organizational activity that consumes a manager's time and challenges his/her effectiveness. Even after decisions are made and outcomes seem obvious, the true impact may not be immediately apparent. Accordingly, much of the research on decision making has focused on the information processing approach in an attempt to better understand and improve managerial decision performance (Abelson & Levi, 1985).

Decisions are made more or less difficult by the amount and quality of pertinent information available to the decision maker. Effective managers know the value of high-quality, complete information. It contributes to accurate situational descriptions and problem diagnosis, reliable alternative generation and implementation, and constructive feedback. Furthermore, with complete and accurate information, decision makers can determine the problem structure and the existence of uncertainty, risk, and conflict.

While the use of quality information is the "ideal", individuals do not always follow this norm. Influenced by forces such as personality characteristics (Fandt & Ferris, in press), the task and performance criteria (Pfeffer & Salancik, 1977), position in the organizational hierarchy,

and the design of the organization's internal system of reporting relationships (Fandt, 1986; O'Reilly, 1982), managers have been depicted as less than perfect decision makers.

Considerable research attention has focused on three of these influencing factors--personality characteristics, performance criteria, and hierarchical position--with consistent conclusions. Less apparent is the influence of the organization's structure on managers' use of information.

The purpose of the present research is to examine managerial information utilization with regard to the structure of the organization. This integrative perspective will provide a broader viewpoint than previous investigations in exploring organizational criteria and furnishing useful guidelines to maximize effective managerial decision making.

Theoretical Framework

Quality Information Leads to Quality Decision Making

There is a direct relationship between the quality of information used by a decision maker and decision-making performance (O'Reilly,

1982). In the "ideal" situation, decision makers would select information from sources perceived to offer the highest quality information. According to Goldstein, Marcus and Rausch (1978):

Quality information allows a decision maker to justify the basis of the decision, arguing that if the information used is timely, accurate, and reliable, then any decision made is likely to be a good one. (p. 44)

Influences on Information Use

Numerous studies have demonstrated that individuals choose information sources based on criteria other than quality (Daft & Lengel, 1984). For example, managers may be influenced to develop preferences for specific information sources in response to performance criteria, the pressure to produce results, psychological and personality biases, and their hierarchical position.

Organizational reward systems often pressure managers to produce instant results by recognizing and rewarding short-term decisions. In turn, individuals are motivated to seek immediate answers and neglect long-term goals.

Individual personality characteristics and psychological biases affect the utilization of information for solving problems. Managers are not always objective in the way they gather, evaluate, and utilize information towards making decisions. Illusions of control (belief of control or "beating" the odds such as a gambling situation), discounting the future, and framing effects (how information is phrased--positively or negatively) represent a few of the many documented subjective biases (Nisbett & Ross, 1980).

While managers at all organizational levels make decisions, there is a distinct relationship between hierarchical level and the extent to which decisions are programmed or non-programmed. Decisions become increasingly less programmed (and require more information) as managers progress higher in the organization.

Structural Influences: Mechanistic-Organic System

Studies have linked the organization's information requirements with the degree of task uncertainty and task complexity (Gifford, Bob-

bitt, & Slocum, 1979). The need for information in managerial decision making increases as tasks become more complex and less routine. This suggests that organizations must adapt different internal structures to effectively achieve performance goals.

Two basic types of organizations--mechanistic and organic--were originally identified and differentiated on the basis of how their managerial processes related to the organization's external environment (Burns & Stalker, 1961). The dramatic differences between these two organizational systems--reporting relationships, rules and procedures, environmental adaptation, reward systems, and technological applications--ultimately impact on the behavior of the individuals within the organization.

Research has proposed that mechanistic structures are most appropriate and effective for firms that operate in relatively stable environments and function with routine technology (Duncan, 1972). The internal structure is represented by having predominantly vertical lines of communication, low task uncertainty, and high job specialization. Rewards are chiefly obtained through obedience to instructions from supervisors. Conformity rather than innovation is encouraged and less flexibility is apparent.

In contrast to the mechanistic system, the organic system is flexible and is appropriate for firms that face turbulent or rapidly-changing environmental conditions (Cheng, 1984). This type of structure is characterized by having lateral as well as vertical communication networks, high task uncertainty, and low job specialization. Decision making is decentralized, status and rank differences are de-emphasized, and individuals are valued for their expertise and innovative behavior rather than for their position in the hierarchy.

Structural Influences On Information Use--Discrepant Findings

Information accessibility. Propositions drawn from prior research findings concluded that managers more frequently selected information that was accessible than information of high quality (O'Reilly, 1983). That is, while the decision maker were able to identify the highest quality sources of information with respect to a given

issue, in practice, information that was easily accessible, although lower in quality, was utilized.

O'Reilly (1983) proposed that an organization's structure restricted access to quality information sources. However, he derived this conclusion from research studies that relied exclusively on government agencies to collect data (e. g., U.S. Congressional representatives, Clausen, 1973; police officers, McCleary, 1977; social welfare agents, O'Reilly, 1982; educational administrators, Pfeffer & Salancik, 1977). These government agencies, operating with primarily bureaucratic structures Tushman & Nadler, 1978), exhibited characteristics corresponding to mechanistic systems. Based on the mechanistic-organic taxonomy, the implication that managers use accessible rather than quality information appears valid, given the mechanistic structures of the organizations studied.

Information quality. More recent studies have challenged previous research conclusions by demonstrating that managers selected quality, not availability, as a determinate of information sources (Fandt, 1986; Fandt & Lewis, 1987). Applying the mechanistic-organic taxonomy, the organizations in these studies characterized the organic system. That is, lateral as well as vertical communication networks were encouraged, task uncertainty and information needs were high, and decision making was decentralized. It seems probable to suggest that the variant organizational characteristics demonstrated by the two structures--organic and mechanistic--will have an impact on managers' use of information.

Research Questions

When managers need information for decisions, do they use the criteria of accessibility, or do they seek high quality information? Are there organizational considerations that influence or impede the use of accurate and timely information? Resolving these questions requires closer attention to the organization's internal structure. With these questions in mind, the following hypothesis was proposed and tested:

HYPOTHESIS 1: Managers will use quality information sources more frequently than accessible information sources when the organization

in which they work has an organic internal structure.

Methodology

Organizational Sample

Three organizations in the service industry were selected for this study based on characteristics established as criteria of an organic internal structure. These criteria included: (a) The organization competed in an environment characterized by rapid changes in technology, products, and/or markets; (b) organizational members' tasks had a high degree of uncertainty; (c) job were not specialized; and (d) communication flowed laterally.

Internal structure measurement. Thirty-five top managers (from the three organizations) completed a four-item survey that was designed to measure specific characteristics of organic and mechanistic internal structures (degree of change in the environment; degree of task certainty and specialization; and flow of information and communication). These 4 items were measured with a 7-point Likert scale with scores ranging from 4 to 28. The four questions were scored so that a low score was indicative of a mechanistic structure and a high score was indicative of an organic structure.

The 35 scores ranged from a low of 19 to a high of 27 with a mean score for the total sample of 23.8. The scores were also examined by organization. The three means were 22.7, 24.2, and 24.5, and t-tests indicated no significant differences between the three organizations on this measure. Clearly, these top managers perceived their organizations to have characteristics of an organic structure. This measure, along with the data collected from the personal interviews with top managers, served to confirm that the organizations selected for the study met the organic structural criteria.

Data Collection

Department managers approached in all three organizations agreed to allow employees to participate in the study during scheduled working hours. Data were collected from 161 employees who were in managerial/customer-service related

jobs. Participation was voluntary and respondents were guaranteed anonymity.

Participants assessed their use of four information sources including (a) computer files, (b) updates (memos and newsletters), (c) the internal work group (peers and supervisor), and (d) the external work group (others outside the unit and inside the organization). Questions pertained to the information used to make decisions and solve routinely encountered customer service problems.

Information source quality and accessibility were measured using an instrument developed by O'Reilly (1982) and tested by Fandt (1986). A 7 - point Likert scale was used as a measure of

the information source quality (accuracy, reliability, and precision) and information source accessibility (availability, expedience, and convenience). Following O'Reilly and Fandt, the items comprising the quality dimension were summed to form a quality index (coefficient alpha .68 for reliability) and the items comprising the accessibility dimension were summed to form an accessibility index (coefficient alpha .71 for reliability).

Results

The results of the first analysis shown in Table 1 include the means, standard deviations, and correlations for both quality and accessibility of the four information sources and the frequency

Table 1
Quality and Accessibility of Four Information Sources

Characteristics	Means	SD	Computers	Updates	Frequency of Use	
					Internal Sources	External Sources
=====						
QUALITY:						
Computers	9.67	2.0	.54**	.06	.04	.04
Updates	8.96	2.9	.13	.53**	.06	.11
Internal Sources	10.54	2.3	.03	.10	.49**	.01
External Sources	7.63	3.2	.15	.10	.05	.59**
=====						
ACCESSIBILITY:						
Computers	10.48	3.1	.32*	-.03	.09	-.04
Updates	8.72	3.1	.11	.14	.08	.01
Internal Sources	10.86	2.6	-.07	.05	.27*	.10
External Sources	8.25	3.1	.11	-.01	.06	.09
=====						
	* p < .01		** p < .001			

Table 2
Regression Results for Frequency of Use of Information Source Regressed on Four Information Sources

	Computers	Updates	Frequency of Use ^a	
			Internal Sources	External Sources
=====				
ACCESSIBILITY	.21*	.15	-.09	.05
QUALITY	.48**	.42**	.49**	.55**
F-Ratio	32.96**	35.65**	22.74**	41.89**
R-Squared	.29	.30	.23	.35
Adjusted R-Squared	.20	.30	.21	.34
df (2, 158)				
=====				
^a Entries are standardized regression coefficients				
	* p < .01		** p < .001	

with which the information sources were used. These data are supportive of the hypothesized relationship of frequency and quality information in the organic organization.

Further analysis examined the independent contributions of perceived quality and perceived accessibility for each of the four information sources to the frequency of their use. Table 2 represents and summarizes the results of four regressions equations that were constructed with each of the frequency variables regressed on the quality and accessibility of information.

All four regression equations are significant. Perhaps the most noteworthy finding visible is the consistency with which quality is related to the information source used. In all four cases, quality is significantly ($p < .001$) associated with the frequency of use of each information source. This demonstrates the important contribution of quality with respect to the use of computers, updates, the internal and external group. Thus, the results provide convincing support for Hypothesis 1.

A second set of regression analyses was conducted to ascertain if the quality and accessibility of information sources interacted to affect the frequency. As suggested by O'Reilly (1982), moderated (hierarchical) multiple regression was used. No significant interactions were obtained.

Discussion

In the "ideal" situation, decision makers will choose information from sources perceived to offer the highest quality information. Quality information is more likely to lead to higher calibre and more effective decision making (Bass, 1984).

The predominate thinking has implied that managers relied on information that was accessible or easily available rather than using accurate, quality information. Previous investigators surmised that the organizational structure restricted the use of high quality sources and reward systems did not encourage this behavior. However, these conclusions were drawn from organizational samples that were limited to bureaucratic organizations. Therefore, this interpretation may only be relevant when the organization has developed a mechanistic internal structure.

The strength of the relationship between information accessibility and frequency of use may be distorted by the internal structure of the organization.

The present study was designed to examine more recent research findings that showed managers did recognize and use quality information. Closer examination of the organizations in these studies indicates that they fit the criteria for organic systems. The present findings confirm the notion that quality may be a significant determinate for using information under certain organizational conditions. That is, the characteristics of an organic internal structure appear to influence individuals differently than a mechanistic system by providing, encouraging, and rewarding utilization of quality information.

The principal reason for research examining information in decision making is the fact that decision making is an organizational activity performed by virtually all employees. Information functions as an essential element in decision making and high quality information will subsequently lead to high quality decisions. Additionally, decision-making research that furthers our knowledge and understanding of how individuals use information to make choices will prove useful in maximizing performance.

Limitations

Previous research has suffered limitations due either to confined laboratory settings or samples that were restricted to organizations characterized by mechanistic internal structures. Nevertheless, the present findings are subject to several qualifications. Since we considered only organizations that were characterized by organic internal structures, generalizations from this study to all organizations seem unfounded. However, the results of the present research do corroborate and extend our knowledge of organizational influences on decision making.

Future Research

The next logical step for future investigations is to develop a framework in relation to both mechanistic and organic organizational structures. This calls for systematic research using multiple data sources with organizations from both the mechanistic and organic categories.

Integrative research will strengthen inferences and resolve questions that have developed from previously discussed discrepancies.

Implications for Managers

While managers cannot control the organization's structure, they can exhibit some control over the departments they manage. When possible, managers need to create, within their own departments, the characteristics of an organic management system. This requires facilitating the access to sources of information and rewarding behavior that utilizes quality information sources.

A manager can facilitate the accessibility of quality information by cultivating well developed communication networks. By encouraging open and lateral communication, power and status differences are diminished and the emphasis on a hierarchical chain of command is lessened. Additionally, managers can encourage and reward subordinates for using high quality information. Feasible techniques include: (a) Increasing employee accountability; (b) allowing employees to contribute to the common task of the department; (c) adjusting and redefining tasks through employee interactions; (d) supporting innovative thinking; and (e) maintaining employee visibility.

The opportunity focuses on managers. Their responsibility is to establish an environment where high quality decision making is encouraged and rewarded through recognition, compensation, incentives, and validation of performance criteria that reinforce these behaviors.

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