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# Membership Structural Design:

## A Pilot Test On DHI Cooperatives



## Abstract

### **Membership Structural Design: A Pilot Test On DHI Cooperatives**

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Cooperatives are organized to be democratic. However, large membership size can create problems for democratic process and governance. Attending meetings and casting votes may not be enough to preserve democratic characteristics. This report develops a set of propositions—a theory—for structuring membership to improve democratic opportunities and responsiveness. Aspects of these propositions are tested against data from dairy herd improvement cooperatives in Wisconsin and are supported. These propositions suggest potential structural design options, given specific stressors in the membership environment, and the management and operations environment.

**Keywords:** Cooperatives, Membership Structure, Democratic Organization, Governance, Dairy Herd Improvement.

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## Preface

While various events have led to highly complex cooperative operations, development of membership structures has lagged. The purpose of this research is to distill a series of propositions—a theory—for improving structural opportunities for democratic process within large cooperatives. These propositions are developed and then tested against data from dairy herd improvement cooperatives (DHI) in Wisconsin.

The report's intended audience is social and economic researchers and those involved directly in the design of large cooperative membership structures. Therefore, the report is fairly technical in style and intended to serve as a resource for this relatively specialized group.

Readers should note the report presents new, perhaps awkward terminology for the first-time user. The authors' intent is to contribute to a systematic and more rigorous understanding of membership. To develop new strategies for member governance in changed environments, the concepts and language of analyses must also develop. We have provided a "Glossary" to facilitate this process.

This research is part of a series of reports on organizational design of cooperative membership by Thomas Gray, Rural Development Administration—Cooperative Services, and Gillian Butler, University of Wisconsin.

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## Highlights

Based on the development of cooperatives from simple to complex organizations, this research develops a series of propositions that can help guide the design of membership structures.

Membership structure is conceived as organization-like, producing a service (member control) for members. In large cooperatives, member control is effectively thought of as involving three aspects-representation, policymaking, and oversight. The goal of structural design should be creation of organizational arrangements that help facilitate the realization of representation, policymaking, and oversight.

Design cannot be done in a vacuum, but rather must take into account its own environments-the members themselves and management and operations. Using the language and concepts of organizational design, and following the development of cooperatives from simple to complex organizations, the following propositions are derived. Definitions and explanations of terms are found in the text.

Proposition List:

1) The greater the complexity of the farmer environment, the greater the delegation of authority to a board.

2) The greater the complexity of the farmer/board environment, the greater the delegation of authority to management and operations.

3) The greater the delegation of authority to management, the greater the loss of direct control by members.

4) The greater the diversity in membership (large numbers of dissimilar characteristics), the greater the need for horizontal divisions into departments.

5) The larger the membership quantitatively (large numbers with similar characteristic), the greater the need for horizontal divisions into departments.

6) The greater the number of horizontal departments, the greater the possibilities for representation.

7) The greater the complexity of management and operations, the greater the relative delegation of authority to management, the greater the subsequent loss of direct control by members.

8) The greater the delegation of authority to management and operations, the greater the use of specialization of the board.

9) The greater the specialization of the board, the greater the oversight and policymaking possibilities.

10) The greater the stability in a member structure environment, the greater the use of standardization options, the greater the certainty of member-control possibilities.

11) The greater the instability in a member structure environment, the greater the use of ad hoc communications options, the greater the **member-control** possibilities.

12) The greater the number of horizontal departments created, the greater the need for coordinating vertical departments.

13) The greater the number of horizontal and vertical departmentations, the greater the possibilities for representation.

## Highlights

14) The greater the complexity of the membership structure, the greater the need for specialization of department hierarchies.

15) The greater the specialization of department hierarchies, the greater the possibilities for member representation.

16) Internal structural complexity (both quantitative and **qualitative**) **imposes** limits on horizontal and vertical differentiations, departmentations, and specializations.

17) The poorer the environmental capacity of a cooperative, the less the delegation of authority to management and operations.

18) The poorer the environmental capacity of a cooperative, the greater the horizontal and vertical differentiations in the structure.

19) The poorer the environmental capacity of a cooperative, the less the delegations of authority to management, the less operation-driven specialization in the board.

These propositions should be considered a group-as a theory-for understanding the design of membership structure. We tested aspects of this set of propositions against data from Wisconsin (DHI) cooperatives. Propositions 2, 5, 8, 10, 12, 17, 18, and 19 are supported. Few of the other propositions were tested directly, due to limitations of the data, i.e., small size of cooperatives. We recommend researchers use these propositions in future empirical studies, and that organizational designers examine these propositions and their implications, in their work on membership. Departmentations and specializations are **structural** innovations that can help accommodate complexity and diversity in the membership, and management and operations environments. Such accommodations can then enrich the setting for representation, oversight, and policy making.

# Membership Structural Design: A Pilot Test On DHI Cooperative&

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## INTRODUCTION AND PREVIOUS STUDIES

Most modern cooperatives try to follow a set of principles and practices first laid down systematically during the British consumer cooperative and German credit union movements of the 1840s and 1860s, i.e., the Rochdale, Raiffeissen, and Schulze-Delitzsch principles. Various reformulations have occurred, although all have common themes. Briscoe, et al.(1982:40) suggest five different aspects:

1. Open and voluntary membership confined to all persons using the cooperative, with no discrimination on the basis of race, sex, politics, religion, or family background.
2. Ownership of the cooperative by member-users only.
3. Control of the cooperative vested with members. Organization of the cooperative should encourage member participation in decision-making and balloting on a one- member, one-vote basis.
4. Benefits received by members in proportion to their use of the cooperative.
5. Return on investment set at a limited rate of interest.

Dunn (1988:85) suggests a more succinct version:

1. The User-Owner Principle: People who own and finance the cooperative are those who use the cooperative.
2. The User-Control Principle: People who control the cooperative are those who use the cooperative.
3. The User-Benefits Principle: The coopera-

tive's sole purpose is to provide and distribute benefits to its users on the basis of their use.

Some see member control via democratic process as the core principle and central to various definitions of cooperatives (Schomisch and Mirowsky [Butler] 1985:4).

A cooperative is a business voluntarily owned and controlled by its member patrons, and operated by them on a nonprofit or cost basis (Schaars 1980:7).

Cooperative societies are democratic organizations. Their affairs should be administered by persons elected or appointed in a manner agreed by the members and accountable to them. Members of primary societies should enjoy equal rights of voting (one member, one vote) and participation in decisions affecting their societies (International Cooperative Alliance 1967:36).

Historically, the focus of research on *member control* has predominantly been at the social-psychological level, with such questions as how to get members to meetings, involved in holding office and voting. Singer (1983) characterizes this body of work as the "member relations paradigm." It is a subset of the larger participation research area and is represented by various authors including Anderson and Sanderson 1943; Beal et al. 1951; John 1953; Folkman 1955; Brown and Bealer 1957; Copp 1964; Torgerson et al. 1972; Rogers 1971; Heffernan 1967; Warner 1966; Warner and Rogers 1971; and others. Most of these papers focus specifically on participation, with an implicit assumption that

member control can be realized with member involvement.

Boynton and Elitzak (1983) address member control more directly, defining control as “the ability of an individual or group to affect an organization’s objectives and the strategies used in the pursuit of those objectives.” They suggest control may be “active” and involve such behaviors as voting, serving on committees, and holding office. Or, it may be more “passive,” and involve such considerations as “the amount of control members could potentially exercise if dissatisfied with the cooperative.” Their focus remains at the social-psychological level, asking members how much control they perceive they should have, and how much they believe they actually have.

Size of cooperatives has increased dramatically during the past 40 years (Kraenzle et al., 1993). Most agricultural cooperatives began as relatively small, local, single-product organizations. As such, they were highly accessible to their members and easily understood by them. However, many of these cooperatives have since grown into large multi-product businesses that use sophisticated technologies and serve large geographic territories.

In the small cooperative, those that can accommodate their total membership in town-meeting type decisionmaking, member control [influence and equality] does not present compromising problems. Membership tends to be homogeneous across several characteristics. Elected representatives tend to be representative, i.e., embodying many of the wants, needs, and opinions typical of the general membership. As cooperatives grow into thousands of members, new requirements are placed on the shape that democratic decisionmaking must take in pursuit of member control. All members can seldom be assembled at one place and at one time. If they could be assembled, getting member input organized, articulated, and discussed would become extremely awkward and difficult (Swanson 1985; Gray 1988; Butler 1988).

This empirical context has driven cooperative size into analyses of participation. Studies emerged to isolate the effect of size of cooperative on participation/control (Warner and Hilander 1964:39; Lasley 1982; Elitzak and Boynton 1983; and Als

1984). Lasley (1982) introduced formal organizational concepts into the member relations research, relating participation to various organizational measures—formalization, centralization-of cooperative operations. Butler (1986) and Gray (1990) followed by beginning conceptual work on *membership structure as organization*.

In this report, we seek to deepen understanding of member control in cooperatives with large memberships. We seek to further answer questions about the organization of large membership structures, and how to orient them toward accentuating member control.

The authors imported “organizational theory” concepts into the member control literature, suggesting their continuity with concepts of democratic organization, exploring their application to membership structure, deriving a set of internally consistent organizational propositions, and testing these propositions against data from dairy herd improvement (DHI) cooperatives. This report focuses on the agricultural cooperative.

## THE CONCEPT OF ORGANIZATION

The study of organization has not yielded one common “theory of organization.” Rather, several different perspectives have emerged—sometimes categorized as organizational development, theory, and/or design (Hage and Finsterbusch 1987). We follow Mintzberg (1979), and Van De Ven and Ferry (1980), for rudimentary definitions of an organization, and combine these with the concept of organizational contingency, first introduced by Burns and Stalker (1961), and Lawrence and Lorsch (1967). This terminology will be explained as the report unfolds.

Organizations develop out of two **dynamics**—*specialization and coordination*—both central and interrelated within an organization (Mintzberg 1979). People come or are brought together to pursue certain goals and objectives. Behaviors and activities are specified, sometimes narrowly, sometimes broadly. Several people may do the same jobs in different locations; a few people, or a lot of people, may do narrowly defined jobs independently or together. A specialization occurs.



Coordination occurs with specialization. Specialization allows some tasks to be completed more efficiently. Coordination brings tasks together in an overall pursuit of organizational goals. The interplay of these two tendencies defines organizational structure. “The structure of an organization can be defined simply as the sum total of the ways in which it specializes its labor into distinct tasks and achieves coordination among them (Mintzberg 1979:3).”

“Contingency theory argues that different organizational structures are required for different organizational contexts (Hage and Finsterbusch 1987:87).” Specializations and coordinations must be accommodated in different arrangements according to pressures from an organization’s environment. These arrangements-or organizational design options-mediate the tension between specialization/coordination and environmental stressors. Stressors create uncertainty while design options rationalize and manage the stress so that goals and objectives can be approximated (table 1).

Table 1— **Structural design strategies**

Sources of Uncertainty	Structural Design Options
Quantitative Complexity and/or Diversity	Departmentalization (Horizontal Differentiation)
	Delegation of Authority (Vertical Differentiation)
Technical Complexity	Job Specialization (Delegation of Authority)
Stability/Instability	Standardization of Information Flows
	Ad hoc and Formal Communication Alternatives
Environmental Capacity (Performance Gap)	Heightens or Lessens Use of Design Options

Note: Adapted from Butler 1988:8; Gray 1989:2.

## Bureaucratic/Democratic Organization and Design Options

Bureaucracy and democracy are frequently viewed as opposing ways of organizing. And there are distinctive differences. *Personnel selection* procedures and criteria differ. In a bureaucracy, an individual is hired for a position on the basis of ability to do a certain job. In a democracy, an individual is elected to fill an office, theoretically because he/she can represent constituent interests.

*Dismissal procedures* vary. In a bureaucracy, a few prespecified officials have authority to dismiss an employee. In a democracy, a body of representatives or qualified electors make dismissal decisions (impeachment or recall) through prespecified voting rules.

Both, however, are *rational-legal mechanisms* based on formally defined rules and procedures. Authority in both is embedded in the position rather than in a person. Both also have specialization and coordination dynamics that are centrally important. Structural forms of each take shape as mediations that account for, and are able to process, stresses from their respective environments.

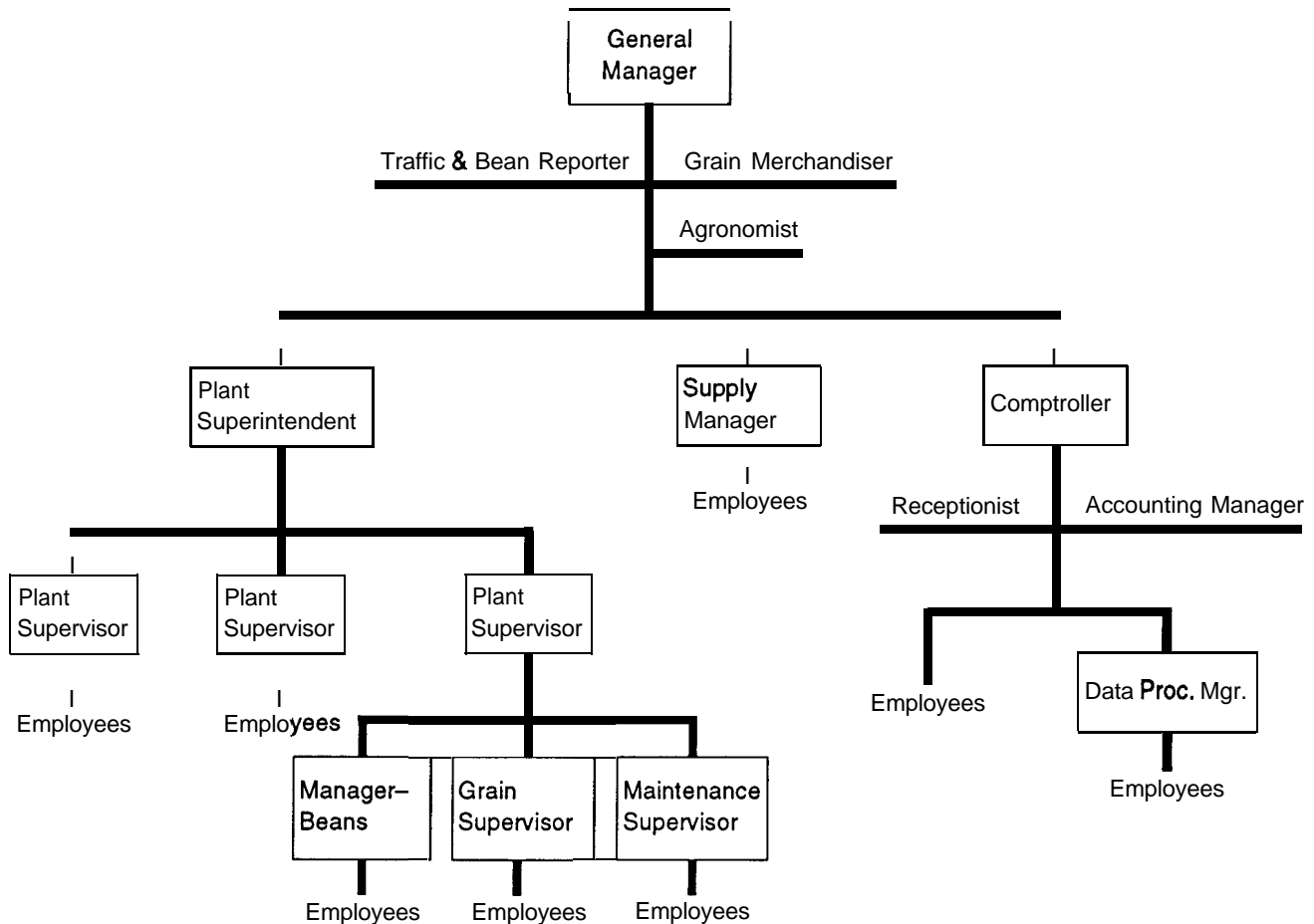
### Structural Design Options

Design options are the structural choices that can be made to realize specialization and coordination. Democratic and bureaucratic organizations solve this dynamic in similar ways.

#### 1. Horizontal divisions (horizontal differentiations)

Organizations have various demands placed on them. To help sort out and homogenize demands, an organization can split into departments. These departments are specialized in handling a narrower range of problems than those faced by the entire organization. At the most basic level, this **departmentation** may be defined along a direction and goal identification function and an operations and methods function. These are organizational departments with separate tasks and located in separate places within the structure. Various **logics** can be used. The split between members/directors and

Figure 1— Management & Operations Structure Example



(Butler 1988:16)

management/employees is by function. Further splits could be made by product, market, geography, or client group (figures 1, 2, 3, and 4).

Figure 1 depicts operations of a cooperative in which departments have been created predominantly by function, i.e., plant production, supply, and comptrolling. It also shows departmentation by product, with one production area specialized for beans and grain. Figure 2 depicts departmentation by function—operations, sales, and secretary-treasurer, and grove production, maintenance, and harvesting—but also within grove production, by location—North, South, East, and West. Figure 3 shows horizontal departmentation by homogeneous function, i.e., production managers and their employees. This is volume departmentation—similar functions being conducted by different people to account for volume difficulties.

Similarly, a democracy may divide tasks into

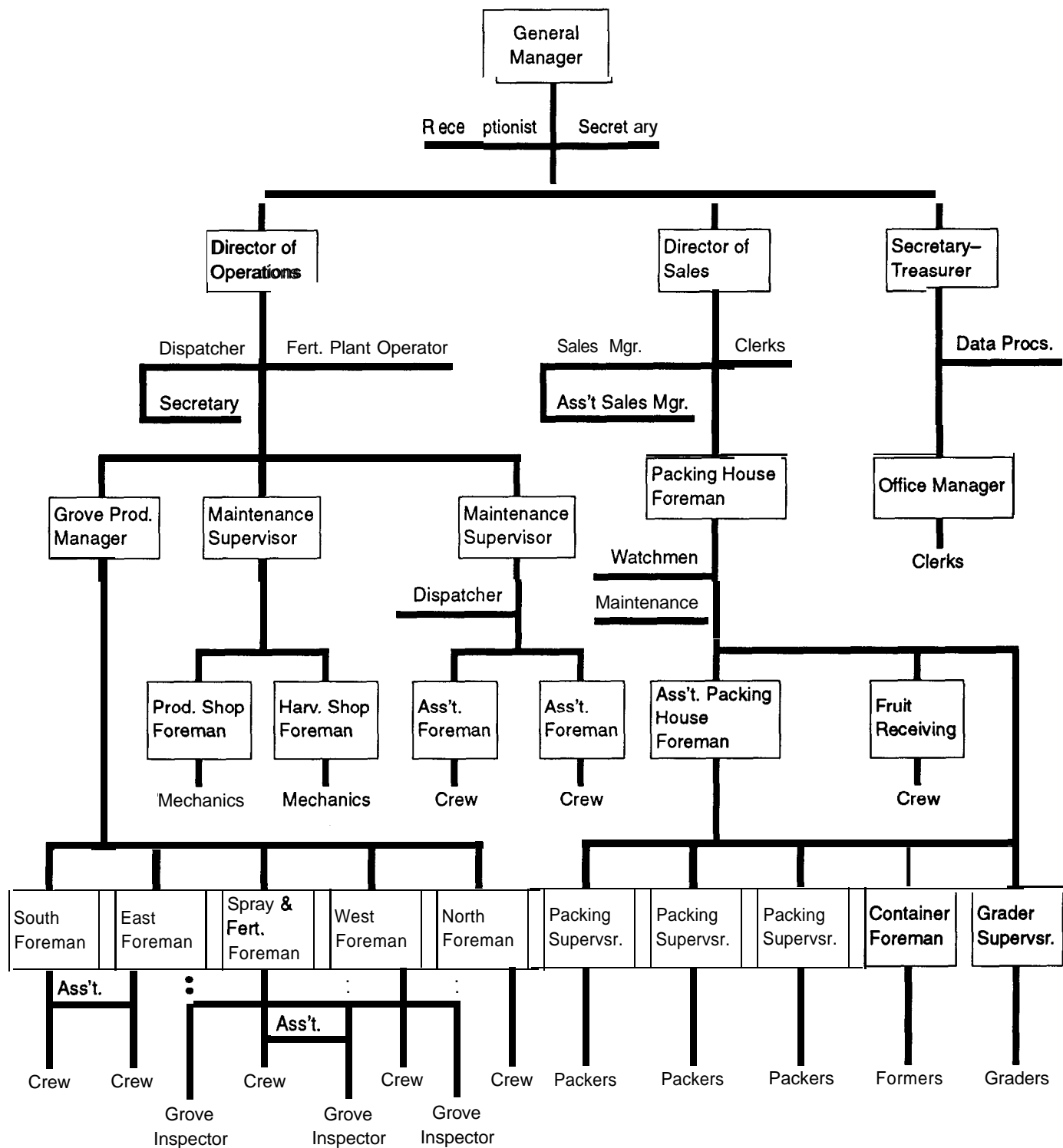
departments. Figure 4 depicts a membership structure with departments by function—young couples, resolutions/districting committees, and delegate body—and by geographic district and region. There are three regions and 11 districts. Each department is separated from the others and has separate duties and delegations of authorities (although departments can be created without delegated authorities). The structural task of departments is specialization.

When several departments are created, the organization is strung out horizontally (horizontal differentiation).

## 2. Vertical levels (vertical differentiation)

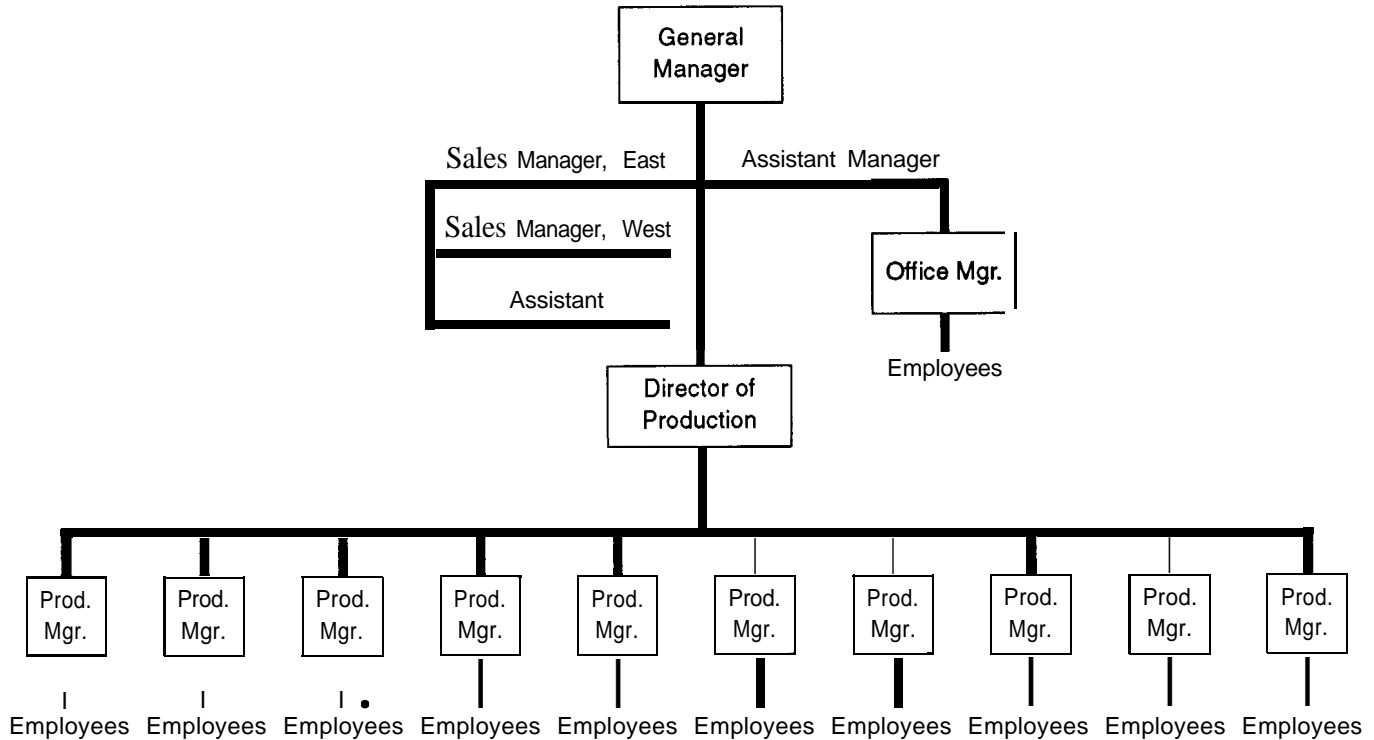
Horizontal departments must be coordinated so that their end results contribute to overall objectives of the organization. The organization will fail without coordination.

Figure 2— Management & Operations Structure Example



(Butler 1988:28)

Figure 3— Management & Operations Structure Example



(Butler 1988:19)

Overhead departments must be created to bring about cohesion and organizational purpose. For example, figure 1 shows the “plant superintendent” integrating activities for the three “plant supervisor” locations. One of the “plant supervisors” brings activities together from the “beans, grain, and maintenance” areas. The general manager coordinates the entire organization. In figure 4 the “young couples committee” coordinates the various “young couples groups.” The board of directors coordinates efforts of the resolutions/district committee, the delegates, and various committees shown. Each level has authority over levels under it.

In a bureaucracy, employees may report to supervisors, who report to department heads. They report to a general manager. A democracy may have local districts, regional boards, delegates, and a board of directors. (Although sources of authority are respectively reversed. In a bureaucracy, the source of authority may lie within the general manager’s position, who may in turn delegate downward. **But**, in a democracy, the source of authority lies with the members, who may in turn delegate upward.)

These departments add height to organizational charts and are termed vertical differentiations.

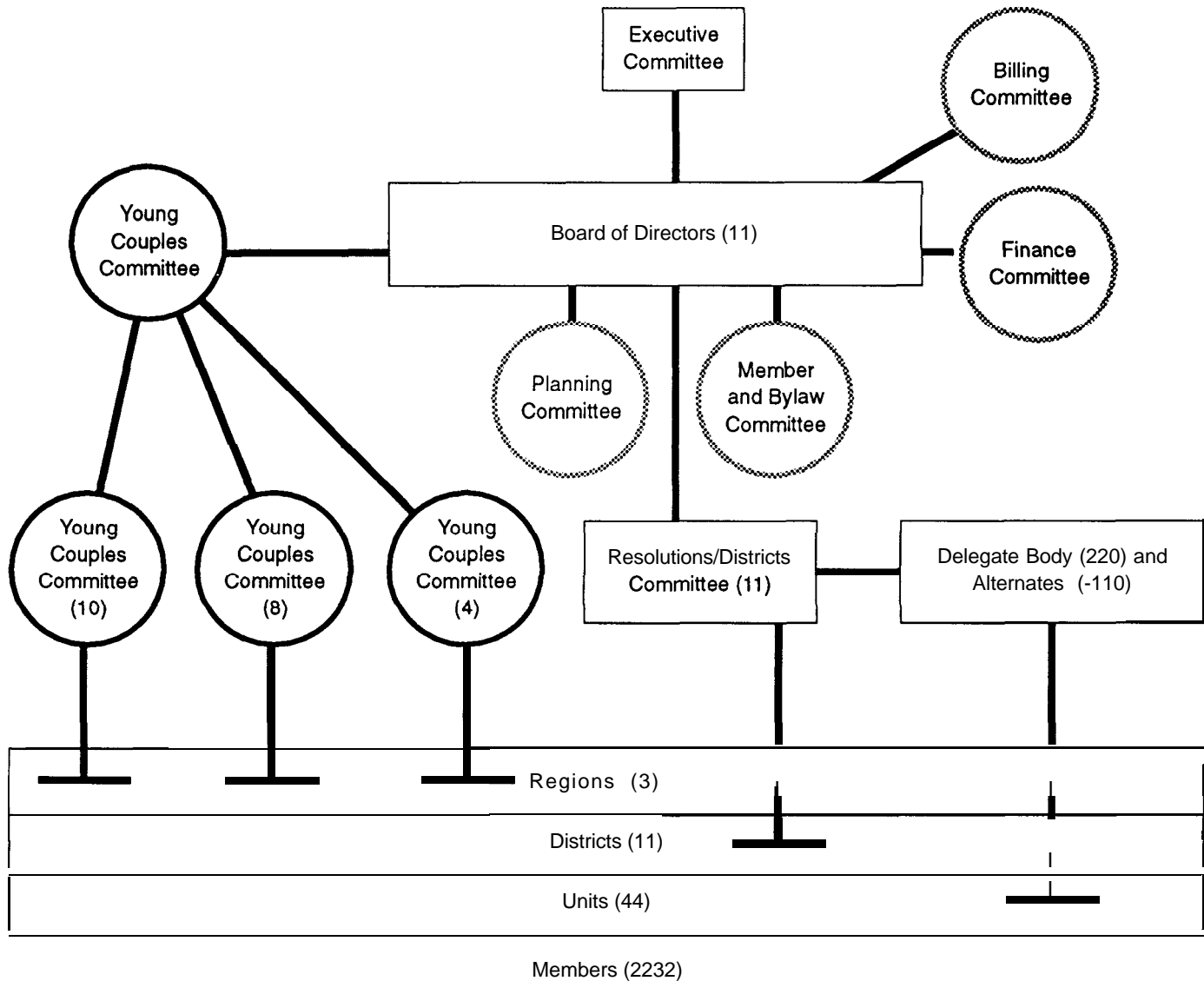
### 3. Job or Task Specialization

“Individuals are generalists when their jobs involve a large number of broadly defined tasks, problems, or issues, but they are specialists when a small number of rather narrow tasks and problems occupy most of their working time (Van de Ven 1980:210).” Job specializations generally are developed within departments, focusing on departmental duties within the confines of delegated departmental authorities. They are assigned to particular positions filled by individuals. (Authority to make final decisions may or may not be delegated to individual positions.) A bureaucracy may have production managers, clerks, and mechanics. A democracy may have board officers, advisory committee members, resolution committee members, and a president of the young leaders group.

### 4. Delegation of Authority

In both bureaucracies and democracies, some decisions are delegated to specific organizational departments and/or positions. For instance, a

Figure 4— Member Structure



(Butler 1988:27)

bureaucracy may delegate to the finance department decisions about which applicants shall be granted credit. A democracy may delegate responsibility for oversight of these credit decisions to its finance committee. Decisionmaking is highly centralized whenever a few people at the top of the organization have the authority to make most decisions. Conversely, decisionmaking is decentralized when the authority to make decisions is widely dispersed among members. The structural task of delegations can be both coordination and/or specialization.

In a cooperative, where member control and influence over decisionmaking is central to definitions of the organization, delegation to the board of

directors and to hired management are both centralizations. Authority is removed (or delegated) to fewer members. When delegated to management, it is entirely removed from direct member decisionmaking. It is centralized out of the realm of direct member decisionmaking and into a member environment, i.e., management and operations.

##### 5. Standardizations or Ad Hoc Communications

“Standardization is the extent to which organizational activities are routinized. Standard procedures include official arrangements which are either formal (documented in writing), regular, or customary (repeated behavior occurring at prescribed time intervals) (Butler 1988:36). “Examples

are strict rules, formal meetings at prescribed times, and standard operating procedures. Both a bureaucracy and a democracy use formally defined procedures. Bureaucracies have credit policies, cash discount policies, sick leave policies, etc. Democracies have established procedures for nominating candidates, making resolutions, notifying members of meetings, etc. The higher the number of formally defined procedures, the higher the level of standardization in the organization.

Examples of ad hoc structural options include temporary committees to handle specific one-time problems, or survey instruments to assess members' views on specific issues. Formal communication alternatives could include permanent committees and positions that bypass other sub-structures with the organization. The structural task of these options is coordination.

Complex organization and democratic organization share many similarities and are suited to similar conceptual treatment. Fundamental is that both kinds of organization must resolve the specialization/coordination dynamic and do so using the described structural options. What specific options are exercised and the shape the structure takes depends upon environmental conditions. The following section will again present the structural options, but from an environmental context.

## **CONTINGENCY APPROACH TO MEMBERSHIP STRUCTURE**

From a contingency theory approach, structural design choices must consider accommodations that mesh environmental contingencies with specialization/coordination to account for member control. Five environmental contingencies will be addressed in this report—quantitative complexity, diversity, qualitative complexity, stability, and environmental capacity.

*Complexity/Diversity* refers to the manageability of problems facing an organization (Van de Ven and Ferry 1980). Can problems be handled directly or do they need to be subdivided? Are the demands so great in number that they overburden an organization so nothing can be done? Are they

so complicated, that technical training is required to resolve them?

The first set of problems is termed “quantitative complexity.” The second set is “technical complexity.” Diversity is similar to quantitative complexity. A number of demands are placed on an organization, although from several different sources.

*Stability/Instability* refers to the speed with which change in an organization's environment occurs. When a cooperative works in a stable environment, the time and nature of demands basically are known, or at least roughly predictable in character and occurrence. In an unstable environment, events occur rapidly and tend to be unpredictable.

*Environmental Capacity* refers to the richness or poorness of the field in which the organization works. In a rich field, the organizational goals can be easily met, but in a poor field, goals are difficult to meet. Some business contexts are simply “richer” than others and thus present more opportunity for “success.”

## **Original Cooperative Structuring**

Empirically, when farmers pool their marketing and purchasing needs in forming cooperatives, they typically encounter quantitative complexity problems. Not all farmers' needs will overlap. Some will be contradictory and others unique to individual farmers. Farmers have to establish procedures to serve collective versus individual interests. Coordination has to occur through a legitimately held process.

“Authority is the power to decide what is to be done, by whom, and to what standard (Kenny et al., 1986:49).” Members delegate authority to a board of directors via an election process. An organizational form takes shape and diversity among the several members—from an organizational viewpoint—is resolved. The board, as a body, assumes authority and responsibility for managing the cooperative, bringing coordination to the several different member interests.

Members may further delegate to a hired man-

agement. Historically, agricultural cooperatives have been small organizations, providing few, easily understood services for local farmers in local markets. The operations component of the organization may only involve weekly, monthly, or even seasonal management.

Under these circumstances, a member of the board of directors might serve as both director and hired manager. However, many cooperatives have since grown into large and complicated organizations; environments are no longer simple; products and services are many and varied. Management likely requires specialized knowledge and full-time attention to operations. Hiring a full-time professionally trained manager, with delegated authorities may be necessary to bring coordination and interpretation to a technically complex environment that is difficult to manage.

Delegations from members to management also may be due to a quantitatively complex environment. Aside from responsibilities on the board, the farmers-director also have individual farm businesses to operate. They generally cannot be available to perform the range of tasks associated with daily operations of the cooperative. Further, directors hold authority as a board. To require committee decisionmaking for countless operational details would severely hamper organizational effectiveness. Delegation to management quantitatively simplifies the farmer's environment.

These delegations put in place, from the standpoint of initial organizing and structuring, a membership structure with two environments, the *members* themselves, and *management and operations*.

These original structurings suggest:

- 1) The greater the complexity of the farmer environment, the greater the delegation of authority to a board.
- 2) The greater the complexity of the farmer/board environment, the greater the delegation of authority to management and operations.
- 3) The greater the delegation of authority to management, the greater the loss of direct control by members.

In one sense, delegations represent loss of con-

trol. Members give their authority to make decisions to someone else. Generally, operational decisions are delegated to management. Policymaking and oversight provisions are retained for member representatives. Member control becomes differentiated within the structure depending upon whether the goal is representation, policymaking, and/or oversight. Representation is most cogent in response to the member environment and policymaking and oversight to the management environment.

### **The Member Environment: Quantitative Complexity and Diversity**

Contingency theory indicates that an organization facing a diverse environment can improve its performance if it identifies like segments of its environment and establishes separate structural departments to accommodate each. The like segments of the organization's environment become the basis for dividing the organization into horizontal sections. A marketing cooperative may increase the efficiency of its operations by establishing functional departments for retail, institutional, and international sales.

Large membership cooperatives may have similar members in diverse locations. Departmentation can simplify this environment by geographically dividing the membership. Elected officers can then focus their attention on representing the interests of particular segments of the membership. This strings the structure out horizontally into a series of geographic member districts and division. Other bases of representation are also possible. Members might be divided by type or size of farming operation or membership tenure. These divisions account for member diversity.

These concerns about diversity and quantitative complexity suggest the following relationships:

- 4) The greater the diversity in membership (large numbers of dissimilar characteristics), the greater the need for horizontal division into departments.
- 5) The larger the membership quantitatively (large numbers with similar characteristics),

the greater the need for horizontal divisions into departments.

- 6) The greater the number of horizontal departments, the greater the possibilities for representation.

### **Management and Operations Environment: Technical Complexity**

The technical complexity of an environment increases along with the variety and technical sophistication of activities pursued within it. As cooperative operations add new products, services, commodities, technologies, and market areas, members are presented with an increasingly complex management environment. Member control at the board level—oversight and policymaking—is challenged. Loss of member control may occur as directors are unable to process increasingly more complex information. Contingency theory suggests this complex environment may be simplified with job and/or task specializations. Oversight and policymaking can be enhanced by using specialized committees that deal with specific commodities, markets, or single aspects of operations (e.g., finance, member relations, and marketing). A contingency approach suggests:

- 7) The greater the complexity of management and operations, the greater the relative delegation of authority to management, the greater the loss of direct control by members.
- 8) The greater the delegation of authority to management and operations, the greater the use of specializations within the board.
- 9) The greater the specialization of the board, the greater the oversight and policymaking possibilities.

### **Member and Management Environments: Stability/Instability**

Some organizations operate in relatively unchanging conditions, selling the same products at the same prices to the same members year after year. Other organizations face rapidly changing circumstances. In a stable environment, an organiza-

tion can standardize many of its activities to achieve coordination and predictability. In an unstable environment, it is less appropriate to standardize because new situations constantly occur that do not conform to the rules. The organization must remain flexible to adapt quickly to new circumstances. Many different influences may make a cooperative's environments unstable. Examples are irregular price movements, rapid member turnover, high rates of urbanization, unpredictable demand in international markets, or changing Government policies.

Member control ultimately concerns communication channels. If communication fails during critical periods, so will member input. Various ad hoc communications options such as temporary committees, surveys, and farm visits allow access and coordination to occur. A contingency approach suggests:

- 10) The greater the stability in a member structure environment, the greater the use of standardization options, the greater the certainty of member control possibilities.
- 11) The greater the instability in a member structure environment, the greater the use of ad hoc communications options, the greater the member control possibilities.

### **The Internal Environment: Size**

As size of membership grows, so does the need for horizontal differentiation. Large numbers of horizontal departments in effect present the structure itself with quantitative complexity problems. Departments need to be coordinated with vertical differentiations. Contingency theory suggests:

- 12) The greater the number of horizontal departments created, the greater the need for coordinating vertical departments.
- 13) The greater the number of horizontal and vertical departmentations within a membership structure, the greater the possibilities for representation.

Adding levels of representation to the membership structure includes more individuals to collect information from members, thus improving representation.



However, structure complexity grows with horizontal and vertical differentiations. The structure itself may block contact between the individual member and oversight and policymaking centers. Departmentation of sub-structures may simplify this complexity. Separate department hierarchies may be created for particular functions.

Separate paths from members to the board might take shape in the form of resolutions, districting, delegate, and young member functions. This approach suggests:

- 14) The greater the complexity of the membership structure, the greater the need for specialization of department hierarchies.
- 15) The greater the specialization of department hierarchies, the greater the possibilities for member representation.

Ultimately, the structure must limit itself, generating the following proposition:

- 16) Internal structural complexity (both quantitative and qualitative) imposes limits on horizontal and vertical differentiations, departmentations, and specializations.

### **The Cooperative Environment: Environmental Capacity**

While we have discussed membership structure as resembling an organization, it is in fact part of a larger organization, i.e., the cooperative. The cooperative contains membership, and management and operations departments. The primary membership task is to control management and operations in a manner that continues to meet member needs, as articulated by the members. The environment of operations is in effect the task environment of the entire organization.

Success or failure of an organization depends not only on the actions of the organization, and/or how it is structured, but also on the capacity for success inherent in its environment. Some business contexts are simply "richer" than others and thus present more opportunity for "success." For instance, a retail trade in luxury items is more likely to succeed in a high-income, high population area (a high-capacity environment) than in the poverty-ridden, sparsely populated area (a low-

capacity environment). A business is likely to be more profitable where there is less competition.

Organizations in high-capacity environments may not feel any need to "fine tune" their structures ("If it ain't broke, don't fix it" philosophy). Conversely, an organization is more likely to try for increased control over its operations through structural modifications when faced with a low-capacity environment and small margins for error. Thus, we would expect the relationship between organizational contingencies (such as complexity, diversity, and stability) and membership structures to be stronger in low-capacity environments.

Hage and Finsterbusch (1988) support this position, stating: "motivation or pressure for change results from the identification of a performance or output gap that is valued by organizational decisionmakers. . . . [quoting Leonard (1977)] . . . We know of no stronger impetus to administrative reform than clear, objective evidence of poor performance in a significant output area."

However, we take one theoretical exception to this statement. The control issue is uniquely different in cooperatives compared with investor-owned firms (IFOs). Authority in a cooperative is delegated from the owners, members, and users of services provided. The impact of environmental capacity on membership structure may be more curvilinear-deepening some accommodation, while moderating others. In cooperatives with no delegation of authority, there may be less likelihood to delegate in situations of low environmental capacity. This may be due not only to desires to retain direct control while under pressure, but also to a financial inability to hire and empower a professional management staff.

Further, as members, directors may be more attuned to representation needs and support a more articulated structure in a poor environment. Members may be more ready to seek out the directors. This contingency suggests:

- 17) The poorer a cooperative's environmental capacity, the less delegation of authority to management and operations.
- 18) The poorer the environmental capacity, the greater horizontal and vertical differentiations in the structure.

And as a corollary:

- 19) The poorer the environmental capacity of a cooperative, the less delegations of authority to management, the less operation-driven specializations in the board.

### Proposition List

- 1) The greater the complexity of the farmer environment, the greater the delegation of authority to a board.
- 2) The greater the complexity of the farmer/board environment, the greater delegation of authority to management and operations.
- 3) The greater the delegation of authority to management, the greater the loss of direct control by members.
- 4) The greater the diversity in membership (large numbers of dissimilar characteristics), the greater the need for horizontal divisions into departments.
- 5) The larger the membership quantitatively (large numbers with similar characteristic), the greater the need for horizontal divisions into departments.
- 6) The greater the number of horizontal departments, the greater the possibilities for representation.
- 7) The greater the complexity of management and operations, the greater the relative delegation of authority to management, the greater the subsequent loss of direct control by members.
- 8) The greater the delegation of authority to management and operations, the greater the need for specialization within the board.
- 9) The greater the specialization of the board, the greater oversight and policymaking possibilities.
- 10) The greater the stability in a member structure environment, the greater the use of standardization options, the greater the certainty of member-control possibilities.
- 11) The greater the instability in a member structure environment, the greater the use

of ad hoc communications options, the greater the member control possibilities.

- 12) The greater the horizontal departments created, the greater the need for coordinating vertical departments.
- 13) The greater number of horizontal and vertical departmentations occur, the greater the possibilities for representation.
- 14) The greater the complexity of the membership structure, the greater the specialization of department hierarchies.
- 15) The greater the specialization of department hierarchies, the greater the possibilities for member representation.
- 16) Internal structural complexity (both quantitative and qualitative) imposes limits on horizontal and vertical differentiations, departmentations, and specializations.
- 17) The poorer the environmental capacity of a cooperative, the less the delegation of authority to management and operations.
- 18) The poorer the environmental capacity of a cooperative, the greater horizontal and vertical differentiations in the structure.
- 19) The poorer the environmental capacity of a cooperative, the less the delegation of authority to management, the less operation-driven specialization in the board.

This proposition list has not been generated to test a theory (or its propositions) per se, but to provide a historically based collection of axiomatic statements, that can help clarify member governance in large cooperatives.

Only some of these statements [by design] are testable. Others cannot be accommodated to these set of data and still others are identities meant only to give conceptual continuity and relevance to the propositions as a group. Such approaches help define and explain central concepts and assumptions of related works, bring coherence to such work with its summaries, and help give direction to current and anticipated work and research (Frankfort-Nachmias, Nachmias, 1992). We provide a “pilot-test” of some of the propositions on Wisconsin DHI cooperatives.

## **SOME EMPIRICAL SUGGESTIONS: A PILOT-TEST ON WISCONSIN DHI CO-OPS**

Given an environmental contingency model, choice of data on Wisconsin DHI cooperatives simplified various concerns. All are in the same business-dairy herd records. Each offers a fairly limited number of services. They share the same institutional environment. All are subject to similar technological changes, governmental regulations, policies, programs, and trends in the dairy industry. Given these shared characteristics, we focused on variance in the *immediate* task environments. Methodological concessions are made to number of observations and statistical complexity, given the primary interests in concept, language, and theory development, and not to an empirical grounding of DHI cooperatives. The methodology and measurement techniques used are consistent with those designed by Van de Ven and Ferry (1980) and published in *Measuring and Assessing Organizations*.

All 30 DHI cooperatives in Wisconsin were examined. Twenty-six were "local associations," and four were centrally managed centers (WDHIC centers). Membership structure varied among the local associations and between the local associations and WDHIC centers.

### **Measures of Organizational Contingencies and Membership Structures**

Measures were based on information provided from personal interviews with board chairpersons and managers-key people knowledgeable about information regarding DHI cooperatives. This methodology is based on techniques developed out of the "key informant" and "elite and specialized interviewing" literature (Dexter 1970, Frankfort-Nachmias, Nachmias 1992).

### **Measures of Organizational Contingencies**

We examined these five organizational characteristics: 1) quantitative complexity in size, 2) technical complexity of the cooperative's operations, 3) diversity of members' interests, 4) stability of the organization's environment, and 5) capacity of the organization's environment.

#### 1. Quantitative Complexity

The number of herds on test at the cooperative was used as a production related measure of size. Size varied from 113 to 2,300 herds, with an average of 559 per cooperative.

#### 2. Technical Complexity of Cooperative Operations

A measure of technical complexity should reflect the variety of goods and services the cooperative offers and technical sophistication of its operations. Interviews with leaders revealed that DHI cooperatives offered a range of activities. Some only collect milk samples and do no laboratory analysis. Some operate laboratories to analyze the samples of only their own members. Others check samples of other DHI cooperatives and a few analyze samples for non-DHI organizations such as dairy plants.

The technical sophistication of the laboratories also varied. Some have simple machines that only measure butterfat. Others can measure protein, somatic cells, and other attributes.

Local DHI associations that collect milk samples only, and do no laboratory work, are simple operations. They hire few employees, require minimal capital investments, and do not require skilled laboratory technicians. DHI units with advanced laboratories for multi-county memberships hire relatively large numbers of skilled employees, require significant capital investments, and must balance the conflicting interests of widely dispersed members.

Technical complexity was assessed based on the following categories:

Complexity =

- 1 No laboratory.
- 2 Simple laboratory (butterfat only).
- 3 Advanced laboratory - own members only.
- 4 Advanced laboratory - test for others.

Of the 30 DHI cooperatives polled, 9 had no laboratory, 12 tested only for butterfat, 3 were more advanced and served members only, and 6 had advanced labs that also tested for others.

### 3. Diversity of Member Interests

Queries of the board chairpersons and managers of each DHI unit revealed that the relative proportions of members on official and unofficial tests indicated degrees of member diversity. Breeders of purebred animals are required to produce “official” records to verify claims about their stock. The commercial dairy producer needs only unofficial records for guidance in culling, feeding, etc. Breeders use DHI records as an advertising tool. Commercial dairy producers, use them as a management tool. This differing use generated conflicts of interest among members, suggesting it as an appropriate measure of diversity.

When the proportions of members on official and unofficial test are broadly unequal (nearly 100 percent in one category), member diversity is understood as extremely low. In such cases, there are few members whose interests diverge from the bulk of the membership. However, when the proportions of members on official and unofficial test are nearly equal (about 50 percent in each category), diversity of member interests is considered as extremely high.

This formula was used to measure diversity:  $\text{diversity} = 1 - \text{absolute value of (Percent Official} - \text{Percent Unofficial)}$ . This formula yields a linear measure that varies from zero to 1.00, with 1.00 representing the highest level of diversity. Actual measures among the DHI cooperatives ranged from 0.56 to 0.98, with the group presenting an average score of 0.78.

### 4. Measuring Stability:

Board chairpersons identified 21 and managers saw 23 different environmental factors that they believe influenced the stability of the cooperative’s environment. However, change in cow numbers in the cooperative territory was the factor most often mentioned by managers and directors as indicative of stability. We used the reported IO-year changes in cow numbers in each cooperative’s territory. The percentage change varied from 81 to 98.8 percent.

### 5. Capacity of the Cooperative’s Environment

Some business environments are simply richer in opportunity than others. DHI managers and directors identified cow availability most often as the major influence on the success of their operations. Large numbers of cows in small geographic areas lower transportation costs for field supervisors and milk sample collections.

Given these reports, the following capacity measure was used:

$$\text{Cow Capacity (Density)} = \frac{\text{Total Number in Territory}}{\text{Land Area in Square miles}}$$

[While key informants identified this measure as most important in determining capacity, interpretation suggests that it reflects cow capacity only and not other influences such as firm competition.]<sup>2</sup> Cow densities varied in DHI cooperative territories from about 10 per square mile to about 92 cows. The average was about 48 cows per square mile.

### Measuring Member Structure Characteristics

Five characteristics of member structure were identified that can be modified in response to the contingencies a cooperative may face: horizontal divisions, vertical levels, specialization, delegation of authority, and standardization. We used simple summations of ratings, and structural levels and divisions, consistent with Van de Ven and Ferry’s (1980) work on organizational design.

### 6. Measuring Horizontal Divisions

According to contingency theory, an organization facing a diverse environment will be more effective if it identifies segments of its environment and establishes separate organizational units to respond to each segment. The measure of horizontal division used here is the number of units the membership is divided into when electing the board of directors.

Cooperatives displayed the following division numbers:

Horizontal Divisions	Number of Co-ops
1	18
2	1
4	1
5	4
6	1
7	3
9	2

While most cooperatives used just one division, several used more than one, and two used as many as nine horizontal divisions.

### 7. Measuring Vertical Levels

Adding vertical levels to a membership structure allows more individuals to collect information from members. An example of a vertical-leveled system is a delegate system. These DHI cooperatives were fairly simple in levels.

Most cooperatives used just one vertical level—members elected directors. In four cooperatives, an additional structure was placed between the members and the primary membership governance body. In one local association, members elected delegates who then elected the board of directors at the annual meeting. In three of the DHI centers, members elected area council members to meet in particular geographic areas. These council members comprised a center council, which provided policy guidance to an individual Wisconsin DHI Cooperative center. Area council members caucus and jointly cast the votes for membership of their area on center council issues. Thus, there was an intermediate structure between members and the central governing body for the organization that aggregated the votes of individual members.

### 8. Measuring Specialization

When a business is complex, more factors must be considered when deciding the best way to do something. In cooperative membership structures, typical specialized roles are board officers such as the president, vice president, secretary, and treasurer. Other specialized roles are created when the board assigns segments of its work to committees or appoints task forces or advisory committees to

advise on particular issues. The following role specializations were displayed:

Level of Specialization	Number of Co-ops
4	10
5	16
7	1
9	3

Interviews revealed specializations included president, vice-president, secretary-treasurer, nominations committee, alternate serving officers, specific personnel, wage and benefit specialists, and various other officers. Measures of role specialization were determined by totaling the number of roles included in the membership structure. Sixteen had 5 specializations, 10 had 4, 3 had 9, and 1 had 7.

### 9. Measuring Delegation of Authority

Delegation of authority was measured by presenting a list of decisions relevant to operating a DHI cooperative and asking respondents to indicate the level of board involvement. The decisions were: hiring or firing field personnel; wages and benefits; personnel policies; operating budget; capital equipment purchases; scope of operations; pricing of services; marketing strategy; and proposals for bylaw changes. Each decision was scored according to the level of board involvement. The scores were then totaled. The score choices used were:

1. The board is not involved in the decision.
2. The board is informed of management's decision.
3. The board presents input for a decision by management.
4. The board formally approves a decision made by management.
5. The board is presented with information, and makes a decision.
6. The board initiates and makes the decision.

The final measure averages total scores of the manager and board president. This yielded a measure with a range from 0 (no board involvement in decisions) to 60 (the board initiates and makes all decisions). Actual scores ranged from 23 to 45.5, with an average score of 40. The lower the score, the greater the delegation of authority. <sup>3</sup>

10. Measuring standardization:

Queries to the board and management on standardization included:

1. Are board meetings scheduled for a year in advance?
2. Is an agenda mailed to directors in advance of board meetings?
3. Are Robert's Rules of Order followed in board meetings?
4. Is there a written job description for directors?
5. Is there a written description of the board's functions?
6. Does the board maintain a policy manual?
7. Does the board set formal goals annually?
8. Does the board participate in a formal planning process?
9. Does the board have a standard employee grievance procedure?
10. Does the board have a standard member grievance procedure?
11. Is the manager systematically evaluated?
12. Does the board regularly review starts and quits?

The number of "yes" answers was averaged to arrive at a measure of the level of standardization. This method yields a measure which can range from 0 to 12 with 0 indicating an extremely low level of standardization and 12 indicating an extremely high level. Actual scores ranged from 1 to 8.5 with 4.27 being the average.

**Correlation Analysis**

We examine correlation coefficients between organizational contingencies and member structures. There are several deliberately imposed limits. Many individual propositions are provided for logical continuity among the set of propositions as a group and are not designed for testing. Because we are analyzing the population of DHI cooperatives, and not sampling a broader population, results pertain only to these set of cooperatives only and cannot be directly extended to other kinds of cooperatives. The small number of observations, while making control of the larger environment possible, limits generalizability. However, results

will tend to support or not support the theory. If supported, the theory can be applied to other research efforts. Organizational concepts and language as applied to membership, are opened for further consideration. Propositions "2, 4, 5, 8, 10, 12, 17, 18, and 19" are considered in this pilot test.

A correlation coefficient indicates the level of association between a pair of variables. A positive association between two variables indicates they tend to move in the same direction; i.e., large values of one variable are associated with large values of the other, and visa versa. A negative correlations indicates an inverse relationship between two variables; i.e., large values of one variable are associated with low values of the other. The absolute size of a calculated correlation always varies between 0.0 and 1.0. The size indicates the relative strength of a relationship between two variables. [For readers unfamiliar with correlation analysis, see footnote 4.]

We base our determination of whether a relationship between variables is weak, moderate, or strong on probabilities associated with significance tests.<sup>5</sup> For this analysis, a correlation of less than 0.25 weak ( $p < .10$ ); 0.25 and 0.30 moderate ( $.10 < p < .05$ ); and more than 0.30 strong ( $p < .05$ ). Table

Table 2— Correlations between organizational contingencies, and member structures.

	1	2	3	4	5	6	7	8	9
Contingencies:									
1. Size									
2. T-Complexity	.58								
3. Diversity	-.47	-.60							
4. Stability	.14	.05	-.05						
5. Capacity	-.26	.02	.32	-.09					
Structures:									
6. Hor. Divs.	.58	.30	-.44	.05	-.19				
7. Vert. Levs.	.88	.30	-.36	.24	-.35	.51			
8. Spec. Roles	.74	.28	-.37	.25	-.29	.54	.34		
9. Delegatn.	.58	.04	-.28	.18	-.20	.17	.03	.56	
10. Stndrdztn	.50	.12	-.17	.23	-.17	.13	.07	.54	.43

Note: Relationships are Pearson correlation coefficients, except for relationships with complexity, which are Spearman rank correlation coefficients.

2 presents the levels of association between measures of organizational contingencies and member structures.

### **Proposition List-Whole Sample**

Propositions 2,4,5,8,10, and 12 are tested for relationships, and then retested-along with propositions 16,17, M-while controlling for environmental capacity.

#### Supported Propositions:

Proposition 2: The greater the complexity of the farmer/board environment, the greater the delegation of authority to management and operations. Organizational complexity can entail two dimensions, “quantitative complexity” or “size,” as well as “qualitative complexity” or “T-complexity” (table 2). The relationship between quantitative complexity (Size) and delegation of authority to management and operations (Delegatn), was supported with a strong correlation of 0.58.

Quantitatively complex environments are associated with greater degrees of delegated authority to management and operations. However, the relationship between technical complexity (T-complexity) and delegation of authority (Delegatn) was not supported with only a 0.04 correlation revealed.

Proposition 5: The greater the quantitative complexity (Size) the greater the horizontal departmentation. The relationship between quantitative complexity (Size) and horizontal departmentations (Hor. Divs.) was strongly supported (0.58). It was found that quantitatively complex environments were associated with greater degrees of horizontal departmentation.

Proposition 8: The greater the delegation of authority to management and operations, the greater the specialization of the board. The relationship between delegation of authority (Delegatn) and specialization (Spec. Roles) was strongly supported (0.56 correlation). It was found that greater delegations to management and operations are associated with greater specialization of the board.

Proposition 10: The greater the stability in the member environment, the greater the standardiza-

tion of procedures. The relationship between stability and standardization (Stndrdznt) was supported, but rather weakly (0.23 correlation). The greater the stability, the greater the standardization of procedures.

Proposition 12: The greater the horizontal departments created, the greater the coordinative vertical departments expected to occur. The relationship between horizontal departments (Hor.Divs) and vertical levels (Vert.Levels.) was strongly supported (0.51 correlation). It was found that structures with a series of horizontal departments also have greater vertical levels.

#### Propositions Not Supported:

Proposition 2: The greater the technical complexity of the farmer/board environment, the greater the delegation of authority to management and operations. The relationship between technical complexity (T-complexity) and delegation of authority (Delegatn.) was not supported (0.04 correlation).

Proposition 4: The greater the diversity in membership (large number of dissimilar characteristics), the greater the horizontal departmentation. The relationship between diversity and horizontal departmentation was not supported. Rather, a strong inverse relationship was found (-.44 correlation). Results tend to mimic those of “capacity” and will be discussed further with presentation of environmental capacity influences.

The remaining propositions were not measurable given the focus of the study, and/or the lack of complexity with these specific cooperatives.

### **The Influence of Environmental Capacity**

We previously suggested relationships between contingencies and structural design are influenced by the environmental capacity of the overall organization. (See initial list of propositions on page 12). Proposition 18 suggested structural relationships with the environment would be stronger in poor capacity environments. We also suggested in caveat, that the perceived need for control by decisionmakers may be stronger in these areas. And in a cooperative, this may take shape as less delega-

**Table 3 — Relationships between contingencies and member structures with capacity controlled.**

	All (n=30)	High Density (n=15)	Low Density (n=15)
Relationship			
Size/Horizontal divisions	.57	-.25	.69
Size/Vertical divisions	.88	<sup>1</sup>	.89
Size/Specialized roles	.74	.17	.74
Size/Standardized procedures	.50	-.24	.62
T. Complexity/Vertical divisions	.30	<sup>1</sup>	.43
T. Complexity/Specialized roles	.28	.58	.09
T. Complexity/Delegation	-.04	.22	.04
Diversity/Horizontal divisions	-.44	-.06	-.58
Stability/Standardized procedures	.23	.49	.03

<sup>1</sup> Correlation cannot be computed because values for "vertical divisions" are all 1.

Note: **Pearsons** correlation coefficients, complexity-Speannan rank correlation coefficients.

tion of authority to management and operations, **and** greater retention of decisionmaking authority by the board (proposition 17). As a corollary (proposition 19), we suggested less delegation should be associated with less specialization at the board level.

Table 3 indicates these relationships are partially borne out. There are strong relationships between size (quantitative complexity) and the various structural measures of horizontal and vertical differentiation in the low-capacity environments. While no correlation is found between the Delegation/Technical Complexity relationship in the low-capacity environments, a moderate one is found in the high-capacity environments. And while no relationship is found between Specialized role/T. Complexity in the low-capacity environments, a strong relationship is found in the high-capacity environments.

Propositions 17, 18, and 19 are supported when considering environmental capacity. The strong Stability/Standardization correlation in the high-density areas is supportive as well, suggesting these areas are less task crisis centered, and therefore more stable, allowing for standardization to occur.

Diversity of membership and its relationship to structure (proposition 4), is "not supported," and also shows a strong inverse relationship-opposite from that expected. The horizontal differentiations that occur in the cooperatives are predominantly based on geographic location, not on type of farming operation. Zero order relationships between capacity and structures in table 2 parallel those between diversity and structures. The relationship between diversity and capacity itself is strong and positive (0.32 correlation). This suggests high capacity environments are rich enough to support both dairy product production and breeding enterprises.

As with other relationships, when capacity is controlled, the relationship between contingencies (Diversity) and structure (Horizontal differentiation) deepens. "Diversity" as measured in this study may be more reflective of the capacity of the environment of dairy herd production.

## CONCLUSION

Most agricultural cooperatives began as relatively small, local, and single-product organizations. They were highly accessible to and easily understood by their members. Many of these small agricultural cooperatives have grown into large multi-product businesses using sophisticated technologies and serving large geographical territories.

These large cooperatives use bureaucratic structures and procedures to coordinate and control their complex operations, divide their work among various departments and levels of the organization, hire professionals and specialists to make specific decisions, and use standardized reports and procedures.

Although these bureaucratic structures and procedures make cooperative operations more efficient, they challenge the ideal of democratic member control. If information demands are so large that members cannot process them (quantitative complexity), or so technical that members lack skill or time to figure them out (technical complexity), or if demands change so rapidly that a timely response is impossible (instability), the organization may fail. Failure from a membership structure



perspective is failure in member control, in representation, oversight, and policymaking.

An earlier paradigm of member control research tended to focus at the social-psychological level of individual farmers. It sought answers to such questions as how to get farmers to meetings, voting, involved in holding office, and patronizing their cooperative.

A newer paradigm looks at an organizational level of membership and at membership structure-if not an organization itself-very similar to one. While earlier questions and answers remain important, membership as organization needs to be understood so new strategies may be produced to help answer previous and newer questions.

New answers may include not only social-psychological ones, but such organizational strategies as creating departments to handle quantitative complexity, job specializations to handle technical complexity, delegations of authority to handle both aspects of complexity, and various standardization and ad hoc communication alternatives to handle stability/instability.

This report analyzes membership at the organizational level by developing a listing of axiomatic statements to help articulate central concepts and assumptions, and to provide a basis for developing later research hypotheses. While the empirical aspects of this work are fairly limited in application, various propositions have been supported, showing promise for an organizational contingency theory approach to membership. and eventually member control.

## FOOTNOTES

1 Appreciation is gratefully extended to Drs. Alton Thompson and Keith Warner for their review. However any omissions or errors in the manuscript are the full responsibility of the co-authors. A much abbreviated version of this report, emphasizing the theory, will appear in the *Journal of Agricultural Cooperation*, 1994.

2 More sophisticated analyses would likely include such capacity-related variables as competition from other organizations. Interviews in this study revealed that these managers and directors held cow density as the major determinant of capacity for these cooperatives. Unfortunately, we cannot know from data from these 30 cooperatives what proportion of total variability in capacity may be due to cow density versus related variables.

3 As originally constructed, this variable reflected centralization of decisionmaking within the board. It was later reconceptualized and recoded to reflect delegation to management. Variable values were therefore weighted with a -1 to reflect this inverse change.

4 Readers unacquainted with this analysis need only know a few things to understand correlation numbers. Correlations measure relationships between variables. For example, the daily temperature and amount of cloudiness are variables. Correlation numbers can only vary between 0.0 and 1.0. The larger the absolute size of the correlation number, the stronger the relationship between the two variables. If the correlation measure between the amount of change in the daily temperature, and the amount of change in cloud cover is [0.7,] this suggests there is a fairly strong relationship between changes in the daily temperature and how much of the sky is covered with clouds.

Correlation numbers also have a sign-either positive or negative. Positive signs imply that when two variables change together, they change in the same direction. Negative signs imply they change in opposite directions. For example, if the

correlation between changes in the daily temperature and the amount of cloud cover in the above example was found to be -0.8, we would know that as larger proportions of the sky are overcast, daily temperature readings will be lower-i.e., more clouds, the lower the temperatures.

One might introduce a third variable, the probability of rain. If a correlation of +0.75 was found between cloud cover and the probability of rain, this number suggests there is a strong relationship between cloud cover and rain-i.e., the more cloud cover, the greater the likelihood it will rain.

5 These Wisconsin DHI cooperatives constitute a population of cooperatives, rather than a random sample, so inferential statistics are not used. The measures of association between variables are not estimates of population parameters. They are the levels of association which exist among the variables in this population. The results of this analysis pertain to this set of cooperatives. However, these results can be used to support (or not to support) the theory developed. The theory, if supported, can then be applied to other kinds of cooperatives for further development.

## GLOSSARY

**Coordination:** Focusing and bringing together various disparate entities, behaviors, and decisions.

**Delegation of Authority:** Passing the legitimacy to make sets of decisions to someone else or to another position. Members delegate authority to the board of directors and to managers. Delegation may serve a coordination and/or a specialization function.

**Democracy:** A system of governance based on **one-person one-vote** determination of decisions.

**Department:** An organizational design option for processing quantitative and qualitative complexity. Departments serve a specialization function.

**Diversity:** A condition in an organization's environment. It creates stress in decisionmaking due to large numbers of differing demands placed on the organization.

**Division of Labor:** Dividing up tasks and assigning them to individuals, and/or organizational structures.

**Quantitative Complexity:** A condition in an organization's environment. It creates stress in **decision-making** due to large numbers of similar demands placed on the organization.

**Environmental Capacity:** A condition outside of an organization or an organizational structure. It refers to the richness or poorness of opportunities for meeting organizational goals and objectives?

**Governance:** The process of governing an organization in the collective interests of the owner-user constituents of a cooperative.

**Hierarchy:** Multi-level structures of authority, responsibility, and behaviors.

**Horizontal Differentiation:** Stringing out of **organi-**

zational departments, generally to serve a specialization function.

**Management and Operations Environment:** That part of a cooperative oriented to realizing goals and objectives of the overall organization. It is outside of, or an environment to, the membership structure.

**Member Control:** The process of governing an organization in the collective interests of the owner-user constituents of a cooperative.

**Member Environment:** The owners, controllers, and users of a cooperative. They represent an environment to the membership structure.

**Membership Structure:** A stable coordination of member positions ideally designed for member governance. It is a mechanism for coordinating specializations among a series of positions.

**Organizational Contingency:** Conditions existing outside an organization or structure that create uncertainty and that stress decisionmaking within an organization.

**Oversight and Policymaking:** Processes of setting broad guidelines for the management and operations of the organization, and the review of such guidelines to assess if they have been realized.

**Qualitative Complexity:** A condition in an organization's environment. It creates stress in decision-making processes, due to demands for sophisticated and/or specialized knowledge.

**Quantitative Complexity:** A condition in an organization's environment. It creates stress in decision-making due to large numbers of similar demands.

**Stability/Instability:** A condition in an organization's environment referring to how quickly or slowly change occurs.

**Specialization:** Subdividing tasks as in a division of labor.

**Standardization:** An organizational design option that can routinize demands, and serve as a coordination function.

**Technical Complexity:** A condition in an organization's environment. It creates stress in decision-making due to requirements for sophisticated and/or specialized knowledge.

**Vertical Differentiation:** Building up of an organizational structure. It serves a coordination function.

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